

NIST Technical Note NIST TN 2260

# Per- and Polyfluoroalkyl Substances in Firefighter Turnout Gear Textiles Exposed to Abrasion, Elevated Temperature, Laundering, or Weathering

Andrew C. Maizel Andre Thompson Meghanne Tighe Samuel Escobar Veras Alix E. Rodowa **Ryan Falkenstein-Smith** Bruce Benner Kathleen Hoffman Michelle Donnelly Oliva Hernandez Nadine Wetzler Trung Ngu Jessica Reiner **Benjamin** Place John Kucklick **Catherine Rimmer** Rick D. Davis

This publication is available free of charge from: https://doi.org/10.6028/NIST.TN.2260



## NIST Technical Note NIST TN 2260

## Per- and Polyfluoroalkyl Substances in Firefighter Turnout Gear Textiles Exposed to Abrasion, Elevated Temperature, Laundering, or Weathering

Rick D. Davis Michelle Donnelly Samuel Escobar Veras\* Ryan Falkenstein-Smith Oliva Hernandez\* Kathleen Hoffman Andrew Maizel Trung Ngu\* Andre Thompson Meghanne Tighe\* Nadine Wetzler\* *Fire Research Division Engineering Laboratory*  Bruce Benner John Kucklick Benjamin Place Jessica Reiner Catherine Rimmer Alix E. Rodowa Chemical Sciences Division Material Measurement Laboratory

\*Former NIST employees; all work for this publication was conducted while at NIST.

This publication is available free of charge from: https://doi.org/10.6028/NIST.TN.2260

January 2024



U.S. Department of Commerce *Gina M. Raimondo, Secretary* 

National Institute of Standards and Technology Laurie E. Locascio, NIST Director and Under Secretary of Commerce for Standards and Technology This work was carried out by the National Institute of Standards and Technology (NIST), an agency of the US government, and, by statue, is not subject to copyright in USA. Certain commercial entities, equipment, or materials may be identified in this document in order to describe an experimental procedure or concept adequately. Such identification is not intended to imply recommendation or endorsement by the National Institute of Standards and Technology, nor is it intended to imply that the entities, materials, or equipment are necessarily the best available for the purpose. The policy of NIST is to use metric units of measurement in all its publications, and to provide statements of uncertainty for all original measurements. In this document, however, data from organizations outside NIST are shown, which may include measurements in non-metric units or measurements without uncertainty statements.

#### **NIST Technical Series Policies**

Copyright, Fair Use, and Licensing Statements NIST Technical Series Publication Identifier Syntax

#### **Publication History**

Approved by the NIST Editorial Review Board on 2023-09-06

#### How to Cite this NIST Technical Series Publication

Maizel AC, Thompson A, Tighe M, Escobar Veras S, Rodowa AE, Falkenstein-Smith R, Benner B, Hoffman K, Donnelly M, Hernandez O, Wetzler N, Ngu T, Reiner J, Place B, Kucklick J, Rimmer C, Davis RD (2023) Per- and Polyfluoroalkyl Substances in Firefighter Turnout Gear Exposed to Abrasion, Elevated Temperature, Laundering, or Weathering. (National Institute of Standards and Technology, Gaithersburg, MD), NIST Technical Note (TN) NIST TN 2260. https://doi.org/10.6028/NIST.TN.2260

#### **NIST Author ORCID iDs**

Bruce Benner: 0000-0002-7589-5625 Rick Davis: 0000-0003-2264-0490 Michelle Donnelly: 0000-0003-1800-5515 Samuel Escobar Veras: 0000-0002-0700-3250 Ryan Falkenstein-Smith: 000-0001-7039-5835 Kathleen Hoffman: 0000-0003-4320-0742 John Kucklick: 0000-0003-0327-0519 Andrew Maizel: 0000-0003-0327-0519 Andrew Maizel: 0000-0002-2981-5241 Benjamin Place: 0000-0002-2981-5241 Benjamin Place: 0000-0002-1419-6062 Catherine Rimmer: 0000-0001-6734-6629 Alix E. Rodowa: 0000-0002-3990-2111 Andre Thompson: 0000-0001-5717-6902 Meghanne Tighe: 0000-0002-8930-892X

#### **Contact Information**

rick.davis@nist.gov

#### Abstract

This is the second report in NIST's response to the National Defense Authorization Act for Fiscal Year 2021, titled the "Guaranteeing Equipment Safety for Firefighters Act of 2020.". The first report, NIST Technical Note 2248, provides a baseline that defines the type, concentration, and prevalence of per- and polyfluoroalkyl substances (PFAS) in textiles used in the construction of new/unused Firefighter's jacket and pants. In this report, NIST Technical Note 2260, NIST is reporting the PFAS measured in the same jacket and pants textiles and using the same PFAS analyte list in TN 2248 after these new/unused fabrics are physically stressed.

Textiles used in the construction of structural firefighter turnout gear have been found to contain per- and polyfluoroalkyl substances (PFAS) as well as fluoropolymer membranes and durable water repellent treatments containing fluorinated polymers. Additionally, older and used turnout gear has been found to contain greater concentrations of PFAS compared with new gear, though the source of these elevated PFAS concentrations is still under investigation. To determine if the stresses that turnout gear textiles encounter during typical use could contribute to the observation of higher PFAS concentrations, this National Institute of Standards and Technology Technical Note reports the concentrations of 51 PFAS in 20 firefighter turnout gear textiles following exposure to abrasion, elevated temperature, laundering, or weathering, which is a combined exposure to ultraviolet radiation and elevated humidity. Compared with corresponding concentrations in unstressed textiles, individual and summed PFAS concentrations in all textile types were higher following abrasion but were similar or lower following laundering. Additionally, summed PFAS concentrations were higher in outer shell textiles following exposure to elevated temperature and weathering. For example, the median summed PFAS concentrations among durable water repellent treated outer shell textiles rose from 1430 µg/kg when new to 3500 µg/kg following abrasion, 4420  $\mu$ g/kg following exposure to elevated temperatures, and 3540  $\mu$ g/kg following weathering, while it fell to 963 µg/kg following laundering. These changes in summed PFAS concentrations with stressing largely reflected changes in the concentrations of PFAS that were present in the highest concentration in unstressed turnout gear textiles: 6:2 FTMAC and 6:2 FTOH. While physical stressing may contribute to altered PFAS concentrations in stressed compared with unstressed turnout gear textiles, the mechanisms responsible for these changes cannot be authoritatively identified by the targeted analytical approach employed here. For example, the analytical approach used in this report cannot distinguish between PFAS produced by the chemical transformation of PFAS that were excluded from the targeted analyte list and increased PFAS extraction due to degradation of firefighter gear textiles and associated fluorinated polymer treatments.

## Keywords

Abrasion; durable water repellent; firefighter; laundering; moisture barrier; outer shell; per- and polyfluoroalkyl substances; PFAS; stressing; turnout gear; thermal liner; weathering; ultraviolet radiation

## **Table of Contents**

Executive Summary1
1. Introduction2
2. Materials and Methods4
2.1. Chemicals and Consumables4
2.2. Structural Firefighter Turnout Gear Textiles4
2.3. PFAS Analytical Standards5
2.4. PFAS Analysis
2.5. Abrasion
2.6. Elevated Temperature9
2.7. Laundering9
2.8. Weathering10
3. Results11
3.1. Abrasion11
3.1.1. Change in Textile Mass with Abrasion11
3.1.2. PFAS Occurrence and Concentration in Abraded Firefighter Gear Textiles12
3.1.3. Change in PFAS Occurrence and Concentration Following Abrasion15
3.2. Elevated Temperature17
3.2.1. Change in Textile Mass with Exposure to Elevated Temperature
3.2.2. PFAS Occurrence and Concentration in Firefighter Gear Textiles Exposed to Elevated Temperatures
3.2.3. Change in PFAS Occurrence and Concentration Following Exposure to Elevated Temperature
3.3. Laundering
3.3.1. PFAS Occurrence and Concentration in Laundered Firefighter Gear Textiles23
3.3.2. Changes in PFAS Occurrence and Concentration Following Laundering25
3.4. Weathering
3.4.1. PFAS Occurrence and Concentrations in Weathered Outer Shell Textiles27
3.4.2. Change in PFAS Occurrence and Concentration in Weathered Outer Shell Textiles 29
3.5. N:2 FTS Concentrations in Moisture Barrier Textile MB-E
4. Discussion
5. Summary
6. Future Work40
7. References
Appendix A. Experimental Details114

A.1. Materials	114
A.1.1. Firefighter Turnout Gear Textiles	114
A.1.2. PFAS Analytical Standards and NIST Reference Materials	117
A.1.3. Method Reproducibility Material (OS-FRM)	124
A.2. PFAS Analysis	124
A.3. Quality Control Results	124
A.3.4. Reporting Limits	125
A.3.5. NIST Reference Materials 8446 and 8447	125
A.3.6. Method Reproducibility Materials (OS-FRM)	126
A.3.7. PFAS Concentrations. in Unstressed Firefighter Gear Textiles	128
A.3.8. PFAS Concentrations in Stressed Firefighter Gear Textiles	128
Appendix B. List of Abbreviations and Acronyms	143

## List of Tables

Table 1. PFAS class names and abbreviations as well as individual compound names,
abbreviations, analytical methods used for quantification of individual PFAS (i.e., NV for
nonvolatile, SV for semivolatile, or V for volatile) as well as Chemical Abstract Service Registry
Numbers (CAS RN) of all PFAS analyzed in this technical note7
<b>Table 2.</b> Mean and standard deviation of measured fractional mass change in textile following
abrasion. Positive values indicate increased mass while negative values indicate decreased
mass. * Indicate significantly different (P < 0.05, paired <i>t</i> -test) masses before and following
abrasion12
<b>Table 3.</b> Measured mass changes in textile samples following thermal stressing. Positive values
indicate increasing mass and negative values indicate decreasing mass. Statistical significance
of mass changes was not evaluated due to the low number of replicates. Where multiple
measurements were made, individual measurements are separated by a comma
<b>Table 4.</b> Median changes in summed PFAS concentrations by stressing and textile type.
● ● > + 150 %, ● + 25 % to + 150 %, <sup>●</sup> - 25 % to + 25 %, ● < - 25 %. NS – not studied33
<b>Table 5.</b> Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of
triplicate measurements) and reporting limits (RL) for abraded MB-A
<b>Table 6.</b> Measured PFAS concentrations ( $\mu$ g-PFAS / kg-textile; mean ± standard deviation of
triplicate measurements) and reporting limits (RL) for MB-A following exposure to elevated
temperature
<b>Table 7.</b> Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of
triplicate measurements) and reporting limits (RL) for laundered MB-A
Table 8. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of
triplicate measurements) and reporting limits (RL) for abraded MB-B
Table 9. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of
triplicate measurements) and reporting limits (RL) for MB-B following exposure to elevated
temperature
<b>Table 10.</b> Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of
triplicate measurements) and reporting limits (RL) for laundered MB-B
Table 11. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of
triplicate measurements) and reporting limits (RL) for abraded MB-C47
Table 12. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of
triplicate measurements) and reporting limits (RL) for MB-C following exposure to elevated
temperature48
Table 13. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of
triplicate measurements) and reporting limits (RL) for laundered MB-C49
Table 14. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of
triplicate measurements) and reporting limits (RL) for abraded MB-D50
<b>Table 15.</b> Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of
triplicate measurements) and reporting limits (RL) for MB-D following exposure to elevated
temperature51
<b>Table 16.</b> Measured PFAS concentrations ( $\mu$ g-PFAS / kg-textile; mean ± standard deviation of
triplicate measurements) and reporting limits (RL) for laundered MB-D
Table 17. Measured PFAS concentrations ( $\mu$ g-PFAS / kg-textile; mean ± standard deviation of
triplicate measurements) and reporting limits (RL) for abraded MB-E
<b>Table 18.</b> Measured PFAS concentrations ( $\mu$ g-PFAS / kg-textile; mean ± standard deviation of
triplicate measurements) and reporting limits (RL) for MB-E following exposure to elevated
temperature54

**Table 19.** Measured PFAS concentrations (µg-PFAS / kg-textile: mean ± standard deviation of **Table 20.** Measured PFAS concentrations ( $\mu$ g-PFAS / kg-textile; mean ± standard deviation of **Table 21.** Measured PFAS concentrations (ug-PFAS / kg-textile: mean ± standard deviation of triplicate measurements) and reporting limits (RL) for MB-F following exposure to elevated **Table 22.** Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of Table 23. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of Table 24. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-A following exposure to elevated **Table 25.** Measured PFAS concentrations (ug-PFAS / kg-textile: mean ± standard deviation of triplicate measurements) and reporting limits (RL) for laundered OS-A. ......61 Table 26. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of Table 27. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for abraded OS-ASC following abrasion. ....63 Table 28. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-ASC following exposure to elevated Table 29. Measured PFAS concentrations (ug-PFAS / kg-textile; mean ± standard deviation of Table 30. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of Table 31. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for abraded OS-B. Table 32. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-B following exposure to elevated Table 33. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of Table 34. Measured PFAS concentrations (µg-PFAS / kg-textile: mean ± standard deviation of triplicate measurements) and reporting limits (RL) for weathered OS-B......70 Table 35. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of Table 36. Measured PFAS concentrations (µg-PFAS / kg-textile: mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-C following exposure to elevated Table 37. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of **Table 38.** Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of **Table 39.** Measured PFAS concentrations ( $\mu$ g-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for abraded OS-D......75 Table 40. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-D following exposure to elevated 

**Table 41.** Measured PFAS concentrations (ug-PFAS / kg-textile: mean ± standard deviation of **Table 42.** Measured PFAS concentrations ( $\mu$ g-PFAS / kg-textile; mean ± standard deviation of Table 43. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of Table 44. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-E following exposure to elevated Table 45. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of Table 46. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for weathered OS-E......82 Table 47. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of Table 48 Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-F following exposure to elevated Table 49. Measured PFAS concentrations (ug-PFAS / kg-textile; mean ± standard deviation of Table 50. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of **Table 51.** Measured PFAS concentrations ( $\mu$ g-PFAS / kg-textile; mean ± standard deviation of Table 52. Measured PFAS concentrations (ug-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-FSC following exposure to elevated Table 53. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of Table 54. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for weathered OS-FSC......90 Table 55. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for abraded OS-G......91 Table 56. Measured PFAS concentrations (ug-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-G following exposure to elevated **Table 57.** Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of Table 58. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of Table 59. Measured PFAS concentrations (µg-PFAS / kg-textile: mean ± standard deviation of Table 60. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for TL-A following exposure to elevated **Table 61.** Measured PFAS concentrations ( $\mu$ g-PFAS / kg-textile; mean ± standard deviation of Table 62. Measured PFAS concentrations (ug-PFAS / kg-textile; mean ± standard deviation of 

Table 63. Measured PFAS concentrations (ug-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for TL-B following exposure to elevated **Table 64.** Measured PFAS concentrations (ug-PFAS / kg-textile; mean ± standard deviation of **Table 65.** Measured PFAS concentrations ( $\mu$ g-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for abraded TL-C......101 Table 66. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for TL-C following exposure to elevated Table 67. Measured PFAS concentrations (µg-PFAS / kg-textile: mean ± standard deviation of Table 68. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for abraded TL-D......104 Table 69. Measured PFAS concentrations (ug-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for TL-D following exposure to elevated Table 70. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of **Table 71.** Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of Table 72. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for TL-E following exposure to elevated Table 73. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of Table 74. Area densities (mean ± standard deviation of triplicate measurements; kg/m<sup>2</sup>) and 
 Table 76. Analytical standard solutions obtained from Wellington Laboratories for use in
 nonvolatile PFAS analysis, with full analyte names, CAS RN, and abbreviations (bold), as well as analyte concentrations with expanded maximum combined percent relative uncertainty. PFHxS, PFOS, MeFOSAA, and EtFOSAA in PFAC30PAR were present as a mixture of **Table 77.** Isotopically labeled internal and injection standard solutions obtained from Wellington Laboratories for use in nonvolatile and semivolatile PFAS analysis, with full analyte names, and analyte concentrations with expanded maximum combined percent relative uncertainty where provided......120 Table 78. Analytical standard solutions purchased from Wellington Laboratories for use in semivolatile PFAS analysis including full analyte names, CAS RN, abbreviations (bold), and analyte concentrations with expanded maximum combined percent relative uncertainty where **Table 79.** Isotopically labeled internal standard solutions obtained from Wellington Laboratories for use in semivolatile PFAS analysis, with full analyte names, and analyte concentrations with Table 80. Analytical standards solutions obtained for volatile PFAS analysis with supplier (WL = Wellington Laboratories, S = Synguest Laboratories), full analyte names, CAS RN, abbreviations (bold), and analyte concentrations with expanded maximum combined percent relative uncertainty where provided......122

Table 81. Isotopically labeled standard solutions purchased from Wellington Laboratories for<br/>volatile PFAS analysis, including full analyte names, and analyte concentrations with expanded<br/>maximum combined percent relative uncertainty where provided.123Table 82. Reference mass fractions for NIST Reference Material 8446 including mean value<br/>and expanded uncertainty with 95 % confidence.123Table 83. Reference mass fractions NIST Reference Material 8447 including mean value and<br/>expanded uncertainty with 95 % confidence.123Table 84. PFAS concentrations (mean ± standard deviation) determined from analysis of twelve<br/>replicates of OS-FRM. Measured concentrations that were below the reporting limit in individual<br/>replicates were not included in average and standard deviation calculations.124

#### **List of Figures**

Figure 1. Mean PFAS concentrations (µg PFAS/kg textile or ppb mass ratio) determined from Figure 2. Summed PFAS concentrations determined from triplicate analysis of firefighter turnout gear textiles following abrasion. Error bars indicate the combined standard uncertainty of summed concentrations. PFAS class is indicated by shade......14 Figure 3. Summed PFAS concentrations determined by triplicate analysis of firefighter gear textiles following abrasion on y-axis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Textile type is indicated in panel label and individual textiles are indicated with marker labels. A 1:1 concentration ratio (i.e., identical concentrations Figure 4. Mean PFAS concentrations (µg PFAS/kg textile or ppb mass ratio) determined from triplicate analysis of firefighter turnout gear textiles after exposure to elevated temperature. .... 19 Figure 5. Summed PFAS concentrations determined from triplicate analysis of firefighter turnout gear textiles following exposure to elevated temperature. Error bars indicate the combined Figure 6. Summed PFAS concentrations determined by triplicate analysis of firefighter gear textiles following exposure to elevated temperatures on v-axis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Textile type is indicated in panel label and individual textiles are indicated with marker labels. A 1:1 concentration ratio (i.e., identical concentrations measured in textile prior to and following stressing) is indicated Figure 7. Mean PFAS concentrations (µg PFAS/kg textile or ppb mass ratio) determined from Figure 8. Summed PFAS concentrations determined from triplicate analysis of firefighter turnout gear textiles following laundering. Error bars indicate the combined standard uncertainty of summed concentrations. PFAS class is indicated by shade......25 Figure 9. Summed PFAS concentrations determined by triplicate analysis of firefighter gear textiles following laundering on y-axis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Textile type is indicated in panel label and individual textiles are indicated with marker labels. A 1:1 concentration ratio (i.e., identical concentrations measured in textile prior to and following stressing) is indicated with a dashed Figure 10. Mean PFAS concentrations (µg PFAS/kg textile or ppb mass ratio) determined from Figure 11. Summed PFAS concentrations determined from triplicate analysis of firefighter turnout gear outer shell textiles following weathering. Error bars indicate the combined standard Figure 12. Summed PFAS concentrations determined by triplicate analysis of firefighter gear outer shell textiles following weathering on y-axis and unstressed firefighter gear textiles on xaxis. Error bars indicate combined standard uncertainty. Textile type is indicated in panel label and individual textiles are indicated with marker labels. A 1:1 concentration ratio (i.e., identical concentrations measured in textile prior to and following stressing) is indicated with a dashed Figure 13. Average summed n:2 FTS concentrations determined from triplicate analysis of MB-E1 following exposure to abrasion (Abr.), elevated temperature (Heat), or laundering (Lau.)....31 Figure 14. Summed n:2 FTS concentrations in MB-E prior to stressing (new), as well as following abrasion (Abr.), exposure to elevated temperatures (Heat), or laundering (Lau.), Error

Figure 15. Summed PFAS concentrations, including n:2 FTSs, determined from triplicate analysis of MB-E following stressing on y-axis and prior to stressing MB-E on x-axis. Error bars indicate combined standard uncertainty. Stressing type is indicated in panel label. Dashed line Figure 16. Summed PFAS concentrations in turnout gear textiles following abrasion (square), exposure to elevated temperatures (triangle pointing up), laundering (diamond), weathering (triangle pointing down), or prior to stressing (circle). PFAS measurements from three reports of unstressed firefighter gear [20,21,24] are also shown. Markers are ordered according to Figure 17. Histograms of reporting limits for individual measurements of (NV) PFAS determined with nonvolatile analytical method (binwidth =  $0.125 \mu g/kg$ ), (SV) PFAS determined with semivolatile analytical method (binwidth = 0.1µg/kg), and (V) PFAS determined with volatile Figure 18. Recoveries of reference PFAS in NIST reference materials 8446 and 8447 across 16 analytical sequences, 100 % recovery is indicated with a solid line while 70 % and 130 % Figure 19. Recovery of PFAS in OS-FRM that had a previously measured concentration over 0.5 µg/kg across 9 nonvolatile, 8 semivolatile, and 10 volatile PFAS extraction batches. 100 % recovery is indicated with a solid line while 70 % and 130 % recoveries are indicated with Figure 20. Summed PFAS concentrations in unstressed firefighter turnout gear textiles according to textile type (MB = moisture barrier, OS = outer shell, SC = scoured outer shell, TL = thermal liner). Error bars indicate the combined standard uncertainty of the summed PFAS concentrations. Bar shade indicates PFAS class. This figure was previously Figure 2 in NIST TN Figure 21. Mean PFAS concentrations determined from triplicate analysis of MB-A (left), MB-B (center), and MB-C (right) either prior to stressing (new) or following abrasion (Abr), exposure to elevated temperatures (Heat), or laundering (Lau.). Concentrations indicated by shade. Figure 22. Mean PFAS concentrations determined from triplicate analysis of MB-D (left), MB-E (center), and MB-F (right) either prior to stressing (new) or following abrasion (Abr), exposure to elevated temperatures (Heat), or laundering (Lau.). Concentrations indicated by shade. Figure 23. Mean PFAS concentrations determined from triplicate analysis of OS-A (left), OS-B (center), and OS-C (right) either prior to stressing (new) or following abrasion (Abr), exposure to elevated temperatures (Heat), laundering (Lau.) or exposure to UV radiation (UV). Concentrations indicated by shade. Measurements not reported due to unmet QC standards are Figure 24. Mean PFAS concentrations determined from triplicate analysis of OS-D (left), OS-E (center), and OS-F (right) either prior to stressing (new) or following abrasion (Abr), exposure to elevated temperatures (Heat), laundering (Lau.) or exposure to UV radiation (UV). Concentrations indicated by shade. Measurements not reported due to unmet QC standards are Figure 25. Mean PFAS concentrations determined from triplicate analysis of OS-G (left), OS-ASC (center), and OS-FSC (right) either prior to stressing (new) or following abrasion (Abr), exposure to elevated temperatures (Heat), laundering (Lau.) or exposure to UV radiation (UV). Concentrations indicated by shade. Measurements not reported due to unmet QC standards are Figure 26. Mean PFAS concentrations determined from triplicate analysis of TL-A (left), TL-B (center), and TL-C (right) either prior to stressing (new) or following abrasion (Abr), exposure to

elevated temperatures (Heat), or laundering (Lau.). Concentrations indicated by shade. Figure 27. Mean PFAS concentrations determined from triplicate analysis of TL-D (left) and TL-E (right) either prior to stressing (new) or following abrasion (Abr.), exposure to elevated temperatures (Heat), or laundering (Lau.). Concentrations indicated by shade. Measurements Figure 28. Mean summed concentrations of PFAS determined from triplicate analysis of volatile PFAS in abraded firefighter gear textiles on y-axis and unstressed firefighter gear textiles on xaxis. Error bars indicate combined standard uncertainty. Marker labels indicate the specific textile. A 1:1 concentration ratio (i.e., identical concentrations measured in unstressed and Figure 29. Mean summed concentrations of PFAS determined from triplicate analysis of nonvolatile PFAS in abraded firefighter gear textiles on y-axis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Marker labels indicate the specific textile. A 1:1 concentration ratio (i.e., identical concentrations measured in unstressed and stressed textile) is indicated with a dashed line......137 Figure 30. Mean summed concentrations of PFAS determined from triplicate analysis of volatile PFAS in firefighter gear textiles following exposure to elevated temperatures on y-axis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Marker labels indicate the specific textile. A 1:1 concentration ratio (i.e., identical concentrations Figure 31. Mean summed concentrations of PFAS determined from triplicate analysis of nonvolatile PFAS in firefighter gear textiles following exposure to elevated temperatures on yaxis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Marker labels indicate the specific textile. A 1:1 concentration ratio (i.e., identical concentrations measured in unstressed and stressed textile) is indicated with a dashed line. 139 Figure 32. Mean summed concentrations of PFAS determined from triplicate analysis of volatile PFAS in firefighter gear textiles following laundering on y-axis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Marker labels indicate the specific textile. A 1:1 concentration ratio (i.e., identical concentrations measured in unstressed and stressed textile) is indicated with a dashed line......140 Figure 33. Mean summed concentrations of PFAS determined from triplicate analysis of nonvolatile PFAS in firefighter gear textiles following laundering on y-axis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Marker labels indicate the specific textile. A 1:1 concentration ratio (i.e., identical concentrations measured in unstressed and stressed textile) is indicated with a dashed line......141 Figure 34. Mean summed concentrations of PFAS determined from triplicate analysis of volatile PFAS in firefighter gear outer shell textiles following weathering on v-axis and unstressed firefighter gear outer shell textiles on x-axis. Error bars indicate combined standard uncertainty. Marker labels indicate the specific textile. A 1:1 concentration ratio (i.e., identical concentrations Figure 35. Mean summed concentrations of PFAS determined from triplicate analysis of nonvolatile PFAS in firefighter gear outer shell textiles following weathering on y-axis and unstressed firefighter gear outer shell textiles on x-axis. Error bars indicate combined standard uncertainty. Marker labels indicate the specific textile. A 1:1 concentration ratio (i.e., identical concentrations measured in unstressed and stressed textile) is indicated with a dashed line .142

#### Preface

This National Institute of Standards and Technology publication (Technical Note 2260) is the second publication provided in response to Section 338 of the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021, titled the "Guaranteeing Equipment Safety for Firefighters Act of 2020." This act directed NIST to: "complete a study of the contents and composition of new and unused personal protective equipment worn by firefighters" and NIST TN 2248 "Per- and Polyfluoroalkyl Substances in New Firefighter Turnout Gear<sup>1</sup> Textiles" was released in response to this directive. The act further directs NIST to examine "the conditions and extent to which per- and polyfluoroalkyl substances are released into the environment over time from the degradation of personal protective equipment from normal use by firefighters…" This Technical Note addresses that directive by reporting per- and polyfluoroalkyl substance (PFAS) occurrence and concentration in structural firefighter jacket and pants textiles following exposure to abrasion, elevated temperature, laundering, or weathering, each carried out according to experimental procedures described in the performance standards that firefighter gear must meet for use in the United States.

This NIST TN was produced through the combined efforts of researchers in the Fire Research Division of the NIST Engineering Laboratory and the Chemical Sciences Division of the NIST Material Measurement Laboratory. Researchers at the National Personal Protective Technology Laboratory of the National Institute of Occupational Safety & Health provided outer shell textiles where the durable water repellent coatings had been scoured by the manufacturer and were responsible for laundering all the textiles in this study.

This is the first report of PFAS concentrations in firefighter gear following exposure to controlled stressing processes and details the change in 51 nonvolatile, semi-volatile, and volatile PFAS following exposure to each of four stresses. Upcoming reports will examine PFAS occurrence and concentrations in other firefighter gear than turnout gear, such as structural firefighter gloves and hoods, and wildland firefighting gear, as well as investigate the lifetime PFAS release potential of firefighter gear during repeated stressing.

<sup>&</sup>lt;sup>1</sup> Structural firefighter "turnout gear" consists of jackets, suspenders, pants, and boots worm by structural firefighters. The NIST Technical Note 2248 and 2260 analyzes the PFAS in the jacket and pants only not in the suspenders or boots.

### Acknowledgments

We thank United States Senator Jeanne Shaheen and her staff for their support of PFAS-firefighter gear research at NIST. Additionally, we thank Crystal Forester from the National Personal Protective Technology Laboratory for providing scoured firefighter turnout gear textiles and laundering all turnout gear textiles.

#### **Author Contributions**

**Bruce Benner:** Methodology, Investigation; **Rick Davis:** Conceptualization, Project Administration, Resources, Supervision; **Michelle Donnelly:** Resources; **Samuel Escobar Veras:** Investigation; **Ryan Falkenstein-Smith:** Methodology, Investigation; **Oliva Hernandez:** Investigation; **Kathleen Hoffman:** Investigation; **John Kucklick:** Validation; **Andrew Maizel:** Conceptualization, Formal Analysis, Investigation, Methodology, Supervision, Validation, Writing; **Trung Ngu:** Investigation; **Benjamin Place:** Resources, Validation, Writing – review & editing; **Jessica Reiner:** Methodology, Validation, Writing – review & editing; **Catherine Rimmer:** Resources; **Alix Rodowa:** Methodology, Investigation, Validation, Writing – review & editing; **Andre Thompson:** Conceptualization, Investigation, Methodology, Resources, Supervision; **Meghanne Tighe:** Investigation, Supervision; **Nadine Wetzler:** Investigation.

#### **Executive Summary**

This National Institute of Standards and Technology publication (Technical Note 2260) evaluates if exposure to physical stressors, similar to those experienced by firefighting gear, alters per- and polyfluoroalkyl substance (PFAS) occurrence and concentrations in the textiles that make up firefighter gear. Twenty moisture barrier, outer shell, and thermal liner textiles were subjected to the abrasion, elevated temperatures, or laundering, while outer shell textiles were also subjected to weathering with ultraviolet radiation and elevated humidity. Fifty-one PFAS were quantified in stressed textiles by targeted analytical methods that coupled solvent extraction with either gas or liquid chromatography-mass spectrometry. This NIST TN follows NIST TN 2248, which determined PFAS occurrence and concentrations in new firefighter gear textiles. The same textiles and PFAS target list were used in both studies.

Across all stressed textiles, 36 PFAS were quantified above reporting limits, with three PFAS (i.e., 6:2 fluorotelomer methacrylate; 6:2 FTMAC, 6:2 fluorotelomer alcohol; 6:2 FTOH, and perfluorobutane sulfonic acid; PFBS) present above 200 µg/kg in at least one stressed textile. Following stressing, summed PFAS concentrations were higher in outer shell textiles than moisture barrier textiles, and lowest in thermal liner and outer shell textiles from which the durable water repellent had been scoured. Abrasion increased summed PFAS concentrations for all textile types (median change in summed PFAS concentration: + 213 %) while weathering (+ 177 %) consistently increased summed PFAS concentrations in outer shell textiles. Laundering produced relatively small changes in summed PFAS concentrations across all textiles (median change - 24 %) and exposure to elevated temperature increased summed PFAS in outer shell textiles (+ 259 %) but resulted in smaller changes in the remaining textile types (- 26 %). Overall, the largest absolute changes in PFAS concentration were observed in outer shell textiles with weathering, where the median summed PFAS concentration increased from 964 µg/kg to 3520 µg/kg. Where stressing increased summed PFAS concentrations, these changes were primarily due to increases in the concentrations of 6:2 FTMAC and 6:2 FTOH, which were also the highest concentration PFAS in unstressed turnout gear textiles, rather than the appearance of previously unobserved PFAS.

Numerous processes may contribute to changes in PFAS concentrations in textiles with stressing such as: changes in the extractable fraction of PFAS due to fluorinated polymer or textile degradation, fluorinated polymer degradation into nonpolymeric PFAS, transformations between PFAS, wash out or volatilization of PFAS, and loss of PFAS associated with dissipated textile fragments. However, the targeted analytical methods used in this study cannot distinguish between PFAS transformations and changes of the fraction of PFAS that are extractable and therefore cannot definitively determine mechanisms underlying changes in measured PFAS concentrations.

This is the first report to quantify changes in PFAS occurrence and concentrations in firefighter turnout gear textiles due to controlled stressing. The results show that stressing, especially abrasion or weathering, can increase measured PFAS concentrations in firefighter gear textiles. Additional research examining firefighter gear for a broader array of target PFAS, determining the extent to which measured PFAS concentrations continue to increase during repeated stressing, and evaluating the extent to which firefighter gear may accumulate PFAS from fire scenes are critical to understand the overall potential PFAS exposure firefighters face from the use of turnout gear.

#### 1. Introduction

Per- and polyfluoroalkyl substances (PFAS) are anthropogenically derived compounds containing at least one perfluoroalkyl moiety ( $C_nF_{2n+1}$ ) and are present in numerous commercial products. One class of PFAS containing commercial products is durable water repellent (DWR) treatments which impart dirt, oil, and water resistance to high performance outer wear [1, 2]. However, there is growing evidence of adverse human health effects from exposure to certain PFAS, including the suppression of vaccine response in human studies [3] as well as negative impacts on development and multiple organ systems in animal studies [4]. In response, the United States Environmental Protection Agency's 2023 Proposed National Primary Drinking Water Regulation has classified both perfluorooctane sulfonic acid (PFOS) [5] and perfluorooctanoic acid (PFOA) [6] as likely human carcinogens in their public comment drafts. In the final 2021 toxicity assessment for GenX chemicals (including HFPO-DA), EPA determined that there is suggestive evidence of carcinogenic potential of oral exposure to GenX chemicals in humans, based on the available data [7]. Additionally, the International Agency for Research on Cancer has identified PFOA as possibly carcinogenic to humans [8] whereas in 2022, CalEPA designated PFOA as Known to the State of California to Cause Cancer.

Firefighters have higher PFAS serum concentrations than the public [9-17]. There are numerous potential PFAS exposure sources suggested for firefighters, such as the use of aqueous film-forming foams (AFFF) and firefighter gear that has been treated with fluorinated polymers or has accumulated PFAS during firefighting activities [18, 19]. Among firefighters, the use of AFFF [11, 12, 16] and direct engagement in firefighting activities (i.e., as opposed to employment as a driver) [9] are associated with higher serum PFAS concentrations. However, the contribution of PFAS from firefighter gear may not be fully appreciated as firefighter serum PFAS concentrations have not been reported for many of the PFAS identified in the highest concentrations in firefighter textiles such as N-methyl perfluorobutane sulfonamido ethanol (MeFBSE), 6:2 fluorotelomer methacrylate (6:2 FTMAC), and 6:2 fluorotelomer alcohol (6:2 FTOH) [20-22].

As specified in the National Fire Protection Association "*Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*" (NFPA 1971), structural firefighting turnout gear includes coats and pants or coveralls as well as gloves, helmets, and footwear [23]. Turnout gear coats, pants, and coveralls typically contain three layers, present in the following order from farthest to closest to the body: outer shell, moisture barrier, and thermal liner. To meet the performance requirements specified in NFPA 1971 for chemical, light, and water resistance, certain layers of turnout gear are commonly treated with fluorinated polymers or include fluoropolymer membranes [20-22, 24]. NFPA 1971 also includes performance specifications related to resistance from typical end-use stresses, such as abrasion (NFPA 1971, § 8.52), heat (§ 8.6), ultraviolet radiation (UV, § 8.62), and laundering (§ 8.24).

To the best of the authors' knowledge, there are no published reports on the effects of controlled stressing on PFAS occurrence and concentrations in firefighter gear, though exposure to UV radiation has been observed to degrade both polyaramid fibers as well as water repellent coatings in turnout gear outer shell textiles [25, 26]. PFAS concentrations in DWR-treated outerwear have been observed to change with exposure to heat, abrasion, weathering, and laundering [27-29]. Following outdoor [27] and laboratory [29] weathering, measured concentrations of individual

PFAS in DWR-treated textiles were up to 100 times higher than measured in the corresponding unstressed textiles. Schellenberger et al. 2022 [27] observed that exposure to abrasion and washing decreased the total fluorine concentrations in DWR-treated textiles that had previously been exposed to outdoor weathering, while van der Veen et al. 2022 [30] observed decreasing perfluoroalkyl acid (PFAA) concentrations in DWR-treated textiles following repeated washing and drying but noted increases in the concentrations of some n:2 fluorotelomer alcohols (n:2 FTOH). The mechanisms responsible for changes in PFAS and total fluorine concentrations in DWR-treated textiles during stressing are still a matter of investigation. PFAS quantification in textiles is typically performed with solvent extraction and mass spectrometry, and the physical degradation of fluorinated polymers or the underlying textiles could increase the fraction of PFAS that are extractable while the degradation of fluorinated polymers could release nonpolymeric PFAS that are quantifiable by mass spectrometry. Additionally, PFAS initially present in a textile may be transformed from species that are not quantifiable to quantifiable with mass spectrometry.

The objective of this NIST report is to communicate the extent to which exposing firefighter gear textiles to stresses related to firefighting activities alter the occurrence and concentration of target PFAS in those textiles. To allow for direct comparison of changes due to stressing, the same textiles and PFAS target list were used in this study as in the unstressed gear study (NIST TN 2248). Twenty firefighter gear textiles were subjected to four stressing processes based on performance tests detailed in NFPA 1971 [23]. Following exposure to abrasion, elevated temperature, laundering, or weathering, the concentrations of 51 PFAS were determined and compared to equivalent concentrations measured in the corresponding textiles prior to stressing. The concentrations reported here provide insight into the amount and mechanisms by which PFAS concentrations in firefighter gear may change as that gear is used for firefighting activities.

#### 2. Materials and Methods

Experimental chemicals and consumables were identical to those used in NIST TN 2248, which reported the occurrence and concentration of PFAS in unstressed firefighter turnout gear textiles and are detailed below (Section 2.1) [22]. Twenty firefighter turnout gear textiles were obtained either from a distributor of firefighter gear or from collaborators at the National Institute for Occupational Safety and Health (NIOSH; Section 2.2). PFAS analytical standards (Sections 2.3 and A.1.2), and analytical techniques (Sections 2.4 and A.2) were also identical to those used in NIST TN 2248 [22], except where indicated below. Details about the methods used to expose textiles to abrasion (Section 2.5), elevated temperature (Section 2.6), laundering (Section 2.7), and weathering (Section 2.8) are also included below.

It should be noted that none of the equipment used for stressing, such as the abrasion foam backing and abrading textile, contributed PFAS to the textiles; therefore, the reported PFAS is from the textiles themselves.

### 2.1. Chemicals and Consumables

Ammonium acetate (Optima LC-MS grade), ammonium hydroxide (Optima grade), ethyl acetate (Optima HPLC and GC grade), and water (Optima LC-MS grade) were obtained from Thermo Fisher Scientific (Waltham, MA).<sup>2</sup> Methanol (OmniSolv LC-MS grade) for high performance liquid chromatography-tandem mass spectrometry (HPLC-MS/MS) mobile phase solutions was obtained from Supelco (Bellefonte, PA), while methanol (Optima LC-MS grade) for all other purposes was obtained from Thermo Fisher Scientific. Nitrogen gas (Ultra High Purity grade) and helium gas (Ultra High Purity grade) were obtained from Roberts Oxygen (Rockville, MD).

High-performance liquid chromatography (HPLC) vials (2 mL capacity, amber glass) and glass vial inserts (250  $\mu$ L) were obtained from Agilent Technologies (Santa Clara, CA). Polyethylene 2 mL vial caps for nonvolatile and semivolatile analysis were obtained from Phenomenex (Torrence, CA) while 2 mL vial caps with polytetrafluoroethylene (PTFE)/silicone septa for volatile analysis were obtained from Agilent Technologies. HPLC vials, inserts, and caps were used as received from their vendors. Supelco Analytical (Bellefone, PA) Supelclean ENVI-Carb solid phase extraction (SPE) tubes (6 mL x 500 mg) were rinsed with 20 mL (2 x 10<sup>-5</sup> m<sup>3</sup>) of 0.1 mol/L (10<sup>2</sup> mol/m<sup>3</sup>) ammonium hydroxide in methanol and dried prior to use. Glass 20 mL capacity scintillation vials, glass Pasteur pipettes, and polypropylene 15 mL centrifuge tubes (Cole-Parmer Instrument Company, Vernon Hills, IL) were used as received. Syringes (1 mL capacity) and syringe filters (0.22  $\mu$ m, nylon) were obtained from Thermo Fisher and rinsed with 1 mL (10<sup>-6</sup> m<sup>3</sup>) methanol prior to use.

## 2.2. Structural Firefighter Turnout Gear Textiles

A variety of common turnout gear textiles was purchased in 2020 from a distributor and repairer of firefighter gear, who received them directly from manufacturers. 1.39 m<sup>2</sup> (1.52 m x 0.914 m)

<sup>&</sup>lt;sup>2</sup> Certain commercial equipment, instruments, or materials are identified in this paper to foster understanding. Such identification does not imply recommendation or endorsement by the National Institute of Standards and Technology, nor does it imply that the materials or equipment identified are necessarily the best available for the purpose.

each of six moisture barrier (MB-A, MB-B, MB-C, MB-D, MB-E, MB-F), five thermal liner (TL-A, TL-B, TL-C, TL-D, TL-E), and seven outer shell textiles (OS-A, OS-B, OS-C, OS-D, OS-E, OS-F, OS-G) were purchased without regard to color. NIST purchased the textiles prior to assembly in firefighter turnout gear and comply with NFPA 1971 requirements [6].

Two "scoured" outer shell textiles (OS-ASC, OS-FSC) were obtained from the National Personal Protective Technology Laboratory of NIOSH, who received the textiles from the manufacturer following the scouring of applied DWR treatments. Except for the scouring of DWR treatments, these textiles were similar to two DWR-treated outer shell textiles included in this study (i.e., OS-A and OS-F), except for colors (Table 74). Due to the lack of DWR treatment, the two scoured outer shell textiles were not established to be NFPA 1971 compliant. Average area densities and images of all turnout gear textiles used in this report are shown in A.1.1 (Table 74).

Moisture barrier textiles were comprised of an expanded polytetrafluoroethylene (ePTFE) membrane with an aramid fiber substrate while outer shell textiles consisted of aromatic polyamide (aramid) fiber blends that were woven with either plain, twill, or ripstop weave patterns. Thermal liner textiles were made from aramid fiber or aramid-blend cloth and included one or two additional layers of attached aramid fiber batting. Prior to stressing, textiles were individually stored in the dark, at room temperature, in plastic resealable baggies.

## 2.3. PFAS Analytical Standards

In addition to the 53 PFAS that were quantified in unstressed firefighter gear textiles in NIST TN 2248 [22], PFAS concentrations in of two n:2 fluorotelomer acrylates: 8:2 fluorotelomer acrylate (8:2 FTAcr) and 10:2 fluorotelomer acrylate (10:2 FTAcr) are reported here. However, due to analytical issues, concentrations of four n:2 fluorotelomer sulfonates (n:2 FTSs) that were quantified in NIST 2248 are not reported here or included in evaluations of the effects of stressing, with the exception of n:2 FTS concentrations in moisture barrier textiles MB-E (Section 3.5). Information for the 51 PFAS quantified in this technical note along with their associated reference standards is provided in Table 1 and Section A.1.2.

## 2.4. PFAS Analysis

Three analytical methods for the identification and quantification of PFAS were utilized and are referred to as "nonvolatile", "semivolatile", and "volatile". The analytical method used to quantify PFAS concentration is shown in Table 1. Extensive description of these methods were previously described in NIST TN 2248 [22]. Briefly, in the nonvolatile method PFAS were extracted from stressed firefighter gear textiles by sonication in methanol at 25 °C with subsequent centrifugation, filtration through graphitized carbon (ENVI-Carb SPE tubes; 500 mg x 6 mL), and evaporation to dryness under nitrogen at 40 °C. Dried nonvolatile extracts were reconstituted in methanol and analyzed by LC-MS/MS. PFAS analyzed by the semivolatile and volatile analytical methods were extracted simultaneously by sonication in ethyl acetate at 25 °C and subsequent centrifugation, filtration through graphitized carbon (ENVI-Carb SPE tubes, 500 mg x 6 mL), and evaporation to 2 mL under nitrogen at 35 °C. The combined semivolatile and volatile extracts were then analyzed by LC-MS/MS or GC-MS, respectively.

Summed PFAS concentrations that were below reporting limits or did not meet quality control standards were given a value and variance of zero. Reporting limits are PFAS specific. Reporting limits for nonvolatile and semivolatile PFAS were  $< 0.5 \,\mu$ g/kg. Reporting limits for volatile PFAS were much higher; no reporting limit was  $< 8.6 \,\mu$ g/kg and some were over 100  $\mu$ g/kg. More details on report limits are available in Appendix A.3.4 and Tables 5 – 73.

Prior to analysis, the samples were stored in the dark, at ambient temperature, and inside plastic resealable bags for up to 602 days. To investigate if volatile PFAS concentrations could change during extended storage, volatile PFAS concentrations were compared among thirteen simultaneously prepared cuttings of outer shell textile OS-FRM that were extracted after between 62 and 602 days of storage. In these cuttings, the concentrations of two volatile PFAS (6:2 FTMAC and 6:2 FTOH) were consistently observed above reporting limits and linear regressions of their measured concentrations over time were not found to be significantly different from 0 (i.e., F < 1). Therefore, no evidence was found that indicated volatile PFAS concentrations were changing over the durations that stressed textiles were stored.

It is worth noting that reporting limits were markedly different for some PFAS in some textiles before and after stressing. The difference in reporting limits between the analysis of stressed and stock textiles especially complicates analysis of the apparent change in 6:2 FTMAC and 6:2 FTOH concentrations in the two scoured textiles (i.e., OS-ASC and OS-FSC). 6:2 FTMAC reporting limits were elevated in the analysis of unstressed compared with stressed textiles because measurements of volatile PFAS in unstressed textiles were made with a model of GC-MS vial cap that contributed 6:2 FTMAC to the measured concentrations. For the analyses of stressed textiles, a different model of GC-MS vial cap was used that contributed lower amounts of 6:2 FTMAC and allowed lower reporting limits to be determined. Similarly, 6:2 FTOH reporting limits were elevated for the determination of unstressed compared with stressed textiles and this was largely due to the use of a calibration range that included lower concentrations of 6:2 FTOH for the analysis of stressed textiles.

**Table 1.** PFAS class names and abbreviations, individual compound names and abbreviations, analytical methods used for quantification of individual PFAS (i.e., NV for nonvolatile, SV for semivolatile, or V for volatile), and Chemical Abstract Service Registry Numbers (CAS RN) of all PFAS analyzed in this technical note.

Class	Name	Analytical Method	CAS RN
	Perfluorobutanoic acid (PFBA)	NV	375-22-4
	Perfluoropentanoic acid (PFPeA)	NV	2706-90-3
	Perfluorohexanoic acid (PFHxA)	NV	307-24-4
	Perfluoroheptanoic acid (PFHpA)	NV	375-85-9
)(1	Perfluorooctanoic acid (PFOA)	NV	335-67-1
Perfluorocarboxylic	Perfluorononanoic acid (PFNA)	NV	375-95-1
cids (PFCA)	Perfluorodecanoic acid (PFDA)	NV	335-76-2
	Perfluoroundecanoic acid (PFUnDA)	NV	2058-94-8
	Perfluorododecanoic acid (PFDoDA)	NV	307-55-1
	Perfluorotridecanoic acid (PFTrDA)	NV	72629-94-8
	Perfluorotetradacanoic acid (PFTeDA)	NV	0376-06-07
	Perfluoropropane sulfonic acid (PFPrS)	NV	423-41-6
	Perfluorobutane sulfonic acid (PFBS)	NV	375-73-5
	Perfluoropentane sulfonic acid (PFPeS)	NV	2706-91-4
erfluoroalkane	Perfluorohexane sulfonic acid (PFHx	NV	108427-53-8
alfonic acids	Perfluoroheptane sulfonic acid (PFHpS)	NV	375-92-8
PFSA)	Perfluorooctane sulfonic acid (PFOS)	NV	45298-90-6
	Perfluorononane sulfonic acid (PFNS)	NV	68259-12-1
	Perfluorodecane sulfonic acid (PFDS)	NV	335-77-3
	Perfluorobutane sulfonamide (FBSA)	NV	30334-69-1
CI 11	Perfluorohexane sulfonamide (FHxSA)	NV	41997-13-1
erfluoroalkane	Perfluorooctane sulfonamide (FOSA)	NV	754-91-6
ulfonamides	<i>N</i> -Methyl perfluorobutane sulfonamide (MeFBSA)	SV	68298-12-4
FASA)	<i>N</i> -Methyl perfluorooctane sulfonamide (MeFOSA)	SV	31506-32-8
	<i>N</i> -Ethyl perfluorooctane sulfonamide (EtFOSA)	SV	4151-50-2
	Perfluorooctane sulfonamido acetic acid (FOSAA)	NV	2806-24-8
erfluoroalkane ulfonamido acetic	<i>N</i> -Methyl perfluorooctane sulfonamido acetic acid (MeFOSAA)	NV	2355-31-9
acids (FASAA)	<i>N</i> -Ethyl perfluorooctane sulfonamido acetic acid (EtFOSAA)	NV	2991-50-6
erfluoroalkane ulonamido	<i>N</i> -Methyl perfluorooctane sulfonamido ethanol (MeFOSE)	SV	24448-09-07
thanols (FASE)	N-Ethyl perfluorooctane sulfonamido ethanol (EtFOSE)	SV	1691-99-2
	Perfluoro-3-methoxypropanoic acid (PF4OPeA)	NV	377-73-1
	Perfluoro-2-ethoxyethane sulfonic acid (PFEESA)	NV	113507-82-7
	Perfluoro-4-methoxybutanoic acid (PF5OHxA)	NV	863090-89-5
er- and	Perfluoro-3,6-dioxaheptanoic acid (3-6-OPFHpA)	NV	151772-58-6
er- and olyfluoroalkyl	Hexafluoropropylene oxide dimer acid (HFPO-DA)	NV	13252-13-6
ther acids (PPEA)	4,8-Dioxa-3H-perfluorononanoate (ADONA)	NV	958445-44-8
emer acius (PPEA)	9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	NV	756426-58-1
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	NV	763051-92-9

Class	Name	Analytical Method	CAS RN
n:2 Fluorotelomer	8:2 Fluorotelomer acrylate (8:2 FTAcr)	V	27905-45-9
acrylates (n:2 FTAcr)	10:2 Fluorotelomer acrylate (10:2 FTAcr)	V	17741-60-5
n:2 Fluorotelomer	6:2 Fluorotelomer methacrylate (6:2 FTMAC)	V	2144-53-8
methacrylates (n:2	8:2 Fluorotelomer methacrylate (8:2 FTMAC)	V	1996-88-9
FTMAC)	10:2 Fluorotelomer methacrylate (10:2 FTMAC)	V	2144-54-9
n:2 Fluorotelomer	8:2 Fluorotelomer acetate (8:2 FTOAc)	V	37858-05-02
acetates (n:2 FTOAc)	10:2 Fluorotelomer acetate (10:2 FTOAc)	V	37858-05-02
	4:2 Fluorotelomer alcohol (4:2 FTOH)	V	2043-47-2
	5:2 Fluorotelomer alcohol (5:2 FTOH)	V	914637-05-1
n:2 Fluorotelomer	6:2 Fluorotelomer alcohol (6:2 FTOH)	V	647-42-7
alcohols (n:2 FTOH)	7:2 Fluorotelomer alcohol (7:2 FTOH)	V	24015-83-6
	8:2 Fluorotelomer alcohol (8:2 FTOH)	V	678-39-7
	10:2 Fluorotelomer alcohol (10:2 FTOH)	V	87017-97-8
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	NV	757124-72-4
n:2 Fluorotelomer	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NV	27619-97-2
sulfonic acids (n:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NV	39108-34-4
	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	NV	120226-60-0

Table 1. (Continued)

#### 2.5. Abrasion

Previously unstressed firefighter turnout gear textiles were abraded against a standard abradant fabric following a method described in NFPA 1971, § 8.52 [23], International Organization for Standardization (ISO) standard 12947-3 "Determination of Abrasion Resistance of Fabrics by the Martindale Method-Part 3" [31] and ASTM standard D4966 "Standard Test Method for Abrasion Resistance of Textile Fabrics, Martindale Abrasion Tester Method "[32] using a Martindale abrasion tester (James and Heal Co. Ltd, United Kingdom). Briefly, circular textile sections, approximately 38 mm in diameter, were cut from each firefighter gear textile with scissors and the mass of each cut section was recorded. The sections were then placed into a specimen holder with a polyurethane foam backing disk. The assembled specimen holder was placed in the Martindale abrasion tester and weight was added to produce a pressure of 9.0 kPA  $\pm$  0.2 kPA between the textile and the abradant fabric. Abradant fabrics, made of worsted wool with a plain weave, were supported on a standard felt. To limit contamination between samples, both the abradant fabrics and polyurethane foam backing disks were replaced between textiles. Additionally, up to four textile samples were abraded simultaneously and therefore glass dome dividers were manufactured and incorporated into the abrasion tester to prevent contamination of one textile from airborne particles released by the abrasion of another textile. Glass dome dividers were rinsed with methanol between stressing sessions to further reduce cross contamination. Each textile specimen was subjected to 20000 rubs with a translational movement that followed a Lissajous figure at a rate of 47.5 revolutions per minute with a maximum stroke length of 60.5 mm. Afterwards, each textile was removed from the abrasion tester and had its mass recorded again. Abraded textiles were stored in the dark at ambient temperature in 15 mL polypropylene centrifuge tubes for between 12 days and 372 days until extraction.

#### 2.6. Elevated Temperature

Previously unstressed firefighter turnout gear textiles were exposed to elevated temperature in a hot air circulating oven (EQ-DHG-9000JB, MTI Corporation, Richmond, CA) using a method described in NFPA 1971 § 8.6 [23] and ASTM standard F2894-19 "Standard Test Method for Evaluation of Materials, Protective Clothing, and Equipment for Heat Resistance Using a Hot Air Circulating Oven" [33]. Briefly, a convection oven was heated to between 260 °C and 268 °C for at least 30 minutes with the temperature verified by a thermocouple suspended inside the oven. Sections of each firefighter gear textile were cut to approximately 152 mm by 50 mm with scissors and the masses of the cut sections were determined. During exposure to elevated temperatures, sections were suspended inside the oven by a metal hook to prevent contact with oven surfaces. Textile sections were exposed to elevated temperatures individually to reduce the risk of contamination. When sections were placed inside the oven, the door was closed no longer than 10 seconds after it was first opened. Each section was left in the oven with the air recirculating for 5 minutes after the measured temperature returned to 260 °C. Then, the section was removed and suspended on a cooling rack to return to ambient temperature before its mass was recorded again. The part of each textile section that had been in contact with the metal hook was removed with scissors. Following exposure to elevated temperature, sections were stored in the dark at ambient temperature inside plastic resealable bags for between 21 days and 594 days until extraction.

### 2.7. Laundering

Previously unstressed firefighter turnout gear textiles were laundered at the National Personal Protective Technology Laboratory, following a process described in National Fire Protection Association Standard 1851 "Standard on Selection, Care and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting" (NPFA 1851) [34]. Sections of each textile were cut to approximately 150 mm by 920 mm and stored separately from other sections until laundering. Each section was laundered individually to reduce cross-contamination in a washer-extractor (Pellerin Milnor Corporation, Kenner, LA) along with ten cotton towels (100% cotton; approximately 0.725 kg each) to act as ballast during the washing and better simulate typical laundering conditions. Citrosqueeze (SC Products Group, Dallas, TX), a detergent marketed as being NFPA 1851 compliant for the cleaning of turnout gear and personal protective equipment, was added to each wash cycle. To the best of our knowledge, Citrosqueeze doesn't contain PFAS. Each section was washed three times and dried in a drying cabinet between washings. Moisture barriers and the thermal liners were laundered using an NFPA-specified gear liner laundering cycle that subjects gear to lower g-forces than the cycles specified for the outer shells. Following the third wash cycle, each section was subjected to a final rinse cycle in a household washing machine to remove any residual detergent before being hung to air dry.

Following laundering, many sections were wrinkled or had gathering and bunching along the stitching. Additionally, some sections exhibited fraying along unfinished edges. To limit the impact of gathering, bunching, or fraying on PFAS measurements, samples for PFAS analysis were cut from the interior of laundered section where no visible fraying or bunching was present. Laundered textile sections were stored inside plastic resealable bags at ambient temperatures in the dark for between 201 days and 565 days until extraction.

#### 2.8. Weathering

Previously unstressed firefighter turnout gear outer shell textiles were subjected to accelerated weathering by alternating exposure to ultraviolet light and moisture using an accelerated weathering tester (QUV by Q-Lab, Westlake, OH), following NFPA 1971 § 8.62 [23], International Organization for Standardization standard 4892-3:2016 "Method of Exposure to UV Lamp Sources" [35] and ASTM International standard G154 "Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials" [36]. Only outer shell sections were exposed to weathering as they are expected to receive the highest solar radiation during use of any turnout gear layer. Outer shell sections were cut to dimensions of approximately 76 mm by 152 mm with methanol-rinsed scissors, mounted in a QUV specimen holder, and placed into the QUV tester. The QUV tester was programmed to expose textile sections to an 8 hours dry exposure period with an irradiance of  $0.76 \text{ W/m}^2$  at 340 nm and the black-panel temperature of 50 °C  $\pm$  3 °C, followed by a 0.25 hours water spray period with UV lamps off and uncontrolled black-panel temperature, and finally a 3.75 hours condensation exposure period with the UV lamps off and the black-panel temperature set to 50 °C  $\pm$  3 °C. These periods were sequentially repeated 24 additional times for a total exposure duration of 300 hours. While up to seven textile samples were weathered simultaneously, samples did not share OUV specimen holders which prevented water that condensed on one textile from running onto another. The weathered sections were then removed from the QUV tester and regions of the outer shell sections that had been shielded by the QUV specimen holder, and therefore not exposed to UV radiation, were trimmed off with methanol-rinsed scissors. QUV specimen holders were cleaned with methanol between the weathering of each textile. Weathered outer shell textile sections were stored inside plastic resealable bags at ambient temperatures in the dark for between 62 days and 637 days until extraction.

#### 3. Results

PFAS were quantified in firefighter gear textile sections that had been exposed to abrasion, elevated temperature, laundering, or weathering, as detailed below. Each textile sample was only exposed to a single stressing process and no PFAS are reported for textiles that were exposed to multiple stressing processes. Additionally, changes in section mass that occurred during exposure to abrasion or elevated temperature are also reported.

#### 3.1. Abrasion

### 3.1.1. Change in Textile Mass with Abrasion

Small changes in the mass of textile sections occurred during abrasion (i.e., median change: -0.61 %), likely due to small amounts of each textile being worn away by the abrasive fabric. Measured fractional changes in the mass of each textile are shown in Table 2. The changes in mass shown in Table 2 may underestimate the actual changes in mass due to abrasion as part of each textile section was protected from abrasion by the attachment device of the abrader. Because of this potential underestimation and the small magnitude of the observed changes, PFAS concentrations in abraded textiles are reported in units of  $\mu$ g-PFAS / kg of abraded textile.

Cuttings from six textiles were observed to increase (P < 0.05, paired *t*-test) in mass which could be attributed to small amounts of material from the abradant fabric or polyurethane foam backing disk transferring to the textile during abrasion. There, was no measurable PFAS in the abradant fabric or foam, therefore, PFAS measured in the abraded samples are only from the firefighter textiles themselves. **Table 2.** Mean and standard deviation of measured fractional mass change in textile following abrasion. Positive values indicate increased mass while negative values indicate decreased mass. \* Indicate significantly different (P < 0.05, paired *t*-test) masses before and following abrasion.

	Mean ± Standard Deviation Mass	
Textile	Change Following Abrasion (%)	Number of Replicates
MB-A	$1.36 \pm 0.72^{*}$	8
MB-B	$0.98 \pm 1.80^{*}$	8
MB-C	$-1.07 \pm 0.95^{*}$	8
MB-D	$-1.16 \pm 0.29*$	8
MB-E	$-1.13 \pm 0.26*$	6
MB-F	$0.50 \pm 0.44*$	8
OS-A	$-0.15 \pm 0.65*$	4
OS-ASC	$-1.95 \pm 0.98*$	8
OS-B	$1.03 \pm 0.29*$	8
OS-C	$-0.11 \pm 0.54$	8
OS-D	$0.04\pm0.23$	8
OS-E	$-0.72 \pm 0.42*$	12
OS-F	$-0.60 \pm 0.09*$	8
OS-FSC	$-5.62 \pm 0.88*$	8
OS-G	$-0.62 \pm 0.77$	8
TL-A	$-4.09 \pm 3.45$	4
TL-B	$-3.73 \pm 0.86^{*}$	4
TL-C	$1.49 \pm 0.45^{*}$	4
TL-D	$-2.29 \pm 1.35^*$	4
TL-E	$3.19 \pm 0.06*$	4

**Mean ± Standard Deviation Mass** 

#### 3.1.2. PFAS Occurrence and Concentration in Abraded Firefighter Gear Textiles

Across 20 abraded firefighter turnout gear textiles, 28 PFAS were quantified above reporting limits with between 2 and 18 PFAS quantified in individual textiles (Figure 1; Table 5 -**Table 73**) including perfluorocarboxylic acids (PFCAs) with between 3 and 13 perfluorinated carbons, perfluoroalkane sulfonic acids (PFSAs) with 3 to 8 and 10 perfluorinated carbons, and per- and polyfluoroalkylsulfonamides (FASAs) with 4, 6, and 8 perfluorinated carbons. The most identified PFAS were the PFAAs perfluoropenanoic acid (PFPeA; present in 18 abraded textiles), perfluorobutanoic acid (PFBA; 17 textiles), and perfluorobutane sulfonic acid (PFBS; 16 textiles), however, their individual concentrations were all under 120 µg/kg. Two 6:2 fluorotelomer PFAS were quantified above reporting limits in at least 11 abraded textiles and were present at the highest individual concentrations of any observed PFAS: 6:2 FTMAC was quantified in 11 abraded textiles at up to 5440 µg/kg ± 560 µg/kg (OS-D; Table 38) while 6:2 FTOH was quantified in 13 textiles at up to 1710 µg/kg ± 320 µg/kg (OS-D).

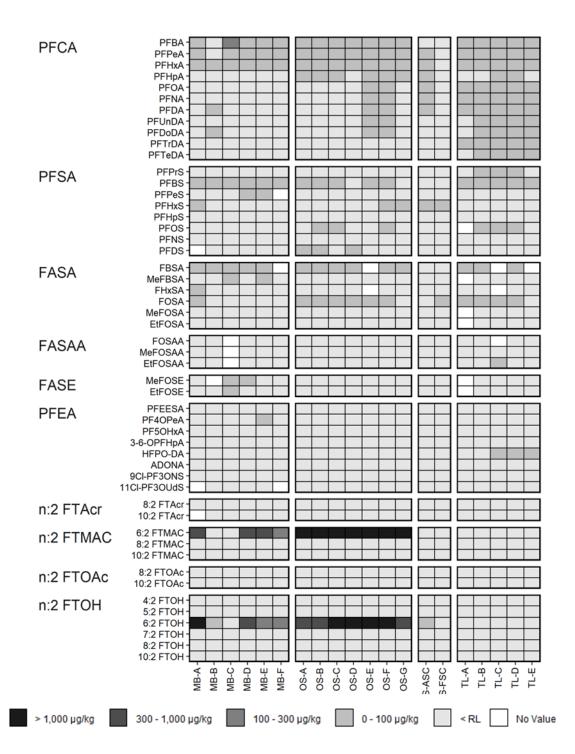


Figure 1. Mean PFAS concentrations (µg PFAS/kg textile or ppb mass ratio) determined from triplicate analysis of firefighter turnout gear textiles following abrasion.

Following abrasion, DWR-treated outer shell textiles had the highest summed PFAS concentrations of any abraded textiles (Figure 2), with summed PFAS concentrations ranging from 2170  $\mu$ g/kg ± 200  $\mu$ g/kg (mean of summed concentrations from triplicate analysis ± combined standard uncertainty; OS-G; Table 55) to 7160  $\mu$ g/kg ± 640  $\mu$ g/kg (OS-D; Table 39), followed by moisture barrier textiles with summed PFAS concentrations ranging from 44.9  $\mu$ g/kg ± 5.1  $\mu$ g/kg (MB-B; Table 8) to 2040  $\mu$ g/kg ± 410  $\mu$ g /kg (MB-A; Table 5). Despite up to 17 PFAS being identified above reporting limits in individual abraded thermal liner textiles summed PFAS concentrations ranged from 2.81  $\mu$ g/kg (TL-E; Table 71) to 10.7  $\mu$ g/kg ± 1.7  $\mu$ g/kg (TL-C; Table 65) and were much lower than summed PFAS concentrations in moisture barrier or DWR-treated outer shell textiles. Two PFAS were identified in the scoured outer shell OS-FSC at a summed concentration of 37.8  $\mu$ g/kg ± 8.0  $\mu$ g/kg (Table 27).

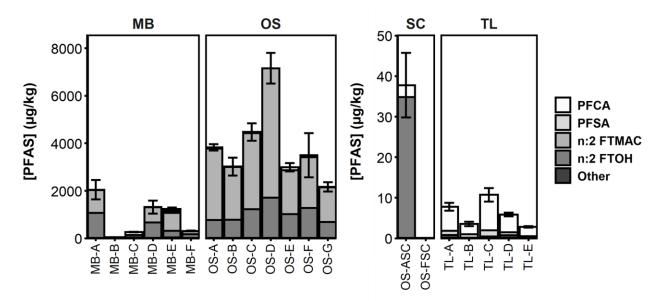


Figure 2. Summed PFAS concentrations determined from triplicate analysis of firefighter turnout gear textiles following abrasion. Error bars indicate the combined standard uncertainty of summed concentrations. PFAS class is indicated by shade.

N:2 FTS concentrations are not included in summed PFAS concentrations following abrasion, or other stressing processes, because intermittent instrumental contamination prevented their analysis from consistently meeting quality control (QC) standards. However, n:2 FTSs were a small contributor to the overall summed PFAS concentrations in unstressed textiles (i.e., < 0.6 % of summed PFAS mass and < 8  $\mu$ g summed n:2 FTS/kg) except for MB-E where n:2 FTSs contributed 614  $\mu$ g/kg  $\pm$  15  $\mu$ g/kg which accounted for 32.9 % of the overall summed PFAS mass. Because n:2 FTS measurements were repeated for stressed MB-E after contamination issues had been addressed, n:2 FTS concentrations are reported and discussed for stressed MB-E in Section 3.5. For all stressed textiles, n:2 FTS measurements that did meet QC standards, including measured PFAS concentrations and reporting limits, are shown in Table 5 - Table **73** though they are not included in summed PFAS measurements.

Nonvolatile PFAS were determined with the same extraction and analytical procedures as the stressed firefighter gear textiles in both the worsted wool abradant fabric and the polyurethane foam used in the abrasion process to determine if firefighter textiles could accumulate PFAS during abrasion. PFPeA ( $0.046 \mu g/kg \pm 0.004 \mu g/kg$ ), perfluorononanoic acid (PNFA;  $0.050 \mu g/kg \pm 0.004 \mu g/kg$ ), perfluorohexane sulfonic acid (PFHxS;  $0.151 \mu g/kg \pm 0.030 \mu g/kg$ ), and PFOS ( $0.286 \mu g/kg \pm 0.036 \mu g/kg$ ) were all quantified above reporting limits in the abradant fabric, as was PFBA ( $0.278 \mu g/kg \pm 0.004 \mu g/kg$ ) in the polyurethane foam. Due to the low individual and summed PFAS concentrations observed in these materials, they were unlikely to appreciably contribute to the observed PFAS concentrations in abraded textiles and therefore acceptable for use in abrasion stressing.

#### 3.1.3. Change in PFAS Occurrence and Concentration Following Abrasion

Higher numbers of PFAS were quantified in abraded firefighter textiles compared with corresponding unstressed textiles. The number of total identified PFAS across all textiles increased from 23 to 28 with abrasion and the median number of PFAS quantified above reporting limits in each textile rose from 7 to 10 following abrasion. Graphical representations of the changes in PFAS occurrence and concentration with abrasion are in Figure 21 -Figure 27.

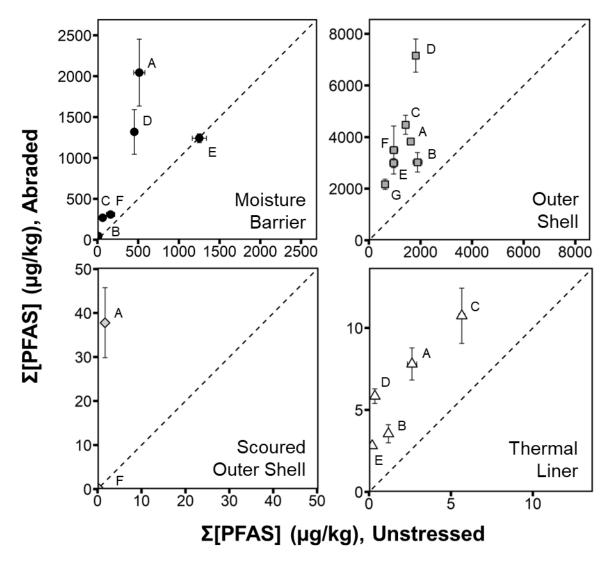
Summed PFAS concentrations were higher following abrasion compared with unstressed textiles in five out of six moisture barrier textiles, as well as all DWR-treated outer shell and thermal liner textiles (Figure 3). Compared with corresponding unstressed textiles, the median summed PFAS concentrations following abrasion was 467 µg/kg higher for moisture barrier textiles (i.e., increased from 307 µg/kg to 774 µg/kg), 2070 µg/kg higher for DWR-treated outer shell textiles (1430 µg/kg to 3500 µg/kg), and 4.65 µg/kg higher for thermal liner textiles (1.18 µg/kg to 5.84 µg/kg). Summed PFAS concentrations were slightly lower in only two abraded textiles compared with the corresponding unstressed textiles: MB-E (1251  $\mu$ g/kg ± 89  $\mu$ g/kg to 1240  $\mu$ g/kg  $\pm$  54 µg/kg) and OS-FSC (0.335 µg/kg  $\pm$  0.032 µg/kg to 0.065 µg/kg  $\pm$  0.012 µg/kg). The largest relative increase in summed PFAS concentrations with abrasion occurred in the scoured outer shell textile OS-ASC (22.2 times increase) and the thermal liner textiles TL-D (16.3 times) and TL-E (14.8 times), all of which had summed concentrations below 2 µg/kg when unstressed. While the combined standard uncertainties associated with measurements of abraded textiles were larger in absolute terms than those associated with unstressed textiles (Figure 3), the ratios of combined standard uncertainties to summed PFAS concentrations are similar between unstressed and abraded textiles. Among all unstressed textiles, the combined standard uncertainty of the summed PFAS concentration ranged from 3.3 % to 31.7 % of the summed PFAS concentration with a median value of 8.9 %, while among abraded textiles the same range was 3.4 % to 26.7 % with a median of 10.2 %.

It should be noted that the reported increase in summed PFAS concentration in OS-ASC with abrasion overestimates the true change because of our assumption that concentrations determined to be below reporting limits are zero for the purposes of summed PFAS concentrations. In unstressed OS-ASC the concentration of 6:2 FTOH was determined to be below the reporting limit of 183  $\mu$ g/kg, while in abraded OS-ASC it was determined to be 34.8  $\mu$ g/kg ± 7.9  $\mu$ g/kg with a reporting limit of 31.0  $\mu$ g/kg. Because the reporting limit of 6:2 FTOH in unstressed OS-ASC was

higher than the reported value of 6:2 FTOH in abraded OS-ASC, it cannot be known if 6:2 FTOH concentrations actually increased with abrasion. In fact, 6:2 FTOH concentrations could have actually decreased by over 80 % with abrasion (i.e., 182  $\mu$ g/kg to 34.8  $\mu$ g/kg), but because the concentration of 6:2 FTOH in unstressed OS-ASC was determined to be below the reporting limit, it is assumed to have increased from zero to 34.8  $\mu$ g/kg ± 7.9  $\mu$ g/kg for the purposes of determining the change in summed PFAS concentrations.

6:2 FTMAC and 6:2 FTOH were primarily responsible for the increases in summed PFAS concentrations in moisture barrier and DWR-treated outer shell textiles following abrasion. Of the 13 moisture barrier and DWR-treated outer shell textiles, changes in the summed concentration of 6:2 FTMAC and 6:2 FTOH with abrasion was equivalent to between 95.9 % and 114 % of the total change in summed PFAS concentration The summed concentrations of nonvolatile PFAS (Figure 29) also increased in most textiles during abrasion, though absolute amount of increase was much smaller than for volatile PFAS.

Seven PFAS were present in at least one abraded textile that were not observed in any unstressed textile (i.e., EtFOSAA, HFPO-DA, MeFBSA, PF4OPeA, PFHxS, PFPeS, and PFTrDA) while two PFAS were identified in at least one unstressed textile and missing from all textiles following abrasion (i.e., FOSAA and PFHpS). However, these PFAS were present at relatively low concentrations and summed to less than 9  $\mu$ g/kg in any abraded textile (up to 0.46 % of overall summed PFAS mass) and less than 0.5  $\mu$ g/kg in any unstressed textile (up to 0.08 % of overall summed PFAS mass).



**Figure 3.** Summed PFAS concentrations determined by triplicate analysis of firefighter gear textiles following abrasion on y-axis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Textile type is indicated in panel label and individual textiles are indicated with marker labels. A 1:1 concentration ratio (i.e., identical concentrations measured in textile prior to and following stressing) is indicated with a dashed line.

#### 3.2. Elevated Temperature

#### 3.2.1. Change in Textile Mass with Exposure to Elevated Temperature

The mass of textile sections was determined prior to and following exposure to elevated temperature and all textile sections were observed to have lost mass during stressing (Table 3). Additionally, changes in mass experienced during exposure to elevated temperature were larger than those experienced by the textiles during abrasion. However, PFAS concentrations in textiles exposed to elevated temperatures are reported in units of  $\mu g$  PFAS / kg of textile following exposure to elevated temperature due to the low magnitude of the measured mass changes.

 Table 3. Measured mass changes in textile samples following thermal stressing. Positive values indicate increasing mass and negative values indicate decreasing mass. Statistical significance of mass changes was not evaluated due to the low number of replicates. Where multiple measurements were made, individual measurements are separated by a comma.

	Measured Mass Change(s) with Exposure to
Textile	Elevated Temperature (%)
MB-A	-7.0, -6.1
MB-B	-5.2, -5.4
MB-C	-6.6, -5.3
MB-D	-8.1, -10.7
MB-E	-2.8, -7.1
MB-F	-8.4, -3.6
OS-A	-5.2
<b>OS-ASC</b>	-2.8
OS-B	-9.5
OS-C	-3.7, -2.4
OS-D	-5.0
OS-E	-5.8
OS-F	-7.0, -4.7
<b>OS-FSC</b>	-1.2
OS-G	-8.1
TL-A	-9.4, -10.5
TL-B	-16.4, -16.9
TL-C	-4.8, -2.7
TL-D	-3.8, -11.5
TL-E	-8.3, -5.9

## 3.2.2. PFAS Occurrence and Concentration in Firefighter Gear Textiles Exposed to Elevated Temperatures

22 PFAS were quantified above reporting limits in at least one textile following exposure to elevated temperatures, with individual stressed textile containing between zero and 14 PFAS (Figure 4). PFCAs with fewer than six perfluorinated carbons, PFBS, 6:2 FTMAC, and 6:2 FTOH which were all quantified above reporting limits in at least 11 textiles following exposure to elevated temperatures. 6:2 FTMAC and 6:2 FTOH were the only volatile PFAS quantified above reporting limits in any textile following exposure to elevated temperatures, however, they were quantified at the highest concentrations of any individual PFAS, with 6:2 FTMAC present at up to 5200  $\mu$ g/kg  $\pm$  110  $\mu$ g/kg (OS-F; Table 48) and 6:2 FTOH present at up to 2026  $\mu$ g/kg  $\pm$  58  $\mu$ g/kg (OS-F). While no per- and polyfluoroalkyl ether acid (PPEA) was identified in unstressed textiles, HFPO-DA, perfluoro-2-ethoxyethane sulfonic acid (PFEESA), and perfluoro-4-methoxybutanoic acid (PF5OHxA) were each identified at low concentrations (i.e., summed mass less than 0.9  $\mu$ g/kg and fraction of summed PFAS mass less than 15 %) in one or two textiles following exposure to elevated temperature.

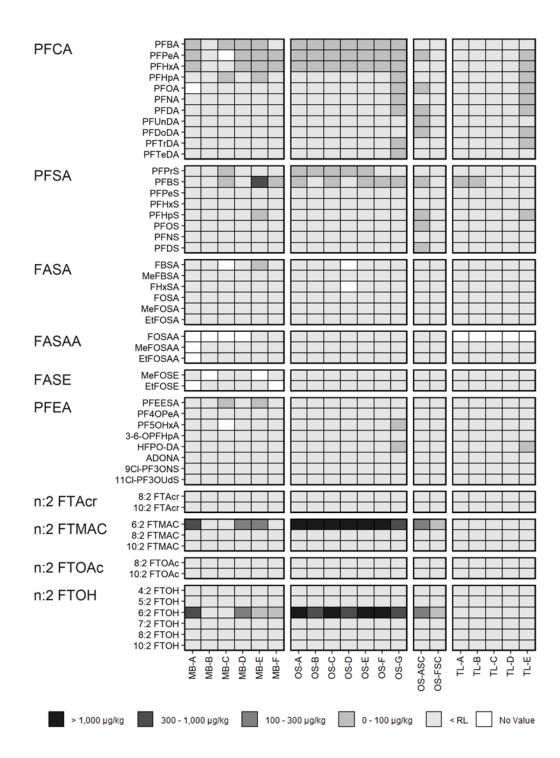


Figure 4. Mean PFAS concentrations (µg PFAS/kg textile or ppb mass ratio) determined from triplicate analysis of firefighter turnout gear textiles after exposure to elevated temperature.

Following exposure to elevated temperatures, summed PFAS concentrations were highest in DWR-treated outer shell textiles, ranging from 1470  $\mu$ g/kg ± 190  $\mu$ g/kg (OS-G; Figure 5) to 7290  $\mu$ g/kg ± 130  $\mu$ g/kg (OS-F), and lower in moisture barrier textiles which ranged from none above reporting limits (MB-B) to 764  $\mu$ g/kg ± 24  $\mu$ g/kg (MB-A). Summed PFAS concentrations in thermal liner textiles ranged from none quantified above reporting limits (TL-C) to 4.86  $\mu$ g/kg ± 0.88  $\mu$ g/kg (TL-E).

