

DDD-C-0095A (GSA-FSS)
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INTERIM FEDERAL SPECIFICATION

CARPET AND RUGS, WOOL, NYLON, ACRYLIC, MODACRYLIC POLYESTER, POLYPROPYLENE

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.

The General Services Administration has authorized the use of this Interim Federal Specification as a valid exception to Federal Specification DDD-C-95, dated April 16, 1965.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers requirements for carpet and rugs intended for use as floor coverings.

1.2 Classification.

1.2.1 Types and classes. The carpet and rugs shall be of the following types and classes as specified (6.2):

Type I - Axminster.

Class 1 - Single level cut pile pattern (25 oz./sq. yd. pile).

Type II - Velvet.

Class 1 - Single cut pile (52 oz./sq. yd. pile).

Class 2 - Single level loop pile-woven thru back (42 oz./sq. yd. pile).

Class 3 - Single level loop pile - woven through back - filament nylon (29 oz./sq. yd. pile).

Class 4 - Multilevel loop pile - woven thru back (44 oz./sq. yd. pile)

Type III - Wilton.

Class 1 - Multilevel cut and loop pile (41 oz./sq. yd. pile).

Type IV - Tufted.

Class 1 - Multilevel loop pile - filament nylon.

Subclass A - (21 oz./sq. yd. pile).

Subclass B - (21 oz./sq. yd. pile).

Subclass C - (25 oz./sq. yd. pile).

Class 2 - Multilevel loop pile (28 oz./sq. yd. pile).

Class 3 - Single level cut pile.

Subclass A - (27 oz./sq. yd. pile).

Subclass B - (35 oz./sq. yd. pile).
Subclass C - (42 oz./sq. yd. pile).
Subclass D - (24 oz./sq. yd. pile).
Subclass E - (35 oz./sq. yd. pile).

Class 4 - Single level loop pile.

Subclass A - (33 oz./sq. yd. pile).
Subclass B - (42 oz./sq. yd. pile).

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Class 5 - Cut and uncut pile.

Subclass A - (26 oz./sq. yd. pile).

Subclass B - (36 oz./sq. yd. pile).

Class 6 - Single level loop pile.

Subclass A - (21 oz./sq. yd. pile) filament nylon or filament polypropylene.

Subclass B - (28 oz./sq. yd. pile) filament nylon or filament polypropylene.

Subclass C - (24 oz./sq. yd. pile) staple nylon or staple polypropylene.

Subclass D - (28 oz./sq. yd. pile) staple nylon or staple polypropylene.

Type V - Deleted (6.7).

Type VI - Modified.

Class 1 - Single level loop pile - attached rubber cushion (25 oz./sq. yd. pile).

2. APPLICABLE DOCUMENTS

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

Federal Specifications:

- UU-P-268 - Paper, Kraft, Untreated, Wrapping.
- PPP-B-35 - Bags, Textile, Shipping, Burlap, Cotton and Waterproof Laminated.
- PPP-B-576 - Box, Wood, Cleated, Veneer, Paper Overlaid.
- PPP-B-591 - Boxes, Shipping, Fiberboard, Wood-Cleated.
- PPP-B-601 - Boxes, Wood, Cleated-Plywood.
- PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner.
- PPP-B-636 - Box, Fiberboard.
- PPP-B-640 - Boxes, Fiberboard, Corrugated, Triple Wall.
- PPP-T-45 - Tape, Gummed, Paper, Reinforced and Plain, for Sealing and Securing.

Federal Standards:

- FEd. Std. No. 123 - Marking for Domestic Shipment (Civilian Agencies)
- Fed. Test Method Std. No. 191 - Textile Test Methods.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outline 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, 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 at the General Services Administration Regional Offices in Boston, New York, Washington, D. C., Atlanta, Chicago, Kansas

City, Mo., Forth Worth, Denver, San Francisco, Log Angeles, and Seattle, Wash.

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

Military Specifications:

MIL-L-10547 - Liners, Case, and Sheet, Overwrap, Water-Vaporproof or Waterproof, Flexible.

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Military Standards:

- MIL-STD-105 - Sampling Procedures 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 specific procurement functions should be obtainable 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.

Federal Trade Commission:

Rules and Regulations Under the Textile Fiber Products Identification Act.

(Copies may be obtained without charge from the Federal Trade Commission Washington, D.C. 20580.)

American Society for Testing and Materials (ASTM) Standards:

- D-297 - Chemical Analysis of Rubber Products.
- D-418 - Woven and Tufted Pile Floor Covering.
- D-1116 - Resistance of Pile Floor Coverings to Attack by Black Carpet Beetle Larvae.
- D-1335 - Tuft Bind of Pile Floor Coverings.

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

American Association of Textile Chemists and Colorists:

AATCC-8 - Colorfastness to Crocking.

(Application for copies should be addressed to the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, N.C. 27709.)

National Motor Freight Traffic Association, Incorporated, Agent:

National Motor Freight Classification.

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

Uniform Classification Committee, Agent:

Uniform Freight Classification.

(Application for copies should be addressed to the Uniform Classification Committee, Tariff Publishing Officer, Room 202, Union Station, 516 West Jackson Blvd., Chicago, Illinois 60606.)

3. REQUIREMENTS

3.1 Samples.

3.1.1 Standard sample. When a standard sample is available, the finished carpet or rugs shall match the standard sample for shade and shall be equal to or better than the standard sample with respect to all characteristics for which the standard sample is referenced (6.3).

3.1.2 Bid sample. Unless otherwise specified (6.2) at the time of submission of bid, the bidder shall submit to the contracting officer three pieces, a minimum of 8 inches square each, of each type and class of carpet he proposes to furnish for determination of acceptability of color, appearance, and texture. A sample of

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binding material at least 6 inches long shall be attached to carpet samples of each color which bidder proposes to furnish. After award of contract one approved sample shall be returned to the contractor, one shall be forwarded to the cognizant Government quality control activity and one shall be retained by the contracting officer.

3.2 Material.

3.2.1 Pile yarn. The pile yarn shall be made of 100 percent wool, nylon, acrylic, modacrylic, polyester or polypropylene fiber or blends of these fibers in yarn exclusive of ornamentation and static control materials. Polyvinyl chloride fiber may be used in a blend not to exceed a maximum of 45%. Not less than 20% of any of the above fibers shall be used when blended with other fibers and such blends cannot consist of more than two fibers. Unless otherwise specified (6.2), spun yarn shall be at least two ply. The required pile yarn shall be as specified (6.2), except as indicated in table I through V. Fiber denier and staple length specified in this document are subject to normal fiber manufacturing variances.

3.2.1.1 Wool. Wool shall be thoroughly scoured carpet type fiber which has never been reclaimed from any woven, tufted, knitted, or felted products. The wool yarn shall contain a minimum of 95% wool based on the original dry weight of the specimen when tested as specified in 4.2.1.

3.2.1.2 Staple nylon. Staple nylon shall be carpet type fiber with a minimum fiber size of 15 denier and of uniform fiber length which has never been reclaimed from any woven, tufted, knitted, or felted products. For level loop carpet, the staple length shall be a minimum of 6 inches and the finished yarn shall contain a minimum of 3.5 turns per inch in the singles, and a minimum of 3.0 turns per inch in the ply. The finished yarn shall contain not more than 2.0 percent chloroform soluble material when tested as specified in 4.2.1.

3.2.1.3 Filament nylon. Filament nylon shall be continuous filament high bulk or textured carpet type yarn. Individual filament size shall be a minimum of 15 denier. Filament nylon shall be used only in those fabrics where specified in the tables of physical requirements. The finished yarn shall contain not more than 2.0 percent chloroform soluble material when tested as specified in 4.2.1.

3.2.1.4 Staple acrylic. Staple acrylic shall be carpet type fiber with a minimum fiber size of 15 denier and of uniform fiber length which has never been reclaimed from any woven, knitted, tufted, or felted products. The finished yarn shall contain not more than 2.0 percent chloroform soluble material when tested as specified in 4.2.1.

