HH-P-96G
5 November 1986
SUPERSEDING
HH-P-96F
11 August 1965

FEDERAL SPECIFICATION

PAPER, GASKET: FIBER (ANIMAL OR PLANT), SHEET

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers a fibrous paper gasket sheet or roll material used as joint sealing material for gasoline, fuel and lubricating oils, air and gases, and water for temperatures to 212°F.

1.2 Classification.

*1.2.1 Types and classes. Paper provided under this specification shall be of the following types and classes, as specified (see 6.1).

Type I - Protein binder.
Type II - Synthetic rubber binder.
  Class A - High oil resistance.
  Class B - Medium oil resistance.

*1.3 Military part number. The military part number shall consist of the letter B, the basic number of this specification, and dash numbers denoting type, class (Type II only), how supplied and thickness.

AMSC N/A FSC 5330

Example:

B HHP96 II B S F

- Thickness (See Table I)
- How Supplied
  - S-Sheet
  - R-Roll
- Class (Type II Only)
  - A-High Oil Resistance
  - B-Medium Oil Resistance
- Type
  - I-Protein Binder
  - II-Synthetic Rubber Binder
- Basic Spec

2. APPLICABLE DOCUMENTS

2.1 Government documents.

*2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

UU-P-268	Paper, Kraft Wrapping
PPP-T-76	Tape, Pressure Sensitive Adhesive, Packaging/Paper (for carton sealing)
PPP-B-585	Box, Wood, Wirebound
PPP-B-591	Boxes, Shipping, Fiberboard, Wood-cleated
PPP-B-601	Boxes, Wood, Cleated Plywood
PPP-B-621	Box, Wood, Nailed and Lock-corner
PPP-B-636	Box, Shipping, Fiberboard
PPP-B-640	Box, Fiberboard, Corrugated, Triple-Wall
PPP-B-1055	Barrier Material, Waterproofed Flexible

STANDARDS

FEDERAL

FED-STD-1	Standard for Laboratory Atmospheric Conditions for Testing
FED-STD-102	Preservation, Packaging and Packing Levels
FED-STD-123	Marking for Shipment (Civil Agencies)
FED-STD-191	Textile Test Methods
FED-STD-601	Rubber, Sampling and Testing

MILITARY

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 obtained from the procuring activity or as directed by the contracting officer).

(Activities outside the Federal Government may obtain copies of Federal specifications, standards, and commercial item descriptions as outlined under General Information in the Index of Federal Specifications, Standards and Commercial Item Descriptions. The Index, which includes cumulative bimonthly 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 and commercial item descriptions required by activities outside the Federal Government for bidding purposes are available without charge from General Services Administration Business Service Centers in Boston, MA; New York, NY; Philadelphia, PA; Washington, D.C.; Atlanta, GA; Chicago, IL; Kansas City, MO; Fort Worth, TX; Houston, TX; Denver, CO; San Francisco, CA; Los Angeles, CA; and Seattle, WA.

(Federal Government activities may obtain copies of Federal standardization documents and the Index of Federal Specifications, Standards and Commercial Item Descriptions from established distribution points in their agencies).

3. REQUIREMENTS

3.1 Material.

3.1.1 Type I. Type I paper shall be made of pulped plant or animal fiber and a binder, rolled or compressed into the form of a sheet. It shall contain no rubber, asbestos, or any substance which may be materially affected by oil, gasoline, or water.

3.2.1 Type II. Type II paper shall consist of a pulped plant or animal fiber and a synthetic-rubber binder rolled or compressed into the form of a sheet. It shall contain no plasticized protein, asbestos, or any substance which may be materially affected by oil, gasoline, or water.

3.2 Thickness. Paper shall be of the nominal thickness shown in table I, as specified (see 4.4.2).

Table I - Thickness.

