DEPARTMENT OF COMMERCE
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
OFFICE OF STANDARDS SERVICES

COMMERCIAL STANDARD CS214-57

GLASS-FIBER REINFORCED POLYESTER CORRUGATED STRUCTURAL PLASTICS PANELS

Commerical Standard CS214-57, Glass-Fiber Reinforced Polyester Corrugated Structural Plastics Panels, was superseded by Product Standard PS53-72, Glass-Fiber Reinforced Polyester Structural Plastic Panels, and withdrawn by the Department of Commerce on January 20, 1982.

The Society of the Plastics Industry, Inc. (SPI) was the sponsor for product standard PS53-72.

For technical assistance and additional information, contact:

Society of the Plastics Industry, Inc. (SPI)
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COMMERCIAL STANDARD **CS214-57**

Reprinted with amendments March 1961

WITHDRAWN

Glass-Fiber Reinforced Polyester Corrugated Structural Plastics Panels

A recorded voluntary standard of the trade published by the U.S. Department of Commerce

For sale by the Superintendent of Documents
U. S. Government Printing Office, Washington 25, D. C. Price 10 cents

TS-5530
APRIL 1961

ADDENDUM
TO
REPRINT OF CS214-57

IN ORDER TO CLARIFY SOME QUESTIONS THAT HAVE BEEN RAISED SINCE THE REPRINT OF CS214-57 WAS APPROVED, THE FOOTNOTES OUTLINED BELOW ARE TO BE CONSIDERED A PART OF THIS COMMERCIAL STANDARD.

1/ APPLIES TO THE FIGURE "2 1/2", UNDER "CORRUGATIONS", PARAGRAPH 5.3.

1/ READS - "GALVANIZED STEEL CORRUGATED PANELS WITH AN ACTUAL PITCH OF 2.67 INCHES ARE DESIGNATED AS HAVING A PITCH OF 2 1/2 INCHES IN THE TRADE."

2/ APPLIES TO THE FIGURE "0.812", UNDER "DEPTH", PARAGRAPH 5.3.

2/ READS - "THE DEPTH OF THE CORRUGATIONS IS MEASURED FROM OUTSIDE TO INSIDE SURFACES. METAL PANELS OF THE SAME CONFIGURATION ARE MEASURED FROM OUTSIDE TO OUTSIDE SURFACES WHICH GIVES A "DEPTH" OF 0.875 INCH."

3/ APPLIES TO PARAGRAPH HEADING "6.4 TRANSVERSE LOAD."

3/ READS - "SAFETY FACTORS MUST BE APPLIED TO THESE VALUES IF THEY ARE TO BE USED FOR DESIGN, ENGINEERING, OR ARCHITECTURAL PURPOSES. VALUES FOR THESE PURPOSES SHOULD BE OBTAINED FROM MANUFACTURERS OF THE PRODUCTS."

COMMODITY STANDARDS DIVISION

USCOMM-DC 61,976

U. S. DEPARTMENT OF COMMERCE

LUTHER H. HODGES, *Secretary*

Issued by

OFFICE OF TECHNICAL SERVICES

Commodity Standards Division

With the cooperation of

NATIONAL BUREAU OF STANDARDS

COMMERCIAL STANDARDS

Commercial Standards are developed by manufacturers, distributors, and users in cooperation with the Commodity Standards Division of the Office of Technical Services, and with the National Bureau of Standards. Their purpose is to establish quality criteria, standard methods of test, rating, certification, and labeling of manufactured commodities, and to provide uniform bases for fair competition.

The adoption and use of a 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 enforcible through usual legal channels as a part of the sales contract.

Commercial Standards originate 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 Commercial Standard through review and revision, whenever, in the opinion of the industry, changing conditions warrant such action.

SIMPLIFIED PRACTICE RECOMMENDATIONS

Under a similar procedure the Commodity Standards Division cooperates with industries in the establishment of Simplified Practice Recommendations. Their purpose is to eliminate avoidable waste through the establishment of standards of practice for sizes, dimensions, varieties, or other characteristics of specific products; to simplify packaging practices; and to establish simplified methods of performing specific tasks.

