



National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material[®] 1476a

Branched Polyethylene Resin

This Standard Reference Material (SRM) is intended for use in calibration and performance evaluation of instruments used in polymer technology and science for the determination of the Melt Flow Rate using ASTM Method D1238-00 [1]. The SRM is supplied as white pellets of polyethylene.

Certified Values and Uncertainties: This material is certified for Melt Flow Rate using ASTM Method D1238-00 condition 190/2.16 [1]. Under this condition the melt flow rate is 1.23 g/10 min with a standard deviation of 0.036 g/10 min and with 29 degrees of freedom. The certified measurement uncertainty is found to be 0.110 g/10 min and is expressed as a combined expanded uncertainty with a coverage factor $k = 2$, calculated in accordance with ISO and NIST Guides procedure [2]. Type A and Type B contributions to the expanded uncertainty include the standard deviation of the Melt Flow measurement, instrument-to-instrument variation as discussed in D1238-00, operator dependence of the measurement, and temperature gradients in the apparatus [3].

Expiration of Certification: The certification of SRM 1476a is valid, within the measurement uncertainties specified, until **01 January 2012**, provided the SRM is handled in accordance with the instructions given in this certificate (see "Instructions for Use"). This certification is nullified if the SRM is damaged, contaminated, or otherwise modified.

Maintenance of SRM Certification: NIST will monitor this SRM over the period of its certification. If substantive technical changes occur that affect the certification before the expiration of this certificate, NIST will notify the purchaser. Registration (see attached sheet) will facilitate notification.

INSTRUCTIONS FOR USE

Storage: The SRM should be stored in the original bottle with the lid tightly closed and under normal laboratory conditions.

Homogeneity: The homogeneity of SRM 1476a was tested by melt flow measurements using ASTM D1238-00. The characterization of this polymer is described in reference [3].

The technical coordination leading to certification of this SRM was provided by B.M. Fanconi of the NIST Polymers Division. The technical measurements and data interpretation were provided by C.M. Guttman, K.M. Flynn, S.J. Wetzel, W.R. Blair, and J.R. Maurey of the NIST Polymers Division.

Support aspects involved in the preparation and issuance of this SRM were coordinated through the NIST Measurement Services Division.

Eric K. Lin, Chief
Polymers Division

Robert L. Watters, Jr., Chief
Measurement Services Division

Gaithersburg, MD 20899
Certificate Issue Date: 29 November 2007
See Certificate Revision History on Last Page

REFERENCES

- [1] ASTM D1238-00; *Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer*; ASTM Standards, Vol. 08.01, American Society for Testing and Materials, West Conshohocken, PA (2001).
- [2] ISO; *Guide to the Expression of Uncertainty in Measurement*; ISBN 92-67-10188-9, 1st ed.; International Organization for Standardization: Geneva, Switzerland (1993); see also Taylor, B.N.; Kuyatt, C.E.; *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*; NIST Technical Note 1297, U.S. Government Printing Office: Washington DC (1994); available at <http://physics.nist.gov/Pubs/>.
- [3] Flynn, K.M.; Wetzel, S.J.; Blair, W.R.; Maurey, J.R.; Guttman, C.M.; *Certification of Standard Reference Material 1476a, A Polyethylene Resin*; NISTIR 7191.

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| Certificate Revision History: 29 November 2007 (Update of certification period); 19 May 2006 (original certificate date). |
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Users of this SRM should ensure that the certificate in their possession is current. This can be accomplished by contacting the SRM Program at: telephone (301) 975-6776; fax (301) 926-4751; e-mail srminfo@nist.gov; or via the Internet at <http://www.nist.gov/srm>.