3.2.1.5 Staple modacrylic. Staple modacrylic shall be carpet type fiber with a minimum fiber size of 15 denier and of uniform fiber length which has never been reclaimed from any woven, tufted, knitted, or felted products. The finished yarn shall contain not more than 2.0 percent chloroform soluble material when tested as specified in 4.2.1.

3.2.1.6 Polyester. Polyester shall be carpet type fiber with a minimum fiber size of 15 denier and of uniform fiber length which has never been reclaimed from any woven, tufted, knitted, or felted products. For level loop carpet, the staple length shall be a minimum of 6 inches and the finished yarn shall contain a minimum of 3.5 turns per inch in the singles, and a minimum of 3.0 turns per inch in the ply. The finished yarn shall contain not more than 2.0 percent chloroform soluble material when tested as specified in 4.2.1.

3.2.1.7 Filament polypropylene olefin. Filament polypropylene olefin shall be continuous filament high bulk or textured carpet type yarn. Individual filament size shall be a minimum of 15 denier. The finished yarn shall contain not more than 2.0 percent cold isopropanol soluble material when tested as specified in 4.2.1.

3.2.1.8 Staple polypropylene olefin. Staple polypropylene olefin shall be of the carpet type, with a minimum fiber size of 15 denier and a minimum staple length of 6 inches, which has never been reclaimed from any woven, tufted, knitted, or felted products. The finished yarn shall contain not more than 2.0 percent cold isopropanol soluble material when tested as specified in 4.2.1. For level loop carpet, the finished yarn shall contain minimum of 3.5 turns per inch in the singles and minimum of 3.0 turns in the ply.

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3.2.1.9 Staple polyvinyl chloride. Staple polyvinyl chloride fiber shall be carpet type with a minimum fiber size of 15 denier or coarser. The finished yarn shall contain not more than 2.0 percent cold isopropanol soluble material when tested as specified in 4.2.1.

3.2.2 Chain, filling, and stuffer yarns. The chain, filling, and stuffer yarns for type I, II, and III carpet and rugs shall be as specified in tables I through III. The chain and filling yarns for type VI carpet shall be as specified in table V.

3.2.3 Backing material. The materials used in the construction of the primary backing or tufted carpet shall be those customarily used and acceptance by the trade.

3.2.4 Backing reinforcement. The backing reinforcement shall be a weave or knitted fabric weighing not less than 6.0 ounces per square yard or a non-woven polypropylene weighing not less than 3.5 ounces per square yard.

3.2.5 Attached rubber cushioning. The compound used in making the cushioning shall be made from natural or synthetic latex or a mixture of natural and synthetic latices. The cushioning shall be free of objectionable odor and shall have a skin on the floor side when affixed to the carpet or rug. The rubber cushioning shall be class 1 or class 2 as follows, unless otherwise specified (6.2):

Class 1: (Foam)

- a. Cushioning shall average not less than 1/8 inch.
- b. The weight per square yard shall be not less than 2.37 pounds.
- c. The density shall be not less than 17 pounds/cu. ft.
- d. The compression resistance shall be not less than 5 pounds per square inch.
- e. The compression set shall be not more than 15 percent.
- f. Delamination strength - more than 2 pounds per inch of width must be required to pull the cushion from the carpet.
- g. Accelerated aging.
 1. Heat aging - after exposure for 24 hours at 275 deg. F, the cushion, after flexing, should remain flexible and serviceable.
 2. Fade Ometer - after 20 hours exposure to the Fade-Ometer, the cushion shall show only slight discoloration or crazing.
- h. The maximum ash content of the cushion shall be 50 percent.

Class II: (Foam or sponge)

- a. Cushioning shall average not less than 3/16 inch.
- b. The weight per square yard shall be not less than 3.50 pounds nor more than 4.25 pounds.
- c. The compressibility shall be not less than 5 pounds nor more than 9 pounds.
- d. The compression set shall be not more than 15 percent.
- e. Delamination strength - more than 2.0 pounds per inch of width must be required to pull the cushion from the carpet.
- f. When subjected to an accelerated aging test, the cushion shall not deteriorate.

3.2.6 Back coating. The back coating compound shall be a synthetic resin or synthetic latex compound.

3.3 Color and matching. The color shall be as specified (6.2) and shall match the standard sample, when available, under natural (north sky) daylight or artificial daylight having a color temperature of 7500 deg. Kelvin (K) and shall be a good approximation to the standard sample under incandescent lamplight at 2800 deg. F. when tested as specified in 4.5.13.

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3.3.1 Colorfastness. The carpet or rugs shall show fastness to light and wet and dry crocking equal to or better than the standard sample. When no standard sample is established, the carpet or rugs shall show good fastness to wet and dry crocking and light. They shall show a rating of good for light colors after 20 standard fading hours (2000 Langleys) and for dark colors after 40 standard fading hours (4000 Langleys). The supplier is to submit with his bid and samples a certified list of the colors, identification of these colors by the bidder's color number, and the category of "light" or "dark" into which each color is classified by the supplier. This list is to be submitted for each pattern and coloration. Testing shall be as specified in 4.4.

3.4 Physical requirements. The finished carpet and rugs shall conform to the physical requirements specified in tables I through V. The weights given in these tables are exclusive of back coating.

3.4.1 Tolerances. Tolerances of minus 6.0 percent will be allowed for pile and total weight only. All other requirements shown in tables I through V are minimum, except where a maximum is indicated. This does not prohibit the increase of any or all constituents listed, except where a maximum is indicated.

3.5 Construction.

3.5.1 Applicable to types and classes.

3.5.1.1 Types I, II, and III. Types I, II, and III carpet or rugs shall be coated on the back of floor side with the coating compound as specified in 3.2.6. The minimum amount of coating compound shall be as specified in tables I, II, and III.

3.5.1.2 Type IV all classes.

3.5.1.2.1 Backing material. Type IV, all classes of carpet or rugs shall have a backing material as specified in 3.2.3 into which the yarns are needled to form the carpet or rug.

3.5.1.2.2 Backing reinforcement. Type IV, all classes of carpet and rugs shall have a backing reinforcement as specified in 3.2.4 applied to the back or floor side of the carpet or rug using the backing compound specified in 3.2.6. The adherence shall be such that the strip requirement shall be a minimum of 2.0 pounds per inch of width when tested as specified in 4.4.

3.5.1.3 Type VI. Type VI carpet or rugs shall be coated on the back or floor side with the coating compound specified in 3.2.6. The minimum amount of coating compound shall be as specified in table V.

3.5.1.4 Rubber cushioning. Type VI carpet and rugs shall have rubber cushioning as specified in 3.2.5 affixed to the floor side of the carpet or rug. Additionally all other types shall be supplied with rubber cushioning when specified (6.2).

3.5.2 Edges. Unless otherwise specified (6.2), type II, classes 2, 3 and 4 carpet or rugs shall have cut edges beveled and sealed. Cut edges of all other types and classes shall be bound as specified in 3.5.2.1 except for carpet supplied specifically for wall-to-wall installation (6.2) and carpet and rugs with attached cushion. The edge treatment for carpet and rugs with attached cushion shall be as follows:

a. For wall-to-wall installations, the full thickness of cushion must

extend even with edges of carpet material on all sides.

- b. Cushion for carpet and rugs other than for wall-to-wall installation shall cover the entire carpet or rug. All carpet and rug edges may be straight cut.

3.5.2.1 Binding. Cut edges shall be bound with a 1-1/2 +/- 1/8 inch woven cotton tape having not less than 100 ends and 27 picks per inch and weighing not less than 0.27 ounces per linear yard. Cotton tape not less than 3/4 inch wide of the same number of ends and picks per square inch may be used. The color of the tape shall be a reasonable match of the pile. Carpet and rugs may be serged at the contracting officer's option.