Glass-Fiber Reinforced Polyester Corrugated Structural Plastics Panels

[Effective October 16, 1957]

1. PURPOSE

1.1 The purpose of this Commercial Standard is to establish a national standard for the information and guidance of producers, distributors, and consumers; to promote understanding between buyers and sellers; to provide a basis for fair competition among producers; to give the consumer confidence in the quality of these products; and to provide a means of identifying products conforming to this standard.

2. SCOPE

2.1 This standard covers dimensional tolerances, intrinsic quality requirements, and methods of tests for two types of corrugated plastics panels of four geometrical configurations. The dimensional tolerances include areal sizes, weight, corrugations, thickness, and squareness. The intrinsic quality requirements include materials, appearance, color uniformity, tolerances on light transmission, transverse load, bearing load, and flammability.

(Par. 2.1 amended effective Jan. 1961.)

3. TERMINOLOGY AND GENERAL DESCRIPTION OF PRODUCTS COVERED

3.1 Unless otherwise indicated, the plastics terminology used in this standard shall be in accordance with the definitions given in ASTM D883–56 T, Definitions of Terms Relating to Plastics.[1]

3.2 *General description.*—This standard describes glass-fiber reinforced polyester corrugated plastics panels intended for structural applications. For this standard, the polyester plastics in the panel shall be based on cured thermoset resins composed principally of synthetic polymeric esters in which the recurring ester groups are an integral part of the main polymer chain. These plastics may contain small amounts of catalyst residues, stabilizers, pigments, dyes, and other resins. The principal reinforcement shall be glass fiber. Other reinforcing fibers or filaments may be used with the glass fibers provided they comprise less than 50 percent by weight of the total reinforcement. Other fillers in powder form may be used to produce desired opacity.

[1] Copies of ASTM publications referred to in this Commercial Standard are obtainable from the American Society for Testing Materials, 1916 Race St., Philadelphia, Pa.

4. TYPES

4.1 The corrugated plastics panels covered by this standard shall be the following types:

Type I—General Purpose.

Type II—Fire Retardant.

The principal difference between the two types of corrugated plastics panels is their resistance to flame and weathering elements. Type I has better weathering properties; Type II has a slower rate of burning. The slower rate of burning is obtained at some sacrifice in resistance to weathering. Type II may cost more than Type I.

5. DIMENSIONAL REQUIREMENTS

5.1 *Sizes.*—Panels are supplied in a variety of widths and lengths (see appendix). The tolerance on specified lengths and widths shall be ±¼ inch when measured in accordance with paragraph 7.2.

5.2 *Weight.*—The weight in ounces per square foot shall be 8 oz./ft.^{2}, plus 15 percent, minus 10 percent, when measured in accordance with paragraph 7.3.

(Par. 5.2 amended effective Jan. 1961.)

5.3 *Corrugations.*—The pitch and depth of the corrugations shall be as listed in the following table when measured in accordance with paragraph 7.4.

Corrugations	Pitch	Depth
Inches	*Inches*	*Inches*
2½	2.67+0.010 and −0.015	0.500±0.100
2.67	2.67+0.010 and −0.015	0.812±0.100
4.2	4.2 +0.010 and −0.015	1.062±0.100
1¼	1.25+0.010 and −0.015	0.250±0.100

(Par. 5.3 amended effective Jan. 1961.)

5.4 *Thickness.*—The thickness shall be 0.062 inch, plus 0.020 inch, and minus 0.015 inch, when measured in accordance with paragraph 7.5.

(Par. 5.4 amended effective Jan. 1961).

5.5 *Squareness.*—Panels 27½ inches or less in width shall be within 1/16 inch of square and those wider than 27½ inches within ⅛ inch of square when measured in accordance with paragraph 7.6.

