



<b>SURFACE VEHICLE RECOMMENDED PRACTICE</b>	<b>J866™</b>	<b>MAR2019</b>
	Issued 1964-03 Revised 2012-07 Stabilized 2019-03  Superseding J866 JUL2012	
<b>Friction Coefficient Identification and Environmental Marking System for Brake Linings</b>		

RATIONALE

Proposal is to stabilize the document as it is up for Five-Year Review, no changes are required, and it represents marking requirements as specified by California and Washington state law for brake pad copper content. Discussions with WA Dept. of Ecology and CA Dept. of Toxic Substances control have confirmed agreement with stabilizing the SAE J866 standard.

STABILIZED NOTICE

This document has been declared "Stabilized" by the SAE Brake Linings Standards Committee and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

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## 1. SCOPE

This SAE Recommended Practice is intended to provide a uniform means of identification which may be used to classify the friction coefficient of brake linings, based on data obtained from tests conducted in accordance with SAE J661 Brake Lining Quality Test Procedure and SAE J2975 Measurement of Copper and other elements in Brake Friction Materials.

NOTE: It is emphasized that this document does not establish friction requirements for brake linings, nor does it designate significant characteristics of brake linings which must be considered in overall brake performance. Due to other factors that include brake system design and operating environment, the friction codes obtained from this document cannot reliably be used to predict brake system performance.

## 2. REFERENCES

### 2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue 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](http://www.sae.org).

SAE J661 Brake Lining Quality Test Procedure

SAE J2975 Measurement of Copper and Other Elements in Brake Friction Materials

### 3. CODING

The required code will consist of two parts. The first part is the friction coefficient as determined from Table 1 when tested according to SAE J661. The second part is environmental markings of section 4. The environmental markings are to be the last characters in the edge code string with no additional alpha or numeric characters following.

It is recommended that all markings be separated by a space, dash, dot or reasonable facsimile between characters for clarity.

**Example:** FF B16 indicates a material with normal and hot friction coefficient over 0.35 but not over 0.45 per SAE J661, meeting the limits for a “B” designation of Table 2 when measured per SAE J2975, and manufactured in 2016

A complete edge code including company ID, formulation, friction coefficient, (optional) batch code and environmental markings would resemble the following example: SCB 115 FF 1660 B16

SCB: Company Assigned ID (Not less than two (2) characters)

115: Formulation Identification

FF: Hot and cold friction coefficient (Required per SAE J661)

1660: Material produced on the 60<sup>th</sup> day of 2016. (The batch code is optional and up to the discretion of the manufacturer as long as it does not conflict with the environmental markings.)

B16: Material meeting the limits for a “B” designation of Table 2 when measured per SAE J2975, and manufactured in 2016 (Required per SAE J866 and must be located at the end of the markings)

The two letters reflecting the friction coefficients are as follows:

TABLE 1 - FRICTION COEFFICIENT CODING

Code Letter	Friction Coefficient
C	Not over 0.15
D	Over 0.15 but not over 0.25
E	Over 0.25 but not over 0.35
F	Over 0.35 but not over 0.45
G	Over 0.45 but not over 0.55
H	Over 0.55
Z	Unclassified

3.1 The first letter will represent normal friction coefficient and the second will represent hot friction coefficient.

3.2 Normal Friction Coefficient

Normal friction coefficient is defined as the average of 4 points on the second fade curve, located at 93 °C (200 °F), 121 °C (250 °F), 149 °C (300 °F), and 204 °C (400 °F).

### 3.3 Hot Friction Coefficient

Hot friction coefficient is defined as the average of 10 points located at 204 °C (400 °F) and 149 °C (300 °F) on the first recovery; 232 °C (450 °F), 280 °C (500 °F), 288 °C (550 °F), 316 °C (600 °F), and 343 °C (650 °F) on the second fade; and 280 °C (500 °F), 204 °C (400 °F), and 149 °C (300 °F) on the second recovery.

NOTE: If any temperature point or points required to calculate friction coefficients are not reached in the prescribed time limit, the coefficient of friction value at 10 min shall be used to give the full number of points required.

### 3.4 Example

A lining having a normal friction coefficient of 0.29 and a hot friction coefficient of 0.40 would be coded "EF".

### 3.5 Location of Code

The appropriate code designation will be marked on an external noncontacting surface in letters not less than 2.8 mm in height where a brake lining is 3.2 mm or greater in thickness, or no more than 0.4 mm less than the thickness where the brake lining thickness is less than 3.2 mm.

## 4. ENVIRONMENTAL MARKINGS

The environmental markings will be used by manufacturers to designate content of various regulated materials and their concentrations. Marking requirements and locations of Section 3 shall apply.

### 4.1 Marking Contents

The markings will consist of a mark or marks denoting material concentration followed by the two digit year of manufacture.

### 4.2 Marking Criteria

#### 4.2.1 "A" Designated Material

An "A+Year" designated material is a material which contains concentrations below the requirements for heavy metals and asbestiform fibers listed below when tested according to SAE J2975. See Table 2.

#### 4.2.2 "B" Designated Material

A "B+Year" designated material is a material, which meets "A" requirements above and has concentrations in the range of greater than 0.5% to a maximum of 5% copper content by weight when measured according to SAE J2975. See Table 2.

### 4.2.3 “N” Designated Material

A “N+Year” designated material is a material, which meets “A” requirements above and also contains 0.5% or lower copper content by weight when measured according to SAE J2975. See Table 2.

TABLE 2 - PERCENT BY WEIGHT LIMITS PER MATERIAL DESIGNATION

Chemical element	“A” material	“B” material	“N” material
Cadmium and its compounds	0.01	0.01	0.01
Chromium (VI)-salts	0.1	0.1	0.1
Lead and its compounds	0.1	0.1	0.1
Mercury and its compounds	0.1	0.1	0.1
Asbestiform fibers	0.1	0.1	0.1
Copper and its compounds	n.a.	>0.5 to 5.0	0.5

Examples: “A15” material manufactured in 2015 and meets the “A” material designation  
 “B16” material manufactured in 2016 and meets the “B” material designation  
 “N17” material manufactured in 2017 and meets the “N” material designation

## 5. NOTES

### 5.1 Marginal Indicia

A change bar (I) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this document. An (R) symbol to the left of the document title indicates a complete revision of the document, including technical revisions. Change bars and (R) are not used in original publications, nor in documents that contain editorial changes only.

PREPARED BY THE SAE BRAKE LININGS STANDARDS COMMITTEE