

CS93-41
Drills; electric, portable (exclusive of high-frequency)

U. S. DEPARTMENT OF COMMERCE
JESSE H. JONES, Secretary
NATIONAL BUREAU OF STANDARDS
LYMAN J. BRIGGS, Director

PORTABLE ELECTRIC DRILLS
(EXCLUSIVE OF HIGH FREQUENCY)

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COMMERCIAL STANDARD CS93-41
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Effective Date for New Production from October 18, 1941



A RECORDED VOLUNTARY STANDARD
OF THE TRADE

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1941

U. S. DEPARTMENT OF COMMERCE

NATIONAL BUREAU OF STANDARDS

PROMULGATION
of
COMMERCIAL STANDARD CS93-41
for
PORTABLE ELECTRIC DRILLS
(EXCLUSIVE OF HIGH FREQUENCY)

On June 26, 1940, at the instance of the Electric Tool Institute, a general conference of representative manufacturers, distributors, and users of portable electric drills adopted a recommended Commercial Standard for this commodity. Those concerned have since accepted and approved for promulgation by the United States Department of Commerce through the National Bureau of Standards, the standard as shown herein.

The standard is effective for new production from October 18, 1941.

Promulgation recommended.

I. J. Fairchild,
Chief, Division of Trade Standards.

Promulgated.

Lyman J. Briggs,
Director, National Bureau of Standards.

Promulgation approved.

Jesse H. Jones,
Secretary of Commerce.

PORTABLE ELECTRIC DRILLS

(EXCLUSIVE OF HIGH FREQUENCY)

COMMERCIAL STANDARD CS93-41

PURPOSE

1. The purpose of this Commercial Standard is to provide a nationally recognized specification for portable electric drills. By its general adoption and use, it is expected to promote a better understanding between buyer and seller and establish a basis for certification of capacity and performance.

SCOPE

2. This standard provides minimum specifications for class *A*; heavy-duty, and class *B*, standard, rotary electric drills manufactured in 11 standard sizes ranging from $\frac{3}{16}$ inch to $1\frac{1}{2}$ inches. It covers design, construction, minimum full-load ampere rating for each class and size of drill; tests name plates; and a uniform method of certifying compliance with the standard.

GENERAL REQUIREMENTS

3. All portable electric drills sold as conforming to this Commercial Standard shall meet the following general requirements.

4. *Construction.*—All parts of the drills shall be rugged in construction and properly supported, mounted, and secured. The drills shall be simple in construction, reliable in operation, and readily accessible for inspection, adjustment, and replacement. Parts shall be interchangeable and of a good fit with other parts made by the same manufacturer.

5. *Safety.*—All portable electric drills shall be designed for facility in operation and safety in use. All rotating parts which are a danger to the operator in use shall be suitably guarded against accidental contact where such guards do not interfere with the correct operation of the tool. The frame, except for the ventilating openings of the tool, shall totally enclose all stationary and rotating electrical parts. The openings for ventilation shall be as small as practicable, not exceeding $\frac{1}{2}$ inch in width, and such that the motor will be protected from injury from outside sources.

6. *Housings.*—Housings shall surround and enclose the mechanism of the drill to guard it effectively from external injury. The practice of using aluminum or other lightweight alloys on portable electric drills is satisfactory.

7. *Switch.*

7a. Each electric drill shall be provided with a conveniently located switch for turning the current of the motor "off" and "on." All switches shall be double-pole, except that single-pole switches may be used on $\frac{3}{16}$ -inch class *A* and *B*, and $\frac{1}{4}$ -inch class *B* drills. The switch mechanism shall be enclosed in an enclosure of strong insulating material of high-dielectric strength. Switches, except those which release automatically, shall be marked plainly to show the "off" and "on" position. Switches operating on 250 volts or less, shall have a minimum $\frac{1}{4}$ -inch clearance between terminals of opposite polarity measured over the surfaces of the insulating material between terminals. The clearance to ground on adjacent frame shall be at least $\frac{3}{8}$ -inch, measured over the surfaces of the insulating material.

