COPPER NAPHTHENATE WOOD-PRESERVATIVE

(Spray, brush, dip application)

COMMERCIAL STANDARD CS152-48

Effective Date for New Production From September 25, 1948

A RECORDED VOLUNTARY STANDARD
OF THE TRADE

UNITED STATES DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary

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COMMODITY STANDARDS

Simplified Practice Recommendations and Commercial Standards are developed by manufacturers, distributors, and users in cooperation with the Commodity Standards Division of the National Bureau of Standards. The purpose of Simplified Practice Recommendations is to eliminate avoidable waste through the establishment of standards of practice for stock sizes and varieties of specific commodities that currently are in general production and demand. The purpose of Commercial Standards is to establish standard methods of test, rating, certification, and labeling of commodities, and to provide uniform bases for fair competition.

The adoption and use of a Simplified Practice Recommendation or Commercial Standard is voluntary. However, when reference to a Commercial Standard is made in contracts, labels, invoices, or advertising literature, the provisions of the standard are enforceable through usual legal channels as a part of the sales contract.

A Simplified Practice Recommendation or Commercial Standard originates with the proponent industry. The sponsors may be manufacturers, distributors, or users of the specific product. One of these three elements of industry submits to the Commodity Standards Division the necessary data to be used as the basis for developing a standard of practice. The Division, by means of assembled conferences or letter referenda, or both, assists the sponsor group in arriving at a tentative standard of practice and thereafter refers it to the other elements of the same industry for approval or for constructive criticism that will be helpful in making any necessary adjustments. The regular procedure of the Division assures continuous servicing of each effective Simplified Practice Recommendation and Commercial Standard, through review and revision, whenever, in the opinion of the industry, changing conditions warrant such action. Simplified Practice Recommendations and Commercial Standards are printed and made available by the Department of Commerce through the Government Printing Office.

COMMERCIAL STANDARD FOR COPPER NAPHTHENATE WOOD-PRESERVATIVE

On June 9, 1948, at the instance of proponent manufacturers, a Recommended Commercial Standard for Copper Naphthenate Wood-Preservative, adjusted in accordance with comment from interested organizations, was circulated to the trade for written acceptance. Those concerned have since accepted and approved the standard as shown herein.

Project Manager: F. W. Reynolds, assisted by H. A. Bonnet, Commodity Standards Division, National Bureau of Standards.

Technical Advisers: E. F. Hickson and C. C. Hartman, Chemistry Division, National Bureau of Standards.

COMMERCIAL STANDARD CS152-48

for

COPPER NAPHTHENATE WOOD-PRESERVATIVE
(Spray, brush, dip application)

PURPOSE

1. The purpose of this commercial standard is to provide a nationally-recognized specification for copper naphthenate wood-preservative for the guidance of producers, distributors, and users; to promote fair competition and consumer confidence in products conforming to this standard; and to provide a basis for labeling and guaranteeing the quality of the product.

SCOPE

2. This standard covers physical and chemical characteristics of copper naphthenate products supplied in either concentrated form or ready-for-use form; and the treatment of wood with preservatives conforming to this specification.

DEFINITION

3. Copper naphthenate is the copper salt of naphthenic acids. Naphthenic acids are carboxylic acid derivatives of cycloalkane hydrocarbons (naphthenes). The monobasic acids have the general type formula $C_nH_{2n-2x}O_2$, where x is the number of rings in the molecule.

REQUIREMENTS

4. *Active ingredient.*—The active ingredient shall be the copper salt of naphthenic acid, resulting from substantially complete chemical combination of the metal with naphthenic acid under customary commercial manufacturing methods.

5. *Diluents.*—The principal diluent shall be a petroleum distillate. Other substances, such as creosote, linseed oil, or water-repellent substances, may be added to provide special characteristics in the finished product. The flash point of the diluent shall be not lower than 100° F when tested in a "Tagliabue" closed-cup tester as described in paragraph 8.

6. *Copper content.*

6a. *Concentrated copper naphthenate wood-preservative.*—The actual percentage of copper, determined as described in paragraph 9, shall be shown on the label of the container. Detailed instruction for dilution shall be given on the label or an accompanying tag or in a booklet.