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3.5.3 Seaming. Standard seamless broadloom widths shall be used unless the size required necessitates seaming. Seams shall be kept to the minimum practicable. Seams, where required, are to be sewn or taped (or both) as specified. Seams on carpet and rugs without attached rubber cushioning shall have a breaking strength of not less than 100 pounds when tested as specified in 4.4. Tape used in making seams shall be a minimum of 2-1/2 inches wide. Seams on rugs with attached rubber cushioning, not installed wall-to-wall, shall be made with carpet type, single face, pressure sensitive adhesive tape with a minimum width of three inches. The tape used should be that recommended by the carpet manufacturer, or equal. In addition, adhesive shall be applied to both edges of the carpet at the joint. These edges shall be brought together to insure direct contact of the adjoining edges after application of the adhesive. For seams on carpet with attached rubber cushioning, used in wall-to-wall installations, the edges shall be brought together to insure good contact. Unless otherwise specified by the ordering activity, the contractor shall secure seams by tape or adhesive, or a combination of these. Such tape or adhesive shall be those recommended by the carpet manufacturer, or equal. The finished seams shall be secure and able to withstand conventional commercial rug cleaning processes.

3.6 Size and pattern. The length, width, and pattern of the carpet and rugs shall be as specified (6.2).

3.6.1 Dimensional tolerance. The dimensional tolerances shall be as follows: Cut rugs - width or length - not more than 1 percent less than specified. Rolls - width - not more than 1 percent less than specified. Length - not less than specified not more than 10 percent longer than specified. Individual roll - not more than 1 yard less than indicated on piece ticket. Total yardage in sample - total gross length of all pieces in sample not less than the total gross length marked on piece tickets.

3.7 Shrinkage. The shrinkage shall not exceed 5.0 percent in either the length or the width when tested as specified in 4.4.

3.8 Flame resistance. Charred portion shall not extend to within 1 inch of the edge of the hole in the flattening frame at any point. The test shall be conducted on both the face and back surface of the carpet or rug. When a carpet or rug has an attached rubber cushion, the rubber cushion shall be tested as the back surface of the carpet or rug.

3.9 Moth repellency. A moth repellent compound shall be properly applied to the wool pile component of carpet and rugs and shall have an insect resistance classification of not less than "resistant" when tested as specified in 4.4.

3.10 Fiber identification. Each carpet and rug shall be labeled, ticketed, or invoiced for fiber content in accordance with the Textile Fiber Products Identification Act.

3.11 Workmanship. Carpet and rugs 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).

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TABLE I. Physical Requirements - Type I

Class	1
Description	Single level cut pile pattern
Tufts/sq. in.	47
Shots/row	3
Weight oz./sq. yd.	
Pile	25
Total	55
Tuft length/in.	Min. 0.700 Max. 0.875
Material	
Pile	See 3.2.1 [1]
Chain	Cotton and/or rayon
Filling	Jute or kraftcord
Stuffer	Cotton and/or rayon
Back coating oz./sq. yd.	6
Tuft bind (oz.)	16
Use (see 6.1)	Medium

[1] When 100 percent staple nylon is used, a minimum fiber size of 6 denier is acceptable, provided not less than 40 percent of the fibers used in the pile are 15 denier or coarser.

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TABLE II. Physical Requirements - Type II

Class	1	2	3	4[1]
Description	Single level cut pile	Single level loop pile woven thru back	Single level loop pile woven thru back	Multilevel loop woven thru back
Tufts/sq. in.	58	60	32	34
Shots/Wire	2	2	2	2
Weight oz./sq. yd.				
Pile	52	42	29	44
Total	78	60	50	64
Pile height	Min. 0.500 Max. 0.625	Min. 0.210 Max. 0.310	Min. 0.200 Max. 0.290	Min 0.190 Max 0.370
Material				
Pile	See 3.2.1	See 3.2.1 excluding nylon nylon blends, polypropylene and polypropylene blends	100 percent filament nylon, see 3.2.1.3	See 3.2.1 excluding nylon, nylon blends, polypropylene and polypropylene blends
Chain	Cotton and/or rayon	Cotton and/or rayon	Cotton and/or rayon	Cotton and/or rayon
Filling	Cotton and/or rayon or jute	Cotton and/or rayon or jute	Cotton and/or rayon or jute	Cotton and/or rayon or jute
Stuffer	Cotton, jute, or kraftcord	Cotton, jute, or kraftcord	Cotton, jute, or kraftcord	Cotton, jute, or kraftcord
Back coating	8	8	6	8
Tuft bind (oz.)	16	80	80	80
Ply twist, turns (per inch)	Min. 1.5 Max. 3.5	Min. 1.5 Max. 3.5	Min. 1.0 Max. 3.0	Min 1.5 Max 3.5
Use (see 6.1)	Heavy	Heavy	Heavy	Heavy

[1] Pile height differential - minimum 0.060.

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TABLE III. Physical Requirements - Type III

Class	1
Description	Multilevel cut and loop
Tufts/sq. in.	40
Frames	2
Shots/wire	2
Weight oz./sq. yd.	
Pile	41
Total	60
Pile height	Min. 0.170 Max. 0.425
Pile height differential	Min. 0.100
Material	
Pile	See 3.2.1 excluding nylon, nylon blends, polypropylene and polypropylene blends
Chain	Cotton and/or rayon
Stuffer	Cotton and/or rayon, or jute
Filling	Cotton, jute, or kraftcord
Back coating (oz.)	10
Tuft bind (oz.)	32
Ply twist turns (per inch)	Min. 1.5 Max. 3.5
Use (see 6.1)	Medium

TABLE IV. Physical Requirements - Type IV

Class	1 [1]			2	3				
Description	Multilevel loop			Multilevel loop	Single level cut pile				
Subclass	A	B	C		A	B	C	D	E
Tufts/sq. in.	35	60	60	38	35	35	35	35	35
Weight oz./sq. yd. pile	21	21	25	28	27	35	42	24	35
Pile height (in.)	Min. 0.125 Max. 0.500	0.100 0.200	0.150 0.250	Min. 0.125 Max. 0.500	Min. 0.300 Max. 0.500	0.400 0.600	0.400 0.700	0.300 0.500	0.400 0.600
Pile height differential	Min. 0.125 Max. -	0.031 0.062	0.031 0.062	Min. 0.125 Max. -	Min. - Max. -	- -	- -	- -	- -
Materials Pile	100 percent filament nylon, See 3.2.1.3			See 3.2.1 excluding nylon, nylon blends, polypropylene and polypropylene blends	See 3.2.1 excluding nylon, nylon blends, polypropylene and polypropylene blends			100 percent staple or filament nylon, See 3.2.1.2 and 3.2.1.3	
Tuft bind (oz.)	100	100	100	100	50	50	50	50	50
Ply twist turns (per inch)				Min. 2.5 Max. 4.5	Min. 2.0 Max. 4.0	2.0 4.0	2.0 4.0	2.0 4.0	2.0 4.0
Use (see 6.1)	Light	Med.	Heavy	Light	Light	Medium	Medium	Medium	Heavy

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TABLE IV. Physical Requirements - Type IV (continued)

Class	4		5		6 [1]			
Description	Single level loop		Cut and uncut		Single level loop			
Subclass	A	B	A	B	A	B	C	D
Tufts/sq. in.	46	60	32	38	54	54	54	54
Weight oz./sq. in. pile	33	42	26	36	21	28	24	28
Pile height (in)	Min. 0.250	0.250	Min. 0.125	0.125	Min. 0.150	0.175	0.150	0.175
	Max. 0.320	0.320	Max. 0.560	0.560	Max. 0.200	0.225	0.200	0.225
Pile height differential	-	-	Min. 0.125	0.125	-	-	-	-
Materials Pile	See 3.2.1 excluding nylon, nylon blends, polypropylene and polypropylene blends		See 3.2.1 excluding nylon, nylon blends, polypropylene and polypropylene blends		100 percent filament nylon or filament polypropylene, see 3.2.1.3 and 3.2.1.7		100 percent staple nylon or staple polypropylene see 3.2.1.2 and 3.2.1.8	
Tuft bind (oz.)	100	100	50	50	100	100	100	100
Ply twist turns (per inch)	Min. 2.5	2.5	Min. 2.0	2.0	-		See sections 3.2.1.2 and 3.2.1.8	
	Max. 4.5	4.5	Max. 4.0	4.0	-			
Use (see 6.1)	Medium	Heavy	Light	Medium	Heavy		Heavy	Heavy

[1] Class 1 and 6 (subclass A & B) carpet or rugs may be manufactured with one ply yarn.