7b. Switches shall be capable of interrupting the stalled motor current at full rated voltage for 50 consecutive contacts at intervals of 10 seconds without flashing to the case and sticking or burning of contacts. To determine whether or not a switch meets these requirements, it should be installed on the electric drill and arranged for *testing only*, connected to an ungrounded circuit in accordance with the following conditions: When the switch is single-pole, the line opposite to that passing through the switch shall be connected to the switch case. When a double-pole switch is used, the side of the line farthest from any adjacent metal within the switch case shall be connected to the switch case. On drills supplied with motors of 250 volts and less, alternating current or direct current, the test shall be applied at rated voltage direct current.

7c. The switch shall have a current rating not less than the full-load current rating on name plate of the drill with which it is to be used. In the case of drills supplied with motors 250 volts or less, where the same switches are used on all lower potential ratings, the switch shall have a 110-volt current rating not less than that of the 110-volt motor.

8. *Motors.*—Motors shall be of rugged construction and shall operate satisfactorily at 6 percent above or below the standard rated voltage. Commutators shall be rugged and shall be of the V-ring and sheet-mica construction. Molded insulation in the commutators shall not be used. Rotors or armatures shall be accurately balanced statically and dynamically. Where the pinion gear is cut on the shaft, motor shafts should be made of high-grade alloy steel and suitably heat-treated. The voltage of portable electric drills shall not exceed 250 volts. The armature and field wiring shall have insulation at least equivalent to class *A* insulation as defined by American Institute of Electrical Engineers, with suitable impregnation to resist moisture.

9. *Brushes.*—Drill motors shall be fitted with rectangular or square carbon brushes fitted in suitable insulated brush holders, provided with spiral or helical springs. Flexible copper shunts shall be provided on all brushes, except on $\frac{3}{16}$ -inch class *A* and *B*, and $\frac{1}{4}$ -inch class *B* drills. A $\frac{1}{4}$ -inch minimum internal creepage shall be maintained as measured from the edge of the live brush holder over the insulation to the adjacent grounded frame. No live parts of brush mechanism shall be exposed to contact by the operator. Where insulated screw caps are used, they shall be protected by the housing from mechanical injury.

10. *Bearings.*—The armature of the motor shall be mounted on ball bearings at least equivalent to Annular Bearing Engineers' Committee No. 1 standard, or comparable roller-type bearings. Intermediate shaft bearings shall be of either the ball, roller, or sleeve type, properly proportioned. Spindle or arbor bearings of tools may be of the ball, roller, or sleeve type. Ball bearings, so mounted as to preclude the possibility of contamination with dust and dirt, shall be of the dustproof type or enclosed in a dustproof housing. All spindles or arbors and other shafts subjected to thrust loads shall have bearings with adequate thrust capacity or a separate ball thrust bearing.

11. *Gears and shafts.*—All gears, except worm gears, shall be made of suitably heat-treated steel and be adequately supported to prevent deflection. Shafts shall be made of high-grade alloy steel and suitably heat-treated. Each shaft shall be adequately supported by at least two bearings of the type required by paragraph 10. Gears and shafts shall be fully enclosed.

12. *Lubrication.*—Bearings shall be arranged so that they are suitably lubricated. Gears shall operate in lubricant which shall be prevented from entering the motor frame or leaking from the gear housing.

13. *Wiring.*—All wiring, except the rubber-covered cord, shall be enclosed in the metal frame of the drill, and conductors shall be securely held in position away from rotating parts. All leads shall be clear from possible oil or grease within frames of drills.

14. *Cord and attachment plugs.*—Each drill shall be equipped with a minimum of 10 feet of approved type *S* or *SJ* flexible rubber-covered, three-wire cord, extending beyond the tool with a suitable two-prong attachment plug of an approved type. Metal frames of the drills and the switch shall be effectively grounded. Ground connections to the frame shall be made inside the frame and well protected against mechanical injury. Such ground connections shall be a separate connection screw which shall not be used for any other purpose, with a lock washer between the screw head and the wire. The green-colored insulated wire shall be used as the ground wire and available for ground connection at the attachment plug. This wire should be suitably tagged with instructions for making proper ground connection. The cord of the portable equipment shall be provided with a strain relief and an antikink device at the junction of the cord with the tool. The size of the conductors shall be determined from the full-load ampere rating of the tool, and shall be in conformance with the table of the allowable carrying capacity of flexible rubber-covered cord as given in the National Electrical Code.