6b. *Ready-for-use copper naphthenate wood-preservative* shall contain not less than 1.0 percent of copper calculated as metallic copper.

7. *Penetration.*—When ready-for-use copper naphthenate having as diluent a volatile solvent, or concentrated copper naphthenate diluted with a volatile solvent in accordance with the manufacturer's instructions, is tested as described in paragraph 10, the wood-preservative shall penetrate the end grain at least 1 inch.

METHODS OF TEST

8. *Flash point.*—A.S.T.M. Designation D 56–36.

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METHODS OF TEST

8. *Flash point.*—A.S.T.M. Designation D 56–36.

9. *Copper content.*—

9a. *Outline of method.*—The sample is heated to drive off volatile material and further heated to burn off the carbon. It is then treated with nitric and sulfuric acids to oxidize any remaining carbon. The nitric acid is expelled, the solution is neutralized with ammonium hydroxide, and the precipitate is filtered off. The filtrate is acidified with sulfuric acid and the copper is titrated iodometrically.

9b. *Reagents and solutions.*—

9b. (1) *Standard copper solution (1 ml = 1 mg Cu).*—Dissolve 1 g of pure copper in 15 ml of nitric acid (1:3). Add 5 ml of sulfuric acid, cover, and evaporate to dense white fumes. Cool, wash down the cover and walls of the vessel with 20 ml of distilled water, and again evaporate to white fumes. Add 400 ml of sulfuric acid (1:1), cool, and dilute to 1 liter in a volumetric flask.

9b. (2) *Standard sodium thiosulfate solution (0.01 N).*—Dissolve 2.5 g of sodium thiosulfate pentahydrate in 1 liter of freshly boiled and cooled distilled water in a sterile glass bottle. If sulfur precipitates during preparation or upon subsequent use, discard the solution and prepare a new one.

9b. (3) *Starch solution.*—Make a paste of 1 g of soluble starch in about 5 ml of distilled water and add to 100 ml of boiling distilled water. Cool.

9b. (4) *Potassium iodide.*—40 g KI made up with distilled water to 100 ml.

9b. (5) *Sodium thiocyanate.*—20 g NaCNS made up with distilled water to 100 ml.

9c. *Standardization of sodium thiosulfate solution and derivation of copper factor.*—Pipette 10 ml of the standard copper solution into a 250 ml Erlenmeyer flask. Add 50 ml of water. Add ammonium hydroxide until solution turns dark blue.

Add sulfuric acid until the dark blue color disappears. Then add three drops in excess. Cool to room temperature and add 5 ml of KI solution. Mix. Add 5 ml of NaCNS. Mix. Titrate with 0.01 *N* sodium thiosulfate to a very pale yellow color. Add 5 ml of starch solution and continue the titration until no blue color remains.

Formula to determine copper factor:

$$\text{Copper factor} = \frac{\text{milliliters of standard copper solution}}{\text{milliliters of sodium thiosulfate solution}}$$

9d. *Determination of percent copper.*—Weigh a 52-mm porcelain crucible (approximately 50-ml capacity) to the nearest milligram. Add approximately 3 ml of the sample and reweigh. (Concentrated copper naphthenates should be diluted quantitatively with mineral spirits to approximately 1 percent copper content, and a 3-ml sample taken for determination of copper. If any sludge is present, it should be centrifuged or allowed to settle, before taking the 3-ml sample.) Place the crucible on a hot plate and heat slowly to boiling. When vigorous boiling stops, increase the temperature of hot plate to maximum heat and heat until no more fumes are evolved. Heat with a Tirrell or Bunsen burner to distill off remainder of the oil and continue to heat strongly to burn off most of the carbon from the sides of the crucible. Tip the crucible at a slight angle and burn off carbon in the full heat of the burner for 5 minutes.

Turn crucible around 180° and again heat for 5 minutes. If there is still a red glow from the sample, repeat until only the crucible is red, the sample remaining black. Cool for 5 minutes.

Add 3 ml of nitric acid (1:1) and 2 ml of sulfuric acid (1:1). Cover with a watch glass and heat gently until the sample is dissolved. Wash contents of crucible into a 250-ml wide-mouthed Erlenmeyer flask with nitric acid (1:1) from a medicine dropper. Add 20 ml of distilled water to the Erlenmeyer flask and heat flask until copious white fumes of SO_3 are being expelled.

