

ZZ-T-001237 (GSA-FSS)

March 25, 1970

## INTERIM FEDERAL SPECIFICATION

### TREAD, STAIR, FLEXIBLE AND SEMI-RIGID TYPE RUBBER AND VINYL

This Interim Federal Specification was developed by the Federal Supply Service, General Services Administration, Washington, D.C. 20406, based upon currently available technical information. It is recommended that Federal agencies use it in procurement and forward recommendations for changes to the preparing activity at the address shown above.

#### 1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers the requirements for flexible and semi-rigid stair trends, rubber and vinyl.

1.2 Classification. The trends covered by this specification shall be of the following types, classes, and styles, as specified:

Type I - Flexible.

Type II - Semi-rigid.

Class 1 - Trend, rectangular (without nosing or riser).

Class 2 - Tread with nosing.

Class 3 - Tread with riser.

Style A - Square.

Style B - Curved.

#### 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 the specification to the extent specified herein:

##### Federal Specifications:

PPP-B-585 - Boxes, Wood, Wirebound.

PPP-B-591 - Boxes, Fiberboard, Wood-Cleated.

PPP-B-601 - Boxes, Wood, Cleated-Plywood.

PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner.

PPP-B-636 - Box, Fiberboard.

##### Federal Standards:

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

Fed. Test Method Std. No. 191 - Textile Test Methods.

Fed. Test Method Std. No. 501 - Floor Coverings, Resilient, Nontextile:  
Sampling and Testing.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specification 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, D.C. 20402.)

(Single copies of this specification and other Federal Specifications

required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers at the General Services Administration Regional Offices in Boston, New York, Washington, D.C., Atlanta, Chicago, Kansas City, Mo., Fort Worth, Denver, San Francisco, Los Angeles, and Auburn, Washington.)

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

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Military Standards:

MIL-STD-105 - Sampling Procedure and Tables for Inspection by Attributes.  
MIL-STD-129 - Marking for Shipment and Storage.

(Copies of Military Specifications and Standards required by contractors in connection with specification 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.

National Classification Board:

National Motor Freight Classification.

(Application for copies shall be addressed to the American Trucking Association, Inc., Attention: Tariff Order Section, 1616 P Street N. W., Washington, D.C. 20036.)

Uniform Classification Committee:

Uniform Freight Classification.

(Application for copies should be addressed to the Uniform Classification Committee, 202 Union Station, Chicago, Illinois 60606.)

### 3. REQUIREMENTS

3.1 Preproduction sample. When specified (6.1), a preproduction sample of the tread shall be submitted to the contracting officer for approval.

#### 3.2 Material.

3.2.1 Rubber for type I stair tread. When the type I stair tread is made of rubber, the stair tread shall be made from synthetic rubber or a mixture of synthetic and reclaimed rubber and shall meet the requirements specified in table I when tested as specified in 4.4.

TABLE I. Physical characteristics of type I rubber stair tread

Characteristic	Requirement
Tensile strength, pounds/sq. inch, minimum	700
Maximum decrease after: Air oven aging percent of original	20
Ultimate elongation of compound:	
Original, minimum, percent	250
Maximum decrease after: Air oven aging, percent of original	25
Flexibility	Shall not break or crack.
Set of compound, maximum percent	25
Water absorption, percent	2.0

3.2.2 Rubber for type II stair tread. When the type II stair tread is made of rubber, the stair tread shall be a compound of material or synthetic rubber alone or in combination and shall meet the requirements specified in table II when tested as specified in 4.4.

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TABLE II. Physical requirements of type II rubber stair tread

Characteristic	Requirement
Hardness, minimum	90
Modulus at 10 percent elongation, p.s.i., minimum	400
Flexibility	Shall not break or crack
Resistance to detergent	Shall not fade or soften.