DETAIL REQUIREMENTS

15. Electric drills shall be divided into two classes, "class A", heavy-duty, and "class B", standard.

16. *Class A.*—Heavy-duty drills shall have the minimum full-load ampere ratings for each size, as shown in table 1, and shall be suitable for heavy production.

17. *Class B.*—Standard drills shall have the minimum full-load ampere ratings for each size as shown in table 1 and shall be suitable for drilling to rated capacity, except for heavy production.

18. *Size.*—Electric drills shall be sized according to the maximum chuck capacity. (See par. 20.) Standard sizes shall be $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{4}$, and $1\frac{1}{2}$ inches.

19. *Handles.*—All drills up to and including $\frac{5}{16}$ -inch class A and $\frac{3}{8}$ -inch class B capacity shall have a suitable end handle or a conveniently located handle and switch. Heavy-duty class A drills of $\frac{3}{8}$ -inch capacity shall be equipped with (1) a combination breastplate and spade handle with a side handle in which a grip-controlled switch is located, or (2) a suitable end handle with switch and an auxiliary side handle. Drills of $\frac{1}{2}$ -inch capacity and greater shall have a combination spade and breastplate handle located on the end of the drill with two side handles located at approximately the center of gravity of the drill. One of the side handles shall be removable, and the other shall contain a grip-controlled switch.

TABLE 1.—Minimum full-load ampere ratings^a

[Applies to both name plates and tests]

Size or capacity of drill	Class A, heavy-duty drills	Class B, standard drills
<i>Inches</i>	<i>Amperes</i>	<i>Amperes</i>
$\frac{3}{16}$	1.8	1.3
$\frac{1}{4}$	2.5	1.8
$\frac{5}{16}$	2.8	2.2
$\frac{3}{8}$	3.5	2.5
$\frac{1}{2}$	5.0	3.5
$\frac{5}{8}$	6.0	4.5
$\frac{3}{4}$	7.5	5.5
$\frac{7}{8}$	8.0	6.0
1	8.5	-----
$1\frac{1}{4}$	11.0	-----
$1\frac{1}{2}$	15.0	-----

^aThe ampere ratings are based on a maintained 115-volt, 60-cycle, single-phase, alternating current. (See par. 21.) Ampere ratings of other voltages are in inverse proportion to the voltage.

20. *Chuck.*—Standard chuck equipment for drills up to and including $\frac{3}{4}$ -inch rating shall be of standard high grade, three-jawed type, so constructed as to hold firmly and centrally, straight shank drills of any size up to the maximum rated capacity of the electric drill. Chucks shall be of the geared type, with three hardened and ground tool steel jaws. A suitable chuck key shall be furnished with each chuck; $\frac{3}{8}$ -inch and 1-inch drills shall have No. 2 or No. 3 Morse Taper Socket, and $1\frac{1}{4}$ - and $1\frac{1}{2}$ -inch drills shall have No. 3 or No. 4 Morse Taper Socket.

TESTS

21. *Ampere rating.*—Full-load ampere rating on name plate shall be the amperage corresponding to a load which reduces the speed to not less than 55 percent and not more than 70 percent of the no-load speed. Temperature rise at rated name plate amperes under continuous operation shall not exceed 25° C on the outside of the case or motor frame and 50° C at any point on the motor windings and 65° C on the commutator, as indicated by the thermometer method of temperature determination. All tests shall be conducted with a maintained rated line voltage on 115 volts, 60 cycles, single-phase, alternating current.

22. *Dielectric test.*—At the completion of the manufacture, each electric drill shall pass the following insulation test. An a-c potential of 900 volts for 1 minute, or 900 volts plus 20 percent for 1 second, shall be applied from the current-carrying parts to the noncurrent-carrying parts for motors intended to operate on potentials not exceeding 250 volts.

NAME PLATE

23. Each drill shall be provided with a suitable metal name plate securely fastened to an integral part of the frame, or the housings, permanently marked in a conspicuous location. The stamping shall give the maker's serial number, type (or other designation) of the tool, the maker's name, size or capacity of the drill, kind of current, volts, full-load amperes, and no-load rpm. Full-load rpm may also be shown and if shown, shall be the rpm at the rated full-load amperes.