Cool 5 minutes and wash down the sides with 5 ml of distilled water from a wash bottle and repeat the fuming. Cool again and add 20 ml of distilled water. Heat to boiling and boil for 3 minutes. Add ammonium hydroxide until the solution turns dark blue and add a few drops in excess. Heat to boiling and filter into a 250-ml Erlenmeyer flask through a No. 40 Whatman paper. Wash paper well with distilled water until all blue color is completely removed. Then discard paper and precipitate.

Add sulfuric acid until the dark blue color disappears. Then add 3 drops in excess. Cool to room temperature and add 5 ml of KI solution. Mix. Add 5 ml of NaCNS. Mix. Titrate with 0.01 N sodium thiosulfate to a very pale yellow color. Add 5 ml of starch solution and continue the titration until no blue color remains.

9e. *Calculation.*—

$$\text{Copper } (\%) = \frac{\text{milliliters of sodium thiosulfate} \times \text{copper factor}}{\text{grams of sample} \times 10}.$$

10. *Penetration.*—Navy Specification 52W5, paragraph F-2d.

10a. *Samples.*—Four pieces of flat grained clear ponderosa pine sapwood 2 inches wide by $\frac{5}{8}$ inch thick and 4 inches long, the grain extending parallel to the long dimension, shall be selected. The wood shall be of average, uniform growth (20 to 40 annual rings per inch) and shall have a moisture content below 15 percent.

10b. *Treatment.*—Wood preservative shall be poured into a flat-bottom glass vessel, such as a petri dish or beaker, to a depth of not less than $\frac{1}{4}$ inch. This solution shall be maintained at a temperature of 77° $\pm$3°F. Within 15 minutes after the solution has been introduced into the vessel, the wood samples shall be suspended vertically to a depth of $\frac{1}{4}$ inch (marked on the wood) in the solution for 3 minutes. The samples shall then be removed, suspended to dry in the same vertical position for 24 hours at room temperature, and split into three pieces of equal dimensions in such a way that the radial face of the wood is exposed. The farthest penetration of the solution shall then be measured on each cut and the average of the eight measurements recorded as the penetration of the sample. Only the penetration on the split surfaces (not on the exterior surfaces) shall be measured.

LABELING

11. *Copper naphthenate wood-preservative.*—In order that the purchaser may be assured that the product complies with this commercial standard, it is recommended that the following statement be included in labels,[1] contracts, sales literature, invoices, etc.:

> This (concentrated) (ready-for-use) copper naphthenate complies with all requirements of Commercial Standard CS152–48, as developed by the trade under the procedure of the National Bureau of Standards, and issued by the U. S. Department of Commerce.

[1] This labeling is in addition to, and not in lieu of, that required under the Federal Insecticide, Fungicide and Rodenticide Act. Before shipment in interstate commerce, such products must be registered with the Insecticide Division, Livestock Branch, Production and Marketing Administration, United States Department of Agriculture.

12. *Treated wood.*—Properly seasoned wood treated with copper naphthenate conforming to this commercial standard may be identified by the following statement in labels, invoices, or contracts:

> This wood has been treated with copper naphthenate conforming to Commercial Standard CS152–48, as developed by the trade under the procedure of the National Bureau of Standards, and issued by the U. S. Department of Commerce. Application has been by _____ method. (brush), (spray), (dip)

EFFECTIVE DATE

13. Having been passed through the regular procedure of the Commodity Standards Division, and approved by the acceptors hereinafter listed, this commercial standard was issued by the United States Department of Commerce, effective from September 25, 1948.

Edwin W. Ely,
Chief, Commodity Standards Division.

HISTORY OF PROJECT

14. On December 9, 1947, interested manufacturers requested the cooperation of the National Bureau of Standards in the establishment of a commercial standard for copper naphthenate wood-preservative.

15. Following receipt of this request by the Bureau, copies of a proposed commercial standard for copper naphthenate wood-preservative, endorsed by the proponent manufacturers, were circulated to selected representatives of manufacturers, distributors, purchasers, testing laboratories, and Government agencies, for advance comment. The specification was adjusted in accordance with majority viewpoint as indicated by the comment.