6. INTRINSIC QUALITY REQUIREMENTS

6.1 *Appearance.*—The panel shall be as free as commercially practicable from visual defects such as foreign inclusions, cracks, crazing, die lines, pinholes, and striations.

6.2 *Color.*—The panels shall be essentially uniform in color when determined in accordance with paragraph 7.7.

6.3 *Light transmission.*—The light transmission shall be within ±5 percent of the designated light transmission value when determined in accordance with paragraph 7.8.

6.4 *Transverse load.*—The transverse load required to fail each specimen when tested in accordance with paragraph 7.9 shall be not less than the following:

Corrugations	Type I	Type II
Inches	*Lbs.*	*Lbs.*
2⅔ x ½	300 per ft. of width	250 per ft. of width
2.67 x ⅜	450 per ft. of width	350 per ft. of width
4.2	400 per ft. of width	300 per ft. of width
1¼ (on 18-inch span).	200 per ft. of width	150 per ft. of width

(Par. 6.4 amended effective Jan. 1961.)

6.5 *Bearing load.*—The average bearing load shall be not less than 225 pounds, and the bearing load of each individual specimen shall be not less than 175 pounds when tested in accordance with paragraph 7.10.

6.6 *Flammability.*—The rate of burning for type I panels shall be less than 2.0 inches per minute, and the rate of burning for type II panels shall be less than 0.35 inch per minute when tested in accordance with paragraph 7.11.

NOTE.—The flammability requirements are intended for identifying type I from type II panels. Their correlation with flammability under actual use conditions is not necessarily implied.

(Par. 6.6 amended effective Jan. 1961.)

NOTE.—*Aging.*—The Society of the Plastics Industry (SPI) Committee that prepared this Commercial Standard recognized the value and need of an aging test during the course of their work. However, after years of work by the SPI group which was assigned the problem of selecting or developing a suitable method of test for aging, as well as by the American Society for Testing Materials, and various governmental agencies, such as the National Bureau of Standards, no suitable method has been found or developed. Two major difficulties have been encountered: (1) The poor degree of reproductibility between different pieces of apparatus of the same type; and (2) the poor degree of correlation between laboratory aging tests and service behavior.

The SPI group working on aging hopes to have a reasonably satisfactory method in a year or two. It was the opinion of the committee recommending this specification for promulgation as a Commercial Standard that it would be more of a detriment to the corrugated panel industry than a benefit to wait for another 2 years to issue this standard because of the lack of this one test. When a suitable test method is developed, the Commercial Standard will be revised. Any help which anyone can offer to the SPI group will be appreciated.

7. TEST METHODS

7.1 *Conditioning.*—The test specimens shall be conditioned in accordance with Procedure A in ASTM D618–54, Methods of Conditioning Plastics and Electrical Insulating Materials for Testing, and tested under these conditions for those tests where conditioning is required.

7.2 *Sizes.*—The panel specimen shall be laid on a flat smooth surface and measured with a steel tape. The length shall be measured on the top of the two sides and the center corrugations to the nearest $\frac{1}{32}$ inch, and the three measurements averaged. The width shall be measured on the projected width at each end and in the center to the nearest $\frac{1}{32}$ inch, and the three measurements averaged.

7.3 *Weight.*—Ten panels shall be weighed individually on a balance or scale accurate to ±1 percent. The area shall be calculated on the basis of length and width measurements made in accordance

with paragraph 7.2. The weight of each panel in ounces per square foot shall be calculated, and the ten results averaged.

7.4 *Corrugations.*—The full size panel specimen shall be laid on a flat, smooth surface and measured.

7.4.1 *Pitch.*—The pitch is the average distance from the crest of one corrugation to the crest of an adjacent corrugation. The crests of the corrugations shall be determined by placing a metal straightedge crosswise on the panel so that it touches the crests. The distance between the crests of the two outer corrugations shall be measured to the nearest 0.01 inch except that no more than 10 corrugations need to be used. This distance shall be divided by the number of valleys included in the measurement to obtain the pitch.