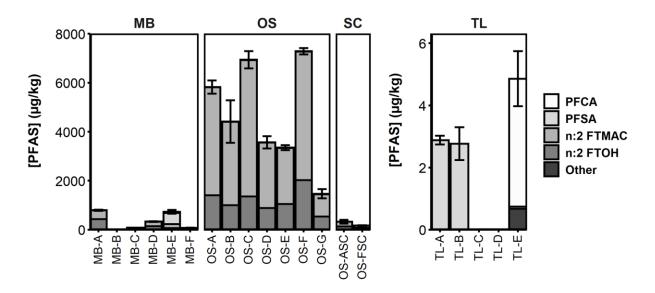
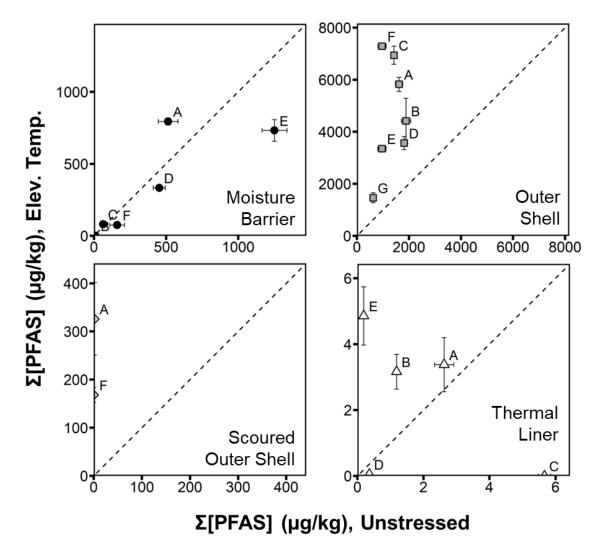


Figure 5. Summed PFAS concentrations determined from triplicate analysis of firefighter turnout gear textiles following exposure to elevated temperature. Error bars indicate the combined standard uncertainty of summed concentrations. Shading indicates PFAS class.

### 3.2.3. Change in PFAS Occurrence and Concentration Following Exposure to Elevated Temperature

A similar number of PFAS were quantified above reporting limits across all textiles exposed to elevated temperatures compared with corresponding unstressed textiles (i.e., 22 vs. 23), and a similar number of PFAS were quantified in each textile, with the median number decreasing from seven to six. In three textiles (i.e., MB-B, TL-C, TL-D) no PFAS were quantified above reporting limits following exposure to elevated temperatures. Summed PFAS concentrations were higher than in the equivalent unstressed textiles for two of six moisture barrier textiles, all nine outer shell textiles, and three of five thermal liner textiles (Figure 6). Median PFAS concentrations following exposure to elevated temperatures were 100  $\mu$ g/kg lower among moisture barriers, 2990  $\mu$ g/kg higher among DWR-treated outer shell textiles, and 1.59  $\mu$ g/kg higher among thermal liners. Graphical representations of the changes in PFAS occurrence and concentration with exposure to elevated temperature are shown in Figure 21 - Figure 27.



**Figure 6.** Summed PFAS concentrations determined by triplicate analysis of firefighter gear textiles following exposure to elevated temperatures on y-axis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Textile type is indicated in panel label and individual textiles are indicated with marker labels. A 1:1 concentration ratio (i.e., identical concentrations measured in textile prior to and following stressing) is indicated with a dashed line.

Changes in summed PFAS concentration after exposure to elevated temperatures were largely due to changes in 6:2 FTMAC and 6:2 FTOH concentrations. 6:2 FTMAC concentrations fell in all moisture barrier but rose in all outer shells by up to 4610  $\mu$ g/kg (OS-F; Table 48). Similarly, 6:2 FTOH concentrations rose in 12 out of 13 textiles where it was observed above reporting limits prior to stressing, with a median increase of 342  $\mu$ g/kg among these textiles. As with abrasion, changes in 6:2 FTMAC and 6:2 FTOH were nearly equivalent to the changes in summed PFAS concentrations and accounted for between 99.7 % and 105 % of the overall change in summed PFAS concentrations following exposure to elevated temperatures in textiles where they were identified after stressing in all textiles except MB-E where summed PFAS concentrations fell from 1251  $\mu$ g/kg to 731  $\mu$ g/kg while the summed concentrations of 6:2 FTMAC and 6:2 FTOH fell from 1190  $\mu$ g/kg to 222  $\mu$ g/kg.

Similar to the change in measured 6:2 FTOH concentration in OS-ASC following abrasion, the quantification of 6:2 FTMAC and 6:2 FTOH in OS-ASC and OS-FSC at concentrations above their reporting limits in textiles that had been exposed to elevated temperature resulted in apparently large increases of summed PFAS concentrations in these textiles. However, due to the higher reporting limits recorded for the analysis of 6:2 FTMAC and 6:2 FTOH in unstressed textiles compared with stressed textiles, it cannot be known if the concentrations of these PFAS increased in the scoured outer shells with exposure to elevated temperature. For example, 6:2 FTMAC was previously determined to be present in unstressed OS-ASC at less than the reporting limit of  $326 \,\mu$ g/kg and was here determined to be present in OS-ASC following exposure to elevated temperatures at  $68 \,\mu$ g/kg ± 47  $\mu$ g/kg. Therefore, while for the purposes of determining summed PFAS concentrations in OS-ASC, 6:2 FTMAC was assumed to increase from zero to  $68 \,\mu$ g/kg, 6:2 FTMAC concentrations could have in fact decreased by almost 80 % (i.e., from  $325 \,\mu$ g/kg to  $68 \,\mu$ g/kg).

While summed nonvolatile PFAS concentrations decreased in most outer shell textiles, summed volatile PFAS concentrations increased in all outer shell textiles with exposure to elevated temperatures (Figure 30 and Figure 31). Conversely, most moisture barrier and thermal liner textiles had higher summed nonvolatile PFAS concentrations after exposure to elevated temperatures, while three moisture barrier textiles had lower volatile PFAS concentrations after exposure to elevated temperatures. The measured increases in volatile PFAS concentration in outer shell textiles following exposure to elevated temperatures were unexpected given that experimentally derived and predicted boiling points of 6:2 FTMAC and 6:2 FTOH (ranging from 140 °C to 220 °C and 90 °C to 174 °C, respectively [37-39]), are well below the 260 °C elevated exposure temperature. The observation of higher summed volatile PFAS concentrations after exposure to elevated temperatures could indicate their production from the degradation of fluorinated polymers as well as an increase in the fraction of PFAS that are extractable from firefighter gear textiles following exposure to elevated temperatures. Studies on the release of PFAS from fluorinated polymers at elevated temperatures have typically used much higher experimental temperatures than those used here to examine conditions relevant to municipal incineration [40]. Therefore, the extent to which fluorinated polymers in DWR treatments are degraded by exposure to air at 260 °C is unknown.

Four PFAS were quantified above reporting limits in at least one firefighter gear textile following exposure to elevated temperatures that were not observed prior to stressing (i.e., HFPO-DA, PF4OHxA, PFEESA, PFTrDA) while five PFAS were not identified in any textile following exposure to elevated temperature that had been identified in at least one unstressed textile (i.e., EtFOSE, FHxSA, FOSA, FOSAA, MeFOSE). However, these PFAS were present at relatively low concentrations and summed less than 1.5  $\mu$ g/kg in any textile prior to or following exposure to elevated temperatures.

## 3.3. Laundering

# 3.3.1. PFAS Occurrence and Concentration in Laundered Firefighter Gear Textiles

PFAS concentrations were determined in 19 firefighter gear textiles following laundering (OS-F was not laundered). 15 unique PFAS were determined to be present above reporting limits across all laundered textiles with between one and 11 PFAS identified in individual laundered textiles (Figure 7). FBSA, PFBA, PFHxA, PFOS, PFPeA, 6:2 FTMAC, and 6:2 FTOH were the most widely detected with each present above reporting limits in at least 10 laundered textiles. 6:2 FTMAC and 6:2 FTOH were present at the highest concentrations of any PFAS, with 6:2 FTMAC quantified at up to 1293  $\mu$ g/kg  $\pm$  42  $\mu$ g/kg (OS-C; Table 37) and 6:2 FTOH up to 223  $\mu$ g/kg  $\pm$  25  $\mu$ g/kg (OS-C).

Following laundering, DWR-treated outer shell textiles had the highest summed concentrations of any textile class, with summed concentrations ranging from 474  $\mu$ g/kg ± 13  $\mu$ g/kg (OS-G; Figure 8) to 1535  $\mu$ g/kg ± 49  $\mu$ g/kg (OS-C), followed by moisture barrier textiles, which ranged from 39.6  $\mu$ g/kg ± 3.5  $\mu$ g/kg (MB-C; Table 13) to 1111  $\mu$ g/kg ± 43  $\mu$ g/kg (MB-E; Table 19), and thermal liner textiles, which ranged from 0.099  $\mu$ g/kg ± 0.012  $\mu$ g/kg (TL-E; Table 73) to 3.1  $\mu$ g/kg ± 2.5  $\mu$ g/kg (TL-A; Table 61). Summed PFAS concentrations in laundered scoured outer shell textiles ranged from 69  $\mu$ g/kg ± 12  $\mu$ g/kg (OS-FSC; Table 53) to 96.3  $\mu$ g/kg ± 3.6  $\mu$ g/k (OS-ASC; Table 29) which was less than intact outer shell textiles but above thermal liner textiles.

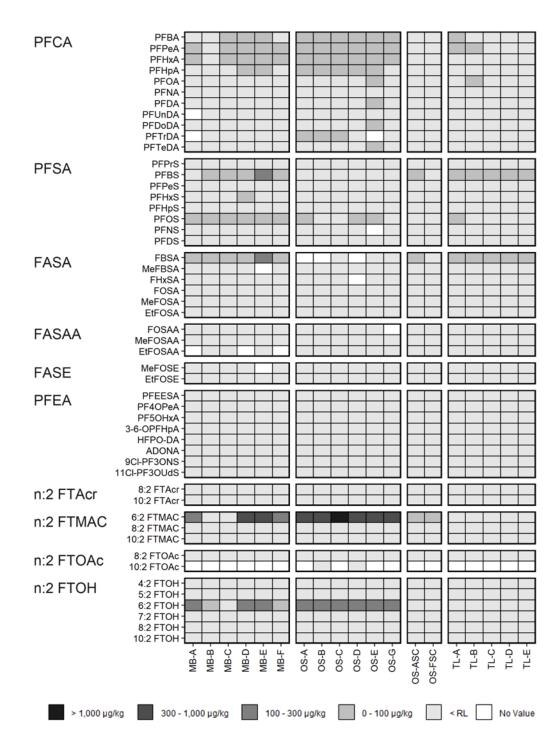


Figure 7. Mean PFAS concentrations (µg PFAS/kg textile or ppb mass ratio) determined from triplicate analysis of firefighter turnout gear textiles following laundering.

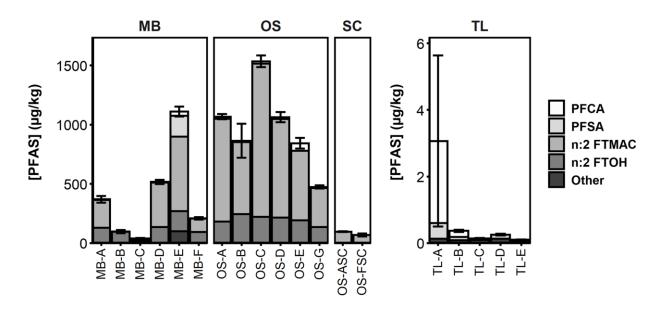


Figure 8. Summed PFAS concentrations determined from triplicate analysis of firefighter turnout gear textiles following laundering. Error bars indicate the combined standard uncertainty of summed concentrations. PFAS class is indicated by shade.

### 3.3.2. Changes in PFAS Occurrence and Concentration Following Laundering

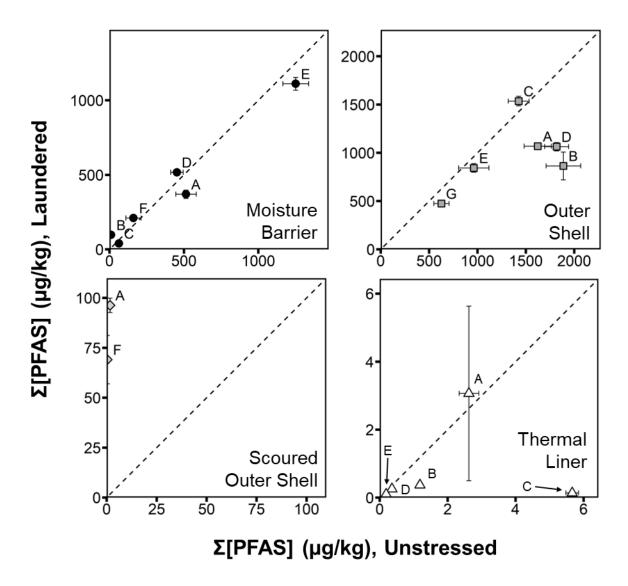
Only 15 unique PFAS were quantified across laundered firefighter gear textiles and the median number of PFAS quantified in individual textiles decreased from seven prior to stressing to 5.5 following laundering. PFAS concentrations in laundered moisture barrier and thermal liner textiles were similar to or lower than in the corresponding unstressed textiles as summed PFAS concentration differed by less than 150  $\mu$ g/kg in all moisture barrier textiles and less than 6  $\mu$ g/kg in all thermal liners (Figure 9). Summed PFAS concentrations in laundered outer shell textiles were either similar to (OS-C, OS-E, OS-G) or lower than (OS-A, OS-B, OS-D) the concentrations in corresponding unstressed outer shell textiles. However, summed PFAS concentrations increased in both scoured outer shells by over a factor of 50. Graphical representations of the changes in PFAS occurrence and concentration with exposure to laundering are shown in Figure 21 - Figure 27.

As with abrasion and exposure to elevated temperature, changes in summed PFAS concentration with laundering were largely driven by changes in the concentrations of 6:2 FTOH and 6:2 FTMAC. 6:2 FTMAC concentrations were lower following laundering in eight of the ten textiles where it was quantified in corresponding unstressed textiles, with concentrations falling by as much as 916  $\mu$ g/kg (OS-B). Similarly, following laundering 6:2 FTOH concentrations were between 83.4  $\mu$ g/kg and 178  $\mu$ g/kg lower in all the outer shell textiles where it had been detected in the corresponding unstressed outer shell textiles. However, in the laundered scoured outer shell textiles, OS-ASC and OS-FSC, which did not have detectable 6:2 FTMAC concentrations prior to laundering, 6:2 FTMAC was quantified and accounted for over 99.6 % of the summed PFAS. As in OS-ASC following exposure to abrasion or elevated temperature, the quantification of 6:2 FTMAC in these textiles following laundering may be a result of the much lower reporting

limits determined from the analysis of laundered textiles (i.e., ~ 70  $\mu$ g/kg vs.~ 330  $\mu$ g/kg). Alternatively, the appearance of these PFAS in the scoured outer shells following laundering could indicate that laundering allowed the extraction of PFAS that were not extractable from the unstressed textiles.

While changes in overall summed PFAS concentrations with laundering were largely similar to changes in summed volatile PFAS (Figure 34), changes in summed nonvolatile PFAS concentrations were distinct in some textiles. For example, while overall summed and summed nonvolatile PFAS concentrations in MB-E fell with laundering, summed nonvolatile PFAS concentrations rose with laundering due to higher measured concentrations of FBSA (i.e., 92.1  $\mu$ g/kg higher) and PFBS (142  $\mu$ g/kg higher). Additionally, while the overall summed PFAS concentrations rose in OS-ASC and OS-FSC, the summed nonvolatile PFAS concentrations fell by over 75 % in both (Figure 33).

Two PFAS were present in at least one laundered textile but no unstressed textiles (i.e., PFHxS, PFTrDA) while 10 PFAS were present in at least one textile when unstressed but not in laundered textiles (i.e., EtFOSE, FHxSA, FOSA, FOSAA, MeFOSE, PFDS, PFHpS, PFNA, PFPrS, PFUnDA). However, the sum of these PFAS did not exceed 1.6  $\mu$ g/kg in any textile before or after laundering and accounted for less than 0.02 % of the summed PFAS in any laundered textile and less than 15 % of the summed PFAS in any unstressed textile.



**Figure 9.** Summed PFAS concentrations determined by triplicate analysis of firefighter gear textiles following laundering on y-axis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Textile type is indicated in panel label and individual textiles are indicated with marker labels. A 1:1 concentration ratio (i.e., identical concentrations measured in textile prior to and following stressing) is indicated with a dashed line.

### 3.4. Weathering

### 3.4.1. PFAS Occurrence and Concentrations in Weathered Outer Shell Textiles

A total of 15 unique PFAS were identified across all weathered outer shell textiles, compared with 17 in corresponding unstressed outer shells, with a median of eight PFAS identified in individual weathered outer shell textiles (Figure 10). PFCAs with between three and 13 perfluorinated carbons were quantified above reporting limits, as were PFBS, perfluoroctane sulfonamide (FOSA), 6:2 FTMAC, and 6:2 FTOH. PFCAs with between three and six perfluorinated carbons

were almost universally detected among weathered outer shell textiles, but all individual concentrations were under 100  $\mu$ g/kg, while 6:2 FTMAC and 6:2 FTOH were universally present in DWR treated outer shell textiles at concentrations between 951  $\mu$ g/kg to 4080  $\mu$ g/kg and 590  $\mu$ g/kg to 1250  $\mu$ g/kg, respectively.

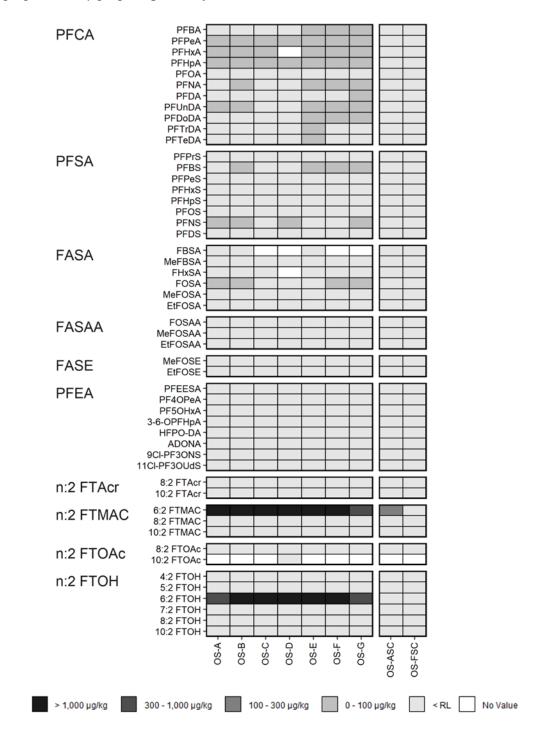


Figure 10. Mean PFAS concentrations (µg PFAS/kg textile or ppb mass ratio) determined from triplicate analysis of firefighter turnout outer shell textiles following weathering.

Summed PFAS concentrations in weathered outer shell textiles with intact water repellent treatments ranged from 1736  $\mu$ g/kg  $\pm$  98  $\mu$ g/kg (OS-G; Table 58) to 5300  $\mu$ g/kg  $\pm$  1200  $\mu$ g/kg (OS-C; Table 38), with 6:2 FTMAC and 6:2 FTOH making up between 88.7 % and 99.9 % of the summed PFAS mass (Figure 11). Among the two weathered scoured outer shell textiles, only 6:2 FTMAC was quantified above reporting limits in OS-ASC while no PFAS were in OS-FSC (Table 30 and Table 54).

Three PFAS were identified in at least one weathered outer shell textile (i.e., PFNS, PFTeDA, PFTrDA) that were not identified in any unstressed outer shell textiles, while an additional five PFAS were identified in at least one unstressed outer shell textile, but not in any UV irradiated outer shell textiles (i.e., FBSA, FHxSA, FOSAA, PFDS, PFOA). These PFAS were present at summed concentrations less than 1.4  $\mu$ g/kg in any outer shell textile prior to or following weathering and contributed less than 0.004 % of the summed PFAS mass in any weathered outer shell textile.

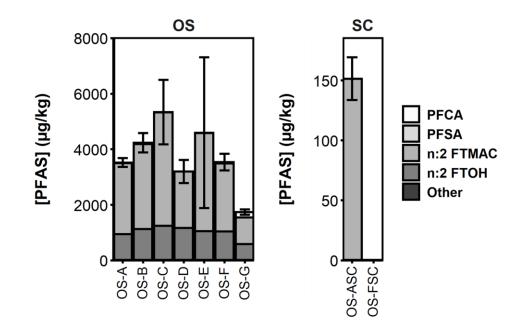


Figure 11. Summed PFAS concentrations determined from triplicate analysis of firefighter turnout gear outer shell textiles following weathering. Error bars indicate the combined standard uncertainty of summed concentrations. PFAS class is indicated by shade.

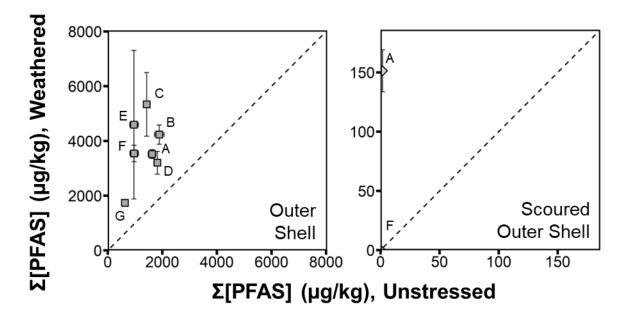
# 3.4.2. Change in PFAS Occurrence and Concentration in Weathered Outer Shell Textiles

Compared with unstressed textiles, summed PFAS concentrations were higher in all weathered DWR-treated outer shell textiles and one of the two scoured treated outer shell textiles (Figure 12). The median increase in summed PFAS concentrations following weathering of DWR-treated outer shell textiles was 2350  $\mu$ g/kg. Virtually all the increase in summed PFAS concentrations arose from increases in 6:2 FTMAC and 6:2 FTOH, both of which rose in all DWR-treated outer shell

textiles. Following weathering of DWR-treated outer shell textiles, the median increase in measured concentrations was 1530  $\mu$ g/kg for 6:2 FTMAC and 771  $\mu$ g/kg for 6:2 FTOH. Among DWR-treated outer shell textiles, the sum in change of 6:2 FTMAC and 6:2 FTOH concentrations was equivalent to between 84 % and 102 % of the change in summed PFAS concentration. Graphical representations of the changes in PFAS occurrence and concentration with weathering are shown in Figure 23 -Figure 25.

As with the stressing processes discussed above, the apparent increase in summed PFAS concentrations in OS-ASC with weathering is due to the quantification of 6:2 FTMAC above reporting limits in weathered OS-ASC while it was found to be below reporting limits in unstressed OS-ASC and therefore assumed to be present at a concentration of zero. However, it cannot be known if the concentration of 6:2 FMAC in weathered OS-ASC (i.e., 151  $\mu$ g/kg ± 18  $\mu$ g/kg) was above the 6:2 FTMAC concentration in unstressed OS-ASC due to the higher reporting limit recorded for the analysis of unstressed OS-ASC (i.e., 326  $\mu$ g/kg).

The change in summed volatile PFAS concentrations with weathering were largely similar to the changes seen in the overall summed PFAS concentrations (Figure 34) while the summed concentrations of nonvolatile PFAS fell in most DWR-treated outer shell textiles and in both scoured outer shell textiles (Figure 35).



**Figure 12.** Summed PFAS concentrations determined by triplicate analysis of firefighter gear outer shell textiles following weathering on y-axis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Textile type is indicated in panel label and individual textiles are indicated with marker labels. A 1:1 concentration ratio (i.e., identical concentrations measured in textile prior to and following stressing) is indicated with a dashed line.

### 3.5. N:2 FTS Concentrations in Moisture Barrier Textile MB-E

N:2 FTS concentrations could not be quantified for some stressed textiles and are therefore not discussed above or included in summed PFAS concentrations. However, they were quantified in MB-E prior to as well as following stressing. Therefore, N:2 FTS concentrations in MB-E are discussed in this section to provide information about this PFAS class, which was present in MB-E at summed concentrations over 75 times higher than in any other unstressed textile (Figure 13, Figure 14, and Figure 15). Compared with 6:2 fluorotelomer sulfonate (6:2 FTS) concentrations measured in unstressed MB-E (613  $\mu$ g/kg ± 15  $\mu$ g/kg), 6:2 FTS concentrations were similar following abrasion (579  $\mu$ g/kg ± 48; Figure 13) and exposure to elevated temperature (503  $\mu$ g/kg ± 57  $\mu$ g/kg) but lower (36.2  $\mu$ g/kg ± 2.1  $\mu$ g/kg) following laundering. Similarly, measured 4:2 fluorotelomer sulfonate (4:2 FTS) concentrations in MB-E prior to stressing (i.e., 0.85  $\mu$ g/kg ± 0.27  $\mu$ g/kg) and exposure to elevated temperature (0.82  $\mu$ g/kg ± 0.091  $\mu$ g/kg) and exposure to elevated temperature (0.82  $\mu$ g/kg ± 0.16  $\mu$ g/kg), but were below the reporting limits (i.e., < 0.139  $\mu$ g/kg) following laundering.

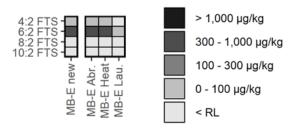
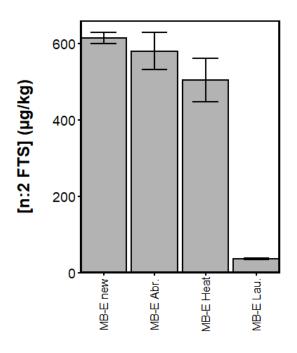
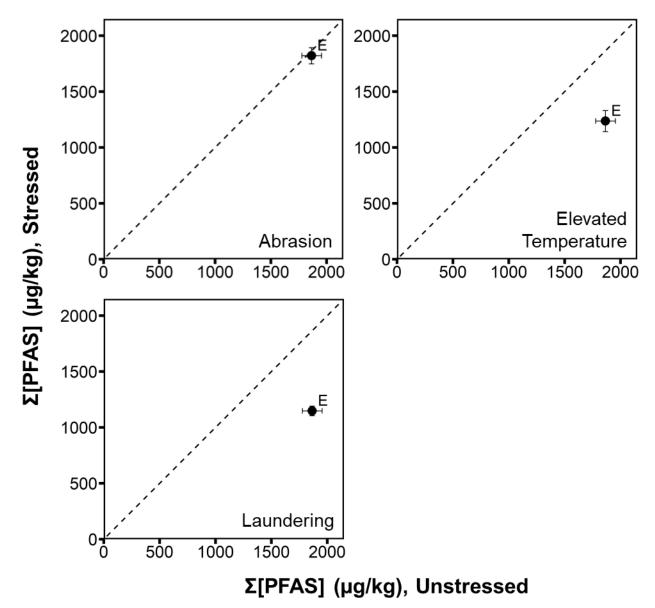


Figure 13. Average summed n:2 FTS concentrations determined from triplicate analysis of MB-E1 following exposure to abrasion (Abr.), elevated temperature (Heat), or laundering (Lau.).



# Figure 14. Summed n:2 FTS concentrations in MB-E prior to stressing (new), as well as following abrasion (Abr.), exposure to elevated temperatures (Heat), or laundering (Lau.). Error bars indicate the combined standard uncertainty of summed concentrations.

When the contribution of n:2 FTS to summed PFAS concentrations in MB-E were considered (Figure 15), similar changes occur with stressing as when n:2 FTS was excluded (Figure 3, Figure 6, Figure 9). For example, when n:2 FTS was included, summed PFAS concentrations in MB-E were similar before and after abrasion (i.e., 1865  $\mu$ g/kg ± 88  $\mu$ g/kg in unstressed and 1820  $\mu$ g/kg ± 73  $\mu$ g/kg) and decreased by a similar amount with exposure to elevated temperatures (1236  $\mu$ g/kg ± 94  $\mu$ g/kg) or laundering (1147  $\mu$ g/kg ± 43  $\mu$ g/kg). Similarly, when n:2 FTS was not included, summed PFAS concentrations in MB-E decreased slightly with abrasion (i.e., 1251  $\mu$ g/kg ± 87  $\mu$ g/kg to 1240  $\mu$ g/kg ± 54  $\mu$ g/kg) and decreased by a similar amount with exposure to elevated temperatures (732  $\mu$ g/kg ± 75  $\mu$ g/kg) or laundering (1111  $\mu$ g/kg ± 43  $\mu$ g/kg).



**Figure 15.** Summed PFAS concentrations, including n:2 FTSs, determined from triplicate analysis of MB-E following stressing on y-axis and prior to stressing MB-E on x-axis. Error bars indicate combined standard uncertainty. Stressing type is indicated in panel label. Dashed line indicates a 1:1 concentration ratio.

### 4. Discussion

Exposing structural firefighter turnout gear textiles to stressing changed measured individual and summed PFAS concentrations, and those changes varied between applied stresses and textile types (Table 4). While summed PFAS concentrations increased in 18 of 20 firefighter gear textiles with abrasion and in eight of nine outer shell textiles with weathering, exposure to elevated temperatures and laundering produced more varied changes. Exposure to elevated temperatures decreased summed PFAS concentrations in four of six moisture barrier textiles (median change across all six moisture barrier textiles: - 34 %) and two of five thermal liner textiles (+ 29 %), but increased concentrations in all seven DWR-treated outer shell textiles (+ 249 %). Similarly, laundering increased summed PFAS concentrations in six of seven DWR-treated outer shell textiles (- 29 %) and in 4 of 5 thermal liner textiles (- 48 %). The wide variation in concentration changes suggests developing an understanding of how stresses alter PFAS concentrations in firefighter gear textiles requires accounting for the influence of multiple processes as well as differences among textile types and individual textiles.

	Abrasion	Elevated Temp.	Laundering	Weathering
Moisture Barrier	•••	•	~	NS
Outer Shell	•••	•••	•	• •
Thermal Liner	•••	÷	•	NS

**Table 4.** Median changes in summed PFAS concentrations by stressing and textile type. • • > + 150 %, • + 25 % to + 150 %, • - 25 % to + 25 %, • < - 25 %. NS – not studied.

The largest increases in summed PFAS concentration occurred with abrasion and the exposure of outer shell textiles to elevated temperature or weathering (Table 4), and these increases were largely driven by changes in 6:2 FTMAC and 6:2 FTOH concentrations, which were the PFAS present in the highest concentrations before and after stressing. Changes in 6:2 FTMAC and 6:2 FTOH concentrations in outer shell textiles were equivalent to 98 % to 100 % of the overall summed PFAS change following abrasion and 85 % to 102 % following weathering. In both MB-A and MB-D, which had the largest absolute and relative increases in summed PFAS concentration with abrasion among moisture barrier textiles, the increase in 6:2 FTOH and 6:2 FTMAC concentrations were equivalent to 99 % of the overall summed concentration increase. Similarly, where stressing decreased summed PFAS concentrations, such as in outer shell textiles with laundering, the decreases were also largely derived from changes in the concentrations of 6:2 FTMAC and 6:2 FTOH, which accounted for at least 91 % of the summed PFAS in outer shell

textiles both before and after laundering. Thermal liner textiles are an exception as no 6:2 FTMAC and 6:2 FTOH was detected prior to or after stressing. In thermal liner textiles, changes in summed PFAS concentrations were almost entirely derived from changes in PFAAs. These sum PFAS changes were below six ug/kg and did not change by more than six  $\mu$ g/kg for stressing processes, which is much smaller than observed in the outer shell and moisture barrier textiles).

The targeted analytical approach utilized here provides limited insight into the mechanisms underlying the observed changes in textile PFAS concentrations with stressing. For example, PFAS transformations will only be observed if the reactants and products are included in the targeted list of analyzed PFAS. Additionally, delineating the contributions of specific mechanisms is complicated by the potential simultaneous occurrence of multiple processes during textile stressing as suggested in previous examinations of PFAS concentrations in DWR-treated textiles before and after stressing [27, 29, 30]. For example, changes in PFAS concentrations from weathering may be a result of multiple processes - fluorinated polymer degradation, PFAS transformations, evaporation of volatile PFAS, and rinsing out of water soluble PFAS.

However, changes in the measured concentrations of specific PFAS subsets can provide some insight into the processes occurring during textile stressing. Abrasion resulted in overall summed PFAS concentration increases, not only among volatile PFAS as discussed above (Figure 28), but also in summed nonvolatile PFAS in most textiles (Figure 29). In the only previous study of PFAS in abraded DWR-treated textiles, Schellenberger et al. [27] quantified total fluorine by combustion ion chromatography in DWR-treated textiles that had previously been exposed to six months outdoor weathering before and after abrasion with Martindale abrader (3000 rubs at 9 Pa) and laundering with a domestic washer. This study found total fluorine concentrations fell following abrasion and laundering, which the authors indicated was likely due to removal of the outer textile layers that contained much of the applied DWR treatment. In contrast, the increased PFAS concentrations with abrasion observed here could indicate that abrasion increased the fraction of the PFAS that was released during extraction, even as a portion of the textiles was visibly abraded away.

Laundering resulted in decreased summed PFAS concentrations in most firefighter gear textiles compared to the corresponding unstressed textiles (Figure 9). Having observed decreased total fluorine concentrations in DWR-treated textiles following abrasion and laundering, Schellenberger et al. [27] identified numerous processes that could lead to reduced PFAS concentrations in laundered textiles, including wash-out of fiber fragments containing DWR treatments, wash-out of water soluble PFAS, and evaporation of volatile PFAS, as well as processes that could lead to increased PFAS concentrations such as the degradation of fluorinated polymers. In contrast, van der Veen et al. [30] reported the only previous PFAS measurements taken before and after laundering of a DWR-treated textile that had not previously been stressed and found that while PFAA concentrations were largely unchanged the concentration of 6:2 FTOH increased from 92  $\mu$ g/kg to 150  $\mu$ g/kg. Van der Veen et al. [30] suggested this increase may indicate an increase of 6:2 FTOH fraction that was extractable by methanol or the hydrolysis of 6:2 FTOH precursors

during laundering. Each of these processes may occur to varying degrees during laundering and produce conflicting PFAS concentration changes across a range of individual textiles.

While exposure to elevated temperatures produced varied changes in summed PFAS concentrations compared with unstressed firefighter gear textiles, volatile PFAS concentrations were higher in all outer shell textiles when compared with corresponding unstressed textiles (Figure 30). There are no previous reports of PFAS concentrations in textiles following exposure to elevated temperatures, but the boiling points of both 6:2 FTMAC and 6:2 FTOH have been predicted to be under 260 °C [38, 39], while side-chain fluorinated acrylates have been found to partially decompose at temperatures under 300 °C [41]. Therefore, exposure to 260 °C could result in the simultaneous vaporization of volatile PFAS and degradation of fluorinated polymers. The observed increase in volatile PFAS concentrations in outer shell textiles following exposure to elevated temperatures suggests that other processes beyond vaporization were occurring and could be indicative of enhancement of the extractable fraction of volatile PFAS or the production of PFAS from degradation of fluorinated polymers.

Weathering of outer shell textiles resulted in increased summed volatile PFAS concentrations, relative to unstressed outer shell textiles (Figure 34), and inconsistent changes among nonvolatile PFAS (Figure 35). Additionally, visible discoloration occurred in all outer shell textiles during weathering, which was taken to indicate degradation of textiles or DWR treatments. As with other stressing processes, multiple mechanisms affecting PFAS concentrations could be occurring simultaneously during weathering. Three previous studies evaluated PFAS concentrations in DWR-treated textiles before and after weathering. Schellenberger et al. [27] exposed polyamide textiles treated with side-chain fluorinated polymers to six months outdoor exposure in Sydney, Australia and quantified 42 PFAS by extraction with methanol and analysis by LC-MS/MS and GC-MS. After weathering, PFAA concentrations had increased by as much as 7000 µg/kg but total fluorine concentrations decreased, which the authors suggested was indicative of physical processes such as the evaporation of volatile PFAS during outdoor exposure as well as the washing out of both soluble PFAS and polymer-coated textile fibers with rain [27]. Additionally, because outdoor exposure apparently produced small, nonpolymeric PFAS with similar perfluorinated chain lengths as the polymer PFAS that were originally applied as side-chain fluorinated polymers, the authors suggested that radical-based degradation of side-chain fluorinated polymers or PFAA precursors could also be occurring.

Two previous studies used an ATLAS weather-O-meter to weather outdoor clothing samples [29] or high performance outer wear textiles that had been treated with side-chain fluorinated polymerbased DWR formulations [30]. In outdoor clothing, concentration increases of up to 100  $\mu$ g/m<sup>2</sup> (equivalent to 600  $\mu$ g/kg assuming 6 m<sup>2</sup>/kg) were observed for individual PFCAs and PFBS, while volatile PFAS concentrations increased by up to 400  $\mu$ g/m<sup>2</sup> for multiple n:2 FTOHs and over 170  $\mu$ g/m<sup>2</sup> for 6:2 FTMAC [29]. Similarly, in response to laboratory weathering, increased PFAA and volatile PFAS concentrations were observed in DWR-treated outer wear textiles [30]. In both studies, multiple mechanisms thought to be relevant to the measured PFAS concentration changes were proposed, including changes in the extractable fraction of PFAS, hydrolysis of fluorinated polymers forming nonpolymeric PFAS, and the conversion by reaction with radical species or hydrolysis of PFAS that were not measured by the study methods to those that were [29, 30].

As discussed above, 6:2 FTMAC or 6:2 FTOH were quantified above reporting limits in some stressed textiles but not the corresponding unstressed textile, which caused large apparent increases in the reported summed PFAS concentrations. For example, neither 6:2 FTMAC or 6:2 FTOH was quantified in scoured outer shell textiles prior to stressing, but both PFAS were repeatedly observed in scoured outer shell textiles following stressing. Because volatile PFAS reporting limits were frequently much lower for the analysis of stressed compared with unstressed textiles, the quantification of 6:2 FTMAC and 6:2 FTOH following stressing could derive from their being present at concentrations above reporting limits from the analysis of stressed textiles, but below the reporting limits from the analysis of unstressed textiles. For example, 6:2 FTMAC and 6:2 FTOH reporting limits in unstressed OS-ASC (i.e., 326 µg/kg and 183 µg/kg, respectively) were above all reported 6:2 FTMAC and 6:2 FTOH concentrations in these OS-ASC after stressing (i.e., up to 196  $\mu$ g/kg ± 47  $\mu$ g/kg and 129  $\mu$ g/kg ± 69  $\mu$ g/kg, respectively). However, the use of unstressed OS-FSC as an extraction blank suggests that, at least for OS-FSC, differences in reporting limits were not solely responsible for the apparent increases in volatile PFAS concentrations with stressing. The apparent increase in concentration of these PFAS could indicate their production during stressing or contamination from contact with other samples such as DWRtreated outer shell textiles which had 6:2 FTMAC concentrations up to 5570  $\mu$ g/kg  $\pm$  330  $\mu$ g/kg after stressing. However, if contamination was responsible, only moisture barrier and outer shell textiles were affected, as 6:2 FTMAC or 6:2 FTOH were not detected in thermal liner textiles. Additionally, their appearance in scoured textiles could indicate the scouring process left remnant PFAS which were not extractable from unstressed textiles but became extractable after stressing.

Ten PFAS were observed above reporting limits in at least one stressed textile but not in any unstressed textile, including four PPEAs, a class that was not observed in any unstressed textile (i.e., HFPO-DA, PFEESA, PF4OPeA, and PF5OHxA). However, these newly identified PFAS did not account for a large fraction of summed PFAS in any stressed textile as none were quantified above 1  $\mu$ g/kg, except for MeFBSA in abraded MB-C (2.01  $\mu$ g/kg ± 1.94  $\mu$ g/kg) and abraded MB-E (8.74  $\mu$ g/kg ± 1.00  $\mu$ g/kg). Given their low concentrations, the detection of these PFAS in stressed but not unstressed textiles could also derive from differences in reporting limits recorded during the analysis of stressed compared with unstressed firefighter gear textiles rather than genuine increases in concentration from stressing. For example, MeFBSA reporting limits in unstressed textiles ranged from 0.825  $\mu$ g/kg to 6.38  $\mu$ g/kg, compared with 0.104  $\mu$ g/kg to 1.25  $\mu$ g/kg in stressed textiles.

The identification of PPEAs in stressed firefighter gear textiles was unexpected, as they were not detected in the corresponding unstressed textiles [22] or in textiles examined by another study of firefighter turnout gear that quantified PPEAs [20]. While this is the first report of PPEAs in firefighter turnout gear textiles, it is not clear that their quantification above reporting limits was due to changes in their concentration during stressing. For example, only HFPO-DA could be verified by a secondary multiple reaction monitoring transition, as secondary transitions were not

collected for PF4OPeA, PF5OHxA, and PFEESA. Additionally, due to the high variability of the reported HPFO-DA measurements (i.e., average relative standard deviation: 50.2 %) and low measured concentrations of the other PPEAs (i.e., up to 0.068  $\mu$ g/kg  $\pm$  0.007  $\mu$ g/kg), contamination during storage, stressing, or extraction cannot be ruled out.

The presence of PFAAs in firefighter gear is of particular interest given the previous reporting of elevated PFAA concentrations in the serum of firefighters relative to the general population [9-14, 16, 17, 42, 43]. PFAAs were widely identified in stressed textiles, with at least one PFAA identified in 62 out of 69 stressed textiles, including PFCAs with between 3 and 13 perfluorinated carbons as well as PFSAs with between 3 and 10. However, PFAA concentrations were typically much lower than concentrations of 6:2 FTOH and 6:2 FTMAC. For example, PFOA and PFOS were not quantified above 2 µg/kg in any stressed textile. Additionally, summed PFAA concentrations changed with stressing similarly to the overall summed PFAS concentrations, which could indicate that differences in the extractable fraction of PFAS due to textile stressing were responsible for the observed changes in measured PFAA concentrations. For example, summed PFAA concentrations increased in 17 of the 18 textiles where overall summed PFAS increased with laundering and summed PFAA concentrations increased by similar ratios as overall PFAS (Figure 9 and Figure 33). However, in outer shell textiles, PFAA concentrations were more likely to decrease while overall summed concentrations increased with abrasion or weathering. Summed PFAA concentrations in DWR-treated outer shell textiles fell in five of seven with abrasion and in four of seven with weathering, while overall summed PFAS concentrations rose in all DWR-treated outer shell textiles with abrasion or weathering. These decreases could derive from abrasive removal of textile layers that contained fluorinated polymer derived DWR treatments, loss from reaction with radical species, or the rinsing out with water spray during weathering.

This NIST Technical Note was produced to assist in determining the potential for typical use to change measured PFAS concentrations in structural firefighter gear. However, there are limitations that complicate making correlations between the observed changes in PFAS concentrations and changes in the amount of PFAS a firefighter may be exposed to from firefighting gear. The targeted analytical approach used here will only observe PFAS that are included in the targeted analyte list. Previous examinations of PFAS in firefighter gear that determined both targeted PFAS concentrations and total fluorine measurements or total oxidizable precursor assay measurements have found that targeted PFAS measurements only account for a small fraction of the total fluorine present in firefighter gear textiles and that targeted PFAS measurements may not agree with total F measurements [20, 24, 27]. Further, some PFAS could have been released from the textiles during stressing while still presenting a potential PFAS exposure source to firefighters. For example, during exposure to abrasion, fragments were observed falling from the firefighter gear textiles, which indicates that the abrasion of firefighter gear could contribute to fire station dust, which has previously been confirmed to contain PFAS [24, 44]. Additionally, firefighter gear textiles lost up to 17 % of their original mass when exposed to elevated temperatures (Table 3); if this loss of mass is indicative of the release of gaseous PFAS then is it likely a similar PFAS loss may occur when the gear is used in the field. Finally, because PFAS concentrations are reported

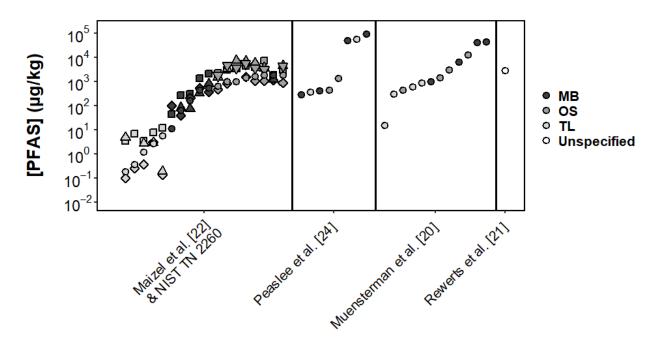
here in terms of the stressed textile mass, the decrease in mass may result in over- or underestimated PFAS mass in garments following exposure to abrasion or elevated temperatures. However, changes in textile mass with exposure to abrasion or elevated temperatures were small relative to the changes in summed PFAS concentrations, which increased by up to 26 times in NFPA 1971 compliant textiles.

This report builds on NIST Technical Note 2248 which reported PFAS concentrations in unstressed firefighter gear textiles and found that the summed PFAS mass in a firefighter garment made of equal masses of moisture barrier, outer shell, and thermal liner textiles could vary by up to a factor of six depending on which textile was selected for each layer [22]. If a similar garment were made of the stressed textiles reported here, an even larger range of summed PFAS concentrations would be possible. A garment made from equal masses of the stressed textiles with the highest summed PFAS concentrations (i.e., abraded MB-A, OS-F exposed to elevated temperatures, and abraded TL-C; average summed PFAS: 3110 µg/kg) would contain more than 20 times the summed PFAS mass of a garment made from equal masses of the lowest concentration textiles (MB-B, OS-G, TL-E; average summed PFAS: 158 µg/kg). Additionally, a garment made from the highest concentration stressed textiles would have about 2.5 times the summed PFAS mass of one made from the highest concentration unstressed textiles (average summed PFAS: 1250 µg/kg). The observation of higher summed PFAS mass in stressed textiles suggests that measurements of PFAS in unstressed or new textiles could underestimate the PFAS concentrations that would be measured in the same textiles after use in firefighting activities. In fact, previous studies of PFAS in DWR-treated textiles undergoing outdoor aging [27] or laboratory weathering [29] both found that textiles that met European Union standards for PFAS concentrations when new sometimes failed to meet the same requirements after stressing. Further, because each textile was only stressed once in this report, it is not known if PFAS concentrations would continue to change with repeated stressing, as a previous report of PFAS concentrations in textiles subjected to outdoor aging did observe larger changes following six months of exposure compared with three months [27].

While summed PFAS concentrations were frequently higher in stressed compared with unstressed firefighter gear textiles, thermal liner textiles still had the lowest summed PFAS concentrations of any type of firefighter gear textile. This could imply lower dermal PFAS exposure to firefighters than would be expected from averaging the PFAS concentrations measured in all three textile types, as thermal liners are the closet layer to skin in assembled gear. No thermal liner textile had a summed concentration over 10.7  $\mu$ g/kg  $\pm$  1.7  $\mu$ g/kg (i.e., abraded TL-C) following any stressing process.

In NIST TN 2248, summed PFAS concentrations in unstressed firefighter turnout gear textiles were compared to summed PFAS concentrations determined in other reports of firefighter gear and firefighter gear textiles [20-22, 24]. It was observed that other reports which included used or older firefighter gear reported higher summed PFAS concentrations than determined in NIST TN 2248. To evaluate the extent to which stressing may contribute to the wider range of summed PFAS concentrations observed across previous reports, Figure 3 from Maizel et al. [22] is

reproduced here with the overlay of summed PFAS concentrations measured in firefighter textiles after stressing (Figure 16). Summed PFAS concentrations in stressed gear were both higher and lower than in corresponding unstressed gear depending on the gear and stressing process. However, trends observed among unstressed textiles remain, for example summed concentrations generally increase from thermal liner textiles to moisture barrier textiles to outer shell textiles. Additionally, the differences in summed concentration with stressing (i.e., from decrease of  $109 \mu g/kg$  to increase of  $6320 \mu g/kg$ ) are similar to or smaller than the range of summed PFAS concentrations observed across previous reports [20, 22, 24], which may indicate that stressing alone is insufficient to account for the observed differences.



**Figure 16**. Summed PFAS concentrations in turnout gear textiles following abrasion (square), exposure to elevated temperatures (triangle pointing up), laundering (diamond), weathering (triangle pointing down), or prior to stressing (circle). PFAS measurements from three reports of unstressed firefighter gear [20,21,24] are also shown. Markers are ordered according to summed PFAS concentrations determined from analysis of unstressed textiles.

## 5. Summary

To investigate the extent to which physical stressors could change PFAS concentrations in firefighter gear, this NIST TN quantified the concentrations of 51 PFAS across 20 firefighter gear textiles following exposure to abrasion, elevated temperature, laundering, or weathering. Changes in PFAS concentration with stressing were determined by comparison with PFAS concentrations determined previously in corresponding unstressed textiles in NIST TN 2248.

Abrasion was found to increase summed PFAS concentrations for all textile types while weathering consistently increased summed PFAS concentrations in outer shell textiles. Laundering produced relatively small changes in summed PFAS concentrations across all textiles and exposure to elevated temperature increased summed PFAS in outer shell textiles but resulted in smaller changes in the remaining textile types. The largest absolute changes in PFAS concentration were observed in outer shell textiles with weathering, where the median summed PFAS concentration increased from 964 µg/kg to 3520 µg/kg. Where stressing increased summed PFAS concentrations, these changes were primarily due to increases in the concentrations of 6:2 FTMAC and 6:2 FTOH, which were also the highest concentration PFAS in unstressed turnout gear textiles, rather than the appearance of previously unobserved PFAS. As in unstressed textiles, summed PFAS concentrations tended to be highest in stressed DWR-treated outer shell textiles and lowest in stressed thermal liner textiles. While the targeted analytical approached used in this NIST TN cannot distinguish between the many processes that could contribute to altered textile PFAS concentrations with stressing, the observed changes with abrasion and weathering are consistent with changes in the fraction of PFAS that are extractable by the analytical method used in this report.

The findings of this NIST TN agree with those previously reported for PFAS in stressed DWRtreated textiles, which also observed that stressing can increase PFAS concentrations in textiles. Therefore, accurately estimating firefighter PFAS exposure from gear requires considering how PFAS concentrations may change as the gear is used.

# 6. Future Work

NIST is continuing to research other potential sources of PFAS exposure to firefighters such as gear worn by wildland firefighters as well as hoods and gloves worn by structural firefighters. Additionally, future work will use high-resolution mass spectrometry to identify a broader swath of PFAS than the limited number of compounds quantified here, including screening for compounds such as N-methyl perfluorobutane sulfonamido ethanol (MeFBSE) which has been identified in firefighter turnout gear [20]. Finally, to better relate the measurements made here with the actual PFAS exposure to firefighters, the capacity of simulated sweat to extract PFAS from firefighter turnout gear will be evaluated.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		<u>, , , , , , , , , , , , , , , , , , , </u>
PFBA	$1.02 \pm 0.78$	0.509	PFEESA	<rl< td=""><td>0.019</td></rl<>	0.019
PFPeA	$1.49 \pm 0.52$	0.162	PF4OPeA	<rl< td=""><td>0.020</td></rl<>	0.020
PFHxA	$8.45 \pm 0.62$	0.279	PF5OHxA	<rl< td=""><td>0.018</td></rl<>	0.018
PFHpA	<rl< td=""><td>0.288</td><td>3-6-OPFHpA</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.288	3-6-OPFHpA	<rl< td=""><td>0.019</td></rl<>	0.019
PFOA	<rl< td=""><td>0.139</td><td>HFPO-DA</td><td><rl< td=""><td>0.191</td></rl<></td></rl<>	0.139	HFPO-DA	<rl< td=""><td>0.191</td></rl<>	0.191
PFNA	<rl< td=""><td>0.020</td><td>ADONA</td><td><rl< td=""><td>0.018</td></rl<></td></rl<>	0.020	ADONA	<rl< td=""><td>0.018</td></rl<>	0.018
PFDA	<rl< td=""><td>0.131</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.036</td></rl<></td></rl<>	0.131	9CI-PF3ONS	<rl< td=""><td>0.036</td></rl<>	0.036
PFUnDA	<rl< td=""><td>0.048</td><td>11Cl-PF3OUdS</td><td>No Value</td><td></td></rl<>	0.048	11Cl-PF3OUdS	No Value	
PFDoDA	<rl< td=""><td>0.069</td><td></td><td></td><td></td></rl<>	0.069			
PFTrDA	<rl< td=""><td>0.095</td><td>n:2 FTAcr(V)</td><td></td><td></td></rl<>	0.095	n:2 FTAcr(V)		
PFTeDA	<rl< td=""><td>0.134</td><td>8:2 FTAcr</td><td><rl< td=""><td>27.1</td></rl<></td></rl<>	0.134	8:2 FTAcr	<rl< td=""><td>27.1</td></rl<>	27.1
			10:2 FTAcr	No Value	
PFSA (NV)					
PFPrS	<rl< td=""><td>0.028</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.028	n:2 FTMAC (V)		
PFBS	$0.075 \pm 0.021$	0.060	6:2 FTMAC	$960 \pm 47$	45.2
PFPeS	<rl< td=""><td>0.019</td><td>8:2 FTMAC</td><td><rl< td=""><td>46.2</td></rl<></td></rl<>	0.019	8:2 FTMAC	<rl< td=""><td>46.2</td></rl<>	46.2
PFHxS	$0.082\pm0.036$	0.018	10:2 FTMAC	<rl< td=""><td>24.4</td></rl<>	24.4
PFHpS	<rl< td=""><td>0.019</td><td></td><td></td><td></td></rl<>	0.019			
PFOS	<rl< td=""><td>0.061</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.061	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.038</td><td>8:2 FTOAc</td><td><rl< td=""><td>26.3</td></rl<></td></rl<>	0.038	8:2 FTOAc	<rl< td=""><td>26.3</td></rl<>	26.3
PFDS	No Value		10:2 FTOAc	<rl< td=""><td>13.3</td></rl<>	13.3
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	$0.66 \pm 0.11$	0.020	4:2 FTOH	<rl< td=""><td>68.7</td></rl<>	68.7
MeFBSA (SV)	<rl< td=""><td>0.138</td><td>5:2 FTOH</td><td><rl< td=""><td>65.4</td></rl<></td></rl<>	0.138	5:2 FTOH	<rl< td=""><td>65.4</td></rl<>	65.4
FHxSA (NV)	$0.039 \pm 0.013$	0.020	6:2 FTOH	$1070 \pm 410$	25.3
FOSA (NV)	$0.0334 \pm 0.0083$	0.020	7:2 FTOH	<rl< td=""><td>65.1</td></rl<>	65.1
MeFOSA (SV)	<rl< td=""><td>0.347</td><td>8:2 FTOH</td><td><rl< td=""><td>121</td></rl<></td></rl<>	0.347	8:2 FTOH	<rl< td=""><td>121</td></rl<>	121
EtFOSA (SV)	<rl< td=""><td>0.348</td><td>10:2 FTOH</td><td><rl< td=""><td>65.4</td></rl<></td></rl<>	0.348	10:2 FTOH	<rl< td=""><td>65.4</td></rl<>	65.4
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.020</td><td>4:2 FTS</td><td>No Value</td><td></td></rl<>	0.020	4:2 FTS	No Value	
MeFOSAA	<rl< td=""><td>0.090</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.090	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.040</td><td>8:2 FTS</td><td><rl< td=""><td>0.087</td></rl<></td></rl<>	0.040	8:2 FTS	<rl< td=""><td>0.087</td></rl<>	0.087
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.349</td><td></td><td></td><td></td></rl<>	0.349			
EtFOSE	<rl< td=""><td>0.721</td><td></td><td></td><td></td></rl<>	0.721			

 Table 5. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for abraded MB-A.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	$1.36 \pm 0.28$	0.719	PFEESA	<rl< td=""><td>0.017</td></rl<>	0.017
PFPeA	$0.923 \pm 0.070$	0.038	PF4OPeA	<rl< td=""><td>0.019</td></rl<>	0.019
PFHxA	$3.54 \pm 0.28$	0.344	PF5OHxA	<rl< td=""><td>0.019</td></rl<>	0.019
РҒНрА	<rl< td=""><td>0.156</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.156	3-6-ОРҒНрА	<rl< td=""><td>0.019</td></rl<>	0.019
PFOA	No Value		HFPO-DA	<rl< td=""><td>0.019</td></rl<>	0.019
PFNA	<rl< td=""><td>0.075</td><td>ADONA</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.075	ADONA	<rl< td=""><td>0.019</td></rl<>	0.019
PFDA	<rl< td=""><td>0.040</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.040	9CI-PF3ONS	<rl< td=""><td>0.020</td></rl<>	0.020
PFUnDA	<rl< td=""><td>0.106</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.106	11Cl-PF3OUdS	<rl< td=""><td>0.020</td></rl<>	0.020
PFDoDA	<rl< td=""><td>0.031</td><td></td><td></td><td></td></rl<>	0.031			
PFTrDA	<rl< td=""><td>0.034</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.034	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.022</td><td>8:2 FTAcr</td><td><rl< td=""><td>16.6</td></rl<></td></rl<>	0.022	8:2 FTAcr	<rl< td=""><td>16.6</td></rl<>	16.6
			10:2 FTAcr	<rl< td=""><td>16.0</td></rl<>	16.0
PFSA (NV)					
PFPrS	<rl< td=""><td>0.044</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.044	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>2.19</td><td>6:2 FTMAC</td><td><math>357 \pm 14</math></td><td>56.8</td></rl<>	2.19	6:2 FTMAC	$357 \pm 14$	56.8
PFPeS	<rl< td=""><td>0.020</td><td>8:2 FTMAC</td><td><rl< td=""><td>58.1</td></rl<></td></rl<>	0.020	8:2 FTMAC	<rl< td=""><td>58.1</td></rl<>	58.1
PFHxS	<rl< td=""><td>3.46</td><td>10:2 FTMAC</td><td><rl< td=""><td>30.6</td></rl<></td></rl<>	3.46	10:2 FTMAC	<rl< td=""><td>30.6</td></rl<>	30.6
PFHpS	<rl< td=""><td>0.021</td><td></td><td></td><td></td></rl<>	0.021			
PFOS	<rl< td=""><td>3.64</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	3.64	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.042</td><td>8:2 FTOAc</td><td><rl< td=""><td>16.2</td></rl<></td></rl<>	0.042	8:2 FTOAc	<rl< td=""><td>16.2</td></rl<>	16.2
PFDS	<rl< td=""><td>0.022</td><td>10:2 FTOAc</td><td><rl< td=""><td>16.7</td></rl<></td></rl<>	0.022	10:2 FTOAc	<rl< td=""><td>16.7</td></rl<>	16.7
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	<rl< td=""><td>0.022</td><td><b>4:2 FTOH</b></td><td><rl< td=""><td>33.9</td></rl<></td></rl<>	0.022	<b>4:2 FTOH</b>	<rl< td=""><td>33.9</td></rl<>	33.9
MeFBSA (SV)	<rl< td=""><td>0.872</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>82.2</td></rl<></td></rl<>	0.872	<b>5:2 FTOH</b>	<rl< td=""><td>82.2</td></rl<>	82.2
FHxSA (NV)	<rl< td=""><td>0.022</td><td>6:2 FTOH</td><td>431 ± 19</td><td>82.8</td></rl<>	0.022	6:2 FTOH	431 ± 19	82.8
FOSA (NV)	<rl< td=""><td>0.024</td><td>7:2 FTOH</td><td><rl< td=""><td>81.9</td></rl<></td></rl<>	0.024	7:2 FTOH	<rl< td=""><td>81.9</td></rl<>	81.9
MeFOSA (SV)	<rl< td=""><td>0.417</td><td>8:2 FTOH</td><td><rl< td=""><td>81.0</td></rl<></td></rl<>	0.417	8:2 FTOH	<rl< td=""><td>81.0</td></rl<>	81.0
EtFOSA (SV)	<rl< td=""><td>0.174</td><td>10:2 FTOH</td><td><rl< td=""><td>167</td></rl<></td></rl<>	0.174	10:2 FTOH	<rl< td=""><td>167</td></rl<>	167
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	No Value		4:2 FTS	No Value	
MeFOSAA	No Value		6:2 FTS	No Value	
EtFOSAA	No Value		8:2 FTS	No Value	
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.175</td><td></td><td></td><td></td></rl<>	0.175			
EtFOSE	No Value				

**Table 6.** Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for MB-A following exposure to elevated temperature.

PFCA (NV) PFBA	(µg/kg)	(µg/kg)		(µg/kg)	(µg/kg)
			PPEA (NV)	• • •	
	<rl< td=""><td>0.893</td><th>PFEESA</th><td><rl< td=""><td>0.042</td></rl<></td></rl<>	0.893	PFEESA	<rl< td=""><td>0.042</td></rl<>	0.042
PFPeA	$0.372\pm0.057$	0.218	PF4OPeA	<rl< td=""><td>0.198</td></rl<>	0.198
PFHxA	$4.19\pm0.45$	0.218	PF5OHxA	<rl< td=""><td>0.076</td></rl<>	0.076
PFHpA	<rl< td=""><td>1.16</td><th>3-6-ОРҒНрА</th><td><rl< td=""><td>0.033</td></rl<></td></rl<>	1.16	3-6-ОРҒНрА	<rl< td=""><td>0.033</td></rl<>	0.033
PFOA	<rl< td=""><td>0.409</td><th>HFPO-DA</th><td><rl< td=""><td>0.451</td></rl<></td></rl<>	0.409	HFPO-DA	<rl< td=""><td>0.451</td></rl<>	0.451
PFNA	<rl< td=""><td>0.218</td><th>ADONA</th><td><rl< td=""><td>0.034</td></rl<></td></rl<>	0.218	ADONA	<rl< td=""><td>0.034</td></rl<>	0.034
PFDA	<rl< td=""><td>0.451</td><th>9CI-PF3ONS</th><td><rl< td=""><td>0.033</td></rl<></td></rl<>	0.451	9CI-PF3ONS	<rl< td=""><td>0.033</td></rl<>	0.033
PFUnDA	No Value		11Cl-PF3OUdS	<rl< td=""><td>0.034</td></rl<>	0.034
PFDoDA	<rl< td=""><td>0.218</td><th></th><td></td><td></td></rl<>	0.218			
PFTrDA	No Value		n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.084</td><th>8:2 FTAcr</th><td><rl< td=""><td>14.0</td></rl<></td></rl<>	0.084	8:2 FTAcr	<rl< td=""><td>14.0</td></rl<>	14.0
			10:2 FTAcr	<rl< td=""><td>13.4</td></rl<>	13.4
PFSA (NV)					
PFPrS	<rl< td=""><td>0.038</td><th><i>n:2 FTMAC (V)</i></th><td></td><td></td></rl<>	0.038	<i>n:2 FTMAC (V)</i>		
PFBS	<rl< td=""><td>0.038</td><th>6:2 FTMAC</th><td><math display="block">234\pm26</math></td><td>59.9</td></rl<>	0.038	6:2 FTMAC	$234\pm26$	59.9
PFPeS	<rl< td=""><td>0.039</td><th>8:2 FTMAC</th><td><rl< td=""><td>61.3</td></rl<></td></rl<>	0.039	8:2 FTMAC	<rl< td=""><td>61.3</td></rl<>	61.3
PFHxS	<rl< td=""><td>0.077</td><th><b>10:2 FTMAC</b></th><td><rl< td=""><td>32.3</td></rl<></td></rl<>	0.077	<b>10:2 FTMAC</b>	<rl< td=""><td>32.3</td></rl<>	32.3
PFHpS	<rl< td=""><td>0.039</td><th></th><td></td><td></td></rl<>	0.039			
PFOS	$1.191\pm0.058$	0.202	<i>n:2 FTOAc (V)</i>		
PFNS	<rl< td=""><td>0.081</td><th>8:2 FTOAc</th><td><rl< td=""><td>13.7</td></rl<></td></rl<>	0.081	8:2 FTOAc	<rl< td=""><td>13.7</td></rl<>	13.7
PFDS	<rl< td=""><td>0.040</td><th>10:2 FTOAc</th><td>No Value</td><td></td></rl<>	0.040	10:2 FTOAc	No Value	
FASA (NV, SV)			n:2 FTOH (V)		
FBSA (NV)	$0.1532 \pm 0.0061$	0.084	<b>4:2 FTOH</b>	<rl< td=""><td>68.6</td></rl<>	68.6
MeFBSA (SV)	<rl< td=""><td>0.440</td><th><b>5:2 FTOH</b></th><td><rl< td=""><td>26.6</td></rl<></td></rl<>	0.440	<b>5:2 FTOH</b>	<rl< td=""><td>26.6</td></rl<>	26.6
FHxSA (NV)	<rl< td=""><td>0.041</td><th>6:2 FTOH</th><td><math display="block">129.6\pm9.5</math></td><td>70.2</td></rl<>	0.041	6:2 FTOH	$129.6\pm9.5$	70.2
FOSA (NV)	<rl< td=""><td>0.110</td><th>7:2 FTOH</th><td><rl< td=""><td>27.2</td></rl<></td></rl<>	0.110	7:2 FTOH	<rl< td=""><td>27.2</td></rl<>	27.2
MeFOSA (SV)	<rl< td=""><td>0.177</td><th>8:2 FTOH</th><td><rl< td=""><td>102</td></rl<></td></rl<>	0.177	8:2 FTOH	<rl< td=""><td>102</td></rl<>	102
EtFOSA (SV)	<rl< td=""><td>0.439</td><th>10:2 FTOH</th><td><rl< td=""><td>69.7</td></rl<></td></rl<>	0.439	10:2 FTOH	<rl< td=""><td>69.7</td></rl<>	69.7
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.218</td><th>4:2 FTS</th><td><rl< td=""><td>0.079</td></rl<></td></rl<>	0.218	4:2 FTS	<rl< td=""><td>0.079</td></rl<>	0.079
MeFOSAA	<rl< td=""><td>0.218</td><th>6:2 FTS</th><td><rl< td=""><td>0.429</td></rl<></td></rl<>	0.218	6:2 FTS	<rl< td=""><td>0.429</td></rl<>	0.429
EtFOSAA	No Value		8:2 FTS	<rl< td=""><td>0.433</td></rl<>	0.433
			10:2 FTS	<rl< td=""><td>0.086</td></rl<>	0.086
FASE (SV)					
MeFOSE	<rl< td=""><td>0.178</td><th></th><td></td><td></td></rl<>	0.178			
EtFOSE	<rl< td=""><td>0.176</td><th></th><td></td><td></td></rl<>	0.176			

 Table 7. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for laundered MB-A.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	<rl< td=""><td>0.889</td><td>PFEESA</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.889	PFEESA	<rl< td=""><td>0.020</td></rl<>	0.020
PFPeA	<rl< td=""><td>0.217</td><td>PF4OPeA</td><td><rl< td=""><td>0.023</td></rl<></td></rl<>	0.217	PF4OPeA	<rl< td=""><td>0.023</td></rl<>	0.023
PFHxA	$0.355 \pm 0.064$	0.217	PF5OHxA	<rl< td=""><td>0.197</td></rl<>	0.197
PFHpA	<rl< td=""><td>0.409</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.023</td></rl<></td></rl<>	0.409	3-6-ОРҒНрА	<rl< td=""><td>0.023</td></rl<>	0.023
PFOA	<rl< td=""><td>0.185</td><td>HFPO-DA</td><td><rl< td=""><td>0.025</td></rl<></td></rl<>	0.185	HFPO-DA	<rl< td=""><td>0.025</td></rl<>	0.025
PFNA	<rl< td=""><td>0.076</td><td>ADONA</td><td><rl< td=""><td>0.023</td></rl<></td></rl<>	0.076	ADONA	<rl< td=""><td>0.023</td></rl<>	0.023
	0.1747 ±		ACI DE2ONS		
PFDA	0.0061	0.073	9CI-PF3ONS	<rl< td=""><td>0.024</td></rl<>	0.024
PFUnDA	<rl< td=""><td>0.068</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.068	11Cl-PF3OUdS	<rl< td=""><td>0.024</td></rl<>	0.024
<b>PFDoDA</b>	$0.0678 \pm$				
FFDODA	0.0064	0.064			
PFTrDA	<rl< td=""><td>0.030</td><td>n:2 FTAcr(V)</td><td></td><td></td></rl<>	0.030	n:2 FTAcr(V)		
PFTeDA	<rl< td=""><td>0.083</td><td>8:2 FTAcr</td><td><rl< td=""><td>23.9</td></rl<></td></rl<>	0.083	8:2 FTAcr	<rl< td=""><td>23.9</td></rl<>	23.9
			10:2 FTAcr	<rl< td=""><td>11.2</td></rl<>	11.2
PFSA (NV)					
PFPrS	<rl< td=""><td>0.038</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.038	n:2 FTMAC (V)		
PFBS	$5.43 \pm 0.72$	0.022	6:2 FTMAC	<rl< td=""><td>39.9</td></rl<>	39.9
PFPeS	<rl< td=""><td>0.027</td><td>8:2 FTMAC</td><td><rl< td=""><td>40.8</td></rl<></td></rl<>	0.027	8:2 FTMAC	<rl< td=""><td>40.8</td></rl<>	40.8
PFHxS	<rl< td=""><td>0.048</td><td>10:2 FTMAC</td><td><rl< td=""><td>21.5</td></rl<></td></rl<>	0.048	10:2 FTMAC	<rl< td=""><td>21.5</td></rl<>	21.5
PFHpS	<rl< td=""><td>0.024</td><td></td><td></td><td></td></rl<>	0.024			
PFOS	<rl< td=""><td>0.201</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.201	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.024</td><td>8:2 FTOAc</td><td><rl< td=""><td>23.3</td></rl<></td></rl<>	0.024	8:2 FTOAc	<rl< td=""><td>23.3</td></rl<>	23.3
PFDS	<rl< td=""><td>0.024</td><td>10:2 FTOAc</td><td><rl< td=""><td>11.7</td></rl<></td></rl<>	0.024	10:2 FTOAc	<rl< td=""><td>11.7</td></rl<>	11.7
FASA (NV, SV)			n:2 FTOH (V)		
FBSA (NV)	$0.461 \pm 0.07$	0.083	4:2 FTOH	<rl< td=""><td>60.7</td></rl<>	60.7
MeFBSA (SV)	<rl< td=""><td>0.121</td><td>5:2 FTOH</td><td><rl< td=""><td>57.7</td></rl<></td></rl<>	0.121	5:2 FTOH	<rl< td=""><td>57.7</td></rl<>	57.7
FHxSA (NV)	<rl< td=""><td>0.025</td><td>6:2 FTOH</td><td><math>38.4 \pm 5</math></td><td>22.3</td></rl<>	0.025	6:2 FTOH	$38.4 \pm 5$	22.3
FOSA (NV)	<rl< td=""><td>0.033</td><td>7:2 FTOH</td><td><rl< td=""><td>57.5</td></rl<></td></rl<>	0.033	7:2 FTOH	<rl< td=""><td>57.5</td></rl<>	57.5
MeFOSA (SV)	<rl< td=""><td>0.303</td><td>8:2 FTOH</td><td><rl< td=""><td>107</td></rl<></td></rl<>	0.303	8:2 FTOH	<rl< td=""><td>107</td></rl<>	107
EtFOSA (SV)	<rl< td=""><td>0.303</td><td>10:2 FTOH</td><td><rl< td=""><td>57.7</td></rl<></td></rl<>	0.303	10:2 FTOH	<rl< td=""><td>57.7</td></rl<>	57.7
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.025</td><td>4:2 FTS</td><td>No Value</td><td></td></rl<>	0.025	4:2 FTS	No Value	
MeFOSAA	<rl< td=""><td>0.134</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.134	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.115</td><td>8:2 FTS</td><td><rl< td=""><td>0.049</td></rl<></td></rl<>	0.115	8:2 FTS	<rl< td=""><td>0.049</td></rl<>	0.049
			10:2 FTS	<rl< td=""><td>0.127</td></rl<>	0.127
FASE (SV)			· · · · ·		
MeFOSE	No Value				
EtFOSE	<rl< td=""><td>0.629</td><td></td><td></td><td></td></rl<>	0.629			

 Table 8. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for abraded MB-B.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	<rl< td=""><td>0.884</td><td>PFEESA</td><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.884	PFEESA	<rl< td=""><td>0.021</td></rl<>	0.021
PFPeA	<rl< td=""><td>0.047</td><td>PF4OPeA</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.047	PF4OPeA	<rl< td=""><td>0.024</td></rl<>	0.024
PFHxA	<rl< td=""><td>0.422</td><td>PF5OHxA</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.422	PF5OHxA	<rl< td=""><td>0.024</td></rl<>	0.024
PFHpA	<rl< td=""><td>0.192</td><td>3-6-OPFHpA</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.192	3-6-OPFHpA	<rl< td=""><td>0.024</td></rl<>	0.024
PFOA	<rl< td=""><td>0.277</td><td>HFPO-DA</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.277	HFPO-DA	<rl< td=""><td>0.024</td></rl<>	0.024
PFNA	<rl< td=""><td>0.092</td><td>ADONA</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.092	ADONA	<rl< td=""><td>0.024</td></rl<>	0.024
PFDA	<rl< td=""><td>0.050</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.025</td></rl<></td></rl<>	0.050	9CI-PF3ONS	<rl< td=""><td>0.025</td></rl<>	0.025
PFUnDA	<rl< td=""><td>0.130</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.025</td></rl<></td></rl<>	0.130	11Cl-PF3OUdS	<rl< td=""><td>0.025</td></rl<>	0.025
PFDoDA	<rl< td=""><td>0.039</td><td></td><td></td><td></td></rl<>	0.039			
PFTrDA	<rl< td=""><td>0.042</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.042	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.027</td><td>8:2 FTAcr</td><td><rl< td=""><td>17.7</td></rl<></td></rl<>	0.027	8:2 FTAcr	<rl< td=""><td>17.7</td></rl<>	17.7
			10:2 FTAcr	<rl< td=""><td>17.0</td></rl<>	17.0
PFSA (NV)					
PFPrS	<rl< td=""><td>0.054</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.054	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>5.23</td><td>6:2 FTMAC</td><td><rl< td=""><td>59.4</td></rl<></td></rl<>	5.23	6:2 FTMAC	<rl< td=""><td>59.4</td></rl<>	59.4
PFPeS	<rl< td=""><td>0.025</td><td>8:2 FTMAC</td><td><rl< td=""><td>58.4</td></rl<></td></rl<>	0.025	8:2 FTMAC	<rl< td=""><td>58.4</td></rl<>	58.4
PFHxS	<rl< td=""><td>4.26</td><td>10:2 FTMAC</td><td><rl< td=""><td>32.0</td></rl<></td></rl<>	4.26	10:2 FTMAC	<rl< td=""><td>32.0</td></rl<>	32.0
PFHpS	<rl< td=""><td>0.025</td><td></td><td></td><td></td></rl<>	0.025			
PFOS	<rl< td=""><td>4.47</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	4.47	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.051</td><td>8:2 FTOAc</td><td><rl< td=""><td>17.3</td></rl<></td></rl<>	0.051	8:2 FTOAc	<rl< td=""><td>17.3</td></rl<>	17.3
PFDS	<rl< td=""><td>0.027</td><td>10:2 FTOAc</td><td><rl< td=""><td>17.7</td></rl<></td></rl<>	0.027	10:2 FTOAc	<rl< td=""><td>17.7</td></rl<>	17.7
FASA (NV, SV)		<u> </u>	n:2 FTOH (V)		
FBSA (NV)	<rl< td=""><td>0.027</td><td><b>4:2 FTOH</b></td><td><rl< td=""><td>82.7</td></rl<></td></rl<>	0.027	<b>4:2 FTOH</b>	<rl< td=""><td>82.7</td></rl<>	82.7
MeFBSA (SV)	<rl< td=""><td>0.439</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>78.7</td></rl<></td></rl<>	0.439	<b>5:2 FTOH</b>	<rl< td=""><td>78.7</td></rl<>	78.7
FHxSA (NV)	<rl< td=""><td>0.027</td><td>6:2 FTOH</td><td><rl< td=""><td>35.8</td></rl<></td></rl<>	0.027	6:2 FTOH	<rl< td=""><td>35.8</td></rl<>	35.8
FOSA (NV)	<rl< td=""><td>0.030</td><td>7:2 FTOH</td><td><rl< td=""><td>36.0</td></rl<></td></rl<>	0.030	7:2 FTOH	<rl< td=""><td>36.0</td></rl<>	36.0
MeFOSA (SV)	<rl< td=""><td>0.437</td><td>8:2 FTOH</td><td><rl< td=""><td>17.6</td></rl<></td></rl<>	0.437	8:2 FTOH	<rl< td=""><td>17.6</td></rl<>	17.6
EtFOSA (SV)	<rl< td=""><td>0.438</td><td>10:2 FTOH</td><td><rl< td=""><td>90.4</td></rl<></td></rl<>	0.438	10:2 FTOH	<rl< td=""><td>90.4</td></rl<>	90.4
FASAA (NV)		<u>.</u>	<i>n:2 FTS (NV)</i>		
FOSAA	No Value		4:2 FTS	No Value	
MeFOSAA	<rl< td=""><td>0.027</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.027	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.027</td><td>8:2 FTS</td><td>No Value</td><td></td></rl<>	0.027	8:2 FTS	No Value	
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	No Value				
EtFOSE	<rl< td=""><td>0.433</td><td></td><td></td><td></td></rl<>	0.433			

