SAE International™ SURFACE VEHICLE STANDARD

SAE J1323 MAY2009

Issued 1980-08
Revised 2009-05

Superseding J1323 DEC2003

Standard Classification System for Fiberboards

RATIONALE

Add titles to Tables 1 through 13 and Figure 1.

1. SCOPE

This SAE Standard provides a means for specifying or describing the pertinent properties of fiberboards for automotive applications. The materials normally specified by this standard are defined in SAE J947. The test methods commonly used for fiberboards are defined in SAE J315.

1.1 Purpose

The purpose of this classification system is to provide guidance to the engineer in the selection of commercially available fiberboards and further provide a method for specifying the fiberboard and its critical properties by use of a standard line call-out.

2. REFERENCES

2.1 Applicable Publications

The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated the latest revision of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J315 Fiberboard Test Procedure

SAE J369 Flammability of Polymeric Interior Materials—Horizontal Test Method

SAE J947 Glossary of Fiberboard Terminology

SAE J949 Test Method for Determining Stiffness (Modulus of Bending) of Interior Trim Materials and Substrates

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: http://www.sae.org

2.1.2 AATCC Publication

Available from American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709-2215, Tel: 919-549-8141, www.aatcc.org.

AATCC Evaluation Form 2 (Gray Scale for Staining)

2.1.3 ASTM Publication

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D 747 Standard Test Method for Apparent Bending Modulus of Plastics by Means of a Cantilever Beam

3. NUMBERING SYSTEM

3.1 The Basic Five Characters

This classification establishes alpha-numeric characters for various performance levels of each fiberboard property or characteristic. In specifying or describing fiberboard materials, each line call-out shall include the number SAE J1323, followed by a sequence of alpha-numerics to describe the fiberboard and its properties. The first five alpha-numeric characters of the call-out after SAE J1323 are mandatory, since they identify the material and specify the critical fiberboard properties, thickness, fiberboard type, and dimensional stability.

3.2 Suffix Letters

To further specify or describe the fiberboard, each line call-out may include one or more suffix - alpha-numeric symbols as listed in Section 5. These suffix letters, when appended to the basic number, specify additional physical or mechanical property requirements. Suffix symbols may be used singly or in combination to describe the properties desired in the fiberboard.

3.3 Special Numbers

The numeral 0 is used when the description of any characteristic is not desired. The numeral 9 is used when the description of any characteristic (or test related thereto) is specified by some supplement to this classification system, such as notes on engineering drawings.

3.4 Special Letter

To identify other characteristics not covered by the existing suffix symbols, the letter Z shall be used. The Z characteristics shall be specified in detail on the engineering drawing or other supplement to this classification. If more than one Z characteristic is specified, they should be identified by subnumeral, for example, Z_1, Z_2, Z_3, etc.

3.5 Example

The line call-out SAE J1323 B2A23A1B7C3D9Z would be broken down to indicate the type of fiberboard and properties as in Figure 1:

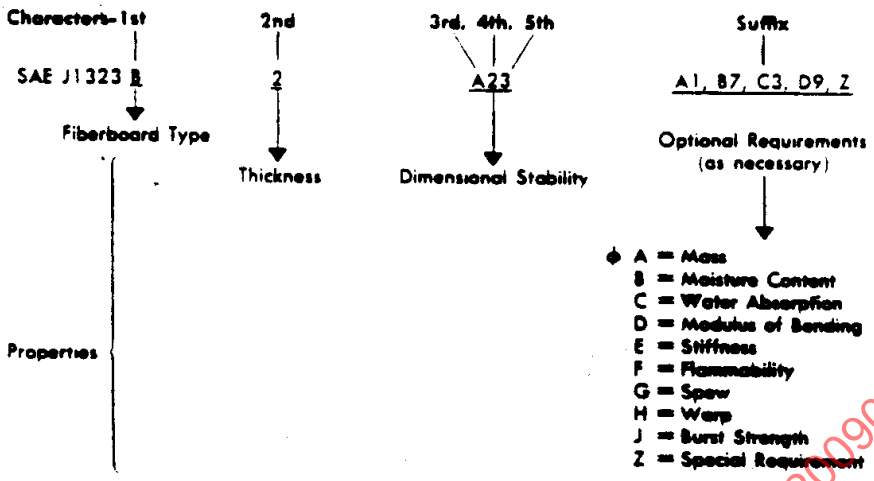

FIGURE 1 - LINE CALL-OUT DETERMINATION

By using the breakdown in Figure 1 and Tables 1 to 4, the example line call-out specifies a hardboard, 2.03 mm thick, with a 0.5% maximum expansion and a 0.75% maximum contraction after humidity exposure. The optional requirements include a weight of 1 kg/m^2 ± 0.05, a moisture content of 5 to 9%, water absorption of 30% maximum, and a special modulus bending requirement.

4. BASIC FIBERBOARD CHARACTERISTICS

Fiberboards identified by this classification system shall have the following three basic characteristics indicated by the first five alpha-numeric symbols.