7.4.2 *Depth.*—The depth of the corrugation is the vertical distance between the plane of the crests and the upper side of the sheet at the bottom of the valley. Ten depth measurements, five at each end, shall be made to the nearest 0.03 inch with a depth micrometer on each specimen and the results averaged.

7.5 *Thickness.*—The thickness measurements shall be made perpendicular to the surface at the point of measurement with a thickness gage to an accuracy of 0.002 inch. Ten measurements shall be made on each specimen. Two measurements shall be made near each end and three near each side. Approximately half the measurements shall be made at the crests and half at the bottoms of the valleys. Each measurement shall meet the requirement in paragraph 5.4.

7.6 *Squareness.*—The panel shall be laid on a flat, smooth surface and measured. Any type of jig that has two rails at 90° to one another may be used to determine squareness. The panel shall be placed in the jig on the surface so that one edge paralled with the corrugations touches one rail along its entire length and with the corner of the panel in the 90° angle between the rails. The widest gap between the edge of the panel that is perpendicular to the corrugations and the rail shall be measured to the nearest $\frac{1}{32}$ inch. The test shall be repeated so that all four corners of each specimen are tested for squareness.

7.7 *Color.*—One panel shall be selected at random and examined from a distance of 10 feet for color uniformity by viewing by reflected light. Apparent minor differences in intensity of the color caused by nonuniform distribution of glass fiber shall not be cause for rejection.

7.8 *Light transmission.*—The light transmission shall be measured in accordance with ASTM D1494–57 T, Method of Test for Diffused Light Transmission.

7.9 *Transverse load.*—The transverse load shall be determined in accordance with ASTM D1502–57T, Method of Test for Transverse Strength of Corrugated Reinforced Plastic Panels, except that samples with $1\frac{1}{4}$ inch corrugations shall be tested with a span of 18 inches. At least three specimens from each sample shall be tested.

(Par. 7.9 amended effective Jan. 1961.)

7.10 *Bearing load.*—The bearing load shall be determined in accordance with Method 1051, Federal Specification L–P–406.[3] Five specimens from each panel shall be tested. Three specimens shall be cut from the crowns of three different corrugations and two from two

[3] Copies of Fed. Spec. L–P–406, Plastics, Organic; General Specifications, Test Method, are obtainable upon application to Business Service Center, GSA Regional Office Building, 7th and D Streets SW., Washington 25, D. C.

different valleys. The specimen shall be wide enough so that bearing and not tensile failures are obtained; this is usually 1⅛ inches or more. The length shall be about 7.5 inches. The bearing hole in the specimen shall be 0.125 inch in diameter with the center 0.750±0.005 inch from one end and equidistant from the sides of the specimen. The bearing load is the maximum load sustained by the specimen during test while the bearing pin moves a distance of 0.25 inch toward the end of the specimen.

7.11 *Flammability.*—The rate of burning shall be determined in accordance with ASTM D635–56 T, Method of Test for Flammability of Plastics Over 0.050 Inch in Thickness, except that six specimens taken from different parts of the panel shall be tested and the results averaged. Two specimens shall be taken from crowns, two from sides of valleys, and two from bottoms of valleys. When Type II panels are found to be self-extinguishing by Method D635–56 T, the rate of burning shall be measured by ASTM D757–49, Method of Test for Flammability of Plastics, Self-Extinguishing Type, except that panels shall be tested in the thickness covered by this standard.

(Par. 7.11 amended effective Jan. 1961.)

8. IDENTIFICATION

8.1 *Labels and literature.*—In order that purchasers may be assured that the corrugated plastics panels actually comply with all requirements of this Commercial Standard, it is recommended that manufacturers include the following statement with their name and address on labels, invoices, sales literature, etc.:

> These (this) (General Purpose, Type I) (Fire Retardant, Type II) glass-fiber reinforced polyester corrugated structural plastics panel(s) comply (complies) with Commercial Standard CS214–57, as developed by the trade, under the procedures of the Commodity Standards Division, and issued by the United States Department of Commerce.

