



## Designation: **F868–02 (Reapproved 2009) F868 – 17**

# Standard Classification for Laminated Composite Gasket Materials<sup>1</sup>

This standard is issued under the fixed designation F868; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 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 [F336](#). This classification system does not cover multilayer steel (MLS) gaskets currently used for some automotive exhaust and head gaskets. MLS gaskets are classified under Classification [F2325](#).

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.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

[A109/A109M Specification for Steel, Strip, Carbon \(0.25 Maximum Percent\), Cold-Rolled](#)

[D2000 Classification System for Rubber Products in Automotive Applications](#)

[F104 Classification System for Nonmetallic Gasket Materials](#)

[F146 Test Methods for Fluid Resistance of Gasket Materials](#)

[F336 Practice for Design and Construction of Nonmetallic Enveloped Gaskets for Corrosive Service](#)

[F433 Practice for Evaluating Thermal Conductivity of Gasket Materials](#)

[F1276 Test Method for Creep Relaxation of Laminated Composite Gasket Materials](#)

[F2325 Classification for Multi-Layer Steel \(MLS\) and Other Metal Layer Gaskets for Transportation Applications](#)

## 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.

<sup>1</sup> This classification is under the jurisdiction of ASTM Committee [F03](#) on Gaskets and is the direct responsibility of Subcommittee [F03.30](#) on Classification.

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<sup>2</sup> 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* volume information, refer to the standard's Document Summary page on the ASTM website.

**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, 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.

**TABLE 1 Basis of Classification**

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