**Table 9.** Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for MB-B following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	<rl< td=""><td>1.09</td><td>PFEESA</td><td><rl< td=""><td>0.051</td></rl<></td></rl<>	1.09	PFEESA	<rl< td=""><td>0.051</td></rl<>	0.051
PFPeA	<rl< td=""><td>0.265</td><td>PF4OPeA</td><td><rl< td=""><td>0.241</td></rl<></td></rl<>	0.265	PF4OPeA	<rl< td=""><td>0.241</td></rl<>	0.241
PFHxA	<rl< td=""><td>0.265</td><td>PF5OHxA</td><td><rl< td=""><td>0.093</td></rl<></td></rl<>	0.265	PF5OHxA	<rl< td=""><td>0.093</td></rl<>	0.093
PFHpA	<rl< td=""><td>1.41</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.040</td></rl<></td></rl<>	1.41	3-6-ОРҒНрА	<rl< td=""><td>0.040</td></rl<>	0.040
PFOA	<rl< td=""><td>0.497</td><td>HFPO-DA</td><td><rl< td=""><td>0.548</td></rl<></td></rl<>	0.497	HFPO-DA	<rl< td=""><td>0.548</td></rl<>	0.548
PFNA	<rl< td=""><td>0.265</td><td>ADONA</td><td><rl< td=""><td>0.041</td></rl<></td></rl<>	0.265	ADONA	<rl< td=""><td>0.041</td></rl<>	0.041
PFDA	<rl< td=""><td>0.548</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.041</td></rl<></td></rl<>	0.548	9CI-PF3ONS	<rl< td=""><td>0.041</td></rl<>	0.041
PFUnDA	<rl< td=""><td>0.265</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.042</td></rl<></td></rl<>	0.265	11Cl-PF3OUdS	<rl< td=""><td>0.042</td></rl<>	0.042
PFDoDA	<rl< td=""><td>0.265</td><td></td><td></td><td></td></rl<>	0.265			
PFTrDA	<rl< td=""><td>0.102</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.102	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.102</td><td>8:2 FTAcr</td><td><rl< td=""><td>15.4</td></rl<></td></rl<>	0.102	8:2 FTAcr	<rl< td=""><td>15.4</td></rl<>	15.4
			10:2 FTAcr	<rl< td=""><td>14.8</td></rl<>	14.8
PFSA (NV)					
PFPrS	<rl< td=""><td>0.046</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.046	n:2 FTMAC (V)		
PFBS	$0.57\pm0.30$	0.046	6:2 FTMAC	<rl< td=""><td>66.0</td></rl<>	66.0
PFPeS	<rl< td=""><td>0.047</td><td>8:2 FTMAC</td><td><rl< td=""><td>67.6</td></rl<></td></rl<>	0.047	8:2 FTMAC	<rl< td=""><td>67.6</td></rl<>	67.6
PFHxS	<rl< td=""><td>0.093</td><td><b>10:2 FTMAC</b></td><td><rl< td=""><td>35.6</td></rl<></td></rl<>	0.093	<b>10:2 FTMAC</b>	<rl< td=""><td>35.6</td></rl<>	35.6
PFHpS	<rl< td=""><td>0.048</td><td></td><td></td><td></td></rl<>	0.048			
PFOS	$0.330\pm0.019$	0.246	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.098</td><td>8:2 FTOAc</td><td><rl< td=""><td>15.2</td></rl<></td></rl<>	0.098	8:2 FTOAc	<rl< td=""><td>15.2</td></rl<>	15.2
PFDS	<rl< td=""><td>0.048</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	0.048	10:2 FTOAc	No Value	
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	$0.340\pm0.081$	0.102	<b>4:2 FTOH</b>	<rl< td=""><td>75.7</td></rl<>	75.7
MeFBSA (SV)	<rl< td=""><td>0.453</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>29.3</td></rl<></td></rl<>	0.453	<b>5:2 FTOH</b>	<rl< td=""><td>29.3</td></rl<>	29.3
FHxSA (NV)	<rl< td=""><td>0.050</td><td>6:2 FTOH</td><td><math>96 \pm 14</math></td><td>77.4</td></rl<>	0.050	6:2 FTOH	$96 \pm 14$	77.4
FOSA (NV)	<rl< td=""><td>0.134</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>30.0</td></rl<></td></rl<>	0.134	<b>7:2 FTOH</b>	<rl< td=""><td>30.0</td></rl<>	30.0
MeFOSA (SV)	<rl< td=""><td>0.182</td><td>8:2 FTOH</td><td><rl< td=""><td>113</td></rl<></td></rl<>	0.182	8:2 FTOH	<rl< td=""><td>113</td></rl<>	113
EtFOSA (SV)	<rl< td=""><td>0.452</td><td>10:2 FTOH</td><td><rl< td=""><td>76.9</td></rl<></td></rl<>	0.452	10:2 FTOH	<rl< td=""><td>76.9</td></rl<>	76.9
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.265</td><td>4:2 FTS</td><td><rl< td=""><td>0.096</td></rl<></td></rl<>	0.265	4:2 FTS	<rl< td=""><td>0.096</td></rl<>	0.096
MeFOSAA	<rl< td=""><td>0.265</td><td>6:2 FTS</td><td><rl< td=""><td>0.521</td></rl<></td></rl<>	0.265	6:2 FTS	<rl< td=""><td>0.521</td></rl<>	0.521
EtFOSAA	<rl< td=""><td>0.265</td><td>8:2 FTS</td><td><rl< td=""><td>0.526</td></rl<></td></rl<>	0.265	8:2 FTS	<rl< td=""><td>0.526</td></rl<>	0.526
			10:2 FTS	<rl< td=""><td>0.105</td></rl<>	0.105
FASE (SV)					
MeFOSE	<rl< td=""><td>0.183</td><td></td><td></td><td></td></rl<>	0.183			
EtFOSE	<rl< td=""><td>0.181</td><td></td><td></td><td></td></rl<>	0.181			

Table 10. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for laundered MB-B.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg
PFCA (NV)			PPEA (NV)		
PFBA	$119.3 \pm 7.5$	0.819	PFEESA	<rl< td=""><td>0.014</td></rl<>	0.014
PFPeA	$1.251 \pm 0.068$	0.200	PF4OPeA	<rl< td=""><td>0.016</td></rl<>	0.016
PFHxA	$1.81 \pm 0.18$	0.200	PF50HxA	<rl< td=""><td>0.182</td></rl<>	0.182
РҒНрА	<rl< td=""><td>0.277</td><td>3-6-OPFHpA</td><td><rl< td=""><td>0.070</td></rl<></td></rl<>	0.277	3-6-OPFHpA	<rl< td=""><td>0.070</td></rl<>	0.070
PFOA	<rl< td=""><td>0.125</td><td>HFPO-DA</td><td><rl< td=""><td>0.017</td></rl<></td></rl<>	0.125	HFPO-DA	<rl< td=""><td>0.017</td></rl<>	0.017
PFNA	<rl< td=""><td>0.051</td><td>ADONA</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.051	ADONA	<rl< td=""><td>0.015</td></rl<>	0.015
PFDA	<rl< td=""><td>0.049</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.031</td></rl<></td></rl<>	0.049	9CI-PF3ONS	<rl< td=""><td>0.031</td></rl<>	0.031
PFUnDA	<rl< td=""><td>0.046</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.031</td></rl<></td></rl<>	0.046	11Cl-PF3OUdS	<rl< td=""><td>0.031</td></rl<>	0.031
PFDoDA	<rl< td=""><td>0.200</td><td></td><td></td><td></td></rl<>	0.200			
PFTrDA	<rl< td=""><td>0.077</td><td>n:2 FTAcr(V)</td><td></td><td></td></rl<>	0.077	n:2 FTAcr(V)		
PFTeDA	<rl< td=""><td>0.077</td><td>8:2 FTAcr</td><td><rl< td=""><td>13.6</td></rl<></td></rl<>	0.077	8:2 FTAcr	<rl< td=""><td>13.6</td></rl<>	13.6
			10:2 FTAcr	<rl< td=""><td>13.1</td></rl<>	13.1
PFSA (NV)					
PFPrS	<rl< td=""><td>0.031</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.031	n:2 FTMAC (V)		
PFBS	$98.9\pm6.0$	0.035	6:2 FTMAC	<rl< td=""><td>46.5</td></rl<>	46.5
PFPeS	<rl< td=""><td>0.035</td><td>8:2 FTMAC</td><td><rl< td=""><td>47.6</td></rl<></td></rl<>	0.035	8:2 FTMAC	<rl< td=""><td>47.6</td></rl<>	47.6
PFHxS	<rl< td=""><td>0.033</td><td><b>10:2 FTMAC</b></td><td><rl< td=""><td>25.1</td></rl<></td></rl<>	0.033	<b>10:2 FTMAC</b>	<rl< td=""><td>25.1</td></rl<>	25.1
PFHpS	<rl< td=""><td>0.036</td><td></td><td></td><td></td></rl<>	0.036			
PFOS	<rl< td=""><td>0.185</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.185	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.074</td><td>8:2 FTOAc</td><td><rl< td=""><td>27.0</td></rl<></td></rl<>	0.074	8:2 FTOAc	<rl< td=""><td>27.0</td></rl<>	27.0
PFDS	<rl< td=""><td>0.036</td><td>10:2 FTOAc</td><td><rl< td=""><td>27.8</td></rl<></td></rl<>	0.036	10:2 FTOAc	<rl< td=""><td>27.8</td></rl<>	27.8
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	$37.4 \pm 2.0$	0.077	<b>4:2 FTOH</b>	<rl< td=""><td>70.6</td></rl<>	70.6
MeFBSA (SV)	$2.0 \pm 1.9$	0.140	5:2 FTOH	<rl< td=""><td>67.2</td></rl<>	67.2
FHxSA (NV)	<rl< td=""><td>0.038</td><td>6:2 FTOH</td><td><rl< td=""><td>67.7</td></rl<></td></rl<>	0.038	6:2 FTOH	<rl< td=""><td>67.7</td></rl<>	67.7
FOSA (NV)	<rl< td=""><td>0.101</td><td>7:2 FTOH</td><td><rl< td=""><td>66.9</td></rl<></td></rl<>	0.101	7:2 FTOH	<rl< td=""><td>66.9</td></rl<>	66.9
MeFOSA (SV)	<rl< td=""><td>0.068</td><td>8:2 FTOH</td><td><rl< td=""><td>66.2</td></rl<></td></rl<>	0.068	8:2 FTOH	<rl< td=""><td>66.2</td></rl<>	66.2
EtFOSA (SV)	<rl< td=""><td>0.218</td><td>10:2 FTOH</td><td><rl< td=""><td>67.3</td></rl<></td></rl<>	0.218	10:2 FTOH	<rl< td=""><td>67.3</td></rl<>	67.3
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	No Value		4:2 FTS	No Value	
MeFOSAA	No Value		6:2 FTS	No Value	
EtFOSAA	No Value		8:2 FTS	<rl< td=""><td>0.033</td></rl<>	0.033
			10:2 FTS	<rl< td=""><td>0.086</td></rl<>	0.086
FASE (SV)					
MeFOSE	$2.34\pm0.46$	0.361			
EtFOSE	$4.80 \pm 0.54$	0.067			

Table 11. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for abraded MB-C.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg
PFCA (NV)			PPEA (NV)		
PFBA	$9.93\pm0.35$	0.514	PFEESA	$\begin{array}{c} 0.01513 \pm \\ 0.00098 \end{array}$	0.012
PFPeA	No Value		PF4OPeA	<rl< td=""><td>0.014</td></rl<>	0.014
PFHxA	<rl< td=""><td>0.245</td><td>PF5OHxA</td><td>No Value</td><td></td></rl<>	0.245	PF5OHxA	No Value	
PFHpA	$0.24\pm0.15$	0.111	<b>3-6-ОРҒНрА</b>	<rl< td=""><td>0.014</td></rl<>	0.014
PFOA	<rl< td=""><td>0.161</td><td>HFPO-DA</td><td><rl< td=""><td>0.014</td></rl<></td></rl<>	0.161	HFPO-DA	<rl< td=""><td>0.014</td></rl<>	0.014
PFNA	<rl< td=""><td>0.054</td><td>ADONA</td><td><rl< td=""><td>0.014</td></rl<></td></rl<>	0.054	ADONA	<rl< td=""><td>0.014</td></rl<>	0.014
PFDA	<rl< td=""><td>0.029</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.014</td></rl<></td></rl<>	0.029	9CI-PF3ONS	<rl< td=""><td>0.014</td></rl<>	0.014
PFUnDA	<rl< td=""><td>0.076</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.076	11Cl-PF3OUdS	<rl< td=""><td>0.015</td></rl<>	0.015
PFDoDA	<rl< td=""><td>0.022</td><td></td><td></td><td></td></rl<>	0.022			
PFTrDA	<rl< td=""><td>0.025</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.025	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.015</td><td>8:2 FTAcr</td><td><rl< td=""><td>19.9</td></rl<></td></rl<>	0.015	8:2 FTAcr	<rl< td=""><td>19.9</td></rl<>	19.9
			10:2 FTAcr	<rl< td=""><td>19.0</td></rl<>	19.0
PFSA (NV)					
PFPrS	0.0385 ± 0.0042	0.031	n:2 FTMAC (V)		
PFBS	$70.5 \pm 2.3$	3.04	6:2 FTMAC	<rl< td=""><td>66.4</td></rl<>	66.4
PFPeS	<rl< td=""><td>0.015</td><td>8:2 FTMAC</td><td><rl< td=""><td>65.3</td></rl<></td></rl<>	0.015	8:2 FTMAC	<rl< td=""><td>65.3</td></rl<>	65.3
PFHxS	<rl< td=""><td>2.47</td><td>10:2 FTMAC</td><td><rl< td=""><td>35.8</td></rl<></td></rl<>	2.47	10:2 FTMAC	<rl< td=""><td>35.8</td></rl<>	35.8
PFHpS	<rl< td=""><td>0.015</td><td></td><td></td><td></td></rl<>	0.015			
PFOS	<rl< td=""><td>2.60</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	2.60	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.03</td><td>8:2 FTOAc</td><td><rl< td=""><td>19.3</td></rl<></td></rl<>	0.03	8:2 FTOAc	<rl< td=""><td>19.3</td></rl<>	19.3
PFDS	<rl< td=""><td>0.016</td><td>10:2 FTOAc</td><td><rl< td=""><td>19.8</td></rl<></td></rl<>	0.016	10:2 FTOAc	<rl< td=""><td>19.8</td></rl<>	19.8
FASA (NV, SV)			n:2 FTOH (V)		
FBSA (NV)	No Value		<b>4:2 FTOH</b>	<rl< td=""><td>92.5</td></rl<>	92.5
MeFBSA (SV)	<rl< td=""><td>0.488</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>88.0</td></rl<></td></rl<>	0.488	<b>5:2 FTOH</b>	<rl< td=""><td>88.0</td></rl<>	88.0
FHxSA (NV)	<rl< td=""><td>0.015</td><td>6:2 FTOH</td><td><rl< td=""><td>40.0</td></rl<></td></rl<>	0.015	6:2 FTOH	<rl< td=""><td>40.0</td></rl<>	40.0
FOSA (NV)	<rl< td=""><td>0.017</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>40.3</td></rl<></td></rl<>	0.017	<b>7:2 FTOH</b>	<rl< td=""><td>40.3</td></rl<>	40.3
MeFOSA (SV)	<rl< td=""><td>0.486</td><td>8:2 FTOH</td><td><rl< td=""><td>19.7</td></rl<></td></rl<>	0.486	8:2 FTOH	<rl< td=""><td>19.7</td></rl<>	19.7
EtFOSA (SV)	<rl< td=""><td>0.487</td><td>10:2 FTOH</td><td><rl< td=""><td>101</td></rl<></td></rl<>	0.487	10:2 FTOH	<rl< td=""><td>101</td></rl<>	101
FASAA (NV)			n:2 FTS (NV)		
FOSAA	No Value		4:2 FTS	No Value	0.7
MeFOSAA	<rl< td=""><td>0.015</td><td>6:2 FTS</td><td><rl< td=""><td>0.896</td></rl<></td></rl<>	0.015	6:2 FTS	<rl< td=""><td>0.896</td></rl<>	0.896
EtFOSAA	<rl< td=""><td>0.015</td><td>8:2 FTS</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.015	8:2 FTS	<rl< td=""><td>0.015</td></rl<>	0.015
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.489</td><td></td><td></td><td></td></rl<>	0.489			
EtFOSE	<rl< td=""><td>0.482</td><td></td><td></td><td></td></rl<>	0.482			

 Table 12. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for MB-C following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	$6.8 \pm 1.8$	0.259	PFEESA	<rl< td=""><td>0.022</td></rl<>	0.022
PFPeA	$1.0 \pm 1.1$	0.048	PF4OPeA	<rl< td=""><td>0.022</td></rl<>	0.022
PFHxA	$0.29 \pm 0.16$	0.129	PF5OHxA	<rl< td=""><td>0.022</td></rl<>	0.022
РҒНрА	<rl< td=""><td>0.106</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.106	3-6-ОРҒНрА	<rl< td=""><td>0.019</td></rl<>	0.019
PFOA	<rl< td=""><td>0.138</td><td>HFPO-DA</td><td><rl< td=""><td>0.030</td></rl<></td></rl<>	0.138	HFPO-DA	<rl< td=""><td>0.030</td></rl<>	0.030
PFNA	<rl< td=""><td>0.072</td><td>ADONA</td><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.072	ADONA	<rl< td=""><td>0.021</td></rl<>	0.021
PFDA	<rl< td=""><td>0.135</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.022</td></rl<></td></rl<>	0.135	9CI-PF3ONS	<rl< td=""><td>0.022</td></rl<>	0.022
PFUnDA	<rl< td=""><td>0.075</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.023</td></rl<></td></rl<>	0.075	11Cl-PF3OUdS	<rl< td=""><td>0.023</td></rl<>	0.023
PFDoDA	<rl< td=""><td>0.051</td><td></td><td></td><td></td></rl<>	0.051			
PFTrDA	<rl< td=""><td>0.116</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.116	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.024</td><td>8:2 FTAcr</td><td><rl< td=""><td>11.9</td></rl<></td></rl<>	0.024	8:2 FTAcr	<rl< td=""><td>11.9</td></rl<>	11.9
			10:2 FTAcr	<rl< td=""><td>11.5</td></rl<>	11.5
PFSA (NV)					
PFPrS	<rl< td=""><td>0.067</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.067	n:2 FTMAC (V)		
PFBS	$15.5 \pm 2.6$	0.027	6:2 FTMAC	<rl< td=""><td>51.1</td></rl<>	51.1
PFPeS	<rl< td=""><td>0.023</td><td>8:2 FTMAC</td><td><rl< td=""><td>52.3</td></rl<></td></rl<>	0.023	8:2 FTMAC	<rl< td=""><td>52.3</td></rl<>	52.3
PFHxS	<rl< td=""><td>0.046</td><td>10:2 FTMAC</td><td><rl< td=""><td>27.6</td></rl<></td></rl<>	0.046	10:2 FTMAC	<rl< td=""><td>27.6</td></rl<>	27.6
PFHpS	<rl< td=""><td>0.023</td><td></td><td></td><td></td></rl<>	0.023			
PFOS	$1.085\pm0.025$	0.183	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.023</td><td>8:2 FTOAc</td><td><rl< td=""><td>11.7</td></rl<></td></rl<>	0.023	8:2 FTOAc	<rl< td=""><td>11.7</td></rl<>	11.7
PFDS	<rl< td=""><td>0.031</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	0.031	10:2 FTOAc	No Value	
FASA (NV, SV)		<u> </u>	n:2 FTOH (V)		
FBSA (NV)	$14.94\pm0.94$	0.024	<b>4:2 FTOH</b>	<rl< td=""><td>58.6</td></rl<>	58.6
MeFBSA (SV)	<rl< td=""><td>0.764</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>114</td></rl<></td></rl<>	0.764	<b>5:2 FTOH</b>	<rl< td=""><td>114</td></rl<>	114
FHxSA (NV)	<rl< td=""><td>0.024</td><td>6:2 FTOH</td><td><rl< td=""><td>59.9</td></rl<></td></rl<>	0.024	6:2 FTOH	<rl< td=""><td>59.9</td></rl<>	59.9
FOSA (NV)	<rl< td=""><td>0.024</td><td>7:2 FTOH</td><td><rl< td=""><td>64.9</td></rl<></td></rl<>	0.024	7:2 FTOH	<rl< td=""><td>64.9</td></rl<>	64.9
MeFOSA (SV)	<rl< td=""><td>0.320</td><td>8:2 FTOH</td><td><rl< td=""><td>61.2</td></rl<></td></rl<>	0.320	8:2 FTOH	<rl< td=""><td>61.2</td></rl<>	61.2
EtFOSA (SV)	<rl< td=""><td>0.321</td><td>10:2 FTOH</td><td><rl< td=""><td>59.6</td></rl<></td></rl<>	0.321	10:2 FTOH	<rl< td=""><td>59.6</td></rl<>	59.6
FASAA (NV)		<u></u> .	n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.416</td><td>4:2 FTS</td><td><rl< td=""><td>0.120</td></rl<></td></rl<>	0.416	4:2 FTS	<rl< td=""><td>0.120</td></rl<>	0.120
MeFOSAA	<rl< td=""><td>0.129</td><td>6:2 FTS</td><td><rl< td=""><td>0.247</td></rl<></td></rl<>	0.129	6:2 FTS	<rl< td=""><td>0.247</td></rl<>	0.247
EtFOSAA	<rl< td=""><td>0.129</td><td>8:2 FTS</td><td><rl< td=""><td>0.249</td></rl<></td></rl<>	0.129	8:2 FTS	<rl< td=""><td>0.249</td></rl<>	0.249
			10:2 FTS	<rl< td=""><td>0.048</td></rl<>	0.048
FASE (SV)					
MeFOSE	<rl< td=""><td>0.765</td><td></td><td></td><td></td></rl<>	0.765			
EtFOSE	<rl< td=""><td>0.754</td><td></td><td></td><td></td></rl<>	0.754			

Table 13. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for laundered MB-C.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	$0.489 \pm 0.046$	0.133	PFEESA	<rl< td=""><td>0.017</td></rl<>	0.017
PFPeA	$0.912\pm0.027$	0.078	PF4OPeA	<rl< td=""><td>0.020</td></rl<>	0.020
PFHxA	$3.24 \pm 0.41$	0.205	PF5OHxA	<rl< td=""><td>0.019</td></rl<>	0.019
РҒНрА	<rl< td=""><td>0.346</td><td><b>3-6-ОРFHpA</b></td><td><rl< td=""><td>0.072</td></rl<></td></rl<>	0.346	<b>3-6-ОРFHpA</b>	<rl< td=""><td>0.072</td></rl<>	0.072
PFOA	<rl< td=""><td>0.384</td><td>HFPO-DA</td><td><rl< td=""><td>0.424</td></rl<></td></rl<>	0.384	HFPO-DA	<rl< td=""><td>0.424</td></rl<>	0.424
PFNA	<rl< td=""><td>0.064</td><td>ADONA</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.064	ADONA	<rl< td=""><td>0.019</td></rl<>	0.019
PFDA	<rl< td=""><td>0.424</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.031</td></rl<></td></rl<>	0.424	9CI-PF3ONS	<rl< td=""><td>0.031</td></rl<>	0.031
PFUnDA	<rl< td=""><td>0.057</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.032</td></rl<></td></rl<>	0.057	11Cl-PF3OUdS	<rl< td=""><td>0.032</td></rl<>	0.032
PFDoDA	<rl< td=""><td>0.205</td><td></td><td></td><td></td></rl<>	0.205			
PFTrDA	<rl< td=""><td>0.079</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.079	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.079</td><td>8:2 FTAcr</td><td><rl< td=""><td>14.3</td></rl<></td></rl<>	0.079	8:2 FTAcr	<rl< td=""><td>14.3</td></rl<>	14.3
			10:2 FTAcr	<rl< td=""><td>13.8</td></rl<>	13.8
PFSA (NV)					
PFPrS	<rl< td=""><td>0.036</td><td><i>n:2 FTMAC (V)</i></td><td></td><td></td></rl<>	0.036	<i>n:2 FTMAC (V)</i>		
DEDC	0.1241 ±				
PFBS	0.0013	0.019	6:2 FTMAC	$640 \pm 58$	48.9
DED_C	0.0429 ±		9.2 ETMAC		
PFPeS	0.0094	0.023	8:2 FTMAC	<rl< td=""><td>50.1</td></rl<>	50.1
PFHxS	<rl< td=""><td>0.041</td><td>10:2 FTMAC</td><td><rl< td=""><td>26.4</td></rl<></td></rl<>	0.041	10:2 FTMAC	<rl< td=""><td>26.4</td></rl<>	26.4
PFHpS	<rl< td=""><td>0.037</td><td></td><td></td><td></td></rl<>	0.037			
PFOS	<rl< td=""><td>0.190</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.190	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.076</td><td>8:2 FTOAc</td><td><rl< td=""><td>28.4</td></rl<></td></rl<>	0.076	8:2 FTOAc	<rl< td=""><td>28.4</td></rl<>	28.4
PFDS	<rl< td=""><td>0.037</td><td>10:2 FTOAc</td><td><rl< td=""><td>29.3</td></rl<></td></rl<>	0.037	10:2 FTOAc	<rl< td=""><td>29.3</td></rl<>	29.3
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	$1.070 \pm 0.099$	0.079	4:2 FTOH	<rl< td=""><td>74.3</td></rl<>	74.3
MeFBSA (SV)	<rl< td=""><td>0.147</td><td>5:2 FTOH</td><td><rl< td=""><td>70.7</td></rl<></td></rl<>	0.147	5:2 FTOH	<rl< td=""><td>70.7</td></rl<>	70.7
FHxSA (NV)	<rl< td=""><td>0.039</td><td>6:2 FTOH</td><td><math>670 \pm 270</math></td><td>71.3</td></rl<>	0.039	6:2 FTOH	$670 \pm 270$	71.3
FOSA (NV)	<rl< td=""><td>0.104</td><td>7:2 FTOH</td><td><rl< td=""><td>70.4</td></rl<></td></rl<>	0.104	7:2 FTOH	<rl< td=""><td>70.4</td></rl<>	70.4
MeFOSA (SV)	<rl< td=""><td>0.071</td><td>8:2 FTOH</td><td><rl< td=""><td>69.7</td></rl<></td></rl<>	0.071	8:2 FTOH	<rl< td=""><td>69.7</td></rl<>	69.7
EtFOSA (SV)	<rl< td=""><td>0.229</td><td>10:2 FTOH</td><td><rl< td=""><td>70.7</td></rl<></td></rl<>	0.229	10:2 FTOH	<rl< td=""><td>70.7</td></rl<>	70.7
× /					
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.205</td><td>4:2 FTS</td><td>No Value</td><td></td></rl<>	0.205	4:2 FTS	No Value	
MeFOSAA	<rl< td=""><td>0.205</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.205	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.097</td><td>8:2 FTS</td><td><rl< td=""><td>0.407</td></rl<></td></rl<>	0.097	8:2 FTS	<rl< td=""><td>0.407</td></rl<>	0.407
		·	10:2 FTS	<rl< td=""><td>0.081</td></rl<>	0.081
FASE (SV)					-
MeFOSE	$0.65 \pm 0.24$	0.379			
EtFOSE	<rl< td=""><td>0.070</td><td></td><td></td><td></td></rl<>	0.070			

Table 14. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for abraded MB-D.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	$2.2 \pm 1.8$	0.693	PFEESA	<rl< td=""><td>0.017</td></rl<>	0.017
PFPeA	$0.543 \pm 0.045$	0.037	PF4OPeA	<rl< td=""><td>0.019</td></rl<>	0.019
PFHxA	$1.93 \pm 0.29$	0.331	PF5OHxA	<rl< td=""><td>0.019</td></rl<>	0.019
РҒНрА	<rl< td=""><td>0.150</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.150	3-6-ОРҒНрА	<rl< td=""><td>0.019</td></rl<>	0.019
PFOA	<rl< td=""><td>0.217</td><td>HFPO-DA</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.217	HFPO-DA	<rl< td=""><td>0.019</td></rl<>	0.019
PFNA	<rl< td=""><td>0.072</td><td>ADONA</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.072	ADONA	<rl< td=""><td>0.019</td></rl<>	0.019
PFDA	<rl< td=""><td>0.039</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.039	9CI-PF3ONS	<rl< td=""><td>0.019</td></rl<>	0.019
PFUnDA	<rl< td=""><td>0.102</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.102	11Cl-PF3OUdS	<rl< td=""><td>0.020</td></rl<>	0.020
PFDoDA	<rl< td=""><td>0.030</td><td></td><td></td><td></td></rl<>	0.030			
PFTrDA	<rl< td=""><td>0.033</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.033	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.021</td><td>8:2 FTAcr</td><td><rl< td=""><td>15.9</td></rl<></td></rl<>	0.021	8:2 FTAcr	<rl< td=""><td>15.9</td></rl<>	15.9
			10:2 FTAcr	<rl< td=""><td>15.2</td></rl<>	15.2
PFSA (NV)					
PFPrS	<rl< td=""><td>0.042</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.042	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>2.11</td><td>6:2 FTMAC</td><td><math display="block">182.7\pm8.2</math></td><td>53.1</td></rl<>	2.11	6:2 FTMAC	$182.7\pm8.2$	53.1
PFPeS	<rl< td=""><td>0.020</td><td>8:2 FTMAC</td><td><rl< td=""><td>52.2</td></rl<></td></rl<>	0.020	8:2 FTMAC	<rl< td=""><td>52.2</td></rl<>	52.2
PFHxS	<rl< td=""><td>3.34</td><td><b>10:2 FTMAC</b></td><td><rl< td=""><td>28.6</td></rl<></td></rl<>	3.34	<b>10:2 FTMAC</b>	<rl< td=""><td>28.6</td></rl<>	28.6
PFHpS	<rl< td=""><td>0.020</td><td></td><td></td><td></td></rl<>	0.020			
PFOS	<rl< td=""><td>3.51</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	3.51	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.040</td><td>8:2 FTOAc</td><td><rl< td=""><td>15.4</td></rl<></td></rl<>	0.040	8:2 FTOAc	<rl< td=""><td>15.4</td></rl<>	15.4
PFDS	<rl< td=""><td>0.021</td><td>10:2 FTOAc</td><td><rl< td=""><td>15.8</td></rl<></td></rl<>	0.021	10:2 FTOAc	<rl< td=""><td>15.8</td></rl<>	15.8
FASA (NV, SV)		<u> </u>	n:2 FTOH (V)		
FBSA (NV)	<rl< td=""><td>0.021</td><td><b>4:2 FTOH</b></td><td><rl< td=""><td>74.0</td></rl<></td></rl<>	0.021	<b>4:2 FTOH</b>	<rl< td=""><td>74.0</td></rl<>	74.0
MeFBSA (SV)	<rl< td=""><td>0.393</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>70.4</td></rl<></td></rl<>	0.393	<b>5:2 FTOH</b>	<rl< td=""><td>70.4</td></rl<>	70.4
FHxSA (NV)	<rl< td=""><td>0.021</td><td>6:2 FTOH</td><td><math>146 \pm 13</math></td><td>32.0</td></rl<>	0.021	6:2 FTOH	$146 \pm 13$	32.0
FOSA (NV)	<rl< td=""><td>0.024</td><td>7:2 FTOH</td><td><rl< td=""><td>32.2</td></rl<></td></rl<>	0.024	7:2 FTOH	<rl< td=""><td>32.2</td></rl<>	32.2
MeFOSA (SV)	<rl< td=""><td>0.391</td><td>8:2 FTOH</td><td><rl< td=""><td>15.8</td></rl<></td></rl<>	0.391	8:2 FTOH	<rl< td=""><td>15.8</td></rl<>	15.8
EtFOSA (SV)	<rl< td=""><td>0.392</td><td>10:2 FTOH</td><td><rl< td=""><td>80.9</td></rl<></td></rl<>	0.392	10:2 FTOH	<rl< td=""><td>80.9</td></rl<>	80.9
FASAA (NV)		<u> </u>	n:2 FTS (NV)		
FOSAA	No Value		4:2 FTS	No Value	
MeFOSAA	<rl< td=""><td>0.021</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.021	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.021</td><td>8:2 FTS</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.021	8:2 FTS	<rl< td=""><td>0.020</td></rl<>	0.020
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.394</td><td></td><td></td><td></td></rl<>	0.394			
EtFOSE	<rl< td=""><td>0.388</td><td></td><td></td><td></td></rl<>	0.388			

 Table 15. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for MB-D following exposure to elevated temperature.

$\begin{array}{c c c c c c c c c c c c c c c c c c c $	(µg/kg) 0.019 0.019 0.017 0.027 0.019 0.020 0.020
PFPeA         0.198 ± 0.031         0.043         PF4OPeA <rl< th="">           PFHxA         1.96 ± 0.11         0.117         PF5OHxA         <rl< td="">           PFHpA         0.164 ± 0.013         0.096         3-6-OPFHpA         <rl< td="">           PFOA         <rl< td="">         0.125         HFPO-DA         <rl< td="">           PFNA         <rl< td="">         0.065         ADONA         <rl< td="">           PFDA         <rl< td="">         0.122         9CI-PF3ONS         <rl< td="">           PFUnDA         <rl< td="">         0.068         11CI-PF3OUdS         <rl< td="">           PFDoDA         <rl< td="">         0.046              PFTrDA         <rl< td="">         0.022         8:2 FTAcr             PFTeDA         <rl< td="">         0.022         8:2 FTAcr              PFTs         <rl< td="">         0.022         8:2 FTMAC              PFSA (NV)                  PFSS         <rl< td="">         0.025         6:2 FTMAC               PFPeS         <rl< td="">         0.020         8:2 FTMAC</rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<>	0.019 0.019 0.017 0.027 0.019 0.020
PFHxA $1.96 \pm 0.11$ $0.117$ PF5OHxA $<$ RL         PFHpA $0.164 \pm 0.013$ $0.096$ $3-6-OPFHpA$ $<$ RL         PFOA $<$ RL $0.125$ HFPO-DA $<$ RL         PFNA $<$ RL $0.065$ ADONA $<$ RL         PFDA $<$ RL $0.065$ ADONA $<$ RL         PFDA $<$ RL $0.068$ PCI-PF3ONS $<$ RL         PFDoDA $<$ RL $0.068$ $11CI-PF3OUdS$ $<$ RL         PFDoDA $<$ RL $0.046$ $n:2 FTAcr$ (V) $RL$ PFTrDA $<$ RL $0.022$ $8:2 FTAcr$ $<$ RL         PFSA (NV) $PFPrS$ $<$ RL $0.060$ $n:2 FTMAC$ (V)         PFBS $0.398 \pm 0.051$ $0.025$ $6:2 FTMAC$ $376 \pm 17$ PFPeS $<$ RL $0.020$ $8:2 FTMAC$ $<$ RL	0.019 0.017 0.027 0.019 0.020
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	0.017 0.027 0.019 0.020
PFOA $<$ RL $0.125$ HFPO-DA $<$ RL           PFNA $<$ RL $0.065$ ADONA $<$ RL           PFDA $<$ RL $0.122$ PCI-PF3ONS $<$ RL           PFUnDA $<$ RL $0.068$ PCI-PF3ONS $<$ RL           PFDoDA $<$ RL $0.068$ $11CI-PF3OUdS$ $<$ RL           PFDoDA $<$ RL $0.046$ $n:2 FTAcr (V)$ $RL$ PFTrDA $<$ RL $0.022$ $8:2 FTAcr$ $<$ RL           PFTeDA $<$ RL $0.022$ $8:2 FTAcr$ $<$ RL           PFSA (NV)                PFPS $<$ RL $0.060$ $n:2 FTMAC (V)$ PFPeS $<$ RL $0.025$ $6:2 FTMAC$ $376 \pm 17$ PFPeS $<$ RL $0.020$ $8:2 FTMAC$ $<$ RL	0.027 0.019 0.020
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	0.019 0.020
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	0.020
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
PFDoDA <rl< th="">         0.046           PFTrDA         <rl< th="">         0.105         <math>n:2 FTAcr(V)</math>           PFTeDA         <rl< th="">         0.022         <math>8:2 FTAcr &lt; <rl< math="">           PFTeDA         <rl< th="">         0.022         <math>8:2 FTAcr &lt; <rl< math="">           PFSA (NV)          <math>n:2 FTMacr &lt; <rl< math="">           PFPrS         <rl< th="">         0.060         <math>n:2 FTMAC(V)</math>           PFBS         0.398 ± 0.051         0.025         <math>6:2 FTMAC</math> <math>376 \pm 17</math>           PFPeS         <rl< th="">         0.020         <math>8:2 FTMAC</math>         &lt;<math><rl< math=""></rl<></math></rl<></rl<></rl<></math></rl<></math></rl<></rl<></math></rl<></rl<></rl<>	0.020
PFTrDA <rl< th="">         0.105         <math>n:2 FTAcr (V)</math>           PFTeDA         <rl< td="">         0.022         <math>8:2 FTAcr</math> <rl< td="">           PFSA (NV)         I0:2 FTAcr         <rl< td="">            PFPrS         <rl< td="">         0.060         <math>n:2 FTMAC (V)</math>           PFBS         0.398 ± 0.051         0.025         <math>6:2 FTMAC (V)</math>           PFPeS         <rl< td="">         0.020         <math>8:2 FTMAC (V)</math></rl<></rl<></rl<></rl<></rl<></rl<>	0.020
PFTeDA <rl< th="">         0.022         8:2 FTAcr         <rl< th="">           PFSA (NV)         I0:2 FTAcr         <rl< td="">         10:2 FTAcr         <rl< td="">           PFPrS         <rl< td="">         0.060         n:2 FTMAC (V)            PFBS         0.398 ± 0.051         0.025         6:2 FTMAC         376 ± 17           PFPeS         <rl< td="">         0.020         8:2 FTMAC         <rl< td=""></rl<></rl<></rl<></rl<></rl<></rl<></rl<>	
Image: PFSA (NV)         Image: 10:2 FTAcr <rl< th="">           PFPrS         <rl< th="">         0.060         <math>n:2 FTMAC (V)</math>           PFBS         0.398 ± 0.051         0.025         <math>6:2 FTMAC</math> <math>376 \pm 17</math>           PFPeS         <rl< th="">         0.020         <math>8:2 FTMAC</math> <rl< th=""></rl<></rl<></rl<></rl<>	
PFSA (NV) $n:2 FTMAC (V)$ PFPrS <rl< td="">         0.060         <math>n:2 FTMAC (V)</math>           PFBS         0.398 ± 0.051         0.025         <math>6:2 FTMAC</math> <math>376 \pm 17</math>           PFPeS         <rl< td="">         0.020         <math>8:2 FTMAC</math> <rl< td=""></rl<></rl<></rl<>	14.7
PFPrS <rl< th="">         0.060         n:2 FTMAC (V)           PFBS         0.398 ± 0.051         0.025         6:2 FTMAC         376 ± 17           PFPeS         <rl< td="">         0.020         8:2 FTMAC         <rl< td=""></rl<></rl<></rl<>	14.1
PFBS $0.398 \pm 0.051$ $0.025$ <b>6:2 FTMAC</b> $376 \pm 17$ PFPeS $<$ RL $0.020$ <b>8:2 FTMAC</b> $<$ RL	
PFPeS <rl< th="">         0.020         8:2 FTMAC         <rl< th=""></rl<></rl<>	
0.0720	62.8
<b>DEH</b> <sub>2</sub> <b>S</b> $0.0730 \pm 0.042$ <b>10.2 ETMAC C</b>	64.3
0.0099 0.042 10.2 FTWAC <kl< th=""><td>33.9</td></kl<>	33.9
<b>PFHpS</b> <rl 0.021<="" th=""><td></td></rl>	
<b>PFOS</b> $1.504 \pm 0.047$ $0.165$ <i>n:2 FTOAc (V)</i>	
PFNS <rl< th="">         0.021         8:2 FTOAc         <rl< th=""></rl<></rl<>	14.4
PFDS <rl< th="">         0.028         10:2 FTOAc         No Value</rl<>	
$\frac{FASA(NV, SV)}{ENCLA(NV)} = \frac{n:2 FTOH(V)}{A 2 ETOH(V)}$	72.0
FBSA (NV) $0.213 \pm 0.029$ $0.022$ <b>4:2 FTOH</b> $<$ RL	72.0
MeFBSA (SV) <rl< th="">         0.868         5:2 FTOH         <rl< th=""></rl<></rl<>	140
FHxSA (NV) <rl< th=""> <math>0.022</math> <b>6:2 FTOH</b> <math>136.1 \pm 5.3</math></rl<>	73.6
FOSA (NV) <rl< th="">         0.022         7:2 FTOH         <rl< th=""></rl<></rl<>	79.8
MeFOSA (SV) <rl< th="">         0.363         8:2 FTOH         <rl< th=""></rl<></rl<>	75.1
EtFOSA (SV) <rl< th="">         0.364         10:2 FTOH         <rl< th=""></rl<></rl<>	73.1
FASAA (NV)   n:2 FTS (NV)	
FOSAA <rl< th="">         0.376         4:2 FTS         <rl< th=""></rl<></rl<>	0.109
MeFOSAA <rl< th="">         0.117         6:2 FTS         <rl< th=""></rl<></rl<>	0.223
EtFOSAANo Value8:2 FTS <rl< th=""></rl<>	0.007
<b>10:2 FTS</b> <rl< th=""><td>0.225</td></rl<>	0.225
FASE (SV)	0.225
MeFOSE <rl 0.869<="" th=""><td></td></rl>	
EtFOSE <rl 0.856<="" th=""><td></td></rl>	

Table 16. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for laundered MB-D.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	$80 \pm 14$	0.139	PFEESA	<rl< td=""><td>0.018</td></rl<>	0.018
PFPeA	$0.46\pm0.10$	0.232	PF4OPeA	No Value	
PFHxA	$2.06\pm0.27$	1.16	PF5OHxA	<rl< td=""><td>0.105</td></rl<>	0.105
PFHpA	<rl< td=""><td>0.360</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.105</td></rl<></td></rl<>	0.360	3-6-ОРҒНрА	<rl< td=""><td>0.105</td></rl<>	0.105
PFOA	<rl< td=""><td>0.163</td><td>HFPO-DA</td><td><rl< td=""><td>0.022</td></rl<></td></rl<>	0.163	HFPO-DA	<rl< td=""><td>0.022</td></rl<>	0.022
PFNA	<rl< td=""><td>0.066</td><td>ADONA</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.066	ADONA	<rl< td=""><td>0.020</td></rl<>	0.020
PFDA	<rl< td=""><td>0.604</td><td>9Cl-PF3ONS</td><td><rl< td=""><td>0.107</td></rl<></td></rl<>	0.604	9Cl-PF3ONS	<rl< td=""><td>0.107</td></rl<>	0.107
PFUnDA	<rl< td=""><td>0.059</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.108</td></rl<></td></rl<>	0.059	11Cl-PF3OUdS	<rl< td=""><td>0.108</td></rl<>	0.108
PFDoDA	<rl< td=""><td>0.511</td><td></td><td></td><td></td></rl<>	0.511			
PFTrDA	<rl< td=""><td>0.391</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.391	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.765</td><td>8:2 FTAcr</td><td><rl< td=""><td>16.3</td></rl<></td></rl<>	0.765	8:2 FTAcr	<rl< td=""><td>16.3</td></rl<>	16.3
			10:2 FTAcr	<rl< td=""><td>15.7</td></rl<>	15.7
PFSA (NV)					
PFPrS	<rl< td=""><td>0.040</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.040	n:2 FTMAC (V)		
PFBS	$84 \pm 15$	0.020	6:2 FTMAC	$752 \pm 25$	55.8
PFPeS	No Value		8:2 FTMAC	<rl< td=""><td>57.1</td></rl<>	57.1
PFHxS	<rl< td=""><td>0.042</td><td>10:2 FTMAC</td><td><rl< td=""><td>30.1</td></rl<></td></rl<>	0.042	10:2 FTMAC	<rl< td=""><td>30.1</td></rl<>	30.1
PFHpS	<rl< td=""><td>0.106</td><td></td><td></td><td></td></rl<>	0.106			
PFOS	<rl< td=""><td>0.103</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.103	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.107</td><td>8:2 FTOAc</td><td><rl< td=""><td>32.4</td></rl<></td></rl<>	0.107	8:2 FTOAc	<rl< td=""><td>32.4</td></rl<>	32.4
PFDS	<rl< td=""><td>0.224</td><td>10:2 FTOAc</td><td><rl< td=""><td>33.4</td></rl<></td></rl<>	0.224	10:2 FTOAc	<rl< td=""><td>33.4</td></rl<>	33.4
FASA (NV, SV)		<u>.</u>	n:2 FTOH (V)		
FBSA (NV)	$27.3\pm4.5$	0.604	<b>4:2 FTOH</b>	<rl< td=""><td>84.8</td></rl<>	84.8
MeFBSA (SV)	$8.7 \pm 1.0$	0.167	5:2 FTOH	<rl< td=""><td>80.6</td></rl<>	80.6
FHxSA (NV)	<rl< td=""><td>0.111</td><td>6:2 FTOH</td><td><math display="block">285\pm47</math></td><td>81.3</td></rl<>	0.111	6:2 FTOH	$285\pm47$	81.3
FOSA (NV)	<rl< td=""><td>0.232</td><td>7:2 FTOH</td><td><rl< td=""><td>80.3</td></rl<></td></rl<>	0.232	7:2 FTOH	<rl< td=""><td>80.3</td></rl<>	80.3
MeFOSA (SV)	<rl< td=""><td>0.080</td><td>8:2 FTOH</td><td><rl< td=""><td>79.5</td></rl<></td></rl<>	0.080	8:2 FTOH	<rl< td=""><td>79.5</td></rl<>	79.5
EtFOSA (SV)	<rl< td=""><td>0.260</td><td>10:2 FTOH</td><td><rl< td=""><td>80.7</td></rl<></td></rl<>	0.260	10:2 FTOH	<rl< td=""><td>80.7</td></rl<>	80.7
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.022</td><td>4:2 FTS</td><td><math display="block">0.828\pm0.091</math></td><td>0.217</td></rl<>	0.022	4:2 FTS	$0.828\pm0.091$	0.217
MeFOSAA	<rl< td=""><td>0.118</td><td>6:2 FTS</td><td><math display="block">579\pm48</math></td><td>1.15</td></rl<>	0.118	6:2 FTS	$579\pm48$	1.15
EtFOSAA	<rl< td=""><td>0.604</td><td>8:2 FTS</td><td><rl< td=""><td>0.043</td></rl<></td></rl<>	0.604	8:2 FTS	<rl< td=""><td>0.043</td></rl<>	0.043
			10:2 FTS	<rl< td=""><td>0.112</td></rl<>	0.112
FASE (SV)					
MeFOSE	<rl< td=""><td>0.430</td><td></td><td></td><td></td></rl<>	0.430			
EtFOSE	<rl< td=""><td>0.080</td><td></td><td></td><td></td></rl<>	0.080			

Table 17. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for abraded MB-E.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg
PFCA (NV)		<u> 10 0/</u>	PPEA (NV)		
PFBA	49.0 ± 3.0	0.825	PFEESA	$0.0676 \pm 0.0069$	0.021
PFPeA	$0.603 \pm 0.091$	0.045	PF4OPeA	<rl< td=""><td>0.023</td></rl<>	0.023
PFHxA	$0.979 \pm 0.085$	0.407	PF50HxA	<rl< td=""><td>0.023</td></rl<>	0.023
РҒНрА	$0.74 \pm 0.27$	0.185	<b>3-6-ОРҒН</b> рА	<rl< td=""><td>0.023</td></rl<>	0.023
PFOA	<rl< td=""><td>0.267</td><td>HFPO-DA</td><td><rl< td=""><td>0.023</td></rl<></td></rl<>	0.267	HFPO-DA	<rl< td=""><td>0.023</td></rl<>	0.023
PFNA	<rl< td=""><td>0.089</td><td>ADONA</td><td><rl< td=""><td>0.023</td></rl<></td></rl<>	0.089	ADONA	<rl< td=""><td>0.023</td></rl<>	0.023
PFDA	<rl< td=""><td>0.048</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.048	9CI-PF3ONS	<rl< td=""><td>0.024</td></rl<>	0.024
PFUnDA	<rl< td=""><td>0.125</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.125	11Cl-PF3OUdS	<rl< td=""><td>0.024</td></rl<>	0.024
PFDoDA	<rl< td=""><td>0.037</td><td></td><td></td><td></td></rl<>	0.037			
PFTrDA	<rl< td=""><td>0.041</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.041	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.026</td><td>8:2 FTAcr</td><td><rl< td=""><td>20.7</td></rl<></td></rl<>	0.026	8:2 FTAcr	<rl< td=""><td>20.7</td></rl<>	20.7
			10:2 FTAcr	<rl< td=""><td>19.8</td></rl<>	19.8
PFSA (NV)					
PFPrS	<rl< td=""><td>0.042</td><td>n:2 FTMAC(V)</td><td></td><td></td></rl<>	0.042	n:2 FTMAC(V)		
PFBS	$452 \pm 73$	2.11	6:2 FTMAC	$159 \pm 13$	69.1
PFPeS	<rl< td=""><td>0.020</td><td>8:2 FTMAC</td><td><rl< td=""><td>70.7</td></rl<></td></rl<>	0.020	8:2 FTMAC	<rl< td=""><td>70.7</td></rl<>	70.7
PFHxS	<rl< td=""><td>3.34</td><td>10:2 FTMAC</td><td><rl< td=""><td>37.3</td></rl<></td></rl<>	3.34	10:2 FTMAC	<rl< td=""><td>37.3</td></rl<>	37.3
PFHpS	$0.077 \pm 0.017$	0.020			
PFOS	<rl< td=""><td>3.506</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	3.506	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.040</td><td>8:2 FTOAc</td><td><rl< td=""><td>20.1</td></rl<></td></rl<>	0.040	8:2 FTOAc	<rl< td=""><td>20.1</td></rl<>	20.1
PFDS	<rl< td=""><td>0.021</td><td>10:2 FTOAc</td><td><rl< td=""><td>69.1</td></rl<></td></rl<>	0.021	10:2 FTOAc	<rl< td=""><td>69.1</td></rl<>	69.1
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	$6.0 \pm 1.3$	0.633	4:2 FTOH	<rl< td=""><td>96.3</td></rl<>	96.3
MeFBSA (SV)	<rl< td=""><td>0.515</td><td>5:2 FTOH</td><td><rl< td=""><td>91.6</td></rl<></td></rl<>	0.515	5:2 FTOH	<rl< td=""><td>91.6</td></rl<>	91.6
FHxSA (NV)	<rl< td=""><td>0.026</td><td>6:2 FTOH</td><td><math>63.4 \pm 4.3</math></td><td>41.7</td></rl<>	0.026	6:2 FTOH	$63.4 \pm 4.3$	41.7
FOSA (NV)	<rl< td=""><td>0.029</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>41.9</td></rl<></td></rl<>	0.029	<b>7:2 FTOH</b>	<rl< td=""><td>41.9</td></rl<>	41.9
MeFOSA (SV)	<rl< td=""><td>0.513</td><td>8:2 FTOH</td><td><rl< td=""><td>20.5</td></rl<></td></rl<>	0.513	8:2 FTOH	<rl< td=""><td>20.5</td></rl<>	20.5
EtFOSA (SV)	<rl< td=""><td>0.514</td><td>10:2 FTOH</td><td><rl< td=""><td>105</td></rl<></td></rl<>	0.514	10:2 FTOH	<rl< td=""><td>105</td></rl<>	105
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.243</td><td>4:2 FTS</td><td><math display="block">0.82\pm0.16</math></td><td>0.228</td></rl<>	0.243	4:2 FTS	$0.82\pm0.16$	0.228
MeFOSAA	<rl< td=""><td>0.026</td><td>6:2 FTS</td><td><math>503 \pm 57</math></td><td>1.21</td></rl<>	0.026	6:2 FTS	$503 \pm 57$	1.21
EtFOSAA	<rl< td=""><td>0.026</td><td>8:2 FTS</td><td><rl< td=""><td>0.025</td></rl<></td></rl<>	0.026	8:2 FTS	<rl< td=""><td>0.025</td></rl<>	0.025
			10:2 FTS	<rl< td=""><td>1.22</td></rl<>	1.22
FASE (SV)					
MeFOSE	No Value				
EtFOSE	<rl< td=""><td>0.508</td><td></td><td></td><td></td></rl<>	0.508			

 Table 18. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for MB-E following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	$33.3 \pm 2.3$	0.300	PFEESA	<rl< td=""><td>0.025</td></rl<>	0.025
PFPeA	$0.134 \pm 0.033$	0.055	PF4OPeA	<rl< td=""><td>0.025</td></rl<>	0.025
PFHxA	$1.97 \pm 0.52$	0.149	PF5OHxA	<rl< td=""><td>0.025</td></rl<>	0.025
PFHpA	$0.36\pm0.19$	0.123	3-6-ОРҒНрА	<rl< td=""><td>0.022</td></rl<>	0.022
PFOA	<rl< td=""><td>0.159</td><td>HFPO-DA</td><td><rl< td=""><td>0.035</td></rl<></td></rl<>	0.159	HFPO-DA	<rl< td=""><td>0.035</td></rl<>	0.035
PFNA	<rl< td=""><td>0.083</td><td>ADONA</td><td><rl< td=""><td>0.025</td></rl<></td></rl<>	0.083	ADONA	<rl< td=""><td>0.025</td></rl<>	0.025
PFDA	<rl< td=""><td>0.156</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.026</td></rl<></td></rl<>	0.156	9CI-PF3ONS	<rl< td=""><td>0.026</td></rl<>	0.026
PFUnDA	<rl< td=""><td>0.087</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.026</td></rl<></td></rl<>	0.087	11Cl-PF3OUdS	<rl< td=""><td>0.026</td></rl<>	0.026
PFDoDA	<rl< td=""><td>0.058</td><td></td><td></td><td></td></rl<>	0.058			
PFTrDA	<rl< td=""><td>0.134</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.134	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.028</td><td>8:2 FTAcr</td><td><rl< td=""><td>14.2</td></rl<></td></rl<>	0.028	8:2 FTAcr	<rl< td=""><td>14.2</td></rl<>	14.2
			10:2 FTAcr	<rl< td=""><td>13.7</td></rl<>	13.7
PFSA (NV)					
PFPrS	<rl< td=""><td>0.077</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.077	n:2 FTMAC (V)		
PFBS	$175 \pm 16$	0.110	6:2 FTMAC	$628 \pm 36$	61.1
PFPeS	<rl< td=""><td>0.026</td><td>8:2 FTMAC</td><td><rl< td=""><td>62.5</td></rl<></td></rl<>	0.026	8:2 FTMAC	<rl< td=""><td>62.5</td></rl<>	62.5
PFHxS	<rl< td=""><td>0.053</td><td><b>10:2 FTMAC</b></td><td><rl< td=""><td>32.9</td></rl<></td></rl<>	0.053	<b>10:2 FTMAC</b>	<rl< td=""><td>32.9</td></rl<>	32.9
PFHpS	<rl< td=""><td>0.026</td><td></td><td></td><td></td></rl<>	0.026			
PFOS	$1.02\pm0.18$	0.115	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.027</td><td>8:2 FTOAc</td><td><rl< td=""><td>14.0</td></rl<></td></rl<>	0.027	8:2 FTOAc	<rl< td=""><td>14.0</td></rl<>	14.0
PFDS	<rl< td=""><td>0.035</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	0.035	10:2 FTOAc	No Value	
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	$101 \pm 11$	0.671	<b>4:2 FTOH</b>	<rl< td=""><td>70.0</td></rl<>	70.0
MeFBSA (SV)	No Value		<b>5:2 FTOH</b>	<rl< td=""><td>136</td></rl<>	136
FHxSA (NV)	<rl< td=""><td>0.028</td><td>6:2 FTOH</td><td><math>170 \pm 14</math></td><td>71.6</td></rl<>	0.028	6:2 FTOH	$170 \pm 14$	71.6
FOSA (NV)	<rl< td=""><td>0.028</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>77.5</td></rl<></td></rl<>	0.028	<b>7:2 FTOH</b>	<rl< td=""><td>77.5</td></rl<>	77.5
MeFOSA (SV)	<rl< td=""><td>0.291</td><td>8:2 FTOH</td><td><rl< td=""><td>73.0</td></rl<></td></rl<>	0.291	8:2 FTOH	<rl< td=""><td>73.0</td></rl<>	73.0
EtFOSA (SV)	<rl< td=""><td>0.291</td><td>10:2 FTOH</td><td><rl< td=""><td>71.1</td></rl<></td></rl<>	0.291	10:2 FTOH	<rl< td=""><td>71.1</td></rl<>	71.1
FASAA (NV)		<u> </u>	n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.258</td><td>4:2 FTS</td><td><rl< td=""><td>0.139</td></rl<></td></rl<>	0.258	4:2 FTS	<rl< td=""><td>0.139</td></rl<>	0.139
MeFOSAA	<rl< td=""><td>0.149</td><td>6:2 FTS</td><td><math>36.2 \pm 2.1</math></td><td>0.285</td></rl<>	0.149	6:2 FTS	$36.2 \pm 2.1$	0.285
EtFOSAA	<rl< td=""><td>0.149</td><td>8:2 FTS</td><td><rl< td=""><td>0.288</td></rl<></td></rl<>	0.149	8:2 FTS	<rl< td=""><td>0.288</td></rl<>	0.288
			10:2 FTS	<rl< td=""><td>1.30</td></rl<>	1.30
FASE (SV)					
MeFOSE	No Value				
EtFOSE	<rl< td=""><td>0.685</td><td></td><td></td><td></td></rl<>	0.685			

Table 19. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for laundered MB-E.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$1.85 \pm 0.14$	0.137	PFEESA	<rl< td=""><td>0.017</td></rl<>	0.017
PFPeA	$1.27\pm0.14$	0.080	PF4OPeA	<rl< td=""><td>0.020</td></rl<>	0.020
PFHxA	$2.964\pm0.056$	0.188	PF5OHxA	<rl< td=""><td>0.020</td></rl<>	0.020
РҒНрА	<rl< td=""><td>0.354</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.354	3-6-ОРҒНрА	<rl< td=""><td>0.020</td></rl<>	0.020
PFOA	<rl< td=""><td>0.401</td><td>HFPO-DA</td><td><rl< td=""><td>0.442</td></rl<></td></rl<>	0.401	HFPO-DA	<rl< td=""><td>0.442</td></rl<>	0.442
PFNA	<rl< td=""><td>0.066</td><td>ADONA</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.066	ADONA	<rl< td=""><td>0.020</td></rl<>	0.020
PFDA	<rl< td=""><td>0.442</td><td>9Cl-PF3ONS</td><td><rl< td=""><td>0.033</td></rl<></td></rl<>	0.442	9Cl-PF3ONS	<rl< td=""><td>0.033</td></rl<>	0.033
PFUnDA	<rl< td=""><td>0.058</td><td>11Cl-PF3OUdS</td><td>No Value</td><td></td></rl<>	0.058	11Cl-PF3OUdS	No Value	
PFDoDA	<rl< td=""><td>0.214</td><td></td><td></td><td></td></rl<>	0.214			
PFTrDA	<rl< td=""><td>0.082</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.082	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.082</td><td>8:2 FTAcr</td><td><rl< td=""><td>8.91</td></rl<></td></rl<>	0.082	8:2 FTAcr	<rl< td=""><td>8.91</td></rl<>	8.91
			10:2 FTAcr	<rl< td=""><td>8.60</td></rl<>	8.60
PFSA (NV)					
PFPrS	<rl< td=""><td>0.037</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.037	n:2 FTMAC (V)		
PFBS	$1.309\pm0.083$	0.019	6:2 FTMAC	$131.9 \pm 3.2$	30.5
PFPeS	No Value		8:2 FTMAC	<rl< td=""><td>31.2</td></rl<>	31.2
PFHxS	<rl< td=""><td>0.075</td><td>10:2 FTMAC</td><td><rl< td=""><td>16.4</td></rl<></td></rl<>	0.075	10:2 FTMAC	<rl< td=""><td>16.4</td></rl<>	16.4
PFHpS	<rl< td=""><td>0.038</td><td></td><td></td><td></td></rl<>	0.038			
PFOS	<rl< td=""><td>0.198</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.198	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.079</td><td>8:2 FTOAc</td><td><rl< td=""><td>17.7</td></rl<></td></rl<>	0.079	8:2 FTOAc	<rl< td=""><td>17.7</td></rl<>	17.7
PFDS	<rl< td=""><td>0.039</td><td>10:2 FTOAc</td><td><rl< td=""><td>18.2</td></rl<></td></rl<>	0.039	10:2 FTOAc	<rl< td=""><td>18.2</td></rl<>	18.2
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	No Value		<b>4:2 FTOH</b>	<rl< td=""><td>46.3</td></rl<>	46.3
MeFBSA (SV)	<rl< td=""><td>0.138</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>44.1</td></rl<></td></rl<>	0.138	<b>5:2 FTOH</b>	<rl< td=""><td>44.1</td></rl<>	44.1
FHxSA (NV)	<rl< td=""><td>0.040</td><td>6:2 FTOH</td><td><math display="block">169\pm15</math></td><td>44.4</td></rl<>	0.040	6:2 FTOH	$169\pm15$	44.4
FOSA (NV)	<rl< td=""><td>0.108</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>43.9</td></rl<></td></rl<>	0.108	<b>7:2 FTOH</b>	<rl< td=""><td>43.9</td></rl<>	43.9
MeFOSA (SV)	<rl< td=""><td>0.066</td><td>8:2 FTOH</td><td><rl< td=""><td>43.4</td></rl<></td></rl<>	0.066	8:2 FTOH	<rl< td=""><td>43.4</td></rl<>	43.4
EtFOSA (SV)	<rl< td=""><td>0.214</td><td>10:2 FTOH</td><td><rl< td=""><td>44.1</td></rl<></td></rl<>	0.214	10:2 FTOH	<rl< td=""><td>44.1</td></rl<>	44.1
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.021</td><td>4:2 FTS</td><td>No Value</td><td></td></rl<>	0.021	4:2 FTS	No Value	
MeFOSAA	<rl< td=""><td>0.116</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.116	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.100</td><td>8:2 FTS</td><td><rl< td=""><td>0.042</td></rl<></td></rl<>	0.100	8:2 FTS	<rl< td=""><td>0.042</td></rl<>	0.042
			10:2 FTS	<rl< td=""><td>0.085</td></rl<>	0.085
FASE (SV)					
MeFOSE	<rl< td=""><td>0.355</td><td></td><td></td><td></td></rl<>	0.355			
EtFOSE	<rl< td=""><td>0.066</td><td></td><td></td><td></td></rl<>	0.066			

Table 20. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for abraded MB-F.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	<rl< td=""><td>0.681</td><td>PFEESA</td><td><rl< td=""><td>0.016</td></rl<></td></rl<>	0.681	PFEESA	<rl< td=""><td>0.016</td></rl<>	0.016
PFPeA	$0.193 \pm 0.064$	0.036	PF4OPeA	<rl< td=""><td>0.018</td></rl<>	0.018
PFHxA	$3.81 \pm 0.44$	0.248	PF5OHxA	<rl< td=""><td>0.018</td></rl<>	0.018
PFHpA	<rl< td=""><td>1.32</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.018</td></rl<></td></rl<>	1.32	3-6-ОРҒНрА	<rl< td=""><td>0.018</td></rl<>	0.018
PFOA	<rl< td=""><td>0.466</td><td>HFPO-DA</td><td><rl< td=""><td>0.018</td></rl<></td></rl<>	0.466	HFPO-DA	<rl< td=""><td>0.018</td></rl<>	0.018
PFNA	<rl< td=""><td>0.071</td><td>ADONA</td><td><rl< td=""><td>0.038</td></rl<></td></rl<>	0.071	ADONA	<rl< td=""><td>0.038</td></rl<>	0.038
PFDA	<rl< td=""><td>0.038</td><td>9Cl-PF3ONS</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.038	9Cl-PF3ONS	<rl< td=""><td>0.019</td></rl<>	0.019
PFUnDA	<rl< td=""><td>0.100</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.100	11Cl-PF3OUdS	<rl< td=""><td>0.019</td></rl<>	0.019
PFDoDA	<rl< td=""><td>0.030</td><td></td><td></td><td></td></rl<>	0.030			
PFTrDA	<rl< td=""><td>0.033</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.033	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.021</td><td>8:2 FTAcr</td><td><rl< td=""><td>20.4</td></rl<></td></rl<>	0.021	8:2 FTAcr	<rl< td=""><td>20.4</td></rl<>	20.4
			10:2 FTAcr	<rl< td=""><td>19.6</td></rl<>	19.6
PFSA (NV)					
PFPrS	<rl< td=""><td>0.041</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.041	n:2 FTMAC (V)		
PFBS	$2.05\pm0.39$	0.043	6:2 FTMAC	<rl< td=""><td>68.3</td></rl<>	68.3
PFPeS	<rl< td=""><td>0.019</td><td>8:2 FTMAC</td><td><rl< td=""><td>67.2</td></rl<></td></rl<>	0.019	8:2 FTMAC	<rl< td=""><td>67.2</td></rl<>	67.2
PFHxS	<rl< td=""><td>0.087</td><td><b>10:2 FTMAC</b></td><td><rl< td=""><td>35.4</td></rl<></td></rl<>	0.087	<b>10:2 FTMAC</b>	<rl< td=""><td>35.4</td></rl<>	35.4
PFHpS	<rl< td=""><td>0.020</td><td></td><td></td><td></td></rl<>	0.020			
PFOS	<rl< td=""><td>0.230</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.230	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.040</td><td>8:2 FTOAc</td><td><rl< td=""><td>19.8</td></rl<></td></rl<>	0.040	8:2 FTOAc	<rl< td=""><td>19.8</td></rl<>	19.8
PFDS	<rl< td=""><td>0.021</td><td>10:2 FTOAc</td><td><rl< td=""><td>20.4</td></rl<></td></rl<>	0.021	10:2 FTOAc	<rl< td=""><td>20.4</td></rl<>	20.4
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	<rl< td=""><td>0.021</td><td><b>4:2 FTOH</b></td><td><rl< td=""><td>103</td></rl<></td></rl<>	0.021	<b>4:2 FTOH</b>	<rl< td=""><td>103</td></rl<>	103
MeFBSA (SV)	<rl< td=""><td>0.506</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>209</td></rl<></td></rl<>	0.506	<b>5:2 FTOH</b>	<rl< td=""><td>209</td></rl<>	209
FHxSA (NV)	<rl< td=""><td>0.021</td><td>6:2 FTOH</td><td><math display="block">68.6\pm7.9</math></td><td>41.2</td></rl<>	0.021	6:2 FTOH	$68.6\pm7.9$	41.2
FOSA (NV)	<rl< td=""><td>0.023</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>41.5</td></rl<></td></rl<>	0.023	<b>7:2 FTOH</b>	<rl< td=""><td>41.5</td></rl<>	41.5
MeFOSA (SV)	<rl< td=""><td>0.504</td><td>8:2 FTOH</td><td><rl< td=""><td>20.3</td></rl<></td></rl<>	0.504	8:2 FTOH	<rl< td=""><td>20.3</td></rl<>	20.3
EtFOSA (SV)	<rl< td=""><td>0.505</td><td>10:2 FTOH</td><td><rl< td=""><td>104</td></rl<></td></rl<>	0.505	10:2 FTOH	<rl< td=""><td>104</td></rl<>	104
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.248</td><td>4:2 FTS</td><td>No Value</td><td></td></rl<>	0.248	4:2 FTS	No Value	
MeFOSAA	<rl< td=""><td>0.248</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.248	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.248</td><td>8:2 FTS</td><td><rl< td=""><td>0.493</td></rl<></td></rl<>	0.248	8:2 FTS	<rl< td=""><td>0.493</td></rl<>	0.493
			10:2 FTS	<rl< td=""><td>0.098</td></rl<>	0.098
FASE (SV)					
MeFOSE	<rl< td=""><td>0.507</td><td></td><td></td><td></td></rl<>	0.507			
EtFOSE	No Value				

 Table 21. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for MB-F following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)	<u>, , , , , , , , , , , , , , , , , , , </u>	<u>,                                    </u>	PPEA (NV)		<u>, , , , , , , , , , , , , , , , , , , </u>
PFBA	<rl< td=""><td>0.255</td><td>PFEESA</td><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.255	PFEESA	<rl< td=""><td>0.021</td></rl<>	0.021
PFPeA	0.0752 ± 0.0051	0.047	PF4OPeA	<rl< td=""><td>0.021</td></rl<>	0.021
PFHxA	$1.99 \pm 0.31$	0.127	PF5OHxA	<rl< td=""><td>0.021</td></rl<>	0.021
РҒНрА	<rl< td=""><td>0.105</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.105	3-6-ОРҒНрА	<rl< td=""><td>0.019</td></rl<>	0.019
PFOA	<rl< td=""><td>0.136</td><td>HFPO-DA</td><td><rl< td=""><td>0.030</td></rl<></td></rl<>	0.136	HFPO-DA	<rl< td=""><td>0.030</td></rl<>	0.030
PFNA	<rl< td=""><td>0.071</td><td>ADONA</td><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.071	ADONA	<rl< td=""><td>0.021</td></rl<>	0.021
PFDA	<rl< td=""><td>0.133</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.022</td></rl<></td></rl<>	0.133	9CI-PF3ONS	<rl< td=""><td>0.022</td></rl<>	0.022
PFUnDA	<rl< td=""><td>0.074</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.022</td></rl<></td></rl<>	0.074	11Cl-PF3OUdS	<rl< td=""><td>0.022</td></rl<>	0.022
PFDoDA	<rl< td=""><td>0.050</td><td></td><td></td><td></td></rl<>	0.050			
PFTrDA	<rl< td=""><td>0.115</td><td>n:2 FTAcr(V)</td><td></td><td></td></rl<>	0.115	n:2 FTAcr(V)		
PFTeDA	<rl< td=""><td>0.024</td><td>8:2 FTAcr</td><td><rl< td=""><td>17.5</td></rl<></td></rl<>	0.024	8:2 FTAcr	<rl< td=""><td>17.5</td></rl<>	17.5
			10:2 FTAcr	<rl< td=""><td>16.8</td></rl<>	16.8
PFSA (NV)					
PFPrS	<rl< td=""><td>0.066</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.066	n:2 FTMAC (V)		
PFBS	$0.51\pm0.22$	0.027	6:2 FTMAC	$112.0\pm9.6$	75.1
PFPeS	<rl< td=""><td>0.022</td><td>8:2 FTMAC</td><td><rl< td=""><td>76.8</td></rl<></td></rl<>	0.022	8:2 FTMAC	<rl< td=""><td>76.8</td></rl<>	76.8
PFHxS	<rl< td=""><td>0.046</td><td><b>10:2 FTMAC</b></td><td><rl< td=""><td>40.5</td></rl<></td></rl<>	0.046	<b>10:2 FTMAC</b>	<rl< td=""><td>40.5</td></rl<>	40.5
PFHpS	<rl< td=""><td>0.022</td><td></td><td></td><td></td></rl<>	0.022			
PFOS	$0.495\pm0.098$	0.180	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.023</td><td>8:2 FTOAc</td><td><rl< td=""><td>17.2</td></rl<></td></rl<>	0.023	8:2 FTOAc	<rl< td=""><td>17.2</td></rl<>	17.2
PFDS	<rl< td=""><td>0.030</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	0.030	10:2 FTOAc	No Value	
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	$0.499 \pm 0.039$	0.024	<b>4:2 FTOH</b>	<rl< td=""><td>86.0</td></rl<>	86.0
MeFBSA (SV)	<rl< td=""><td>0.954</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>168</td></rl<></td></rl<>	0.954	<b>5:2 FTOH</b>	<rl< td=""><td>168</td></rl<>	168
FHxSA (NV)	<rl< td=""><td>0.024</td><td>6:2 FTOH</td><td><math>94 \pm 4.5</math></td><td>88.0</td></rl<>	0.024	6:2 FTOH	$94 \pm 4.5$	88.0
FOSA (NV)	<rl< td=""><td>0.024</td><td>7:2 FTOH</td><td><rl< td=""><td>95.3</td></rl<></td></rl<>	0.024	7:2 FTOH	<rl< td=""><td>95.3</td></rl<>	95.3
MeFOSA (SV)	<rl< td=""><td>0.400</td><td>8:2 FTOH</td><td><rl< td=""><td>89.8</td></rl<></td></rl<>	0.400	8:2 FTOH	<rl< td=""><td>89.8</td></rl<>	89.8
EtFOSA (SV)	<rl< td=""><td>0.400</td><td>10:2 FTOH</td><td><rl< td=""><td>87.4</td></rl<></td></rl<>	0.400	10:2 FTOH	<rl< td=""><td>87.4</td></rl<>	87.4
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.410</td><td>4:2 FTS</td><td><rl< td=""><td>0.119</td></rl<></td></rl<>	0.410	4:2 FTS	<rl< td=""><td>0.119</td></rl<>	0.119
MeFOSAA	<rl< td=""><td>0.127</td><td>6:2 FTS</td><td><rl< td=""><td>0.243</td></rl<></td></rl<>	0.127	6:2 FTS	<rl< td=""><td>0.243</td></rl<>	0.243
EtFOSAA	No Value		8:2 FTS	<rl< td=""><td>0.245</td></rl<>	0.245
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.955</td><td></td><td></td><td></td></rl<>	0.955			
EtFOSE	<rl< td=""><td>0.941</td><td></td><td></td><td></td></rl<>	0.941			

 Table 22. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for laundered MB-F.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg
PFCA (NV)			PPEA (NV)		
PFBA	$18 \pm 11$	0.582	PFEESA	<rl< td=""><td>0.022</td></rl<>	0.022
PFPeA	$19 \pm 12$	0.185	PF4OPeA	<rl< td=""><td>0.023</td></rl<>	0.023
PFHxA	$10.6 \pm 4.4$	0.319	PF5OHxA	<rl< td=""><td>0.021</td></rl<>	0.021
РҒНрА	$1.64 \pm 0.58$	0.330	3-6-OPFHpA	<rl< td=""><td>0.022</td></rl<>	0.022
PFOA	<rl< td=""><td>0.160</td><td>HFPO-DA</td><td><rl< td=""><td>0.219</td></rl<></td></rl<>	0.160	HFPO-DA	<rl< td=""><td>0.219</td></rl<>	0.219
PFNA	<rl< td=""><td>0.023</td><td>ADONA</td><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.023	ADONA	<rl< td=""><td>0.021</td></rl<>	0.021
PFDA	<rl< td=""><td>0.150</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.041</td></rl<></td></rl<>	0.150	9CI-PF3ONS	<rl< td=""><td>0.041</td></rl<>	0.041
PFUnDA	<rl< td=""><td>0.054</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.054	11Cl-PF3OUdS	<rl< td=""><td>0.019</td></rl<>	0.019
PFDoDA	<rl< td=""><td>0.079</td><td></td><td></td><td></td></rl<>	0.079			
PFTrDA	<rl< td=""><td>0.109</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.109	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.154</td><td>8:2 FTAcr</td><td><rl< td=""><td>92.4</td></rl<></td></rl<>	0.154	8:2 FTAcr	<rl< td=""><td>92.4</td></rl<>	92.4
			10:2 FTAcr	<rl< td=""><td>35.0</td></rl<>	35.0
PFSA (NV)					
PFPrS	<rl< td=""><td>0.032</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.032	n:2 FTMAC (V)		
PFBS	$0.247 \pm 0.085$	0.068	6:2 FTMAC	$3000 \pm 110$	301
PFPeS	<rl< td=""><td>0.022</td><td>8:2 FTMAC</td><td><rl< td=""><td>63.3</td></rl<></td></rl<>	0.022	8:2 FTMAC	<rl< td=""><td>63.3</td></rl<>	63.3
PFHxS	<rl< td=""><td>0.021</td><td>10:2 FTMAC</td><td><rl< td=""><td>33.3</td></rl<></td></rl<>	0.021	10:2 FTMAC	<rl< td=""><td>33.3</td></rl<>	33.3
PFHpS	<rl< td=""><td>0.022</td><td></td><td></td><td></td></rl<>	0.022			
PFOS	<rl< td=""><td>0.070</td><td><i>n:2 FTOAc (V)</i></td><td></td><td></td></rl<>	0.070	<i>n:2 FTOAc (V)</i>		
PFNS	<rl< td=""><td>0.044</td><td>8:2 FTOAc</td><td><rl< td=""><td>34.2</td></rl<></td></rl<>	0.044	8:2 FTOAc	<rl< td=""><td>34.2</td></rl<>	34.2
PFDS	$0.112 \pm 0.015$	0.045	10:2 FTOAc	<rl< td=""><td>36.4</td></rl<>	36.4
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	0.0921 ± 0.0038	0.023	4:2 FTOH	<rl< td=""><td>89.6</td></rl<>	89.6
MeFBSA (SV)	<rl< td=""><td>0.473</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>85.3</td></rl<></td></rl<>	0.473	<b>5:2 FTOH</b>	<rl< td=""><td>85.3</td></rl<>	85.3
FHxSA (NV)	<rl< td=""><td>0.023</td><td>6:2 FTOH</td><td><math>774 \pm 75</math></td><td>90.2</td></rl<>	0.023	6:2 FTOH	$774 \pm 75$	90.2
FOSA (NV)	$0.068 \pm 0.0058$	0.023	7:2 FTOH	<rl< td=""><td>89.1</td></rl<>	89.1
MeFOSA (SV)	<rl< td=""><td>0.470</td><td>8:2 FTOH</td><td><rl< td=""><td>88.2</td></rl<></td></rl<>	0.470	8:2 FTOH	<rl< td=""><td>88.2</td></rl<>	88.2
EtFOSA (SV)	<rl< td=""><td>0.472</td><td>10:2 FTOH</td><td><rl< td=""><td>182</td></rl<></td></rl<>	0.472	10:2 FTOH	<rl< td=""><td>182</td></rl<>	182
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.023</td><td>4:2 FTS</td><td><rl< td=""><td>3.89</td></rl<></td></rl<>	0.023	4:2 FTS	<rl< td=""><td>3.89</td></rl<>	3.89
MeFOSAA	<rl< td=""><td>0.103</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.103	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.046</td><td>8:2 FTS</td><td><rl< td=""><td>0.099</td></rl<></td></rl<>	0.046	8:2 FTS	<rl< td=""><td>0.099</td></rl<>	0.099
			10:2 FTS	<rl< td=""><td>0.022</td></rl<>	0.022
FASE (SV)					
MeFOSE	<rl< td=""><td>0.473</td><td></td><td></td><td></td></rl<>	0.473			
EtFOSE	<rl< td=""><td>0.466</td><td></td><td></td><td></td></rl<>	0.466			

 Table 23. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for abraded OS-A.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$2.28\pm0.21$	0.117	PFEESA	<rl< td=""><td>0.018</td></rl<>	0.018
PFPeA	$2.547\pm0.084$	0.043	PF4OPeA	<rl< td=""><td>0.020</td></rl<>	0.020
PFHxA	$7.65\pm0.47$	0.584	PF5OHxA	<rl< td=""><td>0.020</td></rl<>	0.020
PFHpA	<rl< td=""><td>2.46</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	2.46	3-6-ОРҒНрА	<rl< td=""><td>0.020</td></rl<>	0.020
PFOA	<rl< td=""><td>0.096</td><td>HFPO-DA</td><td><rl< td=""><td>0.090</td></rl<></td></rl<>	0.096	HFPO-DA	<rl< td=""><td>0.090</td></rl<>	0.090
PFNA	<rl< td=""><td>0.066</td><td>ADONA</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.066	ADONA	<rl< td=""><td>0.020</td></rl<>	0.020
PFDA	<rl< td=""><td>0.103</td><td>9Cl-PF3ONS</td><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.103	9Cl-PF3ONS	<rl< td=""><td>0.021</td></rl<>	0.021
PFUnDA	<rl< td=""><td>0.022</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.022	11Cl-PF3OUdS	<rl< td=""><td>0.021</td></rl<>	0.021
PFDoDA	<rl< td=""><td>0.022</td><td></td><td></td><td></td></rl<>	0.022			
PFTrDA	<rl< td=""><td>0.066</td><td>n:2 FTAcr(V)</td><td></td><td></td></rl<>	0.066	n:2 FTAcr(V)		
PFTeDA	<rl< td=""><td>0.053</td><td>8:2 FTAcr</td><td><rl< td=""><td>20.7</td></rl<></td></rl<>	0.053	8:2 FTAcr	<rl< td=""><td>20.7</td></rl<>	20.7
			10:2 FTAcr	<rl< td=""><td>20.0</td></rl<>	20.0
PFSA (NV)					
PFPrS	0.0291 ± 0.0029	0.020	n:2 FTMAC (V)		
PFBS	$0.0386 \pm 0.0043$	0.020	6:2 FTMAC	$4410\pm270$	70.9
PFPeS	<rl< td=""><td>0.021</td><td>8:2 FTMAC</td><td><rl< td=""><td>72.5</td></rl<></td></rl<>	0.021	8:2 FTMAC	<rl< td=""><td>72.5</td></rl<>	72.5
PFHxS	<rl< td=""><td>0.021</td><td><b>10:2 FTMAC</b></td><td><rl< td=""><td>38.2</td></rl<></td></rl<>	0.021	<b>10:2 FTMAC</b>	<rl< td=""><td>38.2</td></rl<>	38.2
PFHpS	<rl< td=""><td>0.021</td><td></td><td></td><td></td></rl<>	0.021			
PFOS	<rl< td=""><td>0.058</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.058	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.022</td><td>8:2 FTOAc</td><td><rl< td=""><td>20.2</td></rl<></td></rl<>	0.022	8:2 FTOAc	<rl< td=""><td>20.2</td></rl<>	20.2
PFDS	<rl< td=""><td>0.022</td><td>10:2 FTOAc</td><td><rl< td=""><td>20.8</td></rl<></td></rl<>	0.022	10:2 FTOAc	<rl< td=""><td>20.8</td></rl<>	20.8
FASA (NV, SV)			n:2 FTOH (V)		
FBSA (NV)	<rl< td=""><td>0.022</td><td><b>4:2 FTOH</b></td><td><rl< td=""><td>42.3</td></rl<></td></rl<>	0.022	<b>4:2 FTOH</b>	<rl< td=""><td>42.3</td></rl<>	42.3
MeFBSA (SV)	<rl< td=""><td>1.08</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>103</td></rl<></td></rl<>	1.08	<b>5:2 FTOH</b>	<rl< td=""><td>103</td></rl<>	103
FHxSA (NV)	<rl< td=""><td>0.022</td><td>6:2 FTOH</td><td><math>1402 \pm 12</math></td><td>103</td></rl<>	0.022	6:2 FTOH	$1402 \pm 12$	103
FOSA (NV)	<rl< td=""><td>0.026</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>102</td></rl<></td></rl<>	0.026	<b>7:2 FTOH</b>	<rl< td=""><td>102</td></rl<>	102
MeFOSA (SV)	<rl< td=""><td>0.517</td><td>8:2 FTOH</td><td><rl< td=""><td>101</td></rl<></td></rl<>	0.517	8:2 FTOH	<rl< td=""><td>101</td></rl<>	101
EtFOSA (SV)	<rl< td=""><td>0.215</td><td>10:2 FTOH</td><td><rl< td=""><td>208</td></rl<></td></rl<>	0.215	10:2 FTOH	<rl< td=""><td>208</td></rl<>	208
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.115</td><td>4:2 FTS</td><td><rl< td=""><td>0.508</td></rl<></td></rl<>	0.115	4:2 FTS	<rl< td=""><td>0.508</td></rl<>	0.508
MeFOSAA	<rl< td=""><td>0.117</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.117	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.140</td><td>8:2 FTS</td><td><rl< td=""><td>0.112</td></rl<></td></rl<>	0.140	8:2 FTS	<rl< td=""><td>0.112</td></rl<>	0.112
			10:2 FTS	<rl< td=""><td>0.024</td></rl<>	0.024
FASE (SV)					
MeFOSE	<rl< td=""><td>0.216</td><td></td><td></td><td></td></rl<>	0.216			
EtFOSE	<rl< td=""><td>0.511</td><td></td><td></td><td></td></rl<>	0.511			