TABLE V. Physical Requirements - Type VI

Class	1
Description	Single level loop pile - attached rubber cushion
Tufts/sq. in.	42
Weight oz./sq. yd. pile	25
Total	35
Pile height (in.)	Min. 0.125 Max. 0.200
Materials	
Pile	See 3.2.1 excluding nylon and nylon blends except for 20 percent nylon 80 percent wool blend, polypropylene and polypropylene blends
Chain	Cotton and/or rayon
Filling	Cotton and /or rayon
Back coating oz./sq. yd.	6
Tuft bind (oz.)	50
Ply twist turns (per inch)	Min. 2.0 Max. 4.0
Use (see 6.1)	Medium

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

4.2.1 Testing of components and materials. In addition to the quality assurance provisions of the subsidiary specifications and standards, testing shall be performed on the components and materials listed in table VI where applicable. The sample size (number of sample units) shall be as specified in table VII. The lot shall be unacceptable if one or more sample units fail to meet any specified requirement. The lot size shall be expressed in terms shown in table VI. The sample unit or each component or material shall be as specified in table VI. The methods of testing referenced shall be as specified in Fed. Test Method Std. No. 191, unless otherwise specified.

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TABLE VI. Component Testing

Component and lot size expressed in terms of	Characteristic	Requirement Paragraph	Test Method	Sample Unit
Pile yarn (lbs.)	Material ident.	3.2.1	[1]	
	Ply	3.2.1	Visual	
	Denier	3.2.1.2, 3.2.1.3, 3.2.1.4, 3.2.1.5, 3.2.1.6, 3.2.1.7 3.2.1.8, 3.2.1.9.	4021	
	Turns per inch	Tables II thru V	4054	1/2 lb.
	Wool content	3.2.1.1	2101	
	Chloroform sol. material	3.2.1.2, 3.2.1.3, 3.2.1.4, 3.2.1.5, 3.2.1.6,	2611	
	Isopropanol sol. material	3.2.1.7, 3.2.1.8, 3.2.1.9.	Std. commercial [1]	
		Tables I, II III & V	[1]	1/2 lb.
Chain, filling and stuffer yarns (lbs. ea.)	Material ident.	Tables I, II III & V	[1]	1/2 lb.
Backing reinforcement (yd.)	Weight	3.2.4	5041 of 191	1/2 yd.
Back coating compound (pt.)	Material ident.	3.2.6	[1]	1/2 pt.
Rubber cushioning:	Material ident. (class 1)	3.2.5	[1]	
	Material ident. (class 2)	3.2.5	[1]	
	Weight	3.2.5	4.5.6	1 lin. yd.
	Thickness	3.2.5	4.5.7	
	Density (Class 1)	3.2.5	4.5.8	
	Compressibility	3.2.5	4.5.9	
	Compression set	3.2.5	4.5.10	
Binding	Material ident.	3.5.2.1	1200	
	Width	3.5.2.1	Visual	
	Total ends	3.5.2.1	5050	1 yd.
	Picks per inch	3.5.2.1	5050	
	Weight (oz./lin. yd).	3.5.2.1 [2]	5041	

[1] Acceptance of these characteristics shall be based on a contractor's certificate of compliance. The certificate shall be accompanied by actual test or other verifiable quality data. Test may be conducted on the finished carpet specimens for the isopropanol sol. material characteristic.

[2] Except that the weight shall be reported to the nearest 0.01 ounce.

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TABLE VII. Sample Size

Lot Size (units)	Sample size
800 or less	2
801 to 22,000	3
22,001 and over	5

4.2.2 Examination of the end item. The carpet (or rugs) shall be examined to determine conformance with the requirements of this specification. Defects found during this examination shall be classified in accordance with 4.2.2.1, 4.2.2.2 and 4.2.2.3.

4.2.2.1 Visual examination. The defects listed in table VIII shall be counted regardless of their proximity to one another, except where two or more defects represent a single local be counted. Continuous defects shall be counted as one defect for each yard or fraction thereof in which they occur. The sample unit for this examination shall be one square yard. The AQL shall be 2.5 major and 6.5 total defects (major and minor combined) per 100 units (square yards). The sample size shall be based on inspection level II of MIL-STD-105. The lot size shall be expressed in units of one square yard. When examination is made of full rolls, not more than one-fifth of the total sample square yardage shall be examined on any one roll. When the lot consists of less than 5 rolls, an approximate equal number of square yards shall be examined on each roll to yield the sample yardage. When examination is made on cut rugs, the number of rugs selected shall be sufficient to yield the sample yardage. Visual examination shall be made at a distance of approximately six feet.

TABLE VIII. Classification of defects

		Classification	
		Major	Minor
Finish and Appearance	Spot or stain.		X
	Not evenly constructed, affecting appearance.		X
	Marks across carpet.	X	
	Discolored areas affecting appearance (variations in color due to crushing of pile shall not be considered a defect).		X
	Any noticeable unevenness on top surface affecting appearance.		X
	Any objectionable speck of color other than specified, visible on top surface of pile.		X
Material and Workmanship	Any obviously objectionable streak lengthwise of weave.	X	
	Tufts missing in pile.		X
	Any hole or tear through to back.	X	
	Seams, (when specified), not properly sewed or taped.	X	
	Binding edges not bound (when required)	X	
	poor color match.		X

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TABLE VIII. Classification of Defects (cont.)

Examine	Defects	Classification	
		Major	Minor
Material and Workmanship (cont.)	Back coating skips.		X
	Backing reinforcement (when specified) imperfectly applied; wrinkles, poor adherence.		X
	Attached rubber cushioning (when specified in contract) imperfectly applied; poor adherence.		X

4.2.2.2 Overall examination. Each defect listed shall be counted not more than once in each unit examined. The sample unit for this examination shall be one roll or rug. The number of rolls or rugs examined for visual examination shall be the sample size for this examination. The lot shall be unacceptable if one or more of the following defects are found.

Defects:

Overall uncleanness.
 Color of pattern other than specified.
 Rancid or otherwise objectionable odor.
 Type not as specified.
 Edges of rugs not finished as required.

4.2.2.3 Dimensions examination. Each defect listed below shall be counted not more than once in each unit examined. The sample unit for this shall be one roll or rug. The number of rolls or rugs examined for visual examination (4.2.2.1) shall be the sample size for this examination. The lot shall be unacceptable if one or more of the following defects are found.

Cut rugs - Width or length more than 1 percent less than specified.
 Rolls - Width more than 1 percent less than specified.
 Length - less than specified or more than 10 percent longer than specified - more than 1 yard less than indicated on piece ticket.
 Total yardage in sample - total gross length of all pieces in sample less than the total gross lengths marked on piece tickets.

4.3 Inspection of preparation for delivery. An inspection shall be made to determine that the packaging, packing and marking comply with the requirements in Section 5 of this specification. Defects shall be scored in accordance with the listing below. For examination of interior packaging the sample unit shall be one shipping container fully prepared for delivery, selected at random just prior to the closing operations. Sampling shall be in accordance with MIL-STD-105. Defects of closure listed shall be examined on shipping containers 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 with an AQL of 4.0 defects per hundred units.

Examine	Defects
Markings	Omitted; incorrect; illegible; improper size, location, sequence, or method of application.

Material	Any component missing or damaged.
Workmanship	Inadequate application of components such as incomplete closure of container flaps, loose strapping, in adequate stapling, or distortion of container.
Contents	Net weight exceeds the requirements of the applicable box specification.