16. With the unqualified endorsement of a number of interested organizations, the recommended commercial standard was submitted to the trade for written acceptance on June 9, 1948. Having received acceptances in writing estimated to represent a satisfactory majority, announcement was issued on August 25, 1948, that the standard would become effective for new production on September 25, 1948.

STANDING COMMITTEE

17. The following individuals comprise the membership of the standing committee, which is to review, prior to circulation for acceptance, revisions proposed to keep the standard abreast of progress. Comment concerning the standard and suggestions for revision may be addressed to any member of the committee or to the Commodity Standards Division, National Bureau of Standards, which acts as secretary for the committee.

Arthur Minich, Nuodex Products Co., Inc., Elizabeth F, N. J. (Chairman).
C. D. Thompson, Cuprinol Division, Darworth, Inc., Simsbury, Conn.
Vladimir Shipp, Technical Service Dept., Socony-Vacuum Laboratories, 412 Greenpoint Avenue, Brooklyn 22, N. Y.
Ray R. Hirt, New York State College of Forestry, Syracuse University, Syracuse 10, N. Y.
Oliver D. Diller, Ohio Agricultural Experiment Station, Wooster, Ohio.
Harold M. Rudd, Rudd & Cummings, 1608 Fifteenth Avenue, West, Seattle 99, Wash.
W. M. Barr, W. M. Barr & Co., P. O. Box 3518, Memphis, Tenn.

ACCEPTANCE OF COMMERCIAL STANDARD

If acceptance has not previously been filed, this sheet properly filled in, signed, and returned will provide for the recording of your organization as an acceptor of this commercial standard.

Date_____

Commodity Standards Division,
National Bureau of Standards,
Washington 25, D. C.

Gentlemen:

We believe that the Commercial Standard CS152–48 constitutes a useful standard of practice, and we individually plan to utilize it as far as practicable in the

production [1] distribution [1] purchase [1] testing [1]

of copper naphthenate wood-preservative.

We reserve the right to depart from it as we deem advisable.

We understand, of course, that only those articles which actually comply with the standard in all respects can be identified or labeled as conforming thereto.

Signature of authorized officer_____
(In ink)

(Kindly typewrite or print the following lines)

Name and title of above officer_____

Organization_____
(Fill in exactly as it should be listed)

Street address_____

City, Zone, and State_____

[1] Underscore which one. Please see that separate acceptances are filed for all subsidiary companies and affiliates which should be listed separately as acceptors. In the case of related interests, trade associations, trade papers, etc., desiring to record their general support, the words "General Support" should be added after the signature.

TO THE ACCEPTOR

The following statements answer the usual questions arising in connection with the acceptance and its significance:

1. *Enforcement.*—Commercial standards are commodity specifications voluntarily established by mutual consent of those concerned. They present a common basis of understanding between the producer, distributor, and consumer and should not be confused with any plan of governmental regulation or control. The United States Department of Commerce has no regulatory power in the enforcement of their provisions, but since they represent the will of the interested groups as a whole, their provisions through usage soon become established as trade customs, and are made effective through incorporation into sales contracts by means of labels, invoices, and the like.

2. *The acceptor's responsibility.*—The purpose of commercial standards is to establish for specific commodities, nationally recognized grades or consumer criteria, and the benefits therefrom will be measurable in direct proportion to their general recognition and actual use. Instances will occur when it may be necessary to deviate from the standard and the signing of an acceptance does not preclude such departures; however, such signature indicates an intention to follow the commercial standard where practicable, in the production, distribution, or consumption of the article in question.

3. *The Department's responsibility.*—The major function performed by the Department of Commerce in the voluntary establishment of commercial standards on a Nation-wide basis is fourfold; first, to act as an unbiased coordinator to bring all interested parties together for the mutually satisfactory adjustment of trade standards; second, to supply such assistance and advice as past experience with similar programs may suggest; third, to canvass and record the extent of acceptances and adherence to the standard on the part of producers, distributors, and users; and fourth, after acceptance, to publish and promulgate the standard for the information and guidance of buyers and sellers of the commodity.