3.2.3 Vinyl for type I stair tread. When the type I stair tread is made of vinyl, the stair tread shall be suitably compounded virgin polymer or copolymer of vinyl chloride resin, plasticized with phosphate or phthalate ester plasticizers only. The compound shall be uniform free from fiber and objectionable odor. The vinyl shall meet the requirements of table III when tested as specified in 4.4. Virgin polymer shall be defined as a polymer or copolymer that has not been processed into a finished product prior to use in the specified meeting.

TABLE III. Physical requirements of type I vinyl stair tread

	Requirement		
	Thickness of tread, inch		
	1/8	3/16	1/4
Breaking strength:			
Machine, lbs. (minimum)	13	25	39
Transverse, lbs. (minimum)	13	25	39
Ultimate elongation of compound, original minimum percent (minimum)			
Machine	100	100	100
Transverse	100	100	100
Accelerated weathering	[1]	[1]	[1]
Flexibility at 70 deg. F	[2]	[2]	[2]
at 30 deg. F	[2]	[2]	[2]
Volatile matter, percent, maximum	1.0	1.0	1.0

[1] The sample shall not crack, become stiff and brittle, or soft and tacky and shall not change color appreciably when compared to the unexposed sample after 100 hour sin the weatherometer.

[2] The specimen shall not crack, flake, craze or show any other indication of failure.

3.3 Design and construction. For type I, the stair treads shall be rubber or vinyl composition conforming to the requirements specified herein, at the suppliers option. Type II stair treads shall be rubber conforming to the requirements specified herein. For both types I and II, either styles A or B, the stair tread shall consist of a tread portion for class 1 and tread

portion with nosing or riser, as applicable, for classes 2 and 3. The upper surface of the tread portion shall be smooth, shall have surface designs (tread pattern) or shall have abrasive strips, as specified (6.1), in accordance with the following:

1. Smooth. When smooth is specified, the entire upper surface of the tread portion shall be smooth.

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2. Surface designs. When surface designs are specified, the upper surface of the tread portion shall be of commercial design with longitudinal, diamond, chevron or diagonal striped corrugations. The depth of the corrugation shall be not greater than 50 percent of the overall thickness of the tread. Depth of corrugation may be increased to 60 percent of the overall thickness provided the tensile strength of the treads is not less than 1400 pounds per square inch. The tread design shall be formed to provide wear surface and anti-slip properties. Unless otherwise specified, the surface design shall cover not less than 75 percent of the surface of the overall surface area of the tread portion.

3. Abrasive strips. When abrasive strips are specified, there shall be two mineral coated abrasive grit strips, each strip not less than 3/4 inch nor more than 1 inch wide and not less than 0.038 inch thick, recessed into and adhered to the top surface of a smooth surface tread portion to form a continuous flat top surface overall. Each strip shall run the full length of the tread, shall be parallel to each other, with the front edge of the first strip no closer than 3/4 inch to the front of the tread portion and the second strip spaced approximately 3/4 to 2-3/4 inches from the first.

4. Surface designs on nosings and risers shall be acceptable.

3.4 Color. Unless otherwise specified (.61), the color of the treads shall be black.

3.5 Thickness. The nominal thickness shall be 1/8, 3/16, 1/4 or as otherwise specified (6.1). The overall thickness throughout the tread portion, and the nosing and riser when applicable, shall be the same as the nominal thickness specified, with a minus tolerance of 10 percent; any plus tolerance is allowable. When tapering is specified (6.1), and unless otherwise specified, the thickness shall taper to the back edge of the tread portion and to the free or bottom edge of the nosing or riser, as applicable. The thickness of the tapered edges shall be not be less in thickness than 40 percent of the specified thickness, except that approximately the first 4 inches of the front edge of the tread portion shall be not less in thickness than 20 percent of the specified thickness. When bolstering is specified (6.1), the thickness of the rubber or vinyl at the formed angle for style A or at the beginning of the curve for style B shall exceed the nominal thickness by a minimum of 1/16 inch.