8.1.1 The following abbreviated statement is suggested when available space on labels is insufficient for the full statement:

> Complies with CS214–57, as developed by the trade, and issued by the United States Department of Commerce.

8.2 *Hallmark.*—Corrugated plastics panels may carry the hallmarks shown in figure 1 and figure 2 to indicate compliance with this Commercial Standard.[3]

9. EFFECTIVE DATE

9.1 Having met all procedural requirements of the Commodity Standards Division, including approval by the acceptors hereinafter listed, this Commercial Standard was issued by the United States Department of Commerce, effective October 16, 1957.

EDWIN W. ELY,
Chief, Commodity Standards Division

10. HISTORY OF PROJECT

In a letter dated August 3, 1955, the Society of the Plastics Industry, Inc., requested the cooperation of the Commodity Standards

[3] When used on labels, the hallmark shown in figure 1 should be printed in black on a white background; the hallmark shown in figure 2 should be printed in red on a white background.

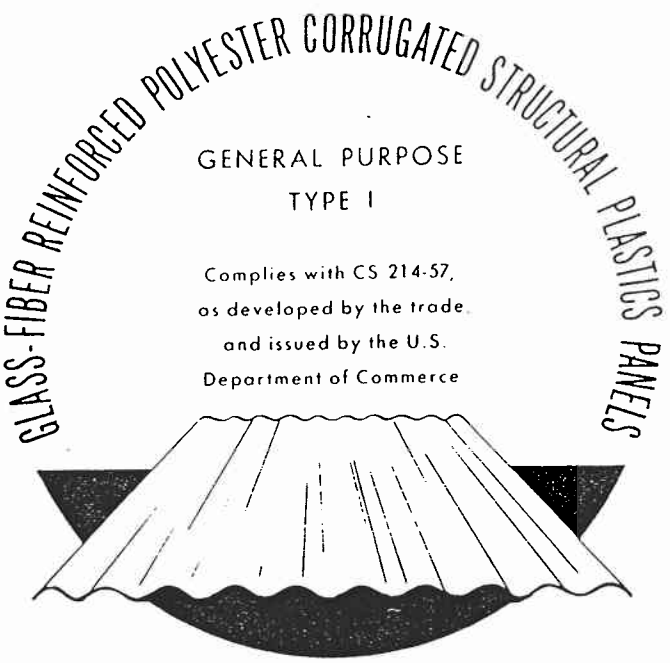

FIGURE 1.—*Hallmark for declaring compliance of Type I panels.*

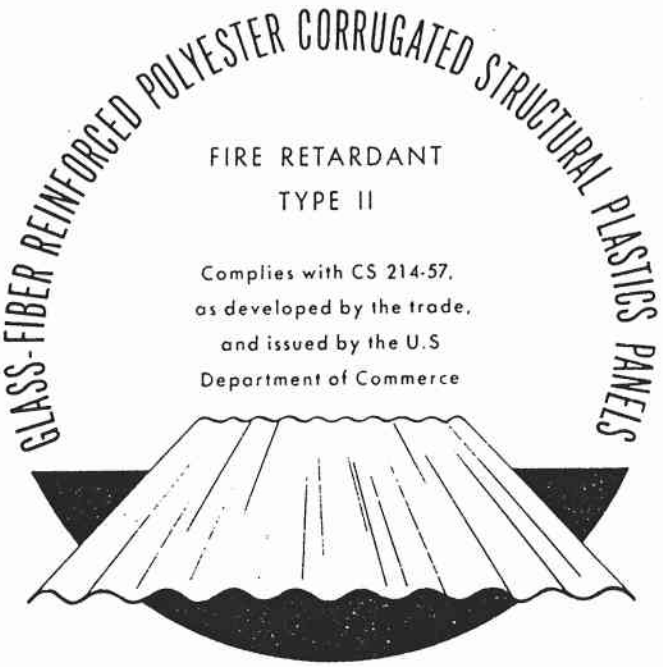

FIGURE 2.—*Hallmark for declaring compliance of Type II panels.*

Division in the establishment of a Commercial Standard for polyester glass-fiber corrugated building panels. A meeting of the industry was held at the National Bureau of Standards on the following October 20. The discussion at that meeting indicated that further work on test methods was desirable.

