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September 1, 1976
SUPERSEDING
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September 28, 1970

FEDERAL SPECIFICATION

TINPLATE (ELECTROLYTIC)

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers electrolytic tinplate produced from low carbon cold-reduced steel. Normally tinplate is furnished in one grade comprised of a mixture of unassorted primes and seconds (see 6.3).

1.2 Classification.

1.2.1 Base metal. Tinplate shall be furnished in one of the following types shown in ASTM A 623 as specified (see 6.2): Type D, type L, type MC, type MR, and type N.

1.2.2 Tempers.

1.2.2.1 Single reduced tinplate is normally furnished in the temper designations shown in tables 3 and 4 of ASTM A 623.

1.2.2.2 Double reduced tinplate is normally furnished in the mechanical designations shown in table 5 of ASTM A 623 (see 6.2 and 6.11).

1.2.3 Classes. Electrolytic tinplate classes shall be as shown in table I of ASTM A 624.

1.2.4 Finish and appearance. The finish and appearance shall be as described in 5.1 and 5.2 of ASTM A 624 (see 6.2).

1.2.5 Base weights. Tinplate shall be furnished in accordance with the base weights shown in table I of ASTM A 623 as specified (see 6.2).

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal form a part of this specification to the extent specified herein.

Federal Standards:

Fed. Std. No. 123 - Marking for Shipment (Civil Agencies).

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U. S. Government Printing Office, Washington, DC 20402.

(Single copies of this specification and other Federal Specifications required by activities outside the Federal Government for bidding purposes are availbale without charge from Business Service Centers at the General Services Administration Regional Offices in Boston, New York, Washington, DC, Atlanta, Chicago, Kansas City, MO., Fort Worth, Denver, San Francisco, Los Angeles, and Seattle, WA.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from the established distribution points in their agencies.)

Military Standards:

MIL-STD-129 - Marking for Shipment and Storage
MIL-STD-163 - Steel Mill1 Products Preparation for Shipment and Storage

(Copies of Military Specifications and Standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

American Society for Testing and Materials (ASTM) Standards:

A 623 - General Requirements for Tin Mill Products
A 624 - Single-Reduced Electrolytic Tin Plate
A 626 - Double-Reduced Electrolytic Tin Plate
A 630 - Determination of Tin Coating Weights for Hot-Dip and Electrolytic Tin Plate

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

3. REQUIREMENTS

3.1 Manufacture.

3.1.1 Base metal. The base metal shall be made by the open-hearth, electric-furnace or basic-oxygen process.

3.2 Chemical composition. When specified in the contract or order (see 6.2), the cast analysis for the specified type shall conform to the requirements of table 2 of ASTM A 623.

3.3 Coating. The tin coating shall be of commercially pure tin. The weight per base box shall conform to the requirements of table I of ASTM A 624 and A 626.

3.4 Finish and appearance. The tinplate shall conform to the particular finish shown in ASTM A 624 and A 626 as specified in the contract or order.

3.5 Dimensions. Dimensional tolerances shall conform to ASTM A 623.

3.6 Identification marking. Each unit load shall be marked with the item name, base weight, size of sheet or coil width, steel type, temper or mechanical designation number, tin coating class, number of cut lengths or numbers of lineal feet (for coils), and unit weight. Unless otherwise specified in the contract or order, differentially coated tin plate shall be marked in accordance with the applicable portions of section 4 of ASTM A 624.

3.7 Workmanship. The tinplate shall be as nearly uniform in thickness as is practicable and shall be flat, clean, smooth and as evenly coated with tin on both sides as commercial practice will permit. The tinplate shall be free from deep scratches, seams, pits, and other serious defects which would affect the intended use (see 6.8).

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Lot. Unless otherwise specified in the contract or order, a lot shall consist of all tinplate of the same type, grade, class, finish, size, and base weight submitted for inspection at one time. Unless otherwise specified in the contract or order, the lot shall not exceed 20,000 sheets (see 6.9) or the equivalent in other dimensions or in coils.

4.3 Examination.

4.3.1 Visual. Unless otherwise specified in the contract or order, all tinplate material shall be subject to visual examination to insure conformance to the requirements for finish (see 3.4), identification marking (see 3.6), and workmanship (see 3.7).

4.3.2 Dimensions and tolerances. All tinplate material shall be subject to examination to insure conformance to dimensional requirements (see 3.5).

4.4 Sampling for tin coating weights. Sampling shall be in accordance with ASTM A 624, A 626, and A 630 as applicable.

4.5 Tests.

4.5.1 Chemical analysis. When chemical analysis is required, it shall be conducted in accordance with 6.1, 6.2, and 7.1 of ASTM A 623.