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4.4 Testing of the end item. The method of testing specified in Fed. Test Method Std. No. 191, wherever applicable, and as listed in table X, shall be followed. Unless otherwise indicated, the physical and chemical values specified in Section 3, tables of physical requirements, apply to the average of the determinations made on a sample unit for test purposes as specified in the applicable test methods. The sample unit for each type and class shall be as specified in table IX. The sample size (number of sample units) shall be as specified in Table VII. The lot size shall be expressed in units of one square yard. Except for the requirements for weight of the back coating and the weight and thickness of the class 1 rubber cushioning, the lot shall be unacceptable if one or more sample units fail to meet any specified requirement. For the weight of the back coating, and the weight and thickness of the class 1 rubber cushioning, the lot shall be unacceptable if the lot average fails to meet the specified requirement.

TABLE IX. Sample unit for end item testing [1]

Types and classes	Sample Unit
Types I, II, IV, all classes Type III Type VI, class 1 (class 2 cushioning)	One 12 by 12 inch sample before coating and a square yard sample of the finished item.
Type VI, class 1 (class 1 cushioning)	One 12 by 12 inch sample before coating; one square yard sample after coating; and one square yard sample of the finished item.

[1] For seamed carpet or rugs without attached rubber cushioning, a seamed sample sufficient for testing shall be included in the sample unit.

TABLE X. End item testing

Characteristics	Requirement References	Test Method
Tufts per square inch	Tables I thru V	4.5.1
Shots	Tables I thru III	Visual [1]
Weight of pile yarn	Tables I thru V	4.5.2 [2]
Total weight	Tables I, II, III, V	5040 or 5041 [3]
Pile height & tuft length	Tables I thru V	4.5.3
Pile height differential	Tables II, III, IV	4.5.3
Weight of back coating [5]	Tables I, II, III, V	4.5.4
Tuft bind	Tables I thru V	ASTM D-1335-67
Adherence of backing reinforcement	3.5.1.2.2	4.5.5
Attached rubber cushioning:		
Weight:		
Class 1	3.2.5	4.5.6.1
Class 2	3.2.5	4.5.6.2
Thickness:		
Class 1	3.2.5	4.5.7.1
Class 2	3.2.5	4.5.7.2
Density:		

Class 1	3.2.5	4.5.8.1
Compressibility:		
Class 1	3.2.5	4.5.9.1
Class 2	3.2.5	4.5.9.2
Compression set:		
Class 1	3.2.5	4.5.10.1
Class 2	3.2.5	4.5.10.2

TABLE X. End item testing (cont.)

Characteristics	Requirement References	Test Method
Adherence:		
Class 1	3.2.5	4.5.11.1
Class 2	3.2.5	4.5.11.2
Accelerated aging:		
Class 1	3.2.5	4.5.12.1
Class 2	3.2.5	4.5.12.2
Ash content	3.2.5	ASTM D-297-68
Colorfastness:		
to light	3.3.1	5660 [4]
to wet and dry crocking	3.3.1	AATCC-8
Shrinkage	3.7	4.5.14
Seam strength	3.5.3	5100
Flame resistance	3.8	4.5.15
Moth repellency (insect resistance)	3.9	ASTM D-1116-69

- [1] One determination shall be made on each sample unit and the results reported as "pass or fail".
- [2] Pile weight may be determine prior to latexing and characteristic may be accepted based on a supplier's certificate of compliance.
- [3] When method 5041 is used, one specimen with an area of at least 16 square inches shall be used.
- [4] In the event of a dispute resulting from the test with method 5660, or as a result of suspected anomalous behavior of certain dye types or formulation, the contracting officer shall authorize the exposure to natural light in accordance with method 5662.
- [5] The test results for each of these characteristics shall be reported as the lot average.

4.5 Tests.

4.5.1 Tufts per square inch. Tufts per square inch shall be determined by multiplying the pitch per inch of pile yarn ends by the rows of pile per inch. Pitch and rows per inch shall be determined in accordance with ASTM D-418-68. Pitch is defined as the number of pile yarn ends per inch of width of the fabric. Rows is defined as the number of rows of tufts per inch of length (also referred to as the number of pile wires per inch for woven fabrics or stitches per inch for tufted).

4.5.2 Weight of pile yarn. The pile yarn shall be separated from other yarns on a sample containing 16 square inches. To express weight of pile yarn per carpet or rug (36 inches by 36 inches), the weight of the pile shall be calculated as follows: Weight of pile yarn (ounces) in 16 square inch sample X 81.0 = weight of pile yarn in ounces per square yard of carpet or rug.

4.5.3 Pile height and tuft length and pile height differential. For single level pile fabrics, pile height or tuft length shall be determined by ASTM D-418-68. For multilevel or profile wire carpet, use the following method: A metal rule graduated in 1/100 inch approximately 3/4 inch wide and 0.040 inch thick shall be inserted between the lengthwise pile rows parallel thereto, and the height of pile in the high pile areas measured five times and the height of the pile in the low pile areas measured five times. The areas measured shall be selected so that lines drawn parallel to and perpendicular to the edge of the sample through the points of measurement

shall be at least 2 inches apart. The average of the five measurements in the high pile area shall be the high pile height and the average of the five measurements in the low pile area shall be the low pile height. The difference between the high pile height and the low pile height shall be the differential pile height.

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4.5.4 Weight of back coating. The weight of the carpet or rug after back coating shall be determined in accordance with method 5040 or 5041 of Fed. Test Method Std. No. 191. When method 5041 is used, one specimen with an area of at least 16 sq. inches shall be used. The results of this test shall be reported as the lot average. The individual sample unit results obtained for the total weight characteristic (exclusive of back coating) shall be averaged and this result subtracted from the lot average weight after back coating. The difference obtained shall be the lot average weight of the back coating and shall be reported to the nearest ounce.

4.5.5 Adherence of backing reinforcement. The adherence of backing reinforcement shall be determined in accordance with method 5100 of Fed. Test Method Std. No. 191 except as noted below. Cut finished samples, with backing reinforcement applied, 3 inches wide in width direction by 6 inches long in length direction. Strip the backing reinforcement from the test specimen for approximately 1-1/2 inches at one of the 3 inch wide ends. Set jaws 1 inch apart, clamp the loose end of the backing reinforcement in the lower jaw and the loose end of the carpet in the upper jaw. Start tester and record the average load required to strip the backing reinforcement. Make three tests, average results, and divide by three to secure the pounds strip per inch of width. The average shall be reported to the nearest 0.1 pound.

4.5.6 Weight of rubber cushioning.

4.5.6.1 Class 1 rubber cushioning. Die cut a total of six 4 inch by 4 inch square specimens from the carpet, taking two specimens from the center area and two specimens from each side area. The cut shall not be nearer than 6 inches from the outer edges of the carpet. Die cut the specimens, with the foam side against the cutting die. The specimens shall be conditioned for a minimum of 4 hours under standard conditions of 70 deg. F. (+/- 2 deg. F.) and 55 percent (+/- 2 percent) relative humidity for testing. Weigh each specimen to the nearest milligram. Using the electric carving knife and supporting guides, separate the foam carpet backing by cutting at the line where the textile components meet the foam component. Cut as closely as possible without damaging the carpet backing components. Put aside the slabs of foam for future use. Remove the remaining foam from the carpet backing by brushing it with a stiff wire bristled brush. Weigh each backing specimen to the nearest milligram. Calculate the weight of the foam for each specimen as the difference between the total weight of the carpet with foam backing and without foam backing. Report the average of the six specimens as the weight of the foam.