3.6 Dimensions. Dimensions shall be as specified (6.1) and measurements shall be taken as specified in figure 1. Unless otherwise specified, the sizes shall be as follows:

Width Inches	Length Inches	Width Inches	Length Inches
9	24	12	24
9	27	12	36
9	36	12	48
9	48	12	60
9	60	12	72
9	72	12-1/2	24
		12-1/2	36

The nominal size shall be the actual width and length of the tread portion. Tolerance shall be plus or minus 3/16 inch. For style A, the single formed by the front of the tread portion and the nosing or riser, as applicable, shall be approximately 90 degrees (tension may be applied to the nosing or riser for this determination). The nosing or riser, as applicable, shall be

the same length as the tread portion.

3.6.1 Nosing and riser. For both types I and II, the dimensions of the nosings and risers shall be as follows:

1. Nosing - (1) Class 2, style A - Unless otherwise specified, the height of the nosing shall be 1-1/2 or 2-3/16 inches, as specified (6.1). Tolerances shall be plus or minus 3/16 inch.
- (2) Class 2, style B - Unless otherwise specified (6.1), the height of the nosing shall be 1-1/2 inches. Tolerances shall be plus or minus 3/16 inch.



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2. Riser - (1) Class 3, style A - Unless otherwise specified (6.1), the height of the riser shall be 7-1/2 inches. Tolerances shall be plus or minus 3/16 inch.
- (2) Class 3, style B - Unless otherwise specified (6.1), the overall height (curved plus straight segments) of the riser shall be 7-1/2 inches. Tolerances shall be plus or minus 3/16 inch. The height of the curved segment shall be approximately 1-1/2 inches and the turnback approximately 1-1/4 inches.

3.7 Workmanship. Stair treads shall conform to the quality and grade of product established by this specification. The occurrence of defects shall not exceed the applicable acceptable quality levels (AQL's).

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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 that supplies and services conform to prescribed requirements.

4.2 Preproduction sample inspection. When a preproduction sample is required, inspection shall be made of the completed end item for conformance with all provisions of this specification.

4.3 Inspection for acceptance. Inspection shall be performed in accordance with the provisions set forth in MIL-STD-105, except where otherwise indicated.

4.3.1 Visual examination. Examination of the end item shall be in accordance with the list of defects listed in table IV. The sample unit shall be one stair tread. The acceptable quality level shall be 4.0 percent defective. A defective unit is one containing any of the defects in table IV. The inspection level shall be level II. The lot size shall be expressed in units of one stair tread.

TABLE IV. Defects

Examine	Defect
Materials, construction, and workmanship	<p>Not color specified.</p> <p>Contains blisters, (greater than 1/16 inch in diameter or more than a cluster of 4 blister contained in an area of 1 square inch), cluster imbedded foreign material or fibers.</p> <p>Has objectionable odor.</p> <p>Material not fabricated as specified.</p> <p>Corrugations deeper than specified.</p>

4.3.2 Dimensional examination. Examination shall be made for defects in dimensions. The lot size shall be expressed in units of one stair tread.

The sample unit shall be one stair tread. The acceptable quality level shall be 6.5 percent defective. A defective unit shall be any unit with a dimension not in accordance with the specification. The inspection level shall be S-3.

4.3.3 Examination of preparation for delivery requirements. An examination shall be made to determine whether packaging, packing and marking complies with section 5 requirements of this specification. The sample unit shall be one shipping container, with the exception that it need not be sealed. Defects of closure listed in table V shall be examined on shipping container fully prepared for delivery. The lot size shall be the number of shipping containers in the end item inspection lot. The inspection level shall be S-2 and the acceptable quality level (AQL) expressed in defects per 100 unit shall be 2.5.

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TABLE V. Classification of preparation for delivery defects

Examine	Defect
Marking	Omitted, incorrect, illegible, improper size, location, sequence or method of application.
Materials	Any component missing. Any component damaged.
Workmanship	Inadequate application of components such as: Incomplete closure of container flaps, improper taping, loose strapping or inadequate stapling. Bulged or distorted container.
Weight	Weight of contents of shipping container exceeds 65 pounds.