 Table 24. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-A following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$0.879 \pm 0.085$	0.507	PFEESA	<rl< td=""><td>0.263</td></rl<>	0.263
PFPeA	$1.06\pm0.015$	0.288	PF4OPeA	<rl< td=""><td>0.156</td></rl<>	0.156
PFHxA	$14.33\pm0.49$	0.844	PF5OHxA	<rl< td=""><td>0.113</td></rl<>	0.113
РҒНрА	$0.518 \pm 0.053$	0.158	<b>3-6-ОРҒНрА</b>	<rl< td=""><td>0.084</td></rl<>	0.084
PFOA	<rl< td=""><td>0.326</td><th>HFPO-DA</th><td><rl< td=""><td>0.163</td></rl<></td></rl<>	0.326	HFPO-DA	<rl< td=""><td>0.163</td></rl<>	0.163
PFNA	<rl< td=""><td>0.151</td><th>ADONA</th><td><rl< td=""><td>0.116</td></rl<></td></rl<>	0.151	ADONA	<rl< td=""><td>0.116</td></rl<>	0.116
PFDA	<rl< td=""><td>0.144</td><th>9Cl-PF3ONS</th><td><rl< td=""><td>0.087</td></rl<></td></rl<>	0.144	9Cl-PF3ONS	<rl< td=""><td>0.087</td></rl<>	0.087
PFUnDA	<rl< td=""><td>0.126</td><th>11Cl-PF3OUdS</th><td><rl< td=""><td>0.023</td></rl<></td></rl<>	0.126	11Cl-PF3OUdS	<rl< td=""><td>0.023</td></rl<>	0.023
PFDoDA	<rl< td=""><td>0.048</td><th></th><td></td><td></td></rl<>	0.048			
PFTrDA	$0.075\pm0.012$	0.048	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.037</td><th>8:2 FTAcr</th><td><rl< td=""><td>12.8</td></rl<></td></rl<>	0.037	8:2 FTAcr	<rl< td=""><td>12.8</td></rl<>	12.8
			10:2 FTAcr	<rl< td=""><td>12.3</td></rl<>	12.3
PFSA (NV)					
PFPrS	<rl< th=""><th>0.150</th><th><i>n:2 FTMAC (V)</i></th><th></th><th></th></rl<>	0.150	<i>n:2 FTMAC (V)</i>		
PFBS	<rl< td=""><td>0.156</td><th>6:2 FTMAC</th><td><math display="block">869\pm17</math></td><td>55.0</td></rl<>	0.156	6:2 FTMAC	$869\pm17$	55.0
PFPeS	<rl< td=""><td>0.117</td><th>8:2 FTMAC</th><td><rl< td=""><td>56.3</td></rl<></td></rl<>	0.117	8:2 FTMAC	<rl< td=""><td>56.3</td></rl<>	56.3
PFHxS	<rl< td=""><td>0.115</td><th>10:2 FTMAC</th><td><rl< td=""><td>29.7</td></rl<></td></rl<>	0.115	10:2 FTMAC	<rl< td=""><td>29.7</td></rl<>	29.7
PFHpS	<rl< td=""><td>0.105</td><th></th><td></td><td></td></rl<>	0.105			
PFOS	$0.0994 \pm 0.0079$	0.066	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.052</td><th>8:2 FTOAc</th><td><rl< td=""><td>12.6</td></rl<></td></rl<>	0.052	8:2 FTOAc	<rl< td=""><td>12.6</td></rl<>	12.6
PFDS	<rl< td=""><td>0.047</td><th>10:2 FTOAc</th><td>No Value</td><td></td></rl<>	0.047	10:2 FTOAc	No Value	
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	No Value		4:2 FTOH	<rl< td=""><td>63.0</td></rl<>	63.0
MeFBSA (SV)	<rl< th=""><th>0.457</th><th>5:2 FTOH</th><th><rl< th=""><th>24.4</th></rl<></th></rl<>	0.457	5:2 FTOH	<rl< th=""><th>24.4</th></rl<>	24.4
FHxSA (NV)	<rl< td=""><td>0.054</td><th>6:2 FTOH</th><td><math>181 \pm 14</math></td><td>64.5</td></rl<>	0.054	6:2 FTOH	$181 \pm 14$	64.5
FOSA (NV)	<rl< td=""><td>0.079</td><th>7:2 FTOH</th><td><rl< td=""><td>25.0</td></rl<></td></rl<>	0.079	7:2 FTOH	<rl< td=""><td>25.0</td></rl<>	25.0
MeFOSA (SV)	<rl< td=""><td>0.184</td><th>8:2 FTOH</th><td><rl< td=""><td>94.0</td></rl<></td></rl<>	0.184	8:2 FTOH	<rl< td=""><td>94.0</td></rl<>	94.0
EtFOSA (SV)	<rl< td=""><td>0.456</td><th>10:2 FTOH</th><td><rl< td=""><td>64.1</td></rl<></td></rl<>	0.456	10:2 FTOH	<rl< td=""><td>64.1</td></rl<>	64.1
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< th=""><th>0.048</th><th>4:2 FTS</th><th><rl< th=""><th>0.069</th></rl<></th></rl<>	0.048	4:2 FTS	<rl< th=""><th>0.069</th></rl<>	0.069
MeFOSAA	<rl< th=""><th>0.126</th><th>6:2 FTS</th><th><rl< th=""><th>12.8</th></rl<></th></rl<>	0.126	6:2 FTS	<rl< th=""><th>12.8</th></rl<>	12.8
EtFOSAA	<rl< td=""><td>0.126</td><th>8:2 FTS</th><td><rl< td=""><td>0.121</td></rl<></td></rl<>	0.126	8:2 FTS	<rl< td=""><td>0.121</td></rl<>	0.121
			10:2 FTS	<rl< td=""><td>0.243</td></rl<>	0.243
FASE (SV)					
MeFOSE	<rl< th=""><th>0.185</th><th></th><th></th><th></th></rl<>	0.185			
EtFOSE	<rl< th=""><th>0.182</th><th></th><th></th><th></th></rl<>	0.182			

 Table 25. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for laundered OS-A.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	<rl< td=""><td>0.813</td><th>PFEESA</th><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.813	PFEESA	<rl< td=""><td>0.020</td></rl<>	0.020
PFPeA	$1.48\pm0.47$	0.026	PF4OPeA	<rl< td=""><td>0.023</td></rl<>	0.023
PFHxA	$12.7\pm3.7$	0.130	PF5OHxA	<rl< td=""><td>0.023</td></rl<>	0.023
PFHpA	$10.0\pm5.9$	0.494	3-6-ОРҒНрА	<rl< td=""><td>0.023</td></rl<>	0.023
PFOA	<rl< td=""><td>0.137</td><th>HFPO-DA</th><td><rl< td=""><td>0.041</td></rl<></td></rl<>	0.137	HFPO-DA	<rl< td=""><td>0.041</td></rl<>	0.041
PFNA	<rl< td=""><td>0.026</td><th>ADONA</th><td><rl< td=""><td>0.023</td></rl<></td></rl<>	0.026	ADONA	<rl< td=""><td>0.023</td></rl<>	0.023
PFDA	<rl< td=""><td>0.077</td><th>9CI-PF3ONS</th><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.077	9CI-PF3ONS	<rl< td=""><td>0.024</td></rl<>	0.024
PFUnDA	$0.0457 \pm 0.0087$	0.039	11Cl-PF3OUdS	<rl< td=""><td>0.024</td></rl<>	0.024
PFDoDA	<rl< td=""><td>0.026</td><th></th><td></td><td></td></rl<>	0.026			
PFTrDA	<rl< td=""><td>0.075</td><th>n:2 FTAcr (V)</th><td></td><td></td></rl<>	0.075	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.047</td><th>8:2 FTAcr</th><td><rl< td=""><td>22.1</td></rl<></td></rl<>	0.047	8:2 FTAcr	<rl< td=""><td>22.1</td></rl<>	22.1
			10:2 FTAcr	<rl< td=""><td>42.6</td></rl<>	42.6
PFSA (NV)					
PFPrS	<rl< td=""><td>0.026</td><th>n:2 FTMAC (V)</th><td></td><td></td></rl<>	0.026	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>0.023</td><th>6:2 FTMAC</th><td><math display="block">2550\pm120</math></td><td>94.9</td></rl<>	0.023	6:2 FTMAC	$2550\pm120$	94.9
PFPeS	<rl< td=""><td>0.024</td><th>8:2 FTMAC</th><td><rl< td=""><td>97.1</td></rl<></td></rl<>	0.024	8:2 FTMAC	<rl< td=""><td>97.1</td></rl<>	97.1
PFHxS	<rl< td=""><td>0.058</td><th>10:2 FTMAC</th><td><rl< td=""><td>51.2</td></rl<></td></rl<>	0.058	10:2 FTMAC	<rl< td=""><td>51.2</td></rl<>	51.2
PFHpS	<rl< td=""><td>0.024</td><th></th><td></td><td></td></rl<>	0.024			
PFOS	<rl< td=""><td>0.048</td><th>n:2 FTOAc (V)</th><td></td><td></td></rl<>	0.048	n:2 FTOAc (V)		
PFNS	$0.043\pm0.016$	0.025	8:2 FTOAc	<rl< td=""><td>21.8</td></rl<>	21.8
PFDS	<rl< td=""><td>1.27</td><th>10:2 FTOAc</th><td>No Value</td><td></td></rl<>	1.27	10:2 FTOAc	No Value	
FASA (NV, SV)			n:2 FTOH (V)		
FBSA (NV)	<rl< td=""><td>0.026</td><th><b>4:2 FTOH</b></th><td><rl< td=""><td>109</td></rl<></td></rl<>	0.026	<b>4:2 FTOH</b>	<rl< td=""><td>109</td></rl<>	109
MeFBSA (SV)	<rl< td=""><td>1.06</td><th>5:2 FTOH</th><td><rl< td=""><td>108</td></rl<></td></rl<>	1.06	5:2 FTOH	<rl< td=""><td>108</td></rl<>	108
FHxSA (NV)	<rl< td=""><td>0.052</td><th>6:2 FTOH</th><td><math>950 \pm 110</math></td><td>111</td></rl<>	0.052	6:2 FTOH	$950 \pm 110$	111
FOSA (NV)	0.0661 ± 0.0092	0.052	7:2 FTOH	<rl< td=""><td>42.8</td></rl<>	42.8
MeFOSA (SV)	<rl< td=""><td>0.193</td><th>8:2 FTOH</th><td><rl< td=""><td>107</td></rl<></td></rl<>	0.193	8:2 FTOH	<rl< td=""><td>107</td></rl<>	107
EtFOSA (SV)	<rl< td=""><td>0.203</td><th>10:2 FTOH</th><td><rl< td=""><td>111</td></rl<></td></rl<>	0.203	10:2 FTOH	<rl< td=""><td>111</td></rl<>	111
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.051</td><th>4:2 FTS</th><td><rl< td=""><td>0.069</td></rl<></td></rl<>	0.051	4:2 FTS	<rl< td=""><td>0.069</td></rl<>	0.069
MeFOSAA	<rl< td=""><td>0.026</td><th>6:2 FTS</th><td><rl< td=""><td>0.696</td></rl<></td></rl<>	0.026	6:2 FTS	<rl< td=""><td>0.696</td></rl<>	0.696
EtFOSAA	<rl< td=""><td>0.052</td><th>8:2 FTS</th><td><rl< td=""><td>0.117</td></rl<></td></rl<>	0.052	8:2 FTS	<rl< td=""><td>0.117</td></rl<>	0.117
			10:2 FTS	<rl< td=""><td>0.116</td></rl<>	0.116
FASE (SV)					
MeFOSE	<rl< td=""><td>0.094</td><th></th><td></td><td></td></rl<>	0.094			
EtFOSE	<rl< td=""><td>0.201</td><th></th><td></td><td></td></rl<>	0.201			

Table 26. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for weathered OS-A.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	<rl< td=""><td>0.465</td><th>PFEESA</th><td><rl< td=""><td>0.017</td></rl<></td></rl<>	0.465	PFEESA	<rl< td=""><td>0.017</td></rl<>	0.017
PFPeA	$0.417 \pm 0.031$	0.148	PF4OPeA	<rl< td=""><td>0.018</td></rl<>	0.018
PFHxA	$0.59 \pm 0.12$	0.255	PF5OHxA	<rl< td=""><td>0.017</td></rl<>	0.017
PFHpA	$1.29 \pm 0.15$	0.263	3-6-OPFHpA	<rl< td=""><td>0.017</td></rl<>	0.017
PFOA	$0.384 \pm 0.043$	0.127	HFPO-DA	<rl< td=""><td>0.175</td></rl<>	0.175
PFNA	$0.048\pm0.016$	0.018	ADONA	<rl< td=""><td>0.017</td></rl<>	0.017
PFDA	$0.192 \pm 0.016$	0.120	9CI-PF3ONS	<rl< td=""><td>0.033</td></rl<>	0.033
PFUnDA	<rl< td=""><td>0.043</td><th>11Cl-PF3OUdS</th><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.043	11Cl-PF3OUdS	<rl< td=""><td>0.015</td></rl<>	0.015
PFDoDA	<rl< td=""><td>0.063</td><th></th><td></td><td></td></rl<>	0.063			
PFTrDA	<rl< td=""><td>0.087</td><th>n:2 FTAcr(V)</th><td></td><td></td></rl<>	0.087	n:2 FTAcr(V)		
PFTeDA	<rl< td=""><td>0.123</td><th>8:2 FTAcr</th><td><rl< td=""><td>33.1</td></rl<></td></rl<>	0.123	8:2 FTAcr	<rl< td=""><td>33.1</td></rl<>	33.1
			10:2 FTAcr	<rl< td=""><td>15.6</td></rl<>	15.6
PFSA (NV)					
PFPrS	<rl< td=""><td>0.026</td><th><i>n:2 FTMAC (V)</i></th><td></td><td></td></rl<>	0.026	<i>n:2 FTMAC (V)</i>		
PFBS	<rl< td=""><td>0.054</td><th>6:2 FTMAC</th><td><rl< td=""><td>55.3</td></rl<></td></rl<>	0.054	6:2 FTMAC	<rl< td=""><td>55.3</td></rl<>	55.3
PFPeS	<rl< td=""><td>0.017</td><th>8:2 FTMAC</th><td><rl< td=""><td>56.6</td></rl<></td></rl<>	0.017	8:2 FTMAC	<rl< td=""><td>56.6</td></rl<>	56.6
PFHxS	0.0366 ± 0.0042	0.017	10:2 FTMAC	<rl< td=""><td>29.8</td></rl<>	29.8
PFHpS	<rl< td=""><td>0.018</td><th></th><td></td><td></td></rl<>	0.018			
PFOS	<rl< td=""><td>0.056</td><th>n:2 FTOAc (V)</th><td></td><td></td></rl<>	0.056	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.035</td><th>8:2 FTOAc</th><td><rl< td=""><td>32.3</td></rl<></td></rl<>	0.035	8:2 FTOAc	<rl< td=""><td>32.3</td></rl<>	32.3
PFDS	<rl< td=""><td>0.036</td><th>10:2 FTOAc</th><td><rl< td=""><td>16.2</td></rl<></td></rl<>	0.036	10:2 FTOAc	<rl< td=""><td>16.2</td></rl<>	16.2
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	<rl< td=""><td>0.018</td><th><b>4:2 FTOH</b></th><td><rl< td=""><td>84.2</td></rl<></td></rl<>	0.018	<b>4:2 FTOH</b>	<rl< td=""><td>84.2</td></rl<>	84.2
MeFBSA (SV)	<rl< td=""><td>0.169</td><th>5:2 FTOH</th><td><rl< td=""><td>80.1</td></rl<></td></rl<>	0.169	5:2 FTOH	<rl< td=""><td>80.1</td></rl<>	80.1
FHxSA (NV)	<rl< td=""><td>0.018</td><th>6:2 FTOH</th><td><math display="block">34.8\pm7.9</math></td><td>31.0</td></rl<>	0.018	6:2 FTOH	$34.8\pm7.9$	31.0
FOSA (NV)	<rl< td=""><td>0.018</td><th><b>7:2 FTOH</b></th><td><rl< td=""><td>79.7</td></rl<></td></rl<>	0.018	<b>7:2 FTOH</b>	<rl< td=""><td>79.7</td></rl<>	79.7
MeFOSA (SV)	<rl< td=""><td>0.422</td><th>8:2 FTOH</th><td><rl< td=""><td>148</td></rl<></td></rl<>	0.422	8:2 FTOH	<rl< td=""><td>148</td></rl<>	148
EtFOSA (SV)	<rl< td=""><td>0.423</td><th>10:2 FTOH</th><td><rl< td=""><td>80.1</td></rl<></td></rl<>	0.423	10:2 FTOH	<rl< td=""><td>80.1</td></rl<>	80.1
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.018</td><th>4:2 FTS</th><td><rl< td=""><td>3.10</td></rl<></td></rl<>	0.018	4:2 FTS	<rl< td=""><td>3.10</td></rl<>	3.10
MeFOSAA	<rl< td=""><td>0.082</td><th>6:2 FTS</th><td>No Value</td><td></td></rl<>	0.082	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.036</td><th>8:2 FTS</th><td><rl< td=""><td>0.079</td></rl<></td></rl<>	0.036	8:2 FTS	<rl< td=""><td>0.079</td></rl<>	0.079
			10:2 FTS	<rl< td=""><td>0.017</td></rl<>	0.017
FASE (SV)					
MeFOSE	<rl< td=""><td>0.425</td><th></th><td></td><td></td></rl<>	0.425			
EtFOSE	<rl< td=""><td>0.878</td><th></th><td></td><td></td></rl<>	0.878			

 Table 27. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for abraded OS-ASC following abrasion.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	<rl< td=""><td>0.136</td><td>PFEESA</td><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.136	PFEESA	<rl< td=""><td>0.021</td></rl<>	0.021
PFPeA	$0.080\pm0.016$	0.050	PF4OPeA	<rl< td=""><td>0.024</td></rl<>	0.024
PFHxA	<rl< td=""><td>0.682</td><td>PF5OHxA</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.682	PF5OHxA	<rl< td=""><td>0.024</td></rl<>	0.024
PFHpA	<rl< td=""><td>2.87</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	2.87	3-6-ОРҒНрА	<rl< td=""><td>0.024</td></rl<>	0.024
PFOA	$0.158 \pm 0.028$	0.113	HFPO-DA	<rl< td=""><td>0.105</td></rl<>	0.105
PFNA	<rl< td=""><td>0.077</td><td>ADONA</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.077	ADONA	<rl< td=""><td>0.024</td></rl<>	0.024
PFDA	$\begin{array}{c} 0.13155 \pm \\ 0.00094 \end{array}$	0.120	9CI-PF3ONS	<rl< td=""><td>0.024</td></rl<>	0.024
PFUnDA	$0.046 \pm 0.011$	0.026	11Cl-PF3OUdS	<rl< td=""><td>0.025</td></rl<>	0.025
PFDoDA	0.0349 ± 0.0039	0.026			
PFTrDA	<rl< td=""><td>0.077</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.077	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.062</td><td>8:2 FTAcr</td><td><rl< td=""><td>13.7</td></rl<></td></rl<>	0.062	8:2 FTAcr	<rl< td=""><td>13.7</td></rl<>	13.7
			10:2 FTAcr	<rl< td=""><td>13.3</td></rl<>	13.3
PFSA (NV)					
PFPrS	<rl< td=""><td>0.024</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.024	n:2 FTMAC (V)		
PFBS	$0.0353 \pm 0.0084$	0.023	6:2 FTMAC	$196 \pm 67$	47.0
PFPeS	<rl< td=""><td>0.025</td><td>8:2 FTMAC</td><td><rl< td=""><td>48.1</td></rl<></td></rl<>	0.025	8:2 FTMAC	<rl< td=""><td>48.1</td></rl<>	48.1
PFHxS	<rl< td=""><td>0.024</td><td>10:2 FTMAC</td><td><rl< td=""><td>25.4</td></rl<></td></rl<>	0.024	10:2 FTMAC	<rl< td=""><td>25.4</td></rl<>	25.4
PFHpS	$0.063 \pm 0.026$	0.025			
PFOS	$0.170\pm0.079$	0.068	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.025</td><td>8:2 FTOAc</td><td><rl< td=""><td>13.4</td></rl<></td></rl<>	0.025	8:2 FTOAc	<rl< td=""><td>13.4</td></rl<>	13.4
PFDS	$0.050\pm0.017$	0.025	10:2 FTOAc	<rl< td=""><td>13.8</td></rl<>	13.8
FASA (NV, SV)			n:2 FTOH (V)		
FBSA (NV)	<rl< td=""><td>0.026</td><td><b>4:2 FTOH</b></td><td><rl< td=""><td>28.1</td></rl<></td></rl<>	0.026	<b>4:2 FTOH</b>	<rl< td=""><td>28.1</td></rl<>	28.1
MeFBSA (SV)	<rl< td=""><td>0.719</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>68.1</td></rl<></td></rl<>	0.719	<b>5:2 FTOH</b>	<rl< td=""><td>68.1</td></rl<>	68.1
FHxSA (NV)	<rl< td=""><td>0.026</td><td>6:2 FTOH</td><td><math>129 \pm 35</math></td><td>68.6</td></rl<>	0.026	6:2 FTOH	$129 \pm 35$	68.6
FOSA (NV)	<rl< td=""><td>0.030</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>67.8</td></rl<></td></rl<>	0.030	<b>7:2 FTOH</b>	<rl< td=""><td>67.8</td></rl<>	67.8
MeFOSA (SV)	<rl< td=""><td>0.344</td><td>8:2 FTOH</td><td><rl< td=""><td>67.1</td></rl<></td></rl<>	0.344	8:2 FTOH	<rl< td=""><td>67.1</td></rl<>	67.1
EtFOSA (SV)	<rl< td=""><td>0.143</td><td>10:2 FTOH</td><td><rl< td=""><td>138</td></rl<></td></rl<>	0.143	10:2 FTOH	<rl< td=""><td>138</td></rl<>	138
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.134</td><td>4:2 FTS</td><td><math display="block">2.62\pm0.30</math></td><td>0.593</td></rl<>	0.134	4:2 FTS	$2.62\pm0.30$	0.593
MeFOSAA	<rl< td=""><td>0.136</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.136	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.164</td><td>8:2 FTS</td><td><rl< td=""><td>0.131</td></rl<></td></rl<>	0.164	8:2 FTS	<rl< td=""><td>0.131</td></rl<>	0.131
			10:2 FTS	<rl< td=""><td>0.029</td></rl<>	0.029
FASE (SV)					
MeFOSE	<rl< td=""><td>0.144</td><td></td><td></td><td></td></rl<>	0.144			
EtFOSE	<rl< td=""><td>0.340</td><td></td><td></td><td></td></rl<>	0.340			

 Table 28. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-ASC following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	<rl< td=""><td>1.05</td><td>PFEESA</td><td><rl< td=""><td>0.049</td></rl<></td></rl<>	1.05	PFEESA	<rl< td=""><td>0.049</td></rl<>	0.049
PFPeA	<rl< td=""><td>0.255</td><td>PF4OPeA</td><td><rl< td=""><td>0.232</td></rl<></td></rl<>	0.255	PF4OPeA	<rl< td=""><td>0.232</td></rl<>	0.232
PFHxA	<rl< td=""><td>0.255</td><td>PF5OHxA</td><td><rl< td=""><td>0.089</td></rl<></td></rl<>	0.255	PF5OHxA	<rl< td=""><td>0.089</td></rl<>	0.089
PFHpA	<rl< td=""><td>1.35</td><td>3-6-OPFHpA</td><td><rl< td=""><td>0.039</td></rl<></td></rl<>	1.35	3-6-OPFHpA	<rl< td=""><td>0.039</td></rl<>	0.039
PFOA	<rl< td=""><td>0.479</td><td>HFPO-DA</td><td><rl< td=""><td>0.528</td></rl<></td></rl<>	0.479	HFPO-DA	<rl< td=""><td>0.528</td></rl<>	0.528
PFNA	<rl< td=""><td>0.255</td><td>ADONA</td><td><rl< td=""><td>0.040</td></rl<></td></rl<>	0.255	ADONA	<rl< td=""><td>0.040</td></rl<>	0.040
PFDA	<rl< td=""><td>0.528</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.039</td></rl<></td></rl<>	0.528	9CI-PF3ONS	<rl< td=""><td>0.039</td></rl<>	0.039
PFUnDA	<rl< td=""><td>0.255</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.040</td></rl<></td></rl<>	0.255	11Cl-PF3OUdS	<rl< td=""><td>0.040</td></rl<>	0.040
PFDoDA	<rl< td=""><td>0.255</td><td></td><td></td><td></td></rl<>	0.255			
PFTrDA	<rl< td=""><td>0.098</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.098	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.098</td><td>8:2 FTAcr</td><td><rl< td=""><td>15.7</td></rl<></td></rl<>	0.098	8:2 FTAcr	<rl< td=""><td>15.7</td></rl<>	15.7
			10:2 FTAcr	<rl< td=""><td>15.1</td></rl<>	15.1
PFSA (NV)					
PFPrS	<rl< td=""><td>0.044</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.044	n:2 FTMAC (V)		
PFBS	$0.23 \pm 0.27$	0.044	6:2 FTMAC	$95.9 \pm 3.5$	67.4
PFPeS	<rl< td=""><td>0.045</td><td>8:2 FTMAC</td><td><rl< td=""><td>69.0</td></rl<></td></rl<>	0.045	8:2 FTMAC	<rl< td=""><td>69.0</td></rl<>	69.0
PFHxS	<rl< td=""><td>0.090</td><td>10:2 FTMAC</td><td><rl< td=""><td>36.3</td></rl<></td></rl<>	0.090	10:2 FTMAC	<rl< td=""><td>36.3</td></rl<>	36.3
PFHpS	<rl< td=""><td>0.046</td><td></td><td></td><td></td></rl<>	0.046			
PFOS	<rl< td=""><td>0.237</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.237	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.095</td><td>8:2 FTOAc</td><td><rl< td=""><td>15.5</td></rl<></td></rl<>	0.095	8:2 FTOAc	<rl< td=""><td>15.5</td></rl<>	15.5
PFDS	<rl< td=""><td>0.046</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	0.046	10:2 FTOAc	No Value	
FASA (NV, SV)			n:2 FTOH (V)		
FBSA (NV)	$0.145\pm0.038$	0.098	<b>4:2 FTOH</b>	<rl< td=""><td>77.2</td></rl<>	77.2
MeFBSA (SV)	<rl< td=""><td>0.455</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>29.9</td></rl<></td></rl<>	0.455	<b>5:2 FTOH</b>	<rl< td=""><td>29.9</td></rl<>	29.9
FHxSA (NV)	<rl< td=""><td>0.048</td><td>6:2 FTOH</td><td><rl< td=""><td>79.0</td></rl<></td></rl<>	0.048	6:2 FTOH	<rl< td=""><td>79.0</td></rl<>	79.0
FOSA (NV)	<rl< td=""><td>0.129</td><td>7:2 FTOH</td><td><rl< td=""><td>30.6</td></rl<></td></rl<>	0.129	7:2 FTOH	<rl< td=""><td>30.6</td></rl<>	30.6
MeFOSA (SV)	<rl< td=""><td>0.183</td><td>8:2 FTOH</td><td><rl< td=""><td>115</td></rl<></td></rl<>	0.183	8:2 FTOH	<rl< td=""><td>115</td></rl<>	115
EtFOSA (SV)	<rl< td=""><td>0.454</td><td>10:2 FTOH</td><td><rl< td=""><td>78.5</td></rl<></td></rl<>	0.454	10:2 FTOH	<rl< td=""><td>78.5</td></rl<>	78.5
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.255</td><td>4:2 FTS</td><td><rl< td=""><td>0.092</td></rl<></td></rl<>	0.255	4:2 FTS	<rl< td=""><td>0.092</td></rl<>	0.092
MeFOSAA	<rl< td=""><td>0.255</td><td>6:2 FTS</td><td><rl< td=""><td>0.502</td></rl<></td></rl<>	0.255	6:2 FTS	<rl< td=""><td>0.502</td></rl<>	0.502
EtFOSAA	<rl< td=""><td>0.255</td><td>8:2 FTS</td><td><rl< td=""><td>0.507</td></rl<></td></rl<>	0.255	8:2 FTS	<rl< td=""><td>0.507</td></rl<>	0.507
			10:2 FTS	<rl< td=""><td>0.101</td></rl<>	0.101
FASE (SV)					
MeFOSE	<rl< td=""><td>0.184</td><td></td><td></td><td></td></rl<>	0.184			
EtFOSE	<rl< td=""><td>0.182</td><td></td><td></td><td></td></rl<>	0.182			

Table 29. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for laundered OS-ASC.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	<rl< td=""><td>0.847</td><td>PFEESA</td><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.847	PFEESA	<rl< td=""><td>0.021</td></rl<>	0.021
PFPeA	<rl< td=""><td>0.027</td><td>PF4OPeA</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.027	PF4OPeA	<rl< td=""><td>0.024</td></rl<>	0.024
PFHxA	<rl< td=""><td>0.136</td><td>PF50HxA</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.136	PF50HxA	<rl< td=""><td>0.024</td></rl<>	0.024
PFHpA	<rl< td=""><td>0.515</td><td>3-6-OPFHpA</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.515	3-6-OPFHpA	<rl< td=""><td>0.024</td></rl<>	0.024
PFOA	<rl< td=""><td>0.143</td><td>HFPO-DA</td><td><rl< td=""><td>0.042</td></rl<></td></rl<>	0.143	HFPO-DA	<rl< td=""><td>0.042</td></rl<>	0.042
PFNA	<rl< td=""><td>0.027</td><td>ADONA</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.027	ADONA	<rl< td=""><td>0.024</td></rl<>	0.024
PFDA	<rl< td=""><td>0.080</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.025</td></rl<></td></rl<>	0.080	9CI-PF3ONS	<rl< td=""><td>0.025</td></rl<>	0.025
PFUnDA	<rl< td=""><td>0.041</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.025</td></rl<></td></rl<>	0.041	11Cl-PF3OUdS	<rl< td=""><td>0.025</td></rl<>	0.025
PFDoDA	<rl< td=""><td>0.027</td><td></td><td></td><td></td></rl<>	0.027			
PFTrDA	<rl< td=""><td>0.078</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.078	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.049</td><td>8:2 FTAcr</td><td><rl< td=""><td>18.6</td></rl<></td></rl<>	0.049	8:2 FTAcr	<rl< td=""><td>18.6</td></rl<>	18.6
			10:2 FTAcr	<rl< td=""><td>35.8</td></rl<>	35.8
PFSA (NV)					
PFPrS	<rl< td=""><td>0.027</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.027	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>0.024</td><td>6:2 FTMAC</td><td><math>151 \pm 18</math></td><td>79.9</td></rl<>	0.024	6:2 FTMAC	$151 \pm 18$	79.9
PFPeS	<rl< td=""><td>0.025</td><td>8:2 FTMAC</td><td><rl< td=""><td>81.7</td></rl<></td></rl<>	0.025	8:2 FTMAC	<rl< td=""><td>81.7</td></rl<>	81.7
PFHxS	<rl< td=""><td>0.061</td><td>10:2 FTMAC</td><td><rl< td=""><td>43.1</td></rl<></td></rl<>	0.061	10:2 FTMAC	<rl< td=""><td>43.1</td></rl<>	43.1
PFHpS	<rl< td=""><td>0.025</td><td></td><td></td><td></td></rl<>	0.025			
PFOS	<rl< td=""><td>0.050</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.050	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.026</td><td>8:2 FTOAc</td><td><rl< td=""><td>18.3</td></rl<></td></rl<>	0.026	8:2 FTOAc	<rl< td=""><td>18.3</td></rl<>	18.3
PFDS	<rl< td=""><td>1.33</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	1.33	10:2 FTOAc	No Value	
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	<rl< td=""><td>0.027</td><td><b>4:2 FTOH</b></td><td><rl< td=""><td>92.1</td></rl<></td></rl<>	0.027	<b>4:2 FTOH</b>	<rl< td=""><td>92.1</td></rl<>	92.1
MeFBSA (SV)	<rl< td=""><td>0.783</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>91.0</td></rl<></td></rl<>	0.783	<b>5:2 FTOH</b>	<rl< td=""><td>91.0</td></rl<>	91.0
FHxSA (NV)	<rl< td=""><td>0.054</td><td>6:2 FTOH</td><td><rl< td=""><td>93.7</td></rl<></td></rl<>	0.054	6:2 FTOH	<rl< td=""><td>93.7</td></rl<>	93.7
FOSA (NV)	<rl< td=""><td>0.054</td><td>7:2 FTOH</td><td><rl< td=""><td>36.1</td></rl<></td></rl<>	0.054	7:2 FTOH	<rl< td=""><td>36.1</td></rl<>	36.1
MeFOSA (SV)	<rl< td=""><td>0.142</td><td>8:2 FTOH</td><td><rl< td=""><td>90.3</td></rl<></td></rl<>	0.142	8:2 FTOH	<rl< td=""><td>90.3</td></rl<>	90.3
EtFOSA (SV)	<rl< td=""><td>0.150</td><td>10:2 FTOH</td><td><rl< td=""><td>93.6</td></rl<></td></rl<>	0.150	10:2 FTOH	<rl< td=""><td>93.6</td></rl<>	93.6
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.053</td><td>4:2 FTS</td><td>No Value</td><td></td></rl<>	0.053	4:2 FTS	No Value	
MeFOSAA	<rl< td=""><td>0.027</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.027	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.054</td><td>8:2 FTS</td><td><rl< td=""><td>0.122</td></rl<></td></rl<>	0.054	8:2 FTS	<rl< td=""><td>0.122</td></rl<>	0.122
			10:2 FTS	<rl< td=""><td>0.121</td></rl<>	0.121
FASE (SV)					
MeFOSE	<rl< td=""><td>0.069</td><td></td><td></td><td></td></rl<>	0.069			
EtFOSE	<rl< td=""><td>0.148</td><td></td><td></td><td></td></rl<>	0.148			

 Table 30. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for weathered OS-ASC.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	$5.453 \pm 0.081$	0.382	PFEESA	<rl< td=""><td>0.014</td></rl<>	0.014
PFPeA	$5.37 \pm 0.21$	0.122	PF4OPeA	<rl< td=""><td>0.015</td></rl<>	0.015
PFHxA	$8.49 \pm 0.50$	0.21	PF5OHxA	<rl< td=""><td>0.014</td></rl<>	0.014
PFHpA	$2.58\pm0.22$	0.217	3-6-ОРҒНрА	<rl< td=""><td>0.014</td></rl<>	0.014
PFOA	<rl< td=""><td>0.105</td><td>HFPO-DA</td><td><rl< td=""><td>0.144</td></rl<></td></rl<>	0.105	HFPO-DA	<rl< td=""><td>0.144</td></rl<>	0.144
PFNA	<rl< td=""><td>0.015</td><td>ADONA</td><td><rl< td=""><td>0.014</td></rl<></td></rl<>	0.015	ADONA	<rl< td=""><td>0.014</td></rl<>	0.014
PFDA	<rl< td=""><td>0.098</td><td>9Cl-PF3ONS</td><td><rl< td=""><td>0.027</td></rl<></td></rl<>	0.098	9Cl-PF3ONS	<rl< td=""><td>0.027</td></rl<>	0.027
PFUnDA	<rl< td=""><td>0.036</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.012</td></rl<></td></rl<>	0.036	11Cl-PF3OUdS	<rl< td=""><td>0.012</td></rl<>	0.012
PFDoDA	<rl< td=""><td>0.052</td><td></td><td></td><td></td></rl<>	0.052			
PFTrDA	<rl< td=""><td>0.072</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.072	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.101</td><td>8:2 FTAcr</td><td><rl< td=""><td>25.7</td></rl<></td></rl<>	0.101	8:2 FTAcr	<rl< td=""><td>25.7</td></rl<>	25.7
			10:2 FTAcr	<rl< td=""><td>12.1</td></rl<>	12.1
PFSA (NV)					
PFPrS	<rl< td=""><td>0.021</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.021	n:2 FTMAC (V)		
PFBS	$0.211 \pm 0.038$	0.045	6:2 FTMAC	$2210 \pm 370$	42.9
PFPeS	<rl< td=""><td>0.014</td><td>8:2 FTMAC</td><td><rl< td=""><td>43.9</td></rl<></td></rl<>	0.014	8:2 FTMAC	<rl< td=""><td>43.9</td></rl<>	43.9
PFHxS	<rl< td=""><td>0.014</td><td>10:2 FTMAC</td><td><rl< td=""><td>23.1</td></rl<></td></rl<>	0.014	10:2 FTMAC	<rl< td=""><td>23.1</td></rl<>	23.1
PFHpS	<rl< td=""><td>0.014</td><td></td><td></td><td></td></rl<>	0.014			
PFOS	0.1184 ± 0.0037	0.046	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.029</td><td>8:2 FTOAc</td><td><rl< td=""><td>25.0</td></rl<></td></rl<>	0.029	8:2 FTOAc	<rl< td=""><td>25.0</td></rl<>	25.0
PFDS	$0.115\pm0.059$	0.03	10:2 FTOAc	<rl< td=""><td>12.6</td></rl<>	12.6
FASA (NV, SV)			n:2 FTOH (V)		
FBSA (NV)	$0.072\pm0.015$	0.015	<b>4:2 FTOH</b>	<rl< td=""><td>65.3</td></rl<>	65.3
MeFBSA (SV)	<rl< td=""><td>0.131</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>62.1</td></rl<></td></rl<>	0.131	<b>5:2 FTOH</b>	<rl< td=""><td>62.1</td></rl<>	62.1
FHxSA (NV)	<rl< td=""><td>0.015</td><td>6:2 FTOH</td><td><math>784 \pm 26</math></td><td>24.0</td></rl<>	0.015	6:2 FTOH	$784 \pm 26$	24.0
FOSA (NV)	$0.0440 \pm 0.0094$	0.015	7:2 FTOH	<rl< td=""><td>61.9</td></rl<>	61.9
MeFOSA (SV)	<rl< td=""><td>0.327</td><td>8:2 FTOH</td><td><rl< td=""><td>115</td></rl<></td></rl<>	0.327	8:2 FTOH	<rl< td=""><td>115</td></rl<>	115
EtFOSA (SV)	<rl< td=""><td>0.328</td><td>10:2 FTOH</td><td><rl< td=""><td>62.2</td></rl<></td></rl<>	0.328	10:2 FTOH	<rl< td=""><td>62.2</td></rl<>	62.2
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.015</td><td>4:2 FTS</td><td><rl< td=""><td>2.55</td></rl<></td></rl<>	0.015	4:2 FTS	<rl< td=""><td>2.55</td></rl<>	2.55
MeFOSAA	<rl< td=""><td>0.068</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.068	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.030</td><td>8:2 FTS</td><td>No Value</td><td></td></rl<>	0.030	8:2 FTS	No Value	
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.329</td><td></td><td></td><td></td></rl<>	0.329			
EtFOSE	<rl< td=""><td>0.681</td><td></td><td></td><td></td></rl<>	0.681			

Table 31. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for abraded OS-B.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$2.37\pm0.12$	0.116	PFEESA	<rl< td=""><td>0.018</td></rl<>	0.018
PFPeA	$2.632\pm0.070$	0.043	PF4OPeA	<rl< td=""><td>0.020</td></rl<>	0.020
PFHxA	$5.789 \pm 0.070$	0.582	PF5OHxA	<rl< td=""><td>0.020</td></rl<>	0.020
РҒНрА	<rl< td=""><td>2.45</td><th><b>3-6-ОРҒНрА</b></th><td><rl< td=""><td>0.020</td></rl<></td></rl<>	2.45	<b>3-6-ОРҒНрА</b>	<rl< td=""><td>0.020</td></rl<>	0.020
PFOA	<rl< td=""><td>0.096</td><th>HFPO-DA</th><td><rl< td=""><td>0.090</td></rl<></td></rl<>	0.096	HFPO-DA	<rl< td=""><td>0.090</td></rl<>	0.090
PFNA	<rl< td=""><td>0.066</td><th>ADONA</th><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.066	ADONA	<rl< td=""><td>0.020</td></rl<>	0.020
PFDA	<rl< td=""><td>0.103</td><th>9CI-PF3ONS</th><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.103	9CI-PF3ONS	<rl< td=""><td>0.021</td></rl<>	0.021
PFUnDA	<rl< td=""><td>0.022</td><th>11Cl-PF3OUdS</th><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.022	11Cl-PF3OUdS	<rl< td=""><td>0.021</td></rl<>	0.021
PFDoDA	<rl< td=""><td>0.022</td><th></th><td></td><td></td></rl<>	0.022			
PFTrDA	<rl< td=""><td>0.066</td><th>n:2 FTAcr (V)</th><td></td><td></td></rl<>	0.066	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.053</td><th>8:2 FTAcr</th><td><rl< td=""><td>19.4</td></rl<></td></rl<>	0.053	8:2 FTAcr	<rl< td=""><td>19.4</td></rl<>	19.4
			10:2 FTAcr	<rl< td=""><td>18.8</td></rl<>	18.8
PFSA (NV)					
PFPrS	0.0306 ± 0.0053	0.020	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>0.020</td><th>6:2 FTMAC</th><td><math display="block">3410\pm860</math></td><td>66.5</td></rl<>	0.020	6:2 FTMAC	$3410\pm860$	66.5
PFPeS	<rl< td=""><td>0.021</td><th>8:2 FTMAC</th><td><rl< td=""><td>68.1</td></rl<></td></rl<>	0.021	8:2 FTMAC	<rl< td=""><td>68.1</td></rl<>	68.1
PFHxS	<rl< td=""><td>0.020</td><th>10:2 FTMAC</th><td><rl< td=""><td>35.9</td></rl<></td></rl<>	0.020	10:2 FTMAC	<rl< td=""><td>35.9</td></rl<>	35.9
PFHpS	<rl< td=""><td>0.021</td><th></th><td></td><td></td></rl<>	0.021			
PFOS	<rl< td=""><td>0.058</td><th>n:2 FTOAc (V)</th><td></td><td></td></rl<>	0.058	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.022</td><th>8:2 FTOAc</th><td><rl< td=""><td>18.9</td></rl<></td></rl<>	0.022	8:2 FTOAc	<rl< td=""><td>18.9</td></rl<>	18.9
PFDS	<rl< td=""><td>0.022</td><th>10:2 FTOAc</th><td><rl< td=""><td>19.5</td></rl<></td></rl<>	0.022	10:2 FTOAc	<rl< td=""><td>19.5</td></rl<>	19.5
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	<rl< td=""><td>0.022</td><th><b>4:2 FTOH</b></th><td><rl< td=""><td>39.7</td></rl<></td></rl<>	0.022	<b>4:2 FTOH</b>	<rl< td=""><td>39.7</td></rl<>	39.7
MeFBSA (SV)	<rl< td=""><td>1.01</td><th><b>5:2 FTOH</b></th><td><rl< td=""><td>96.2</td></rl<></td></rl<>	1.01	<b>5:2 FTOH</b>	<rl< td=""><td>96.2</td></rl<>	96.2
FHxSA (NV)	<rl< td=""><td>0.022</td><th>6:2 FTOH</th><td><math display="block">1000\pm160</math></td><td>97.0</td></rl<>	0.022	6:2 FTOH	$1000\pm160$	97.0
FOSA (NV)	<rl< td=""><td>0.026</td><th><b>7:2 FTOH</b></th><td><rl< td=""><td>95.8</td></rl<></td></rl<>	0.026	<b>7:2 FTOH</b>	<rl< td=""><td>95.8</td></rl<>	95.8
MeFOSA (SV)	<rl< td=""><td>0.482</td><th>8:2 FTOH</th><td><rl< td=""><td>94.8</td></rl<></td></rl<>	0.482	8:2 FTOH	<rl< td=""><td>94.8</td></rl<>	94.8
EtFOSA (SV)	<rl< td=""><td>0.201</td><th>10:2 FTOH</th><td><rl< td=""><td>196</td></rl<></td></rl<>	0.201	10:2 FTOH	<rl< td=""><td>196</td></rl<>	196
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.114</td><th>4:2 FTS</th><td><rl< td=""><td>0.507</td></rl<></td></rl<>	0.114	4:2 FTS	<rl< td=""><td>0.507</td></rl<>	0.507
MeFOSAA	<rl< td=""><td>0.116</td><th>6:2 FTS</th><td>No Value</td><td></td></rl<>	0.116	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.140</td><th>8:2 FTS</th><td><rl< td=""><td>0.112</td></rl<></td></rl<>	0.140	8:2 FTS	<rl< td=""><td>0.112</td></rl<>	0.112
			10:2 FTS	<rl< td=""><td>0.024</td></rl<>	0.024
FASE (SV)					
MeFOSE	<rl< td=""><td>0.202</td><th></th><td></td><td></td></rl<>	0.202			
EtFOSE	<rl< td=""><td>0.477</td><th></th><td></td><td></td></rl<>	0.477			

 Table 32. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-B following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	$1.03 \pm 0.19$	0.457	PFEESA	<rl< td=""><td>0.237</td></rl<>	0.237
PFPeA	$1.25 \pm 0.28$	0.26	PF4OPeA	<rl< td=""><td>0.141</td></rl<>	0.141
PFHxA	8.1 ± 1.6	0.761	PF5OHxA	<rl< td=""><td>0.102</td></rl<>	0.102
PFHpA	$0.69 \pm 0.16$	0.142	3-6-ОРҒНрА	<rl< td=""><td>0.076</td></rl<>	0.076
PFOA	<rl< td=""><td>0.294</td><td>HFPO-DA</td><td><rl< td=""><td>0.147</td></rl<></td></rl<>	0.294	HFPO-DA	<rl< td=""><td>0.147</td></rl<>	0.147
PFNA	<rl< td=""><td>0.136</td><td>ADONA</td><td><rl< td=""><td>0.104</td></rl<></td></rl<>	0.136	ADONA	<rl< td=""><td>0.104</td></rl<>	0.104
PFDA	<rl< td=""><td>0.130</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.078</td></rl<></td></rl<>	0.130	9CI-PF3ONS	<rl< td=""><td>0.078</td></rl<>	0.078
PFUnDA	<rl< td=""><td>0.114</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.114	11Cl-PF3OUdS	<rl< td=""><td>0.020</td></rl<>	0.020
PFDoDA	<rl< td=""><td>0.044</td><td></td><td></td><td></td></rl<>	0.044			
PFTrDA	$0.077\pm0.029$	0.044	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.033</td><td>8:2 FTAcr</td><td><rl< td=""><td>15.9</td></rl<></td></rl<>	0.033	8:2 FTAcr	<rl< td=""><td>15.9</td></rl<>	15.9
			10:2 FTAcr	<rl< td=""><td>15.3</td></rl<>	15.3
PFSA (NV)					
PFPrS	<rl< td=""><td>0.135</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.135	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>0.141</td><td>6:2 FTMAC</td><td><math>610 \pm 100</math></td><td>143</td></rl<>	0.141	6:2 FTMAC	$610 \pm 100$	143
PFPeS	<rl< td=""><td>0.105</td><td>8:2 FTMAC</td><td><rl< td=""><td>69.9</td></rl<></td></rl<>	0.105	8:2 FTMAC	<rl< td=""><td>69.9</td></rl<>	69.9
PFHxS	<rl< td=""><td>0.104</td><td><b>10:2 FTMAC</b></td><td><rl< td=""><td>36.8</td></rl<></td></rl<>	0.104	<b>10:2 FTMAC</b>	<rl< td=""><td>36.8</td></rl<>	36.8
PFHpS	<rl< td=""><td>0.095</td><td></td><td></td><td></td></rl<>	0.095			
PFOS	<rl< td=""><td>0.060</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.060	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.047</td><td>8:2 FTOAc</td><td><rl< td=""><td>15.7</td></rl<></td></rl<>	0.047	8:2 FTOAc	<rl< td=""><td>15.7</td></rl<>	15.7
PFDS	<rl< td=""><td>0.042</td><td>10:2 FTOAc</td><td><rl< td=""><td>42.8</td></rl<></td></rl<>	0.042	10:2 FTOAc	<rl< td=""><td>42.8</td></rl<>	42.8
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	No Value		<b>4:2 FTOH</b>	<rl< td=""><td>78.3</td></rl<>	78.3
MeFBSA (SV)	<rl< td=""><td>0.385</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>30.3</td></rl<></td></rl<>	0.385	<b>5:2 FTOH</b>	<rl< td=""><td>30.3</td></rl<>	30.3
FHxSA (NV)	<rl< td=""><td>0.049</td><td>6:2 FTOH</td><td><math display="block">250\pm100</math></td><td>80.1</td></rl<>	0.049	6:2 FTOH	$250\pm100$	80.1
FOSA (NV)	<rl< td=""><td>0.071</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>31.0</td></rl<></td></rl<>	0.071	<b>7:2 FTOH</b>	<rl< td=""><td>31.0</td></rl<>	31.0
MeFOSA (SV)	<rl< td=""><td>0.155</td><td>8:2 FTOH</td><td><rl< td=""><td>117</td></rl<></td></rl<>	0.155	8:2 FTOH	<rl< td=""><td>117</td></rl<>	117
EtFOSA (SV)	<rl< td=""><td>0.385</td><td>10:2 FTOH</td><td><rl< td=""><td>79.6</td></rl<></td></rl<>	0.385	10:2 FTOH	<rl< td=""><td>79.6</td></rl<>	79.6
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.044</td><td>4:2 FTS</td><td><rl< td=""><td>0.062</td></rl<></td></rl<>	0.044	4:2 FTS	<rl< td=""><td>0.062</td></rl<>	0.062
MeFOSAA	<rl< td=""><td>0.114</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.114	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.114</td><td>8:2 FTS</td><td><rl< td=""><td>0.109</td></rl<></td></rl<>	0.114	8:2 FTS	<rl< td=""><td>0.109</td></rl<>	0.109
			10:2 FTS	<rl< td=""><td>0.220</td></rl<>	0.220
FASE (SV)					
MeFOSE	<rl< td=""><td>0.156</td><td></td><td></td><td></td></rl<>	0.156			
EtFOSE	<rl< td=""><td>0.154</td><td></td><td></td><td></td></rl<>	0.154			

 Table 33. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for laundered OS-B.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	<rl< td=""><td>0.743</td><th>PFEESA</th><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.743	PFEESA	<rl< td=""><td>0.019</td></rl<>	0.019
PFPeA	$1.80\pm0.72$	0.023	PF4OPeA	<rl< td=""><td>0.021</td></rl<>	0.021
PFHxA	$15.6\pm4.3$	0.119	PF5OHxA	<rl< td=""><td>0.021</td></rl<>	0.021
PFHpA	$26.4\pm7.6$	0.452	<b>3-6-ОРҒНрА</b>	<rl< td=""><td>0.021</td></rl<>	0.021
PFOA	<rl< td=""><td>0.126</td><th>HFPO-DA</th><td><rl< td=""><td>0.037</td></rl<></td></rl<>	0.126	HFPO-DA	<rl< td=""><td>0.037</td></rl<>	0.037
PFNA	$\begin{array}{c} 0.0580 \pm \\ 0.0018 \end{array}$	0.024	ADONA	<rl< td=""><td>0.021</td></rl<>	0.021
PFDA	<rl< td=""><td>0.070</td><th>9Cl-PF3ONS</th><td><rl< td=""><td>0.022</td></rl<></td></rl<>	0.070	9Cl-PF3ONS	<rl< td=""><td>0.022</td></rl<>	0.022
PFUnDA	0.0462 ± 0.0017	0.036	11Cl-PF3OUdS	<rl< td=""><td>0.022</td></rl<>	0.022
PFDoDA	<rl< td=""><td>0.023</td><th></th><td></td><td></td></rl<>	0.023			
PFTrDA	<rl< td=""><td>0.068</td><th>n:2 FTAcr (V)</th><td></td><td></td></rl<>	0.068	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.043</td><th>8:2 FTAcr</th><td><rl< td=""><td>15.6</td></rl<></td></rl<>	0.043	8:2 FTAcr	<rl< td=""><td>15.6</td></rl<>	15.6
			10:2 FTAcr	<rl< td=""><td>29.9</td></rl<>	29.9
PFSA (NV)					
PFPrS	<rl< td=""><td>0.024</td><th>n:2 FTMAC (V)</th><td></td><td></td></rl<>	0.024	n:2 FTMAC (V)		
PFBS	$0.067 \pm 0.031$	0.021	6:2 FTMAC	$3060 \pm 340$	66.7
PFPeS	<rl< td=""><td>0.022</td><th>8:2 FTMAC</th><td><rl< td=""><td>68.2</td></rl<></td></rl<>	0.022	8:2 FTMAC	<rl< td=""><td>68.2</td></rl<>	68.2
PFHxS	<rl< td=""><td>0.053</td><th>10:2 FTMAC</th><td><rl< td=""><td>35.9</td></rl<></td></rl<>	0.053	10:2 FTMAC	<rl< td=""><td>35.9</td></rl<>	35.9
PFHpS	<rl< td=""><td>0.022</td><th></th><td></td><td></td></rl<>	0.022			
PFOS	<rl< td=""><td>0.044</td><th>n:2 FTOAc (V)</th><td></td><td></td></rl<>	0.044	n:2 FTOAc (V)		
PFNS	$0.0326 \pm 0.0077$	0.022	8:2 FTOAc	<rl< td=""><td>15.3</td></rl<>	15.3
PFDS	<rl< td=""><td>1.16</td><th>10:2 FTOAc</th><td>No Value</td><td></td></rl<>	1.16	10:2 FTOAc	No Value	
FASA (NV, SV)			n:2 FTOH (V)		
FBSA (NV)	<rl< td=""><td>0.023</td><th><b>4:2 FTOH</b></th><td><rl< td=""><td>76.8</td></rl<></td></rl<>	0.023	<b>4:2 FTOH</b>	<rl< td=""><td>76.8</td></rl<>	76.8
MeFBSA (SV)	<rl< td=""><td>1.08</td><th><b>5:2 FTOH</b></th><td><rl< td=""><td>75.9</td></rl<></td></rl<>	1.08	<b>5:2 FTOH</b>	<rl< td=""><td>75.9</td></rl<>	75.9
FHxSA (NV)	<rl< td=""><td>0.048</td><th>6:2 FTOH</th><td><math>1130 \pm 100</math></td><td>78.2</td></rl<>	0.048	6:2 FTOH	$1130 \pm 100$	78.2
FOSA (NV)	$0.064\pm0.015$	0.048	7:2 FTOH	<rl< td=""><td>30.1</td></rl<>	30.1
MeFOSA (SV)	<rl< td=""><td>0.196</td><th>8:2 FTOH</th><td><rl< td=""><td>75.3</td></rl<></td></rl<>	0.196	8:2 FTOH	<rl< td=""><td>75.3</td></rl<>	75.3
EtFOSA (SV)	<rl< td=""><td>0.207</td><th>10:2 FTOH</th><td><rl< td=""><td>78.1</td></rl<></td></rl<>	0.207	10:2 FTOH	<rl< td=""><td>78.1</td></rl<>	78.1
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	< <u>RL</u>	0.047	4:2 FTS	<rl< td=""><td>0.063</td></rl<>	0.063
MeFOSAA	< <u>RL</u>	0.023	6:2 FTS	$1.26 \pm 0.13$	0.636
EtFOSAA	<rl< td=""><td>0.048</td><th>8:2 FTS</th><td>&lt;<u>RL</u></td><td>0.107</td></rl<>	0.048	8:2 FTS	< <u>RL</u>	0.107
			10:2 FTS	<rl< td=""><td>0.106</td></rl<>	0.106
FASE (SV)					
MeFOSE	< <u>RL</u>	0.095			
EtFOSE	<rl< td=""><td>0.204</td><th></th><td></td><td></td></rl<>	0.204			

Table 34. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for weathered OS-B.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$16 \pm 4.4$	0.405	PFEESA	<rl< td=""><td>0.015</td></rl<>	0.015
PFPeA	$16.3 \pm 5.0$	0.129	PF4OPeA	<rl< td=""><td>0.016</td></rl<>	0.016
PFHxA	$14.1 \pm 2.9$	0.222	PF5OHxA	<rl< td=""><td>0.014</td></rl<>	0.014
PFHpA	$3.53 \pm 0.3$	0.230	<b>3-6-ОРҒН</b> рА	<rl< td=""><td>0.015</td></rl<>	0.015
PFOA	<rl< td=""><td>0.111</td><th>HFPO-DA</th><td><rl< td=""><td>0.152</td></rl<></td></rl<>	0.111	HFPO-DA	<rl< td=""><td>0.152</td></rl<>	0.152
PFNA	<rl< td=""><td>0.016</td><th>ADONA</th><td><rl< td=""><td>0.014</td></rl<></td></rl<>	0.016	ADONA	<rl< td=""><td>0.014</td></rl<>	0.014
PFDA	<rl< td=""><td>0.104</td><th>9CI-PF3ONS</th><td><rl< td=""><td>0.029</td></rl<></td></rl<>	0.104	9CI-PF3ONS	<rl< td=""><td>0.029</td></rl<>	0.029
PFUnDA	<rl< td=""><td>0.038</td><th>11Cl-PF3OUdS</th><td><rl< td=""><td>0.013</td></rl<></td></rl<>	0.038	11Cl-PF3OUdS	<rl< td=""><td>0.013</td></rl<>	0.013
PFDoDA	<rl< td=""><td>0.055</td><th></th><td></td><td></td></rl<>	0.055			
PFTrDA	<rl< td=""><td>0.076</td><th>n:2 FTAcr (V)</th><td></td><td></td></rl<>	0.076	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.107</td><th>8:2 FTAcr</th><td><rl< td=""><td>26.5</td></rl<></td></rl<>	0.107	8:2 FTAcr	<rl< td=""><td>26.5</td></rl<>	26.5
			10:2 FTAcr	<rl< td=""><td>12.5</td></rl<>	12.5
PFSA (NV)					
PFPrS	<rl< td=""><td>0.022</td><th>n:2 FTMAC(V)</th><td></td><td></td></rl<>	0.022	n:2 FTMAC(V)		
PFBS	$0.207 \pm 0.077$	0.047	6:2 FTMAC	$3200 \pm 320$	44.2
PFPeS	<rl< td=""><td>0.015</td><th>8:2 FTMAC</th><td><rl< td=""><td>45.2</td></rl<></td></rl<>	0.015	8:2 FTMAC	<rl< td=""><td>45.2</td></rl<>	45.2
PFHxS	<rl< td=""><td>0.015</td><th>10:2 FTMAC</th><td><rl< td=""><td>23.8</td></rl<></td></rl<>	0.015	10:2 FTMAC	<rl< td=""><td>23.8</td></rl<>	23.8
PFHpS	<rl< td=""><td>0.015</td><th></th><td></td><td></td></rl<>	0.015			
PFOS	0.0565 ± 0.0019	0.049	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.031</td><th>8:2 FTOAc</th><td><rl< td=""><td>25.8</td></rl<></td></rl<>	0.031	8:2 FTOAc	<rl< td=""><td>25.8</td></rl<>	25.8
PFDS	<rl< td=""><td>0.031</td><th>10:2 FTOAc</th><td><rl< td=""><td>13.0</td></rl<></td></rl<>	0.031	10:2 FTOAc	<rl< td=""><td>13.0</td></rl<>	13.0
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	$0.183 \pm 0.010$	0.016	<b>4:2 FTOH</b>	<rl< td=""><td>67.2</td></rl<>	67.2
MeFBSA (SV)	<rl< td=""><td>0.134</td><th><b>5:2 FTOH</b></th><td><rl< td=""><td>63.9</td></rl<></td></rl<>	0.134	<b>5:2 FTOH</b>	<rl< td=""><td>63.9</td></rl<>	63.9
FHxSA (NV)	<rl< td=""><td>0.016</td><th>6:2 FTOH</th><td><math display="block">1220\pm190</math></td><td>24.7</td></rl<>	0.016	6:2 FTOH	$1220\pm190$	24.7
FOSA (NV)	0.0591 ± 0.0022	0.016	7:2 FTOH	<rl< td=""><td>63.7</td></rl<>	63.7
MeFOSA (SV)	<rl< td=""><td>0.336</td><th>8:2 FTOH</th><td><rl< td=""><td>118</td></rl<></td></rl<>	0.336	8:2 FTOH	<rl< td=""><td>118</td></rl<>	118
EtFOSA (SV)	<rl< td=""><td>0.337</td><th>10:2 FTOH</th><td><rl< td=""><td>64.0</td></rl<></td></rl<>	0.337	10:2 FTOH	<rl< td=""><td>64.0</td></rl<>	64.0
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.016</td><th>4:2 FTS</th><td>No Value</td><td></td></rl<>	0.016	4:2 FTS	No Value	
MeFOSAA	<rl< td=""><td>0.072</td><th>6:2 FTS</th><td>No Value</td><td></td></rl<>	0.072	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.032</td><th>8:2 FTS</th><td><rl< td=""><td>0.069</td></rl<></td></rl<>	0.032	8:2 FTS	<rl< td=""><td>0.069</td></rl<>	0.069
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.338</td><th></th><td></td><td></td></rl<>	0.338			
EtFOSE	<rl< td=""><td>0.699</td><th></th><td></td><td></td></rl<>	0.699			

 Table 35. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for abraded OS-C.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$2.39 \pm 0.15$	0.124	PFEESA	<rl< td=""><td>0.019</td></rl<>	0.019
PFPeA	$3.33 \pm 0.10$	0.045	PF4OPeA	<rl< td=""><td>0.021</td></rl<>	0.021
PFHxA	$4.99 \pm 0.42$	0.619	PF50HxA	<rl< td=""><td>0.021</td></rl<>	0.021
PFHpA	<rl< td=""><td>2.60</td><th><b>3-6-ОРFHpA</b></th><td><rl< td=""><td>0.021</td></rl<></td></rl<>	2.60	<b>3-6-ОРFHpA</b>	<rl< td=""><td>0.021</td></rl<>	0.021
PFOA	<rl< td=""><td>0.102</td><th>HFPO-DA</th><td><rl< td=""><td>0.096</td></rl<></td></rl<>	0.102	HFPO-DA	<rl< td=""><td>0.096</td></rl<>	0.096
PFNA	<rl< td=""><td>0.070</td><th>ADONA</th><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.070	ADONA	<rl< td=""><td>0.021</td></rl<>	0.021
PFDA	<rl< td=""><td>0.109</td><th>9Cl-PF3ONS</th><td><rl< td=""><td>0.022</td></rl<></td></rl<>	0.109	9Cl-PF3ONS	<rl< td=""><td>0.022</td></rl<>	0.022
PFUnDA	<rl< td=""><td>0.024</td><th>11Cl-PF3OUdS</th><td><rl< td=""><td>0.022</td></rl<></td></rl<>	0.024	11Cl-PF3OUdS	<rl< td=""><td>0.022</td></rl<>	0.022
PFDoDA	<rl< td=""><td>0.024</td><th></th><td></td><td></td></rl<>	0.024			
PFTrDA	<rl< td=""><td>0.070</td><th>n:2 FTAcr (V)</th><td></td><td></td></rl<>	0.070	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.056</td><th>8:2 FTAcr</th><td><rl< td=""><td>16.5</td></rl<></td></rl<>	0.056	8:2 FTAcr	<rl< td=""><td>16.5</td></rl<>	16.5
			10:2 FTAcr	<rl< td=""><td>15.9</td></rl<>	15.9
PFSA (NV)					
PFPrS	$0.0232 \pm 0.0038$	0.021	n:2 FTMAC (V)		
PFBS	$0.130 \pm 0.036$	0.021	6:2 FTMAC	$5570\pm330$	56.5
PFPeS	<rl< td=""><td>0.022</td><th>8:2 FTMAC</th><td><rl< td=""><td>57.8</td></rl<></td></rl<>	0.022	8:2 FTMAC	<rl< td=""><td>57.8</td></rl<>	57.8
PFHxS	<rl< td=""><td>0.022</td><th>10:2 FTMAC</th><td><rl< td=""><td>30.4</td></rl<></td></rl<>	0.022	10:2 FTMAC	<rl< td=""><td>30.4</td></rl<>	30.4
PFHpS	<rl< td=""><td>0.023</td><th></th><td></td><td></td></rl<>	0.023			
PFOS	<rl< td=""><td>0.062</td><th>n:2 FTOAc (V)</th><td></td><td></td></rl<>	0.062	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.023</td><th>8:2 FTOAc</th><td><rl< td=""><td>16.1</td></rl<></td></rl<>	0.023	8:2 FTOAc	<rl< td=""><td>16.1</td></rl<>	16.1
PFDS	<rl< td=""><td>0.023</td><th>10:2 FTOAc</th><td><rl< td=""><td>16.6</td></rl<></td></rl<>	0.023	10:2 FTOAc	<rl< td=""><td>16.6</td></rl<>	16.6
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	<rl< td=""><td>0.024</td><th><b>4:2 FTOH</b></th><td><rl< td=""><td>33.7</td></rl<></td></rl<>	0.024	<b>4:2 FTOH</b>	<rl< td=""><td>33.7</td></rl<>	33.7
MeFBSA (SV)	<rl< td=""><td>0.856</td><th><b>5:2 FTOH</b></th><td><rl< td=""><td>81.7</td></rl<></td></rl<>	0.856	<b>5:2 FTOH</b>	<rl< td=""><td>81.7</td></rl<>	81.7
FHxSA (NV)	<rl< td=""><td>0.024</td><th>6:2 FTOH</th><td><math display="block">1360\pm110</math></td><td>82.3</td></rl<>	0.024	6:2 FTOH	$1360\pm110$	82.3
FOSA (NV)	<rl< td=""><td>0.027</td><th>7:2 FTOH</th><td><rl< td=""><td>81.4</td></rl<></td></rl<>	0.027	7:2 FTOH	<rl< td=""><td>81.4</td></rl<>	81.4
MeFOSA (SV)	<rl< td=""><td>0.409</td><th>8:2 FTOH</th><td><rl< td=""><td>80.5</td></rl<></td></rl<>	0.409	8:2 FTOH	<rl< td=""><td>80.5</td></rl<>	80.5
EtFOSA (SV)	<rl< td=""><td>0.171</td><th>10:2 FTOH</th><td><rl< td=""><td>166</td></rl<></td></rl<>	0.171	10:2 FTOH	<rl< td=""><td>166</td></rl<>	166
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.122</td><th>4:2 FTS</th><td><rl< td=""><td>0.539</td></rl<></td></rl<>	0.122	4:2 FTS	<rl< td=""><td>0.539</td></rl<>	0.539
MeFOSAA	<rl< td=""><td>0.124</td><th>6:2 FTS</th><td>No Value</td><td></td></rl<>	0.124	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.149</td><th>8:2 FTS</th><td><rl< td=""><td>0.119</td></rl<></td></rl<>	0.149	8:2 FTS	<rl< td=""><td>0.119</td></rl<>	0.119
			10:2 FTS	<rl< td=""><td>0.026</td></rl<>	0.026
FASE (SV)					
MeFOSE	<rl< td=""><td>0.171</td><th></th><td></td><td></td></rl<>	0.171			
EtFOSE	<rl< td=""><td>0.405</td><th></th><td></td><td></td></rl<>	0.405			

 Table 36. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-C following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	$2.20 \pm 0.11$	0.551	PFEESA	<rl< td=""><td>0.286</td></rl<>	0.286
PFPeA	$2.53\pm0.23$	0.313	PF4OPeA	<rl< td=""><td>0.169</td></rl<>	0.169
PFHxA	$13.04 \pm 0.59$	0.918	PF5OHxA	<rl< td=""><td>0.123</td></rl<>	0.123
PFHpA	$1.81 \pm 0.17$	0.172	3-6-ОРҒНрА	<rl< td=""><td>0.092</td></rl<>	0.092
PFOA	<rl< td=""><td>0.354</td><td>HFPO-DA</td><td><rl< td=""><td>0.177</td></rl<></td></rl<>	0.354	HFPO-DA	<rl< td=""><td>0.177</td></rl<>	0.177
PFNA	<rl< td=""><td>0.164</td><td>ADONA</td><td><rl< td=""><td>0.126</td></rl<></td></rl<>	0.164	ADONA	<rl< td=""><td>0.126</td></rl<>	0.126
PFDA	<rl< td=""><td>0.156</td><td>9Cl-PF3ONS</td><td><rl< td=""><td>0.094</td></rl<></td></rl<>	0.156	9Cl-PF3ONS	<rl< td=""><td>0.094</td></rl<>	0.094
PFUnDA	<rl< td=""><td>0.137</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.137	11Cl-PF3OUdS	<rl< td=""><td>0.024</td></rl<>	0.024
PFDoDA	<rl< td=""><td>0.053</td><td></td><td></td><td></td></rl<>	0.053			
PFTrDA	$0.116\pm0.031$	0.053	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.040</td><td>8:2 FTAcr</td><td><rl< td=""><td>12.7</td></rl<></td></rl<>	0.040	8:2 FTAcr	<rl< td=""><td>12.7</td></rl<>	12.7
			10:2 FTAcr	<rl< td=""><td>12.2</td></rl<>	12.2
PFSA (NV)					
PFPrS	<rl< td=""><td>0.163</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.163	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>0.170</td><td>6:2 FTMAC</td><td><math>1293 \pm 42</math></td><td>54.6</td></rl<>	0.170	6:2 FTMAC	$1293 \pm 42$	54.6
PFPeS	<rl< td=""><td>0.127</td><td>8:2 FTMAC</td><td><rl< td=""><td>55.8</td></rl<></td></rl<>	0.127	8:2 FTMAC	<rl< td=""><td>55.8</td></rl<>	55.8
PFHxS	<rl< td=""><td>0.125</td><td><b>10:2 FTMAC</b></td><td><rl< td=""><td>29.4</td></rl<></td></rl<>	0.125	<b>10:2 FTMAC</b>	<rl< td=""><td>29.4</td></rl<>	29.4
PFHpS	<rl< td=""><td>0.114</td><td></td><td></td><td></td></rl<>	0.114			
PFOS	<rl< td=""><td>0.072</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.072	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.057</td><td>8:2 FTOAc</td><td><rl< td=""><td>12.5</td></rl<></td></rl<>	0.057	8:2 FTOAc	<rl< td=""><td>12.5</td></rl<>	12.5
PFDS	<rl< td=""><td>0.051</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	0.051	10:2 FTOAc	No Value	
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	<rl< td=""><td>0.077</td><td><b>4:2 FTOH</b></td><td><rl< td=""><td>62.5</td></rl<></td></rl<>	0.077	<b>4:2 FTOH</b>	<rl< td=""><td>62.5</td></rl<>	62.5
MeFBSA (SV)	<rl< td=""><td>0.411</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>24.2</td></rl<></td></rl<>	0.411	<b>5:2 FTOH</b>	<rl< td=""><td>24.2</td></rl<>	24.2
FHxSA (NV)	<rl< td=""><td>0.059</td><td>6:2 FTOH</td><td><math display="block">223\pm25</math></td><td>64.0</td></rl<>	0.059	6:2 FTOH	$223\pm25$	64.0
FOSA (NV)	<rl< td=""><td>0.085</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>24.8</td></rl<></td></rl<>	0.085	<b>7:2 FTOH</b>	<rl< td=""><td>24.8</td></rl<>	24.8
MeFOSA (SV)	<rl< td=""><td>0.165</td><td>8:2 FTOH</td><td><rl< td=""><td>93.2</td></rl<></td></rl<>	0.165	8:2 FTOH	<rl< td=""><td>93.2</td></rl<>	93.2
EtFOSA (SV)	<rl< td=""><td>0.410</td><td>10:2 FTOH</td><td><rl< td=""><td>63.5</td></rl<></td></rl<>	0.410	10:2 FTOH	<rl< td=""><td>63.5</td></rl<>	63.5
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.053</td><td>4:2 FTS</td><td><rl< td=""><td>0.075</td></rl<></td></rl<>	0.053	4:2 FTS	<rl< td=""><td>0.075</td></rl<>	0.075
MeFOSAA	<rl< td=""><td>0.137</td><td>6:2 FTS</td><td><rl< td=""><td>13.9</td></rl<></td></rl<>	0.137	6:2 FTS	<rl< td=""><td>13.9</td></rl<>	13.9
EtFOSAA	<rl< td=""><td>0.137</td><td>8:2 FTS</td><td><rl< td=""><td>0.131</td></rl<></td></rl<>	0.137	8:2 FTS	<rl< td=""><td>0.131</td></rl<>	0.131
			10:2 FTS	<rl< td=""><td>0.265</td></rl<>	0.265
FASE (SV)					
MeFOSE	<rl< td=""><td>0.166</td><td></td><td></td><td></td></rl<>	0.166			
EtFOSE	<rl< td=""><td>0.164</td><td></td><td></td><td></td></rl<>	0.164			

Table 37. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for laundered OS-C.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	<rl< td=""><td>0.774</td><td>PFEESA</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.774	PFEESA	<rl< td=""><td>0.019</td></rl<>	0.019
PFPeA	$0.67\pm0.15$	0.024	PF4OPeA	<rl< td=""><td>0.022</td></rl<>	0.022
PFHxA	$5.80\pm0.83$	0.124	PF5OHxA	<rl< td=""><td>0.022</td></rl<>	0.022
PFHpA	$4.5 \pm 1.5$	0.470	3-6-ОРҒНрА	<rl< td=""><td>0.022</td></rl<>	0.022
PFOA	<rl< td=""><td>0.131</td><td>HFPO-DA</td><td><rl< td=""><td>0.039</td></rl<></td></rl<>	0.131	HFPO-DA	<rl< td=""><td>0.039</td></rl<>	0.039
PFNA	<rl< td=""><td>0.025</td><td>ADONA</td><td><rl< td=""><td>0.022</td></rl<></td></rl<>	0.025	ADONA	<rl< td=""><td>0.022</td></rl<>	0.022
PFDA	<rl< td=""><td>0.073</td><td>9Cl-PF3ONS</td><td><rl< td=""><td>0.023</td></rl<></td></rl<>	0.073	9Cl-PF3ONS	<rl< td=""><td>0.023</td></rl<>	0.023
PFUnDA	<rl< td=""><td>0.037</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.023</td></rl<></td></rl<>	0.037	11Cl-PF3OUdS	<rl< td=""><td>0.023</td></rl<>	0.023
PFDoDA	<rl< td=""><td>0.024</td><td></td><td></td><td></td></rl<>	0.024			
PFTrDA	<rl< td=""><td>0.071</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.071	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.045</td><td>8:2 FTAcr</td><td><rl< td=""><td>18.7</td></rl<></td></rl<>	0.045	8:2 FTAcr	<rl< td=""><td>18.7</td></rl<>	18.7
			10:2 FTAcr	<rl< td=""><td>36.0</td></rl<>	36.0
PFSA (NV)					
PFPrS	<rl< td=""><td>0.025</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.025	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>0.022</td><td>6:2 FTMAC</td><td><math display="block">4100 \pm 1100</math></td><td>80.2</td></rl<>	0.022	6:2 FTMAC	$4100 \pm 1100$	80.2
PFPeS	<rl< td=""><td>0.023</td><td>8:2 FTMAC</td><td><rl< td=""><td>82.0</td></rl<></td></rl<>	0.023	8:2 FTMAC	<rl< td=""><td>82.0</td></rl<>	82.0
PFHxS	<rl< td=""><td>0.056</td><td>10:2 FTMAC</td><td><rl< td=""><td>43.2</td></rl<></td></rl<>	0.056	10:2 FTMAC	<rl< td=""><td>43.2</td></rl<>	43.2
PFHpS	<rl< td=""><td>0.023</td><td></td><td></td><td></td></rl<>	0.023			
PFOS	<rl< td=""><td>0.046</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.046	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.023</td><td>8:2 FTOAc</td><td><rl< td=""><td>18.4</td></rl<></td></rl<>	0.023	8:2 FTOAc	<rl< td=""><td>18.4</td></rl<>	18.4
PFDS	<rl< td=""><td>1.21</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	1.21	10:2 FTOAc	No Value	
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	No Value		<b>4:2 FTOH</b>	<rl< td=""><td>92.4</td></rl<>	92.4
MeFBSA (SV)	<rl< td=""><td>0.935</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>91.3</td></rl<></td></rl<>	0.935	<b>5:2 FTOH</b>	<rl< td=""><td>91.3</td></rl<>	91.3
FHxSA (NV)	<rl< td=""><td>0.050</td><td>6:2 FTOH</td><td><math display="block">1250\pm350</math></td><td>94.0</td></rl<>	0.050	6:2 FTOH	$1250\pm350$	94.0
FOSA (NV)	<rl< td=""><td>0.050</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>36.2</td></rl<></td></rl<>	0.050	<b>7:2 FTOH</b>	<rl< td=""><td>36.2</td></rl<>	36.2
MeFOSA (SV)	<rl< td=""><td>0.170</td><td>8:2 FTOH</td><td><rl< td=""><td>90.6</td></rl<></td></rl<>	0.170	8:2 FTOH	<rl< td=""><td>90.6</td></rl<>	90.6
EtFOSA (SV)	<rl< td=""><td>0.179</td><td>10:2 FTOH</td><td><rl< td=""><td>93.9</td></rl<></td></rl<>	0.179	10:2 FTOH	<rl< td=""><td>93.9</td></rl<>	93.9
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.049</td><td>4:2 FTS</td><td><rl< td=""><td>0.066</td></rl<></td></rl<>	0.049	4:2 FTS	<rl< td=""><td>0.066</td></rl<>	0.066
MeFOSAA	<rl< td=""><td>0.024</td><td>6:2 FTS</td><td><math>17 \pm 20</math></td><td>0.663</td></rl<>	0.024	6:2 FTS	$17 \pm 20$	0.663
EtFOSAA	<rl< td=""><td>0.050</td><td>8:2 FTS</td><td><rl< td=""><td>0.112</td></rl<></td></rl<>	0.050	8:2 FTS	<rl< td=""><td>0.112</td></rl<>	0.112
			10:2 FTS	<rl< td=""><td>0.110</td></rl<>	0.110
FASE (SV)					
MeFOSE	<rl< td=""><td>0.083</td><td></td><td></td><td></td></rl<>	0.083			
EtFOSE	<rl< td=""><td>0.177</td><td></td><td></td><td></td></rl<>	0.177			