4.1 Fiberboard Type

The first character of the line call-out specifies the type of fiberboard as defined in SAE J947, and listed in Table 1:

TABLE 1 - FIBERBOARD TYPE DETERMINATION

First Character	Fiberboard Type
A	None Specified
B	Hardboard
C	Paperboard – Laminated
D	Paperboard – Single Ply
E	Paperboard – Wet Machine Board
F	Molded Cellulosic Fiber Pulp Product
G	Kraft Paper
H	Paperboard – Corrugated
Z	Special Requirements, as Necessary

4.2 Thickness

The second character of the line call-out specifies the fiberboard thickness in millimeters as determined in SAE J315, and listed in Table 2. The thickness tolerance for paperboard is ±5% from the average panel thickness; however, the thickness variation within a hardboard panel (in the range of 1.65 to 3.18 mm thick) is ±0.25 mm from the average panel thickness.

TABLE 2 - THICKNESS DESIGNATION

Second Character	G (Paper) mm	D and E (Single Ply Paperboard) mm	C (Laminated Paperboard) mm	B and F (Hardboard or Molded Fiberboard) mm	H (Corrugated Fiberboard(1)) mm
1	0.025	0.25	1.02	1.65	2.26 (E flute)
2	0.051	0.64	1.65	2.03	3.00 (B flute)
3	0.076	0.76	1.78	2.54	4.19 (C flute)
4	0.102	1.02	2.03	3.18	5.13 (A flute)
5	0.127		2.54		
6	0.152		3.05		
7	0.178		3.18		
8	0.203				
9	Special Requirements, as Necessary				

1. The corrugated fiberboard thickness values are based upon the use of 42/1000 ft^2 (195 g/m^2) kraft paper. The flute designations indicate the following construction:
   A flute = 118 ± 10 flutes/m
   B flute = 164 ± 10 flutes/m
   C flute - 138 ± 10 flutes/m
   E flute = 308 ± 13 flutes/m

4.3 Dimensional Stability

The third, fourth, and fifth characters of the line call-out specify the maximum[1] percent expansion and contraction of the fiberboard for both the machine and across-machine direction, as determined in SAE J315, and listed in Tables 3 and 4. The third character denotes the method of test in SAE J315, the fourth character specifies the maximum expansion, and, the fifth character specifies the maximum contraction.

TABLE 3 - DIMENSIONAL STABILITY TEST METHOD DETERMINATION

Third Character	Test Method
A	Method A (humidity)
B	Method B (water immersion)

[1] The maximum dimensional movement on fiberboards will occur in the across-machine direction. Paper and paperboards will usually have only half the dimensional movement in the machine direction, due to linear fiber orientation during manufacture.

TABLE 4 - EXPANSION OR CONTRACTION DESIGNATION

Fourth and Fifth Characters	Expansion or Contraction % max
0	None specified
1	0.25
2	0.50
3	0.75
4	1.0
5	1.5
6	2.0
7	3.0
8	4.0
9	Special Requirement, as Necessary

5. SUPPLEMENTARY CHARACTERISTICS

Additional fiberboard requirements can be included by adding one or more of the following suffixes:

5.1 Suffix Letter A

Mass determined in accordance with SAE J315. Specify the mass in kg/m^2. (See Table 5.) The tolerance unless otherwise specified shall be ±5%.

TABLE 5 - MASS DESIGNATION

Suffix Number	kg/m^2
A1	$1 \pm 0.05\ kg/m^2$
A1.5	$1.5 \pm 0.075\ kg/m^2$
A9	Special Requirement

5.2 Suffix Letter B

Moisture Content determined in accordance with SAE J315. Specify the moisture content in percent with a range of ±2%. (See Table 6.)

TABLE 6 - MOISTURE CONTENT DESIGNATION

Suffix Number	% Moisture Content
B1	0–3
B2	0–4
B3	1–5
B4	2–6
B5	3–7
B6	4–8
B7	5–9
B8	6–10
B9	Special Requirement

5.3 Suffix Letter C

Water Absorption determined in accordance with SAE J315. (See Table 7.)

TABLE 7 - WATER ABSORBTION DESIGNATION

Suffix Number	Water Absorption % max
C1	10 for 2.5 h immersion
C2	20 for 2.5 h immersion
C3	30 for 2.5 h immersion
C4	60 for 2.5 h immersion
C5	10 for 24 h immersion
C6	20 for 24 h immersion
C7	30 for 24 h immersion
C8	60 for 24 h immersion
C9	Special Requirement

5.4 Suffix Letter D

Stiffness (modulus of bending) determined in accordance with SAE J949a. (See Table 8.)

a. First Suffix Number - machine direction stiffness min
b. Second Suffix Number - across-machine direction stiffness min

TABLE 8 - STIFFNESS DESIGNATION (MODULUS OF BENDING)

Suffix Number	Stiffness
D1	350 kPa
D2	700 kPa
D3	2000 kPa
D4	3500 kPa
D5	6000 kPa
D9	Special Requirement

Example: D21 = 700 kPa M.D. min and 350 kPa A.M.D. min

5.5 Suffix Letter E

Stiffness (cantilever beam) determined in accordance with ASTM D 747. (See Table 9.)

a. First Suffix Number - M.D. stiffness min
b. Second Suffix Number - A.M.D. stiffness min

TABLE 9 - STIFFNESS DESIGNATION (CANTILEVER BEAM)

Suffix Number	Stiffness
E1	500 kPa
E2	1000 kPa
E3	1500 kPa
E4	2000 kPa
E9	Special Requirement