~~Designation:F868–91(Reapproved 1997)ε1~~ Designation: F 868 – 02 (Reapproved 2009)

Standard Classification for Laminated Composite Gasket Materials[1]

This standard is issued under the fixed designation F 868; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

~~ε[1] NOTE—Section 11 was corrected editorially in March 1997.~~

1. Scope

1.1 This classification covers a means for specifying or describing pertinent properties of commercial laminate composite gasket materials (LCGM). These structures are composed of two or more chemically different layers of material. These materials may be organic or inorganic, or combinations with various binders or impregnants. Gasket coatings are not covered since details thereof are intended to be given on engineering drawings, or as separate specifications. Commercial materials designated as enveloped gaskets are excluded from this classification; they are covered in Practice F 336.

1.2 Since all of the properties that contribute to gasket performance are not included, use of this classification as a basis for selecting LCGM is limited.

1.3 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

A~~109~~~~Specification for Steel, Strip, Carbon, Cold-Rolled~~ 109/A 109M Specification for Steel, Strip, Carbon (0.25 Maximum Percent), Cold-Rolled

D 2000 Classification System for Rubber Products in Automotive Applications

F 104 Classification System for Nonmetallic Gasket Materials

F 146 Test Methods for Fluid Resistance of Gasket Materials

F 336 Practice for Design and Construction of Nonmetallic Enveloped Gaskets for Corrosive Service

F 433 Practice for Evaluating Thermal Conductivity of Gasket Materials

F 1276 Test Method for Creep Relaxation of Laminated Composite Gasket Materials

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *board*—the term board is used in the context of a thick (generally greater than 1.52 mm (0.060 in.)) and rigid nonmetallic material often purchased in sheet or strip form.

3.1.2 *composite gasket material*—a gasket structure composed of two or more different materials joined together in flat, parallel layers.

4. Significance and Use

4.1 This classification is intended to encourage uniformity in reporting properties; to provide a common language for communications between producers and users; to guide engineers and designers in the use, construction, and properties of commercially available materials; and to be versatile enough to cover new materials and test methods as they are introduced.

5. Basis of Classification

5.1 This classification is based on the principle that LCGM should be described, insofar as possible, in terms of use,

[1] This classification is under the jurisdiction of ASTM Committee ~~F-3 on Gaskets and is the direct responsibility of Subcommittee F03.10 on Composite Gaskets.~~ ~~Current edition approved Aug. 15, 1991. Published October 1991. Originally published as F868–84. Last previous edition F868–88.~~F03 on Gaskets and is the direct responsibility of Subcommittee F03.30 on Classification.

Current edition approved May 1, 2009. Published May 2009. Originally approved in 1984. Last previous edition approved in 2002 as F 868 – 02.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* ~~, Vol 01.03.~~volume information, refer to the standard's Document Summary page on the ASTM website.

composition, combining method, and specific physical and mechanical characteristics. Thus, users of gasket materials can, by selecting different combinations of materials and properties, define various parts. Suppliers, likewise, can report uses, composition, and properties of available products.

6. Numbering System

6.1 To permit line call-out of the description mentioned in 5.1, this classification establishes letter or number symbols to describe use, composition, and physical properties and performance levels of certain properties.

6.2 In specifying or describing gasket materials, each line call-out shall include the number of this system and a number and letter series describing the use, composition, and combining method plus suffix call-out, as shown in Table 1.

6.3 To further specify or describe gasket materials, each line call-out may include one or more suffix letter-numeral symbols, as listed in Table 2.

7. Physical and Mechanical Properties

7.1 Gasket materials identified by this classification shall have a number and letter call-out for end-use and construction indicated in Table 1 and additional properties by a letter-numeral call-out shown in Table 2.

8. Thickness Requirements

8.1 Gasket materials identified by this classification shall conform to the thickness specified on the gasket drawing or on the order.

8.2 The thickness of individual components of the composite may be specified on the drawing, where necessary, and where components can be measured.

9. Sampling

9.1 Specimens shall be selected from finished gaskets or sheets of suitable size, whichever is the more practicable. If finished gaskets are used, the dimensions of sample and any variations from method must be reported.

9.2 Sufficient specimens shall be selected to provide a minimum of three determinations for each test specified. The average of the determinations shall be considered as the result.

10. Conditioning

10.1 Prior to all tests, specimens shall be conditioned as follows:

10.1.1 When all Classification F 104 layers of the composite are of the same "type," condition per that type.

10.1.2 When the layers of the composite are of different Classification F 104 "types," the composite shall be conditioned 22 h in a controlled humidity room, or in a closed chamber containing air at 21 to 30°C (70 to 86°F) and 50 to 55 % relative humidity.

10.1.3 Other conditioning may be used as agreed upon between producer and user.

11. Test Methods

11.1 The test methods are indicated in Table 2 ~~under each suffix symbol when appropriate.~~ under each suffix symbol when

TABLE 1 Basis of Classification

First digit Typical end-use	Letter group Composition (Component material)	Second digit Combining method
0. Not specified	N. Not specified	0. Not specified
1. Carburetor, engine	B. Board	1. Tanged perforation
2. Intake manifold, engine	M. Metal	2. Chemical bond
3. Exhaust manifold, engine	F. Classification F 104 material	3. Tanged perforation plus chemical bond
4. Cylinder head, engine	R. Rubber Classification D 2000	4. Grommets
5. Transmission, engine	P. Plastics	5. Overlap
6. Ducts and piping	T. Textiles	6. Bonded and vulcanized
7. Compressors	S. As specified	9. As specified
9. As specified		
	Suffix designation Any specific test requirement Letters represent types of tests Numbers represent values	

NOTE—This classification is intended to be open-ended with a two-digit plus letter group call-out. The letters in the group for a given composite gasket material will be those representing the layers in order.

Example: 4 FMF1; F = F112440; M = Specification A 109