4.5.6.2 Class 2 rubber cushioning. The specimen shall be one square yard of the finished item (with cushioning). The specimen shall be conditioned for a minimum of 4 hours under standard conditions of 70 deg. F. (+/- 2 deg. F.) and 65 percent (+/- 2 percent) relative humidity for testing. The specimen shall be weighed to the nearest 0.01 pound per sq. yd. The results from the sample units in the sample size shall be averaged and computed to the nearest 0.01 pound per sq. yd. This is the lot average weight of the finished item. A one square yard specimen of the carpet, before application of the cushioning, shall be tested for weight as specified above. The results from the sample units in the sample size shall be averaged and computed to the nearest 0.01 pounds per square yard. This is the lot average weight of the carpet before application of the cushioning. The difference between the weight before application of the cushioning and the weight of the finished item shall be the lot average weight of the cushioning and shall be reported to the nearest 0.01 pound per square yard.

4.5.7 Thickness and rubber cushion.

4.5.7.1 Class 1 rubber cushion. Mark the foam cut from each specimen for identification. Using a single determination, measure the total thickness of each specimen to the nearest millimeter. The thickness gauge shall have a circular presser foot with a diameter of 1.129 +/- .001 inch. The presser foot shall be allowed to exert a pressure 100 grams per square inch. The load shall be applied slowly without impact and the thickness shall be read immediately. The average of six readings shall be reported as the thickness of the foam.

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4.5.7.2 Class 2 rubber cushion. The specimen shall be one square yard of the finished item (with cushioning). The thickness between the two plans surfaces of the specimen shall be determined under pressure of 0.100 pounds per square inch (p.s.i.) (+/- 0.001 p.s.i.) distributed over a circular area 1.129 inches +/- .001 inch (7.5 +/-) in diameter. Apply pressure slowly to avoid impact and protect the specimen from vibration during the test. Five readings shall be taken on the specimen and the average computed to the nearest 0.001 inch (millimeter). The results from the sample units in the sample size shall be averaged and computed to the nearest 0.001 inch (millimeter). This is the lot average thickness of the finished item. A one square yard specimen of the carpet before application of cushioning shall be tested for thickness as specified above. The results from the sample units in the sample size shall be averaged and computed to the nearest 0.001 inch (millimeter). This is the lot average thickness of the carpet before application of the cushioning. The difference between the thickness before application of the cushioning and the thickness of the finished item shall be the average thickness of the rubber cushioning.

4.5.8 Density of rubber cushion.

4.5.8.1 Class 1 rubber cushion. The density of class 1 rubber cushion is determined by the following procedure:

The average weight in grams of the six specimens measured for weight shall be converted to pounds by multiplying by 0.002205. The average thickness in inches shall be converted to volume in cubic feet by multiplying 4" x 4" x average thickness in inches by 0.0005787.

Then: Density =
$$\frac{\text{Weight in pounds}}{\text{Volume in cubic feet}}$$

4.5.9 Compression resistance.

4.5.9.1 Class 1 rubber cushion. Using 2" x 2" foam specimens, form plies of plied specimens approximately 1" thick. Place the plied specimens in a compression tester (Instron recommended) and, with a circular presser foot one square inch in area (1.129" diameter), determine the total thickness of the plied specimen at a load of 100 grams per square inch. Compress the specimen to 75% of its original thickness using the 1.00 square inch presser foot and immediately determine the load required to compress the specimen this amount. This reading, exclusive of the 100 gram preload, is the compression resistance of the foam. Using a second set of specimens, repeat the test to obtain a second set of values. Both values shall be averaged and the result reported as the compression resistance.

4.5.9.2 Class 2 rubber cushion. The specimen shall be a one inch (2.5 cm.) square sample cut from full thickness of cushion material before adhering to the carpet. The specimen shall be compressed to 75 percent of its original thickness. Thickness shall be measured with a gauge having a circular foot one square inch (6.5 square centimeters) area under a load of 100 grams (g) (0.220 lbs.). The number pounds required to compress the sample shall be the compressibility and shall be reported to the nearest pound.

4.5.10 Compression set.

4.5.10.1 Class 1 rubber cushion. Pile up 2" x 2" specimens one on another until the pile has a total thickness of approximately 1". Prepare

two such piles using a total of approximately 16 of the 2" x 2" specimens for 1/8" foam and approximately 10 of the 2" x 2" specimens for 3/16" foam. Apply a load of 100 grams per square inch and determine the thickness of the plied specimens using a fixture consisting of two parallel plates that are larger than the 2" x 2" specimens and spacer bars that are equal in thickness to 50% of the thickness of the plied specimens. Compress the plied specimens of 50% of its original thickness as determined under a 100 gram per square inch load.

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Place the fixture with the compressed specimens in a circulating air oven at 158 deg. +/- 2 deg. F. for 22 hours +/- 1/2 hour. Remove the fixture from the oven, unclamp immediately and remove the plied specimen from the fixture. After 30 minutes recovery period, remeasure the thickness of the plied specimens under a load of 100 grams per square inch. Determine the difference from the original thickness. Divide the difference by the original thickness x 100. This value is the compression set. Do the tests on both sets of specimens and report the average.

When plying the specimens, place a skin side against a cut side. If the plies adhere together after the oven treatment, do not separate before measuring.

4.5.10.2 Class 2 rubber cushion. The specimen shall be 2" x 2" sample cut from the full thickness of the cushion before adhering to the carpet. The specimen shall be compressed 50 percent of its original thickness between two parallel plates. The thickness shall be measured in accordance with 4.5.8.1. The sample compressed shall be placed in a Geer oven at 158 deg. F. (+/- 2 deg. F.) for 22 hours (+/- 1/2 hour). At the end of the specified time, the sample shall be removed from the plates and allowed to rest at room temperature for 30 minutes. The thickness measurement shall be taken and subtracted from the original thickness. The loss in thickness shall be expressed as a percentage of the original thickness and reported to the nearest percent.

4.5.11 Adherence.

4.5.11.1 Class 1 rubber cushion. From the original sample cut a 2" x 6" strip lengthwise of the carpet, one from the center, and one from each side area. Cover the foam side with self-adhering tape. Separate the foam from the carpet for approximately 1-1/2 inches at one end of the 2 inch wide ends. A tensile tester equivalent to that described in Method 5100 of Fed. Test Method Std. No. 191 shall be used. Set the clamps 1" apart, clamp the loose end of the attached foam in the lower clamp and the loose end of the carpet in the upper clamp. The clamps must be as wide as the strips that are being gripped. Start the tester at a speed of <UT> per minute and record the five highest readings required to strip the attached foam from the carpet. Test the three specimens, average the results, and divide by two to determine the load in pounds per inch in width.

4.5.11.2 Class 2 rubber cushion. A specimen of the finished carpet with rubber cushioning attached shall be subjected to accelerated aging by exposure in a circulating air oven for 96 hours at a temperature of 90 deg. F. (+/- 2 deg. F.). After removal of the sample from the oven and allowing it to cool to room temperature, grasp the base carpet with the fingers of one hand and the thickness of the rubber cushioning with the fingers of the other hand and pull firmly in opposite directions. The cushioning should tear before pulling free from the carpet.

4.5.12 Accelerated aging.

4.5.12.1 Class 1 rubber cushion. Place a 2" x 4" specimen of the foam, attached to the carpet in a circulating air oven at 275 deg. F. for 24 hours. Place another 2-1/2" x 3" specimen attached to the carpet in a Fadeometer in accordance with method 5660 of Fed. Test Method Std. No. 191. Foam samples should withstand these exposures with no more than slight discolorations and/or surface degradation following either test. Upon flexing, a slight cracking or crazing is acceptable.

4.5.12.2 Class 2 rubber cushion. A piece of the rubber cushioning shall

be placed in an oxygen bomb (not more than 1 ounce of rubber per 170 cubic inches of oxygen) at a temperature of 158 deg. F. and a pressure 300 pounds (+/- 10 pounds) per square inch for a period of seven days. Upon removal, sample should not be sticky and should not crack when bent back upon itself.

4.5.13 Color matching test. A test specimen at least 8 inches square shall be mounted at an angle of 45 deg. to the horizontal and compared with the standard sample of the approved color sample furnished by the contracting officer, similarly mounted under the light conditions specified in 3.3. When a artificial light source is used it shall be placed so that its rays strike the sample normal to its surface. The viewing distance shall be 18 to 24 inches.