Nominal Thickness	Variation Allowed
Inch	Inch
A - 0.003	0.003 - 0.005
B - .006	.005 - .008
C - .010	.009 - .012
D - 1/64	.012 - .020
E - 1/32	.027 - .035
F - 1/16	.056 - .069
G - 3/32	.084 - .103
H - 1/8	.113 - .138
I - 3/16	.169 - .206
J - 1/4	.225 - .275

3.3 Flexibility. The paper shall not crack or break, nor shall the plies separate, when tested as described in 4.4.3.

3.4 Tensile strength.

3.4.1 Type I. The tensile strength of type I paper in each direction shall be not less than 2000 pounds per square inch (p.s.i.) when tested as described in 4.4.4.

3.4.2 Type II. The tensile strength of type II paper in each direction shall be not less than 800 p.s.i. when tested as described in 4.4.4.

3.5 Compressibility and recovery. The paper shall have the compressibility and recovery shown in table II when tested as described in 4.4.5.

Table II. Compressibility and recovery.

Nominal Thickness	Number of plies	Compression minimum	Recovery minimum
Inch		Percent	Percent
0.003	20	15	30
.006	10	15	30
.010	6	13	30
1/64	4	12	40
1/32	1	12	40
1/16	1	12	50
3/32	1	12	50
1/8	1	12	50
3/16	1	10	55
1/4	1	10	55

3.6 Resistance to liquids. The paper shall not change in weight by more than the amounts given in table III when tested as described in 4.4.6.

Table III. Change in weight in liquids.

	Change in weight, maximum		
	Fuel oil	Petroleum base oil	Water
	Percent	Percent	Percent
Type I	25	20	125
Type II			
Class A	75	70	40
Class B	100	90	40

*3.7 Identification marking. Paper shall be marked with the manufacturer's name, FSCM, or trademark and the month and year of manufacture.

3.8 Workmanship. The paper shall be free from defects which may affect its serviceability.

*4. QUALITY ASSURANCE PROVISIONS

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

4.2 Sampling.

4.2.1 Lot. For purposes of sampling, a lot shall consist of all paper of the same thickness produced under essentially the same conditions and offered for delivery at one time.

4.2.2 Sampling for acceptance inspection.

4.2.2.1 Sampling for examination. A random sample of sheets or rolls shall be selected from each lot of paper for examination specified in 4.3.1, with lot acceptance based on table IV in accordance with MIL-STD-105.

Table IV. Sampling for examination.[1]

Number of sheets or rolls in lot	Number of sheets or rolls in sample	Acceptance number (defective)	Rejection number (defective)
15 and under	5	0	1
16 to 40	7	0	1
41 to 110	10	0	1
111 to 300	15	1	2
301 to 500	25	1	2
501 and over	35	2	3

[1]Six square yards of paper shall be unrolled from each sample roll for examination.

4.2.2.2 Sampling for tests. Samples of gasket material shall be selected from each lot in accordance with table V for the tests described in 4.4. Each sample piece shall be 18 by 18 inches.

Table V. Sampling for tests.

Lot size (number of rolls or sheets)	Sample size (number of rolls or sheets)	(Number of 18 by 18 inch pieces)
15 and under	2	2
16 to 40	3	3
41 to 110	4	4
111 to 300	5	5
301 to 500	7	7
501 and over	10	10

4.3 Quality conformance inspection.

4.3.1 Examination. Each of the sample rolls or sheets selected in accordance with 4.2.2.1 shall be surface examined, and measured to determine conformance with the requirements of this specification which do not require tests. Any roll or sheet in the sample containing one or more visual or dimensional defects shall not be offered for delivery, and if the number of defective rolls or sheets in any sample exceeds the acceptance number for that sample, this shall be cause for rejection of the lot represented by the sample.

4.3.2 Tests. The samples selected in accordance with 4.2.2.2 shall be subjected to the tests specified in 4.4 to determine conformance with this specification. If any of the samples tested is found to be not in conformance with this specification, this shall be cause for rejection of the lot represented by the sample.