4.4 Testing of the end item. Tests shall be performed for the characteristics specified in tables VI, VIII and VIII. The lot size for purposes of sampling shall be expressed in units of one stair tread. The sample unit shall be one stair tread. The inspection level shall be S-1 of MIL-STD-105. Failure in any test shall constitute grounds for rejection. Except as otherwise specified, test methods listed are as specified in Federal Test Method Standard 501, Floor Coverings, Resilient, Nontextile: Sampling and Testing. Tests shall be conducted on the tread portion of the stair tread. Test results may be accepted based on suppliers certificate of compliance for all characteristics listed.

TABLE VI. Type I rubber stair treads

Characteristic	Requirement paragraph	Test Method
Tensile strength, initial	3.2.1	4111
Decrease after: Air oven aging	3.2.1	5111
Elongation, initial	3.2.1	4121
Decrease after: Air oven aging	3.2.1	5111
Flexibility	3.2.1	3121
Set of compound	3.2.1	4311
Water absorption	3.2.1	7511
Thickness	3.5	2121

TABLE VII. Type II rubber stair treads

Characteristic	Requirement paragraph	Test Method
Hardness	3.2.2	3511
Modulus	3.2.2	4211

Flexibility	3.2.2	3111
Resistance to detergent	3.2.2	9341
Thickness	3.5	2121

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[1] A one (1) inch mandrel shall be used for a 1/8 inch thick stair tread and a two (2) inch mandrel for stair treads greater than 1/8 inch in thickness.

TABLE VIII. Type I vinyl stair treads

Characteristic	Requirement paragraph	Test Method
Breaking strength	3.2.3	4111[1]
Elongation	3.2.3	4121
Accelerated weathering	3.2.3	5804[2]
Flexibility - 70 deg. F.	3.2.3	[3]
30 deg. F.	3.2.3	6511[4]
Volatile matter	3.2.3	9211[5]
Thickness	3.5	2121

[1] Report shall be made in pounds per square inch. Thickness of sample need not be determined. Die II shall be used in lieu of die III.

[2] of Fed. Test Method Std. No. 191, Textile Test Methods.

[3] Flexibility at 70 deg. F. A specimen of matting, not less than 4 inches shall be doubled and pressed flat on itself in any direction with the surface design area outside and held in this position for a period of five minutes. At the end of the five minute period the specimen shall be examined for breaking, cracking, or any other evidence of failure, while in the doubled and pressed flat state. The examination shall be visual and at a normal reading distance of one foot. One determination shall be performed for each sample unit and the result shall be expressed as pas or fail.

[4] Low temperature flexibility shall be tested using a 1 (+ 1/8) inch mandrel.

[5] The oven should be regulated to insure minimum air velocity.

## 5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A, B, or C, as specified (6.1).

5.1.1 Level A. Stair treads, of one dimension only, shall be packaged in a close-fitting box conforming to PPP-B-636, class weather resistant. The box shall be closed in accordance with the appendix to the box specification.

5.1.2 Level B. Twenty-four stair treads, of one dimension only, shall be packaged in a close-fitting box conforming to PPP-B-636, class domestic. The box shall be closed in accordance with the appendix to the box specification.

5.1.3 Level C. The stair treads shall be packaged in accordance with the suppliers commercial practice.

5.2 Packing. Packing shall be level A, B, or C, as specified (6.1).

5.2.1 Level A. Stair treads, packaged as specified in 5.1, shall be

packed in a close-fitting box conforming to PPP-B-585, class 3; PPP-B-591, Class II; PPP-B-601, overseas type; or PPP-B-621, class 2. The box shall be closed and strapped in accordance with the appendix to the applicable box specification.