Accordingly, the Fiberglass Reinforced Panel Council of the Society of the Plastics Industry, Inc., working jointly with the Plastics Section of the National Bureau of Standards, developed improved test methods and submitted a Recommended Commercial Standard for glass-fiber reinforced polyester corrugated structural plastic

panels which was circulated to the industry for acceptance June 19, 1957.

On September 16, 1957, the Commodity Standards Division announced that acceptances had been received representing a satisfactory majority and that the Commercial Standard, to be designated CS214–57, would become effective October 16, 1957.

Project Manager: F. W. Reynolds, Commodity Standards Division, Office of Technical Services.

Technical Adviser: F. W. Reinhart, Plastics Section, National Bureau of Standards.

APPENDIX

Chemical resistance.—The performance of reinforced polyester panels in contact with either concentrated or dilute acids will vary directly with the inherent resistance of polyester resins to the acid with which it is brought in contact. It may be expected that translucent reinforced panels will be strongly resistant to most acids and acid vapors, most organic chemicals, water, soaps, and ordinary household detergents. Since it is impossible to determine all of the conditions to which translucent reinforced panels may be exposed, the industry recommends that specific problems in corrosive or alkaline installations be referred to a manufacturer or competent laboratory for solution.

Products available.—A variety of products meeting the requirements of this standard are available commercially. These vary in size, color, and light transmission. Data of this nature on currently available materials can be obtained from the manufacturers and their dealers.

Size.—The most common sizes currently available are: 26 to 48 inches in width, 6 to 12 feet in length.

Color.—Color may be designated in accordance with the ISCC-NBS Method of Designating Color and a Dictionary of Color Names, NBS Circular 553.[1]

Finish.—Three finishes are available: (1) Smooth finish on both sides, (2) crinkle finish on both sides, and (3) smooth finish on one side and crackle finish on the other side.

Light transmission.—10 to 80 percent.

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. Comments concerning the standard and suggestions for revision may be addressed to any member of the committee or to the Commodity Standards Division, Office of Technical Services, United States Department of Commerce, which acts as secretary for the committee.

LEONARD S. MEYER, International Molded Plastics, Inc., Cleveland, Ohio. (Chairman.)
THEODORE IRVING COE, American Institute of Architects, 1735 New York Ave. NW., Washington, D. C.
W. O. ERICKSON, Barrett Div., Allied Chemical & Dye Corp., Station 1, P. O. Box 27, Toledo, Ohio.
GEORGE R. HUISMAN, Filon Plastics Corp., 2051 East Maple Ave., El Segundo, Calif.
ARTHUR L. SMITH, Rohm & Hass Co., Bristol, Pa.
RALPH SONNEBORN, Owens-Corning Fiberglas Corp., Aston, R. I.
JOEL STAHL, Stahl Industries, Inc., 130 Linden St., Youngstown, Ohio.
CLARENCE T. WILSON, Robertson, St. Louis County, Mo. (Representing Prefabricated Home Manufacturers' Institute.)

[1] Copies available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at $2.00 per copy.

WITHDRAWN

CS 214-57

ACCEPTANCE OF COMMERCIAL STANDARD

If an 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
Office of Technical Services
U. S. Department of Commerce
Washington 25, D. C.

Gentlemen:

We believe that Commercial Standard CS 214–57 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 glass-fiber reinforced polyester corrugated structural plastics panels. We reserve the right to depart from it as we deem advisable.

We understand, of course, that only those products 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_____

(Cut on this line)

[1] Underscore the one that applies. 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 of 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 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 nationwide 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 of 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, purchase, or testing of glass-fiber reinforced polyester corrugated structural plastics panels. In accepting this standard they reserve the right to depart from it as they individually deem advisable. It is expected that products 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

Prefabricated Home Manufacturers' Institute, Washington, D. C.
Society of the Plastics Industry, Inc., New York, N. Y.