4. *Announcement and promulgation.*—When the standard has been endorsed by a satisfactory majority of production or consumption in the absence of active valid opposition, the success of the project is announced. If, however, in the opinion of the standing committee or the Department of Commerce, the support of any standard is inadequate, the right is reserved to withhold promulgation and publication.

ACCEPTORS

The organizations listed below have individually accepted this standard for use as far as practicable in the production, distribution, testing, or purchase of copper naphthenate wood-preservative. In accepting the standard they reserved the right to depart therefrom as they individually deem advisable. It is expected that articles which actually comply with the requirements of this standard in all respects will be regularly identified or labeled as conforming thereto, and that purchasers will require such specific evidence of conformity.

ASSOCIATIONS

(General Support)

Woodwork Jobbers Service Bureau, Chicago, Ill.

FIRMS AND OTHER INTERESTS

Advance Solvents & Chemical Corp., New York, N. Y.
Allied Analytical & Research Laboratories, Dallas, Tex.
Apex Chemical Co., Apex, N. C.
Arizona Testing Laboratories, Phoenix, Ariz.
Armor Laboratories, Inc., Glendale, Calif.
Baird, David, Co., Camden, N. J.
Baltimore Copper Paint Co., Baltimore, Md.
Baltimore & Ohio Railroad Co., Baltimore, Md.
Barr, W. M., & Co., Memphis, Tenn.
Beechem Laboratories, St. Johns, Mich.
Bell Lumber & Pole Co., Minneapolis, Minn.
Bennetts Chemical Laboratory, Inc., Tacoma, Wash.
Breinig Bros., Inc., Hoboken, N. J.
Bridgeport Testing Laboratory, Bridgeport, Conn.
Carbozite Protective Coatings, Inc., Greensburg, Pa.
Charlton Laboratories, Portland, Oreg.
Colburn Laboratories, Inc., Chicago, Ill.
Conservation Products Corp., The, Port Arthur, Tex.
Cre-O-Tox Chemical Products Co., Memphis, Tenn.
Cuprinol Division, Darworth, Inc., Simsbury, Conn.
Curtis & Tompkins, Ltd., San Francisco, Calif.
Darling Lumber Co., Portland, Oreg.
Eimer & Amend—Fisher Scientific Co., New York, N. Y.
Ekroth Laboratories, Inc., Brooklyn, N. Y.
Electrical Testing Laboratories, Inc., New York, N. Y.
Evans Research & Development Corp., New York, N. Y.
Fassett, C. M., Laboratories, The, Spokane, Wash.
Ferro Chemical Corp., Cleveland, Ohio.
Forman-Ford & Co., Minneapolis, Minn.
Froeling & Robertson, Inc., Richmond, Va.
General Petroleum Corp., Los Angeles, Calif.
Glidden Co., The, Cleveland, Ohio.
Gordon, Geo. C., Chemical Co., Kansas City, Mo.
Hale, George A., St. Louis, Mo.
Harshaw Chemical Co., The, Cleveland, Ohio.
Horn, A. C., Co., Division of Sun Chemical Co., Long Island City, N. Y.
Kinsol Corp., Chicago, Ill.
LaWall & Harrisson, Philadelphia, Pa.
Lehigh & New England Railroad Co., Pen Argyl, Pa.