CERTIFICATION

24. In order to assure the purchaser that he is receiving a portable electric drill which complies with the requirements of this standard, it is recommended that a label or certificate bearing the following wording shall accompany each drill:

The manufacturer certifies that this portable electric drill complies with all the requirements of Commercial Standard CS93-41, as issued by the National Bureau of Standards of the United States Department of Commerce.

or more briefly:

This drill conforms to Commercial Standard CS93-41.

Name of manufacturer

Name of manufacturer

EFFECTIVE DATE

The standard is effective for new production from October 18, 1941.

STANDING COMMITTEE

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. Each organization nominated its own representatives. Comment concerning the standard and suggestions for revision may be addressed to any member of the committee or to the Division of Trade Standards, National Bureau of Standards, which acts as secretary for the committee.

- BLAINE B. RAMEY (chairman), Black & Decker Mfg. Co., Towson, Md.
- WHITFIELD MORETTI, Millers Falls Co., Greenfield, Mass.
- E. L. CONNELL, Chicago Pneumatic Tool Co., 1241 East 49th St., Cleveland, Ohio.
- H. C. PECK, The Stanley Electric Tool Division, The Stanley Works, New Britain, Conn.
- P. L. HOUSER, Industrial Engineering & Construction Dept., International Harvester Co., 180 N. Michigan Ave., Chicago, Ill.

ANDREW G. CAREY, Carey Machinery & Supply Co., 119 E. Lombard St., Baltimore, Md. (representing National Supply & Machinery Distributors' Association).

C. K. MORTON, St. Louis Airplane Division, Curtiss-Wright Corp., Robertson, Mo.
FRANK K. HANLIN, Underwriters' Laboratories, Inc., 207 E. Ohio St., Chicago, Ill.

HISTORY OF PROJECT

Pursuant to a request on February 16, 1940, from the Electric Tool Institute for the cooperation of the National Bureau of Standards in the establishment of a Commercial Standard for portable electric drills, a proposed standard as drafted by the ETI was submitted to manufacturers for comment. The resulting comment was reviewed by a committee of engineers, and a draft incorporating suitable changes was used as a basis for discussion at a general conference in Chicago on June 26, 1940, to which all concerned were invited.

The report of the general conference and the recommended Commercial Standard as adopted by the conference were circulated on July 17, 1940, to producers, distributors and users for written acceptance.

Some subsequent modifications to clarify ambiguities were approved by the Standing Committee and forwarded on March 7 and 8, 1941, to all concerned.

Upon receipt of written acceptances from a preponderant majority, announcement was issued on April 18, 1941, that the standard would become effective for new production from October 18, 1941.

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 _____

Division of Trade Standards,
National Bureau of Standards,
Washington, D. C.

Gentlemen:

Having considered the statements on the reverse side of this sheet, we accept the Commercial Standard CS93-41 as our standard of practice in the

Production ¹ Distribution ¹ Use ¹

of portable electric drills.

We will assist in securing its general recognition and use, and will cooperate with the standing committee to effect revisions of the standard when necessary.

(Cut along this line)

Signature of Individual 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 and State _____

¹ Please designate which group you represent by drawing lines through the other two. Please file separate acceptances for all subsidiary companies and affiliates which should be listed separately as acceptors. In the case of related interests, trade papers, colleges, etc., desiring to record their general approval, the words "in principle" 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 acceptance 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 and individuals listed below have accepted this standard as their standard of practice in the production, distribution, and use of portable electric drills. Such endorsement does not signify that they may not find it necessary to deviate from the standard, nor that producers so listed guarantee all of their products in this field to conform with the requirements of this standard. Therefore specific evidence of conformity should be obtained where required.