4.4 Test procedures.

4.4.1 Conditioning.

4.4.1.1 Type I. All tests of type I paper, except moisture, shall be made of material which has been conditioned in a circulating-air oven at a temperature of 50° ± 1°C. (122° ± 2°F) for a period of 24 hours. The specimen shall be tested immediately after removal from the oven.

4.4.1.2 Type II. All tests of type II paper, except moisture, shall be made of material which has been conditioned for not less than 24 hours as described in Fed. Std. No. 1. The tests shall be conducted in the same atmosphere.

4.4.2 Thickness. The minimum and maximum thickness of each sample of paper shall be determined as described in method 2011 of Fed. Test Method Std. No. 601 except that (1) the total force on the specimen shall be 6 ± 0.5 ounces and (2) the unit or test unit shall consist of the 18- by 18-inch sample (see 3.2).

4.4.3 Flexibility. A specimen from each sample of paper, approximately one inch in width and the full thickness of the paper shall be bent 180° around a mandrel having a diameter twice the normal thickness of the packing. While in the bent position, the specimen shall be examined for cracking, breaking, and ply separation (see 3.3).

4.4.4 Tensile strength (see 3.4).

4.4.4.1 Specimen. The specimen shall be dumbbell in shape and cut with die I in method 4111 of Fed. Test Method Std. No. 601. The thickness of the specimen shall be the thickness of the paper undergoing test.

4.4.4.2 Apparatus. The apparatus shall be as follows:

*(a) Testing machine as described in FED-STD-191, Method 5102.

(b) Micrometer caliper described in 4.4.2.

(c) Die I of method 4111 of Fed. Test Method Std. No. 601.

4.4.4.3 Procedure.

4.4.4.3.1 Cross-sectional area of the specimen.

4.4.4.3.1.1 Width. The width of the specimen shall be the width between the cutting edges of the die in the reduced section.

4.4.4.3.1.2 Thickness. The thickness of the specimen shall be determined as described in 4.4.2 except that three measurements equally spaced along the middle portion and longitudinal center line of the specimen shall be made to the nearest 0.001 inch and the three values averaged. The average value for each specimen shall be used in calculating the cross-sectional area of the specimen.

*4.4.4.3.2 Description of procedure. The remainder of the procedure shall be as described in FED-STD 191, Method 5102.

4.4.4.4 Results.

4.4.4.4.1 Calculation. The tensile strength of the specimen shall be calculated as follows:

$$\text{Tensile strength, pound per square inch} = \frac{F}{C}$$

where:

F = breaking force of the specimen in pounds.
C = cross-sectional area of the unstretched specimen in square inches.

*4.4.4.4.2 Test specimens. Three specimens with the long dimension parallel to the grain of the paper and three specimens with the long dimension at right angles to the grain shall be tested from each sample of paper.

*4.4.4.4.3 Test results. The average of the results obtained from the three specimens tested from each direction shall be the tensile strength of the sample of paper in each direction.

*4.4.4.4.4 Recording results. The tensile strength of the sample in each direction shall be recorded to the nearest 10 p.s.i.

4.4.5 Compressibility and recovery. The compressibility and recovery of each sample of paper (see 4.3.2) shall be determined as described in method 3331 of Fed. Test Method Std. No. 601 except that (1) the diameter of the penetrator shall be 1.129 $\pm$ 0.01 inch, (2) the preload shall be 1.0 pound, (3) the major load shall be 199 pounds, and (4) the thickness of the specimen undergoing test shall be as indicated by the number of plies in table II (see 3.5).

4.4.6 Resistance to liquids. The resistance to liquids of each sample of paper, shall be determined as described in method 6251 of Fed. Test Method Std. No. 601 except that the time of immersion shall be 22 $\pm$ ½ hour (see 3.6). The immersion media shall be as follows:

(a) Fuel oil - Medium #6 in method 6001 of Fed. Test Method Std. No. 601.

(b) Petroleum-base oil - Medium #3 in method 6001 of Fed. Test Method Std. No. 601.

(c) Water - Distilled water.