Table 38. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for weathered OS-C.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$1.99\pm0.22$	0.400	PFEESA	<rl< td=""><td>0.015</td></rl<>	0.015
PFPeA	$2.42\pm0.18$	0.127	PF4OPeA	<rl< td=""><td>0.016</td></rl<>	0.016
PFHxA	$4.099\pm0.088$	0.219	PF5OHxA	<rl< td=""><td>0.014</td></rl<>	0.014
РҒНрА	<rl< td=""><td>0.227</td><th>3-6-ОРҒНрА</th><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.227	3-6-ОРҒНрА	<rl< td=""><td>0.015</td></rl<>	0.015
PFOA	<rl< td=""><td>0.110</td><th>HFPO-DA</th><td><rl< td=""><td>0.151</td></rl<></td></rl<>	0.110	HFPO-DA	<rl< td=""><td>0.151</td></rl<>	0.151
PFNA	<rl< td=""><td>0.016</td><th>ADONA</th><td><rl< td=""><td>0.014</td></rl<></td></rl<>	0.016	ADONA	<rl< td=""><td>0.014</td></rl<>	0.014
PFDA	<rl< td=""><td>0.103</td><th>9CI-PF3ONS</th><td><rl< td=""><td>0.028</td></rl<></td></rl<>	0.103	9CI-PF3ONS	<rl< td=""><td>0.028</td></rl<>	0.028
PFUnDA	<rl< td=""><td>0.037</td><th>11Cl-PF3OUdS</th><td><rl< td=""><td>0.013</td></rl<></td></rl<>	0.037	11Cl-PF3OUdS	<rl< td=""><td>0.013</td></rl<>	0.013
PFDoDA	<rl< td=""><td>0.054</td><th></th><td></td><td></td></rl<>	0.054			
PFTrDA	<rl< td=""><td>0.075</td><th>n:2 FTAcr (V)</th><td></td><td></td></rl<>	0.075	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.106</td><th>8:2 FTAcr</th><td><rl< td=""><td>27.9</td></rl<></td></rl<>	0.106	8:2 FTAcr	<rl< td=""><td>27.9</td></rl<>	27.9
			10:2 FTAcr	<rl< td=""><td>13.1</td></rl<>	13.1
PFSA (NV)					
PFPrS	<rl< td=""><td>0.022</td><th>n:2 FTMAC (V)</th><td></td><td></td></rl<>	0.022	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>0.047</td><th>6:2 FTMAC</th><td><math>5440 \pm 560</math></td><td>46.6</td></rl<>	0.047	6:2 FTMAC	$5440 \pm 560$	46.6
PFPeS	<rl< td=""><td>0.015</td><th>8:2 FTMAC</th><td><rl< td=""><td>47.7</td></rl<></td></rl<>	0.015	8:2 FTMAC	<rl< td=""><td>47.7</td></rl<>	47.7
PFHxS	<rl< td=""><td>0.015</td><th>10:2 FTMAC</th><td><rl< td=""><td>25.1</td></rl<></td></rl<>	0.015	10:2 FTMAC	<rl< td=""><td>25.1</td></rl<>	25.1
PFHpS	<rl< td=""><td>0.015</td><th></th><td></td><td></td></rl<>	0.015			
PFOS	<rl< td=""><td>0.048</td><th>n:2 FTOAc (V)</th><td></td><td></td></rl<>	0.048	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.030</td><th>8:2 FTOAc</th><td><rl< td=""><td>27.2</td></rl<></td></rl<>	0.030	8:2 FTOAc	<rl< td=""><td>27.2</td></rl<>	27.2
PFDS	0.0958 ± 0.0025	0.031	10:2 FTOAc	<rl< td=""><td>13.7</td></rl<>	13.7
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	$0.0228 \pm 0.0034$	0.016	4:2 FTOH	<rl< td=""><td>70.9</td></rl<>	70.9
MeFBSA (SV)	<rl< td=""><td>0.141</td><th><b>5:2 FTOH</b></th><td><rl< td=""><td>67.5</td></rl<></td></rl<>	0.141	<b>5:2 FTOH</b>	<rl< td=""><td>67.5</td></rl<>	67.5
FHxSA (NV)	<rl< td=""><td>0.016</td><th>6:2 FTOH</th><td><math display="block">1710\pm320</math></td><td>26.1</td></rl<>	0.016	6:2 FTOH	$1710\pm320$	26.1
FOSA (NV)	$0.0470 \pm 0.0056$	0.016	7:2 FTOH	<rl< td=""><td>67.2</td></rl<>	67.2
MeFOSA (SV)	<rl< td=""><td>0.353</td><th>8:2 FTOH</th><td><rl< td=""><td>125</td></rl<></td></rl<>	0.353	8:2 FTOH	<rl< td=""><td>125</td></rl<>	125
EtFOSA (SV)	<rl< td=""><td>0.354</td><th>10:2 FTOH</th><td><rl< td=""><td>67.5</td></rl<></td></rl<>	0.354	10:2 FTOH	<rl< td=""><td>67.5</td></rl<>	67.5
FASAA (NV)	DI	0.01.5	<i>n:2 FTS (NV)</i>	<b>DI</b>	0.67
FOSAA	< <u>RL</u>	0.016	4:2 FTS	<rl< td=""><td>2.67</td></rl<>	2.67
MeFOSAA	< <u>RL</u>	0.071	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.031</td><th>8:2 FTS</th><td>No Value</td><td></td></rl<>	0.031	8:2 FTS	No Value	
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.355</td><th></th><td></td><td></td></rl<>	0.355			
EtFOSE	<rl< td=""><td>0.734</td><th></th><td></td><td></td></rl<>	0.734			

 Table 39. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for abraded OS-D.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$2.77\pm0.77$	0.116	PFEESA	<rl< td=""><td>0.018</td></rl<>	0.018
PFPeA	$1.888\pm0.097$	0.043	PF4OPeA	<rl< td=""><td>0.020</td></rl<>	0.020
PFHxA	$5.79 \pm 0.20$	0.582	PF5OHxA	<rl< td=""><td>0.020</td></rl<>	0.020
PFHpA	<rl< td=""><td>2.45</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	2.45	3-6-ОРҒНрА	<rl< td=""><td>0.020</td></rl<>	0.020
PFOA	<rl< td=""><td>0.096</td><td>HFPO-DA</td><td><rl< td=""><td>0.090</td></rl<></td></rl<>	0.096	HFPO-DA	<rl< td=""><td>0.090</td></rl<>	0.090
PFNA	<rl< td=""><td>0.066</td><td>ADONA</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.066	ADONA	<rl< td=""><td>0.020</td></rl<>	0.020
PFDA	<rl< td=""><td>0.103</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.103	9CI-PF3ONS	<rl< td=""><td>0.021</td></rl<>	0.021
PFUnDA	<rl< td=""><td>0.022</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.022	11Cl-PF3OUdS	<rl< td=""><td>0.021</td></rl<>	0.021
PFDoDA	<rl< td=""><td>0.022</td><td></td><td></td><td></td></rl<>	0.022			
PFTrDA	<rl< td=""><td>0.066</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.066	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.053</td><td>8:2 FTAcr</td><td><rl< td=""><td>15.3</td></rl<></td></rl<>	0.053	8:2 FTAcr	<rl< td=""><td>15.3</td></rl<>	15.3
			10:2 FTAcr	<rl< td=""><td>14.7</td></rl<>	14.7
PFSA (NV)					
PFPrS	$0.1176 \pm 0.0050$	0.020	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>0.020</td><td>6:2 FTMAC</td><td><math display="block">2670\pm250</math></td><td>52.3</td></rl<>	0.020	6:2 FTMAC	$2670\pm250$	52.3
PFPeS	<rl< td=""><td>0.021</td><td>8:2 FTMAC</td><td><rl< td=""><td>53.5</td></rl<></td></rl<>	0.021	8:2 FTMAC	<rl< td=""><td>53.5</td></rl<>	53.5
PFHxS	<rl< td=""><td>0.020</td><td>10:2 FTMAC</td><td><rl< td=""><td>28.2</td></rl<></td></rl<>	0.020	10:2 FTMAC	<rl< td=""><td>28.2</td></rl<>	28.2
PFHpS	<rl< td=""><td>0.021</td><td></td><td></td><td></td></rl<>	0.021			
PFOS	<rl< td=""><td>0.058</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.058	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.022</td><td>8:2 FTOAc</td><td><rl< td=""><td>14.9</td></rl<></td></rl<>	0.022	8:2 FTOAc	<rl< td=""><td>14.9</td></rl<>	14.9
PFDS	<rl< td=""><td>0.022</td><td>10:2 FTOAc</td><td><rl< td=""><td>15.3</td></rl<></td></rl<>	0.022	10:2 FTOAc	<rl< td=""><td>15.3</td></rl<>	15.3
FASA (NV, SV)			n:2 FTOH (V)		
FBSA (NV)	No Value		4:2 FTOH	<rl< td=""><td>31.2</td></rl<>	31.2
MeFBSA (SV)	<rl< td=""><td>0.797</td><td>5:2 FTOH</td><td><rl <rl< td=""><td>75.6</td></rl<></rl </td></rl<>	0.797	5:2 FTOH	<rl <rl< td=""><td>75.6</td></rl<></rl 	75.6
FHxSA (NV)	No Value	0.171	6:2 FTOH	881 ± 18	76.2
FOSA (NV)	<rl< td=""><td>0.026</td><td>7:2 FTOH</td><td><rl< td=""><td>75.3</td></rl<></td></rl<>	0.026	7:2 FTOH	<rl< td=""><td>75.3</td></rl<>	75.3
MeFOSA (SV)	<rl< td=""><td>0.381</td><td>8:2 FTOH</td><td><rl< td=""><td>74.5</td></rl<></td></rl<>	0.381	8:2 FTOH	<rl< td=""><td>74.5</td></rl<>	74.5
EtFOSA (SV)	<rl< td=""><td>0.159</td><td>10:2 FTOH</td><td><rl< td=""><td>154</td></rl<></td></rl<>	0.159	10:2 FTOH	<rl< td=""><td>154</td></rl<>	154
~ /					
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.114</td><td>4:2 FTS</td><td><rl< td=""><td>0.507</td></rl<></td></rl<>	0.114	4:2 FTS	<rl< td=""><td>0.507</td></rl<>	0.507
MeFOSAA	<rl< td=""><td>0.116</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.116	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.140</td><td>8:2 FTS</td><td><rl< td=""><td>0.112</td></rl<></td></rl<>	0.140	8:2 FTS	<rl< td=""><td>0.112</td></rl<>	0.112
			10:2 FTS	<rl< td=""><td>0.024</td></rl<>	0.024
FASE (SV)					
MeFOSE	<rl< td=""><td>0.160</td><td></td><td></td><td></td></rl<>	0.160			
EtFOSE	<rl< td=""><td>0.377</td><td></td><td></td><td></td></rl<>	0.377			

**Table 40.** Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-D following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$1.02 \pm 0.33$	0.482	PFEESA	<rl< td=""><td>0.250</td></rl<>	0.250
PFPeA	$1.16\pm0.10$	0.274	PF4OPeA	<rl< td=""><td>0.148</td></rl<>	0.148
PFHxA	$11.08\pm0.50$	0.803	PF5OHxA	<rl< td=""><td>0.108</td></rl<>	0.108
РҒНрА	$0.729 \pm 0.017$	0.150	3-6-ОРҒНрА	<rl< td=""><td>0.080</td></rl<>	0.080
PFOA	<rl< td=""><td>0.310</td><td>HFPO-DA</td><td><rl< td=""><td>0.155</td></rl<></td></rl<>	0.310	HFPO-DA	<rl< td=""><td>0.155</td></rl<>	0.155
PFNA	<rl< td=""><td>0.143</td><td>ADONA</td><td><rl< td=""><td>0.110</td></rl<></td></rl<>	0.143	ADONA	<rl< td=""><td>0.110</td></rl<>	0.110
PFDA	<rl< td=""><td>0.137</td><td>9Cl-PF3ONS</td><td><rl< td=""><td>0.082</td></rl<></td></rl<>	0.137	9Cl-PF3ONS	<rl< td=""><td>0.082</td></rl<>	0.082
PFUnDA	<rl< td=""><td>0.120</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.120	11Cl-PF3OUdS	<rl< td=""><td>0.021</td></rl<>	0.021
PFDoDA	<rl< td=""><td>0.046</td><td></td><td></td><td></td></rl<>	0.046			
PFTrDA	<rl< td=""><td>0.046</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.046	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.035</td><td>8:2 FTAcr</td><td><rl< td=""><td>12.3</td></rl<></td></rl<>	0.035	8:2 FTAcr	<rl< td=""><td>12.3</td></rl<>	12.3
			10:2 FTAcr	<rl< td=""><td>11.8</td></rl<>	11.8
PFSA (NV)					
PFPrS	<rl< td=""><td>0.142</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.142	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>0.148</td><td>6:2 FTMAC</td><td><math display="block">833.9\pm9.9</math></td><td>115</td></rl<>	0.148	6:2 FTMAC	$833.9\pm9.9$	115
PFPeS	<rl< td=""><td>0.111</td><td>8:2 FTMAC</td><td><rl< td=""><td>54.0</td></rl<></td></rl<>	0.111	8:2 FTMAC	<rl< td=""><td>54.0</td></rl<>	54.0
PFHxS	<rl< td=""><td>0.109</td><td><b>10:2 FTMAC</b></td><td><rl< td=""><td>28.5</td></rl<></td></rl<>	0.109	<b>10:2 FTMAC</b>	<rl< td=""><td>28.5</td></rl<>	28.5
PFHpS	<rl< td=""><td>0.100</td><td></td><td></td><td></td></rl<>	0.100			
PFOS	$0.090 \pm 0.012$	0.063	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.049</td><td>8:2 FTOAc</td><td><rl< td=""><td>12.1</td></rl<></td></rl<>	0.049	8:2 FTOAc	<rl< td=""><td>12.1</td></rl<>	12.1
PFDS	<rl< td=""><td>0.044</td><td>10:2 FTOAc</td><td><rl< td=""><td>34.2</td></rl<></td></rl<>	0.044	10:2 FTOAc	<rl< td=""><td>34.2</td></rl<>	34.2
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	No Value		4:2 FTOH (V)	<rl< td=""><td>60.5</td></rl<>	60.5
MeFBSA (SV)	<rl< td=""><td>0.366</td><td>5:2 FTOH</td><td><rl <rl< td=""><td>23.4</td></rl<></rl </td></rl<>	0.366	5:2 FTOH	<rl <rl< td=""><td>23.4</td></rl<></rl 	23.4
FHxSA (NV)	No Value	0.500	6:2 FTOH	$\frac{\langle \mathbf{RL} \rangle}{215 \pm 42}$	61.9
FOSA (NV)	<rl< td=""><td>0.075</td><td>7:2 FTOH</td><td>&lt;<u>RL</u></td><td>24.0</td></rl<>	0.075	7:2 FTOH	< <u>RL</u>	24.0
MeFOSA (SV)	<rl <rl< td=""><td>0.147</td><td>8:2 FTOH</td><td><rl <rl< td=""><td>90.2</td></rl<></rl </td></rl<></rl 	0.147	8:2 FTOH	<rl <rl< td=""><td>90.2</td></rl<></rl 	90.2
EtFOSA (SV)	<rl< td=""><td>0.365</td><td>10:2 FTOH</td><td><rl< td=""><td>61.5</td></rl<></td></rl<>	0.365	10:2 FTOH	<rl< td=""><td>61.5</td></rl<>	61.5
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.046</td><td>4:2 FTS</td><td><rl< td=""><td>0.066</td></rl<></td></rl<>	0.046	4:2 FTS	<rl< td=""><td>0.066</td></rl<>	0.066
MeFOSAA	<rl< td=""><td>0.120</td><td>6:2 FTS</td><td><rl< td=""><td>12.2</td></rl<></td></rl<>	0.120	6:2 FTS	<rl< td=""><td>12.2</td></rl<>	12.2
EtFOSAA	<rl< td=""><td>0.120</td><td>8:2 FTS</td><td><rl< td=""><td>0.115</td></rl<></td></rl<>	0.120	8:2 FTS	<rl< td=""><td>0.115</td></rl<>	0.115
			10:2 FTS	<rl< td=""><td>0.232</td></rl<>	0.232
FASE (SV)					
MeFOSE	<rl< td=""><td>0.148</td><td></td><td></td><td></td></rl<>	0.148			
EtFOSE	<rl< td=""><td>0.146</td><td></td><td></td><td></td></rl<>	0.146			

Table 41. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for laundered OS-D.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	<rl< td=""><td>0.772</td><th>PFEESA</th><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.772	PFEESA	<rl< td=""><td>0.019</td></rl<>	0.019
PFPeA	$0.622\pm0.067$	0.024	PF4OPeA	<rl< td=""><td>0.022</td></rl<>	0.022
PFHxA	No Value		PF5OHxA	<rl< td=""><td>0.022</td></rl<>	0.022
PFHpA	$3.6 \pm 1.3$	0.469	<b>3-6-ОРҒНрА</b>	<rl< td=""><td>0.022</td></rl<>	0.022
PFOA	<rl< td=""><td>0.130</td><th>HFPO-DA</th><td><rl< td=""><td>0.038</td></rl<></td></rl<>	0.130	HFPO-DA	<rl< td=""><td>0.038</td></rl<>	0.038
PFNA	<rl< td=""><td>0.025</td><th>ADONA</th><td><rl< td=""><td>0.022</td></rl<></td></rl<>	0.025	ADONA	<rl< td=""><td>0.022</td></rl<>	0.022
PFDA	<rl< td=""><td>0.073</td><th>9CI-PF3ONS</th><td><rl< td=""><td>0.023</td></rl<></td></rl<>	0.073	9CI-PF3ONS	<rl< td=""><td>0.023</td></rl<>	0.023
PFUnDA	<rl< td=""><td>0.037</td><th>11Cl-PF3OUdS</th><td><rl< td=""><td>0.023</td></rl<></td></rl<>	0.037	11Cl-PF3OUdS	<rl< td=""><td>0.023</td></rl<>	0.023
PFDoDA	<rl< td=""><td>0.024</td><th></th><td></td><td></td></rl<>	0.024			
PFTrDA	<rl< td=""><td>0.071</td><th>n:2 FTAcr (V)</th><td></td><td></td></rl<>	0.071	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.045</td><th>8:2 FTAcr</th><td><rl< td=""><td>14.6</td></rl<></td></rl<>	0.045	8:2 FTAcr	<rl< td=""><td>14.6</td></rl<>	14.6
			10:2 FTAcr	<rl< td=""><td>28.1</td></rl<>	28.1
PFSA (NV)					
PFPrS	<rl< td=""><td>0.025</td><th>n:2 FTMAC (V)</th><td></td><td></td></rl<>	0.025	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>0.022</td><th>6:2 FTMAC</th><td><math>2040 \pm 120</math></td><td>170</td></rl<>	0.022	6:2 FTMAC	$2040 \pm 120$	170
PFPeS	<rl< td=""><td>0.023</td><th>8:2 FTMAC</th><td><rl< td=""><td>64.1</td></rl<></td></rl<>	0.023	8:2 FTMAC	<rl< td=""><td>64.1</td></rl<>	64.1
PFHxS	<rl< td=""><td>0.055</td><th>10:2 FTMAC</th><td><rl< td=""><td>33.8</td></rl<></td></rl<>	0.055	10:2 FTMAC	<rl< td=""><td>33.8</td></rl<>	33.8
PFHpS	<rl< td=""><td>0.023</td><th></th><td></td><td></td></rl<>	0.023			
PFOS	<rl< td=""><td>0.046</td><th>n:2 FTOAc (V)</th><td></td><td></td></rl<>	0.046	n:2 FTOAc (V)		
PFNS	$0.0252 \pm 0.0012$	0.023	8:2 FTOAc	<rl< td=""><td>14.4</td></rl<>	14.4
PFDS	<rl< td=""><td>1.21</td><th>10:2 FTOAc</th><td><rl< td=""><td>50.8</td></rl<></td></rl<>	1.21	10:2 FTOAc	<rl< td=""><td>50.8</td></rl<>	50.8
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	No Value		<b>4:2 FTOH</b>	<rl< td=""><td>72.3</td></rl<>	72.3
MeFBSA (SV)	<rl< td=""><td>1.24</td><th>5:2 FTOH</th><td><rl< td=""><td>71.4</td></rl<></td></rl<>	1.24	5:2 FTOH	<rl< td=""><td>71.4</td></rl<>	71.4
FHxSA (NV)	No Value		6:2 FTOH	$1160\pm400$	73.5
FOSA (NV)	<rl< td=""><td>0.050</td><th>7:2 FTOH</th><td><rl< td=""><td>28.3</td></rl<></td></rl<>	0.050	7:2 FTOH	<rl< td=""><td>28.3</td></rl<>	28.3
MeFOSA (SV)	<rl< td=""><td>0.227</td><th>8:2 FTOH</th><td><rl< td=""><td>70.8</td></rl<></td></rl<>	0.227	8:2 FTOH	<rl< td=""><td>70.8</td></rl<>	70.8
EtFOSA (SV)	<rl< td=""><td>0.240</td><th>10:2 FTOH</th><td><rl< td=""><td>73.4</td></rl<></td></rl<>	0.240	10:2 FTOH	<rl< td=""><td>73.4</td></rl<>	73.4
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.049</td><th>4:2 FTS</th><td><rl< td=""><td>0.066</td></rl<></td></rl<>	0.049	4:2 FTS	<rl< td=""><td>0.066</td></rl<>	0.066
MeFOSAA	<rl< td=""><td>0.024</td><th>6:2 FTS</th><td>No Value</td><td></td></rl<>	0.024	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.050</td><th>8:2 FTS</th><td><rl< td=""><td>0.112</td></rl<></td></rl<>	0.050	8:2 FTS	<rl< td=""><td>0.112</td></rl<>	0.112
			10:2 FTS	<rl< td=""><td>0.110</td></rl<>	0.110
FASE (SV)					
MeFOSE	<rl< td=""><td>0.111</td><th></th><td></td><td></td></rl<>	0.111			
EtFOSE	<rl< td=""><td>0.237</td><th></th><td></td><td></td></rl<>	0.237			

 Table 42. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for weathered OS-D.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$33.0 \pm 4.4$	0.411	PFEESA	<rl< td=""><td>0.015</td></rl<>	0.015
PFPeA	$35.1 \pm 5.2$	0.131	PF4OPeA	<rl< td=""><td>0.016</td></rl<>	0.016
PFHxA	$46.3 \pm 3.7$	0.226	PF5OHxA	<rl< td=""><td>0.015</td></rl<>	0.015
РҒНрА	$6.3 \pm 0.6$	0.233	3-6-ОРҒНрА	<rl< td=""><td>0.015</td></rl<>	0.015
PFOA	$0.539 \pm 0.064$	0.113	HFPO-DA	<rl< td=""><td>0.155</td></rl<>	0.155
PFNA	$0.226\pm0.033$	0.016	ADONA	<rl< td=""><td>0.015</td></rl<>	0.015
PFDA	$0.441 \pm 0.075$	0.106	9CI-PF3ONS	<rl< td=""><td>0.029</td></rl<>	0.029
PFUnDA	$0.080\pm0.026$	0.038	11Cl-PF3OUdS	<rl< td=""><td>0.013</td></rl<>	0.013
PFDoDA	$0.081 \pm 0.021$	0.056			
PFTrDA	<rl< td=""><td>0.077</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.077	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.109</td><td>8:2 FTAcr</td><td><rl< td=""><td>29.1</td></rl<></td></rl<>	0.109	8:2 FTAcr	<rl< td=""><td>29.1</td></rl<>	29.1
			10:2 FTAcr	<rl< td=""><td>13.7</td></rl<>	13.7
PFSA (NV)					
PFPrS	<rl< td=""><td>0.023</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.023	n:2 FTMAC (V)		
PFBS	$0.100\pm0.014$	0.048	6:2 FTMAC	$1850\pm150$	48.6
PFPeS	<rl< td=""><td>0.015</td><td>8:2 FTMAC</td><td><rl< td=""><td>49.7</td></rl<></td></rl<>	0.015	8:2 FTMAC	<rl< td=""><td>49.7</td></rl<>	49.7
PFHxS	<rl< td=""><td>0.015</td><td>10:2 FTMAC</td><td><rl< td=""><td>26.2</td></rl<></td></rl<>	0.015	10:2 FTMAC	<rl< td=""><td>26.2</td></rl<>	26.2
PFHpS	<rl< td=""><td>0.016</td><td></td><td></td><td></td></rl<>	0.016			
PFOS	<rl< td=""><td>0.05</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.05	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.031</td><td>8:2 FTOAc</td><td><rl< td=""><td>28.3</td></rl<></td></rl<>	0.031	8:2 FTOAc	<rl< td=""><td>28.3</td></rl<>	28.3
PFDS	<rl< td=""><td>0.032</td><td>10:2 FTOAc</td><td><rl< td=""><td>14.3</td></rl<></td></rl<>	0.032	10:2 FTOAc	<rl< td=""><td>14.3</td></rl<>	14.3
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	No Value		4:2 FTOH	<rl< td=""><td>73.9</td></rl<>	73.9
MeFBSA (SV)	<rl< td=""><td>0.148</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>70.3</td></rl<></td></rl<>	0.148	<b>5:2 FTOH</b>	<rl< td=""><td>70.3</td></rl<>	70.3
FHxSA (NV)	No Value		6:2 FTOH	$1016 \pm 97$	195
FOSA (NV)	$0.034 \pm 0.013$	0.016	7:2 FTOH	<rl< td=""><td>70.1</td></rl<>	70.1
MeFOSA (SV)	<rl< td=""><td>0.370</td><td>8:2 FTOH</td><td><rl< td=""><td>130</td></rl<></td></rl<>	0.370	8:2 FTOH	<rl< td=""><td>130</td></rl<>	130
EtFOSA (SV)	<rl< td=""><td>0.371</td><td>10:2 FTOH</td><td><rl< td=""><td>70.4</td></rl<></td></rl<>	0.371	10:2 FTOH	<rl< td=""><td>70.4</td></rl<>	70.4
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.016</td><td>4:2 FTS</td><td>No Value</td><td></td></rl<>	0.016	4:2 FTS	No Value	
MeFOSAA	<rl< td=""><td>0.073</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.073	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.032</td><td>8:2 FTS</td><td><math>0.626 \pm 0.072</math></td><td>0.07</td></rl<>	0.032	8:2 FTS	$0.626 \pm 0.072$	0.07
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.372</td><td></td><td></td><td></td></rl<>	0.372			
EtFOSE	<rl< td=""><td>0.769</td><td></td><td></td><td></td></rl<>	0.769			

Table 43. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for abraded OS-E.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		40 O/
PFBA	$2.387 \pm 0.072$	0.131	PFEESA	<rl< td=""><td>0.020</td></rl<>	0.020
PFPeA	$3.278 \pm 0.047$	0.048	PF4OPeA	<rl< td=""><td>0.023</td></rl<>	0.023
PFHxA	$6.94 \pm 0.19$	0.656	PF5OHxA	<rl< td=""><td>0.023</td></rl<>	0.023
PFHpA	<rl< td=""><td>2.76</td><td><b>3-6-ОРFHpA</b></td><td><rl< td=""><td>0.023</td></rl<></td></rl<>	2.76	<b>3-6-ОРFHpA</b>	<rl< td=""><td>0.023</td></rl<>	0.023
PFOA	<rl< td=""><td>0.108</td><td>HFPO-DA</td><td><rl< td=""><td>0.101</td></rl<></td></rl<>	0.108	HFPO-DA	<rl< td=""><td>0.101</td></rl<>	0.101
PFNA	<rl< td=""><td>0.074</td><td>ADONA</td><td><rl< td=""><td>0.023</td></rl<></td></rl<>	0.074	ADONA	<rl< td=""><td>0.023</td></rl<>	0.023
PFDA	<rl< td=""><td>0.116</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.116	9CI-PF3ONS	<rl< td=""><td>0.024</td></rl<>	0.024
PFUnDA	<rl< td=""><td>0.025</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.025	11Cl-PF3OUdS	<rl< td=""><td>0.024</td></rl<>	0.024
PFDoDA	<rl< td=""><td>0.025</td><td></td><td></td><td></td></rl<>	0.025			
PFTrDA	<rl< td=""><td>0.074</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.074	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.059</td><td>8:2 FTAcr</td><td><rl< td=""><td>14.4</td></rl<></td></rl<>	0.059	8:2 FTAcr	<rl< td=""><td>14.4</td></rl<>	14.4
			10:2 FTAcr	<rl< td=""><td>13.9</td></rl<>	13.9
PFSA (NV)					
PFPrS	$0.0859 \pm 0.0075$	0.023	n:2 FTMAC (V)		
PFBS	$0.060 \pm 0.013$	0.022	6:2 FTMAC	$2289\pm98$	49.1
PFPeS	<rl< td=""><td>0.024</td><td>8:2 FTMAC</td><td><rl< td=""><td>50.3</td></rl<></td></rl<>	0.024	8:2 FTMAC	<rl< td=""><td>50.3</td></rl<>	50.3
PFHxS	<rl< td=""><td>0.023</td><td>10:2 FTMAC</td><td><rl< td=""><td>26.5</td></rl<></td></rl<>	0.023	10:2 FTMAC	<rl< td=""><td>26.5</td></rl<>	26.5
PFHpS	<rl< td=""><td>0.024</td><td></td><td></td><td></td></rl<>	0.024			
PFOS	<rl< td=""><td>0.065</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.065	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.024</td><td>8:2 FTOAc</td><td><rl< td=""><td>14.0</td></rl<></td></rl<>	0.024	8:2 FTOAc	<rl< td=""><td>14.0</td></rl<>	14.0
PFDS	<rl< td=""><td>0.024</td><td>10:2 FTOAc</td><td><rl< td=""><td>14.4</td></rl<></td></rl<>	0.024	10:2 FTOAc	<rl< td=""><td>14.4</td></rl<>	14.4
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	<rl< td=""><td>0.025</td><td><b>4:2 FTOH</b></td><td><rl< td=""><td>29.3</td></rl<></td></rl<>	0.025	<b>4:2 FTOH</b>	<rl< td=""><td>29.3</td></rl<>	29.3
MeFBSA (SV)	<rl< td=""><td>0.749</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>71.1</td></rl<></td></rl<>	0.749	<b>5:2 FTOH</b>	<rl< td=""><td>71.1</td></rl<>	71.1
FHxSA (NV)	<rl< td=""><td>0.025</td><td>6:2 FTOH</td><td><math>1050 \pm 19</math></td><td>71.6</td></rl<>	0.025	6:2 FTOH	$1050 \pm 19$	71.6
FOSA (NV)	<rl< td=""><td>0.029</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>70.8</td></rl<></td></rl<>	0.029	<b>7:2 FTOH</b>	<rl< td=""><td>70.8</td></rl<>	70.8
MeFOSA (SV)	<rl< td=""><td>0.358</td><td>8:2 FTOH</td><td><rl< td=""><td>70.0</td></rl<></td></rl<>	0.358	8:2 FTOH	<rl< td=""><td>70.0</td></rl<>	70.0
EtFOSA (SV)	<rl< td=""><td>0.149</td><td>10:2 FTOH</td><td><rl< td=""><td>144</td></rl<></td></rl<>	0.149	10:2 FTOH	<rl< td=""><td>144</td></rl<>	144
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.129</td><td>4:2 FTS</td><td><rl< td=""><td>0.571</td></rl<></td></rl<>	0.129	4:2 FTS	<rl< td=""><td>0.571</td></rl<>	0.571
MeFOSAA	<rl< td=""><td>0.131</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.131	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.157</td><td>8:2 FTS</td><td><rl< td=""><td>0.126</td></rl<></td></rl<>	0.157	8:2 FTS	<rl< td=""><td>0.126</td></rl<>	0.126
			10:2 FTS	$0.0577 \pm 0.0076$	0.027
FASE (SV)					
MeFOSE	<rl< td=""><td>0.150</td><td></td><td></td><td></td></rl<>	0.150			
EtFOSE	<rl< td=""><td>0.354</td><td></td><td></td><td></td></rl<>	0.354			

 Table 44. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-E following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$3.43 \pm 0.30$	0.328	PFEESA	<rl< td=""><td>0.17</td></rl<>	0.17
PFPeA	$4.61 \pm 0.21$	0.186	PF4OPeA	<rl< td=""><td>0.101</td></rl<>	0.101
PFHxA	$50.25 \pm 0.46$	0.546	PF5OHxA	<rl< td=""><td>0.073</td></rl<>	0.073
РҒНрА	$4.51 \pm 0.21$	0.102	3-6-ОРҒНрА	<rl< td=""><td>0.054</td></rl<>	0.054
PFOA	$0.377\pm0.053$	0.211	HFPO-DA	<rl< td=""><td>0.106</td></rl<>	0.106
PFNA	<rl< td=""><td>0.098</td><td>ADONA</td><td><rl< td=""><td>0.075</td></rl<></td></rl<>	0.098	ADONA	<rl< td=""><td>0.075</td></rl<>	0.075
PFDA	$0.246\pm0.031$	0.093	9CI-PF3ONS	<rl< td=""><td>0.056</td></rl<>	0.056
PFUnDA	<rl< td=""><td>0.081</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.081	11Cl-PF3OUdS	<rl< td=""><td>0.015</td></rl<>	0.015
PFDoDA	$0.118\pm0.012$	0.031			
PFTrDA	No Value		n:2 FTAcr (V)		
PFTeDA	$0.049 \pm 0.022$	0.024	8:2 FTAcr	<rl< td=""><td>11.2</td></rl<>	11.2
			10:2 FTAcr	<rl< td=""><td>10.8</td></rl<>	10.8
PFSA (NV)					
PFPrS	<rl< td=""><td>0.097</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.097	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>0.101</td><td>6:2 FTMAC</td><td><math>587 \pm 45</math></td><td>48.2</td></rl<>	0.101	6:2 FTMAC	$587 \pm 45$	48.2
PFPeS	<rl< td=""><td>0.076</td><td>8:2 FTMAC</td><td><rl< td=""><td>49.3</td></rl<></td></rl<>	0.076	8:2 FTMAC	<rl< td=""><td>49.3</td></rl<>	49.3
PFHxS	<rl< td=""><td>0.074</td><td>10:2 FTMAC</td><td><rl< td=""><td>26.0</td></rl<></td></rl<>	0.074	10:2 FTMAC	<rl< td=""><td>26.0</td></rl<>	26.0
PFHpS	<rl< td=""><td>0.068</td><td></td><td></td><td></td></rl<>	0.068			
PFOS	$0.149 \pm 0.017$	0.043	n:2 FTOAc (V)		
PFNS	No Value		8:2 FTOAc	<rl< td=""><td>11.1</td></rl<>	11.1
PFDS	<rl< td=""><td>0.030</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	0.030	10:2 FTOAc	No Value	
FASA (NV, SV)		<u> </u>	n:2 FTOH (V)		
FBSA (NV)	<rl< td=""><td>0.046</td><td><b>4:2 FTOH</b></td><td><rl< td=""><td>55.2</td></rl<></td></rl<>	0.046	<b>4:2 FTOH</b>	<rl< td=""><td>55.2</td></rl<>	55.2
MeFBSA (SV)	<rl< td=""><td>0.364</td><td>5:2 FTOH</td><td><rl< td=""><td>21.4</td></rl<></td></rl<>	0.364	5:2 FTOH	<rl< td=""><td>21.4</td></rl<>	21.4
FHxSA (NV)	<rl< td=""><td>0.035</td><td>6:2 FTOH</td><td><math>192.1 \pm 4.4</math></td><td>56.5</td></rl<>	0.035	6:2 FTOH	$192.1 \pm 4.4$	56.5
FOSA (NV)	<rl< td=""><td>0.051</td><td>7:2 FTOH</td><td><rl< td=""><td>21.9</td></rl<></td></rl<>	0.051	7:2 FTOH	<rl< td=""><td>21.9</td></rl<>	21.9
MeFOSA (SV)	<rl< td=""><td>0.146</td><td>8:2 FTOH</td><td><rl< td=""><td>82.3</td></rl<></td></rl<>	0.146	8:2 FTOH	<rl< td=""><td>82.3</td></rl<>	82.3
EtFOSA (SV)	<rl< td=""><td>0.363</td><td>10:2 FTOH</td><td><rl< td=""><td>56.1</td></rl<></td></rl<>	0.363	10:2 FTOH	<rl< td=""><td>56.1</td></rl<>	56.1
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.031</td><td>4:2 FTS</td><td><rl< td=""><td>0.045</td></rl<></td></rl<>	0.031	4:2 FTS	<rl< td=""><td>0.045</td></rl<>	0.045
MeFOSAA	<rl< td=""><td>0.081</td><td>6:2 FTS</td><td><rl< td=""><td>8.27</td></rl<></td></rl<>	0.081	6:2 FTS	<rl< td=""><td>8.27</td></rl<>	8.27
EtFOSAA	<rl< td=""><td>0.081</td><td>8:2 FTS</td><td><math>0.344 \pm 0.069</math></td><td>0.078</td></rl<>	0.081	8:2 FTS	$0.344 \pm 0.069$	0.078
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.147</td><td></td><td></td><td></td></rl<>	0.147			
EtFOSE	<rl< td=""><td>0.145</td><td></td><td></td><td></td></rl<>	0.145			

 Table 45. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for laundered OS-E.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$1.06\pm0.17$	0.754	PFEESA	<rl< td=""><td>0.019</td></rl<>	0.019
PFPeA	$1.43\pm0.10$	0.024	PF4OPeA	<rl< td=""><td>0.021</td></rl<>	0.021
PFHxA	$7.49\pm0.23$	0.121	PF5OHxA	<rl< td=""><td>0.021</td></rl<>	0.021
РҒНрА	$2.57\pm0.49$	0.458	3-6-ОРҒНрА	<rl< td=""><td>0.021</td></rl<>	0.021
PFOA	<rl< td=""><td>0.127</td><th>HFPO-DA</th><td><rl< td=""><td>0.038</td></rl<></td></rl<>	0.127	HFPO-DA	<rl< td=""><td>0.038</td></rl<>	0.038
PFNA	$0.067\pm0.023$	0.024	ADONA	<rl< td=""><td>0.021</td></rl<>	0.021
PFDA	<rl< td=""><td>0.071</td><th>9CI-PF3ONS</th><td><rl< td=""><td>0.022</td></rl<></td></rl<>	0.071	9CI-PF3ONS	<rl< td=""><td>0.022</td></rl<>	0.022
PFUnDA	$0.0484 \pm 0.0069$	0.036	11Cl-PF3OUdS	<rl< td=""><td>0.022</td></rl<>	0.022
PFDoDA	$\begin{array}{c} 0.0445 \pm \\ 0.0075 \end{array}$	0.024			
PFTrDA	$0.0759 \pm 0.0050$	0.069	n:2 FTAcr (V)		
PFTeDA	$0.083\pm0.018$	0.044	8:2 FTAcr	<rl< td=""><td>23.1</td></rl<>	23.1
			10:2 FTAcr	<rl< td=""><td>44.4</td></rl<>	44.4
PFSA (NV)					
PFPrS	<rl< td=""><td>0.024</td><th>n:2 FTMAC (V)</th><td></td><td></td></rl<>	0.024	n:2 FTMAC (V)		
PFBS	$0.108\pm0.016$	0.021	6:2 FTMAC	$3500\pm2700$	98.9
PFPeS	<rl< td=""><td>0.022</td><th>8:2 FTMAC</th><td><rl< td=""><td>101</td></rl<></td></rl<>	0.022	8:2 FTMAC	<rl< td=""><td>101</td></rl<>	101
PFHxS	<rl< td=""><td>0.054</td><th>10:2 FTMAC</th><td><rl< td=""><td>53.3</td></rl<></td></rl<>	0.054	10:2 FTMAC	<rl< td=""><td>53.3</td></rl<>	53.3
PFHpS	<rl< td=""><td>0.023</td><th></th><td></td><td></td></rl<>	0.023			
PFOS	<rl< td=""><td>0.045</td><th><i>n:2 FTOAc (V)</i></th><td></td><td></td></rl<>	0.045	<i>n:2 FTOAc (V)</i>		
PFNS	<rl< td=""><td>0.023</td><th>8:2 FTOAc</th><td><rl< td=""><td>22.7</td></rl<></td></rl<>	0.023	8:2 FTOAc	<rl< td=""><td>22.7</td></rl<>	22.7
PFDS	<rl< td=""><td>1.18</td><th>10:2 FTOAc</th><td>No Value</td><td></td></rl<>	1.18	10:2 FTOAc	No Value	
FASA (NV, SV)			<i>n:2 FTOH (V)</i>		
FBSA (NV)	<rl< td=""><td>0.024</td><th>4:2 FTOH</th><td><rl< td=""><td>114</td></rl<></td></rl<>	0.024	4:2 FTOH	<rl< td=""><td>114</td></rl<>	114
MeFBSA (SV)	<rl< td=""><td>0.934</td><th>5:2 FTOH</th><td><rl< td=""><td>113</td></rl<></td></rl<>	0.934	5:2 FTOH	<rl< td=""><td>113</td></rl<>	113
FHxSA (NV)	<rl< td=""><td>0.048</td><th>6:2 FTOH</th><td><math>1050 \pm 120</math></td><td>116</td></rl<>	0.048	6:2 FTOH	$1050 \pm 120$	116
FOSA (NV)	<rl< td=""><td>0.048</td><th>7:2 FTOH</th><td><rl< td=""><td>44.7</td></rl<></td></rl<>	0.048	7:2 FTOH	<rl< td=""><td>44.7</td></rl<>	44.7
MeFOSA (SV)	<rl< td=""><td>0.17</td><th>8:2 FTOH</th><td><rl< td=""><td>112</td></rl<></td></rl<>	0.17	8:2 FTOH	<rl< td=""><td>112</td></rl<>	112
EtFOSA (SV)	<rl< td=""><td>0.179</td><th>10:2 FTOH</th><td><rl< td=""><td>116</td></rl<></td></rl<>	0.179	10:2 FTOH	<rl< td=""><td>116</td></rl<>	116
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.047</td><th>4:2 FTS</th><td><math display="block">0.77\pm0.68</math></td><td>0.064</td></rl<>	0.047	4:2 FTS	$0.77\pm0.68$	0.064
MeFOSAA	<rl< td=""><td>0.024</td><th>6:2 FTS</th><td>No Value</td><td></td></rl<>	0.024	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.048</td><th>8:2 FTS</th><td><math display="block">2.76\pm0.24</math></td><td>0.109</td></rl<>	0.048	8:2 FTS	$2.76\pm0.24$	0.109
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.083</td><th></th><td></td><td></td></rl<>	0.083			
EtFOSE	<rl< td=""><td>0.177</td><th></th><td></td><td></td></rl<>	0.177			

Table 46. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for weathered OS-E.

$\begin{array}{c c c c c c c c c c c c c c c c c c c $	RL (µg/kg)	Concentration (µg/kg)	PFAS	RL (µg/kg)	Concentration (µg/kg)	PFAS
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			PPEA (NV)			PFCA (NV)
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	0.014	<rl< td=""><th>PFEESA</th><td>0.384</td><td><math>17.9 \pm 1.9</math></td><td>PFBA</td></rl<>	PFEESA	0.384	$17.9 \pm 1.9$	PFBA
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	0.015	<rl< td=""><th>PF4OPeA</th><td>0.122</td><td><math display="block">19.3\pm2.4</math></td><td>PFPeA</td></rl<>	PF4OPeA	0.122	$19.3\pm2.4$	PFPeA
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	0.014	<rl< td=""><th>PF5OHxA</th><td>0.211</td><td><math>40.3 \pm 1.4</math></td><td>PFHxA</td></rl<>	PF5OHxA	0.211	$40.3 \pm 1.4$	PFHxA
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	0.014	<rl< td=""><th>3-6-ОРҒНрА</th><td>0.218</td><td><math display="block">6.03\pm0.21</math></td><td>РҒНрА</td></rl<>	3-6-ОРҒНрА	0.218	$6.03\pm0.21$	РҒНрА
PFDA $0.381 \pm 0.0071$ $0.099$ PCI-PF3ONS $<$ RL $(C)$ PFUnDA $0.0766 \pm 0.004$ $0.036$ $11CI-PF3OUdS$ $<$ RL $(C)$ PFDoDA $0.081 \pm 0.021$ $0.052$ $n:2 FTAcr$ $<$ RL $(C)$ PFTrDA $<$ RL $0.072$ $n:2 FTAcr$ $<$ RL $(C)$ PFTrDA $<$ RL $0.0101$ $8:2 FTAcr$ $<$ RL $(C)$ PFPrS $<$ RL $0.021$ $n:2 FTMAC$ $(V)$ $(V)$ PFPs $<$ RL $0.021$ $n:2 FTMAC$ $(V)$ $(V)$ PFPs $<$ RL $0.014$ $8:2 FTMAC$ $(2140 \pm 750)$ $4:2$ PFPeS $<$ RL $0.014$ $8:2 FTMAC$ $(V)$ $(V)$ PFHxS $0.09 \pm 0.11$ $0.014$ $8:2 FTMAC$ $(V)$ $(V)$ PFNS $<$ RL $0.015$ $n:2 FTOAc$ $(V)$ $(V)$ PFNS $<$ RL $0.029$ $(V)$ $(V)$ $(V)$ $(V)$ $(V)$ $(V)$ PFDS $<$ RL $0.015$ $(V)$ <	0.145	<rl< td=""><th>HFPO-DA</th><td>0.105</td><td><math display="block">0.423\pm0.033</math></td><td>PFOA</td></rl<>	HFPO-DA	0.105	$0.423\pm0.033$	PFOA
PFUnDA $0.0766 \pm 0.004$ $0.036$ PFDoDA $0.081 \pm 0.021$ $0.052$ PFTrDA $<$ RL $0.072$ PFTrDA $<$ RL $0.072$ PFTrDA $<$ RL $0.072$ PFTeDA $<$ RL $0.011$ PFTeDA $<$ RL $0.011$ PFPS $<$ RL $0.021$ PFPS $<$ RL $0.021$ PFPS $<$ RL $0.014$ PFPS $<$ RL $0.014$ PFHxS $0.09 \pm 0.11$ $0.014$ DFFNS $<$ RL $0.015$ PFNS $<$ RL $0.015$ PFNS $<$ RL $0.029$ PFNS $<$ RL $0.029$ PFNS $<$ RL $0.022$ PFNS $<$ RL $0.022$ $0.015$ <tr< td=""><td>0.014</td><td><rl< td=""><th>ADONA</th><td>0.015</td><td><math display="block">0.202\pm0.015</math></td><td>PFNA</td></rl<></td></tr<>	0.014	<rl< td=""><th>ADONA</th><td>0.015</td><td><math display="block">0.202\pm0.015</math></td><td>PFNA</td></rl<>	ADONA	0.015	$0.202\pm0.015$	PFNA
PFDoDA $0.081 \pm 0.021$ $0.052$ PFTrDA $<$ RL $0.072$ $n:2 FTAcr (V)$ PFTeDA $<$ RL $0.101$ $8:2 FTAcr$ $<$ RL $2$ PFSA (NV) $PFPS$ $<$ RL $0.021$ $n:2 FTMAC (V)$ $n:2 FTMAC (V)$ PFBS $1.61 \pm 0.15$ $0.045$ $6:2 FTMAC$ $2140 \pm 750$ $4$ PFPeS $<$ RL $0.014$ $8:2 FTMAC$ $2140 \pm 750$ $4$ PFPeS $<$ RL $0.014$ $8:2 FTMAC$ $<$ RL $5$ PFNS $<$ RL $0.014$ $8:2 FTMAC$ $<$ RL $2$ PFNS $<$ RL $0.014$ $8:2 FTMAC$ $<$ RL $2$ PFNS $<$ RL $0.015$ $n:2 FTOAc$ $<$ RL $2$ PFNS $<$ RL $0.029$ $n:2 FTOAc$ $<$ RL $2$ PFDS $<$ RL $0.030$ $10:2 FTOAc$ $<$ RL $10:2 FTOH$ FASA (NV, SV) $=$ $n:2 FTOH (V)$ $=$ $n:2 FTOH (V)$ $=$ FBSA (NV) $<$ RL $0.015$ $5:2 FTOH$ </td <td>0.027</td> <td><rl< td=""><th>9CI-PF3ONS</th><td>0.099</td><td><math display="block">0.381 \pm 0.0071</math></td><td>PFDA</td></rl<></td>	0.027	<rl< td=""><th>9CI-PF3ONS</th><td>0.099</td><td><math display="block">0.381 \pm 0.0071</math></td><td>PFDA</td></rl<>	9CI-PF3ONS	0.099	$0.381 \pm 0.0071$	PFDA
PFTrDA $<$ RL $0.072$ $n:2 FTAcr (V)$ PFTeDA $<$ RL $0.101$ $8:2 FTAcr$ $<$ RL $2$ PFSA (NV)       PFPS $<$ RL $0.021$ $n:2 FTMAC (V)$ $10:2 FTAcr$ $<$ RL $11$ PFPS $<$ RL $0.021$ $n:2 FTMAC (V)$ $n:2 FTMAC (V)$ $10:2 FTMAC (V)$ PFBS $1.61 \pm 0.15$ $0.045$ $6:2 FTMAC (V)$ $2140 \pm 750$ $4$ PFPeS $<$ RL $0.014$ $8:2 FTMAC (V)$ $2140 \pm 750$ $4$ PFPeS $<$ RL $0.014$ $8:2 FTMAC (V)$ $2140 \pm 750$ $4$ PFDS $<$ RL $0.014$ $8:2 FTMAC (V)$ $RL$ $2140 \pm 750$ $4$ PFDS $<$ RL $0.014$ $8:2 FTMAC (V)$ $RL$ $2140 \pm 750$ $4$ PFDS $<$ RL $0.015$ $8:2 FTMAC (V)$ $RL$ $2140 \pm 750$ $4$ PFDS $<$ RL $0.015$ $8:2 FTOAc (V)$ $RL$ $2140 \pm 750$ $2140 \pm 750$ PFDS $<$ RL $0.029$ $RL$ $R10:2 FTOAc (V)$ $RL$ <t< td=""><td>0.012</td><td><rl< td=""><th>11Cl-PF3OUdS</th><td>0.036</td><td><math>0.0766 \pm 0.004</math></td><td>PFUnDA</td></rl<></td></t<>	0.012	<rl< td=""><th>11Cl-PF3OUdS</th><td>0.036</td><td><math>0.0766 \pm 0.004</math></td><td>PFUnDA</td></rl<>	11Cl-PF3OUdS	0.036	$0.0766 \pm 0.004$	PFUnDA
PFTeDA $<$ RL       0.101       8:2 FTAcr $<$ RL       2         PFSA (NV)         10:2 FTAcr $<$ RL       1         PFPS $<$ RL       0.021 $n:2 FTMAC$ (V)           PFBS $1.61 \pm 0.15$ $0.045$ $6:2 FTMAC$ $2140 \pm 750$ $4$ PFPeS $<$ RL $0.014$ $8:2 FTMAC$ $<$ RL $5$ PFHs $<$ RL $0.014$ $8:2 FTMAC$ $<$ RL $5$ PFNS $<$ RL $0.014$ $8:2 FTMAC$ $<$ RL $5$ PFNS $<$ RL $0.014$ $8:2 FTMAC$ $<$ RL $2$ PFNS $<$ RL $0.014$ $8:2 FTOAc$ $<$ RL $2$ PFNS $<$ RL $0.029$ $8:2 FTOAc$ $<$ RL $2$ PFDS $<$ RL $0.030$ $10:2 FTOAc$ $<$ RL $1$ FASA (NV, SV) $<$ RL $0.030$ $10:2 FTOH$ $<$ RL $7$ FMeFBSA (SV) $<$ RL $0.015$ $6:2 FTOH$ $<$ RL $7$ FOSA (NV) $0.0297 \pm 0.01$				0.052	$0.081\pm0.021$	PFDoDA
Image: PFSA (NV)       Image: PFSA (NV)         PFPrS $<$ RL       0.021         PFBS       1.61 ± 0.15       0.045         PFPeS $<$ RL       0.014         PFPeS $<$ RL       0.014         PFHxS       0.09 ± 0.11       0.014         PFHpS $<$ RL       0.015         PFNS $<$ RL       0.029         PFNS $<$ RL       0.029         PFDS $<$ RL       0.029         PFDS $<$ RL       0.030         I0:2 FTOAc $<$ RL       2         PFDS $<$ RL       0.029         PFDS $<$ RL       0.029         PFDS $<$ RL       0.029         BFASA (NV, SV) $n:2$ FTOH (V)         FBSA (NV) $0.226 \pm 0.022$ 0.015         FMESA (NV) $0.0297 \pm$ $0.015$ FOSA (NV) $0.00297 \pm$ $0.015$ Gez FTOH $<$ RL $7$ MeFOSA (SV) $<$ RL $0.372$ FASA (NV) $<$ RL $0.372$ FOSA (NV) $0.0297 \pm$ $0.15$ $6:2$ FTOH $<$ RL $7$ </td <td></td> <td></td> <th>n:2 FTAcr (V)</th> <td>0.072</td> <td><rl< td=""><td>PFTrDA</td></rl<></td>			n:2 FTAcr (V)	0.072	<rl< td=""><td>PFTrDA</td></rl<>	PFTrDA
PFSA (NV)       n:2 FTMAC (V)         PFPrS $<$ RL       0.021         PFBS $1.61 \pm 0.15$ 0.045         PFPeS $<$ RL       0.014         PFPeS $<$ RL       0.014         PFHxS $0.09 \pm 0.11$ 0.014         PFHpS $<$ RL       0.015         PFOS $0.182 \pm 0.066$ 0.046         PFNS $<$ RL       0.015         PFNS $<$ RL       0.029         PFDS $<$ RL       0.029         PFDS $<$ RL       0.029         PFDS $<$ RL       0.029         PFDS $<$ RL       0.029         Bt2 FTOAc $<$ RL       2         PFDS $<$ RL       0.029         Bt2 FTOAc $<$ RL       1         PFDS $<$ RL       0.030         I0:2 FTOAC $<$ RL       1         PFDS $<$ RL       0.030         I0:2 FTOH $<$ RL       7         MeFBSA (NV) $<$ RL       0.015         Gt2 FTOH $<$ RL       7         FOSA (NV) $<$ RL       0.372         MeFOSA (SV) $<$	29.3	<rl< td=""><th>8:2 FTAcr</th><td>0.101</td><td><rl< td=""><td>PFTeDA</td></rl<></td></rl<>	8:2 FTAcr	0.101	<rl< td=""><td>PFTeDA</td></rl<>	PFTeDA
PFPrS <rl< th=""><math>0.021</math><math>n:2 FTMAC (V)</math>PFBS<math>1.61 \pm 0.15</math><math>0.045</math><math>6:2 FTMAC</math><math>2140 \pm 750</math>PFPeS<rl< th=""><math>0.014</math><math>8:2 FTMAC</math><math><rl< math=""><math>5:2</math>PFHxS<math>0.09 \pm 0.11</math><math>0.014</math><math>10:2 FTMAC</math><math><rl< math=""><math>2</math>PF0S<math>0.182 \pm 0.066</math><math>0.046</math><math>n:2 FTOAc (V)</math>PFNS<rl< th=""><math>0.029</math><math>8:2 FTOAc</math><math><rl< math=""><math>2</math>PFDS<rl< th=""><math>0.029</math><math>8:2 FTOAc</math><math><rl< math=""><math>2</math>PFDS<rl< th=""><math>0.030</math><math>10:2 FTOAc</math><math><rl< math=""><math>2</math>PFDS<rl< th=""><math>0.030</math><math>10:2 FTOH (V)</math><math>RL</math><math>2</math>PFDS<rl< th=""><math>0.030</math><math>10:2 FTOH</math><math><rl< math=""><math>7</math>PFDS (NV)<math>0.226 \pm 0.022</math><math>0.015</math><math>4:2 FTOH</math><math><rl< math=""><math>7</math>PFBSA (NV)<math>0.226 \pm 0.022</math><math>0.015</math><math>4:2 FTOH</math><math><rl< math=""><math>7</math>PFESA (NV)<math>RL</math><math>0.149</math><math>5:2 FTOH</math><math><rl< math=""><math>7</math>PFOSA (NV)<math>0.0032</math><math>0.015</math><math>7:2 FTOH</math><math><rl< math=""><math>7</math>PFOSA (SV)<math>RL</math><math>0.373</math><math>R:2 FTS</math><math>No Value</math>POSAA&lt;<rl< th=""><math>0.015</math><math>R:2 FTS</math><math>No Value</math>POSAA&lt;<rl< th=""><math>0.068</math><math>6:2 FTS</math><math>No Value</math></rl<></rl<></rl<></math></rl<></math></rl<></math></rl<></math></rl<></math></rl<></rl<></rl<></math></rl<></rl<></math></rl<></rl<></math></rl<></rl<></math></rl<></math></rl<></rl<>	13.8	<rl< td=""><th>10:2 FTAcr</th><td></td><td></td><td></td></rl<>	10:2 FTAcr			
PFBS $1.61 \pm 0.15$ $0.045$ $6:2 \text{ FTMAC}$ $2140 \pm 750$ $4$ PFPeS $<$ RL $0.014$ $8:2 \text{ FTMAC}$ $<$ RL $5$ PFHxS $0.09 \pm 0.11$ $0.014$ $10:2 \text{ FTMAC}$ $<$ RL $2$ PFBS $<$ RL $0.015$ $n:2 \text{ FTMAC}$ $<$ RL $2$ PFOS $0.182 \pm 0.066$ $0.046$ $n:2 \text{ FTOAc}$ (V) $N$ PFNS $<$ RL $0.029$ $8:2 \text{ FTOAc}$ $<$ RL $2$ PFDS $<$ RL $0.029$ $8:2 \text{ FTOAc}$ $<$ RL $2$ PFDS $<$ RL $0.029$ $8:2 \text{ FTOAc}$ $<$ RL $2$ PFDS $<$ RL $0.029$ $8:2 \text{ FTOAc}$ $<$ RL $2$ PFDS $<$ RL $0.029$ $8:2 \text{ FTOAc}$ $<$ RL $2$ PFDS $<$ RL $0.030$ $10:2 \text{ FTOAc}$ $<$ RL $1$ PFDS $<$ RL $0.030$ $10:2 \text{ FTOAc}$ $<$ RL $1$ PFDS $<$ RL $0.032$ $0.015$ $<$ $<$ $<$ PFDS $<$ RL $0.015$ $<$ $<$ $<$ $<$ $<$ PFDS $<$ RL $0.032$ $0.015$ $<$ $<$ $<$ $<$ $<$ PFDS $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ PFDS $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ PFDS $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ $<$ PFDS $<$ $<$ $<$ <td></td> <td></td> <th></th> <td></td> <td></td> <td>PFSA (NV)</td>						PFSA (NV)
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			n:2 FTMAC (V)	0.021	<rl< td=""><td>PFPrS</td></rl<>	PFPrS
PFHxS $0.09 \pm 0.11$ $0.014$ $10:2 \text{ FTMAC}$ $< \text{RL}$ $22$ PF0S $0.182 \pm 0.066$ $0.046$ $n:2 \text{ FTOAc}(V)$ $n:2 \text{ FTOAc}(V)$ PFNS $< \text{RL}$ $0.029$ $8:2 \text{ FTOAc}$ $< \text{RL}$ $22$ PFDS $< \text{RL}$ $0.030$ $10:2 \text{ FTOAc}$ $< \text{RL}$ $22$ PFDS $< \text{RL}$ $0.030$ $10:2 \text{ FTOAc}$ $< \text{RL}$ $22$ PFDS $< \text{RL}$ $0.030$ $10:2 \text{ FTOAc}$ $< \text{RL}$ $12$ FASA (NV, SV) $= \frac{10.22 \text{ FTOH}(V)$ $= \frac{10.22 \text{ FTOH}(V)$ $= \frac{10.22 \text{ FTOH}(V)$ $= \frac{10.22 \text{ FTOH}(V)$ FBSA (NV) $0.226 \pm 0.022$ $0.015$ $= \frac{12 \text{ FTOH}(V)$ $= \frac{12 \text{ FTOH}(V)$ $= \frac{12 \text{ FTOH}(V)$ $= \frac{12 \text{ FTOH}(V)$ $= \frac{12 \text{ FTOH}(V)}{1270 \pm 560}$ $= 12 \text{ FTO$	48.9	$2140\pm750$	6:2 FTMAC	0.045	$1.61\pm0.15$	PFBS
PFHpS $<$ RL         0.015           PFOS         0.182 ± 0.066         0.046         n:2 FTOAc (V)           PFNS $<$ RL         0.029         8:2 FTOAc $<$ RL         2           PFDS $<$ RL         0.030         10:2 FTOAc $<$ RL         2           PFDS $<$ RL         0.030         10:2 FTOAc $<$ RL         2           PFDS $<$ RL         0.030         10:2 FTOAc $<$ RL         1           FASA (NV, SV) $=$	50	<rl< td=""><th>8:2 FTMAC</th><td>0.014</td><td><rl< td=""><td>PFPeS</td></rl<></td></rl<>	8:2 FTMAC	0.014	<rl< td=""><td>PFPeS</td></rl<>	PFPeS
PFOS $0.182 \pm 0.066$ $0.046$ $n:2 FTOAc (V)$ PFNS $<$ RL $0.029$ $8:2 FTOAc$ $<$ RL $2$ PFDS $<$ RL $0.030$ $n:2 FTOAc$ $<$ RL $2$ PFDS $<$ RL $0.030$ $n:2 FTOAc$ $<$ RL $2$ FASA (NV, SV) $n:2 FTOH (V)$ $n:2 FTOH (V)$ $n:2 FTOH (V)$ FBSA (NV) $0.226 \pm 0.022$ $0.015$ $4:2 FTOH$ $<$ RL $7$ MeFBSA (SV) $<$ RL $0.149$ $5:2 FTOH$ $<$ RL $7$ FHxSA (NV) $<$ RL $0.015$ $6:2 FTOH$ $<$ RL $7$ FOSA (NV) $0.0297 \pm 0.015$ $0.015$ $7:2 FTOH$ $<$ RL $7$ MeFOSA (SV) $<$ RL $0.372$ $8:2 FTOH$ $<$ RL $7$ FASAA (NV) $<$ RL $0.373$ $10:2 FTOH$ $<$ RL $7$ FOSAA $<$ RL $0.015$ $n:2 FTS (NV)$ $n:2 FTS$ $No Value$ MeFOSAA $<$ RL $0.068$ $6:2 FTS$ $No Value$ <td>26.4</td> <td><rl< td=""><th>10:2 FTMAC</th><td>0.014</td><td><math display="block">0.09\pm0.11</math></td><td>PFHxS</td></rl<></td>	26.4	<rl< td=""><th>10:2 FTMAC</th><td>0.014</td><td><math display="block">0.09\pm0.11</math></td><td>PFHxS</td></rl<>	10:2 FTMAC	0.014	$0.09\pm0.11$	PFHxS
PFNS $<$ RL $0.029$ $8:2$ FTOAc $<$ RL $2$ PFDS $<$ RL $0.030$ $10:2$ FTOAc $<$ RL $1$ FASA (NV, SV) $n:2$ FTOH (V) $n:2$ FTOH (V) $n:2$ FTOH (V)         FBSA (NV) $0.226 \pm 0.022$ $0.015$ $4:2$ FTOH $<$ RL $7$ MeFBSA (SV) $<$ RL $0.149$ $5:2$ FTOH $<$ RL $7$ FHxSA (NV) $<$ RL $0.015$ $6:2$ FTOH $<$ RL $7$ FOSA (NV) $0.0297 \pm$ $0.015$ $7:2$ FTOH $<$ RL $7$ MeFOSA (SV) $<$ RL $0.372$ $8:2$ FTOH $<$ RL $7$ FASAA (NV) $<$ RL $0.372$ $8:2$ FTOH $<$ RL $7$ FOSA (SV) $<$ RL $0.372$ $8:2$ FTOH $<$ RL $7$ FOSAA $<$ RL $0.015$ $n:2$ FTS (NV) $n:2$ FTS (NV) $n:2$ FTS       No Value         MeFOSAA $<$ RL $0.068$ $6:2$ FTS       No Value $6:2$ FTS $No$ Value				0.015	<rl< td=""><td>PFHpS</td></rl<>	PFHpS
PFDS $<$ RL       0.030       10:2 FTOAc $<$ RL       1         FASA (NV, SV)       n:2 FTOH (V)         FBSA (NV)       0.226 $\pm$ 0.022       0.015       4:2 FTOH $<$ RL       7         MeFBSA (SV) $<$ RL       0.149       5:2 FTOH $<$ RL       7         FHxSA (NV) $<$ RL       0.015       6:2 FTOH $<$ RL       7         FOSA (NV) $_{0.0297 \pm$ $0.015$ 7:2 FTOH $<$ RL       7         MeFOSA (SV) $<$ RL       0.372       8:2 FTOH $<$ RL       7         FASAA (NV) $<$ RL       0.373       10:2 FTOH $<$ RL       7         MeFOSAA (SV) $<$ RL       0.373       10:2 FTOH $<$ RL       7         FASAA (NV) $<$ RL       0.373       10:2 FTOH $<$ RL       7         MeFOSAA $<$ RL       0.015 $<$ RL $7$ $<$ RL       7         FASAA (NV) $<$ RL $0.373$ $<$ RL $7$ $<$ RL $7$ MeFOSAA $<$ RL $0.015$ $<$ RL $7$ $<$ RL $7$ FASAA (NV) $<$ RL $<$ RL $7$			n:2 FTOAc (V)	0.046	$0.182\pm0.066$	PFOS
FASA (NV, SV)       n:2 FTOH (V)         FBSA (NV) $0.226 \pm 0.022$ $0.015$ 4:2 FTOH $<$ RL       7         MeFBSA (SV) $<$ RL $0.149$ 5:2 FTOH $<$ RL       7         FHxSA (NV) $<$ RL $0.015$ 6:2 FTOH $<$ RL       7         FOSA (NV) $<$ RL $0.015$ 6:2 FTOH $<$ RL       7         MeFOSA (SV) $<$ RL $0.015$ 7:2 FTOH $<$ RL       7         MeFOSA (SV) $<$ RL $0.372$ 8:2 FTOH $<$ RL       7         MeFOSA (SV) $<$ RL $0.373$ 10:2 FTOH $<$ RL       7         FASAA (NV) $<$ RL $0.373$ 10:2 FTOH $<$ RL       7         FOSAA $<$ RL $0.015$ 4:2 FTS       No Value         MeFOSAA $<$ RL $0.068$ 6:2 FTS       No Value	28.5	<rl< td=""><th>8:2 FTOAc</th><td>0.029</td><td><rl< td=""><td>PFNS</td></rl<></td></rl<>	8:2 FTOAc	0.029	<rl< td=""><td>PFNS</td></rl<>	PFNS
FBSA (NV) $0.226 \pm 0.022$ $0.015$ $4:2 \text{ FTOH}$ $<\text{RL}$ $77$ MeFBSA (SV) $<\text{RL}$ $0.149$ $5:2 \text{ FTOH}$ $<\text{RL}$ $77$ FHxSA (NV) $<\text{RL}$ $0.015$ $6:2 \text{ FTOH}$ $<\text{RL}$ $77$ FOSA (NV) $0.0297 \pm 0.015$ $0.015$ $7:2 \text{ FTOH}$ $<\text{RL}$ $77$ MeFOSA (SV) $<\text{RL}$ $0.372$ $8:2 \text{ FTOH}$ $<\text{RL}$ $77$ MeFOSA (SV) $<\text{RL}$ $0.372$ $8:2 \text{ FTOH}$ $<\text{RL}$ $77$ MeFOSA (SV) $<\text{RL}$ $0.373$ $10:2 \text{ FTOH}$ $<\text{RL}$ $77$ FASAA (NV) $=$	14.4	<rl< td=""><th>10:2 FTOAc</th><td>0.030</td><td><rl< td=""><td>PFDS</td></rl<></td></rl<>	10:2 FTOAc	0.030	<rl< td=""><td>PFDS</td></rl<>	PFDS
MeFBSA (SV) $<$ RL       0.149       5:2 FTOH $<$ RL       77         FHxSA (NV) $<$ RL       0.015       6:2 FTOH       1270 $\pm$ 560       22         FOSA (NV) $0.0297 \pm$ $0.015$ $0.015$ $7:2$ FTOH $<$ RL $77$ MeFOSA (SV) $<$ RL $0.372$ $8:2$ FTOH $<$ RL $77$ MeFOSA (SV) $<$ RL $0.372$ $8:2$ FTOH $<$ RL $77$ FASAA (NV) $<$ RL $0.373$ $10:2$ FTOH $<$ RL $77$ FOSAA $<$ RL $0.015$ $n:2$ FTS (NV) $<$ RL $77$ MeFOSAA $<$ RL $0.015$ $n:2$ FTS (NV) $<$ RL $77$ MeFOSAA $<$ RL $0.015$ $n:2$ FTS (NV) $<$ RL $77$ MeFOSAA $<$ RL $0.015$ $n:2$ FTS (NV) $<$ RL $77$ MeFOSAA $<$ RL $0.015$ $0.015$ $n:2$ FTS $No$ Value			<i>n:2 FTOH</i> ( <i>V</i> )			FASA (NV, SV)
FHxSA (NV) $<$ RL       0.015       6:2 FTOH       1270 $\pm$ 560       2         FOSA (NV)       0.0297 $\pm$ 0.015       7:2 FTOH        2         MeFOSA (SV) $<$ RL       0.372       8:2 FTOH $<$ RL       1         EtFOSA (SV) $<$ RL       0.373       10:2 FTOH $<$ RL       1         FASAA (NV) $=$	74.4	<rl< td=""><th>4:2 FTOH</th><td>0.015</td><td><math display="block">0.226\pm0.022</math></td><td>FBSA (NV)</td></rl<>	4:2 FTOH	0.015	$0.226\pm0.022$	FBSA (NV)
FOSA (NV) $0.0297 \pm 0.015$ 7:2 FTOH $<$ RL       7         MeFOSA (SV) $<$ RL $0.372$ 8:2 FTOH $<$ RL       1         EtFOSA (SV) $<$ RL $0.373$ 10:2 FTOH $<$ RL       7         FASAA (NV) $=$ <td>70.8</td> <td><rl< td=""><th>5:2 FTOH</th><td>0.149</td><td><rl< td=""><td>MeFBSA (SV)</td></rl<></td></rl<></td>	70.8	<rl< td=""><th>5:2 FTOH</th><td>0.149</td><td><rl< td=""><td>MeFBSA (SV)</td></rl<></td></rl<>	5:2 FTOH	0.149	<rl< td=""><td>MeFBSA (SV)</td></rl<>	MeFBSA (SV)
FOSA (NV)       0.0032       0.015       7:2 FTOH <rl< th="">       77         MeFOSA (SV)       <rl< th="">       0.372       8:2 FTOH       <rl< th="">       1         EtFOSA (SV)       <rl< th="">       0.373       10:2 FTOH       <rl< th="">       77         FASAA (NV)       m:2 FTS (NV)       m:2 FTS (NV)       minimized for the second sec</rl<></rl<></rl<></rl<></rl<>	27.4	$1270\pm560$	6:2 FTOH	0.015		FHxSA (NV)
EtFOSA (SV) <rl< th="">         0.373         10:2 FTOH         <rl< th="">         77           FASAA (NV)         n:2 FTS (NV)         4:2 FTS         No Value           MeFOSAA         <rl< th="">         0.068         6:2 FTS         No Value</rl<></rl<></rl<>	70.5	<rl< th=""><th>7:2 FTOH</th><th>0.015</th><th></th><th>FOSA (NV)</th></rl<>	7:2 FTOH	0.015		FOSA (NV)
FASAA (NV)         n:2 FTS (NV)           FOSAA <rl< td="">         0.015         4:2 FTS         No Value           MeFOSAA         <rl< td="">         0.068         6:2 FTS         No Value</rl<></rl<>	131	<rl< td=""><th>8:2 FTOH</th><td>0.372</td><td><rl< td=""><td>MeFOSA (SV)</td></rl<></td></rl<>	8:2 FTOH	0.372	<rl< td=""><td>MeFOSA (SV)</td></rl<>	MeFOSA (SV)
FOSAA <rl< th="">         0.015         4:2 FTS         No Value           MeFOSAA         <rl< th="">         0.068         6:2 FTS         No Value</rl<></rl<>	70.8	<rl< td=""><th>10:2 FTOH</th><td>0.373</td><td><rl< td=""><td>EtFOSA (SV)</td></rl<></td></rl<>	10:2 FTOH	0.373	<rl< td=""><td>EtFOSA (SV)</td></rl<>	EtFOSA (SV)
FOSAA <rl< th="">         0.015         4:2 FTS         No Value           MeFOSAA         <rl< th="">         0.068         6:2 FTS         No Value</rl<></rl<>			<i>n:2 FTS (NV)</i>			FASAA (NV)
MeFOSAA <rl< th="">         0.068         6:2 FTS         No Value</rl<>		No Value		0.015	<rl< td=""><td></td></rl<>	
<b>EIFUSAA</b> <kl <math="">0.030 <b>8:2 F18</b> <math>0.32/\pm0.0/5</math> (</kl>	0.065	$0.327 \pm 0.075$	8:2 FTS	0.030	<rl< td=""><td>EtFOSAA</td></rl<>	EtFOSAA
10:2 FTS No Value						
FASE (SV)						FASE (SV)
MeFOSE <rl 0.374<="" td=""><td></td><td></td><th></th><td>0.374</td><td><rl< td=""><td>MeFOSE</td></rl<></td></rl>				0.374	<rl< td=""><td>MeFOSE</td></rl<>	MeFOSE
<b>EtFOSE</b> <rl 0.774<="" td=""><td></td><td></td><th></th><td>0.774</td><td><rl< td=""><td>EtFOSE</td></rl<></td></rl>				0.774	<rl< td=""><td>EtFOSE</td></rl<>	EtFOSE

Table 47. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for abraded OS-F.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	$2.64 \pm 0.22$	0.115	PFEESA	<rl< td=""><td>0.018</td></rl<>	0.018
PFPeA	$3.36\pm0.16$	0.042	PF4OPeA	<rl< td=""><td>0.020</td></rl<>	0.020
PFHxA	$7.87 \pm 0.72$	0.577	PF5OHxA	<rl< td=""><td>0.020</td></rl<>	0.020
PFHpA	<rl< td=""><td>2.42</td><td>3-6-OPFHpA</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	2.42	3-6-OPFHpA	<rl< td=""><td>0.020</td></rl<>	0.020
PFOA	<rl< td=""><td>0.095</td><td>HFPO-DA</td><td><rl< td=""><td>0.089</td></rl<></td></rl<>	0.095	HFPO-DA	<rl< td=""><td>0.089</td></rl<>	0.089
PFNA	<rl< td=""><td>0.065</td><td>ADONA</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.065	ADONA	<rl< td=""><td>0.020</td></rl<>	0.020
PFDA	<rl< td=""><td>0.102</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.102	9CI-PF3ONS	<rl< td=""><td>0.021</td></rl<>	0.021
PFUnDA	<rl< td=""><td>0.022</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.022	11Cl-PF3OUdS	<rl< td=""><td>0.021</td></rl<>	0.021
PFDoDA	<rl< td=""><td>0.022</td><td></td><td></td><td></td></rl<>	0.022			
PFTrDA	<rl< td=""><td>0.065</td><td>n:2 FTAcr(V)</td><td></td><td></td></rl<>	0.065	n:2 FTAcr(V)		
PFTeDA	<rl< td=""><td>0.052</td><td>8:2 FTAcr</td><td><rl< td=""><td>15.2</td></rl<></td></rl<>	0.052	8:2 FTAcr	<rl< td=""><td>15.2</td></rl<>	15.2
			10:2 FTAcr	<rl< td=""><td>14.7</td></rl<>	14.7
PFSA (NV)					
PFPrS	<rl< td=""><td>0.020</td><td>n:2 FTMAC(V)</td><td></td><td></td></rl<>	0.020	n:2 FTMAC(V)		
PFBS	$0.99 \pm 0.11$	0.020	6:2 FTMAC	$5250 \pm 110$	52.2
PFPeS	<rl< td=""><td>0.021</td><td>8:2 FTMAC</td><td><rl< td=""><td>53.4</td></rl<></td></rl<>	0.021	8:2 FTMAC	<rl< td=""><td>53.4</td></rl<>	53.4
PFHxS	<rl< td=""><td>0.020</td><td>10:2 FTMAC</td><td><rl< td=""><td>28.1</td></rl<></td></rl<>	0.020	10:2 FTMAC	<rl< td=""><td>28.1</td></rl<>	28.1
PFHpS	<rl< td=""><td>0.021</td><td></td><td></td><td></td></rl<>	0.021			
PFOS	<rl< td=""><td>0.057</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.057	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.021</td><td>8:2 FTOAc</td><td><rl< td=""><td>14.9</td></rl<></td></rl<>	0.021	8:2 FTOAc	<rl< td=""><td>14.9</td></rl<>	14.9
PFDS	<rl< td=""><td>0.021</td><td>10:2 FTOAc</td><td><rl< td=""><td>15.3</td></rl<></td></rl<>	0.021	10:2 FTOAc	<rl< td=""><td>15.3</td></rl<>	15.3
FASA (NV, SV)			n:2 FTOH (V)		
FBSA (NV)	<rl< td=""><td>0.022</td><td>4:2 FTOH</td><td><rl< td=""><td>31.1</td></rl<></td></rl<>	0.022	4:2 FTOH	<rl< td=""><td>31.1</td></rl<>	31.1
MeFBSA (SV)	<rl< td=""><td>0.795</td><td>5:2 FTOH</td><td><rl< td=""><td>75.5</td></rl<></td></rl<>	0.795	5:2 FTOH	<rl< td=""><td>75.5</td></rl<>	75.5
FHxSA (NV)	<rl< td=""><td>0.022</td><td>6:2 FTOH</td><td><math display="block">2026\pm58</math></td><td>76.1</td></rl<>	0.022	6:2 FTOH	$2026\pm58$	76.1
FOSA (NV)	<rl< td=""><td>0.025</td><td>7:2 FTOH</td><td><rl< td=""><td>75.2</td></rl<></td></rl<>	0.025	7:2 FTOH	<rl< td=""><td>75.2</td></rl<>	75.2
MeFOSA (SV)	<rl< td=""><td>0.380</td><td>8:2 FTOH</td><td><rl< td=""><td>74.4</td></rl<></td></rl<>	0.380	8:2 FTOH	<rl< td=""><td>74.4</td></rl<>	74.4
EtFOSA (SV)	<rl< td=""><td>0.159</td><td>10:2 FTOH</td><td><rl< td=""><td>153</td></rl<></td></rl<>	0.159	10:2 FTOH	<rl< td=""><td>153</td></rl<>	153
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.113</td><td>4:2 FTS</td><td>No Value</td><td></td></rl<>	0.113	4:2 FTS	No Value	
MeFOSAA	<rl< td=""><td>0.115</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.115	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.138</td><td>8:2 FTS</td><td><rl< td=""><td>0.111</td></rl<></td></rl<>	0.138	8:2 FTS	<rl< td=""><td>0.111</td></rl<>	0.111
			10:2 FTS	<rl< td=""><td>0.024</td></rl<>	0.024
FASE (SV)					
MeFOSE	<rl< td=""><td>0.159</td><td></td><td></td><td></td></rl<>	0.159			
EtFOSE	<rl< td=""><td>0.376</td><td></td><td></td><td></td></rl<>	0.376			