ASSOCIATIONS

<p>Allied Automotive Industries of California, Ltd., San Francisco, Calif. American Transit Association, New York, N. Y. Anti-Friction Bearing Manufacturers Association, Inc., New York, N. Y. Associated General Contractors of America, Inc., Washington, D. C. Automotive Engine Rebuilders Association, Indianapolis, Ind. (In principle.) Chicago Retail Hardware Association, The, Chicago, Ill. Cleveland, Master Plumbers League of, Cleveland, Ohio.</p>	<p>Electric Tool Institute, Sioux Falls, Iowa. Heating, Piping & Air Conditioning Contractors, National Association, New York, N. Y. National Association of Builders Exchanges, Washington, D. C. National Electrical Contractors Association, New York, N. Y. New England Iron & Hardware Association, Boston, Mass. Saginaw Association of Master Plumbers, Saginaw, Mich. Southern Supply & Machinery Distributors Association, Inc., Richmond, Va.</p>
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FIRMS

<p>Albertson & Co., Inc., Sioux City, Iowa. Alexander Film Co., Colorado Springs, Colo. Ames Co., B. C., Waltham, Mass. Armstrong Rubber Co., The, West Haven, Conn. Autocar Co., The, Ardmore, Pa. Bailey & Son, H. P., Plymouth, Mass. Baker Plumbing Co., Beaumont, Tex. Barr & Creelman Mill & Plumbing Supply Co., Rochester, N. Y. Barrett Hardware Co., Joliet, Ill. Bell Aircraft Corporation, Buffalo, N. Y. Bell Hardware, Bolivar, N. Y. Bellanca Aircraft Corporation, New Castle, Del. Benthall Machine Co., Inc., Suffolk, Va. Bethlehem Plumbing Supply Co., Bethlehem, Pa. Black & Decker Manufacturing Co., The, Towson, Md. Bodine Electric Co., Chicago, Ill. Boyer-Campbell Co., The, Detroit, Mich. Breeze Corporation, Inc., Newark, N. J.</p>	<p>Breyer Ice Cream Co., Philadelphia, Pa. Bulotti Machinery Co., C. F., San Francisco, Calif. Burnham Plumbing Co., San Francisco, Calif. Carey Machinery & Supply Co., Baltimore, Md. Central Aircraft Corporation, Keyport, N. J. Central Heating & Plumbing Co., Johnson City, N. Y. Central Plumbing Supply Co., The, Bridgeport, Conn. Chambersburg Engineering Co., Chambersburg, Pa. Chase & Cooledge Co., The, Holyoke, Mass. Chenoweth, James, Philippi, W. Va. Chicago Pneumatic Tool Co., New York, N. Y., and Denver, Colo. Christie Laboratories, Inc., Cleveland, Ohio. Chrysler Corporation, Detroit, Mich. Clark, Jr., Electric Co., James, Louisville, Ky. Consolidated Aircraft Corporation, San Diego, Calif.</p>
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- Conwell & Co., E. L., Philadelphia, Pa.
(In principle.)
County Seat Plumbing Supply Co., Inc.,
White Plains, N. Y.
Cunningham-Hall Aircraft Corporation,
Rochester, N. Y.
Curtiss-Wright Corporation, Curtiss
Aeroplane Division, Buffalo, N. Y.
Detroit Testing Laboratory, The, De-
troit, Mich.
Dill & Collins, Inc., Philadelphia, Pa.
Diveco Twin Truck Co., Detroit, Mich.
Doane Motor Truck Co., San Francisco,
Calif.
Douglas Aircraft Co., Inc., Santa
Monica, Calif.
Dumore Co., The, Racine, Wis.