FIRMS AND OTHER INTERESTS

Allied Chemical & Dye Corp., Barrett Division, New York, N. Y.
Allied Chemical & Dye Corp., Barrett Division, Toledo, Ohio.
Alsynite Company of America, San Diego, Calif.
American Cyanamid Co., Plastics & Resins Division, New York, N. Y.
American Cyanamid Co., Purchasing Division, Stamford, Conn.
American Polyglas Corp., Carlstadt, N. J.
Bakelite Co., Division of Union Carbide Corp., Product and Process Development, New York, N. Y. (General support.)
Barclite Corporation of America, New York, N. Y.
Butler Manufacturing Co., Buildings Division, Kansas City, Mo.
Celanese Corporation of America, Resin Products Department, Plastics Division, Newark, N. J. (General support.)
Chemical Process Co., Redwood City, Calif.
Depew Manufacturing Corp., Hicksville, Long Island, N. Y.
Diamond Alkali Co., Technical Service, Painesville, Ohio.
Dockery Manufacturing Co., Inc., Rockingham, N. C.
Durapane Corp., Kansas City, Kans.
Ferro Corp., Plastic Color Department, Cleveland, Ohio. (General support.)
Fiber Glass Plastic, Inc., Miami, Fla.
Filon Plastics Corp., Chicago, Ill.
Filon Plastics Corp., El Segundo, Calif.
Filon Plastics Corp., Elmsford, N. Y.
General Electric Co., West Coast Section, Chemical Materials Department, Los Angeles, Calif.
Glidden Co., Glidpol National Laboratory, Chicago, Ill.
Hardeman Laminating Co., Inc., Milwaukee, Wis.
Hooker Electrochemical Co., Durez Plastics Division, North Tonawanda, N. Y.
Interchemical Corp., Commercial Resins Department, Finishes Division, Cincinnati, Ohio.
International Molded Plastics, Inc., Cleveland, Ohio.
International Plastics Corp., Branford, Conn.
Kemlite Corp., Joliet, Ill.
L. O. F Glass Fibers Co., Corrulux, Division, Huston, Tex.
L. O. F Glass Fibers Co., Eastern Division, Toledo, Ohio.
Laminated Fiberglass Corporation of America, New York, N. Y.
Macy, R. H., & Co., Inc., Macy's Bureau of Standards, New York, N. Y.
Northwestern University, School of Business, Research Associate, Evanston, Ill. (General support.)
Owens-Corning Fiberglas Corp., New York, N. Y.
Pittsburgh Plate Glass Co., Fiber Glass Division, Pittsburgh, Pa.
Plasteel Products Corp., Washington, Pa.
Reichhold Chemicals (Canada) Ltd., Toronto, Canada.
Reichhold Chemicals, Inc., Polyester Resin Division, White Plains, N. Y.
Resolite Corp., Research and Production Departments, Zelienople, Pa.
Rippolite Plastic Products, Inc., Burbank, Calif.
Robertson, H. H., Co., Research, Pittsburgh, Pa.
Rohm & Haas Co., Polyester Sales, Philadelphia, Pa. (General support.)
Stahl Industries, Inc., Staycite Division, Youngstown, Ohio.
Strick Plastics Division, Perkasie, Pa.
Sun-Glas Products, Inc., Livonia, Mich.
Temrock, Inc., Barrington, Ill.
U. S. Rubber Co., Naugatuck Chemical Division, Vibrin Plastics, Naugatuck, Conn.

OTHER COMMERCIAL STANDARDS

A list of Commercial Standards may be obtained from the Commodity Standards Division, Office of Technical Services, United States Department of Commerce, Washington 25, D. C. This list contains the purchase price of each publication and directions for ordering copies.

* U.S. GOVERNMENT PRINTING OFFICE : 1961 O—591543