Lowe Bros. Co., The, Dayton, Ohio
Magnolia Petroleum Co., Dallas, Tex.
Marsh & Truman Lumber Co., Chicago, Ill.
Massachusetts, Commonwealth of, Public Works Department, Boston, Mass.
McGean Chemical Co., The, Cleveland, Ohio.
Merchants & Manufacturers Paint Co., Inc., Louisville, Ky.
Michigan Pole & Tie Co., Newberry, Mich.
Minnesota Testing Laboratories, Inc., Duluth, Minn.
Monsanto Chemical Co., Western Division, Seattle, Wash.
Morse Laboratories, Sacramento, Calif.
New York Central Railroad Co., The, New York, N. Y.
New York Testing Laboratories, Inc., New York, N. Y.
Norfolk Testing Laboratories, Norfolk, Va.
Northwest Laboratories, Seattle, Wash.
Nuodex Products Co., Inc., Elizabeth, N. J.
Nutting, H. C., Co., The, Cincinnati, Ohio.
O'Brien Corp., The, South Bend, Ind.
Oklahoma Testing Laboratories, Oklahoma City, Okla.
Omaha Testing Laboratories, Omaha, Nebr.
Oronite Chemical Co., San Francisco, Calif.
Orthmann Laboratories, Inc., The, Milwaukee, Wis.
Osmose Wood Preserving Co. of America, Inc., Buffalo, N. Y.
Pacific Chemical Laboratories, San Francisco, Calif.
Paquin, Felix, & Associates, Galveston, Tex.
Parker, Ira, & Sons Co., Oshkosh, Wis.
Patterson-Sargent Co., The, Cleveland, Ohio.
Penniman & Browne, Inc., Baltimore, Md.
Perma Products Co., The, Cleveland, Ohio.
Pittsburgh Testing Laboratory, San Francisco, Calif.
Plastic Products Co., Detroit, Mich.
Polytechnique Laboratories, New York, N. Y.
Protection Products Manufacturing Co., Kalamazoo, Mich.
Protexol, Corp., Kenilworth, N. J.
Red Spot Paint & Varnish Co., Evansville, Ind.
Rudd Paint & Varnish Co., Evansville, Ind.
Sadtler, Samuel P., & Son, Inc., Philadelphia, Pa.
Saskatchewan, University of, Department of Chemistry, Saskatoon, Saskatchewan, Canada.
Sears, Roebuck & Co., Chicago, Ill.
Shell Oil Co., Inc., San Francisco, Calif.
Shepherd Chemical Co., The, Cincinnati, Ohio.
Skinner & Sherman, Inc., Boston, Mass.
Snell, Foster D., Inc., New York, N. Y.
Socony-Vacuum Oil Co., Inc., Brooklyn, N. Y.
Southern Testing Laboratories, Inc., Birmingham, Ala.
Stanco, Inc., New York, N. Y.
Sterling Paint Co., Emeryville, Calif.
Stillman & Van Siclen, Inc., New York, N. Y.
Stresen-Reuter, Fred'k A., Inc., Chicago, Ill.
Texas Solvents & Chemicals Co., Houston, Tex.
Textor Laboratories, The, Cleveland, Ohio.
Thompson-Hayward Chemical Co., Kansas City, Mo.
Triangle Chemical Co., Macon, Ga.
Twin City Testing & Engineering Laboratory, St. Paul, Minn.
Twining Laboratories, The, Fresno, Calif.
United States Testing Co., Inc., Hoboken, N. J.
Vicklund, Richard E., Fort Belvoir, Va.
Vita-Var Corp., Newark, N. J.
Wayne Chemical Products Co., Detroit, Mich.
Westinghouse Electric Corp., East Pittsburgh, Pa.
Witco Chemical Co., Chicago, Ill.
Wood Treating Chemicals Co., St. Louis, Mo.