Dunlop Tire & Rubber Corporation,
Buffalo, N. Y.
Edlund Machinery Co., Inc., Cortland,
N. Y.
Emerson Electric Manufacturing Co.,
The, St. Louis, Mo.
Emery Industries, Inc., Cincinnati,
Ohio.
Firestone Tire & Rubber Co., The,
Akron, Ohio.
FitzJohn Coach Co., Muskegon, Mich.
Four Wheel Drive Auto Co., Clinton-
ville, Wis.
Freeport Plumbing & Heating Engi-
neers, Freeport, N. Y.
Froehling & Robertson, Inc., Richmond
Va.
General Motors Corporation, Detroit,
Mich.
General Tire & Rubber Co., Akron,
Ohio.
Goodrich Co., B. F., Akron, Ohio.
Goodyear Tire & Rubber Co., The,
Akron, Ohio.
Gould & Eberhardt, Irvington, N. J.
Grady Plumbing Co., Carbondale, Ill.
Graham-Paige Motors Corporation,
Dearborn, Mich.
Gramm Motor Truck Corporation,
Delphos, Ohio.
Hama Co., J. D., Chicago, Ill.
Hamilton Tool Co., A. Muehlmann
Division, Hamilton, Ohio.
Hardware & Supply Co., The, Akron,
Ohio.
Heating & Plumbing Co., Johnson City,
N. Y.
Home Plumbing & Heating Co., Twin
Falls, Idaho.
Hubbard Co., The S. B., Jacksonville,
Fla.
Idaho Hardware & Plumbing Co., Ltd.,
Boise, Idaho.
Imperial Body Works, Atlanta, Ga.
Independent Pneumatic Tool Co., Chi-
cago, Ill.
International Harvester Co., Chicago,
Ill.
Jacobs Plumbing Supply Corporation,
C. & S., Brooklyn, N. Y.
Johnson Plumbing Co., Texarkana, Ark.
Kellogg Co., M. W., Jersey City, N. J.
Kelly-Springfield Tire Co., The, Cum-
berland, Md.
Koppers Co., Seaboard Division,
Kearny, N. J.
Lebanon Plumbing Supply Co., Leban-
on, Pa.
Leeds & Northrup Co., Philadelphia, Pa.
Lockheed Aircraft Corporation, Bur-
bank, Calif.
Los Angeles Testing Laboratory, Los
Angeles, Calif.
Luscombe Airplane Corporation, W.
Trenton, N. J.
Mall Tool Co., Chicago, Ill.
Malone Plumbing Supply Co., S. S.
Pittsburgh, Pa.
Mansfield Tire & Rubber Co., The,
Mansfield, Ohio.
Martin Co., The Glenn L., Baltimore,
Md.
Mechanical Construction Corporation,
Hibbing, Minn.
Mellon Institute of Industrial Re-
search, Pittsburgh, Pa.
Midland Plumbing Supply Co., Inc., E.
St. Louis, Ill.
Miffin, S. W., Philadelphia, Pa.
Millers Falls Co., Greenfield, Mass.
Milwaukee Electric Tool Corporation,
Milwaukee, Wis.
Mohawk Paper Mills, Inc., Waterford,
N. Y.
Moreland Motor Truck Co., Los Ange-
les, Calif.
Moore-Eastwood & Co., Dayton, Ohio.
Murphy, Inc., J. L., New York, N. Y.
Nevins, Inc., Henry B., City Island,
N. Y.
New Orleans, Inc., Better Business
Bureau of, New Orleans, La. (In
principle.)
New York Testing Laboratories, Inc.,
New York, N. Y.
Orange & Rockland Electric Co., Mon-
roe, N. Y.
Oregon Culvert & Pipe Co., Portland,
Oreg.
Oshkosh Motor Truck, Inc., Oshkosh,
Wis.
P. & H. Supply Co., The, Ft. Wayne,
Ind.
Pennsylvania Rubber Co., Inc., Jean-
nette, Pa.
Perth Amboy Hardware Co., Perth
Amboy, N. J.
Piper Aircraft Corporation, Lock Haven,
Pa.
Pitcairn Autogiro Co., Willow Grove,
Pa.
Plumbing-Heating Metal Works, Pal-
metto, Fla.
Polson Rubber Co., The, Garrettsville,
Ohio.
Praetorius Sanitary Plumbing, Wm. P.,
Grand Rapids, Mich.