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4.5.14 Shrinkage test. A 12 by 12 inch sample of the specified carpet shall be conditioned under standard conditions as defined in Fed. Test Method Std. No. 191 for a period of 24 hours. Specimen shall then be marked and measured at three different locations in the length and width directions; immerse sample in 110 deg. F. water for 15 minutes; mix 2 g. of sodium alkylsulfate type of detergent with 50 g. of water at 110 deg. F. and apply to pile surface of carpet. Scrub sample with a soft bristle brush by stroking back and forth 20 times (10 times in each unilateral direction), and in both length and width directions; rinse well to remove majority of detergent; squeeze and dry at 125 deg. F. until bone dry; again condition under standard conditions for 24 hours.

4.5.14.1 Shrinkage evaluation. The specimen shall be measured and the shrinkage computed using the following formula:

$$\text{Shrinkage} = \frac{A - B}{A} \times 100, \text{ where } A = \text{Average}$$

of initial measurement and B = Average measurements after shampooing. The shrinkage in both the length and width directions shall be reported to the nearest 0.1 percent.

4.5.15 Flame resistance.

4.5.15.1 Test specimens. Each test specimen shall be a 9 +/- 1/4 inches square section of the carpet or rug to be tested. Eight specimens are required.

4.5.15.2 Apparatus.

a. Test chamber. The test chamber shall consist of an open top hollow cube made of noncombustible material[1] with inside dimensions 12 by 12 by 12 inches and a minimum of 1/4 inch wall thickness. The flat bottom of the box shall be made of the same material as the sides and shall be easily removable. The sides shall be fastened together with screws or brackets and taped to prevent air leakage into the box during use.

NOTE: A minimum of two chambers and two extra bottoms is suggested for efficient operation.

b. Flattening frame. A steel plate, 9 by 9 inches, 1/4 inch thick with a 8 inch diameter hole in its center is required to hold the carpet or rug flat during the course of the test. It is recommended that one be provided for each test chamber.

c. Standard igniting source. No. 1588 methenamine timed burning tablet or an equal tablet. These tablets shall be stored in a desiccator over a desiccant for 24 hours prior to use. (Small quantities or sorbed water may cause the tablets to fracture when first ignited. If a major fracture occurs, any results from that test shall be ignored, and it shall be repeated.)

d. Circulating air oven. A forced circulating drying oven capable of removing the moisture from the specimens when maintained at 105 deg. C. (221 deg. F.) for 2 hours.[2]

e. Desiccating cabinet. An airtight and moisturetight cabinet capable of holding the floor covering specimens horizontally without contacting each other during the cooling period following drying, and

containing silica gel dessicant.

f. Gloves. Nonhygroscopic gloves (such as rubber polyethylene) for handling the sample after drying, and raising the pile on specimens prior to testing.

g. Hood. A hood capable of being closed and having its draft turned off during each test and capable of rapidly removing the products of combustion following each test. The front or sides of the hood should be transparent to permit observation of the test in progress.

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h. Mirror. A small mirror mounted above each test chamber at an angle to permit observation of the specimen from outside of the hood.

i. Vacuum cleaner. A vacuum cleaner to remove all loose material from each specimen prior to conditioning. All surfaces of the vacuum cleaner contacting the specimen shall be flat and smooth.

4.5.15.3 Procedure.

a. Cutting, and when specified, washing procedure if fire retardant treated. Cut eight 9 +/- 1/4 inch square specimens of each carpet or rug to be tested. Note, if the carpet or rug has had a fire-retardant treatment, or is made of fibers which have had a fire-retardant treatment, and when specified in the contract or order (6.2), the selected sample or oversized specimens thereof shall be washed, prior to cutting of test specimens, 10 times under the washing and drying procedure prescribed in Method 124-1967 of the American Association of Textile Chemists and Colorists (washing procedure 6.2 (III) with a water temperature of 60 deg. +/- 2.8 deg. C. (140 deg. F +/- 5 deg. F.), drying procedure 6.3.2 (B), maximum load 3.64 kg. (8 pounds), unless otherwise specified.

b. Conditioning. Clean each specimen with the vacuum cleaner until it is free of all loose ends left during the manufacturing process and from any material that may have been worked into the pile during handling.[3] Care must be exercised to avoid "fuzzing" of the pile yarn.

Place the specimens in the drying oven in a manner that will permit free circulation of the air at 105 deg. C. (221 deg. F.) around them for 2 hours.[4] Remove the specimens from the oven with gloved hands and place them horizontally in the desiccator with traffic surface up and free from contact with each other until cooled to room temperature, but in no instance less than 1 hour.

c. Testing. Place the test chamber in the draft-protected environment hood with draft off) with its bottom in place. Wearing gloves, remove a test specimen from the desiccator and brush its surface with a gloved hand in such a manner as to raise its pile. Place the specimen on the center of the floor of the test chamber, traffic surface up, exercising care that the specimen is horizontal and flat. Place the flattening frame on the specimen and position a methenamine tablet on one of its flat sides in the center of the 8 inch hole.

Ignite the tablet by touching a lighted match or an equivalent igniting source carefully to its top. If more than 2 minutes elapse between the removal of the specimen from the desiccator and the ignition of the tablet, the conditioning must be repeated.

Continue each test until one of the following conditions occurs:

- (1) The last vestige of flame or glow disappears. (This is frequently accompanied by a final puff of smoke.)
- (2) The flaming or smoldering has approached within 1 inch of the edge of the hole in the flattening frame at any point.

When all combustion has ceased, ventilate the hood and measure the shortest distance between the edge of the hole in the flattening frame and the charred area. Record the distance measured for each specimen.

Remove the specimen from the chamber and remove any burr residue

from the floor of the chamber. Before proceeding to the next test, the floor must be cooled to normal room temperature or replaced with one that is at normal room temperature.

After completion of the testing on the specimens with the traffic surface up, the same testing shall be performed on the specimens except that the back surface shall be up and tested with the methenamine tablet.

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d. Report. The number of specimens of the eight tested in which the charred area does not extend to within 1 inch of the edge of the hole in the flattening frame shall be reported.

e. Interpretation of results. If the charred area does not extend to within 1 inch of the edge of the hole in the flattening frame at any point for at least seven of the eight specimens, the carpet or rug meets the acceptance criterion. That is, at least seven of the eight specimens must meet the acceptance criterion when tested with the traffic surface up and at least seven of the eight specimens must meet the acceptance criterion when tested with the back surface up.

Footnotes:

- [1] 6.35 mm. (1/4 inch) cement asbestos board is a suitable material.
- [2] Option 1 of ASTM D 2654-67T, Methods of Test for "Amount of Moisture in Textile Materials" describes a satisfactory oven.
- [3] The vacuum cleaning described is not intended to simulate the effects of repeated vacuum cleaning in service.
- [4] If the specimens are moist, permit them to air-dry at laboratory conditions prior to placement in the oven.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A or C, as specified (6.2).

5.1.1 Level A. Carpet or rugs, singly or in multiples, shall be tightly rolled. Carpet or rugs six feet or more in width shall be rolled open width on a convolute or spiral wound chipboard tube, or a pole. The tube shall have a minimum wall thickness of 0.25 inch with a minimum inside diameter of 2 inches. For rolls weighing 200 pounds or more, regardless of width, the tube shall have a minimum inside diameter of 3 inches. The ends of the tube or pole shall be flush with or extend not more than one inch beyond each end of the maximum width of the rolled carpet or rug. Carpet or rugs shall be secured to prevent unwinding with cotton tape or twine placed approximately one-sixth of the width from each end. Rolls wider than 36 inches shall have an additional fastening placed at the center of the roll. Rolled and tied carpet or rugs shall be completely wrapped with 60 pound minimum basis weight kraft paper conforming to grade B of UU-P-268. All seams and folds of the paper wrap shall be securely sealed 2-1/2 inch minimum width gummed paper tape conforming to PPP-T-45, Type III, class 2, grade B.