4.5.2 Tin-coating weight test. Tin-coating weight test shall be conducted in accordance with ASTM A 630.

4.6 Rejection and retest. Unless otherwise specified in the contract or order, rejection and retest shall be conducted in accordance with ASTM A 623.

5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging. Preservation and packaging shall be level A or C as specified (see 6.2).

5.1.1 Level A. For Military requirements, preservation for shipment shall be in accordance with MIL-STD-163.

5.1.2 Level C. Cleaning, drying, preservation, and packaging shall be in accordance with the manufacturer's commercial practice.

5.2 Packing. Tinplate shall be packed for shipment in accordance with level A or C as specified (see 6.2).

5.2.1 Level A. For Military requirements, packing for shipment shall be in accordance with MIL-STD-163.

5.2.2 Level C. Tinplate shall be packed in accordance with commercial practice in a manner adequate to insure carrier acceptance and safe delivery to destination at the lowest transportation rate.

5.3 Marking.

5.3.1 Civil agencies. In addition to any special marking specified in the contract or order, marking for shipment shall be accordance with Fed. Std. No. 123.

5.3.2 Military activities. In addition to any special marking specified in the contract or order, marking for shipment shall be in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. Tinplate covered by this specification is intended for use where a neat appearance, protective properties, and easy solderability are of prime importance as, for example, in the manufacturer of cans, containers, houseware, kitchenware, etc. Tinplate is commonly used as containers for food. Tinplate is not suitable for gasoline tanks, since it corrodes under these conditions. Terneplate is commonly used for this purpose.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents:

a. Title, number, and date of this specification.
b. Steel type, tin coating designation number, temper designation or mechanical designation desired, class, and base weight (see 1.2).
c. Finish (see 1.2.4).
d. Chemical composition (see 3.2).
e. Special marking required for differentially coated tin plate (see 3.6).
f. Preparation for delivery requirements (see section 5).
g. Dimensions, coil or cut size (see 6.4).
h. Quantity in base boxes (see 6.5 and 6.10).

6.2.1 Information on the intended end use should be given to enable the producer to select the proper combination of processing treatments.

6.3 Definitions.

6.3.1 Primes. Tinplate that is free from defects readily observable by the unaided eys.

6.3.2 Seconds. Tinplate that has minor imperfections to a moderate degree or extent. These defects are in the coating, in the base metal, or are defects incidental to the manufacturing process.

6.4 Tinplate is commonly available in both cut length and coil form. Electrolytic sizes range in steps of 1/16 inch from 24 to 36 inches in width and in steps of 1/16 inch from 18 to 45 inches in length.

6.5 The quantity contained in a package is traditional and was originally set at 112 to conform to the English weight system and to permit manual handling of packages conveniently and individually. Units of 56 and 224 are used for smaller and larger than normal sizes to keep the package weight within the range of convenient manual handling.

6.6 In modern practice tinplate is packed in bundles which are equivalent to 10, 12, or 20 packages. The package is not ordinarily used as a shipping unit but is essentially a unit of quantity.

6.7 The practice in the production of tinplate is to shear to a minimum of 1/8 inch in width and 1/4 inch in length over the specified dimensions. The greater dimension is the length. The practice for coiled products is to trim 1/4 inch over the specified dimension.

6.8 Electrodeposited tinplate is available in either cut lengths or coils. Because of the nature of coils, individual areas or portions of coils will have defects present to a greater extent than may occur in cut lengths.

6.9 Base box weights. Tinplate is selected and sold on the basis of its weight per unit area rather than on a gage or thickness basis. The unit of area is the base box, equal to the area of 112 sheets, 14 by 20 inches, or 31,360 square inches (217.8 square feet).

6.10 Since a base box is equivalent in area to 112 sheets of 280 square inches each, for other sizes the number of base boxes in a package of 112 plates may be determined from the following formula:

$$\text{Number of base boxes in package} = \frac{A}{280}$$

Where A = the ordered size in square inches for an individual plate.

Ratio tables which provide the same information are shown in ASTM A 623.

6.11 Rolling direction. Double reduced plate is relatively brittle and has very distinct directional properties. The rolling direction must be specified on cut sizes and will be indicated by underlining the slit (rolling width) dimension. To minimize the flange-cracking hazard when the product is used for can bodies, the rolling direction must be around the circumference of the can.

MILITARY CUSTODIANS:

Army - MR
Navy - AS
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Review activities:

Army - AT, GL, MU, WV
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