UNITED STATES GOVERNMENT

Army, Department of the, Logistics Division, Washington, D. C.

COMMERCIAL STANDARDS

CS No.	Item
0–40.	Commercial standards and their value to business (third edition).
1–42.	Clinical thermometers (third edition).
2–30.	Mopsticks.
3–40.	Stoddard solvent (third edition).
4–29.	Staple porcelain (all-clay) plumbing fixtures.
5–46.	Pipe nipples; brass, copper, steel and wrought-iron (second edition).
6–31.	Wrought-iron pipe nipples (second edition). Superseded by CS5–46.
7–29.	Standard weight malleable iron or steel screwed unions.
8–41.	Gage blanks (third edition).
9–33.	Builders' template hardware (second edition).
10–29.	Brass pipe nipples. Superseded by CS5–46.
11–41.	Moisture regains of cotton yarns (second edition).
12–48.	Fuel oils (sixth edition).
13–44.	Dress patterns (fourth edition).
14–43.	Boys' button-on waists, shirts, junior and sport shirts (made from woven fabrics) (third edition).
15–46.	Men's pajama sizes (made from woven fabrics) (third edition).
16–29.	Wall paper.
17–47.	Diamond core drill fittings (fourth edition).
18–29.	Hickory golf shafts.
19–32.	Foundry patterns of wood (second edition).
20–47.	Staple vitreous china plumbing fixtures (fourth edition).
21–39.	Interchangeable ground-glass joints, stopcocks, and stoppers (fourth edition).
22–40.	Builders' hardware (nontemplate) (second edition).
23–30.	Feldspar.
24–43.	Screw threads and tap-drill sizes.
25–30.	Special screw threads. Superseded by CS24–43.
26–30.	Aromatic red cedar closet lining.
27–36.	Mirrors (second edition).
28–46.	Cotton fabric tents, tarpaulins and covers (second edition).
29–31.	Staple seats for water-closet bowls.
30–31.	Colors for sanitary ware. (Withdrawn as commercial standard March 15, 1948).
31–38.	Wood shingles (fourth edition).
32–31.	Cotton cloth for rubber and pyroxylin coating.
33–43.	Knit underwear (exclusive of rayon) (second edition).
34–31.	Bag, case, and strap leather.
35–47.	Hardwood plywood (third edition).
36–33.	Fourdrinier wire cloth (second edition).
37–31.	Steel bone plates and screws.
38–32.	Hospital rubber sheeting.
39–37.	Wool and part wool blankets (second edition). (Withdrawn as commercial standard, July 14, 1941).
40–32.	Surgeons' rubber gloves.
41–32.	Surgeons' latex gloves.
42–43.	Structural fiber insulating board (third edition).
43–32.	Grading of sulphonated oils.
44–32.	Apple wraps.
45–48.	Douglas fir plywood (eighth edition).
46–40.	Hosiery lengths and sizes (third edition).
47–34.	Marking of gold-filled and rolled-gold-plate articles other than watch-cases.
48–40.	Domestic burners for Pennsylvania anthracite (underfeed type) (second edition).
49–34.	Chip board, laminated chip board, and miscellaneous boards for bookbinding purposes.
50–34.	Binders board for bookbinding and other purposes.
51–35.	Marking articles made of silver in combination with gold.
52–35.	Mohair pile fabrics (100-percent mohair plain velvet, 100-percent mohair plain frieze, and 50-percent mohair plain frieze).
53–35.	Colors and finishes for cast stone.
54–35.	Mattresses for hospitals.
55–35.	Mattresses for institutions.
56–41.	Oak flooring (second edition).
57–40.	Book cloths, buckrams, and impregnated fabrics for bookbinding purposes except library bindings (second edition).
58–36.	Woven elastic fabrics for use in overalls (overall elastic webbing).
59–44.	Textiles—testing and reporting (fourth edition).
60–48.	Hardwood dimension lumber (second edition).
61–37.	Wood-slat venetian blinds.
62–38.	Colors for kitchen accessories.
63–38.	Colors for bathroom accessories.
64–37.	Walnut veneers.
65–43.	Methods of analysis and of reporting fiber composition of textile products (second edition).
66–38.	Marking of articles made wholly or in part of platinum.
67–38.	Marking articles made of karat gold.
68–38.	Liquid hypochlorite disinfectant, deodorant, and germicide.
69–38.	Pine oil disinfectant.
70–41.	Phenolic disinfectant (emulsifying type) (second edition) (published with CS71–41).
71–41.	Phenolic disinfectant (soluble type) (second edition) (published with CS70–41).
72–38.	Household insecticide (liquid spray type).
73–48.	Old growth Douglas fir, Sitka spruce, and Western hemlock standard stock doors (fourth edition).
74–39.	Solid hardwood wall paneling.
75–42.	Automatic mechanical draft oil burners designed for domestic installations (second edition).
76–39.	Hardwood interior trim and molding.
77–48.	Enameled cast-iron plumbing fixtures (second edition).
78–40.	Ground-and-polished lenses for sun glasses (second edition) (published with CS79–40).