5.1.2 Level C. Carpets or rugs shall be packaged in accordance with the industry's practice, providing that this insures protection for the rug or carpet during shipment and provides for safe delivery to its destination.

5.2 Packing. Packing shall be level A, B, or C, as specified (6.2).

5.2.1 Level A. Rolled carpet or rugs of one size, type, class, subclass, pattern, and color only, packaged as specified in 5.1, shall be packed in a snug fitting box conforming to type CF, class weather resistant, V3c, style FOL of PPP-B-636; style A or B, class 2 of PPP-B-576; class II of PPP-B-591; overseas type of PPP-B-601; class 2, style 2 or 4 of PPP-B-621; or class 2, style A, B, or C of PPP-B-640, with style 3 or 4 ends. Each shipping container shall be provided with a type I, grade C case liner conforming to MIL-L-10547. Each shipping container shall be closed and reinforced in accordance with the appendix to the applicable container specification. The weight of the contents of each fiberboard shipping container shall not exceed 65 pounds, nor shall the weight of the contents of each of the other shipping containers exceed 200 pounds, except when an

individual roll exceeds this weight. When this occurs the gross weight of the triple wall fiberboard shipping container shall not exceed 350 pounds. When specified (6.2), individual rolls of carpet or rugs shall be inserted in snug fitting laminated textile shipping bags conforming to type III, class 2, No. P-14, style B of PPP-B-35, with waterproof sewn seams. Cloth covered rolls shall have each open end closed with two double looped wire ties. The wire ties shall be not less than 6 inches long of 0.72 inch thick galvanized soft iron or steel wire with a 1/2 inch diameter formed eye at each end. The first wire tie shall be applied as close to the roll as possible. The second wire tie shall be applied at a distance approximately 1 inch from the first wire tie. The twisted ends of the wire ties shall alternate and face in opposite directions.

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5.2.2 Level B. Rolled carpet or rugs of one size, type, class, subclass, pattern and color only, packaged as specified in 5.1, shall be packed in a snug fitting box conforming to type CF, class domestic, style FOL of PPP-B-636; style A or B, class 1 of PPP-B-576; class 1, style A or B, of PPP-B-591; domestic type, style A or B, of PPP-B-601; class 1, style 2 or 4 of PPP-B-621; or class 1, style A, B or C of PPP-B-640, with style 3 and 4 ends. When specified (6.2), each shipping container shall be provided with a type I, grade C case liner conforming to MIL-L-10547. The minimum bursting strength of the fiberboard shall be 275 p.s.i. Each shipping container shall be closed in accordance with the appendix of the applicable container specification. The weight of the contents of each fiberboard shipping container shall not exceed the specification weight limitation, nor shall the weight of the contents of each of the other shipping containers exceed 200 pounds, except when an individual roll exceeds this weight. When this occurs the gross weight of the triplewall fiberboard shipping container shall not exceed 350 pounds. Alternatively, individual rolls of carpet or rugs shall be inserted in snug fitting laminated textile shipping bags conforming to type III, class 1, No. P-5, style A or B of PPP-B-35. Cloth covered rolls have each open end closed with two double looped wire ties. The wire shall be not less than 6 inches long of 0.072 inch thick galvanized soft iron or steel wire with a 1/2 inch diameter formed eye at each end. The first wire tie shall be applied as close to the roll as possible. The second wire tie shall be applied at a distance approximately 1 inch from the first wire tie. The twisted ends of the wire ties shall alternate and face in opposite directions.

5.2.3 Level C. Carpet or rugs, packaged as specified in 5.1, shall be packed in a manner to insure carrier acceptance and safe delivery at destination in compliance with the National Motor Freight Classification rules and the Uniform Freight Classification rules.

5.3 Marking. Marking shall be in accordance with 5.3.1 or 5.3.2 as specified (6.2).

5.3.1 Civil agencies. In addition to any special markings required by the contract or order, shipments shall be marked in accordance with Fed. Std. No. 123.

5.3.2 Military requirements. In addition to any special marking required by the contract or order, shipments shall be marked in accordance with MIL-STD-129.

6. NOTES.

6.1 Intended use. As a guide in the selection of the quality carpet to be used in the various areas of use, the following suggestions are offered. The levels of traffic listed opposite "Use" in Tables I through V are based on experience factors with these constructions and are furnished as a guide. It should be kept in mind that each installation must be judged carefully as to the peculiar traffic conditions expected. In some area, it might be advisable to use a heavier, better grade due to the peculiar wear factors in these situations. As a basis for estimating probable carpet performance in use, the levels of traffic experienced can be broken down as follows:

Light - Bedrooms, dressing rooms, some dining rooms in private homes.

Medium - Living and dining rooms in private homes, private office, motel and hotel bedrooms.

Heavy - Commercial type installations in office buildings, public rooms, hotel lobbies, stairways and stores.

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

- (a) Title, number, and date of this specification.
- (b) Type, class, subclass, and pile fiber required (1.2.1 and 3.2.1).
- (c) When bid samples are not required (3.1.2).
- (d) Ply of yarn when necessary (3.2.1).
- (e) Rubber cushioning required, if other than as specified (3.2.5).
- (f) Color required (3.3).
- (g) When rubber cushion is required for other than type VI, class 1, carpet or rugs (3.5.1.4).
- (h) Edge treatment for type II, class 2, 3, and 4 when other than specified (3.5.2).
- (i) When carpet or rug required is for wall-to-wall installation (3.5.2).

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- (j) Length, width, and pattern of carpet or rugs (3.6).
- (k) Specify when washing procedure is applicable, if fire retardant treated (4.5.15.3).
- (l) Selection of applicable levels of packaging and packing (5.1 and 5.2).
- (m) Whether carpet or rugs shall be inserted in laminated textile shipping bags for level A shipment (5.2.1).
- (n) Whether a case liner is required for containers (5.2.2).
- (o) Type of marking required (5.3).

6.3 Standard sample. For access to the standard sample, address the procuring office issuing the invitation for bids.

6.4 Tufts per square inch. The term "tufts per square inch" is used in the tables of physical requirements in lieu of other designations of construction, such as "pitch per inch" and "rows per inch", in order to allow for variations in these factors of pitch and rows between individual company fabrics offered to meet bid requirements. The use of this designation for construction elements should result in broader industry wide participation, more competitive bidding, greater style selectivity, and increased flexibility in procurement. A tuft is to be considered a cut loop or two fibril or filament clusters of one pile yarn.

6.5 Comparison of types and classes. The types, classes, and subclasses of carpets included in DDD-C-0095A (GSA-FSS), as listed below, are of the same construction as the types, classes, and subclasses listed under DDD-C-95 and Interim Amendment-2 below:

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DDD-C-95 and Interim Amendment-2

Type	Class	Subclass	Type	Class	Subclass
I	1	-	I	1	-
II	1	-	II	1	B
II	2	-	II	3	-
II	3	-	II	5	-
II	4	-	II	6	-
III	1	-	III	3	-
IV	1	A	IV	1	-
IV	1	B (New Item)	-	-	-
IV	1	C (New Item)	-	-	-
IV	2	-	IV	2	-
IV	3	A	IV	3	A
IV	3	B	IV	3	B
IV	3	C	IV	3	C
IV	3	D (New Item)	-	-	-
IV	3	E	IV	3	B
IV	4	A	IV	4	A
IV	4	B	IV	4	B
IV	5	A	IV	5	A
IV	5	B	IV	5	B
IV	6	A	IV	6	A
IV	6	B	IV	6	B
IV	6	C (New Item)	-	-	-
IV	6	D (New Item)	-	-	-

V (Deleted)			V	1	-
			V	2	-
VI	1	-	VI	1	-

6.6 Special flame resistance. Federal agencies responsible for hospitals and medical facilities are directed to the publication General Standards of Construction and Equipment for Hospital and Medical Facilities, issued by the U. S. Department of Health, Education, and Welfare. This publication contains regulations relating to the implementation of the Hill-Burton program, including special construction and fire resistive requirements.