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| Pratt & Whitney (Division Niles-Bement-Pond Co.), W. Hartford, Conn. | Twin Coach Co., Kent, Ohio. |
| Republic Aviation Corporation, Farmingdale, L. I., N. Y. | Twining Laboratories, The, Fresno, Calif. |
| Ryan Aeronautical Co., San Diego, Calif. | Tyson Bros., Mesa, Ariz. |
| Ryerson & Son, Inc., Joseph T., Chicago, Ill. | Underwriters' Laboratories, Inc., Chicago, Ill. |
| Sacramento, Better Business Bureau of, Sacramento, Calif. (In principle.) | United Aircraft Corporation, Vought-Sikorsky Aircraft Division, Stratford, Conn. |
| Saint Louis Car Co., St. Louis, Mo. | United States Electrical Tool Co., The, Cincinnati, Ohio. |
| Schauer Machine Co., Cincinnati, Ohio. | United States Rubber Co., New York, N. Y., Indianapolis, Ind., and other cities. |
| Schenuit Rubber Co., F. G., Baltimore, Md. | United States Testing Co., Inc., Hoboken, N. J. |
| Seattle Hardware Co., Seattle, Wash. | Van Camp Hardware & Iron Co., Indianapolis, Ind. |
| Skilsaw, Inc., Chicago, Ill. | Van Dorn Portable Electric Tools (Division of Black & Decker), Baltimore, Md. |
| Smith, Emory & Co., San Francisco, Calif. (In principle.) | Vega Airplane Co., Burbank, Calif. |
| Smolka Co., Inc., New York, N. Y. | Vermilya-Brown Co., Inc., New York, N. Y. |
| Spangler Plumbing Co., Birmingham, Ala. | Vinyard Ship Building Co., Milford, Del. |
| Spartan Aircraft Co., Tulsa, Okla. | Vultee Aircraft, Inc., Vultee Field, Calif. |
| Standard Pressed Steel Co., Jenkintown, Pa. | Weakley-Watson-Miller Hardware Co., Brownwood, Tex. |
| Stanley Works, The, The R. L. Carter Division, New Britain, Conn. | West Virginia Pulp & Paper Co., Piedmont, W. Va. |
| Stanley Works, The, Stanley Electric Tool Division, New Britain, Conn. | Westchester Square Plumbing Supply Co., Inc., Bronx, New York, N. Y. |
| State Plumbing Supply Co., Philadelphia, Pa. | Western Electric Co., Inc., Chicago, Ill. |
| Stecher Co., The Charles, Chicago, Ill. | Westinghouse Electric Supply Co., New York, N. Y. |
| Sterling Motor Truck Co., Inc., Milwaukee, Wis. | White Motor Co., The, Cleveland, Ohio. |
| Suiter Plumbing Co., H. A., Oskaloosa, Iowa. | Willys-Overland Motors, Inc., Toledo, Ohio. |
| Sullivan Hardware Co., Anderson, S. C. | Wodack Electric Tool Corporation, Chicago, Ill. |
| Summers Hardware & Supply Co., Johnson City, Tenn. | Woolcock Plumbing & Heating Co., Niagara Falls, N. Y. |
| Superior-Sterling Co., Bluefield, W. Va. | |
| Syntron Co., Homer City, Pa. | |
| Taylorcraft Aviation Corporation, Alliance, Ohio. | |
| Temco Electric Motor Co., The, Leipsic, Ohio. | |
| Turner Supply Co., Mobile, Ala. | |