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79–40. Blown, drawn, and dropped lenses for sun glasses (second edition) (published with CS78–40).
80–41. Electric direction signal systems other than semaphore type for commercial and other vehicles subject to special motor vehicle laws (after market).
81–41. Adverse-weather lamps for vehicles (after market).
82–41. Inner-controlled spotlamps for vehicles (after market).
83–41. Clearance, marker, and identification lamps for vehicles (after market).
84–41. Electric tail lamps for vehicles (after market).
85–41. Electric license-plate lamps for vehicles (after market).
86–41. Electric stop lamps for vehicles (after market).
87–41. Red electric warning lanterns.
88–41. Liquid burning flares.
89–40. Hardwood stair treads and risers.
90– . (Reserved for power shovels and cranes).
91–41. Factory-fitted Douglas fir entrance doors.
92–41. Cedar, cypress and redwood tank stock lumber.
93–41. Portable electric drills (exclusive of high frequency).
94–41. Calking lead.
95–41. Lead pipe.
96–41. Lead traps and bends.
97–42. Electric supplementary driving and passing lamps for vehicles (after market).
98–42. Artists' oil paints.
99–42. Gas floor furnaces—gravity circulating type.
100–47. Porcelain-enameled steel utensils (third edition).
101–43. Flue-connected oil-burning space heaters equipped with vaporizing pot-type burners.
102– . (Reserved for Diesel and fuel-oil engines).
103–48. Rayon jacquard velour (with or without other decorative yarn) (second edition).
104–46. Warm-air furnaces equipped with vaporizing pot-type oil burners (second edition).
105–48. Mineral wool insulation—for low temperatures (second edition).
106–44. Boys' pajama sizes (woven fabrics) (second edition).
107–45. Commercial electric-refrigeration condensing units (second edition). (Withdrawn as commercial standard September 4, 1947.)
108–43. Treading automobile and truck tires.
109–44. Solid-fuel-burning forced-air furnaces.
110–43. Tire repairs—vulcanized (passenger, truck, and bus tires).
111–43. Earthenware (vitreous-glazed) plumbing fixtures.
112–43. Homogeneous fiber wallboard.
113–44. Oil-burning floor furnaces equipped with vaporizing pot-type burners.
114–43. Hospital sheeting for mattress protection.
115–44. Porcelain-enameled tanks for domestic use.
116–44. Bituminized-fiber drain and sewer pipe.
117–44. Mineral wool; blankets, blocks, insulating cement, and pipe insulation for heated industrial equipment.
118–44. Marking of jewelry and novelties of silver.
(E) 119–45.[1] Dial indicators (for linear measurements).
120–48. Standard stock ponderosa pine doors (third edition).
121–45. Women's slip sizes (woven fabrics).
122–45. Western hemlock plywood.
123–45. Grading of diamond powder.
(E) 124–45.[1] Master disks.
125–47. Prefabricated homes (second edition).
126–45. Tank mounted air compressors.
127–45. Self-contained mechanically refrigerated drinking water coolers.
128–45. Men's sport shirt sizes—woven fabrics (other than those marked with regular neckband sizes).
129–47. Materials for safety wearing apparel (second edition).
130–46. Color materials for art education in schools.
131–46. Industrial mineral wool products, all types—testing and reporting.
132–46. Hardware cloth.
133–46. Woven wire netting.
134–46. Cast-aluminum cooking utensils (metal composition).
135–46. Men's shirt sizes (exclusive of work shirts).
136–46. Blankets for hospitals (wool, and wool and cotton).
137–46. Size measurements for men's and boys' shorts (woven fabrics).
138–47. Insect wire screening.
139–47. Work gloves.
140–47. Testing and rating convectors.
141–47. Sine bars, blocks, plates, and fixtures.
142–47. Automotive lifts.
143–47. Standard strength and extra strength perforated clay pipe.
144–47. Formed metal porcelain enameled sanitary ware.
145–47. Testing and rating hand-fired hot-water-supply boilers.
146–47. Gowns for hospital patients.
147–47. Colors for molded urea plastics.
148–48. Men's circular flat and rib knit rayon underwear.
149–48. Utility type house dress sizes.
150–48. Hot rolled rail steel bars (produced from Tee-section rails).
151–48. Body measurements for the sizing of apparel for infants, babies, toddlers, and children (for the knit-underwear industry).
152–48. Copper naphthenate wood-preservative.

NOTICE.—Those interested in commercial standards with a view toward accepting them as a basis of everyday practice may secure copies of the above standards, while the supply lasts, by addressing the Commodity Standards Division, National Bureau of Standards, Washington 25, D. C.

[1] Where "(E)" precedes the CS number, it indicates an emergency commercial standard, drafted under war conditions with a view toward early revision.

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