Table 48 Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-F following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	<rl< td=""><td>0.487</td><td>PFEESA</td><td><rl< td=""><td>0.253</td></rl<></td></rl<>	0.487	PFEESA	<rl< td=""><td>0.253</td></rl<>	0.253
PFPeA	0.4569 ± 0.0052	0.277	PF4OPeA	<rl< td=""><td>0.150</td></rl<>	0.150
PFHxA	$4.69 \pm 0.30$	0.811	PF5OHxA	<rl< td=""><td>0.109</td></rl<>	0.109
РҒНрА	0.2312 ± 0.0099	0.152	3-6-ОРГНрА	<rl< td=""><td>0.081</td></rl<>	0.081
PFOA	<rl< td=""><td>0.313</td><td>HFPO-DA</td><td><rl< td=""><td>0.157</td></rl<></td></rl<>	0.313	HFPO-DA	<rl< td=""><td>0.157</td></rl<>	0.157
PFNA	<rl< td=""><td>0.145</td><td>ADONA</td><td><rl< td=""><td>0.111</td></rl<></td></rl<>	0.145	ADONA	<rl< td=""><td>0.111</td></rl<>	0.111
PFDA	<rl< td=""><td>0.138</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.083</td></rl<></td></rl<>	0.138	9CI-PF3ONS	<rl< td=""><td>0.083</td></rl<>	0.083
PFUnDA	<rl< td=""><td>0.121</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.022</td></rl<></td></rl<>	0.121	11Cl-PF3OUdS	<rl< td=""><td>0.022</td></rl<>	0.022
PFDoDA	<rl< td=""><td>0.046</td><td></td><td></td><td></td></rl<>	0.046			
PFTrDA	<rl< td=""><td>0.046</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.046	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.035</td><td>8:2 FTAcr</td><td><rl< td=""><td>14.5</td></rl<></td></rl<>	0.035	8:2 FTAcr	<rl< td=""><td>14.5</td></rl<>	14.5
			10:2 FTAcr	<rl< td=""><td>13.9</td></rl<>	13.9
PFSA (NV)					
PFPrS	<rl< td=""><td>0.144</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.144	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>0.150</td><td>6:2 FTMAC</td><td><math>1007 \pm 48</math></td><td>62.1</td></rl<>	0.150	6:2 FTMAC	$1007 \pm 48$	62.1
PFPeS	<rl< td=""><td>0.112</td><td>8:2 FTMAC</td><td><rl< td=""><td>63.6</td></rl<></td></rl<>	0.112	8:2 FTMAC	<rl< td=""><td>63.6</td></rl<>	63.6
PFHxS	<rl< td=""><td>0.111</td><td>10:2 FTMAC</td><td><rl< td=""><td>33.5</td></rl<></td></rl<>	0.111	10:2 FTMAC	<rl< td=""><td>33.5</td></rl<>	33.5
PFHpS	<rl< td=""><td>0.101</td><td></td><td></td><td></td></rl<>	0.101			
PFOS	0.2103 ± 0.0073	0.064	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.050</td><td>8:2 FTOAc</td><td><rl< td=""><td>14.3</td></rl<></td></rl<>	0.050	8:2 FTOAc	<rl< td=""><td>14.3</td></rl<>	14.3
PFDS	$0.065\pm0.019$	0.045	10:2 FTOAc	No Value	
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	No Value		4:2 FTOH	<rl< td=""><td>71.2</td></rl<>	71.2
MeFBSA (SV)	<rl< td=""><td>0.467</td><td>5:2 FTOH</td><td><rl< td=""><td>27.6</td></rl<></td></rl<>	0.467	5:2 FTOH	<rl< td=""><td>27.6</td></rl<>	27.6
FHxSA (NV)	No Value		6:2 FTOH	$137.9\pm7.4$	72.8
FOSA (NV)	<rl< td=""><td>0.076</td><td>7:2 FTOH</td><td><rl< td=""><td>28.2</td></rl<></td></rl<>	0.076	7:2 FTOH	<rl< td=""><td>28.2</td></rl<>	28.2
MeFOSA (SV)	<rl< td=""><td>0.188</td><td>8:2 FTOH</td><td><rl< td=""><td>106</td></rl<></td></rl<>	0.188	8:2 FTOH	<rl< td=""><td>106</td></rl<>	106
EtFOSA (SV)	<rl< td=""><td>0.465</td><td>10:2 FTOH</td><td><rl< td=""><td>72.3</td></rl<></td></rl<>	0.465	10:2 FTOH	<rl< td=""><td>72.3</td></rl<>	72.3
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.046</td><td>4:2 FTS</td><td><rl< td=""><td>0.066</td></rl<></td></rl<>	0.046	4:2 FTS	<rl< td=""><td>0.066</td></rl<>	0.066
MeFOSAA	<rl< td=""><td>0.121</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.121	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.121</td><td>8:2 FTS</td><td><rl< td=""><td>0.116</td></rl<></td></rl<>	0.121	8:2 FTS	<rl< td=""><td>0.116</td></rl<>	0.116
			10:2 FTS	<rl< td=""><td>0.234</td></rl<>	0.234
FASE (SV)					
MeFOSE	<rl< td=""><td>0.189</td><td></td><td></td><td></td></rl<>	0.189			
EtFOSE	<rl< td=""><td>0.186</td><td></td><td></td><td></td></rl<>	0.186			

 Table 49. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for laundered OS-F.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$3.75 \pm 0.47$	0.793	PFEESA	<rl< td=""><td>0.020</td></rl<>	0.020
PFPeA	$7.11 \pm 0.88$	0.025	PF4OPeA	<rl< td=""><td>0.022</td></rl<>	0.022
PFHxA	$26.7 \pm 2.7$	0.127	PF5OHxA	<rl< td=""><td>0.022</td></rl<>	0.022
PFHpA	$18.3 \pm 2.1$	0.482	<b>3-6-ОРҒНрА</b>	<rl< td=""><td>0.022</td></rl<>	0.022
PFOA	<rl< td=""><td>0.134</td><th>HFPO-DA</th><td><rl< td=""><td>0.040</td></rl<></td></rl<>	0.134	HFPO-DA	<rl< td=""><td>0.040</td></rl<>	0.040
PFNA	$0.158 \pm 0.028$	0.025	ADONA	<rl< td=""><td>0.022</td></rl<>	0.022
PFDA	<rl< td=""><td>0.075</td><th>9CI-PF3ONS</th><td><rl< td=""><td>0.023</td></rl<></td></rl<>	0.075	9CI-PF3ONS	<rl< td=""><td>0.023</td></rl<>	0.023
PFUnDA	$0.090\pm0.016$	0.038	11Cl-PF3OUdS	<rl< td=""><td>0.024</td></rl<>	0.024
PFDoDA	$0.064\pm0.021$	0.025			
PFTrDA	<rl< td=""><td>0.073</td><th>n:2 FTAcr(V)</th><td></td><td></td></rl<>	0.073	n:2 FTAcr(V)		
PFTeDA	<rl< td=""><td>0.046</td><th>8:2 FTAcr</th><td><rl< td=""><td>14.8</td></rl<></td></rl<>	0.046	8:2 FTAcr	<rl< td=""><td>14.8</td></rl<>	14.8
			10:2 FTAcr	<rl< td=""><td>28.5</td></rl<>	28.5
PFSA (NV)					
PFPrS	<rl< td=""><td>0.025</td><th><i>n:2 FTMAC (V)</i></th><td></td><td></td></rl<>	0.025	<i>n:2 FTMAC (V)</i>		
PFBS	$0.058 \pm 0.028$	0.022	6:2 FTMAC	$2440\pm290$	63.6
PFPeS	<rl< td=""><td>0.023</td><th>8:2 FTMAC</th><td><rl< td=""><td>65.1</td></rl<></td></rl<>	0.023	8:2 FTMAC	<rl< td=""><td>65.1</td></rl<>	65.1
PFHxS	<rl< td=""><td>0.057</td><th>10:2 FTMAC</th><td><rl< td=""><td>34.3</td></rl<></td></rl<>	0.057	10:2 FTMAC	<rl< td=""><td>34.3</td></rl<>	34.3
PFHpS	<rl< td=""><td>0.024</td><th></th><td></td><td></td></rl<>	0.024			
PFOS	<rl< td=""><td>0.047</td><th>n:2 FTOAc (V)</th><td></td><td></td></rl<>	0.047	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.024</td><th>8:2 FTOAc</th><td><rl< td=""><td>14.6</td></rl<></td></rl<>	0.024	8:2 FTOAc	<rl< td=""><td>14.6</td></rl<>	14.6
PFDS	<rl< td=""><td>1.24</td><th>10:2 FTOAc</th><td>No Value</td><td></td></rl<>	1.24	10:2 FTOAc	No Value	
FASA (NV, SV)		<u></u> .	n:2 FTOH (V)		
FBSA (NV)	No Value		<b>4:2 FTOH</b>	<rl< td=""><td>73.3</td></rl<>	73.3
MeFBSA (SV)	<rl< td=""><td>1.24</td><th><b>5:2 FTOH</b></th><td><rl< td=""><td>72.5</td></rl<></td></rl<>	1.24	<b>5:2 FTOH</b>	<rl< td=""><td>72.5</td></rl<>	72.5
FHxSA (NV)	<rl< td=""><td>0.051</td><th>6:2 FTOH</th><td><math display="block">1042\pm76</math></td><td>74.6</td></rl<>	0.051	6:2 FTOH	$1042\pm76$	74.6
FOSA (NV)	$\begin{array}{c} 0.05524 \pm \\ 0.00095 \end{array}$	0.051	7:2 FTOH	<rl< td=""><td>28.7</td></rl<>	28.7
MeFOSA (SV)	<rl< td=""><td>0.225</td><th>8:2 FTOH</th><td><rl< td=""><td>71.9</td></rl<></td></rl<>	0.225	8:2 FTOH	<rl< td=""><td>71.9</td></rl<>	71.9
EtFOSA (SV)	<rl< td=""><td>0.237</td><th>10:2 FTOH</th><td><rl< td=""><td>74.5</td></rl<></td></rl<>	0.237	10:2 FTOH	<rl< td=""><td>74.5</td></rl<>	74.5
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.050</td><th>4:2 FTS</th><td><rl< td=""><td>0.068</td></rl<></td></rl<>	0.050	4:2 FTS	<rl< td=""><td>0.068</td></rl<>	0.068
MeFOSAA	<rl< td=""><td>0.025</td><th>6:2 FTS</th><td><math display="block">9.8\pm2.6</math></td><td>0.679</td></rl<>	0.025	6:2 FTS	$9.8\pm2.6$	0.679
EtFOSAA	<rl< td=""><td>0.051</td><th>8:2 FTS</th><td><math display="block">1.06\pm0.34</math></td><td>0.115</td></rl<>	0.051	8:2 FTS	$1.06\pm0.34$	0.115
			10:2 FTS	$0.69\pm0.17$	0.113
FASE (SV)					
MeFOSE	<rl< td=""><td>0.109</td><th></th><td></td><td></td></rl<>	0.109			
EtFOSE	<rl< td=""><td>0.235</td><th></th><td></td><td></td></rl<>	0.235			

Table 50. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for weathered OS-F.

PFCA (NV)         PPEA (NV)           PFBA $<$ RL         0.534           PFPeA $<$ RL         0.170           PFBA $<$ RL         0.170           PFPAPA $<$ RL         0.120           PFDA $<$ RL         0.293           PFOMPA $<$ RL         0.021           PFDA $<$ RL         0.146           PFDA $<$ RL         0.021           PFDA $<$ RL         0.021           PFDA $<$ RL         0.0137           PFDA $<$ RL         0.010           PFDA $<$ RL         0.01072           PFTDA $<$ RL         0.0100           PFDA $<$ RL         0.0100           PFSA (NV) $=$ $=$ PFTS $<$ RL         0.0030           PFSA (NV) $=$ $=$ PFPS $<$ RL         0.0030           PFSSA (NV) $=$ $=$ PFPS $<$ $=$ PFDS $<$ $=$ $=$ $=$ $=$ PFSA (NV) $<$ <	PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)														
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
|--|---|---|---|---|---|---|---|--|--|--|--|--|--|--|--
--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|---|---|---|---
---|---|---|---|---|---|---|---|---|---|---|--|---
---|---|---|--|---|---|---|--
---|---|---|--|---|---|---|--|---|---
---|--|---|--|---|---|---|--|---|--|---
--|---|--|---|--|---|--|---|--|---|--|---|--|---|---|---|---
---|--|--|--|---|--|---|--|---|---|--------|--|-------|--|--|--|
| PFPeA <rl< th="">         0.170         PF40PeA         <rl< th="">         0.02           PFHpA         <rl< td="">         0.302         P50HxA         <rl< td="">         0.01           PFOA         <rl< td="">         0.146         HFPO-DA         <rl< td="">         0.02           PFOA         <rl< td="">         0.021         ADONA         <rl< td="">         0.02           PFNA         <rl< td="">         0.137         9C1-PF3ONS         <rl< td="">         0.03           PFDA         <rl< td="">         0.072           0.03           PFTDA         <rl< td="">         0.072            0.010           PFTeDA         <rl< td="">         0.100         n:2 FTAcr               PFTrDA         <rl< td="">         0.101         n:2 FTAcr  <td>PFCA (NV)</td><td></td><td></td><td>PPEA (NV)</td><td></td><td></td></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<>   | PFCA (NV)   |   |   | PPEA (NV)   |   |   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFHxA            PF50HxA   | PFBA  | <rl< td=""><td>0.534</td><td>PFEESA</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>  | 0.534   | PFEESA  | <rl< td=""><td>0.020</td></rl<>   | 0.020   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFHpA $<$ RL         0.302         3-6-OPFHpA $<$ RL         0.02           PFOA $<$ RL         0.146         HFPO-DA $<$ RL         0.20           PFDA $<$ RL         0.0137         PFO-DA $<$ RL         0.021           PFDA $<$ RL         0.137         PC-DA $<$ RL         0.030           PFDoDA $<$ RL         0.002         11CI-PF3OUdS $<$ RL         0.013           PFDoTA $<$ RL         0.100 $n:2 FTAcr$ $<$ RL         0.010           PFTDA $<$ RL         0.101 $n:2 FTAcr$ $<$ RL         0.010           PFTSA $<$ RL         0.0030 $n:2 FTMAC$ $<$ RL         13.0           PFPSS $<$ RL         0.0063 $= TFMAC$ $<$ RL         46.1           PFPSS $<$ RL         0.0020 $= n:2 FTMAC$ $<$ RL         47.2           PFNS $<$ RL         0.0020 $= n:2 FTMAC$ $<$ RL         42.9           PFPSS $<$ RL         0.0020 $= n:2 FTOAc$ $<$ RL         42.9           PFDS $<$ RL         0.0021 $< n:2 FTOA$  | PFPeA   | <rl< td=""><td>0.170</td><td>PF4OPeA</td><td><rl< td=""><td>0.021</td></rl<></td></rl<>   | 0.170   | PF4OPeA   | <rl< td=""><td>0.021</td></rl<>   | 0.021   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFOA $<$ RL         0.146         HFP0-DA $<$ RL         0.20           PFNA $<$ RL         0.021         ADONA $<$ RL         0.01           PFDA $<$ RL         0.137         9CI-PF3ONS $<$ RL         0.001           PFDDA $<$ RL         0.0050         ITCI-PF3OUdS $<$ RL         0.01           PFDDA $<$ RL         0.100 $n:2$ FTAcr (V) $n:2$ FTAcr (V)           PFTrDA $<$ RL         0.101 $n:2$ FTAcr (V) $n:2$ FTAcr (V)           PFTsS $<$ RL         0.030 $n:2$ FTMAC (V) $n:2$ FTMAC (V)           PFPsS $<$ RL         0.020 $s:2$ FTMAC $<$ RL $46.1$ PFPsS $<$ RL         0.020 $s:2$ FTMAC $<$ RL $47.2$ PFHsS $<$ RL         0.020 $s:2$ FTMAC $<$ RL $42.9$ PFDS $<$ RL         0.020 $s:2$ FTMAC $<$ RL $42.9$ PFDS $<$ RL         0.020 $s:2$ FTOAc $<$ RL $24.9$ PFDS $<$ RL         0.020 $s:2$ FTOAc $<$ RL </td <td>PFHxA</td> <td><rl< td=""><td>0.293</td><td>PF5OHxA</td><td><rl< td=""><td>0.019</td></rl<></td></rl<></td>  | PFHxA   | <rl< td=""><td>0.293</td><td>PF5OHxA</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>   | 0.293   | PF5OHxA   | <rl< td=""><td>0.019</td></rl<>   | 0.019   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFNA $<$ RL         0.021         ADONA $<$ RL         0.0137           PFDA $<$ RL         0.137         9Cl-PF3ONS $<$ RL         0.03           PFDoDA $<$ RL         0.050         11Cl-PF3OUds $<$ RL         0.01           PFDoDA $<$ RL         0.072 $=$  | PFHpA   | <rl< td=""><td>0.302</td><td>3-6-OPFHpA</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>  | 0.302   | 3-6-OPFHpA  | <rl< td=""><td>0.020</td></rl<>   | 0.020   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFDA $<$ RL         0.137         9CI-PF3ONS $<$ RL         0.03           PFUnDA $<$ RL         0.050         11CI-PF3OUdS $<$ RL         0.01           PFDoDA $<$ RL         0.072 $    < < < <<<0.01 <<<0.01 <<<0.01 <<<0.01 <<<0.01 <<<0.01 <<<<C         << << < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $<0.01$ $<<<0.01 <<<0.01 <<<0.01 <<<0.01 <<<0.01 <<<<C         << << < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   | 0.01  | $<<0.01 <<<0.01 <<<0.01 <<<0.01 <<<0.01 <<<<C         << << < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $<0.01$ $<<<0.01 <<<0.01 <<<0.01 <<<0.01 <<<<C         << << < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   | 0.01  | $<<0.01 <<<0.01 <<<0.01 <<<0.01 <<<<C         << << < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $<0.01$ $<<<0.01 <<<0.01 <<<0.01 <<<<C         << << < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   | 0.01   | $<<0.01 <<<0.01 <<<0.01 <<<<C         << << < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   | $<0.01$ $<<<0.01 <<<0.01 <<<<C         << << < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | 0.01   | $<<0.01 <<<0.01 <<<<C         << << < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   | $<0.01$ $<<<0.01 <<<<C         << << < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | 0.01   | $<<0.01 <<<<C         << << < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   | $<0.01$ $<<<<C         << <<
< < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | 0.01   | $<<<C         << << < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   | $<<C         << << < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $<C         << << < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   | C $<< << < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $< << < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   | $<< < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   | $< < < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $< < < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $< < < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $< < < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $< < < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $< < < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $< < <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $< <  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $<  < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $ < < <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   | $< <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $<  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $ <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $ <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   | $ <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   
  | $ <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   | $ <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $ <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   | $ <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $ <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   | $ <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $ <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   | $ <  <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $ <  <  <  <  <  <  <  <  <  <  <  <  <  <  < $   | $ <  <  <  <  <  <  <  <  <  <  <  <  <  < $  | $ <  <  <  <  <  <  <  <  <  <  <  <  < $  | $ <  <  <  <  <  <  <  <  <  <  <  < $  | $ <  <  <  <  <  <  <  <  <  <  < $   
   | $ <  <  <  <  <  <  <  <  <  < $  | $ <  <  <  <  <  <  <  <  < $   | $ <  <  <  <  <  <  <  < $   | $ <  <  <  <  <  <  < $   | $ <  <  <  <  <  < $  | $ <  <  <  <  < $   | $ <  <  <  < $   | $ <  <  < $   | $ <  < $  | $ < $   
   |  | PFOA  | <rl< td=""><td>0.146</td><td>HFPO-DA</td><td><rl< td=""><td>0.201</td></rl<></td></rl<>   | 0.146   | HFPO-DA  | <rl< td=""><td>0.201</td></rl<>   | 0.201   |   |  | | | | | | | | | | | | | | | | | | | |
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFUnDA <rl< th="">         0.050         11Cl-PF30UdS         <rl< th="">         0.01           PFTDDA         <rl< td="">         0.100         n:2 FTAcr         <rl< td="">         27.6           PFTeDA         <rl< td="">         0.141         8:2 FTAcr         <rl< td="">         27.6           PFTSA (NV)          10:2 FTAcr         <rl< td="">         13.0           PFSA (NV)          n:2 FTMAC         <rl< td="">         13.0           PFPS          0.020         6:2 FTMAC         <rl< td="">         46.1           PFPeS         <rl< td="">         0.020         6:2 FTMAC         <rl< td="">         47.2           PFHS           0.0295 ±         10:2 FTMAC         <rl< td="">         47.2           PFHS           0.020         8:2 FTMAC         <rl< td="">         47.2           PFNS            0.020              PFNS                                 &lt;</rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<>  | PFNA  | <rl< td=""><td>0.021</td><td>ADONA</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>   | 0.021   | ADONA   | <rl< td=""><td>0.019</td></rl<>   | 0.019   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFDoDA $< RL$ $0.072$ PFTrDA $< RL$ $0.100$ $n:2 FTAcr$ $< RL$ $2.6$ PFTrDA $< RL$ $0.141$ $s:2 FTAcr$ $< RL$ $2.6$ PFSA (NV)       PFPrS $< RL$ $0.030$ $n:2 FTMAC$ (V) $rest for the constraint of the cons$ | PFDA  | <rl< td=""><td>0.137</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.038</td></rl<></td></rl<>  | 0.137   | 9CI-PF3ONS  | <rl< td=""><td>0.038</td></rl<>   | 0.038   |   |  |  |  |  |  |  |  |  |  |  |   
        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |  
                              |   |   |   |   |   |   |  |   |   |   |   
   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |   |  |   
   |   |   |  |   |  |   |  |   |  |   |  |   |  |   
   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFTrDA $<$ RL       0.100 $n:2 FTAcr$ (V)         PFTeDA $<$ RL       0.141 $s:2 FTAcr$ $<$ RL       27.6         PFSA (NV) $ s:2 FTAcr <RL       27.6         PFPs       <RL       0.030       s:2 FTAcr <RL       13.0         PFPs       <RL       0.003       ert FTAcr <RL       13.0         PFPs       <RL       0.0020       s:2 FTMaC <RL       46.1         PFPeS       <RL       0.020       s:2 FTMAC <RL       46.1         PFNS       <RL       0.020       s:2 FTMAC <RL       47.2         PFHpS       <RL       0.020       s:2 FTMAC <RL       47.2         PFNS       <RL       0.020       s:2 FTMAC <RL       <47.2         PFNS       <RL       0.020       s:2 FTMAC <RL       <RL       <24.9         PFDS       <RL       0.020       s:2 FTOAc <RL       <24.9       <         PFNS       <RL       0.040       s:2 FTOAc <RL       < < < < < $  | PFUnDA  | <rl< td=""><td>0.050</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.017</td></rl<></td></rl<>  | 0.050   | 11Cl-PF3OUdS  | <rl< td=""><td>0.017</td></rl<>   | 0.017   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFTeDA $<$ RL $0.141$ 8:2 FTAcr $<$ RL $27.6$ PFSA (NV) $      < < < < < << <<< <<<<>       <<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$   | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ |
$<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< <<
<<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<><<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<>< <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ <<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $<<<<>< <<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math>&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math>&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th> | $<<<<>< <<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math>&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th> | $<<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th> | $ <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math>
&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th> | $ <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th> | $ <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th> | $ <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th> | $ <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th> | $ <<<<>< < <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math>
</math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th> | $ <<<<>< < <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th> | $ <<<<>< < <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></math></th></th></math></th> | $ <<<<>< < <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></math></th> | $ <<<<<>< < <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th> | $ <<<<>< < <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math>
&lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></th></math></th></th></math></th> | $ <<<<>< < <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th></th></math></th> | $ <<<<<>< << <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th></th> | < <th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th></th></math></th> | $ <<<<<>< < <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></math></th> | $ <<<<<>< < <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th> | $ <<<<<>< << <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th> | < <th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th> | $ <<<<<>< < <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math>
&lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th> | $ <<<<<>< << <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th></th> | < <th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th></th></math></th> | $ <<<<<<>< << <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th></th> | < <th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th></th></math></th> | $ <<<<<>< < <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th></th></math></th> | $ <<<<<><<<<<>< << <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th></th> | < <th><math> &lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th></th></math></th> | $ <<<<<<><<<<<>< << <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th></th> | < <th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th></th></math></th> | $ <<<<<<<><<<<<>< < <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&lt;&gt;&lt;<th><math> </math>&lt;<th><math> &lt;</math></th></th></math></th> | $ <<<<<<<<<<>< < <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | $ $ < <th><math> &lt;</math></th> | $ <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<$ | PFDoDA | <rl< td=""><td>0.072</td><td></td><td></td><td></td></rl<> | 0.072 |  |  |  |
PFSA (NV)       I0:2 FTAcr $<$ RL       13.0         PFPrS $<$ RL       0.030 $n:2 FTMAC (V)$ $n:2 FTMAC (V)$ PFBS $<$ RL       0.063 $6:2 FTMAC$ $<$ RL       46.1         PFPeS $<$ RL       0.020 $8:2 FTMAC$ $<$ RL       46.1         PFHS $<$ RL       0.020 $8:2 FTMAC$ $<$ RL       46.1         PFHpS $<$ RL       0.020 $<$ RL $4.2 + 9$ PFHpS $<$ RL       0.020 $<$ RL $24.9$ PFNS $<$ RL       0.020 $<$ RL $24.9$ PFNS $<$ RL       0.020 $<$ RL $<$ RL $24.9$ PFNS $<$ RL       0.020 $<$ RL $<$ RL $24.9$ PFNS $<$ RL       0.020 $<$ RL $<$ RL $24.9$ PFNS $<$ RL       0.020 $<$ RL	PFTrDA	<rl< td=""><td>0.100</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.100	n:2 FTAcr (V)																							
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |  |  
  |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFSA (NV) $n:2 FTMAC (V)$ PFPrS $<$ RL       0.030         PFBS $<$ RL       0.063         PFPeS $<$ RL       0.020         PFHxS $0.0295 \pm$ $6:2 FTMAC$ $<$ RL $46.1$ PFHpS $<$ RL $0.0022$ $0.019$ $8:2 FTMAC$ $<$ RL $47.2$ PFHpS $<$ RL $0.0022$ $0.019$ $8:2 FTMAC$ $<$ RL $47.2$ PFNS $<$ RL $0.0020$ $<$ RL $0.020$ $<$ RL $24.9$ PFDS $<$ RL $0.0020$ $=$ RL $<$ RL $24.9$ PFDS $<$ RL $0.0020$ $=$ RL $24.9$ PFDS $<$ RL $0.0020$ $=$ RL $=$ RL $24.9$ PFDS $<$ RL $0.020$ $=$ RL <t< td=""><td>PFTeDA</td><td><rl< td=""><td>0.141</td><td>8:2 FTAcr</td><td><rl< td=""><td>27.6</td></rl<></td></rl<></td></t<>  | PFTeDA  | <rl< td=""><td>0.141</td><td>8:2 FTAcr</td><td><rl< td=""><td>27.6</td></rl<></td></rl<>  | 0.141   | 8:2 FTAcr   | <rl< td=""><td>27.6</td></rl<>  | 27.6  |   |  |  |  |  |  |  |  |  |  
   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |   |   
   |   |   |   |   |   |   |   |   |   |  |   |  
  |   |   |  |   |   |   |  |   |   |  
  |  |   |   |   |  |   |   |   |  |   
   |  |   |   |   |  |   |  |   |  |   |  |   |  |   
   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFPrS $<$ RL       0.030 <i>n:2 FTMAC</i> (V)         PFBS $<$ RL       0.063 <i>6:2 FTMAC</i> $<$ RL       46.1         PFPeS $<$ RL       0.020 $<$ B:2 FTMAC $<$ RL       46.1         PFHpS $<$ RL       0.002       0.019 $<$ B:2 FTMAC $<$ RL       47.2         PFHpS $<$ RL       0.002       0.019 $<$ B:2 FTMAC $<$ RL       47.2         PFMS $<$ RL       0.002       0.019 $<$ B:2 FTMAC $<$ RL       47.2         PFNS $<$ RL       0.020 $<$ RL $<$ RL       0.020 $<$ RL $<$ RL       24.9         PFDS $<$ RL       0.020 $n:2 FTOAc$ (V) $<$ RL       26.9         PFDS $<$ RL       0.040 $n:2 FTOAc$ (V) $<$ RL $26.9$ PFDS $<$ RL       0.040 $n:2 FTOAc$ (V) $<$ RL $26.9$ PFDS $<$ RL $0.040$ $n:2 FTOAc$ (V) $<$ RL $26.9$ PFDS $<$ RL $0.021$ $n:2 FTOH$ (V) $<$ RL $26.9$ FASA (NV) $<$ RL $0.021$ $n:2 FTOH (V)       <R$   |   |   |   | 10:2 FTAcr  | <rl< td=""><td>13.0</td></rl<>  | 13.0  |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFBS <rl< th="">       0.063       6:2 FTMAC       <rl< th="">       46.1         PFPeS       <rl< td="">       0.020       8:2 FTMAC       <rl< td="">       47.2         PFHxS       0.0022       0.019       8:2 FTMAC       <rl< td="">       47.2         PFHyS       <rl< td="">       0.002       0.019       10:2 FTMAC       <rl< td="">       47.2         PFNS       <rl< td="">       0.002       0.019       10:2 FTMAC       <rl< td="">       24.9         PFNS       <rl< td="">       0.064       n:2 FTOAc (V)            PFNS       <rl< td="">       0.040       8:2 FTOAc            PFDS       <rl< td="">       0.041       10:2 FTOAc             PFNS       <rl< td="">       0.041       10:2 FTOAc  <td< td=""><td>PFSA (NV)</td><td></td><td></td><td></td><td></td><td></td></td<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<>  | PFSA (NV)   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFPeS <rl< th="">         0.020         8:2 FTMAC         <rl< th="">         47.2           PFHxS         0.0295 ±         0.0022         0.019         10:2 FTMAC         <rl< td="">         24.9           PFHpS         <rl< td="">         0.020         n:2 FTOAc (V)              PFNS         <rl< td="">         0.040         8:2 FTOAc         <rl< td="">         26.9           PFDS         <rl< td="">         0.041         8:2 FTOAc              PFASA (NV, SV)          n:2 FTOAc               FASA (NV, SV)           n:2 FTOH (V)               FASA (NV, SV)</rl<></rl<></rl<></rl<></rl<></rl<></rl<>   | PFPrS   | <rl< td=""><td>0.030</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>   | 0.030   | n:2 FTMAC (V)   |   |   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFHxS         0.0295 ±<br>0.0022         0.019           PFHpS <rl< td="">         0.020           PFOS         <rl< td="">         0.064           PFNS         <rl< td="">         0.040           PFDS         <rl< td="">         0.041           PFDS         <rl< td="">         0.041           PFDS         <rl< td="">         0.041           PFDS         <rl< td="">         0.041           FASA (NV, SV)             FBSA (NV)         <rl< td="">         0.021           MeFBSA (SV)         <rl< td="">         0.021           FASA (NV)         <rl< td="">         0.021           FASA (NV)         <rl< td="">         0.021           MeFBSA (SV)         <rl< td="">         0.021           FASA (NV)         <rl< td="">         0.021           FASA (NV)         <rl< td="">         0.21           FOSA (NV)         0.035 ± 0.011         0.021           FASAA (NV)         <rl< td="">         0.350           BEtFOSA (SV)         <rl< td="">         0.351           I0:2 FTOH         <rl< td="">         123           Dis2 FTOH         <rl< td="">         3.57           MeFOSAA         <rl< td="">         0.021           FASE (SV)</rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<>   | PFBS  | <rl< td=""><td>0.063</td><td>6:2 FTMAC</td><td><rl< td=""><td>46.1</td></rl<></td></rl<>  | 0.063   | 6:2 FTMAC   | <rl< td=""><td>46.1</td></rl<>  | 46.1  |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFHxs         0.0022         0.019         10:2 FTMAC <rl< th="">         24.9           PFNs         <rl< td="">         0.020         n:2 FTOAc (V)         <td< td=""><td>PFPeS</td><td><rl< td=""><td>0.020</td><td>8:2 FTMAC</td><td><rl< td=""><td>47.2</td></rl<></td></rl<></td></td<></rl<></rl<>   | PFPeS   | <rl< td=""><td>0.020</td><td>8:2 FTMAC</td><td><rl< td=""><td>47.2</td></rl<></td></rl<>  | 0.020   | 8:2 FTMAC   | <rl< td=""><td>47.2</td></rl<>  | 47.2  |   |  |  |  |  |  |  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |  
  |   |   |   |   |   |   |  |   |   |   |   
   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |   |  |   
   |   |   |  |   |  |   |  |   |  |   |  |   |  |   
   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFOS $<$ RL       0.064 $n:2 \ FTOAc \ (V)$ PFNS $<$ RL       0.040 $8:2 \ FTOAc \ (V)$ PFDS $<$ RL       0.041 $8:2 \ FTOAc \ (V)$ FASA (NV, SV) $n:2 \ FTOAc \ (V)$ $8:2 \ FTOAc \ (V)$ FBSA (NV) $<$ RL       0.041 $10:2 \ FTOAc \ (V)$ FBSA (NV, SV) $n:2 \ FTOAc \ (V)$ $n:2 \ FTOAc \ (V)$ FBSA (NV) $<$ RL       0.021 $n:2 \ FTOH \ (V)$ MeFBSA (SV) $<$ RL       0.140 $5:2 \ FTOH \ (V)$ $<$ RL $66.7 \ 5:2 \ FTOH \ (V)$ FMSA (NV) $<$ RL       0.021 $6:2 \ FTOH \ (V)$ $<$ RL $25.8 \ 6.5 \ 8:2 \ FTOH \ (V)$ FOSA (NV) $0.035 \pm 0.011 \ 0.021$ $0.21 \ 7:2 \ FTOH \ (V)$ $<$ RL $25.8 \ 8:2 \ FTOH \ (V)$ FASAA (NV) $<$ RL $0.350 \ 8:2 \ FTOH \ (V)$ $<$ RL $66.5 \ 8:2 \ FTOH \ (V)$ FASAA (NV) $<$ RL $0.021 \ 9.351 \ 10:2 \ FTS \ (NV)$ $<$ RL $66.8 \ 8:2 \ FTS \ No \ Value \ 9.352 \ 10:2 \ FTS \ No \ Value \ 9.352 \ 10:2 \ FTS \ No \ Value \ 9.352 \ 10:2 \ FTS \ No \ Value \ 9.352 \ 10:2 \ FTS \ No \ Value \ 9.352 \ 10:2 \ FTS \ No \ Value \ 9.352 \ 10:2 \ FTS \ No \ Value \ 10:2 \ FTS \ No \ Value \ 10:$   | PFHxS   |   | 0.019   | 10:2 FTMAC  | <rl< td=""><td>24.9</td></rl<>  | 24.9  |   |  |  |  |  |  |  |  |  |  
   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |   |             
   |   |   |   |   |   |   |   |   |   |  |   |  
  |   |   |  |   |   |   |  |   |   |  
  |  |   |   |   |  |   |   |   |  |   
   |  |   |   |   |  |   |  |   |  |   |  |   |  
           |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFNS <rl< th="">       0.040       8:2 FTOAc       <rl< th="">       26.9         PFDS       <rl< th="">       0.041       10:2 FTOAc       <rl< th="">       26.9         FASA (NV, SV)         n:2 FTOH (V)        13.5         FASA (NV)       <rl< th="">       0.021       4:2 FTOAc            FBSA (NV)       <rl< th="">       0.021       4:2 FTOH       <rl< th="">       70.2         MeFBSA (SV)       <rl< th="">       0.140       5:2 FTOH       <rl< th="">       66.7         FHxSA (NV)       <rl< th="">       0.021       6:2 FTOH       <rl< th="">       25.8         FOSA (NV)       0.035 ± 0.011       0.021       6:2 FTOH       <rl< th="">       25.8         MeFOSA (SV)       <rl< th="">       0.350       8:2 FTOH       <rl< th="">       123         Disc FTOSA (SV)       <rl< th="">       0.351       10:2 FTS           FASA (NV)                FASA (NV)                   MeFOSA (SV)                &lt;</rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<>   | PFHpS   | <rl< td=""><td>0.020</td><td></td><td></td><td></td></rl<>  | 0.020   |   |   |   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| PFDS <rl< th="">       0.041       10:2 FTOAc       <rl< th="">       13.5         FASA (NV, SV)       n:2 FTOH (V)         FBSA (NV)       <rl< th="">       0.021       n:2 FTOH (V)         FBSA (NV)       <rl< th="">       0.021       10:2 FTOH (V)         MeFBSA (SV)       <rl< th="">       0.021       4:2 FTOH       <rl< th="">       70.2         MeFBSA (SV)       <rl< th="">       0.140       5:2 FTOH       <rl< th="">       66.7         FNSA (NV)       <rl< th="">       0.021       6:2 FTOH       <rl< th="">       25.8         FOSA (NV)       0.035 ± 0.011       0.021       6:2 FTOH       <rl< th="">       25.8         MeFOSA (SV)       <rl< th="">       0.350       8:2 FTOH       <rl< th="">       123         EtFOSA (SV)       <rl< th="">       0.351       10:2 FTOH       <rl< th="">       66.8         FASAA (NV)               FOSAA                FASA (NV)                  FASA (NV)                 <td>PFOS</td><td><rl< td=""><td>0.064</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<></td></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<>  | PFOS  | <rl< td=""><td>0.064</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>   | 0.064   | n:2 FTOAc (V)   |   |   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| FASA (NV, SV)       n:2 FTOH (V)         FBSA (NV) <rl< td="">       0.021         MeFBSA (SV)       <rl< td="">       0.140         FHxSA (NV)       <rl< td="">       0.140         FHxSA (NV)       <rl< td="">       0.021         FOSA (NV)       <rl< td="">       0.021         FOSA (NV)       <rl< td="">       0.021         FOSA (NV)       0.035 ± 0.011       0.021         FOSA (SV)       <rl< td="">       0.350         MeFOSA (SV)       <rl< td="">       0.350         FASAA (NV)       <rl< td="">       0.351         FOSAA       <rl< td="">       0.021         FASAA (NV)       <rl< td="">       0.351         FASAA (NV)       <rl< td="">       0.351         FOSAA       <rl< td="">       0.021         FASAA (NV)       <rl< td="">       0.351         FOSAA       <rl< td="">       0.021         FASA (NV)       <rl< td="">       0.021         FASE (SV)           MeFOSE       <rl< td="">       0.352</rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<>  | PFNS  | <rl< td=""><td>0.040</td><td>8:2 FTOAc</td><td><rl< td=""><td>26.9</td></rl<></td></rl<>  | 0.040   | 8:2 FTOAc   | <rl< td=""><td>26.9</td></rl<>  | 26.9  |   |  |  |  |  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |  |  
  |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| FBSA (NV) <rl< th="">       0.021       4:2 FTOH       <rl< th="">       70.2         MeFBSA (SV)       <rl< th="">       0.140       5:2 FTOH       <rl< th="">       66.7         FHxSA (NV)       <rl< th="">       0.021       6:2 FTOH       <rl< th="">       25.8         FOSA (NV)       0.035 ± 0.011       0.021       6:2 FTOH       <rl< th="">       25.8         FOSA (NV)       0.035 ± 0.011       0.021       7:2 FTOH       <rl< th="">       66.5         MeFOSA (SV)       <rl< th="">       0.350       8:2 FTOH       <rl< th="">       123         EtFOSA (SV)       <rl< th="">       0.351       10:2 FTOH       <rl< th="">       66.8         FASAA (NV)               FOSAA                FOSAA</rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<></rl<>   | PFDS  | <rl< td=""><td>0.041</td><td>10:2 FTOAc</td><td><rl< td=""><td>13.5</td></rl<></td></rl<>   | 0.041   | 10:2 FTOAc  | <rl< td=""><td>13.5</td></rl<>  | 13.5  |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| MeFBSA (SV) $<$ RL0.1405:2 FTOH $<$ RL66.7FHxSA (NV) $<$ RL0.0216:2 FTOH $<$ RL25.8FOSA (NV)0.035 $\pm$ 0.0110.0217:2 FTOH $<$ RL66.5MeFOSA (SV) $<$ RL0.3508:2 FTOH $<$ RL123EtFOSA (SV) $<$ RL0.35110:2 FTOH $<$ RL66.8FASAA (NV)n:2 FTS (NV)FOSAA $<$ RL0.0214:2 FTS $<$ RL3.57MeFOSAA $<$ RL0.0956:2 FTSNo ValueEtFOSAA $<$ RL0.0428:2 FTS $<$ RL0.09FASE (SV)I0:2 FTSNo ValueMeFOSE $<$ RL0.352 $<$ $<$   | . , ,   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| FHxSA (NV) $<$ RL $0.021$ $6:2 \text{ FTOH}$ $<$ RL $25.8$ FOSA (NV) $0.035 \pm 0.011$ $0.021$ $6:2 \text{ FTOH}$ $<$ RL $25.8$ MeFOSA (SV) $<$ RL $0.350$ $7:2 \text{ FTOH}$ $<$ RL $66.5$ MeFOSA (SV) $<$ RL $0.350$ $8:2 \text{ FTOH}$ $<$ RL $123$ EtFOSA (SV) $<$ RL $0.351$ $10:2 \text{ FTOH}$ $<$ RL $123$ FASAA (NV) $<$ RL $0.351$ $10:2 \text{ FTOH}$ $<$ RL $66.8$ FASAA (NV) $<$ RL $0.021$ $n:2 FTS (NV)$ $<$ RL $3.57$ MeFOSAA $<$ RL $0.095$ $<$ S2 FTS $<$ RL $3.57$ MeFOSAA $<$ RL $0.095$ $6:2 \text{ FTS}$ No Value $<$ S2 FTS $<$ RL $0.09$ FASE (SV) $<$ RL $0.352$ $<$ RL $0.352$ $<$ RL $0.09$   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| FOSA (NV) $0.035 \pm 0.011$ $0.021$ 7:2 FTOH $<$ RL $66.5$ MeFOSA (SV) $<$ RL $0.350$ $8:2$ FTOH $<$ RL $123$ EtFOSA (SV) $<$ RL $0.351$ $10:2$ FTOH $<$ RL $123$ FASAA (NV) $<$ RL $0.351$ $10:2$ FTOH $<$ RL $66.5$ FOSAA $<$ RL $0.351$ $10:2$ FTOH $<$ RL $66.8$ FOSAA $<$ RL $0.021$ $n:2$ FTS (NV) $<$ RL $66.8$ MeFOSAA $<$ RL $0.021$ $n:2$ FTS (NV) $<$ RL $3.57$ MeFOSAA $<$ RL $0.095$ $6:2$ FTS $<$ RL $0.09$ EtFOSAA $<$ RL $0.042$ $8:2$ FTS $<$ RL $0.09$ MeFOSE $<$ RL $0.352$ $>$ $>$ $>$ $>$   | × /   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| MeFOSA (SV) <rl< th="">       0.350       8:2 FTOH       <rl< th="">       123         EtFOSA (SV)       <rl< th="">       0.351       10:2 FTOH       <rl< th="">       66.8         FASAA (NV)       m:2 FTS (NV)              FOSAA       <rl< th="">       0.021       m:2 FTS (NV)   <td>FHxSA (NV)</td><td></td><td>0.021</td><td>6:2 FTOH</td><td><rl< td=""><td>25.8</td></rl<></td></rl<></rl<></rl<></rl<></rl<>   | FHxSA (NV)  |   | 0.021   | 6:2 FTOH  | <rl< td=""><td>25.8</td></rl<>  | 25.8  |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| EtFOSA (SV) <rl< th="">       0.351       10:2 FTOH       <rl< th="">       66.8         FASAA (NV)       n:2 FTS (NV)         FOSAA       <rl< th="">       0.021       4:2 FTS       <rl< th="">       3.57         MeFOSAA       <rl< th="">       0.095       6:2 FTS       No Value         EtFOSAA       <rl< th="">       0.042       8:2 FTS       <rl< th="">       0.09         FASE (SV)      </rl<></rl<></rl<></rl<></rl<></rl<></rl<>  | · /   |   |   |   |   | 66.5  |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| FASAA (NV)       n:2 FTS (NV)         FOSAA <rl< td="">       0.021         MeFOSAA       <rl< td="">       0.095         EtFOSAA       <rl< td="">       0.042         FASE (SV)        In:2 FTS         MeFOSE       <rl< td="">       0.352</rl<></rl<></rl<></rl<>   |   | <rl< td=""><td>0.350</td><td></td><td><rl< td=""><td>123</td></rl<></td></rl<>  | 0.350   |   | <rl< td=""><td>123</td></rl<>   | 123   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| FOSAA <rl< th="">         0.021         4:2 FTS         <rl< th="">         3.57           MeFOSAA         <rl< th="">         0.095         6:2 FTS         No Value           EtFOSAA         <rl< th="">         0.042         8:2 FTS         <rl< th="">         0.09           FASE (SV)        </rl<></rl<></rl<></rl<></rl<>   | EtFOSA (SV)   | <rl< td=""><td>0.351</td><td>10:2 FTOH</td><td><rl< td=""><td>66.8</td></rl<></td></rl<>  | 0.351   | 10:2 FTOH   | <rl< td=""><td>66.8</td></rl<>  | 66.8  |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| MeFOSAA <rl< th="">         0.095         6:2 FTS         No Value           EtFOSAA         <rl< td="">         0.042         8:2 FTS         <rl< td="">         0.09           FASE (SV)         I0:2 FTS         No Value             MeFOSE         <rl< td="">         0.352</rl<></rl<></rl<></rl<>   | · · · · ·   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| EtFOSAA <rl< th="">         0.042         8:2 FTS         <rl< th="">         0.09           Interview         Inte</rl<></rl<>  |   |   |   |   |   | 3.57  |   |  |  |  |  |  |  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |  
  |   |   |   |   |   |   |  |   |   |   |   
   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |   |  |   
   |   |   |  |   |  |   |  |   |  |   |  |   |  |                           
   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| Instant         Instant         No Value           FASE (SV)         MeFOSE <rl< th="">         0.352</rl<>  |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| FASE (SV)           MeFOSE <rl< th="">         0.352</rl<>   | EtFOSAA   | <rl< td=""><td>0.042</td><td></td><td></td><td>0.091</td></rl<>   | 0.042   |   |   | 0.091   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| MeFOSE <rl 0.352<="" td=""><td></td><td></td><td></td><td>10:2 FTS</td><td>No Value</td><td></td></rl>   |   |   |   | 10:2 FTS  | No Value  |   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
|  | · · ·   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
| EtFOSE <rl 0.728<="" td=""><td></td><td></td><td></td><td></td><td></td><td></td></rl>   |   |   |   |   |   |   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |
|  | EtFOSE  | <rl< td=""><td>0.728</td><td></td><td></td><td></td></rl<>  | 0.728   |   |   |   |   |  |  |  |  |  |  |  |  |                             
  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |   |  
  |   |   |   |   |   |   |   |   |   |   |  |   |   
   |   |   |  |   |   |   |  |   |   |   
   |  |   |   |   |  |   |   |   |  |  
  |  |   |   |   |  |   |  |   |  |   |  |   |   
  |   |  |   |  |   |  |   |  |   |   |   |   |   |  |  |  |   |  |   |  |   |   |        |  |       |  |  |  |

**Table 51.** Measured PFAS concentrations ( $\mu$ g-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for abraded OS-FSC.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	<rl< td=""><td>0.985</td><td>PFEESA</td><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.985	PFEESA	<rl< td=""><td>0.021</td></rl<>	0.021
PFPeA	<rl< td=""><td>0.241</td><td>PF4OPeA</td><td><rl< td=""><td>0.046</td></rl<></td></rl<>	0.241	PF4OPeA	<rl< td=""><td>0.046</td></rl<>	0.046
PFHxA	<rl< td=""><td>0.241</td><td>PF5OHxA</td><td><rl< td=""><td>0.219</td></rl<></td></rl<>	0.241	PF5OHxA	<rl< td=""><td>0.219</td></rl<>	0.219
PFHpA	<rl< td=""><td>1.28</td><td>3-6-OPFHpA</td><td><rl< td=""><td>0.084</td></rl<></td></rl<>	1.28	3-6-OPFHpA	<rl< td=""><td>0.084</td></rl<>	0.084
PFOA	<rl< td=""><td>0.112</td><td>HFPO-DA</td><td><rl< td=""><td>0.497</td></rl<></td></rl<>	0.112	HFPO-DA	<rl< td=""><td>0.497</td></rl<>	0.497
PFNA	<rl< td=""><td>0.077</td><td>ADONA</td><td><rl< td=""><td>0.023</td></rl<></td></rl<>	0.077	ADONA	<rl< td=""><td>0.023</td></rl<>	0.023
PFDA	<rl< td=""><td>0.120</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.120	9CI-PF3ONS	<rl< td=""><td>0.024</td></rl<>	0.024
PFUnDA	<rl< td=""><td>0.026</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.025</td></rl<></td></rl<>	0.026	11Cl-PF3OUdS	<rl< td=""><td>0.025</td></rl<>	0.025
PFDoDA	<rl< td=""><td>0.026</td><td></td><td></td><td></td></rl<>	0.026			
PFTrDA	<rl< td=""><td>0.077</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.077	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.061</td><td>8:2 FTAcr</td><td><rl< td=""><td>12.1</td></rl<></td></rl<>	0.061	8:2 FTAcr	<rl< td=""><td>12.1</td></rl<>	12.1
			10:2 FTAcr	<rl< td=""><td>11.7</td></rl<>	11.7
PFSA (NV)					
PFPrS	<rl< td=""><td>0.023</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.023	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>0.023</td><td>6:2 FTMAC</td><td><math>80 \pm 13</math></td><td>41.5</td></rl<>	0.023	6:2 FTMAC	$80 \pm 13$	41.5
PFPeS	<rl< td=""><td>0.025</td><td>8:2 FTMAC</td><td><rl< td=""><td>42.5</td></rl<></td></rl<>	0.025	8:2 FTMAC	<rl< td=""><td>42.5</td></rl<>	42.5
PFHxS	<rl< td=""><td>0.024</td><td>10:2 FTMAC</td><td><rl< td=""><td>22.4</td></rl<></td></rl<>	0.024	10:2 FTMAC	<rl< td=""><td>22.4</td></rl<>	22.4
PFHpS	<rl< td=""><td>0.025</td><td></td><td></td><td></td></rl<>	0.025			
PFOS	<rl< td=""><td>0.068</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.068	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.025</td><td>8:2 FTOAc</td><td><rl< td=""><td>11.8</td></rl<></td></rl<>	0.025	8:2 FTOAc	<rl< td=""><td>11.8</td></rl<>	11.8
PFDS	<rl< td=""><td>0.025</td><td>10:2 FTOAc</td><td><rl< td=""><td>12.2</td></rl<></td></rl<>	0.025	10:2 FTOAc	<rl< td=""><td>12.2</td></rl<>	12.2
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	<rl< td=""><td>0.093</td><td>4:2 FTOH</td><td><rl< td=""><td>24.8</td></rl<></td></rl<>	0.093	4:2 FTOH	<rl< td=""><td>24.8</td></rl<>	24.8
MeFBSA (SV)	<rl< td=""><td>0.635</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>60.1</td></rl<></td></rl<>	0.635	<b>5:2 FTOH</b>	<rl< td=""><td>60.1</td></rl<>	60.1
FHxSA (NV)	<rl< td=""><td>0.045</td><td>6:2 FTOH</td><td><math>87.5 \pm 8.3</math></td><td>60.5</td></rl<>	0.045	6:2 FTOH	$87.5 \pm 8.3$	60.5
FOSA (NV)	<rl< td=""><td>0.122</td><td>7:2 FTOH</td><td><rl< td=""><td>59.8</td></rl<></td></rl<>	0.122	7:2 FTOH	<rl< td=""><td>59.8</td></rl<>	59.8
MeFOSA (SV)	<rl< td=""><td>0.304</td><td>8:2 FTOH</td><td><rl< td=""><td>59.2</td></rl<></td></rl<>	0.304	8:2 FTOH	<rl< td=""><td>59.2</td></rl<>	59.2
EtFOSA (SV)	<rl< td=""><td>0.127</td><td>10:2 FTOH</td><td><rl< td=""><td>122</td></rl<></td></rl<>	0.127	10:2 FTOH	<rl< td=""><td>122</td></rl<>	122
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.134</td><td>4:2 FTS</td><td><rl< td=""><td>0.087</td></rl<></td></rl<>	0.134	4:2 FTS	<rl< td=""><td>0.087</td></rl<>	0.087
MeFOSAA	<rl< td=""><td>0.136</td><td>6:2 FTS</td><td><math>0.519 \pm 0.049</math></td><td>0.473</td></rl<>	0.136	6:2 FTS	$0.519 \pm 0.049$	0.473
EtFOSAA	<rl< td=""><td>0.163</td><td>8:2 FTS</td><td><rl< td=""><td>0.131</td></rl<></td></rl<>	0.163	8:2 FTS	<rl< td=""><td>0.131</td></rl<>	0.131
			10:2 FTS	<rl< td=""><td>0.028</td></rl<>	0.028
FASE (SV)					
MeFOSE	<rl< td=""><td>0.127</td><td></td><td></td><td></td></rl<>	0.127			
EtFOSE	<rl< td=""><td>0.300</td><td></td><td></td><td></td></rl<>	0.300			

 Table 52. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-FSC following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	<rl< td=""><td>0.991</td><td>PFEESA</td><td><rl< td=""><td>0.047</td></rl<></td></rl<>	0.991	PFEESA	<rl< td=""><td>0.047</td></rl<>	0.047
PFPeA	<rl< td=""><td>0.242</td><td>PF4OPeA</td><td><rl< td=""><td>0.22</td></rl<></td></rl<>	0.242	PF4OPeA	<rl< td=""><td>0.22</td></rl<>	0.22
PFHxA	<rl< td=""><td>0.242</td><td>PF5OHxA</td><td><rl< td=""><td>0.085</td></rl<></td></rl<>	0.242	PF5OHxA	<rl< td=""><td>0.085</td></rl<>	0.085
РҒНрА	<rl< td=""><td>1.28</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.037</td></rl<></td></rl<>	1.28	3-6-ОРҒНрА	<rl< td=""><td>0.037</td></rl<>	0.037
PFOA	<rl< td=""><td>0.454</td><td>HFPO-DA</td><td><rl< td=""><td>0.50</td></rl<></td></rl<>	0.454	HFPO-DA	<rl< td=""><td>0.50</td></rl<>	0.50
PFNA	<rl< td=""><td>0.242</td><td>ADONA</td><td><rl< td=""><td>0.037</td></rl<></td></rl<>	0.242	ADONA	<rl< td=""><td>0.037</td></rl<>	0.037
PFDA	<rl< td=""><td>0.500</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.037</td></rl<></td></rl<>	0.500	9CI-PF3ONS	<rl< td=""><td>0.037</td></rl<>	0.037
PFUnDA	<rl< td=""><td>0.242</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.038</td></rl<></td></rl<>	0.242	11Cl-PF3OUdS	<rl< td=""><td>0.038</td></rl<>	0.038
PFDoDA	<rl< td=""><td>0.242</td><td></td><td></td><td></td></rl<>	0.242			
PFTrDA	<rl< td=""><td>0.093</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.093	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.093</td><td>8:2 FTAcr</td><td><rl< td=""><td>16.5</td></rl<></td></rl<>	0.093	8:2 FTAcr	<rl< td=""><td>16.5</td></rl<>	16.5
			10:2 FTAcr	<rl< td=""><td>15.8</td></rl<>	15.8
PFSA (NV)					
PFPrS	<rl< td=""><td>0.042</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.042	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>0.042</td><td>6:2 FTMAC</td><td><math>69 \pm 12</math></td><td>70.6</td></rl<>	0.042	6:2 FTMAC	$69 \pm 12$	70.6
PFPeS	<rl< td=""><td>0.043</td><td>8:2 FTMAC</td><td><rl< td=""><td>72.2</td></rl<></td></rl<>	0.043	8:2 FTMAC	<rl< td=""><td>72.2</td></rl<>	72.2
PFHxS	<rl< td=""><td>0.085</td><td><b>10:2 FTMAC</b></td><td><rl< td=""><td>38.0</td></rl<></td></rl<>	0.085	<b>10:2 FTMAC</b>	<rl< td=""><td>38.0</td></rl<>	38.0
PFHpS	<rl< td=""><td>0.043</td><td></td><td></td><td></td></rl<>	0.043			
PFOS	<rl< td=""><td>0.225</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.225	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.09</td><td>8:2 FTOAc</td><td><rl< td=""><td>16.2</td></rl<></td></rl<>	0.09	8:2 FTOAc	<rl< td=""><td>16.2</td></rl<>	16.2
PFDS	<rl< td=""><td>0.044</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	0.044	10:2 FTOAc	No Value	
FASA (NV, SV)		<u> </u>	n:2 FTOH (V)		
FBSA (NV)	<rl< td=""><td>0.093</td><td><b>4:2 FTOH</b></td><td><rl< td=""><td>80.9</td></rl<></td></rl<>	0.093	<b>4:2 FTOH</b>	<rl< td=""><td>80.9</td></rl<>	80.9
MeFBSA (SV)	<rl< td=""><td>0.448</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>31.3</td></rl<></td></rl<>	0.448	<b>5:2 FTOH</b>	<rl< td=""><td>31.3</td></rl<>	31.3
FHxSA (NV)	<rl< td=""><td>0.046</td><td>6:2 FTOH</td><td><rl< td=""><td>82.7</td></rl<></td></rl<>	0.046	6:2 FTOH	<rl< td=""><td>82.7</td></rl<>	82.7
FOSA (NV)	<rl< td=""><td>0.122</td><td>7:2 FTOH</td><td><rl< td=""><td>32.1</td></rl<></td></rl<>	0.122	7:2 FTOH	<rl< td=""><td>32.1</td></rl<>	32.1
MeFOSA (SV)	<rl< td=""><td>0.180</td><td>8:2 FTOH</td><td><rl< td=""><td>121</td></rl<></td></rl<>	0.180	8:2 FTOH	<rl< td=""><td>121</td></rl<>	121
EtFOSA (SV)	<rl< td=""><td>0.447</td><td>10:2 FTOH</td><td><rl< td=""><td>82.2</td></rl<></td></rl<>	0.447	10:2 FTOH	<rl< td=""><td>82.2</td></rl<>	82.2
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.242</td><td>4:2 FTS</td><td><rl< td=""><td>0.087</td></rl<></td></rl<>	0.242	4:2 FTS	<rl< td=""><td>0.087</td></rl<>	0.087
MeFOSAA	<rl< td=""><td>0.242</td><td>6:2 FTS</td><td><rl< td=""><td>0.476</td></rl<></td></rl<>	0.242	6:2 FTS	<rl< td=""><td>0.476</td></rl<>	0.476
EtFOSAA	<rl< td=""><td>0.242</td><td>8:2 FTS</td><td><rl< td=""><td>0.480</td></rl<></td></rl<>	0.242	8:2 FTS	<rl< td=""><td>0.480</td></rl<>	0.480
			10:2 FTS	<rl< td=""><td>0.096</td></rl<>	0.096
FASE (SV)					
MeFOSE	<rl< td=""><td>0.181</td><td></td><td></td><td></td></rl<>	0.181			
EtFOSE	<rl< td=""><td>0.179</td><td></td><td></td><td></td></rl<>	0.179			

Table 53. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for laundered OS-FSC.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	<rl< td=""><td>0.901</td><td>PFEESA</td><td><rl< td=""><td>0.023</td></rl<></td></rl<>	0.901	PFEESA	<rl< td=""><td>0.023</td></rl<>	0.023
PFPeA	<rl< td=""><td>0.028</td><td>PF4OPeA</td><td><rl< td=""><td>0.025</td></rl<></td></rl<>	0.028	PF4OPeA	<rl< td=""><td>0.025</td></rl<>	0.025
PFHxA	<rl< td=""><td>0.145</td><td>PF5OHxA</td><td><rl< td=""><td>0.025</td></rl<></td></rl<>	0.145	PF5OHxA	<rl< td=""><td>0.025</td></rl<>	0.025
РҒНрА	<rl< td=""><td>0.547</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.025</td></rl<></td></rl<>	0.547	3-6-ОРҒНрА	<rl< td=""><td>0.025</td></rl<>	0.025
PFOA	<rl< td=""><td>0.152</td><td>HFPO-DA</td><td><rl< td=""><td>0.045</td></rl<></td></rl<>	0.152	HFPO-DA	<rl< td=""><td>0.045</td></rl<>	0.045
PFNA	<rl< td=""><td>0.029</td><td>ADONA</td><td><rl< td=""><td>0.025</td></rl<></td></rl<>	0.029	ADONA	<rl< td=""><td>0.025</td></rl<>	0.025
PFDA	<rl< td=""><td>0.085</td><td>9Cl-PF3ONS</td><td><rl< td=""><td>0.026</td></rl<></td></rl<>	0.085	9Cl-PF3ONS	<rl< td=""><td>0.026</td></rl<>	0.026
PFUnDA	<rl< td=""><td>0.043</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.027</td></rl<></td></rl<>	0.043	11Cl-PF3OUdS	<rl< td=""><td>0.027</td></rl<>	0.027
PFDoDA	<rl< td=""><td>0.028</td><td></td><td></td><td></td></rl<>	0.028			
PFTrDA	<rl< td=""><td>0.083</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.083	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.053</td><td>8:2 FTAcr</td><td><rl< td=""><td>13.2</td></rl<></td></rl<>	0.053	8:2 FTAcr	<rl< td=""><td>13.2</td></rl<>	13.2
			10:2 FTAcr	<rl< td=""><td>25.4</td></rl<>	25.4
PFSA (NV)					
PFPrS	<rl< td=""><td>0.029</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.029	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>0.025</td><td>6:2 FTMAC</td><td><rl< td=""><td>56.6</td></rl<></td></rl<>	0.025	6:2 FTMAC	<rl< td=""><td>56.6</td></rl<>	56.6
PFPeS	<rl< td=""><td>0.027</td><td>8:2 FTMAC</td><td><rl< td=""><td>58.0</td></rl<></td></rl<>	0.027	8:2 FTMAC	<rl< td=""><td>58.0</td></rl<>	58.0
PFHxS	<rl< td=""><td>0.065</td><td><b>10:2 FTMAC</b></td><td><rl< td=""><td>30.5</td></rl<></td></rl<>	0.065	<b>10:2 FTMAC</b>	<rl< td=""><td>30.5</td></rl<>	30.5
PFHpS	<rl< td=""><td>0.027</td><td></td><td></td><td></td></rl<>	0.027			
PFOS	<rl< td=""><td>0.054</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.054	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.027</td><td>8:2 FTOAc</td><td><rl< td=""><td>13.0</td></rl<></td></rl<>	0.027	8:2 FTOAc	<rl< td=""><td>13.0</td></rl<>	13.0
PFDS	<rl< td=""><td>1.41</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	1.41	10:2 FTOAc	No Value	
FASA (NV, SV)		<u> </u>	n:2 FTOH (V)		
FBSA (NV)	<rl< td=""><td>0.028</td><td><b>4:2 FTOH</b></td><td><rl< td=""><td>65.3</td></rl<></td></rl<>	0.028	<b>4:2 FTOH</b>	<rl< td=""><td>65.3</td></rl<>	65.3
MeFBSA (SV)	<rl< td=""><td>0.474</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>64.5</td></rl<></td></rl<>	0.474	<b>5:2 FTOH</b>	<rl< td=""><td>64.5</td></rl<>	64.5
FHxSA (NV)	<rl< td=""><td>0.058</td><td>6:2 FTOH</td><td><rl< td=""><td>66.4</td></rl<></td></rl<>	0.058	6:2 FTOH	<rl< td=""><td>66.4</td></rl<>	66.4
FOSA (NV)	<rl< td=""><td>0.058</td><td>7:2 FTOH</td><td><rl< td=""><td>25.6</td></rl<></td></rl<>	0.058	7:2 FTOH	<rl< td=""><td>25.6</td></rl<>	25.6
MeFOSA (SV)	<rl< td=""><td>0.086</td><td>8:2 FTOH</td><td><rl< td=""><td>64.0</td></rl<></td></rl<>	0.086	8:2 FTOH	<rl< td=""><td>64.0</td></rl<>	64.0
EtFOSA (SV)	<rl< td=""><td>0.091</td><td>10:2 FTOH</td><td><rl< td=""><td>66.4</td></rl<></td></rl<>	0.091	10:2 FTOH	<rl< td=""><td>66.4</td></rl<>	66.4
FASAA (NV)		<u>.</u>	<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.057</td><td>4:2 FTS</td><td><math display="block">0.18\pm0.13</math></td><td>0.077</td></rl<>	0.057	4:2 FTS	$0.18\pm0.13$	0.077
MeFOSAA	<rl< td=""><td>0.028</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.028	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.058</td><td>8:2 FTS</td><td><rl< td=""><td>0.130</td></rl<></td></rl<>	0.058	8:2 FTS	<rl< td=""><td>0.130</td></rl<>	0.130
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.042</td><td></td><td></td><td></td></rl<>	0.042			
EtFOSE	<rl< td=""><td>0.090</td><td></td><td></td><td></td></rl<>	0.090			

Table 54. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for weathered OS-FSC.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$5.88 \pm 0.26$	0.388	PFEESA	<rl< td=""><td>0.014</td></rl<>	0.014
PFPeA	$6.36\pm0.25$	0.123	PF4OPeA	<rl< td=""><td>0.015</td></rl<>	0.015
PFHxA	$12.9 \pm 1.2$	0.212	PF5OHxA	<rl< td=""><td>0.014</td></rl<>	0.014
РҒНрА	$4.0 \pm 0.3$	0.220	3-6-ОРҒНрА	<rl< td=""><td>0.015</td></rl<>	0.015
PFOA	<rl< td=""><td>0.106</td><td>HFPO-DA</td><td><rl< td=""><td>0.146</td></rl<></td></rl<>	0.106	HFPO-DA	<rl< td=""><td>0.146</td></rl<>	0.146
PFNA	<rl< td=""><td>0.015</td><td>ADONA</td><td><rl< td=""><td>0.014</td></rl<></td></rl<>	0.015	ADONA	<rl< td=""><td>0.014</td></rl<>	0.014
PFDA	<rl< td=""><td>0.100</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.027</td></rl<></td></rl<>	0.100	9CI-PF3ONS	<rl< td=""><td>0.027</td></rl<>	0.027
PFUnDA	<rl< td=""><td>0.036</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.012</td></rl<></td></rl<>	0.036	11Cl-PF3OUdS	<rl< td=""><td>0.012</td></rl<>	0.012
PFDoDA	<rl< td=""><td>0.053</td><td></td><td></td><td></td></rl<>	0.053			
PFTrDA	<rl< td=""><td>0.073</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.073	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.102</td><td>8:2 FTAcr</td><td><rl< td=""><td>31.5</td></rl<></td></rl<>	0.102	8:2 FTAcr	<rl< td=""><td>31.5</td></rl<>	31.5
			10:2 FTAcr	<rl< td=""><td>14.8</td></rl<>	14.8
PFSA (NV)					
PFPrS	<rl< td=""><td>0.021</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.021	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>0.045</td><td>6:2 FTMAC</td><td><math display="block">1450\pm180</math></td><td>52.5</td></rl<>	0.045	6:2 FTMAC	$1450\pm180$	52.5
PFPeS	<rl< td=""><td>0.015</td><td>8:2 FTMAC</td><td><rl< td=""><td>53.7</td></rl<></td></rl<>	0.015	8:2 FTMAC	<rl< td=""><td>53.7</td></rl<>	53.7
PFHxS	$\begin{array}{c} 0.02682 \pm \\ 0.00053 \end{array}$	0.014	10:2 FTMAC	<rl< td=""><td>28.3</td></rl<>	28.3
PFHpS	<rl< td=""><td>0.015</td><td></td><td></td><td></td></rl<>	0.015			
PFOS	<rl< td=""><td>0.047</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.047	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.029</td><td>8:2 FTOAc</td><td><rl< td=""><td>30.6</td></rl<></td></rl<>	0.029	8:2 FTOAc	<rl< td=""><td>30.6</td></rl<>	30.6
PFDS	<rl< td=""><td>0.030</td><td>10:2 FTOAc</td><td><rl< td=""><td>15.4</td></rl<></td></rl<>	0.030	10:2 FTOAc	<rl< td=""><td>15.4</td></rl<>	15.4
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	$0.0283 \pm 0.0043$	0.015	4:2 FTOH	<rl< td=""><td>79.9</td></rl<>	79.9
MeFBSA (SV)	<rl< td=""><td>0.159</td><td>5:2 FTOH</td><td><rl< td=""><td>76.0</td></rl<></td></rl<>	0.159	5:2 FTOH	<rl< td=""><td>76.0</td></rl<>	76.0
FHxSA (NV)	<rl< td=""><td>0.015</td><td>6:2 FTOH</td><td><math>690 \pm 80</math></td><td>29.4</td></rl<>	0.015	6:2 FTOH	$690 \pm 80$	29.4
FOSA (NV)	<rl< td=""><td>0.015</td><td>7:2 FTOH</td><td><rl< td=""><td>75.7</td></rl<></td></rl<>	0.015	7:2 FTOH	<rl< td=""><td>75.7</td></rl<>	75.7
MeFOSA (SV)	<rl< td=""><td>0.400</td><td>8:2 FTOH</td><td><rl< td=""><td>140</td></rl<></td></rl<>	0.400	8:2 FTOH	<rl< td=""><td>140</td></rl<>	140
EtFOSA (SV)	<rl< td=""><td>0.401</td><td>10:2 FTOH</td><td><rl< td=""><td>76.1</td></rl<></td></rl<>	0.401	10:2 FTOH	<rl< td=""><td>76.1</td></rl<>	76.1
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.015</td><td>4:2 FTS</td><td><rl< td=""><td>2.59</td></rl<></td></rl<>	0.015	4:2 FTS	<rl< td=""><td>2.59</td></rl<>	2.59
MeFOSAA	<rl< td=""><td>0.069</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.069	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.030</td><td>8:2 FTS</td><td><rl< td=""><td>0.066</td></rl<></td></rl<>	0.030	8:2 FTS	<rl< td=""><td>0.066</td></rl<>	0.066
			10:2 FTS	<rl< td=""><td>0.015</td></rl<>	0.015
FASE (SV)					
MeFOSE	<rl< td=""><td>0.402</td><td></td><td></td><td></td></rl<>	0.402			
EtFOSE	<rl< td=""><td>0.831</td><td></td><td></td><td></td></rl<>	0.831			

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$3.88 \pm 0.59$	0.079	PFEESA	<rl< td=""><td>0.010</td></rl<>	0.010
PFPeA	$1.97\pm0.32$	0.043	PF4OPeA	<rl< td=""><td>0.012</td></rl<>	0.012
PFHxA	$11.15\pm0.82$	0.108	PF5OHxA	$0.028\pm0.014$	0.011
РҒНрА	$0.94 \pm 0.40$	0.204	3-6-ОРҒНрА	<rl< td=""><td>0.011</td></rl<>	0.011
PFOA	$0.51\pm0.31$	0.092	HFPO-DA	$0.80\pm0.64$	0.013
PFNA	$0.36\pm0.28$	0.038	ADONA	<rl< td=""><td>0.011</td></rl<>	0.011
PFDA	$0.30\pm0.21$	0.036	9CI-PF3ONS	<rl< td=""><td>0.012</td></rl<>	0.012
PFUnDA	<rl< td=""><td>0.023</td><th>11Cl-PF3OUdS</th><td><rl< td=""><td>0.012</td></rl<></td></rl<>	0.023	11Cl-PF3OUdS	<rl< td=""><td>0.012</td></rl<>	0.012
PFDoDA	<rl< td=""><td>0.023</td><th></th><td></td><td></td></rl<>	0.023			
PFTrDA	$0.104\pm0.077$	0.015	n:2 FTAcr (V)		
PFTeDA	$0.060\pm0.041$	0.030	8:2 FTAcr	<rl< td=""><td>14.6</td></rl<>	14.6
			10:2 FTAcr	<rl< td=""><td>14.1</td></rl<>	14.1
PFSA (NV)					
PFPrS	<rl< td=""><td>0.020</td><th>n:2 FTMAC (V)</th><td></td><td></td></rl<>	0.020	n:2 FTMAC (V)		
PFBS	$0.092\pm0.020$	0.011	6:2 FTMAC	$900 \pm 160$	49.8
PFPeS	<rl< td=""><td>0.014</td><th>8:2 FTMAC</th><td><rl< td=""><td>51.0</td></rl<></td></rl<>	0.014	8:2 FTMAC	<rl< td=""><td>51.0</td></rl<>	51.0
PFHxS	<rl< td=""><td>0.021</td><th><b>10:2 FTMAC</b></th><td><rl< td=""><td>26.9</td></rl<></td></rl<>	0.021	<b>10:2 FTMAC</b>	<rl< td=""><td>26.9</td></rl<>	26.9
PFHpS	<rl< td=""><td>0.012</td><th></th><td></td><td></td></rl<>	0.012			
PFOS	<rl< td=""><td>0.046</td><th>n:2 FTOAc (V)</th><td></td><td></td></rl<>	0.046	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.012</td><th>8:2 FTOAc</th><td><rl< td=""><td>14.2</td></rl<></td></rl<>	0.012	8:2 FTOAc	<rl< td=""><td>14.2</td></rl<>	14.2
PFDS	<rl< td=""><td>0.012</td><th>10:2 FTOAc</th><td><rl< td=""><td>14.6</td></rl<></td></rl<>	0.012	10:2 FTOAc	<rl< td=""><td>14.6</td></rl<>	14.6
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	<rl< td=""><td>0.013</td><th><b>4:2 FTOH</b></th><td><rl< td=""><td>29.7</td></rl<></td></rl<>	0.013	<b>4:2 FTOH</b>	<rl< td=""><td>29.7</td></rl<>	29.7
MeFBSA (SV)	<rl< td=""><td>0.772</td><th><b>5:2 FTOH</b></th><td><rl< td=""><td>72.1</td></rl<></td></rl<>	0.772	<b>5:2 FTOH</b>	<rl< td=""><td>72.1</td></rl<>	72.1
FHxSA (NV)	<rl< td=""><td>0.013</td><th>6:2 FTOH</th><td><math>541 \pm 96</math></td><td>72.7</td></rl<>	0.013	6:2 FTOH	$541 \pm 96$	72.7
FOSA (NV)	<rl< td=""><td>0.016</td><th><b>7:2 FTOH</b></th><td><rl< td=""><td>71.8</td></rl<></td></rl<>	0.016	<b>7:2 FTOH</b>	<rl< td=""><td>71.8</td></rl<>	71.8
MeFOSA (SV)	<rl< td=""><td>0.369</td><th>8:2 FTOH</th><td><rl< td=""><td>71.1</td></rl<></td></rl<>	0.369	8:2 FTOH	<rl< td=""><td>71.1</td></rl<>	71.1
EtFOSA (SV)	<rl< td=""><td>0.154</td><th>10:2 FTOH</th><td><rl< td=""><td>147</td></rl<></td></rl<>	0.154	10:2 FTOH	<rl< td=""><td>147</td></rl<>	147
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.012</td><th>4:2 FTS</th><td><rl< td=""><td>0.513</td></rl<></td></rl<>	0.012	4:2 FTS	<rl< td=""><td>0.513</td></rl<>	0.513
MeFOSAA	<rl< td=""><td>0.067</td><th>6:2 FTS</th><td>No Value</td><td></td></rl<>	0.067	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.057</td><th>8:2 FTS</th><td><rl< td=""><td>0.024</td></rl<></td></rl<>	0.057	8:2 FTS	<rl< td=""><td>0.024</td></rl<>	0.024
			10:2 FTS	<rl< td=""><td>0.025</td></rl<>	0.025
FASE (SV)					
MeFOSE	<rl< td=""><td>0.155</td><th></th><td></td><td></td></rl<>	0.155			
EtFOSE	<rl< td=""><td>0.365</td><th></th><td></td><td></td></rl<>	0.365			