*4.5 Inspection of packaging, packing and marking. An inspection shall be made to determine that the packaging, packing, and marking comply with the requirements in section 5. Defects shall be scored in accordance with table VI. 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 and the AQL shall be 4.0 defects per hundred units.

Table IV. Classification of preparation for delivery defects.

Examine	Defects
Markings (exterior and interior)	Omitted; incorrect; illegible; improper size, location, sequence, or method of application.
Materials	Any component missing, or damaged.
Workmanship	Inadequate application of components such as incomplete closure of container flaps, loose strapping, inadequate stapling. Distortion of container.

5. PACKAGING

(For Civil Agency procurement, the definitions and application of levels of packaging and packing shall be in accordance with Fed. Std. No. 102.)

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

5.1.1 Level A.

*5.1.1.1 Sheets. The paper sheets furnished in widths, thicknesses, and quantities as specified (see 6.1) shall be packaged flat and wrapped in paper conforming to PPP-B-1055. The wrap shall be secured with tape conforming to PPP-T-76. A minimum of 2-inch overlap shall be provided at all overlapping edges.

5.1.1.2 Rolls. The paper rolls furnished in lengths and widths as specified shall be wrapped in paper conforming to PPP-B-1055. The wrap shall be secured with tape conforming to PPP-T-76. A minimum of 2-inch overlap shall be provided at all overlapping edges.

5.1.2 Level B.

5.1.2.1 Sheets. The paper sheets furnished in widths, thicknesses, and quantities as specified shall be packaged flat and wrapped in paper conforming to UU-P-268, grade B. The wrap shall be secured with tape conforming to PPP-T-76. A minimum of 2-inch overlap should be provided at all overlapping edges.

5.1.2.2 Rolls. The paper rolls furnished in lengths and widths as specified shall be wrapped in paper conforming to UU-P-268, grade B. The wrap shall be secured with tape conforming to PPP-T-76. A minimum of 2-inch overlap shall be provided at all overlapping edges.

5.1.3 Level C. The sheets or rolls of paper shall be packaged in accordance with the suppliers commercial practice.

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

5.2.1 Level A. Unit packages of sheets or rolls of like description shall be packed in a close-fitting box conforming to PPP-B-585, class 3; PPP-B-591, class 2; PPP-B-601, overseas type; PPP-B-621, class 2; PPP-B-636, class weather-resistant; or PPP-B-640, class 2, grade A. The boxes shall be closed and strapped in accordance with the applicable specifications or appendix thereto. The gross weight of the triple wall box or the wood boxes shall not exceed 200 pounds. The gross weight of the PPP-B-636 box shall not exceed the weight limitations of the box specification.

5.2.2 Level B. Unit packages of sheets or rolls of like description shall be packed 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.

5.2.3 Level C. The sheets or rolls of paper shall be packed to ensure carrier acceptance and safe delivery at destination in containers complying with the rules and regulations applicable to the mode of transportation.

5.3 Marking.

5.3.1 Civil agencies. In addition to markings required by the contract or order, the interior packages and shipping containers shall be marked in accordance with FED-STD-123.

5.3.2 Military activities. In addition to markings required by the contract or order, the interior packages and shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Ordering data. Purchasers should exercise any desired options offered herein and procurement documents should specify the following:

(a) Title, number, and date of this specification.

(b) Military part number (see 1.3).

(c) Levels of packaging and packing required (see 5.1 and 5.2).

(d) Sampling plan, if other than specified.

6.2 Transportation description. The transportation descriptions and minimum weights applicable to this commodity are:

Rail:

Packing paper.
Carload minimum weight 36,000 pounds.

Motor:

Packing, paper.
Truckload minimum weight 36,000 pounds, subject to Rule 115, National Motor Freight Classification.

*6.3 Changes from previous issue. The margins of this specification are marked with asterisks to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

MILITARY INTERESTS:

Custodians:
Army: MI
Air Force: 99

Review Activities:
Army: EA, ME, AR
Defense Supply Center: IS

Preparing Activity:
Army: MI

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