5.2.2 Level B. Stair treads, packaged as specified in 5.1.2, shall require no additional packing.

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5.2.3 Level C. The stair treads, packaged as specified in 5.1, shall be packed to insure carrier acceptance and safe delivery at destination at lowest rates, in containers complying with the Uniform Freight Classification Rules or National Motor Freight Classification Rules, as applicable.

5.3 Standard packaging (civil agencies). The standard packaging and packing for civil agencies shall be as specified in 5.1.2 and 5.2.2 respectively (6.1).

#### 5.4 Marking.

5.4.1 Civil agencies. In addition to markings required by the contract or order, the shipping containers shall be marked in accordance with Fed. Std. No. 123.

5.4.2 Military agencies. In addition to markings required by the contract or order, the shipping containers shall be marked in accordance with MIL-STD-129.

#### 6. NOTES

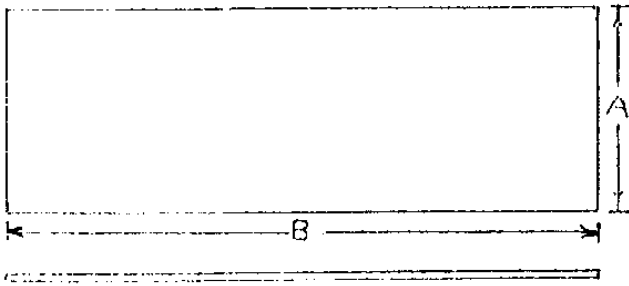
6.1 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents.

- (a) Title, number and date of this specification.
- (b) Type, class and style required (1.2).
- (c) When preproduction sample is required (3.1).
- (d) Whether smooth, surface designs or abrasive strips required (3.3).
- (e) Color if other than black required (3.4).
- (f) Thickness required (3.5).
- (g) When tapering is allowed or bolstering required (3.5).
- (h) Dimensions (width and length) required (3.6).
- (i) Height of nosing for class 2, style B, for both types I and II, if other than specified (3.6.1).
- (j) Height of nosing for class 2, style B, for both types I and II, if other than specified (3.6.1).
- (k) Height of riser for class 3, style A, and class 3, style B, for both types I and II, if other than specified (3.6.1).
- (l) Selection of applicable levels of packaging and packing (5.1 and 5.2).

6.2 Standard pack for civil agencies. The standard pack requirements in 5.3 are intended for use in procurements of Stores Stock replenishment. Procuring officers should use the standard pack requirements when it is known that the material will be shipped from a supplier to a domestic warehouse, supply depot, or intermediate storage point for temporary storage, subsequent issue or shipment to eventual user.

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## CLASS 1



## LEGEND:

A - Width, Overall (TREAD PORTION)

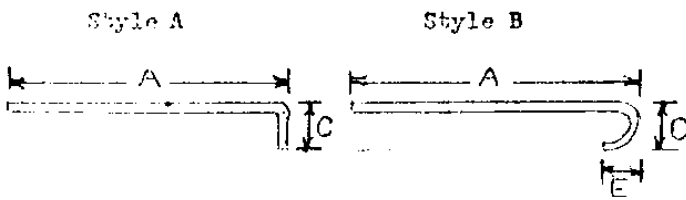
B - Length, Overall

C - Height, Overall

D - Height of Segment

E - Turnback

## CLASS 2



## CLASS 3

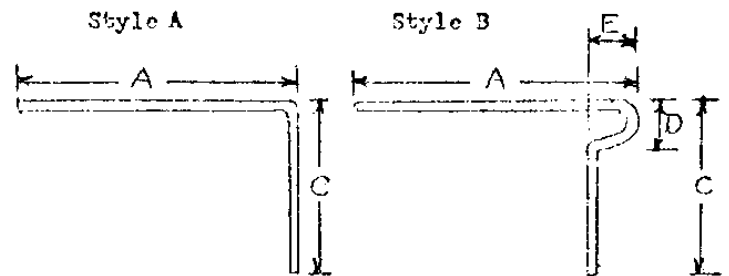


FIGURE 1.