 Table 56. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for OS-G following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$0.994 \pm 0.018$	0.930	PFEESA	<rl< td=""><td>0.044</td></rl<>	0.044
PFPeA	$0.964\pm0.052$	0.227	PF4OPeA	<rl< td=""><td>0.207</td></rl<>	0.207
PFHxA	$6.77\pm0.40$	0.227	PF5OHxA	<rl< td=""><td>0.079</td></rl<>	0.079
РҒНрА	<rl< td=""><td>1.20</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.035</td></rl<></td></rl<>	1.20	3-6-ОРҒНрА	<rl< td=""><td>0.035</td></rl<>	0.035
PFOA	<rl< td=""><td>0.426</td><td>HFPO-DA</td><td><rl< td=""><td>0.470</td></rl<></td></rl<>	0.426	HFPO-DA	<rl< td=""><td>0.470</td></rl<>	0.470
PFNA	<rl< td=""><td>0.227</td><td>ADONA</td><td><rl< td=""><td>0.035</td></rl<></td></rl<>	0.227	ADONA	<rl< td=""><td>0.035</td></rl<>	0.035
PFDA	<rl< td=""><td>0.470</td><td>9Cl-PF3ONS</td><td><rl< td=""><td>0.035</td></rl<></td></rl<>	0.470	9Cl-PF3ONS	<rl< td=""><td>0.035</td></rl<>	0.035
PFUnDA	<rl< td=""><td>0.227</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.036</td></rl<></td></rl<>	0.227	11Cl-PF3OUdS	<rl< td=""><td>0.036</td></rl<>	0.036
PFDoDA	<rl< td=""><td>0.227</td><td></td><td></td><td></td></rl<>	0.227			
PFTrDA	<rl< td=""><td>0.087</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.087	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.087</td><td>8:2 FTAcr</td><td><rl< td=""><td>15.2</td></rl<></td></rl<>	0.087	8:2 FTAcr	<rl< td=""><td>15.2</td></rl<>	15.2
			10:2 FTAcr	<rl< td=""><td>14.6</td></rl<>	14.6
PFSA (NV)					
PFPrS	<rl< td=""><td>0.039</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.039	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>0.039</td><td>6:2 FTMAC</td><td><math>329 \pm 10</math></td><td>64.9</td></rl<>	0.039	6:2 FTMAC	$329 \pm 10$	64.9
PFPeS	<rl< td=""><td>0.040</td><td>8:2 FTMAC</td><td><rl< td=""><td>66.4</td></rl<></td></rl<>	0.040	8:2 FTMAC	<rl< td=""><td>66.4</td></rl<>	66.4
PFHxS	<rl< td=""><td>0.080</td><td><b>10:2 FTMAC</b></td><td><rl< td=""><td>35.0</td></rl<></td></rl<>	0.080	<b>10:2 FTMAC</b>	<rl< td=""><td>35.0</td></rl<>	35.0
PFHpS	<rl< td=""><td>0.041</td><td></td><td></td><td></td></rl<>	0.041			
PFOS	<rl< td=""><td>0.211</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.211	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.084</td><td>8:2 FTOAc</td><td><rl< td=""><td>14.9</td></rl<></td></rl<>	0.084	8:2 FTOAc	<rl< td=""><td>14.9</td></rl<>	14.9
PFDS	<rl< td=""><td>0.041</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	0.041	10:2 FTOAc	No Value	
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	<rl< td=""><td>0.087</td><td><b>4:2 FTOH</b></td><td><rl< td=""><td>74.4</td></rl<></td></rl<>	0.087	<b>4:2 FTOH</b>	<rl< td=""><td>74.4</td></rl<>	74.4
MeFBSA (SV)	<rl< td=""><td>0.468</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>28.8</td></rl<></td></rl<>	0.468	<b>5:2 FTOH</b>	<rl< td=""><td>28.8</td></rl<>	28.8
FHxSA (NV)	<rl< td=""><td>0.043</td><td>6:2 FTOH</td><td><math display="block">136.4\pm8.7</math></td><td>76.1</td></rl<>	0.043	6:2 FTOH	$136.4\pm8.7$	76.1
FOSA (NV)	<rl< td=""><td>0.115</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>29.5</td></rl<></td></rl<>	0.115	<b>7:2 FTOH</b>	<rl< td=""><td>29.5</td></rl<>	29.5
MeFOSA (SV)	<rl< td=""><td>0.188</td><td>8:2 FTOH</td><td><rl< td=""><td>111</td></rl<></td></rl<>	0.188	8:2 FTOH	<rl< td=""><td>111</td></rl<>	111
EtFOSA (SV)	<rl< td=""><td>0.467</td><td>10:2 FTOH</td><td><rl< td=""><td>75.6</td></rl<></td></rl<>	0.467	10:2 FTOH	<rl< td=""><td>75.6</td></rl<>	75.6
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	No Value		4:2 FTS	<rl< td=""><td>0.082</td></rl<>	0.082
MeFOSAA	<rl< td=""><td>0.227</td><td>6:2 FTS</td><td><math display="block">1.33\pm0.47</math></td><td>0.447</td></rl<>	0.227	6:2 FTS	$1.33\pm0.47$	0.447
EtFOSAA	<rl< td=""><td>0.227</td><td>8:2 FTS</td><td><rl< td=""><td>0.451</td></rl<></td></rl<>	0.227	8:2 FTS	<rl< td=""><td>0.451</td></rl<>	0.451
			10:2 FTS	<rl< td=""><td>0.090</td></rl<>	0.090
FASE (SV)					
MeFOSE	<rl< td=""><td>0.189</td><td></td><td></td><td></td></rl<>	0.189			
EtFOSE	<rl< td=""><td>0.187</td><td></td><td></td><td></td></rl<>	0.187			

Table 57. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for laundered OS-G.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$6.09\pm0.89$	0.787	PFEESA	<rl< td=""><td>0.02</td></rl<>	0.02
PFPeA	$18.2 \pm 1.4$	0.025	PF4OPeA	<rl< td=""><td>0.022</td></rl<>	0.022
PFHxA	$76.8\pm3.7$	0.126	PF5OHxA	<rl< td=""><td>0.022</td></rl<>	0.022
PFHpA	$93.82\pm0.40$	0.478	3-6-ОРҒНрА	<rl< td=""><td>0.022</td></rl<>	0.022
PFOA	<rl< td=""><td>0.133</td><td>HFPO-DA</td><td><rl< td=""><td>0.039</td></rl<></td></rl<>	0.133	HFPO-DA	<rl< td=""><td>0.039</td></rl<>	0.039
PFNA	$0.071 \pm 0.026$	0.025	ADONA	<rl< td=""><td>0.022</td></rl<>	0.022
PFDA	$0.084 \pm 0.021$	0.074	9Cl-PF3ONS	<rl< td=""><td>0.023</td></rl<>	0.023
PFUnDA	$0.0574 \pm 0.0083$	0.038	11Cl-PF3OUdS	<rl< td=""><td>0.023</td></rl<>	0.023
PFDoDA	$0.053 \pm 0.012$	0.025			
PFTrDA	<rl< td=""><td>0.072</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.072	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.046</td><td>8:2 FTAcr</td><td><rl< td=""><td>15.3</td></rl<></td></rl<>	0.046	8:2 FTAcr	<rl< td=""><td>15.3</td></rl<>	15.3
			10:2 FTAcr	<rl< td=""><td>29.5</td></rl<>	29.5
PFSA (NV)					
PFPrS	<rl< td=""><td>0.025</td><td>n:2 FTMAC(V)</td><td></td><td></td></rl<>	0.025	n:2 FTMAC(V)		
PFBS	$0.118 \pm 0.045$	0.022	6:2 FTMAC	951 ± 81	65.7
PFPeS	<rl< td=""><td>0.023</td><td>8:2 FTMAC</td><td><rl< td=""><td>67.3</td></rl<></td></rl<>	0.023	8:2 FTMAC	<rl< td=""><td>67.3</td></rl<>	67.3
PFHxS	<rl< td=""><td>0.056</td><td>10:2 FTMAC</td><td><rl< td=""><td>35.5</td></rl<></td></rl<>	0.056	10:2 FTMAC	<rl< td=""><td>35.5</td></rl<>	35.5
PFHpS	<rl< td=""><td>0.024</td><td></td><td></td><td></td></rl<>	0.024			
PFOS	<rl< td=""><td>0.047</td><td><i>n:2 FTOAc (V)</i></td><td></td><td></td></rl<>	0.047	<i>n:2 FTOAc (V)</i>		
PFNS	0.0445 ± 0.0049	0.024	8:2 FTOAc	<rl< td=""><td>15.1</td></rl<>	15.1
PFDS	<rl< td=""><td>1.23</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	1.23	10:2 FTOAc	No Value	
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	No Value		<b>4:2 FTOH</b>	<rl< td=""><td>75.8</td></rl<>	75.8
MeFBSA (SV)	<rl< td=""><td>1.01</td><td>5:2 FTOH</td><td><rl< td=""><td>74.9</td></rl<></td></rl<>	1.01	5:2 FTOH	<rl< td=""><td>74.9</td></rl<>	74.9
FHxSA (NV)	<rl< td=""><td>0.050</td><td>6:2 FTOH</td><td><math>590 \pm 56</math></td><td>77.1</td></rl<>	0.050	6:2 FTOH	$590 \pm 56$	77.1
FOSA (NV)	$0.061 \pm 0.01$	0.050	<b>7:2 FTOH</b>	<rl< td=""><td>29.7</td></rl<>	29.7
MeFOSA (SV)	<rl< td=""><td>0.184</td><td>8:2 FTOH</td><td><rl< td=""><td>74.3</td></rl<></td></rl<>	0.184	8:2 FTOH	<rl< td=""><td>74.3</td></rl<>	74.3
EtFOSA (SV)	<rl< td=""><td>0.194</td><td>10:2 FTOH</td><td><rl< td=""><td>77.0</td></rl<></td></rl<>	0.194	10:2 FTOH	<rl< td=""><td>77.0</td></rl<>	77.0
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.049</td><td>4:2 FTS</td><td><rl< td=""><td>0.067</td></rl<></td></rl<>	0.049	4:2 FTS	<rl< td=""><td>0.067</td></rl<>	0.067
MeFOSAA	<rl< td=""><td>0.025</td><td>6:2 FTS</td><td><math display="block">9.42\pm0.35</math></td><td>0.673</td></rl<>	0.025	6:2 FTS	$9.42\pm0.35$	0.673
EtFOSAA	<rl< td=""><td>0.050</td><td>8:2 FTS</td><td><rl< td=""><td>0.114</td></rl<></td></rl<>	0.050	8:2 FTS	<rl< td=""><td>0.114</td></rl<>	0.114
			10:2 FTS	<rl< td=""><td>0.112</td></rl<>	0.112
FASE (SV)					
MeFOSE	<rl< td=""><td>0.090</td><td></td><td></td><td></td></rl<>	0.090			
EtFOSE	<rl< td=""><td>0.192</td><td></td><td></td><td></td></rl<>	0.192			

Table 58. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for weathered OS-G.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$3.57 \pm 0.95$	0.091	PFEESA	<rl< td=""><td>0.012</td></rl<>	0.012
PFPeA	$0.739 \pm 0.086$	0.053	PF4OPeA	<rl< td=""><td>0.013</td></rl<>	0.013
PFHxA	$0.689 \pm 0.075$	0.125	PF5OHxA	<rl< td=""><td>0.013</td></rl<>	0.013
PFHpA	<rl< td=""><td>0.236</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.013</td></rl<></td></rl<>	0.236	3-6-ОРҒНрА	<rl< td=""><td>0.013</td></rl<>	0.013
PFOA	$0.737 \pm 0.089$	0.107	HFPO-DA	<rl< td=""><td>0.015</td></rl<>	0.015
PFNA	$0.0639 \pm 0.009$	0.044	ADONA	<rl< td=""><td>0.013</td></rl<>	0.013
PFDA	$0.087 \pm 0.021$	0.042	9CI-PF3ONS	<rl< td=""><td>0.014</td></rl<>	0.014
PFUnDA	<rl< td=""><td>0.039</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.014</td></rl<></td></rl<>	0.039	11Cl-PF3OUdS	<rl< td=""><td>0.014</td></rl<>	0.014
PFDoDA	<rl< td=""><td>0.037</td><td></td><td></td><td></td></rl<>	0.037			
PFTrDA	$0.041 \pm 0.017$	0.017	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.035</td><td>8:2 FTAcr</td><td><rl< td=""><td>11.8</td></rl<></td></rl<>	0.035	8:2 FTAcr	<rl< td=""><td>11.8</td></rl<>	11.8
			10:2 FTAcr	<rl< td=""><td>11.4</td></rl<>	11.4
PFSA (NV)					
PFPrS	<rl< td=""><td>0.026</td><td>n:2 FTMAC(V)</td><td></td><td></td></rl<>	0.026	n:2 FTMAC(V)		
PFBS	$1.05 \pm 0.13$	0.013	6:2 FTMAC	<rl< td=""><td>40.5</td></rl<>	40.5
PFPeS	<rl< td=""><td>0.016</td><td>8:2 FTMAC</td><td><rl< td=""><td>41.5</td></rl<></td></rl<>	0.016	8:2 FTMAC	<rl< td=""><td>41.5</td></rl<>	41.5
PFHxS	<rl< td=""><td>0.028</td><td>10:2 FTMAC</td><td><rl< td=""><td>21.9</td></rl<></td></rl<>	0.028	10:2 FTMAC	<rl< td=""><td>21.9</td></rl<>	21.9
PFHpS	<rl< td=""><td>0.014</td><td></td><td></td><td></td></rl<>	0.014			
PFOS	No Value		n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.014</td><td>8:2 FTOAc</td><td><rl< td=""><td>23.5</td></rl<></td></rl<>	0.014	8:2 FTOAc	<rl< td=""><td>23.5</td></rl<>	23.5
PFDS	<rl< td=""><td>0.014</td><td>10:2 FTOAc</td><td><rl< td=""><td>24.2</td></rl<></td></rl<>	0.014	10:2 FTOAc	<rl< td=""><td>24.2</td></rl<>	24.2
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	$0.8 \pm 0.13$	0.015	4:2 FTOH (V)	<rl< td=""><td>61.6</td></rl<>	61.6
MeFBSA (SV)	No Value	0.015	5:2 FTOH	<rl <rl< td=""><td>58.6</td></rl<></rl 	58.6
FHxSA (NV)	<rl< td=""><td>0.015</td><td>6:2 FTOH</td><td><rl <rl< td=""><td>59.0</td></rl<></rl </td></rl<>	0.015	6:2 FTOH	<rl <rl< td=""><td>59.0</td></rl<></rl 	59.0
FOSA (NV)	0.0243 ± 0.0045	0.019	7:2 FTOH	<rl< td=""><td>58.3</td></rl<>	58.3
MeFOSA (SV)	No Value	0.017	8:2 FTOH	<rl< td=""><td>57.7</td></rl<>	57.7
EtFOSA (SV)	No Value		10:2 FTOH	<rl< td=""><td>58.6</td></rl<>	58.6
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.014</td><td>4:2 FTS</td><td><rl< td=""><td>0.281</td></rl<></td></rl<>	0.014	4:2 FTS	<rl< td=""><td>0.281</td></rl<>	0.281
MeFOSAA	<rl< td=""><td>0.077</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.077	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.066</td><td>8:2 FTS</td><td><rl< td=""><td>0.028</td></rl<></td></rl<>	0.066	8:2 FTS	<rl< td=""><td>0.028</td></rl<>	0.028
			10:2 FTS	<rl< td=""><td>0.073</td></rl<>	0.073
FASE (SV)					
MeFOSE	No Value				
EtFOSE	No Value				

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	<rl< td=""><td>0.553</td><td>PFEESA</td><td><rl< td=""><td>0.013</td></rl<></td></rl<>	0.553	PFEESA	<rl< td=""><td>0.013</td></rl<>	0.013
PFPeA	<rl< td=""><td>0.029</td><td>PF4OPeA</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.029	PF4OPeA	<rl< td=""><td>0.015</td></rl<>	0.015
PFHxA	<rl< td=""><td>0.264</td><td>PF5OHxA</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.264	PF5OHxA	<rl< td=""><td>0.015</td></rl<>	0.015
РҒНрА	<rl< td=""><td>0.120</td><td><b>3-6-ОРFHpA</b></td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.120	<b>3-6-ОРFHpA</b>	<rl< td=""><td>0.015</td></rl<>	0.015
PFOA	<rl< td=""><td>0.173</td><td>HFPO-DA</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.173	HFPO-DA	<rl< td=""><td>0.015</td></rl<>	0.015
PFNA	<rl< td=""><td>0.058</td><td>ADONA</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.058	ADONA	<rl< td=""><td>0.015</td></rl<>	0.015
PFDA	<rl< td=""><td>0.031</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.016</td></rl<></td></rl<>	0.031	9CI-PF3ONS	<rl< td=""><td>0.016</td></rl<>	0.016
PFUnDA	<rl< td=""><td>0.081</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.016</td></rl<></td></rl<>	0.081	11Cl-PF3OUdS	<rl< td=""><td>0.016</td></rl<>	0.016
PFDoDA	<rl< td=""><td>0.024</td><td></td><td></td><td></td></rl<>	0.024			
PFTrDA	<rl< td=""><td>0.026</td><td>n:2 FTAcr(V)</td><td></td><td></td></rl<>	0.026	n:2 FTAcr(V)		
PFTeDA	<rl< td=""><td>0.017</td><td>8:2 FTAcr</td><td><rl< td=""><td>94.2</td></rl<></td></rl<>	0.017	8:2 FTAcr	<rl< td=""><td>94.2</td></rl<>	94.2
			10:2 FTAcr	<rl< td=""><td>35.7</td></rl<>	35.7
PFSA (NV)					
PFPrS	<rl< td=""><td>0.034</td><td>n:2 FTMAC(V)</td><td></td><td></td></rl<>	0.034	n:2 FTMAC(V)		
PFBS	$2.88\pm0.14$	1.68	6:2 FTMAC	<rl< td=""><td>307</td></rl<>	307
PFPeS	<rl< td=""><td>0.016</td><td>8:2 FTMAC</td><td><rl< td=""><td>64.5</td></rl<></td></rl<>	0.016	8:2 FTMAC	<rl< td=""><td>64.5</td></rl<>	64.5
PFHxS	<rl< td=""><td>2.66</td><td>10:2 FTMAC</td><td><rl< td=""><td>34.0</td></rl<></td></rl<>	2.66	10:2 FTMAC	<rl< td=""><td>34.0</td></rl<>	34.0
PFHpS	<rl< td=""><td>0.016</td><td></td><td></td><td></td></rl<>	0.016			
PFOS	<rl< td=""><td>2.80</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	2.80	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.032</td><td>8:2 FTOAc</td><td><rl< td=""><td>34.9</td></rl<></td></rl<>	0.032	8:2 FTOAc	<rl< td=""><td>34.9</td></rl<>	34.9
PFDS	<rl< td=""><td>0.017</td><td>10:2 FTOAc</td><td><rl< td=""><td>37.1</td></rl<></td></rl<>	0.017	10:2 FTOAc	<rl< td=""><td>37.1</td></rl<>	37.1
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	<rl< td=""><td>0.017</td><td><b>4:2 FTOH</b></td><td><rl< td=""><td>91.4</td></rl<></td></rl<>	0.017	<b>4:2 FTOH</b>	<rl< td=""><td>91.4</td></rl<>	91.4
MeFBSA (SV)	<rl< td=""><td>0.481</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>87.0</td></rl<></td></rl<>	0.481	<b>5:2 FTOH</b>	<rl< td=""><td>87.0</td></rl<>	87.0
FHxSA (NV)	<rl< td=""><td>0.017</td><td>6:2 FTOH</td><td><rl< td=""><td>92.0</td></rl<></td></rl<>	0.017	6:2 FTOH	<rl< td=""><td>92.0</td></rl<>	92.0
FOSA (NV)	<rl< td=""><td>0.019</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>90.9</td></rl<></td></rl<>	0.019	<b>7:2 FTOH</b>	<rl< td=""><td>90.9</td></rl<>	90.9
MeFOSA (SV)	<rl< td=""><td>0.479</td><td>8:2 FTOH</td><td><rl< td=""><td>89.9</td></rl<></td></rl<>	0.479	8:2 FTOH	<rl< td=""><td>89.9</td></rl<>	89.9
EtFOSA (SV)	<rl< td=""><td>0.480</td><td>10:2 FTOH</td><td><rl< td=""><td>185</td></rl<></td></rl<>	0.480	10:2 FTOH	<rl< td=""><td>185</td></rl<>	185
FASAA (NV)			n:2 FTS (NV)		
FOSAA	No Value		4:2 FTS	<rl< td=""><td>0.028</td></rl<>	0.028
MeFOSAA	<rl< td=""><td>0.017</td><td>6:2 FTS</td><td><rl< td=""><td>0.964</td></rl<></td></rl<>	0.017	6:2 FTS	<rl< td=""><td>0.964</td></rl<>	0.964
EtFOSAA	<rl< td=""><td>0.017</td><td>8:2 FTS</td><td><rl< td=""><td>0.016</td></rl<></td></rl<>	0.017	8:2 FTS	<rl< td=""><td>0.016</td></rl<>	0.016
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.482</td><td></td><td></td><td></td></rl<>	0.482			
EtFOSE	<rl< td=""><td>0.475</td><td></td><td></td><td></td></rl<>	0.475			

**Table 60.** Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for TL-A following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	$2.3 \pm 2.6$	0.199	PFEESA	<rl< td=""><td>0.017</td></rl<>	0.017
PFPeA	$0.21 \pm 0.21$	0.037	PF4OPeA	<rl< td=""><td>0.017</td></rl<>	0.017
PFHxA	<rl< td=""><td>0.099</td><td>PF5OHxA</td><td><rl< td=""><td>0.017</td></rl<></td></rl<>	0.099	PF5OHxA	<rl< td=""><td>0.017</td></rl<>	0.017
PFHpA	<rl< td=""><td>0.082</td><td>3-6-OPFHpA</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.082	3-6-OPFHpA	<rl< td=""><td>0.015</td></rl<>	0.015
PFOA	<rl< td=""><td>0.106</td><td>HFPO-DA</td><td><rl< td=""><td>0.023</td></rl<></td></rl<>	0.106	HFPO-DA	<rl< td=""><td>0.023</td></rl<>	0.023
PFNA	<rl< td=""><td>0.055</td><td>ADONA</td><td><rl< td=""><td>0.016</td></rl<></td></rl<>	0.055	ADONA	<rl< td=""><td>0.016</td></rl<>	0.016
PFDA	<rl< td=""><td>0.103</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.017</td></rl<></td></rl<>	0.103	9CI-PF3ONS	<rl< td=""><td>0.017</td></rl<>	0.017
PFUnDA	<rl< td=""><td>0.058</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.017</td></rl<></td></rl<>	0.058	11Cl-PF3OUdS	<rl< td=""><td>0.017</td></rl<>	0.017
PFDoDA	<rl< td=""><td>0.039</td><td></td><td></td><td></td></rl<>	0.039			
PFTrDA	<rl< td=""><td>0.089</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.089	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.018</td><td>8:2 FTAcr</td><td><rl< td=""><td>14.9</td></rl<></td></rl<>	0.018	8:2 FTAcr	<rl< td=""><td>14.9</td></rl<>	14.9
			10:2 FTAcr	<rl< td=""><td>14.3</td></rl<>	14.3
PFSA (NV)					
PFPrS	<rl< td=""><td>0.051</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.051	n:2 FTMAC (V)		
PFBS	$0.331\pm0.073$	0.021	6:2 FTMAC	<rl< td=""><td>63.8</td></rl<>	63.8
PFPeS	<rl< td=""><td>0.017</td><td>8:2 FTMAC</td><td><rl< td=""><td>65.3</td></rl<></td></rl<>	0.017	8:2 FTMAC	<rl< td=""><td>65.3</td></rl<>	65.3
PFHxS	<rl< td=""><td>0.035</td><td>10:2 FTMAC</td><td><rl< td=""><td>34.4</td></rl<></td></rl<>	0.035	10:2 FTMAC	<rl< td=""><td>34.4</td></rl<>	34.4
PFHpS	<rl< td=""><td>0.017</td><td></td><td></td><td></td></rl<>	0.017			
PFOS	$0.142\pm0.011$	0.140	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.018</td><td>8:2 FTOAc</td><td><rl< td=""><td>14.6</td></rl<></td></rl<>	0.018	8:2 FTOAc	<rl< td=""><td>14.6</td></rl<>	14.6
PFDS	<rl< td=""><td>0.024</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	0.024	10:2 FTOAc	No Value	
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	$0.131 \pm 0.026$	0.018	<b>4:2 FTOH</b>	<rl< td=""><td>73.1</td></rl<>	73.1
MeFBSA (SV)	<rl< td=""><td>0.851</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>142</td></rl<></td></rl<>	0.851	<b>5:2 FTOH</b>	<rl< td=""><td>142</td></rl<>	142
FHxSA (NV)	<rl< td=""><td>0.018</td><td>6:2 FTOH</td><td><rl< td=""><td>74.8</td></rl<></td></rl<>	0.018	6:2 FTOH	<rl< td=""><td>74.8</td></rl<>	74.8
FOSA (NV)	<rl< td=""><td>0.018</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>81</td></rl<></td></rl<>	0.018	<b>7:2 FTOH</b>	<rl< td=""><td>81</td></rl<>	81
MeFOSA (SV)	<rl< td=""><td>0.356</td><td>8:2 FTOH</td><td><rl< td=""><td>76.3</td></rl<></td></rl<>	0.356	8:2 FTOH	<rl< td=""><td>76.3</td></rl<>	76.3
EtFOSA (SV)	<rl< td=""><td>0.357</td><td>10:2 FTOH</td><td><rl< td=""><td>74.3</td></rl<></td></rl<>	0.357	10:2 FTOH	<rl< td=""><td>74.3</td></rl<>	74.3
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.319</td><td>4:2 FTS</td><td><rl< td=""><td>0.092</td></rl<></td></rl<>	0.319	4:2 FTS	<rl< td=""><td>0.092</td></rl<>	0.092
MeFOSAA	<rl< td=""><td>0.099</td><td>6:2 FTS</td><td><rl< td=""><td>0.189</td></rl<></td></rl<>	0.099	6:2 FTS	<rl< td=""><td>0.189</td></rl<>	0.189
EtFOSAA	<rl< td=""><td>0.099</td><td>8:2 FTS</td><td><rl< td=""><td>0.191</td></rl<></td></rl<>	0.099	8:2 FTS	<rl< td=""><td>0.191</td></rl<>	0.191
			10:2 FTS	<rl< td=""><td>0.037</td></rl<>	0.037
FASE (SV)					
MeFOSE	<rl< td=""><td>0.852</td><td></td><td></td><td></td></rl<>	0.852			
EtFOSE	<rl< td=""><td>0.839</td><td></td><td></td><td></td></rl<>	0.839			

Table 61. Measured PFAS concentrations (µg-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for laundered TL-A.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		<u>, , , , , , , , , , , , , , , , , , , </u>
PFBA	$0.54 \pm 0.28$	0.088	PFEESA	<rl< td=""><td>0.011</td></rl<>	0.011
PFPeA	$0.22\pm0.18$	0.052	PF4OPeA	<rl< td=""><td>0.013</td></rl<>	0.013
PFHxA	$0.45 \pm 0.25$	0.121	PF5OHxA	<rl< td=""><td>0.013</td></rl<>	0.013
PFHpA	<rl< td=""><td>0.229</td><th>3-6-ОРҒНрА</th><td><rl< td=""><td>0.013</td></rl<></td></rl<>	0.229	3-6-ОРҒНрА	<rl< td=""><td>0.013</td></rl<>	0.013
PFOA	$0.49 \pm 0.2$	0.103	HFPO-DA	<rl< td=""><td>0.014</td></rl<>	0.014
PFNA	$0.21\pm0.15$	0.042	ADONA	<rl< td=""><td>0.013</td></rl<>	0.013
PFDA	$0.28\pm0.10$	0.041	9CI-PF3ONS	<rl< td=""><td>0.013</td></rl<>	0.013
PFUnDA	$0.079 \pm 0.046$	0.038	11Cl-PF3OUdS	<rl< td=""><td>0.013</td></rl<>	0.013
PFDoDA	$0.123\pm0.017$	0.036			
PFTrDA	$0.063\pm0.022$	0.017	n:2 FTAcr (V)		
PFTeDA	$0.085 \pm 0.0043$	0.034	8:2 FTAcr	<rl< td=""><td>13.8</td></rl<>	13.8
			10:2 FTAcr	<rl< td=""><td>13.3</td></rl<>	13.3
PFSA (NV)					
PFPrS	$0.0343 \pm 0.005$	0.026	n:2 FTMAC (V)		
PFBS	$0.69 \pm 0.23$	0.012	6:2 FTMAC	<rl< td=""><td>47.2</td></rl<>	47.2
PFPeS	<rl< td=""><td>0.015</td><th>8:2 FTMAC</th><td><rl< td=""><td>48.3</td></rl<></td></rl<>	0.015	8:2 FTMAC	<rl< td=""><td>48.3</td></rl<>	48.3
PFHxS	<rl< td=""><td>0.027</td><th>10:2 FTMAC</th><td><rl< td=""><td>25.5</td></rl<></td></rl<>	0.027	10:2 FTMAC	<rl< td=""><td>25.5</td></rl<>	25.5
PFHpS	<rl< td=""><td>0.013</td><th></th><td></td><td></td></rl<>	0.013			
PFOS	$0.096\pm0.016$	0.052	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.014</td><th>8:2 FTOAc</th><td><rl< td=""><td>27.4</td></rl<></td></rl<>	0.014	8:2 FTOAc	<rl< td=""><td>27.4</td></rl<>	27.4
PFDS	<rl< td=""><td>0.014</td><th>10:2 FTOAc</th><td><rl< td=""><td>28.2</td></rl<></td></rl<>	0.014	10:2 FTOAc	<rl< td=""><td>28.2</td></rl<>	28.2
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	$0.151\pm0.043$	0.014	<b>4:2 FTOH</b>	<rl< td=""><td>71.7</td></rl<>	71.7
MeFBSA (SV)	<rl< td=""><td>0.142</td><th><b>5:2 FTOH</b></th><td><rl< td=""><td>68.3</td></rl<></td></rl<>	0.142	<b>5:2 FTOH</b>	<rl< td=""><td>68.3</td></rl<>	68.3
FHxSA (NV)	<rl< td=""><td>0.014</td><th>6:2 FTOH</th><td><rl< td=""><td>68.8</td></rl<></td></rl<>	0.014	6:2 FTOH	<rl< td=""><td>68.8</td></rl<>	68.8
FOSA (NV)	$0.02528 \pm 0.00033$	0.018	7:2 FTOH	<rl< td=""><td>68.0</td></rl<>	68.0
MeFOSA (SV)	<rl< td=""><td>0.068</td><th>8:2 FTOH</th><td><rl< td=""><td>67.3</td></rl<></td></rl<>	0.068	8:2 FTOH	<rl< td=""><td>67.3</td></rl<>	67.3
EtFOSA (SV)	<rl< td=""><td>0.221</td><th>10:2 FTOH</th><td><rl< td=""><td>68.3</td></rl<></td></rl<>	0.221	10:2 FTOH	<rl< td=""><td>68.3</td></rl<>	68.3
FASAA (NV)			n:2 FTS (NV)		
FOSAA	<rl< td=""><td>0.014</td><th>4:2 FTS</th><td><rl< td=""><td>0.273</td></rl<></td></rl<>	0.014	4:2 FTS	<rl< td=""><td>0.273</td></rl<>	0.273
MeFOSAA	<rl< td=""><td>0.075</td><th>6:2 FTS</th><td>No Value</td><td></td></rl<>	0.075	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.064</td><th>8:2 FTS</th><td><rl< td=""><td>0.027</td></rl<></td></rl<>	0.064	8:2 FTS	<rl< td=""><td>0.027</td></rl<>	0.027
			10:2 FTS	<rl< td=""><td>0.071</td></rl<>	0.071
FASE (SV)					
MeFOSE	<rl< td=""><td>0.367</td><th></th><td></td><td></td></rl<>	0.367			
EtFOSE	<rl< td=""><td>0.068</td><th></th><td></td><td></td></rl<>	0.068			

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	<rl< td=""><td>0.544</td><td>PFEESA</td><td><rl< td=""><td>0.013</td></rl<></td></rl<>	0.544	PFEESA	<rl< td=""><td>0.013</td></rl<>	0.013
PFPeA	<rl< td=""><td>0.029</td><td>PF4OPeA</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.029	PF4OPeA	<rl< td=""><td>0.015</td></rl<>	0.015
PFHxA	<rl< td=""><td>0.260</td><td>PF5OHxA</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.260	PF5OHxA	<rl< td=""><td>0.015</td></rl<>	0.015
РҒНрА	<rl< td=""><td>0.118</td><td>3-6-OPFHpA</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.118	3-6-OPFHpA	<rl< td=""><td>0.015</td></rl<>	0.015
PFOA	<rl< td=""><td>0.171</td><td>HFPO-DA</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.171	HFPO-DA	<rl< td=""><td>0.015</td></rl<>	0.015
PFNA	<rl< td=""><td>0.057</td><td>ADONA</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.057	ADONA	<rl< td=""><td>0.015</td></rl<>	0.015
PFDA	<rl< td=""><td>0.031</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.031	9CI-PF3ONS	<rl< td=""><td>0.015</td></rl<>	0.015
PFUnDA	<rl< td=""><td>0.080</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.080	11Cl-PF3OUdS	<rl< td=""><td>0.015</td></rl<>	0.015
PFDoDA	<rl< td=""><td>0.024</td><td></td><td></td><td></td></rl<>	0.024			
PFTrDA	<rl< td=""><td>0.026</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.026	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.016</td><td>8:2 FTAcr</td><td><rl< td=""><td>78.7</td></rl<></td></rl<>	0.016	8:2 FTAcr	<rl< td=""><td>78.7</td></rl<>	78.7
			10:2 FTAcr	<rl< td=""><td>29.8</td></rl<>	29.8
PFSA (NV)					
PFPrS	<rl< td=""><td>0.033</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.033	n:2 FTMAC (V)		
PFBS	$2.77\pm0.53$	1.66	6:2 FTMAC	<rl< td=""><td>257</td></rl<>	257
PFPeS	<rl< td=""><td>0.015</td><td>8:2 FTMAC</td><td><rl< td=""><td>53.9</td></rl<></td></rl<>	0.015	8:2 FTMAC	<rl< td=""><td>53.9</td></rl<>	53.9
PFHxS	<rl< td=""><td>2.62</td><td><b>10:2 FTMAC</b></td><td><rl< td=""><td>28.4</td></rl<></td></rl<>	2.62	<b>10:2 FTMAC</b>	<rl< td=""><td>28.4</td></rl<>	28.4
PFHpS	<rl< td=""><td>0.016</td><td></td><td></td><td></td></rl<>	0.016			
PFOS	<rl< td=""><td>2.75</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	2.75	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.032</td><td>8:2 FTOAc</td><td><rl< td=""><td>29.2</td></rl<></td></rl<>	0.032	8:2 FTOAc	<rl< td=""><td>29.2</td></rl<>	29.2
PFDS	<rl< td=""><td>0.017</td><td>10:2 FTOAc</td><td><rl< td=""><td>31.0</td></rl<></td></rl<>	0.017	10:2 FTOAc	<rl< td=""><td>31.0</td></rl<>	31.0
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	<rl< td=""><td>0.016</td><td><b>4:2 FTOH</b></td><td><rl< td=""><td>76.4</td></rl<></td></rl<>	0.016	<b>4:2 FTOH</b>	<rl< td=""><td>76.4</td></rl<>	76.4
MeFBSA (SV)	<rl< td=""><td>0.403</td><td>5:2 FTOH</td><td><rl< td=""><td>72.7</td></rl<></td></rl<>	0.403	5:2 FTOH	<rl< td=""><td>72.7</td></rl<>	72.7
FHxSA (NV)	<rl< td=""><td>0.016</td><td>6:2 FTOH</td><td><rl< td=""><td>76.9</td></rl<></td></rl<>	0.016	6:2 FTOH	<rl< td=""><td>76.9</td></rl<>	76.9
FOSA (NV)	<rl< td=""><td>0.018</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>76.0</td></rl<></td></rl<>	0.018	<b>7:2 FTOH</b>	<rl< td=""><td>76.0</td></rl<>	76.0
MeFOSA (SV)	<rl< td=""><td>0.401</td><td>8:2 FTOH</td><td><rl< td=""><td>75.2</td></rl<></td></rl<>	0.401	8:2 FTOH	<rl< td=""><td>75.2</td></rl<>	75.2
EtFOSA (SV)	<rl< td=""><td>0.402</td><td>10:2 FTOH</td><td><rl< td=""><td>155</td></rl<></td></rl<>	0.402	10:2 FTOH	<rl< td=""><td>155</td></rl<>	155
FASAA (NV)			n:2 FTS (NV)		
FOSAA	No Value		4:2 FTS	No Value	
MeFOSAA	<rl< td=""><td>0.016</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.016	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.016</td><td>8:2 FTS</td><td><math display="block">0.038\pm0.016</math></td><td>0.016</td></rl<>	0.016	8:2 FTS	$0.038\pm0.016$	0.016
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.403</td><td></td><td></td><td></td></rl<>	0.403			
EtFOSE	<rl< td=""><td>0.397</td><td></td><td></td><td></td></rl<>	0.397			

 Table 63. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for TL-B following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	<rl< td=""><td>0.188</td><td>PFEESA</td><td><rl< td=""><td>0.016</td></rl<></td></rl<>	0.188	PFEESA	<rl< td=""><td>0.016</td></rl<>	0.016
PFPeA	$0.055\pm0.008$	0.035	PF4OPeA	<rl< td=""><td>0.016</td></rl<>	0.016
PFHxA	<rl< td=""><td>0.094</td><td>PF5OHxA</td><td><rl< td=""><td>0.016</td></rl<></td></rl<>	0.094	PF5OHxA	<rl< td=""><td>0.016</td></rl<>	0.016
РҒНрА	<rl< td=""><td>0.077</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.014</td></rl<></td></rl<>	0.077	3-6-ОРҒНрА	<rl< td=""><td>0.014</td></rl<>	0.014
PFOA	$0.130\pm0.021$	0.100	HFPO-DA	<rl< td=""><td>0.022</td></rl<>	0.022
PFNA	<rl< td=""><td>0.052</td><td>ADONA</td><td><rl< td=""><td>0.016</td></rl<></td></rl<>	0.052	ADONA	<rl< td=""><td>0.016</td></rl<>	0.016
PFDA	<rl< td=""><td>0.098</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.016</td></rl<></td></rl<>	0.098	9CI-PF3ONS	<rl< td=""><td>0.016</td></rl<>	0.016
PFUnDA	<rl< td=""><td>0.054</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.016</td></rl<></td></rl<>	0.054	11Cl-PF3OUdS	<rl< td=""><td>0.016</td></rl<>	0.016
PFDoDA	<rl< td=""><td>0.037</td><td></td><td></td><td></td></rl<>	0.037			
PFTrDA	<rl< td=""><td>0.085</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.085	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.017</td><td>8:2 FTAcr</td><td><rl< td=""><td>12.9</td></rl<></td></rl<>	0.017	8:2 FTAcr	<rl< td=""><td>12.9</td></rl<>	12.9
			10:2 FTAcr	<rl< td=""><td>12.4</td></rl<>	12.4
PFSA (NV)					
PFPrS	<rl< td=""><td>0.049</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.049	n:2 FTMAC (V)		
PFBS	$0.097\pm0.016$	0.020	6:2 FTMAC	<rl< td=""><td>55.3</td></rl<>	55.3
PFPeS	<rl< td=""><td>0.016</td><td>8:2 FTMAC</td><td><rl< td=""><td>56.6</td></rl<></td></rl<>	0.016	8:2 FTMAC	<rl< td=""><td>56.6</td></rl<>	56.6
PFHxS	<rl< td=""><td>0.034</td><td>10:2 FTMAC</td><td><rl< td=""><td>29.8</td></rl<></td></rl<>	0.034	10:2 FTMAC	<rl< td=""><td>29.8</td></rl<>	29.8
PFHpS	<rl< td=""><td>0.017</td><td></td><td></td><td></td></rl<>	0.017			
PFOS	<rl< td=""><td>0.133</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.133	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.017</td><td>8:2 FTOAc</td><td><rl< td=""><td>12.7</td></rl<></td></rl<>	0.017	8:2 FTOAc	<rl< td=""><td>12.7</td></rl<>	12.7
PFDS	<rl< td=""><td>0.022</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	0.022	10:2 FTOAc	No Value	
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	$0.085\pm0.018$	0.017	<b>4:2 FTOH</b>	<rl< td=""><td>63.3</td></rl<>	63.3
MeFBSA (SV)	<rl< td=""><td>0.877</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>123</td></rl<></td></rl<>	0.877	<b>5:2 FTOH</b>	<rl< td=""><td>123</td></rl<>	123
FHxSA (NV)	<rl< td=""><td>0.017</td><td>6:2 FTOH</td><td><rl< td=""><td>64.8</td></rl<></td></rl<>	0.017	6:2 FTOH	<rl< td=""><td>64.8</td></rl<>	64.8
FOSA (NV)	<rl< td=""><td>0.017</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>70.2</td></rl<></td></rl<>	0.017	<b>7:2 FTOH</b>	<rl< td=""><td>70.2</td></rl<>	70.2
MeFOSA (SV)	<rl< td=""><td>0.367</td><td>8:2 FTOH</td><td><rl< td=""><td>66.1</td></rl<></td></rl<>	0.367	8:2 FTOH	<rl< td=""><td>66.1</td></rl<>	66.1
EtFOSA (SV)	<rl< td=""><td>0.368</td><td>10:2 FTOH</td><td><rl< td=""><td>64.4</td></rl<></td></rl<>	0.368	10:2 FTOH	<rl< td=""><td>64.4</td></rl<>	64.4
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.302</td><td>4:2 FTS</td><td><rl< td=""><td>0.088</td></rl<></td></rl<>	0.302	4:2 FTS	<rl< td=""><td>0.088</td></rl<>	0.088
MeFOSAA	<rl< td=""><td>0.094</td><td>6:2 FTS</td><td><rl< td=""><td>0.179</td></rl<></td></rl<>	0.094	6:2 FTS	<rl< td=""><td>0.179</td></rl<>	0.179
EtFOSAA	<rl< td=""><td>0.094</td><td>8:2 FTS</td><td><rl< td=""><td>0.181</td></rl<></td></rl<>	0.094	8:2 FTS	<rl< td=""><td>0.181</td></rl<>	0.181
			10:2 FTS	<rl< td=""><td>0.035</td></rl<>	0.035
FASE (SV)					
MeFOSE	<rl< td=""><td>0.878</td><td></td><td></td><td></td></rl<>	0.878			
EtFOSE	<rl< td=""><td>0.865</td><td></td><td></td><td></td></rl<>	0.865			

 Table 64. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for laundered TL-B.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg
PFCA (NV)			PPEA (NV)		
PFBA	$1.16 \pm 0.21$	0.083	PFEESA	<rl< td=""><td>0.011</td></rl<>	0.011
PFPeA	$0.49\pm0.18$	0.049	PF4OPeA	<rl< td=""><td>0.012</td></rl<>	0.012
PFHxA	$1.49 \pm 0.79$	0.114	PF5OHxA	<rl< td=""><td>0.012</td></rl<>	0.012
PFHpA	$0.818 \pm 0.097$	0.216	3-6-ОРҒНрА	<rl< td=""><td>0.012</td></rl<>	0.012
PFOA	$2.2 \pm 1.2$	0.098	HFPO-DA	$0.178\pm0.047$	0.013
PFNA	$1.00 \pm 0.65$	0.04	ADONA	<rl< td=""><td>0.012</td></rl<>	0.012
PFDA	$0.95 \pm 0.38$	0.039	9CI-PF3ONS	<rl< td=""><td>0.012</td></rl<>	0.012
PFUnDA	$0.181 \pm 0.091$	0.036	11Cl-PF3OUdS	<rl< td=""><td>0.013</td></rl<>	0.013
PFDoDA	$0.34 \pm 0.11$	0.034			
PFTrDA	$0.0566 \pm 0.0029$	0.016	n:2 FTAcr (V)		
PFTeDA	$0.104\pm0.037$	0.032	8:2 FTAcr	<rl< td=""><td>10.1</td></rl<>	10.1
			10:2 FTAcr	<rl< td=""><td>9.75</td></rl<>	9.75
PFSA (NV)					
PFPrS	$0.065\pm0.017$	0.024	n:2 FTMAC (V)		
PFBS	$1.257\pm0.077$	0.012	6:2 FTMAC	<rl< td=""><td>34.6</td></rl<>	34.6
PFPeS	<rl< td=""><td>0.015</td><td>8:2 FTMAC</td><td><rl< td=""><td>35.4</td></rl<></td></rl<>	0.015	8:2 FTMAC	<rl< td=""><td>35.4</td></rl<>	35.4
PFHxS	<rl< td=""><td>0.025</td><td>10:2 FTMAC</td><td><rl< td=""><td>18.6</td></rl<></td></rl<>	0.025	10:2 FTMAC	<rl< td=""><td>18.6</td></rl<>	18.6
PFHpS	<rl< td=""><td>0.013</td><td></td><td></td><td></td></rl<>	0.013			
PFOS	$0.178 \pm 0.029$	0.049	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.013</td><td>8:2 FTOAc</td><td><rl< td=""><td>20.0</td></rl<></td></rl<>	0.013	8:2 FTOAc	<rl< td=""><td>20.0</td></rl<>	20.0
PFDS	<rl< td=""><td>0.013</td><td>10:2 FTOAc</td><td><rl< td=""><td>20.7</td></rl<></td></rl<>	0.013	10:2 FTOAc	<rl< td=""><td>20.7</td></rl<>	20.7
FASA (NV, SV)			n:2 FTOH (V)		
FBSA (NV)	No Value		<b>4:2 FTOH</b>	<rl< td=""><td>52.5</td></rl<>	52.5
MeFBSA (SV)	<rl< td=""><td>0.104</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>50.0</td></rl<></td></rl<>	0.104	<b>5:2 FTOH</b>	<rl< td=""><td>50.0</td></rl<>	50.0
FHxSA (NV)	No Value		6:2 FTOH	<rl< td=""><td>50.3</td></rl<>	50.3
FOSA (NV)	$0.059 \pm 0.014$	0.017	7:2 FTOH	<rl< td=""><td>49.8</td></rl<>	49.8
MeFOSA (SV)	<rl< td=""><td>0.05</td><td>8:2 FTOH</td><td><rl< td=""><td>49.2</td></rl<></td></rl<>	0.05	8:2 FTOH	<rl< td=""><td>49.2</td></rl<>	49.2
EtFOSA (SV)	<rl< td=""><td>0.162</td><td>10:2 FTOH</td><td><rl< td=""><td>50.0</td></rl<></td></rl<>	0.162	10:2 FTOH	<rl< td=""><td>50.0</td></rl<>	50.0
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	No Value		4:2 FTS	$0.467 \pm 0.071$	0.257
MeFOSAA	<rl< td=""><td>0.071</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.071	6:2 FTS	No Value	
EtFOSAA	$0.25 \pm 0.11$	0.061	8:2 FTS	$0.58\pm0.35$	0.026
			10:2 FTS	$0.548\pm0.055$	0.067
FASE (SV)					
MeFOSE	<rl< td=""><td>0.268</td><td></td><td></td><td></td></rl<>	0.268			
EtFOSE	<rl< td=""><td>0.050</td><td></td><td></td><td></td></rl<>	0.050			

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	<rl< td=""><td>0.465</td><td>PFEESA</td><td><rl< td=""><td>0.011</td></rl<></td></rl<>	0.465	PFEESA	<rl< td=""><td>0.011</td></rl<>	0.011
PFPeA	<rl< td=""><td>0.025</td><td>PF4OPeA</td><td><rl< td=""><td>0.013</td></rl<></td></rl<>	0.025	PF4OPeA	<rl< td=""><td>0.013</td></rl<>	0.013
PFHxA	<rl< td=""><td>0.222</td><td>PF50HxA</td><td><rl< td=""><td>0.013</td></rl<></td></rl<>	0.222	PF50HxA	<rl< td=""><td>0.013</td></rl<>	0.013
РҒНрА	<rl< td=""><td>0.101</td><td>3-6-OPFHpA</td><td><rl< td=""><td>0.013</td></rl<></td></rl<>	0.101	3-6-OPFHpA	<rl< td=""><td>0.013</td></rl<>	0.013
PFOA	<rl< td=""><td>0.146</td><td>HFPO-DA</td><td><rl< td=""><td>0.013</td></rl<></td></rl<>	0.146	HFPO-DA	<rl< td=""><td>0.013</td></rl<>	0.013
PFNA	<rl< td=""><td>0.048</td><td>ADONA</td><td><rl< td=""><td>0.013</td></rl<></td></rl<>	0.048	ADONA	<rl< td=""><td>0.013</td></rl<>	0.013
PFDA	<rl< td=""><td>0.026</td><td>9Cl-PF3ONS</td><td><rl< td=""><td>0.013</td></rl<></td></rl<>	0.026	9Cl-PF3ONS	<rl< td=""><td>0.013</td></rl<>	0.013
PFUnDA	<rl< td=""><td>0.068</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.013</td></rl<></td></rl<>	0.068	11Cl-PF3OUdS	<rl< td=""><td>0.013</td></rl<>	0.013
PFDoDA	<rl< td=""><td>0.020</td><td></td><td></td><td></td></rl<>	0.020			
PFTrDA	<rl< td=""><td>0.022</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.022	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.014</td><td>8:2 FTAcr</td><td><rl< td=""><td>79.1</td></rl<></td></rl<>	0.014	8:2 FTAcr	<rl< td=""><td>79.1</td></rl<>	79.1
			10:2 FTAcr	<rl< td=""><td>30.0</td></rl<>	30.0
PFSA (NV)					
PFPrS	<rl< td=""><td>0.028</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.028	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>1.42</td><td>6:2 FTMAC</td><td><rl< td=""><td>258</td></rl<></td></rl<>	1.42	6:2 FTMAC	<rl< td=""><td>258</td></rl<>	258
PFPeS	<rl< td=""><td>0.013</td><td>8:2 FTMAC</td><td><rl< td=""><td>54.2</td></rl<></td></rl<>	0.013	8:2 FTMAC	<rl< td=""><td>54.2</td></rl<>	54.2
PFHxS	<rl< td=""><td>2.24</td><td><b>10:2 FTMAC</b></td><td><rl< td=""><td>28.6</td></rl<></td></rl<>	2.24	<b>10:2 FTMAC</b>	<rl< td=""><td>28.6</td></rl<>	28.6
PFHpS	<rl< td=""><td>0.013</td><td></td><td></td><td></td></rl<>	0.013			
PFOS	<rl< td=""><td>2.35</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	2.35	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.027</td><td>8:2 FTOAc</td><td><rl< td=""><td>29.3</td></rl<></td></rl<>	0.027	8:2 FTOAc	<rl< td=""><td>29.3</td></rl<>	29.3
PFDS	<rl< td=""><td>0.014</td><td>10:2 FTOAc</td><td><rl< td=""><td>31.2</td></rl<></td></rl<>	0.014	10:2 FTOAc	<rl< td=""><td>31.2</td></rl<>	31.2
FASA (NV, SV)			<i>n:2 FTOH (V)</i>		
FBSA (NV)	<rl< td=""><td>0.014</td><td>4:2 FTOH</td><td><rl< td=""><td>76.8</td></rl<></td></rl<>	0.014	4:2 FTOH	<rl< td=""><td>76.8</td></rl<>	76.8
MeFBSA (SV)	<rl< td=""><td>0.406</td><td>5:2 FTOH</td><td><rl< td=""><td>73.1</td></rl<></td></rl<>	0.406	5:2 FTOH	<rl< td=""><td>73.1</td></rl<>	73.1
FHxSA (NV)	<rl< td=""><td>0.014</td><td>6:2 FTOH</td><td><rl< td=""><td>77.3</td></rl<></td></rl<>	0.014	6:2 FTOH	<rl< td=""><td>77.3</td></rl<>	77.3
FOSA (NV)	<rl< td=""><td>0.016</td><td>7:2 FTOH</td><td><rl< td=""><td>76.4</td></rl<></td></rl<>	0.016	7:2 FTOH	<rl< td=""><td>76.4</td></rl<>	76.4
MeFOSA (SV)	<rl< td=""><td>0.404</td><td>8:2 FTOH</td><td><rl< td=""><td>75.6</td></rl<></td></rl<>	0.404	8:2 FTOH	<rl< td=""><td>75.6</td></rl<>	75.6
EtFOSA (SV)	<rl< td=""><td>0.405</td><td>10:2 FTOH</td><td><rl< td=""><td>156</td></rl<></td></rl<>	0.405	10:2 FTOH	<rl< td=""><td>156</td></rl<>	156
FASAA (NV)			n:2 FTS (NV)		
FOSAA	No Value		4:2 FTS	<rl< td=""><td>0.023</td></rl<>	0.023
MeFOSAA	<rl< td=""><td>0.014</td><td>6:2 FTS</td><td><rl< td=""><td>0.811</td></rl<></td></rl<>	0.014	6:2 FTS	<rl< td=""><td>0.811</td></rl<>	0.811
EtFOSAA	<rl< td=""><td>0.014</td><td>8:2 FTS</td><td><math display="block">0.194 \pm 0.012</math></td><td>0.013</td></rl<>	0.014	8:2 FTS	$0.194 \pm 0.012$	0.013
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.406</td><td></td><td></td><td></td></rl<>	0.406			
EtFOSE	<rl< td=""><td>0.400</td><td></td><td></td><td></td></rl<>	0.400			

**Table 66.** Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for TL-C following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	<rl< td=""><td>0.217</td><td>PFEESA</td><td><rl< td=""><td>0.018</td></rl<></td></rl<>	0.217	PFEESA	<rl< td=""><td>0.018</td></rl<>	0.018
PFPeA	<rl< td=""><td>0.040</td><td>PF4OPeA</td><td><rl< td=""><td>0.018</td></rl<></td></rl<>	0.040	PF4OPeA	<rl< td=""><td>0.018</td></rl<>	0.018
PFHxA	<rl< td=""><td>0.108</td><td>PF5OHxA</td><td><rl< td=""><td>0.018</td></rl<></td></rl<>	0.108	PF5OHxA	<rl< td=""><td>0.018</td></rl<>	0.018
PFHpA	<rl< td=""><td>0.089</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.016</td></rl<></td></rl<>	0.089	3-6-ОРҒНрА	<rl< td=""><td>0.016</td></rl<>	0.016
PFOA	<rl< td=""><td>0.115</td><td>HFPO-DA</td><td><rl< td=""><td>0.025</td></rl<></td></rl<>	0.115	HFPO-DA	<rl< td=""><td>0.025</td></rl<>	0.025
PFNA	<rl< td=""><td>0.060</td><td>ADONA</td><td><rl< td=""><td>0.018</td></rl<></td></rl<>	0.060	ADONA	<rl< td=""><td>0.018</td></rl<>	0.018
PFDA	<rl< td=""><td>0.113</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.113	9CI-PF3ONS	<rl< td=""><td>0.019</td></rl<>	0.019
PFUnDA	<rl< td=""><td>0.063</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.063	11Cl-PF3OUdS	<rl< td=""><td>0.019</td></rl<>	0.019
PFDoDA	<rl< td=""><td>0.042</td><td></td><td></td><td></td></rl<>	0.042			
PFTrDA	<rl< td=""><td>0.098</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.098	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.020</td><td>8:2 FTAcr</td><td><rl< td=""><td>15.4</td></rl<></td></rl<>	0.020	8:2 FTAcr	<rl< td=""><td>15.4</td></rl<>	15.4
			10:2 FTAcr	<rl< td=""><td>14.8</td></rl<>	14.8
PFSA (NV)					
PFPrS	<rl< td=""><td>0.056</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.056	n:2 FTMAC (V)		
PFBS	$0.04 \pm 0.01$	0.023	6:2 FTMAC	<rl< td=""><td>66.2</td></rl<>	66.2
PFPeS	<rl< td=""><td>0.019</td><td>8:2 FTMAC</td><td><rl< td=""><td>67.7</td></rl<></td></rl<>	0.019	8:2 FTMAC	<rl< td=""><td>67.7</td></rl<>	67.7
PFHxS	<rl< td=""><td>0.039</td><td><b>10:2 FTMAC</b></td><td><rl< td=""><td>35.7</td></rl<></td></rl<>	0.039	<b>10:2 FTMAC</b>	<rl< td=""><td>35.7</td></rl<>	35.7
PFHpS	<rl< td=""><td>0.019</td><td></td><td></td><td></td></rl<>	0.019			
PFOS	<rl< td=""><td>0.153</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.153	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.019</td><td>8:2 FTOAc</td><td><rl< td=""><td>15.2</td></rl<></td></rl<>	0.019	8:2 FTOAc	<rl< td=""><td>15.2</td></rl<>	15.2
PFDS	<rl< td=""><td>0.026</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	0.026	10:2 FTOAc	No Value	
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	$0.096\pm0.011$	0.020	<b>4:2 FTOH</b>	<rl< td=""><td>75.8</td></rl<>	75.8
MeFBSA (SV)	<rl< td=""><td>0.904</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>148</td></rl<></td></rl<>	0.904	<b>5:2 FTOH</b>	<rl< td=""><td>148</td></rl<>	148
FHxSA (NV)	<rl< td=""><td>0.020</td><td>6:2 FTOH</td><td><rl< td=""><td>77.6</td></rl<></td></rl<>	0.020	6:2 FTOH	<rl< td=""><td>77.6</td></rl<>	77.6
FOSA (NV)	<rl< td=""><td>0.020</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>84.0</td></rl<></td></rl<>	0.020	<b>7:2 FTOH</b>	<rl< td=""><td>84.0</td></rl<>	84.0
MeFOSA (SV)	<rl< td=""><td>0.379</td><td>8:2 FTOH</td><td><rl< td=""><td>79.2</td></rl<></td></rl<>	0.379	8:2 FTOH	<rl< td=""><td>79.2</td></rl<>	79.2
EtFOSA (SV)	<rl< td=""><td>0.379</td><td>10:2 FTOH</td><td><rl< td=""><td>77.1</td></rl<></td></rl<>	0.379	10:2 FTOH	<rl< td=""><td>77.1</td></rl<>	77.1
FASAA (NV)		<u> </u>	<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.349</td><td>4:2 FTS</td><td><rl< td=""><td>0.101</td></rl<></td></rl<>	0.349	4:2 FTS	<rl< td=""><td>0.101</td></rl<>	0.101
MeFOSAA	<rl< td=""><td>0.108</td><td>6:2 FTS</td><td><rl< td=""><td>0.207</td></rl<></td></rl<>	0.108	6:2 FTS	<rl< td=""><td>0.207</td></rl<>	0.207
EtFOSAA	<rl< td=""><td>0.108</td><td>8:2 FTS</td><td><rl< td=""><td>0.209</td></rl<></td></rl<>	0.108	8:2 FTS	<rl< td=""><td>0.209</td></rl<>	0.209
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.905</td><td></td><td></td><td></td></rl<>	0.905			
EtFOSE	<rl< td=""><td>0.892</td><td></td><td></td><td></td></rl<>	0.892			

 Table 67. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for laundered TL-C.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	$1.29\pm0.22$	0.085	PFEESA	<rl< td=""><td>0.011</td></rl<>	0.011
PFPeA	$0.63\pm0.17$	0.050	PF4OPeA	<rl< td=""><td>0.013</td></rl<>	0.013
PFHxA	$0.61\pm0.14$	0.116	PF5OHxA	<rl< td=""><td>0.012</td></rl<>	0.012
PFHpA	$0.44\pm0.10$	0.220	3-6-ОРҒНрА	<rl< td=""><td>0.012</td></rl<>	0.012
PFOA	$0.419 \pm 0.090$	0.099	HFPO-DA	$0.60\pm0.21$	0.014
PFNA	$0.293 \pm 0.093$	0.041	ADONA	<rl< td=""><td>0.012</td></rl<>	0.012
PFDA	$0.253\pm0.095$	0.039	9CI-PF3ONS	<rl< td=""><td>0.013</td></rl<>	0.013
PFUnDA	$0.121 \pm 0.053$	0.036	11Cl-PF3OUdS	<rl< td=""><td>0.013</td></rl<>	0.013
PFDoDA	$0.113 \pm 0.047$	0.034			
PFTrDA	$0.098 \pm 0.029$	0.016	n:2 FTAcr (V)		
PFTeDA	$0.071 \pm 0.035$	0.032	8:2 FTAcr	<rl< td=""><td>13.9</td></rl<>	13.9
			10:2 FTAcr	<rl< td=""><td>13.4</td></rl<>	13.4
PFSA (NV)					
PFPrS	0.0299 ±	0.005	n:2 FTMAC (V)		
DEDG	0.0026	0.025		DI	47.7
PFBS	$0.62 \pm 0.13$	0.012	6:2 FTMAC	< <u>RL</u>	47.7
PFPeS	< <u>RL</u>	0.015	8:2 FTMAC	<rl< td=""><td>48.8</td></rl<>	48.8
PFHxS	< <u>RL</u>	0.026	<b>10:2 FTMAC</b>	<rl< td=""><td>25.7</td></rl<>	25.7
PFHpS	<rl< td=""><td>0.013</td><th></th><td></td><td></td></rl<>	0.013			
PFOS	$0.0831 \pm 0.0052$	0.050	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.013</td><th>8:2 FTOAc</th><td><rl< td=""><td>27.7</td></rl<></td></rl<>	0.013	8:2 FTOAc	<rl< td=""><td>27.7</td></rl<>	27.7
PFDS	<rl< td=""><td>0.013</td><th>10:2 FTOAc</th><td><rl< td=""><td>28.5</td></rl<></td></rl<>	0.013	10:2 FTOAc	<rl< td=""><td>28.5</td></rl<>	28.5
			· · · · · · · · · · · · · · · · · · ·		
FASA (NV, SV)			<i>n:2 FTOH (V)</i>		
FBSA (NV)	$0.125 \pm 0.014$	0.014	4:2 FTOH	<rl< td=""><td>72.4</td></rl<>	72.4
MeFBSA (SV)	<rl< td=""><td>0.144</td><th><b>5:2 FTOH</b></th><td><rl< td=""><td>68.9</td></rl<></td></rl<>	0.144	<b>5:2 FTOH</b>	<rl< td=""><td>68.9</td></rl<>	68.9
FHxSA (NV)	<rl< td=""><td>0.014</td><th>6:2 FTOH</th><td><rl< td=""><td>69.4</td></rl<></td></rl<>	0.014	6:2 FTOH	<rl< td=""><td>69.4</td></rl<>	69.4
FOSA (NV)	$0.0457 \pm$	0.018	7:2 FTOH	<rl< td=""><td>68.6</td></rl<>	68.6
MeFOSA (SV)	0.0031 <rl< td=""><td></td><th>8:2 FTOH</th><td><rl <rl< td=""><td></td></rl<></rl </td></rl<>		8:2 FTOH	<rl <rl< td=""><td></td></rl<></rl 	
		0.069	10:2 FTOH		67.9
EtFOSA (SV)	<rl< td=""><td>0.224</td><th>10;2 Г I ОП</th><td><rl< td=""><td>69.0</td></rl<></td></rl<>	0.224	10;2 Г I ОП	<rl< td=""><td>69.0</td></rl<>	69.0
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.013</td><th>4:2 FTS</th><td><math>1.04 \pm 0.18</math></td><td>0.262</td></rl<>	0.013	4:2 FTS	$1.04 \pm 0.18$	0.262
MeFOSAA	<rl< td=""><td>0.072</td><th>6:2 FTS</th><td>No Value</td><td></td></rl<>	0.072	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.062</td><th>8:2 FTS</th><td><rl< td=""><td>0.026</td></rl<></td></rl<>	0.062	8:2 FTS	<rl< td=""><td>0.026</td></rl<>	0.026
			10:2 FTS	<rl< td=""><td>0.068</td></rl<>	0.068
FASE (SV)					
MeFOSE	<rl< td=""><td>0.371</td><th></th><td></td><td></td></rl<>	0.371			
EtFOSE	<rl< td=""><td>0.069</td><th></th><td></td><td></td></rl<>	0.069			

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	<rl< td=""><td>0.530</td><td>PFEESA</td><td><rl< td=""><td>0.013</td></rl<></td></rl<>	0.530	PFEESA	<rl< td=""><td>0.013</td></rl<>	0.013
PFPeA	<rl< td=""><td>0.028</td><td>PF4OPeA</td><td><rl< td=""><td>0.014</td></rl<></td></rl<>	0.028	PF4OPeA	<rl< td=""><td>0.014</td></rl<>	0.014
PFHxA	<rl< td=""><td>0.253</td><td>PF5OHxA</td><td><rl< td=""><td>0.014</td></rl<></td></rl<>	0.253	PF5OHxA	<rl< td=""><td>0.014</td></rl<>	0.014
РҒНрА	<rl< td=""><td>0.115</td><td><b>3-6-ОРFHpA</b></td><td><rl< td=""><td>0.014</td></rl<></td></rl<>	0.115	<b>3-6-ОРFHpA</b>	<rl< td=""><td>0.014</td></rl<>	0.014
PFOA	<rl< td=""><td>0.166</td><td>HFPO-DA</td><td><rl< td=""><td>0.014</td></rl<></td></rl<>	0.166	HFPO-DA	<rl< td=""><td>0.014</td></rl<>	0.014
PFNA	<rl< td=""><td>0.055</td><td>ADONA</td><td><rl< td=""><td>0.014</td></rl<></td></rl<>	0.055	ADONA	<rl< td=""><td>0.014</td></rl<>	0.014
PFDA	<rl< td=""><td>0.030</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.030	9CI-PF3ONS	<rl< td=""><td>0.015</td></rl<>	0.015
PFUnDA	<rl< td=""><td>0.078</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.078	11Cl-PF3OUdS	<rl< td=""><td>0.015</td></rl<>	0.015
PFDoDA	<rl< td=""><td>0.023</td><td></td><td></td><td></td></rl<>	0.023			
PFTrDA	<rl< td=""><td>0.025</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.025	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.016</td><td>8:2 FTAcr</td><td><rl< td=""><td>82.2</td></rl<></td></rl<>	0.016	8:2 FTAcr	<rl< td=""><td>82.2</td></rl<>	82.2
			10:2 FTAcr	<rl< td=""><td>31.1</td></rl<>	31.1
PFSA (NV)					
PFPrS	<rl< td=""><td>0.032</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.032	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>1.62</td><td>6:2 FTMAC</td><td><rl< td=""><td>268</td></rl<></td></rl<>	1.62	6:2 FTMAC	<rl< td=""><td>268</td></rl<>	268
PFPeS	<rl< td=""><td>0.015</td><td>8:2 FTMAC</td><td><rl< td=""><td>56.3</td></rl<></td></rl<>	0.015	8:2 FTMAC	<rl< td=""><td>56.3</td></rl<>	56.3
PFHxS	<rl< td=""><td>2.55</td><td>10:2 FTMAC</td><td><rl< td=""><td>29.7</td></rl<></td></rl<>	2.55	10:2 FTMAC	<rl< td=""><td>29.7</td></rl<>	29.7
PFHpS	<rl< td=""><td>0.015</td><td></td><td></td><td></td></rl<>	0.015			
PFOS	<rl< td=""><td>2.68</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	2.68	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.031</td><td>8:2 FTOAc</td><td><rl< td=""><td>30.5</td></rl<></td></rl<>	0.031	8:2 FTOAc	<rl< td=""><td>30.5</td></rl<>	30.5
PFDS	<rl< td=""><td>0.016</td><td>10:2 FTOAc</td><td><rl< td=""><td>32.4</td></rl<></td></rl<>	0.016	10:2 FTOAc	<rl< td=""><td>32.4</td></rl<>	32.4
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	<rl< td=""><td>0.016</td><td><b>4:2 FTOH</b></td><td><rl< td=""><td>79.8</td></rl<></td></rl<>	0.016	<b>4:2 FTOH</b>	<rl< td=""><td>79.8</td></rl<>	79.8
MeFBSA (SV)	<rl< td=""><td>0.420</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>75.9</td></rl<></td></rl<>	0.420	<b>5:2 FTOH</b>	<rl< td=""><td>75.9</td></rl<>	75.9
FHxSA (NV)	<rl< td=""><td>0.016</td><td>6:2 FTOH</td><td><rl< td=""><td>80.3</td></rl<></td></rl<>	0.016	6:2 FTOH	<rl< td=""><td>80.3</td></rl<>	80.3
FOSA (NV)	<rl< td=""><td>0.018</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>79.3</td></rl<></td></rl<>	0.018	<b>7:2 FTOH</b>	<rl< td=""><td>79.3</td></rl<>	79.3
MeFOSA (SV)	<rl< td=""><td>0.418</td><td>8:2 FTOH</td><td><rl< td=""><td>78.5</td></rl<></td></rl<>	0.418	8:2 FTOH	<rl< td=""><td>78.5</td></rl<>	78.5
EtFOSA (SV)	<rl< td=""><td>0.419</td><td>10:2 FTOH</td><td><rl< td=""><td>162</td></rl<></td></rl<>	0.419	10:2 FTOH	<rl< td=""><td>162</td></rl<>	162
FASAA (NV)		<u> </u>	n:2 FTS (NV)		
FOSAA	No Value		4:2 FTS	No Value	
MeFOSAA	<rl< td=""><td>0.016</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.016	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.016</td><td>8:2 FTS</td><td><rl< td=""><td>0.015</td></rl<></td></rl<>	0.016	8:2 FTS	<rl< td=""><td>0.015</td></rl<>	0.015
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.421</td><td></td><td></td><td></td></rl<>	0.421			
EtFOSE	<rl< td=""><td>0.414</td><td></td><td></td><td></td></rl<>	0.414			

**Table 69.** Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for TL-D following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	<rl< td=""><td>0.236</td><td>PFEESA</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.236	PFEESA	<rl< td=""><td>0.020</td></rl<>	0.020
PFPeA	<rl< td=""><td>0.044</td><td>PF4OPeA</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.044	PF4OPeA	<rl< td=""><td>0.020</td></rl<>	0.020
PFHxA	<rl< td=""><td>0.117</td><td>PF5OHxA</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.117	PF5OHxA	<rl< td=""><td>0.020</td></rl<>	0.020
PFHpA	<rl< td=""><td>0.097</td><td>3-6-OPFHpA</td><td><rl< td=""><td>0.017</td></rl<></td></rl<>	0.097	3-6-OPFHpA	<rl< td=""><td>0.017</td></rl<>	0.017
PFOA	<rl< td=""><td>0.125</td><td>HFPO-DA</td><td><rl< td=""><td>0.027</td></rl<></td></rl<>	0.125	HFPO-DA	<rl< td=""><td>0.027</td></rl<>	0.027
PFNA	<rl< td=""><td>0.066</td><td>ADONA</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.066	ADONA	<rl< td=""><td>0.020</td></rl<>	0.020
PFDA	<rl< td=""><td>0.123</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.123	9CI-PF3ONS	<rl< td=""><td>0.020</td></rl<>	0.020
PFUnDA	<rl< td=""><td>0.068</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.021</td></rl<></td></rl<>	0.068	11Cl-PF3OUdS	<rl< td=""><td>0.021</td></rl<>	0.021
PFDoDA	<rl< td=""><td>0.046</td><td></td><td></td><td></td></rl<>	0.046			
PFTrDA	<rl< td=""><td>0.106</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.106	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.022</td><td>8:2 FTAcr</td><td><rl< td=""><td>15.9</td></rl<></td></rl<>	0.022	8:2 FTAcr	<rl< td=""><td>15.9</td></rl<>	15.9
			10:2 FTAcr	<rl< td=""><td>15.3</td></rl<>	15.3
PFSA (NV)					
PFPrS	<rl< td=""><td>0.061</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.061	n:2 FTMAC (V)		
PFBS	$0.120\pm0.024$	0.025	6:2 FTMAC	<rl< td=""><td>68.1</td></rl<>	68.1
PFPeS	<rl< td=""><td>0.020</td><td>8:2 FTMAC</td><td><rl< td=""><td>69.7</td></rl<></td></rl<>	0.020	8:2 FTMAC	<rl< td=""><td>69.7</td></rl<>	69.7
PFHxS	<rl< td=""><td>0.042</td><td>10:2 FTMAC</td><td><rl< td=""><td>36.7</td></rl<></td></rl<>	0.042	10:2 FTMAC	<rl< td=""><td>36.7</td></rl<>	36.7
PFHpS	<rl< td=""><td>0.021</td><td></td><td></td><td></td></rl<>	0.021			
PFOS	<rl< td=""><td>0.167</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.167	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.021</td><td>8:2 FTOAc</td><td><rl< td=""><td>15.6</td></rl<></td></rl<>	0.021	8:2 FTOAc	<rl< td=""><td>15.6</td></rl<>	15.6
PFDS	<rl< td=""><td>0.028</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	0.028	10:2 FTOAc	No Value	
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	$0.134\pm0.011$	0.022	<b>4:2 FTOH</b>	<rl< td=""><td>78.1</td></rl<>	78.1
MeFBSA (SV)	<rl< td=""><td>0.836</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>152</td></rl<></td></rl<>	0.836	<b>5:2 FTOH</b>	<rl< td=""><td>152</td></rl<>	152
FHxSA (NV)	<rl< td=""><td>0.022</td><td>6:2 FTOH</td><td><rl< td=""><td>79.9</td></rl<></td></rl<>	0.022	6:2 FTOH	<rl< td=""><td>79.9</td></rl<>	79.9
FOSA (NV)	<rl< td=""><td>0.022</td><td><b>7:2 FTOH</b></td><td><rl< td=""><td>86.5</td></rl<></td></rl<>	0.022	<b>7:2 FTOH</b>	<rl< td=""><td>86.5</td></rl<>	86.5
MeFOSA (SV)	<rl< td=""><td>0.350</td><td>8:2 FTOH</td><td><rl< td=""><td>81.5</td></rl<></td></rl<>	0.350	8:2 FTOH	<rl< td=""><td>81.5</td></rl<>	81.5
EtFOSA (SV)	<rl< td=""><td>0.351</td><td>10:2 FTOH</td><td><rl< td=""><td>79.4</td></rl<></td></rl<>	0.351	10:2 FTOH	<rl< td=""><td>79.4</td></rl<>	79.4
FASAA (NV)			<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.379</td><td>4:2 FTS</td><td><rl< td=""><td>0.110</td></rl<></td></rl<>	0.379	4:2 FTS	<rl< td=""><td>0.110</td></rl<>	0.110
MeFOSAA	<rl< td=""><td>0.117</td><td>6:2 FTS</td><td><rl< td=""><td>0.225</td></rl<></td></rl<>	0.117	6:2 FTS	<rl< td=""><td>0.225</td></rl<>	0.225
EtFOSAA	<rl< td=""><td>0.117</td><td>8:2 FTS</td><td><rl< td=""><td>0.227</td></rl<></td></rl<>	0.117	8:2 FTS	<rl< td=""><td>0.227</td></rl<>	0.227
			10:2 FTS	<rl< td=""><td>0.044</td></rl<>	0.044
FASE (SV)					
MeFOSE	<rl< td=""><td>0.837</td><td></td><td></td><td></td></rl<>	0.837			
EtFOSE	<rl< td=""><td>0.825</td><td></td><td></td><td></td></rl<>	0.825			

 Table 70. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for laundered TL-D.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg
PFCA (NV)			PPEA (NV)		
PFBA	$0.433 \pm 0.090$	0.084	PFEESA	<rl< td=""><td>0.011</td></rl<>	0.011
PFPeA	$0.311 \pm 0.096$	0.049	PF4OPeA	<rl< td=""><td>0.012</td></rl<>	0.012
PFHxA	$0.424 \pm 0.030$	0.115	PF5OHxA	<rl< td=""><td>0.012</td></rl<>	0.012
РҒНрА	<rl< td=""><td>0.217</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.012</td></rl<></td></rl<>	0.217	3-6-ОРҒНрА	<rl< td=""><td>0.012</td></rl<>	0.012
PFOA	$0.393 \pm 0.033$	0.098	HFPO-DA	$0.425 \pm 0.084$	0.013
PFNA	$0.208 \pm 0.050$	0.040	ADONA	<rl< td=""><td>0.012</td></rl<>	0.012
PFDA	$0.210 \pm 0.030$	0.039	9CI-PF3ONS	<rl< td=""><td>0.012</td></rl<>	0.012
PFUnDA	$0.093 \pm 0.032$	0.036	11Cl-PF3OUdS	<rl< td=""><td>0.013</td></rl<>	0.013
PFDoDA	$0.1085 \pm 0.0087$	0.034			
PFTrDA	0.0521 ± 0.0053	0.016	n:2 FTAcr (V)		
PFTeDA	0.0464 ± 0.0052	0.032	8:2 FTAcr	<rl< td=""><td>15.2</td></rl<>	15.2
			10:2 FTAcr	<rl< td=""><td>14.7</td></rl<>	14.7
PFSA (NV)					
PFPrS	<rl< td=""><td>0.024</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.024	n:2 FTMAC (V)		
PFBS	0.1095 ± 0.0040	0.012	6:2 FTMAC	<rl< td=""><td>52.1</td></rl<>	52.1
PFPeS	<rl< td=""><td>0.015</td><td>8:2 FTMAC</td><td><rl< td=""><td>53.3</td></rl<></td></rl<>	0.015	8:2 FTMAC	<rl< td=""><td>53.3</td></rl<>	53.3
PFHxS	<rl< td=""><td>0.025</td><td>10:2 FTMAC</td><td><rl< td=""><td>28.1</td></rl<></td></rl<>	0.025	10:2 FTMAC	<rl< td=""><td>28.1</td></rl<>	28.1
PFHpS	<rl< td=""><td>0.013</td><td></td><td></td><td></td></rl<>	0.013			
PFOS	<rl< td=""><td>0.049</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.049	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.013</td><td>8:2 FTOAc</td><td><rl< td=""><td>30.2</td></rl<></td></rl<>	0.013	8:2 FTOAc	<rl< td=""><td>30.2</td></rl<>	30.2
PFDS	<rl< td=""><td>0.013</td><td>10:2 FTOAc</td><td><rl< td=""><td>31.1</td></rl<></td></rl<>	0.013	10:2 FTOAc	<rl< td=""><td>31.1</td></rl<>	31.1
FASA (NV, SV)			<i>n:2 FTOH</i> ( <i>V</i> )		
FBSA (NV)	No Value		<b>4:2 FTOH</b>	<rl< td=""><td>79.1</td></rl<>	79.1
MeFBSA (SV)	<rl< td=""><td>0.156</td><td>5:2 FTOH</td><td><rl< td=""><td>75.2</td></rl<></td></rl<>	0.156	5:2 FTOH	<rl< td=""><td>75.2</td></rl<>	75.2
FHxSA (NV)	<rl< td=""><td>0.013</td><td>6:2 FTOH</td><td><rl< td=""><td>75.8</td></rl<></td></rl<>	0.013	6:2 FTOH	<rl< td=""><td>75.8</td></rl<>	75.8
FOSA (NV)	<rl< td=""><td>0.017</td><td>7:2 FTOH</td><td><rl< td=""><td>74.9</td></rl<></td></rl<>	0.017	7:2 FTOH	<rl< td=""><td>74.9</td></rl<>	74.9
MeFOSA (SV)	<rl< td=""><td>0.075</td><td>8:2 FTOH</td><td><rl< td=""><td>74.2</td></rl<></td></rl<>	0.075	8:2 FTOH	<rl< td=""><td>74.2</td></rl<>	74.2
EtFOSA (SV)	<rl< td=""><td>0.243</td><td>10:2 FTOH</td><td><rl< td=""><td>75.3</td></rl<></td></rl<>	0.243	10:2 FTOH	<rl< td=""><td>75.3</td></rl<>	75.3
FASAA (NV)	DI	0.012	<i>n:2 FTS (NV)</i>	0.005 0.050	0.070
FOSAA	<rl< td=""><td>0.013</td><td>4:2 FTS</td><td><math>0.635 \pm 0.050</math></td><td>0.258</td></rl<>	0.013	4:2 FTS	$0.635 \pm 0.050$	0.258
MeFOSAA	< <u>RL</u>	0.071	6:2 FTS	No Value	0.07
EtFOSAA	<rl< td=""><td>0.061</td><td>8:2 FTS</td><td><rl< td=""><td>0.026</td></rl<></td></rl<>	0.061	8:2 FTS	<rl< td=""><td>0.026</td></rl<>	0.026
			10:2 FTS	<rl< td=""><td>0.067</td></rl<>	0.067
FASE (SV)					
MeFOSE	<rl< td=""><td>0.403</td><td></td><td></td><td></td></rl<>	0.403			
EtFOSE	<rl< td=""><td>0.075</td><td></td><td></td><td></td></rl<>	0.075			

**Table 71.** Measured PFAS concentrations ( $\mu$ g-PFAS / kg-textile; mean ± standard deviation of triplicate<br/>measurements) and reporting limits (RL) for abraded TL-E.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)		<u> </u>	PPEA (NV)		
PFBA	<rl< td=""><td>0.595</td><td>PFEESA</td><td><rl< td=""><td>0.014</td></rl<></td></rl<>	0.595	PFEESA	<rl< td=""><td>0.014</td></rl<>	0.014
PFPeA	$0.69 \pm 0.46$	0.032	PF4OPeA	<rl< td=""><td>0.016</td></rl<>	0.016
PFHxA	$1.03 \pm 0.15$	0.285	PF5OHxA	<rl< td=""><td>0.016</td></rl<>	0.016
РҒНрА	$0.45 \pm 0.27$	0.129	3-6-OPFHpA	<rl< td=""><td>0.016</td></rl<>	0.016
PFOA	$0.83 \pm 0.10$	0.187	HFPO-DA	$0.67 \pm 0.61$	0.016
PFNA	$0.65 \pm 0.25$	0.062	ADONA	<rl< td=""><td>0.016</td></rl<>	0.016
PFDA	$0.33 \pm 0.15$	0.033	9CI-PF3ONS	<rl< td=""><td>0.017</td></rl<>	0.017
PFUnDA	<rl< td=""><td>0.088</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.017</td></rl<></td></rl<>	0.088	11Cl-PF3OUdS	<rl< td=""><td>0.017</td></rl<>	0.017
PFDoDA	$0.088\pm0.085$	0.026			
PFTrDA	$0.048 \pm 0.023$	0.029	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.018</td><td>8:2 FTAcr</td><td><rl< td=""><td>87.5</td></rl<></td></rl<>	0.018	8:2 FTAcr	<rl< td=""><td>87.5</td></rl<>	87.5
			10:2 FTAcr	<rl< td=""><td>33.1</td></rl<>	33.1
PFSA (NV)					
PFPrS	<rl< td=""><td>0.036</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.036	n:2 FTMAC (V)		
PFBS	<rl< td=""><td>1.81</td><td>6:2 FTMAC</td><td><rl< td=""><td>285</td></rl<></td></rl<>	1.81	6:2 FTMAC	<rl< td=""><td>285</td></rl<>	285
PFPeS	<rl< td=""><td>0.017</td><td>8:2 FTMAC</td><td><rl< td=""><td>59.9</td></rl<></td></rl<>	0.017	8:2 FTMAC	<rl< td=""><td>59.9</td></rl<>	59.9
PFHxS	<rl< td=""><td>2.87</td><td>10:2 FTMAC</td><td><rl< td=""><td>31.6</td></rl<></td></rl<>	2.87	10:2 FTMAC	<rl< td=""><td>31.6</td></rl<>	31.6
PFHpS	$0.071 \pm 0.034$	0.017			
PFOS	<rl< td=""><td>3.01</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	3.01	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.035</td><td>8:2 FTOAc</td><td><rl< td=""><td>32.4</td></rl<></td></rl<>	0.035	8:2 FTOAc	<rl< td=""><td>32.4</td></rl<>	32.4
PFDS	<rl< td=""><td>0.018</td><td>10:2 FTOAc</td><td><rl< td=""><td>34.5</td></rl<></td></rl<>	0.018	10:2 FTOAc	<rl< td=""><td>34.5</td></rl<>	34.5
FASA (NV, SV)		<u></u>	n:2 FTOH (V)		
FBSA (NV)	<rl< td=""><td>0.018</td><td><b>4:2 FTOH</b></td><td><rl< td=""><td>84.9</td></rl<></td></rl<>	0.018	<b>4:2 FTOH</b>	<rl< td=""><td>84.9</td></rl<>	84.9
MeFBSA (SV)	<rl< td=""><td>0.446</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>80.7</td></rl<></td></rl<>	0.446	<b>5:2 FTOH</b>	<rl< td=""><td>80.7</td></rl<>	80.7
FHxSA (NV)	<rl< td=""><td>0.018</td><td>6:2 FTOH</td><td><rl< td=""><td>85.4</td></rl<></td></rl<>	0.018	6:2 FTOH	<rl< td=""><td>85.4</td></rl<>	85.4
FOSA (NV)	<rl< td=""><td>0.020</td><td>7:2 FTOH</td><td><rl< td=""><td>84.4</td></rl<></td></rl<>	0.020	7:2 FTOH	<rl< td=""><td>84.4</td></rl<>	84.4
MeFOSA (SV)	<rl< td=""><td>0.444</td><td>8:2 FTOH</td><td><rl< td=""><td>83.5</td></rl<></td></rl<>	0.444	8:2 FTOH	<rl< td=""><td>83.5</td></rl<>	83.5
EtFOSA (SV)	<rl< td=""><td>0.445</td><td>10:2 FTOH</td><td><rl< td=""><td>172</td></rl<></td></rl<>	0.445	10:2 FTOH	<rl< td=""><td>172</td></rl<>	172
FASAA (NV)		<u> </u>	<i>n:2 FTS (NV)</i>		
FOSAA	No Value		4:2 FTS	No Value	
MeFOSAA	<rl< td=""><td>0.018</td><td>6:2 FTS</td><td>No Value</td><td></td></rl<>	0.018	6:2 FTS	No Value	
EtFOSAA	<rl< td=""><td>0.018</td><td>8:2 FTS</td><td><rl< td=""><td>0.017</td></rl<></td></rl<>	0.018	8:2 FTS	<rl< td=""><td>0.017</td></rl<>	0.017
			10:2 FTS	No Value	
FASE (SV)					
MeFOSE	<rl< td=""><td>0.446</td><td></td><td></td><td></td></rl<>	0.446			
EtFOSE	<rl< td=""><td>0.440</td><td></td><td></td><td></td></rl<>	0.440			

 Table 72. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for TL-E following exposure to elevated temperature.