U. S. GOVERNMENT

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| Agriculture, Department of, Technical Advisory Board, Washington, D. C. | Veterans Administration, Washington, D. C. |
| Treasury Department, Washington, D. C. | War Department, Washington, D. C. |

COMMERCIAL STANDARDS

CS No.	Item	CS No.	Item
0-40.	Commercial standards and their value to business (third edition).	52-35.	Mohair pile fabrics (100-percent mohair plain velvet, 100-percent mohair plain frieze, and 50-percent mohair plain frieze).
1-32.	Clinical thermometers (second edition).	53-35.	Colors and finishes for cast stone.
2-30.	Mopsticks.	54-35.	Mattresses for hospitals.
3-40.	Stoddard solvent (third edition).	55-35.	Mattresses for institutions.
4-29.	Staple porcelain (all-clay), plumbing fixtures.	56-41.	Oak flooring (second edition).
5-40.	Pipe nipples; brass, copper, steel, and wrought iron.	57-40.	Book cloths, buckrams, and impregnated fabrics for bookbinding purposes except library bindings (second edition).
6-31.	Wrought-iron pipe nipples (second edition). Superseded by CS5-40.	58-36.	Woven elastic fabrics for use in overalls (overall elastic webbing).
7-29.	Standard weight malleable iron or steel screwed unions.	59-41.	Woven textile fabrics—testing and reporting (third edition).
8-41.	Gage blanks (third edition).	60-36.	Hardwood dimension lumber.
9-33.	Builders' template hardware (second edition).	61-37.	Wood-slat venetian blinds.
10-29.	Brass pipe nipples. Superseded by CS5-40.	62-38.	Colors for kitchen accessories.
11-41.	Moisture regains of cotton yarns (second edition).	63-38.	Colors for bathroom accessories.
12-40.	Fuel oils (fifth edition).	64-37.	Walnut veneers.
13-39.	Dress patterns (second edition).	65-38.	Wool and part-wool fabrics.
14-39.	Boys' button-on waists, shirts, junior and polo shirts (made from woven fabrics) (second edition).	66-38.	Marking of articles made wholly or in part of platinum.
15-29.	Men's pajamas.	67-38.	Marking articles made of karat gold.
16-29.	Wall paper.	68-38.	Liquid hypochlorite disinfectant, deodorant, and germicide.
17-42.	Diamond core drill fittings (third edition).	69-38.	Pine-oil disinfectant.
18-29.	Hickory golf shafts.	70-41.	Phenolic disinfectant (emulsifying type) (second edition) (published with CS71-41).
19-32.	Foundry patterns of wood (second edition).	71-41.	Phenolic disinfectant (soluble type) (second edition) (published with CS70-41).
20-36.	Staple vitreous china plumbing fixtures (second edition).	72-38.	Household insecticide (liquid spray type).
21-39.	Interchangeable ground-glass joints, stopcocks, and stoppers (fourth edition).	73-38.	Old growth Douglas fir standard stock doors.
22-40.	Builders' hardware (nontemplate) (second edition).	74-39.	Solid hardwood wall paneling.
23-30.	Feldspar.	75-39.	Automatic mechanical draft oil burners designed for domestic installations.
24-30.	Standard screw threads.	76-39.	Hardwood interior trim and molding.
25-30.	Special screw threads.	77-40.	Sanitary cast-iron enameled ware.
26-30.	Aromatic red cedar closet lining.	78-40.	Ground-and-polished lenses for sun glasses (second edition) (published with CS79-40).
27-36.	Mirrors (second edition).	79-40.	Blown, drawn, and dropped lenses for sun glasses (second edition) (published with CS78-40).
28-32.	Cotton fabric tents, tarpaulins, and covers.	80-41.	Electric direction signal systems other than semaphore type for commercial and other vehicles subject to special motor-vehicle laws (after market).
29-31.	Staple seats for water-closet bowls.	81-41.	Adverse-weather lamps for vehicles (after market).
30-31.	Colors for sanitary ware.	82-41.	Inner-controlled spot lamps for vehicles (after market).
31-38.	Wood shingles (fourth edition).	83-41.	Clearance, marker, and identification lamps for vehicles (after market).
32-31.	Cotton cloth for rubber and pyroxylin coating.	84-41.	Electric tail lamps for vehicles (after market).
33-32.	Knit underwear (exclusive of rayon).	85-41.	Electric license-plate lamps for vehicles (after market).
34-31.	Bag, case, and strap leather.	86-41.	Electric stop lamps for vehicles (after market).
35-31.	Plywood (hardwood and eastern red cedar).	87-41.	Red electric warning lanterns.
36-33.	Fourdriner wire cloth (second edition).	88-41.	Liquid-burning flares.
37-31.	Steel bone plates and screws.	89-40.	Hardwood stair treads and risers.
38-32.	Hospital rubber sheeting.	90-	(Reserved for power shovels and cranes).
39-37.	Wool and part wool blankets (second edition). (Withdrawn as commercial standard, July 14, 1941.)	91-41.	Factory fitted Douglas fir entrance doors.
40-32.	Surgeons' rubber gloves.	92-41.	Cedar, cypress, and redwood tank stock lumber.
41-32.	Surgeons' latex gloves.	93-41.	Portable electric drills (exclusive of high frequency).
42-35.	Fiber insulating board (second edition).	94-41.	Calking lead.
43-32.	Grading of sulfonated oils.	95-41.	Lead pipe.
44-32.	Apple wraps.	96-41.	Lead traps and bends.
45-40.	Douglas fir plywood (domestic grades) (fourth 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.		

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 Division of Trade Standards, National Bureau of Standards, Washington, D. C.