PFAS	Concentration (µg/kg)	RL (µg/kg)	PFAS	Concentration (µg/kg)	RL (µg/kg)
PFCA (NV)			PPEA (NV)		
PFBA	<rl< td=""><td>0.233</td><td>PFEESA</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.233	PFEESA	<rl< td=""><td>0.019</td></rl<>	0.019
PFPeA	<rl< td=""><td>0.043</td><td>PF4OPeA</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.043	PF4OPeA	<rl< td=""><td>0.019</td></rl<>	0.019
PFHxA	<rl< td=""><td>0.116</td><td>PF5OHxA</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.116	PF5OHxA	<rl< td=""><td>0.019</td></rl<>	0.019
PFHpA	<rl< td=""><td>0.096</td><td>3-6-ОРҒНрА</td><td><rl< td=""><td>0.017</td></rl<></td></rl<>	0.096	3-6-ОРҒНрА	<rl< td=""><td>0.017</td></rl<>	0.017
PFOA	<rl< td=""><td>0.124</td><td>HFPO-DA</td><td><rl< td=""><td>0.027</td></rl<></td></rl<>	0.124	HFPO-DA	<rl< td=""><td>0.027</td></rl<>	0.027
PFNA	<rl< td=""><td>0.065</td><td>ADONA</td><td><rl< td=""><td>0.019</td></rl<></td></rl<>	0.065	ADONA	<rl< td=""><td>0.019</td></rl<>	0.019
PFDA	<rl< td=""><td>0.121</td><td>9CI-PF3ONS</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.121	9CI-PF3ONS	<rl< td=""><td>0.020</td></rl<>	0.020
PFUnDA	<rl< td=""><td>0.067</td><td>11Cl-PF3OUdS</td><td><rl< td=""><td>0.020</td></rl<></td></rl<>	0.067	11Cl-PF3OUdS	<rl< td=""><td>0.020</td></rl<>	0.020
PFDoDA	<rl< td=""><td>0.045</td><td></td><td></td><td></td></rl<>	0.045			
PFTrDA	<rl< td=""><td>0.104</td><td>n:2 FTAcr (V)</td><td></td><td></td></rl<>	0.104	n:2 FTAcr (V)		
PFTeDA	<rl< td=""><td>0.021</td><td>8:2 FTAcr</td><td><rl< td=""><td>14.7</td></rl<></td></rl<>	0.021	8:2 FTAcr	<rl< td=""><td>14.7</td></rl<>	14.7
			10:2 FTAcr	<rl< td=""><td>14.1</td></rl<>	14.1
PFSA (NV)					
PFPrS	<rl< td=""><td>0.060</td><td>n:2 FTMAC (V)</td><td></td><td></td></rl<>	0.060	n:2 FTMAC (V)		
PFBS	$0.050\pm0.012$	0.025	6:2 FTMAC	<rl< td=""><td>63.0</td></rl<>	63.0
PFPeS	<rl< td=""><td>0.020</td><td>8:2 FTMAC</td><td><rl< td=""><td>64.5</td></rl<></td></rl<>	0.020	8:2 FTMAC	<rl< td=""><td>64.5</td></rl<>	64.5
PFHxS	<rl< td=""><td>0.042</td><td>10:2 FTMAC</td><td><rl< td=""><td>34.0</td></rl<></td></rl<>	0.042	10:2 FTMAC	<rl< td=""><td>34.0</td></rl<>	34.0
PFHpS	<rl< td=""><td>0.020</td><td></td><td></td><td></td></rl<>	0.020			
PFOS	<rl< td=""><td>0.164</td><td>n:2 FTOAc (V)</td><td></td><td></td></rl<>	0.164	n:2 FTOAc (V)		
PFNS	<rl< td=""><td>0.021</td><td>8:2 FTOAc</td><td><rl< td=""><td>14.5</td></rl<></td></rl<>	0.021	8:2 FTOAc	<rl< td=""><td>14.5</td></rl<>	14.5
PFDS	<rl< td=""><td>0.028</td><td>10:2 FTOAc</td><td>No Value</td><td></td></rl<>	0.028	10:2 FTOAc	No Value	
FASA (NV, SV)			<i>n:2 FTOH</i> (V)		
FBSA (NV)	0.0490 ± 0.0031	0.021	4:2 FTOH	<rl< td=""><td>72.2</td></rl<>	72.2
MeFBSA (SV)	<rl< td=""><td>0.814</td><td><b>5:2 FTOH</b></td><td><rl< td=""><td>141</td></rl<></td></rl<>	0.814	<b>5:2 FTOH</b>	<rl< td=""><td>141</td></rl<>	141
FHxSA (NV)	<rl< td=""><td>0.021</td><td>6:2 FTOH</td><td><rl< td=""><td>73.9</td></rl<></td></rl<>	0.021	6:2 FTOH	<rl< td=""><td>73.9</td></rl<>	73.9
FOSA (NV)	<rl< td=""><td>0.021</td><td>7:2 FTOH</td><td><rl< td=""><td>80.1</td></rl<></td></rl<>	0.021	7:2 FTOH	<rl< td=""><td>80.1</td></rl<>	80.1
MeFOSA (SV)	<rl< td=""><td>0.341</td><td>8:2 FTOH</td><td><rl< td=""><td>75.4</td></rl<></td></rl<>	0.341	8:2 FTOH	<rl< td=""><td>75.4</td></rl<>	75.4
EtFOSA (SV)	<rl< td=""><td>0.342</td><td>10:2 FTOH</td><td><rl< td=""><td>73.4</td></rl<></td></rl<>	0.342	10:2 FTOH	<rl< td=""><td>73.4</td></rl<>	73.4
FASAA (NV)		<u> </u>	<i>n:2 FTS (NV)</i>		
FOSAA	<rl< td=""><td>0.373</td><td>4:2 FTS</td><td><rl< td=""><td>0.108</td></rl<></td></rl<>	0.373	4:2 FTS	<rl< td=""><td>0.108</td></rl<>	0.108
MeFOSAA	<rl< td=""><td>0.116</td><td>6:2 FTS</td><td><rl< td=""><td>0.222</td></rl<></td></rl<>	0.116	6:2 FTS	<rl< td=""><td>0.222</td></rl<>	0.222
EtFOSAA	<rl< td=""><td>0.116</td><td>8:2 FTS</td><td><rl< td=""><td>0.223</td></rl<></td></rl<>	0.116	8:2 FTS	<rl< td=""><td>0.223</td></rl<>	0.223
			10:2 FTS	<rl< td=""><td>0.043</td></rl<>	0.043
FASE (SV)					
MeFOSE	<rl< td=""><td>0.815</td><td></td><td></td><td></td></rl<>	0.815			
EtFOSE	<rl< td=""><td>0.803</td><td></td><td></td><td></td></rl<>	0.803			

 Table 73. Measured PFAS concentrations (μg-PFAS / kg-textile; mean ± standard deviation of triplicate measurements) and reporting limits (RL) for laundered TL-E.

## 7. References

- [1] Buck RC, Franklin J, Berger U, Conder JM, Cousins IT, de Voogt P, Jensen AA, Kannan K, Mabury SA, van Leeuwen SP (2011) Perfluoroalkyl and polyfluoroalkyl substances in the environment: Terminology, classification, and origins. *Integrated Environmental Assessment and Management* 7(4):513-541. <u>https://doi.org/10.1002/ieam.258</u>
- [2] Gluge J, Scheringer M, Cousins IT, DeWitt JC, Goldenman G, Herzke D, Lohmann R, Ng CA, Trier X, Wang Z (2020) An overview of the uses of per- and polyfluoroalkyl substances (PFAS). *Environmental Science: Processes & Impacts* 22(12):2345-2373. <u>https://doi.org/10.1039/d0em00291g</u>
- [3] U.S. Environmental Protection Agency (2022) INTERIM Drinking Water Health Advisory: Perfluorooctane Sulfonic Acid (PFOS) CASRN 1763-23-1, U.S. Environmental Protection Agency (Health and Ecological Criteria Division, Office of Science and Technology, Office of Water).
- [4] U.S. Department of Health and Human Services (2021) *Toxicological Profile for Perfluoroalkyls*, U.S. Department of Health and Human Services (Agency for Toxic Substances and Disease Registry).
- [5] U.S. Environmental Protection Agency (2023) *PUBLIC COMMENT DRAFT Toxicity Assessment and Proposed Maximum Contaminant Level Goal for Perfluorooctane Sulfonic Acid (PFOS) in Drinking Water*, U.S. Environmental Protection Agency (Health and Ecological Criteria Division, Office of Science and Technology, Office of Water).
- [6] U.S. Environmental Protection Agency (2023) *PUBLIC COMMENT DRAFT Toxicity Assessment and Proposed Maximum Contaminant Level Goal for Perfluorooctanoic Acid* (*PFOA*) in Drinking Water, U.S. Environmental Protection Agency (Health and Ecological Criteria Division, Office of Science and Technology, Office of Water).
- [7] U.S. Environmental Protection Agency (2021) *Human Health Toxicity Values for Hexafluoropropylene Oxide (HFPO) Dimer Acid and Its Ammonium Salt (CASRN 13252-13-6 and CASRN 62037-80-3)*, U.S. Environmental Protection Agency (Health and Ecological Criteria Division, Office of Science and Technology, Office of Water).
- [8] International Agency for Research on Cancer (2017) Some chemicals used as solvents and in polymer manufacture. (World Health Organization, Lyon, France), Vol. 110.
- [9] Trowbridge J, Gerona RR, Lin T, Rudel RA, Bessonneau V, Buren H, Morello-Frosch R (2020) Exposure to perfluoroalkyl substances in a cohort of women firefighters and office workers in San Francisco. *Environmental Science & Technology* 54(6):3363-3374. <u>https://doi.org/10.1021/acs.est.9b05490</u>
- [10] Graber JM, Black TM, Shah NN, Caban-Martinez AJ, Lu SE, Brancard T, Yu CH, Turyk ME, Black K, Steinberg MB, Fan Z, Burgess JL (2021) Prevalence and predictors of perand polyfluoroalkyl substances (PFAS) serum levels among members of a suburban US volunteer fire department. *International Journal of Environmental Research and Public Health* 18(7):3730. <u>https://doi.org/10.3390/ijerph18073730</u>
- [11] Nilsson S, Smurthwaite K, Aylward LL, Kay M, Toms LM, King L, Marrington S, Barnes C, Kirk MD, Mueller JF, Braunig J (2022) Serum concentration trends and apparent half-lives of per- and polyfluoroalkyl substances (PFAS) in Australian firefighters. *International Journal of Hygiene and Environmental Health* 246:114040. <u>https://doi.org/10.1016/j.ijheh.2022.114040</u>

- [12] Rotander A, Toms LM, Aylward L, Kay M, Mueller JF (2015) Elevated levels of PFOS and PFHxS in firefighters exposed to aqueous film forming foam (AFFF). *Environment International* 82:28-34. <u>https://doi.org/10.1016/j.envint.2015.05.005</u>
- [13] Khalil N, Ducatman AM, Sinari S, Billheimer D, Hu C, Littau S, Burgess JL (2020) Perand polyfluoroalkyl substance and cardio metabolic markers in firefighters. *Journal of Occupational and Environmental Medicine* 62(12):1076-1081. https://doi.org/10.1097/JOM.0000000002062
- [14] Dobraca D, Israel L, McNeel S, Voss R, Wang M, Gajek R, Park JS, Harwani S, Barley F, She J, Das R (2015) Biomonitoring in California firefighters: Metals and perfluorinated chemicals. *Journal of Occupational and Environmental Medicine* 57(1):88-97. <u>https://doi.org/10.1097/JOM.00000000000307</u>
- [15] Shaw SD, Berger ML, Harris JH, Yun SH, Wu Q, Liao C, Blum A, Stefani A, Kannan K (2013) Persistent organic pollutants including polychlorinated and polybrominated dibenzo-p-dioxins and dibenzofurans in firefighters from Northern California. *Chemosphere* 91(10):1386-1394. https://doi.org/10.1016/j.chemosphere.2012.12.070
- [16] Leary DB, Takazawa M, Kannan K, Khalil N (2020) Perfluoroalkyl substances and metabolic syndrome in firefighters: A pilot study. *Journal of Occupational and Environmental Medicine* 62(1):52-57. <u>https://doi.org/10.1097/JOM.00000000001756</u>
- [17] Jin C, Sun Y, Islam A, Qian Y, Ducatman A (2011) Perfluoroalkyl acids including perfluorooctane sulfonate and perfluorohexane sulfonate in firefighters. *Journal of Occupational and Environmental Medicine* 53(3):324-328. <u>https://doi.org/10.1097/JOM.0b013e31820d1314</u>
- [18] Mazumder N-U-S, Hossain MT, Jahura FT, Girase A, Hall AS, Lu J, Ormond RB (2023) Firefighters' exposure to per-and polyfluoroalkyl substances (PFAS) as an occupational hazard: A review. *Frontiers in Materials* 10. <u>https://doi.org/10.3389/fmats.2023.1143411</u>
- [19] Rosenfeld PE, Spaeth KR, Remy LL, Byers V, Muerth SA, Hallman RC, Summers-Evans J, Barker S (2023) Perfluoroalkyl substances exposure in firefighters: Sources and implications. *Environmental Research* 220:115164. <u>https://doi.org/10.1016/j.envres.2022.115164</u>
- [20] Muensterman DJ, Titaley IA, Peaslee GF, Minc LD, Cahuas L, Rodowa AE, Horiuchi Y, Yamane S, Fouquet TNJ, Kissel JC, Carignan CC, Field JA (2022) Disposition of fluorine on new firefighter turnout gear. *Environmental Science & Technology* 56(2):974-983. <u>https://doi.org/10.1021/acs.est.1c06322</u>
- [21] Rewerts JN, Morre JT, Massey Simonich SL, Field JA (2018) In-vial extraction large volume gas chromatography mass spectrometry for analysis of volatile PFASs on papers and textiles. *Environmental Science & Technology* 52(18):10609-10616. https://doi.org/10.1021/acs.est.8b04304
- [22] Maizel AC, Thompson A, Tighe M, Escobar Veras S, Rodowa AE, Falkenstein-Smith F, Benner B, Hoffman K, Donnelly M, Hernandez O, Wetzler N, Ngu T, Reiner J, Place B, Kucklick J, Rimmer C, Davis RD (2023) Per- and Polyfluoroalkyl Substances in New Firefighter Turnout Gear Textiles. (National Institute of Standards and Technology), NIST TN 2248. <u>https://doi.org/10.6028/nist.Tn.2248</u>
- [23] National Fire Protection Association (2017) *NFPA 1971 Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting, 2018 Edition* (National Fire Protection Association, Quiny, MA).

- [24] Peaslee GF, Wilkinson JT, McGuinness SR, Tighe M, Caterisano N, Lee S, Gonzales A, Roddy M, Mills S, Mitchell K (2020) Another pathway for firefighter exposure to perand polyfluoroalkyl substances: Firefighter textiles. *Environmental Science & Technology Letters* 7(8):594-599. https://doi.org/10.1021/acs.estlett.0c00410
- [25] Davis R, Chin J, Lin C-C, Petit S (2010) Accelerated weathering of polyaramid and polybenzimidazole firefighter protective clothing fabrics. *Polymer Degradation and Stability* 95(9):1642-1654. <u>https://doi.org/10.1016/j.polymdegradstab.2010.05.029</u>
- [26] Nazaré S, Davis RD, Peng J-S, Chin J (2012) Accelerated Weathering of Firefighter Protective Clothing: Delineating the Impact of Thermal, Moisture, and Ultraviolet Light Exposures. (National Institute of Standards and Technology), NIST TN 1746. <u>https://doi.org/10.6028/nist.Tn.1746</u>
- [27] Schellenberger S, Liagkouridis I, Awad R, Khan S, Plassmann M, Peters G, Benskin JP, Cousins IT (2022) An outdoor aging study to investigate the release of per- and polyfluoroalkyl substances (PFAS) from functional textiles. *Environmental Science & Technology* 56(6):3471-3479. <u>https://doi.org/10.1021/acs.est.1c06812</u>
- [28] van der Veen I, Weiss JM, Hanning AC, de Boer J, Leonards PE (2016) Development and validation of a method for the quantification of extractable perfluoroalkyl acids (PFAAs) and perfluorooctane sulfonamide (FOSA) in textiles. *Talanta* 147:8-15. https://doi.org/10.1016/j.talanta.2015.09.021
- [29] van der Veen I, Hanning AC, Stare A, Leonards PEG, de Boer J, Weiss JM (2020) The effect of weathering on per- and polyfluoroalkyl substances (PFASs) from durable water repellent (DWR) clothing. *Chemosphere* 249:126100. https://doi.org/10.1016/j.chemosphere.2020.126100
- [30] van der Veen I, Schellenberger S, Hanning AC, Stare A, de Boer J, Weiss JM, Leonards PEG (2022) Fate of per- and polyfluoroalkyl substances from durable water-repellent clothing during use. *Environmental Science & Technology* 56(9):5886-5897. https://doi.org/10.1021/acs.est.1c07876
- [31] International Organization for Standardization (1998) *ISO 12947-3 Textiles -Determination of the Abrasion Resistance of Fabrics by the Martindale Method* (International Organization for Standardization, Switzerland).
- [32] ASTM International (2016) D4966-12 Standard Test Method for Abrasion Resistance of Textile Fabrics (Martindale Abrasion Tester Method) (ASTM International, West Conchohocken, PA). <u>https://doi.org/10.1520/d4966-12r16</u>
- [33] ASTM International (2019) F2894-19 Standard Test Method for Evaluation of Materials, Protective Clothing, and Equipment for Heat Resistance Using a Hot Air Circulating Oven (ASTM International, West Conchohocken, PA). https://doi.org/10.1520/f2894-19
- [34] National Fire Protection Association (2019) *NFPA 1851 Standard on the Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting* (National Fire Protection Association, Quincy, MA).
- [35] International Organization for Standardization (2016) *ISO* 4892-3:2016 *Plastics Methods of Exposure to Laboratory Light Sources* (International Organization for Standardization, Switzerland).

- [36] ASTM International (2000) G154-00a Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials (ASTM International, West Conchohocken, PA).
- [37] Krusic PJ, Marchione AA, Davidson F, Kaiser MA, Kao CP, Richardson RE, Botelho M, Waterland RL, Buck RC (2005) Vapor pressure and intramolecular hydrogen bonding in fluorotelomer alcohols. *Journal of Physical Chemistry A* 109(28):6232-6241. https://doi.org/10.1021/jp0502961
- [38] U.S. Environmental Protection Agency (2023) *Comptox Chemicals Dashboard*. 2-(*Perfluorohexyl*)*ethyl methacrylate*. Available at <u>https://comptox.epa.gov/dashboard/chemical/details/DTXSID3047558</u>.
- [39] U.S. Environmental Protection Agency (2023) *Comptox Chemical Dashboard 2-*(*Perfluorohexyl*)*ethanol*. Available at https://comptox.epa.gov/dashboard/chemical/details/DTXSID5044572
- [40] Yamada T, Taylor PH, Buck RC, Kaiser MA, Giraud RJ (2005) Thermal degradation of fluorotelomer treated articles and related materials. *Chemosphere* 61(7):974-984. <u>https://doi.org/10.1016/j.chemosphere.2005.03.025</u>
- [41] Zuev VV, Bertini F, Audisio G (2006) Investigation on the thermal degradation of acrylic polymers with fluorinated side-chains. *Polymer Degradation and Stability* 91(3):512-516. https://doi.org/10.1016/j.polymdegradstab.2005.03.025
- [42] Goodrich JM, Calkins MM, Caban-Martinez AJ, Stueckle T, Grant C, Calafat AM, Nematollahi A, Jung AM, Graber JM, Jenkins T, Slitt AL, Dewald A, Cook Botelho J, Beitel S, Littau S, Gulotta J, Wallentine D, Hughes J, Popp C, Burgess JL (2021) Perand polyfluoroalkyl substances, epigenetic age and DNA methylation: a cross-sectional study of firefighters. *Epigenomics* 13(20):1619-1636. <u>https://doi.org/10.2217/epi-2021-0225</u>
- [43] Laitinen JA, Koponen J, Koikkalainen J, Kiviranta H (2014) Firefighters' exposure to perfluoroalkyl acids and 2-butoxyethanol present in firefighting foams. *Toxicology Letters* 231(2):227-232. <u>https://doi.org/10.1016/j.toxlet.2014.09.007</u>
- [44] Hall SM, Patton S, Petreas M, Zhang S, Phillips AL, Hoffman K, Stapleton HM (2020) Per- and polyfluoroalkyl substances in dust collected from residential homes and fire stations in North America. *Environ Sci Technol* 54(22):14558-14567. <u>https://doi.org/10.1021/acs.est.0c04869</u>

# **Appendix A. Experimental Details**

### A.1. Materials

## A.1.1. Firefighter Turnout Gear Textiles

Table 74 shows the area density  $(kg/m^2)$  and an example image of each textile prior to stressing.

**Table 74**. Area densities (mean ± standard deviation of triplicate measurements; kg/m<sup>2</sup>) and images of firefighter turnout gear textiles prior to stressing.

Textile	Area Density (kg/m <sup>2</sup> )	Image
MB-A	$0.1672 \pm 0.0026$	
MB-B	0.1533 ± 0.0015	
MB-C	$0.2540 \pm 0.0011$	
MB-D	0.2049 ± 0.0037	
MB-E	$0.1675 \pm 0.0012$	
MB-F	$0.2128 \pm 0.0031$	

Textile	Area Density (kg/m <sup>2</sup> )	Image
OS-A	$0.2244 \pm 0.0070$	
OS-ASC	0.2093 ± 0.0027	
OS-B	$0.2635 \pm 0.0055$	
OS-C	$0.2333 \pm 0.0093$	
OS-D	$0.2619 \pm 0.0085$	
OS-E	0.2461 ± 0.0114	
OS-F	$0.2574 \pm 0.0016$	

## Table 74. (Continued)

Textile	Area Density (kg/m <sup>2</sup> )	Image
OS-FSC	$0.2178 \pm 0.0073$	
OS-G	$0.2779 \pm 0.0046$	
TL-A	$0.3428 \pm 0.0087$	B7 BE
TL-B	0.3813 ± 0.0147	
TL-C	0.3727 ± 0.0019	
TL-D	$0.3533 \pm 0.0043$	
TL-E	0.3412 ± 0.0106	

Table 74. (Continued)

## A.1.2. PFAS Analytical Standards and NIST Reference Materials

The selection of PFAS for inclusion in this study was based on previous reports in the scientific literature, the professional experience of NIST researchers related to PFAS and firefighter gear, as well as conversations with subject matter experts outside NIST. Analytical standards were obtained for 55 PFAS including 11 PFCAs, eight PFSAs, six perfluoroalkane sulfonamides (FASA), three per- and polyfluoroalkane sulfonamido acetic acids (FASAA), two perfluoroalkane sulfonamido ethanols (FASE), eight PPEAs, six n:2 FTOHs, two n:2 fluorotelomer acrylates (n:2 FTAcr), three n:2 fluorotelomer methacrylates (n:2 FTMAC), two n:2 fluorotelomer acetates (n:2 FTOAc), two n:2 fluorotelomer acrylates (n:2 FTS).

Analytical standards (Table 75) and isotopically labeled standards (Table 76) for nonvolatile PFAS as well as semivolatile PFAS (Table 77 and Table **78**) were obtained from Wellington Laboratories (Guelph, Ontario, Canada). Analytical standards and isotopically labeled standards for volatile PFAS (Table 79 and

NIST Reference Materials (RMs) 8446 Perfluorinated Carboxylic Acids and Perfluorooctane Sulfonamide in Methanol (8446) and 8447 Perfluorinated Sulfonic Acids in Methanol (8447) were obtained for use as quality control samples (Table 81 and Table 82).

 Table 80) were obtained from Wellington Laboratories and Synquest Laboratories (Alachua, FL).

**Table 75.** Analytical standard solutions obtained from Wellington Laboratories for use in nonvolatile PFASanalysis, with full analyte names, CAS RN, and abbreviations (bold), as well as analyte concentrationswith expanded maximum combined percent relative uncertainty. PFHxS, PFOS, MeFOSAA, andEtFOSAA in PFAC30PAR were present as a mixture of structural isomers.

Standard	Contents	Concentration
PFAC30-	Perfluoro-n-butanoic acid (375-22-4; PFBA), Perfluoro-n-	$(1.00 \mu g/mL \pm$
PAR	pentanoic acid (2706-90-3; PFPeA), Perfluoro-n-hexanoic acid	$0.05 \mu g/mL$ ) in
	(307-24-4; <b>PFHxA</b> ), Perfluoro-n-heptanoic acid (375-85-9;	methanol/isopropanol
	PFHpA), Perfluoro-n-octanoic acid (335-67-1; PFOA),	(6%) /water $(<1%)$
	Perfluoro-n-nonanoic acid (375-95-1; PFNA), Perfluoro-n-	
	decanoic acid (335-76-2; PFDA), Perfluoro-n-undecanoic acid	
	(2058-94-8; <b>PFUnDA</b> ), Perfluoro-n-dodecanoic acid (307-55-1;	
	PFDoDA), Perfluoro-n-tridecanoic acid (72629-94-8; PFTrDA),	
	Perfluoro-n-tetradecanoic acid (0376-06-07; PFTeDA),	
	Perfluoro-1-butanesulfonamide (30334-69-1; FBSA), Perfluoro-	
	1-hexanesulfonamide (41997-13-1; FHxSA), Perfluoro-1-	
	octanesulfonamide (754-91-6; FOSA), Tetrafluoro-2-	
	(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (13252-13-6;	
	HFPO-DA), N-methylperfluoro-1-octanesulfonamidoacetic acid	
	(2355-31-9; <b>N-MeFOSAA</b> ), N-ethylperfluoro-1-	
	octanesulfonamidoacetic acid (2991-50-6, N-EtFOSAA),	
	Potassium perfluorobutanesulfonate (29420-49-3; <b>PFBS</b> ),	
	Sodium perfluoropentanesulfonate (630402-22-1; <b>PFPeS</b> ),	
	Potassium perfluorohexanesulfonate (3871-99-6; <b>PFHxS</b> ),	
	Sodium perfluoroheptanesulfonate (21934-50-9; <b>PFHpS</b> ),	
	Potassium perfluorooctanesulfonate (2795-39-3; <b>PFOS</b> ), Sodium	
	perfluorononanesulfonate (98789-57-2; <b>PFNS</b> ), Sodium	
	perfluorodecanesulfonate (2806-15-7; <b>PFDS</b> ), Sodium	
	1H,1H,2H,2H,-perfluoro-1-hexanesulfonate (27619-93-8; <b>4:2</b>	
	FTS), Sodium 1H,1H,2H,2H,-perfluoro-1-octanesulfonate	
	(27619-94-9; <b>6:2 FTS</b> ), Sodium 1H,1H,2H,2H,-perfluoro-1-	
	decanesulfonate (27619-96-1; <b>8:2 FTS)</b> , Sodium dodecafluoro-	
	3H-4,8-dioxanonatoate; <b>NaDONA</b> ), Potassium 9-	
	chlorohexadecafluoro-3-oxanonane-1-sulfonate (73606-19-6; 9Cl-PF3ONS), Potassium 11-chloroeicosafluoro-3-	
	oxaundecane-1-sulfonate (83329-89-9; <b>11Cl-PF3OUdS</b> )	
PFAC-	Perfluoro-4-oxapentenoic acid (377-73-1; <b>PF40PeA</b> ), Perfluoro-	$(2.0 \mu\text{g/mL} \pm$
MXG	5-oxahexanoic acid (863090-89-5; <b>PF50HxA</b> ), Perfluoro-3,6-	$(2.0 \ \mu g/mL)$ in
MAG	dioxaheptanoic acid (151772-58-6; <b>3,6-OPFHpA</b> ), Potassium	methanol/water (<1%)
	perfluoro(2-ethoxyethane)sulfonic acid ( <b>PFEESA</b> )	methanon water (<170)
L-PFPrS	Sodium perfluoropropanesulfonate (359868-82-9; <b>PFPrS</b> )	$(50.0 \mu\text{g/mL} \pm$
		$2.5 \mu\text{g/mL}$ ) in
		methanol
FOSAA	Perfluorooctane sulfonamidoacetic acid (2806-24-6; FOSAA)	$(50.0 \mu g/mL \pm$
		$2.5 \mu\text{g/mL}$ ) in
		methanol/water (<1%)
10:2FTS	Sodium 1H,1H,2H,2H,-perfluoro-1-dodecanesulfonate (10:2	$(50.0 \mu g/mL \pm$
	FTS)	$2.5 \mu\text{g/mL}$ ) in
		methanol

**Table 76.** Isotopically labeled internal and injection standard solutions obtained from WellingtonLaboratories for use in nonvolatile and semivolatile PFAS analysis, with full analyte names, and analyte<br/>concentrations with expanded maximum combined percent relative uncertainty where provided.

Standard	Contents	Concentration
MPFAC-24ES	Perfluoro-n-[13C4]-butanoic acid, Perfluoro-n- [13C5]-pentanoic acid, Perfluoro-n-[1,2,3,4,6- 13C5]-hexanoic acid, Perfluoro-n-[1,2,3,4,- 13C4]-heptanoic acid, Perfluoro-n-[13C8]- octanoic acid, Perfluoro-n-[13C9]-nonanoic acid, Perfluoro-n-[1,2,3,4,5,6-13C5]decanoic acid, Perfluoro-n-[1,2,3,4,5,6,7- 13C7]undecanoic acid, Perfluoro-n-[1,2- 13C2]dodecanoic acid, Perfluoro-n-[1,2- 13C2]tetradecanoic acid, Sodium perfluoro-1- [2,3,4-13C3]-butanesulfonate, Sodium perfluoro-1-[1,2,3-13C3]-hexanesulfonate, Sodium perfluoro-1-[13C8]-octanesulfonate, Perfluoro-1-[13C8]octanesulfonamide, N- methyl-d3-perlfuoro-1-octanesulfonamid acetic acid, N-ethyl-d5-perfluoro-1-octanesulfonamido acetic acid, Sodium 1H, 1H, 2H, 2H-perfluoro- 1-[1,2-13C2]-hexane sulfonate, Sodium 1H, 1H, 2H, 2H-perfluoro-1-[1,2-13C2]-octane sulfonate, Sodium 1H, 1H, 2H, 2H-perfluoro-1- [1,2-13C2]-decane sulfonate	(1.00 µg/mL ± 0.05 µg/mL) in methanol/ isopropanol (2%)/water (<1%)
M3HFPO-DA	Tetrafluoro(heptafluoropropoxy)[ <sup>13</sup> C <sub>3</sub> ]- propanoic acid	$(50.0 \ \mu g/mL \pm 2.5 \ \mu g/mL)$ in methanol
MPFAC-C-IS	Perfluoro-n-[2,3,4-13C3]-butanoic acid ( <b>PFBA-INJ</b> ), Perfluoro-n-[1,2,3,4-13C4]-octanoic acid ( <b>PFOA -INJ</b> ), Perfluoro-n-[1,2-13C2]decanoic acid ( <b>PFDA -INJ</b> ), Sodium perfluoro-1-[1,2,3,4-13C4]-octanesulfonate ( <b>PFOS -INJ</b> )	$(50.0 \ \mu g/mL \pm 2.5 \ \mu g/mL)$ in methanol/ water $(<1\%)$

**Table 77.** Analytical standard solutions purchased from Wellington Laboratories for use in semivolatile PFAS analysis including full analyte names, CAS RN, abbreviations (bold), and analyte concentrations with expanded maximum combined percent relative uncertainty where provided.

Standard	Contents	Concentration
N-MeFBSA-M	Nonafluoro-N-methylbutancesulfonamide	$(50 \ \mu g/mL \pm$
	(6829-12-4; <b>MeFBSA</b> )	$2.5 \mu g/mL$ ) in methanol
N-MeFOSA-M	Heptadecafluoro-N-methyloctancesulfonamide	$(50 \ \mu g/mL \pm$
	(31506-32-8; <b>MeFOSA</b> )	2.5 $\mu$ g/mL) in methanol
N-EtFOSA-M	Heptadecafluoro-N-ethyloctancesulfonamide	$(50 \ \mu g/mL \pm 2.5 \ \mu g/mL$
	(4151-50-2; <b>EtFOSA</b> )	in methanol
N-MeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)-	$(50 \ \mu g/mL \pm$
	ethanol (24448-09-7; <b>MeFOSE</b> )	$2.5 \mu g/mL$ ) in methanol
N-EtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)-	$(50 \ \mu g/mL \pm$
	ethanol (1691-99-2; <b>EtFOSE</b> )	$2.5 \mu g/mL$ ) in methanol

**Table 78.** Isotopically labeled internal standard solutions obtained from Wellington Laboratories for use in semivolatile PFAS analysis, with full analyte names, and analyte concentrations with expanded maximum combined percent relative uncertainty where provided.

Standard	Contents	Concentration
d-N-MeFOSA-M	N-methy-d3-perflouro-1-octanesulfonamide	$(50~\mu\text{g/mL}\pm2.5~\mu\text{g/mL})$
		in methanol
d-N-EtFOSA	N-ethyl-d5-perfluoro-1-octanesulfonamide	$(50~\mu\text{g/mL}\pm2.5~\mu\text{g/mL})$
		in methanol
d7-N-MeFOSE-M	2-(N-methyl-d3-perfluoro-1-	$(50~\mu\text{g/mL}\pm2.5~\mu\text{g/mL})$
	octanesulfonamido)ethan-d4-ol	in methanol
d9-N-EtFOSE-M	2-(N-ethyl-d5-perfluoro-1-	$(50~\mu\text{g/mL}\pm2.5~\mu\text{g/mL})$
	octanesulfonamido)ethan-d4-ol	in methanol

 Table 79.
 Analytical standards solutions obtained for volatile PFAS analysis with supplier (WL =

 Wellington Laboratories, S = Synquest Laboratories), full analyte names, CAS RN, abbreviations (bold), and analyte concentrations with expanded maximum combined percent relative uncertainty where provided.

Standard	Contents	Concentration
8:2FTAcr (W)	1H, 1H, 2H, 2H-Perfluorodecyl acrylate	$(50.0 \mu g/mL \pm$
	(27905-45-9; <b>8:2 FTAcr</b> )	2.5 $\mu$ g/mL) in isooctane
10:2 FTAcr	1H, 1H, 2H, 2H-Pefluorododecyl acrylate	$(47.9 \ \mu g/mL \pm$
(W)	(17741-60-5; <b>10:2 FTAcr</b> )	2.4 $\mu$ g/mL) in isooctane
FBET (W)	2-Perflourobutyl ethanol (2043-47-2; 4:2	$(50.0 \mu g/mL \pm$
	FTOH)	2.5 $\mu$ g/mL) in methanol
<b>5:2sFTOH (W)</b>	1-Perfluoropentyl ethanol (914637-05-1; 5:2	$(50.0 \ \mu g/mL \pm$
	FTOH)	$2.5 \mu g/mL$ ) in methanol
FHET (W)	2-Perfluorohexyl ethanol (647-42-7; 6:2	$(50.0 \mu g/mL \pm$
	FTOH)	2.5 $\mu$ g/mL) in methanol
7:2sFTOH (W)	1-Perfluoroheptyl ethanol (24015-83-6; 7:2	$(50.0 \mu g/mL \pm$
	FTOH)	2.5 $\mu$ g/mL) in methanol
FOET (W)	2-Perfluorooctyl ethanol (678-39-7; 8:2	$(50.0 \mu\text{g/mL} \pm$
	FTOH)	$2.5 \mu g/mL$ ) in methanol
FDET (W)	2-Perfluorodecyl ethanol (865-86-1; <b>10:2</b>	$(50.0 \mu g/mL \pm$
	FTOH)	2.5 $\mu$ g/mL) in methanol
8:2 FTOAc (W)	1H, 1H, 2H, 2H-Perfluorodecyl acetate	$(48.5 \ \mu g/mL \pm 2.4$
	(37858-04-1; <b>8:2 FTOAc</b> )	$\mu$ g/mL) in isooctane
10:2FTOAc	1H, 1H, 2H, 2H-Perfluorododecyl acetate	$(50.0 \mu g/mL \pm$
(W)	(37858-05-2; <b>10:2 FTOAc</b> )	$2.5 \mu g/mL$ ) in isooctane
8:2 FTAcr (W)	1H, 1H, 2H, 2H-Perfluorodecyl acrylate	$(50.0 \mu g/mL \pm$
	(27905-45-9; <b>8:2 FTAcr</b> )	2.5 $\mu$ g/mL) in isooctane
10:2 FTAcr	1H, 1H, 2H, 2H-Perfluorododecyl acrylate	$(47.9 \ \mu g/mL \pm 2.4$
(W)	(17741-60-5; <b>10:2 FTAcr</b> )	$\mu$ g/mL) in isooctane
2324-3-46 (S)	1H, 1H, 2H, 2H-Perfluorooctyl methacrylate	(97 % Purity)
	(2144-53-8; <b>6:2 FTMAC</b> )	- /
2324-3-42 (S)	1H, 1H, 2H, 2H-Perfluorodecyl methacrylate	(97 % Purity)
	(1996-88-9; <b>8:2 FTMAC</b> )	· • • •
2324-3-Y5 (S)	1H, 1H, 2H, 2H-Perfluorododecyl	(97 % Purity)
	methacrylate (2144-54-9; <b>10:2 FTMAC</b> )	

NIST Reference Materials (RMs) 8446 Perfluorinated Carboxylic Acids and Perfluorooctane Sulfonamide in Methanol (8446) and 8447 Perfluorinated Sulfonic Acids in Methanol (8447) were obtained for use as quality control samples (Table 81 and Table 82).

**Table 80.** Isotopically labeled standard solutions purchased from Wellington Laboratories for volatile

 PFAS analysis, including full analyte names, and analyte concentrations with expanded maximum

 combined percent relative uncertainty where provided.

Standard	Contents	Concentration
MFBET	2-Perfluorobutyl-[1,1,2,2- <sup>2</sup> H <sub>4</sub> ]-ethanol	$(48.5\ \mu g/mL\pm 2.4$
		$\mu$ g/mL) in methanol
MFHET	2-Perfluorohexyl- $[1,1-^{2}H_{2}]$ - $[1,2-^{13}C_{2}]$ -ethanol	$(50 \ \mu g/mL \pm 2.5 \ \mu g/mL)$
		in methanol
MFOET	2-Perfluorooctyl-[1,1- <sup>2</sup> H <sub>2</sub> ]-[1,2- <sup>13</sup> C <sub>2</sub> ]-ethanol	$(50~\mu\text{g/mL}\pm2.5~\mu\text{g/mL})$
		in methanol
MFDET	2-Perfluorodecyl- $[1,1-^{2}H_{2}]-[1,2-^{13}C_{2}]$ -ethanol	$(50 \ \mu g/mL \pm 2.5 \ \mu g/mL)$
		in methanol

**Table 81.** Reference mass fractions for NIST Reference Material 8446 including mean value and expanded uncertainty with 95 % confidence.

PFAS	Mass Fraction
	(mg/kg)
PFHxA	$59.1 \pm 1.4$
PFHpA	$76.0\pm7.2$
PFOA	$54.8\pm2.2$
PFNA	$63.0\pm1.4$
PFDA	$58.1\pm4.0$
PFUdA	$62.8\pm6.5$
PFDoDA	$59.5\pm7.0$
PFTrDA	$62.9\pm2.8$
PFTeDA	$58.0\pm3.8$
PFBA	$43 \pm 11$
PFPeA	$60.9\pm0.9$
FOSA	$66.9 \pm 1.7$

 Table 82. Reference mass fractions NIST Reference Material 8447 including mean value and expanded uncertainty with 95 % confidence.

PFAS	Mass Fraction (mg/kg)
PFBS	$42.3\pm2.3$
PFHxS	$55.2 \pm 1.7$
PFOS	$56.6\pm2.5$

#### A.1.3. Method Reproducibility Material (OS-FRM)

As described in NIST TN 2248, 400 cuttings of outer shell textile OS-F were prepared and designated OS-FRM. Once PFAS concentrations in OS-FRM were determined (Table 83), a single section of OS-FRM was extracted and analyzed with each batch of 11 textile samples for nonvolatile, semivolatile, and volatile PFAS analysis.

 Table 83. PFAS concentrations (mean ± standard deviation) determined from analysis of twelve

 replicates of OS-FRM. Measured concentrations that were below the reporting limit in individual replicates

 were not included in average and standard deviation calculations.

PFAS	(µg/kg)
Nonvolatile PFAS	
PFBA	$11.69\pm0.48$
PFPeA	$12.81\pm0.73$
PFHxA	$38.1\pm3.2$
PFHpA	$5.37\pm0.43$
PFOA	$0.369\pm0.075$
PFNA	$0.214\pm0.048$
PFDA	$0.316\pm0.051$
PFBS	$1.38\pm0.29$
FBSA	$0.333\pm0.018$
FHxSA	$0.0345 \pm 0.005$
Semivolatile PFAS	
MeFOSE	$0.53\pm0.12$
Volatile PFAS	
6:2 FTOH	$273\pm39$
6:2 FTMAC	$613\pm107$

#### A.2. PFAS Analysis

PFAS analytical methods, including quality control limits, for GC-MS analysis of volatile PFAS as well as LC-MS/MS analysis of semivolatile and nonvolatile PFAS were performed as described in NIST TN 2248 [22].

#### A.3. Quality Control Results

With each analytical sequence a range of quality control (QC) results were obtained. Reporting limits determined with each measurement (Section A.3.4), NIST RM 8446 and 8447 recovery (Section A.3.5), as well as OS-FRM recovery (Section A.3.6) are detailed below.

#### A.3.4. Reporting Limits

Reporting limits determined for each PFAS measurement in stressed firefighter gear textiles are above in Tables 5 - 73. Histograms of the reporting limits for measurements made with each of the three analytical methods are shown in Figure 17. Most of the determined reporting limits for nonvolatile (2084 out of 2194) and semivolatile (265 out of 328) PFAS measurements were  $< 0.5 \ \mu g/kg$ . Reporting limits for volatile PFAS were much higher; out of a total of 858 reported volatile GC measurements, no reporting limit was under 8.6  $\mu g/kg$  and 71 were over 100  $\mu g/kg$ .

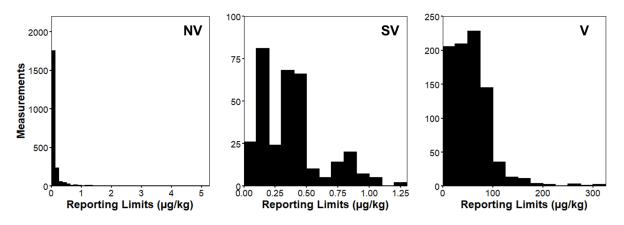


Figure 17. Histograms of reporting limits for individual measurements of (NV) PFAS determined with nonvolatile analytical method (binwidth =  $0.125 \ \mu g/kg$ ), (SV) PFAS determined with semivolatile analytical method (binwidth =  $0.1 \ \mu g/kg$ ), and (V) PFAS determined with volatile analytical method (binwidth =  $25 \ \mu g/kg$ ).

### A.3.5. NIST Reference Materials 8446 and 8447

Nonvolatile PFAS concentrations in extracts of firefighter turnout gear textiles were determined across 16 analytical sequences. Gravimetric dilutions of NIST RMs 8446 Perfluorinated Carboxylic Acids and Perfluorooctane Sulfonamide in Methanol as well as 8447 Perfluorinated Sulfonic Acids in Methanol were prepared and analyzed with each sequence and measured concentrations were between 80.4 % - 119 % of the reference values for all analytes (Figure 18). The recovery of all NIST RM 8446 and 8447 analytes suggests that calibration regressions determined with each nonvolatile analytical sequence were consistent and accurate.

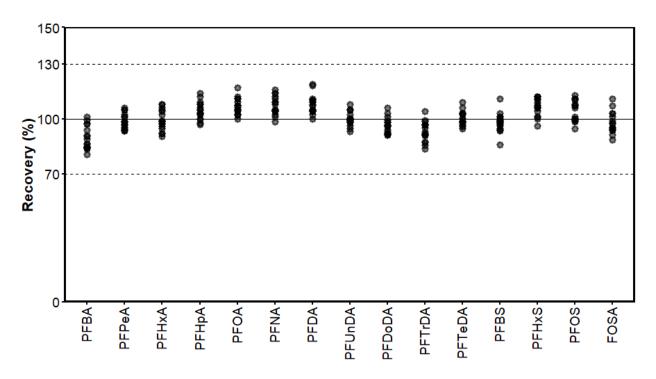
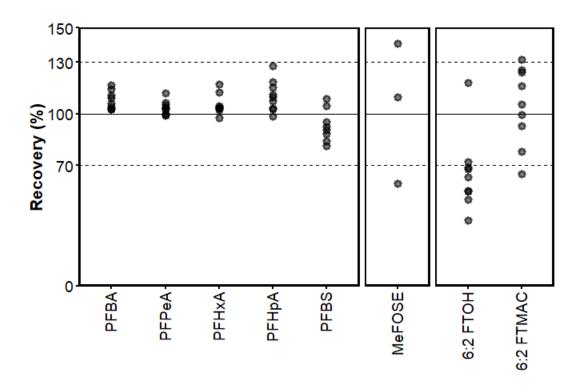


Figure 18. Recoveries of reference PFAS in NIST reference materials 8446 and 8447 across 16 analytical sequences. 100 % recovery is indicated with a solid line while 70 % and 130 % recoveries are indicated with dashed lines.

#### A.3.6. Method Reproducibility Materials (OS-FRM)

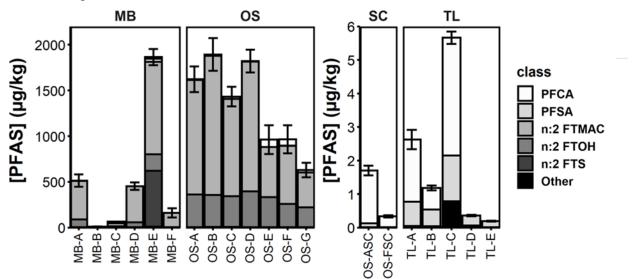
Extraction batches included a single cutting of OS-FRM to determine extraction consistency. Recovery across nine nonvolatile, eight semivolatile, and 10 volatile extraction batches are shown in Figure 19. Some analytes were not quantified in all batches due to reporting limits being above the measured or nominal PFAS concentrations. Recoveries ranged from 81.3 % to 128 % for nonvolatile PFAS, 59.5 % to 141 % for semivolatile PFAS, and 38.0 % to 132 % for volatile PFAS.



**Figure 19.** Recovery of PFAS in OS-FRM that had a previously measured concentration over 0.5 µg/kg across 9 nonvolatile, 8 semivolatile, and 10 volatile PFAS extraction batches. 100 % recovery is indicated with a solid line while 70 % and 130 % recoveries are indicated with dashed lines.

## A.3.7. PFAS Concentrations in Unstressed Firefighter Gear Textiles

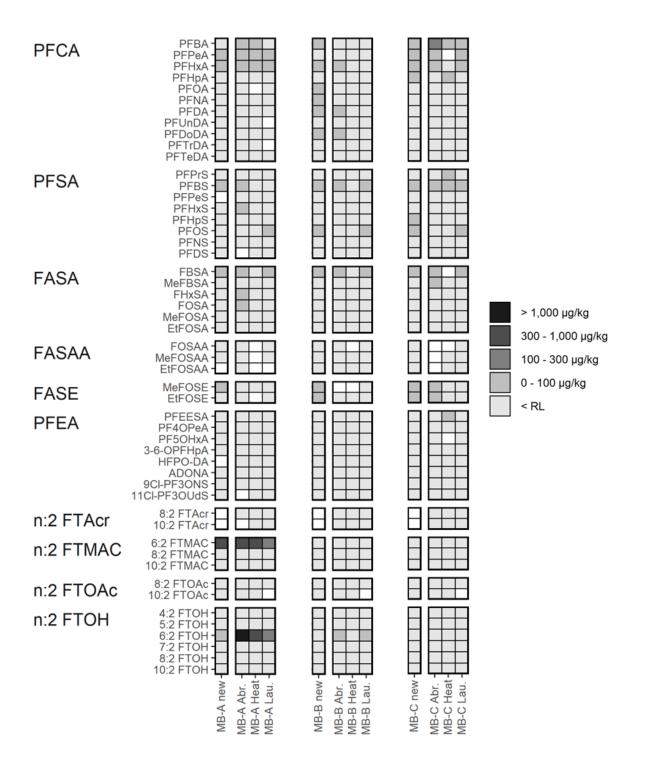
PFAS concentrations in unstressed firefighter gear textiles were previously reported in NIST TN 2248 [22]. The summed PFAS concentrations determined in unstressed firefighter textiles are shown in Figure 20.



**Figure 20.** Summed PFAS concentrations in unstressed firefighter turnout gear textiles according to textile type (MB = moisture barrier, OS = outer shell, SC = scoured outer shell, TL = thermal liner). Error bars indicate the combined standard uncertainty of the summed PFAS concentrations. Bar shade indicates PFAS class. This figure was previously Figure 2 in NIST TN 2248 [22].

## A.3.8. PFAS Concentrations in Stressed Firefighter Gear Textiles

The measured PFAS concentrations determined in unstressed firefighter gear textiles in NIST TN 2248 [22] as well as the same firefighter gear textiles following exposure to each stressing process are shown in Figure 21 - Figure 27. Scatter plots comparing summed nonvolatile or volatile PFAS concentrations before and after each stressing process are in Figure 28 - Figure 35.



**Figure 21.** Mean PFAS concentrations determined from triplicate analysis of MB-A (left), MB-B (center), and MB-C (right) either prior to stressing (new) or following abrasion (Abr), exposure to elevated temperatures (Heat), or laundering (Lau.). Concentrations indicated by shade. Measurements not reported due to unmet QC standards are in white.

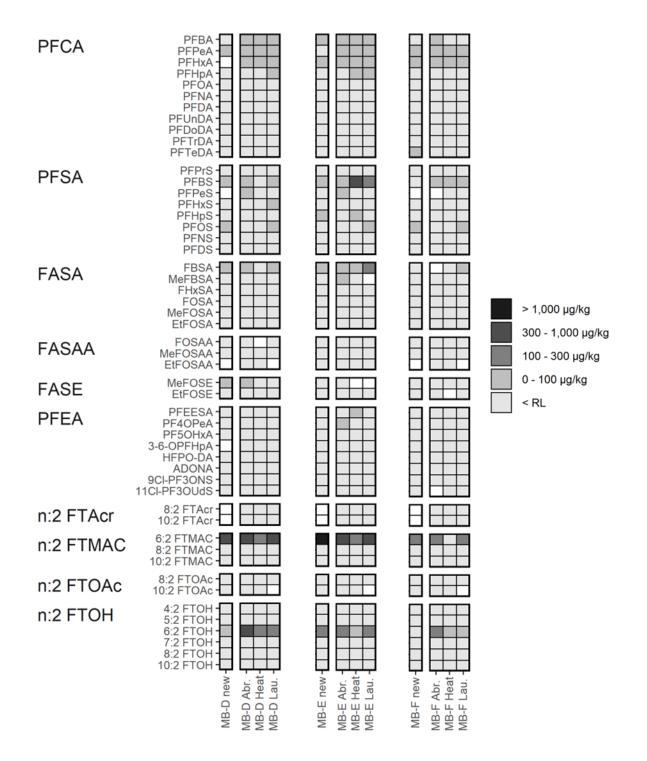
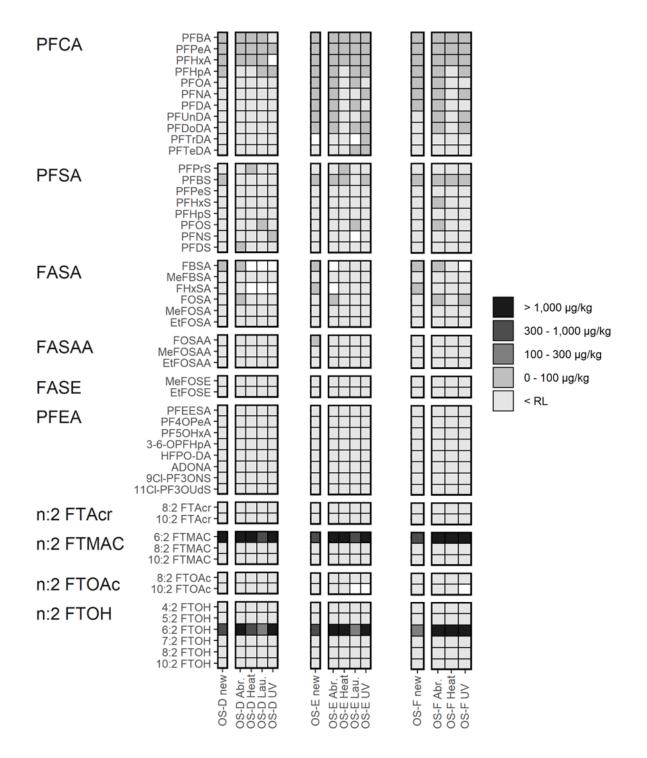


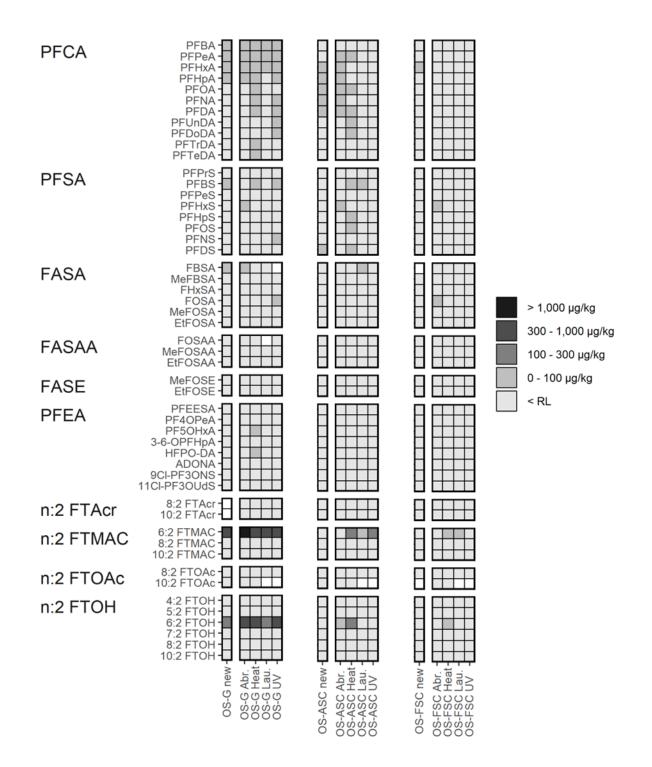
Figure 22. Mean PFAS concentrations determined from triplicate analysis of MB-D (left), MB-E (center), and MB-F (right) either prior to stressing (new) or following abrasion (Abr), exposure to elevated temperatures (Heat), or laundering (Lau.). Concentrations indicated by shade. Measurements not reported due to unmet QC standards are in white.

PFCA	PFBA - PFPeA - PFHxA - PFHpA - PFOA - PFDA - PFDA - PFDA - PFDDA - PFTrDA - PFTrDA - PFTreDA -			
PFSA	PFPrS - PFNS - P			
FASA	FBSA - MeFBSA - FHxSA - FOSA - MeFOSA - EtFOSA -			> 1,000 µg/kg 300 - 1,000 µg/kg
FASAA	FOSAA - MeFOSAA - EtFOSAA -			100 - 300 µg/kg
FASE	MeFOSE -			0 - 100 μg/kg < RL
PFEA	PFEESA PF4OPeA PF5OHxA 3-6-OPFHPA HFPO-DA ADONA 9CI-PF3ONS 11CI-PF3OUdS			
n:2 FTAcr	8:2 FTAcr -			
n:2 FTMAC	6:2 FTMAC - 8:2 FTMAC - 10:2 FTMAC -			
n:2 FTOAc	8:2 FTOAc -			
n:2 FTOH	4:2 FTOH 5:2 FTOH 6:2 FTOH 7:2 FTOH 8:2 FTOH 10:2 FTOH 10:2 FTOH 8:2 STOH 10:2 STOH 10	OS-B new	OS-C new	
	sooso Sooso	ö össö	Soooo Sooo	

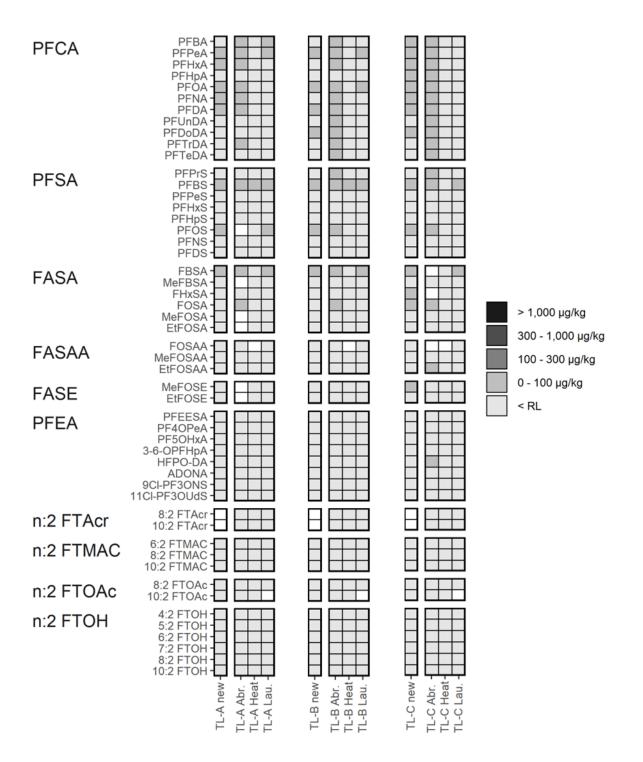
**Figure 23.** Mean PFAS concentrations determined from triplicate analysis of OS-A (left), OS-B (center), and OS-C (right) either prior to stressing (new) or following abrasion (Abr), exposure to elevated temperatures (Heat), laundering (Lau.) or exposure to UV radiation (UV). Concentrations indicated by shade. Measurements not reported due to unmet QC standards are in white.



**Figure 24.** Mean PFAS concentrations determined from triplicate analysis of OS-D (left), OS-E (center), and OS-F (right) either prior to stressing (new) or following abrasion (Abr), exposure to elevated temperatures (Heat), laundering (Lau.) or exposure to UV radiation (UV). Concentrations indicated by shade. Measurements not reported due to unmet QC standards are in white.



**Figure 25.** Mean PFAS concentrations determined from triplicate analysis of OS-G (left), OS-ASC (center), and OS-FSC (right) either prior to stressing (new) or following abrasion (Abr), exposure to elevated temperatures (Heat), laundering (Lau.) or exposure to UV radiation (UV). Concentrations indicated by shade. Measurements not reported due to unmet QC standards are in white.



**Figure 26.** Mean PFAS concentrations determined from triplicate analysis of TL-A (left), TL-B (center), and TL-C (right) either prior to stressing (new) or following abrasion (Abr), exposure to elevated temperatures (Heat), or laundering (Lau.). Concentrations indicated by shade. Measurements not reported due to unmet QC standards are in white.

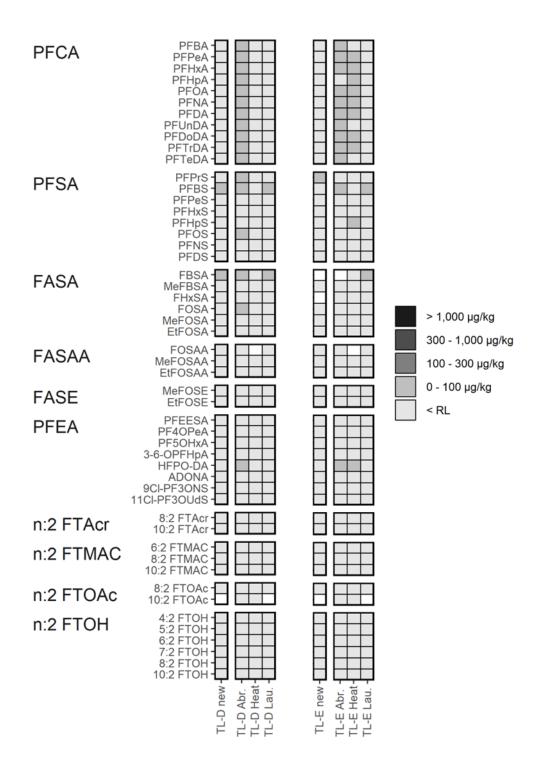


Figure 27. Mean PFAS concentrations determined from triplicate analysis of TL-D (left) and TL-E (right) either prior to stressing (new) or following abrasion (Abr.), exposure to elevated temperatures (Heat), or laundering (Lau.). Concentrations indicated by shade. Measurements not reported due to unmet QC standards are in white.

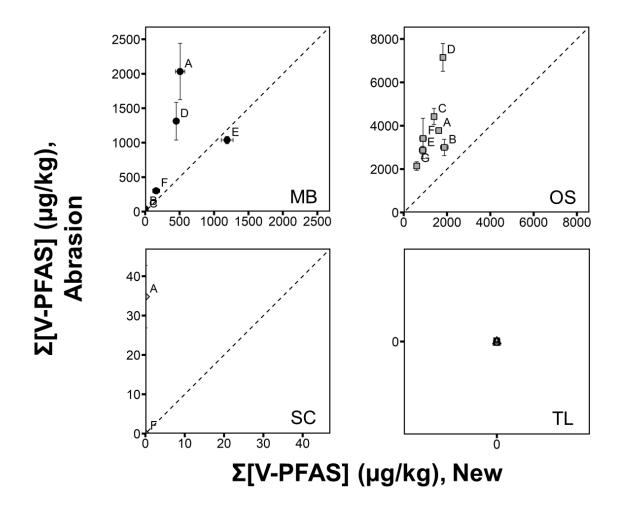
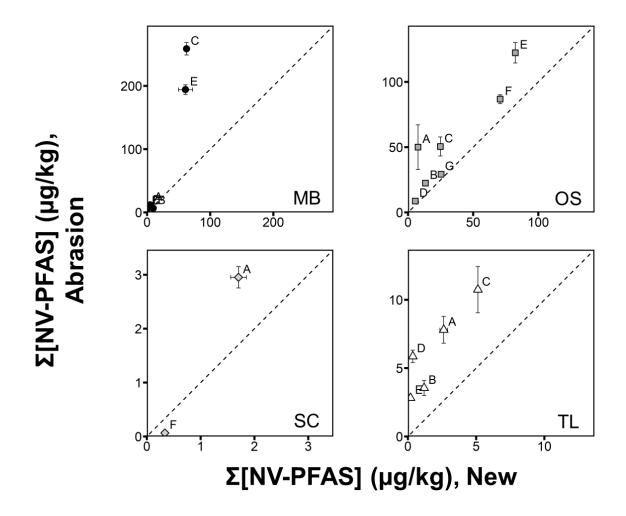
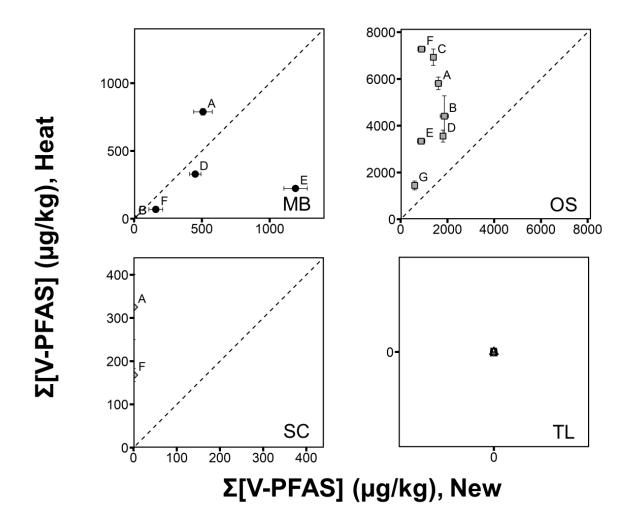


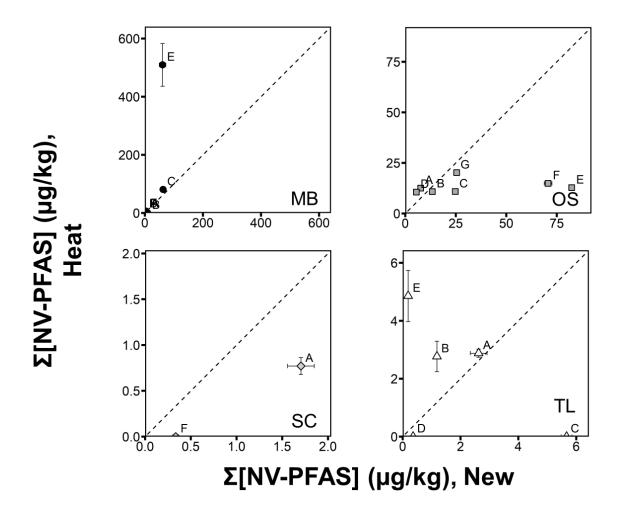
Figure 28. Mean summed concentrations of PFAS determined from triplicate analysis of volatile PFAS in abraded firefighter gear textiles on y-axis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Marker labels indicate the specific textile. A 1:1 concentration ratio (i.e., identical concentrations measured in unstressed and stressed textile) is indicated with a dashed line.



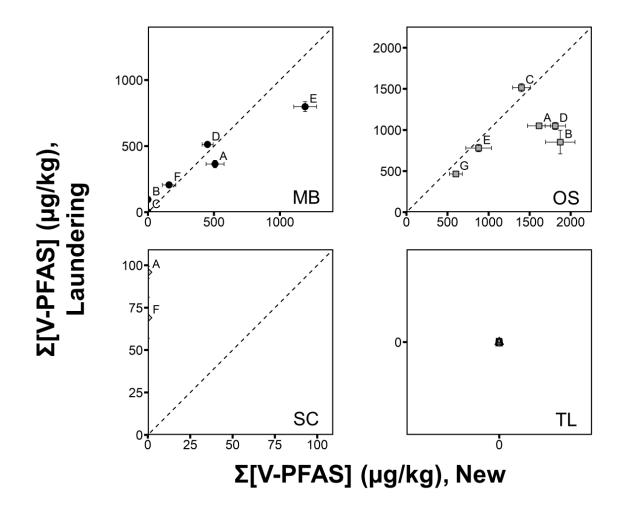
**Figure 29.** Mean summed concentrations of PFAS determined from triplicate analysis of nonvolatile PFAS in abraded firefighter gear textiles on y-axis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Marker labels indicate the specific textile. A 1:1 concentration ratio (i.e., identical concentrations measured in unstressed and stressed textile) is indicated with a dashed line.



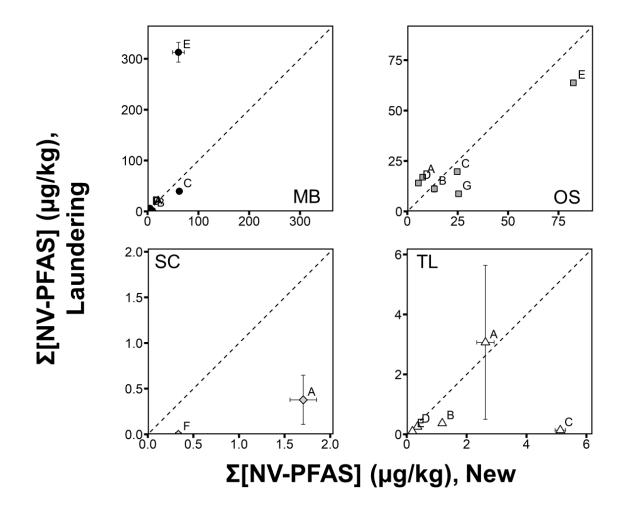
**Figure 30.** Mean summed concentrations of PFAS determined from triplicate analysis of volatile PFAS in firefighter gear textiles following exposure to elevated temperatures on y-axis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Marker labels indicate the specific textile. A 1:1 concentration ratio (i.e., identical concentrations measured in unstressed and stressed textile) is indicated with a dashed line.



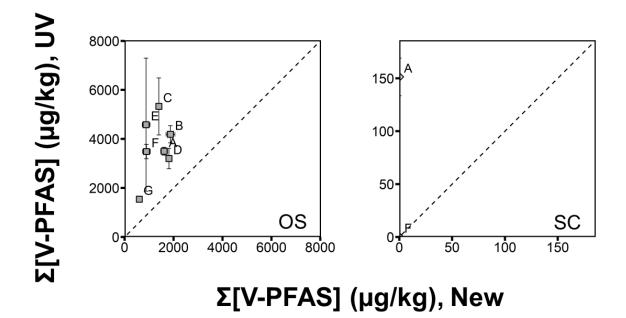
**Figure 31.** Mean summed concentrations of PFAS determined from triplicate analysis of nonvolatile PFAS in firefighter gear textiles following exposure to elevated temperatures on y-axis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Marker labels indicate the specific textile. A 1:1 concentration ratio (i.e., identical concentrations measured in unstressed and stressed textile) is indicated with a dashed line.



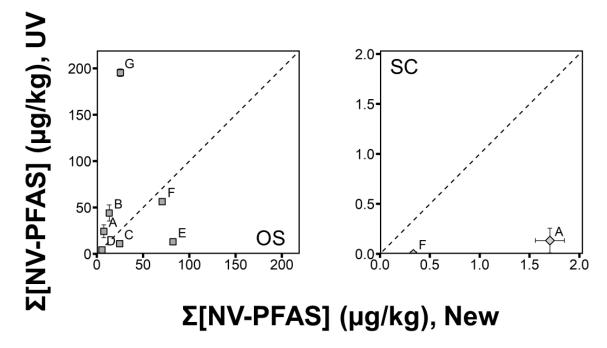
**Figure 32.** Mean summed concentrations of PFAS determined from triplicate analysis of volatile PFAS in firefighter gear textiles following laundering on y-axis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Marker labels indicate the specific textile. A 1:1 concentration ratio (i.e., identical concentrations measured in unstressed and stressed textile) is indicated with a dashed line.



**Figure 33.** Mean summed concentrations of PFAS determined from triplicate analysis of nonvolatile PFAS in firefighter gear textiles following laundering on y-axis and unstressed firefighter gear textiles on x-axis. Error bars indicate combined standard uncertainty. Marker labels indicate the specific textile. A 1:1 concentration ratio (i.e., identical concentrations measured in unstressed and stressed textile) is indicated with a dashed line.



**Figure 34.** Mean summed concentrations of PFAS determined from triplicate analysis of volatile PFAS in firefighter gear outer shell textiles following weathering on y-axis and unstressed firefighter gear outer shell textiles on x-axis. Error bars indicate combined standard uncertainty. Marker labels indicate the specific textile. A 1:1 concentration ratio (i.e., identical concentrations measured in unstressed and stressed textile) is indicated with a dashed line.



**Figure 35.** Mean summed concentrations of PFAS determined from triplicate analysis of nonvolatile PFAS in firefighter gear outer shell textiles following weathering on y-axis and unstressed firefighter gear outer shell textiles on x-axis. Error bars indicate combined standard uncertainty. Marker labels indicate the specific textile. A 1:1 concentration ratio (i.e., identical concentrations measured in unstressed and stressed textile) is indicated with a dashed line

## Appendix B. List of Abbreviations and Acronyms

**10:2 FTAcr** 10:2 fluorotelomer acrylate

**4:2 FTS** 4:2 fluorotelomer sulfonate

**6:2 FTMAC** 6:2 fluorotelomer methacrylate

**6:2 FTOH** 6:2 fluorotelomer alcohol

**6:2 FTS** 6:2 fluorotelomer sulfonate

**8:2 FTAcr** 8:2 fluorotelomer acrylate

**AFFF** Aqueous film-forming foams

**CAS RN** Chemical Abstract Service Registry Number

**CSD** Chemical Sciences Division

**DWR** Durable water repellent

**ePTFE** Expanded polytetrafluoroethylene.

**FASA** Perfluoroalkane sulfonamide

**FASAA** Per- and polyfluoroalkane sulfonamido acetic acid

**FASE** Perfluoroalkane sulfonamido ethanol

**FBSA** Perfluorobutane sulfonamide

**FOSA** Perfluorooctane sulfonamide

**FRD** Fire Research Division

**GC-MS** Gas chromatography-mass spectrometry

**HFPO-DA** Hexafluoropropylene oxide dimer acid **HPLC** High performance liquid chromatography

**INJ** Injection standard

**IS** Internal standard

**ISO** International Organization for Standardization

**LC** Liquid chromatography

**MB** Moisture barrier

**MeFBSE** N-Methyl perfluorobutane sulfonamidoethanol

**MRM** Multiple reaction monitoring

MS Mass spectrometry

**MS/MS** Tandem mass spectrometry

**n:2 FTAcr** n:2 fluorotelomer acrylate

**n:2 FTOAc** n:2 fluorotelomer acetate

**n:2 FTOH** n:2 fluorotelomer alcohol

**n:2 FTMAC** n:2 fluorotelomer methacrylate

**n:2 FTS** n:2 fluorotelomer sulfonate

**NFPA** National Fire Protection Association

**NIOSH** National Institute for Occupational Safety and Health

**NIST** National Institute of Standards and Technology

143

**NIST TN** National Institute of Standards and Technology Technical Note

**OS** Outer shell

**PF5OPxA** Perfluoro-4-methoxybutanoic acid

**PFAA** Perfluoroalkyl acid

**PFAS** Per- and polyfluoroalkyl substances

**PFBA** Perfluorobutanoic acid

**PFBS** Perfluorobutane sulfonic acid

**PFCA** Perfluorocarboxylic acid

**PFDA** Perfluorodecanoic acid

**PFEESA** Perfluoro-2-ethoxyethane sulfonic acid

**PFHpA** Perfluoroheptanoic acid

**PFHxA** Perfluorohexanoic acid

**PFHxS** Perfluoro hexane sulfonic acid **PFNA** Perfluorononanoic acid

**PFOA** Perfluorooctanoic acid

**PFOS** Perfluorooctane sulfonic acid

**PFPeA** Perfluoropentanoic acid

**PFSA** Perfluoroalkane sulfonic acid

**PPEA** Per- and polyfluoroalkyl ether acid

**PTFE** Polytetrafluoroethylene

**QC** Quality control

**RL** Reporting limit

**RM** Reference material

**SC** "Scoured" outer shell

**SPE** Solid phase extraction

**TL** Thermal liner