



SURFACE VEHICLE STANDARD

J2558™

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Classification System for Thermoplastic Elastomers

RATIONALE

Routine review to update for current industry trends.

1. SCOPE

This SAE Standard provides a system for specifying significant material properties of thermoplastic elastomers (TPEs) that are intended for, but not limited to, use in automotive applications.

NOTE 1: For the purposes of this document a TPE is defined as a polymeric material that, without further chemical modifications, is capable of recovering from deformations quickly and forcibly and is also capable of being repeatedly softened by heating and hardened by cooling within a temperature range characteristic of the material.

NOTE 2: When the TPE product is to be used for purposes where the requirements are too specific to be completely prescribed by this classification system, it is necessary for the purchaser to consult the supplier in advance to establish the appropriate properties, test methods, and specification test limits.

In all cases where provisions of this classification system would conflict with those of the detailed specifications for a particular product, the latter shall take precedence.

This classification is based on SI units.

1.1 Purpose

The purpose of this classification system is to provide a method by which TPEs may be specified by the use of a simple line call-out designation. To allow line call-outs, the system includes a symbol for the type of TPE to be used and letters and numbers for each level of property or characteristic.

EXAMPLE: A thermoplastic vulcanizate might be specified as follows: SAE J2558 TPV (A35445, BS2440, DA55, EL290, G15, SGA970, TS4).

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Documents

Document Sharing Hub

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 version 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 +1 724-776-4970 (outside USA), www.sae.org.

SAE J369	Flammability of Polymeric Interior Materials - Horizontal Test Method
SAE J1545	Instrumental Color Difference Measurement for Exterior Finishes, Textiles, and Colored Trim
SAE J1756	Determination of the Fogging Characteristics of Interior Automotive Materials
SAE J2412	Accelerated Exposure of Automotive Interior Trim Components Using a Controlled Irradiance Water Cooled Xenon-Arc Apparatus
SAE J2527	Accelerated Exposure of Automotive Exterior Materials Using a Controlled Irradiance Water-Cooled Xenon Arc Apparatus

2.1.2 FMVSS Publication

Available from the United States Government Printing Office, 732 North Capitol Street, NW, Washington, DC 20401, Tel: 202-512-1800, www.gpo.gov.

FMVSS 302	Flammability of Interior Materials - Passenger Car, Multi-Purpose Passenger Vehicles
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2.1.3 ISO Publications

Copies of these documents are available online at <https://webstore.ansi.org/>.

ISO 34	Rubber, vulcanized - Determination of tear strength (trouser, angle and crescent test pieces)
ISO 37	Rubber, vulcanized or thermoplastic - Determination of tensile stress-strain properties
ISO 188	Rubber, vulcanized - Accelerated aging or heat resistance tests
ISO 812	Rubber, vulcanized - Determination of low-temperature brittleness
ISO 815	Rubber, vulcanized or thermoplastic - Determination of compression set at ambient, elevated or low temperature
ISO 868	Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness)
ISO 1183	Plastics - Methods for determining the density and relative density of non-cellular plastics
ISO 1431-1	Rubber, vulcanized or thermoplastic - Resistance to ozone cracking - Part 1: Static strain test
ISO 1817	Rubber, vulcanized - Determination of the effect of liquids
ISO 3384	Rubber, vulcanized - Determination of stress relaxation in compression at ambient and at elevated temperatures

ISO 3795 Road vehicles, and tractors and machinery for agriculture and forestry - Determination of burning behaviour of interior materials

ISO 3865 Rubber, vulcanized or thermoplastic - Methods of test for staining in contact with organic material third edition

ISO 8013 Rubber, vulcanized - Determination of creep in compression or shear

2.1.4 AATCC Publication

Available from American Association of Textile Chemists and Colorists, 1 Davis Drive, P.O. Box 12215, Research Triangle Park, NC 27709-2215, Tel: +1 919-549-8141, <https://www.aatcc.org/>.

AATCC Evaluation Procedure 1—Gray Scale Color Change

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 UL Publication

Available from UL, 333 Pfingsten Road, Northbrook, IL 60062-2096, Tel: 847-272-8800, www.ul.com.

UL-94 Test for Flammability of Plastic Materials for Parts, Devices, and Appliances

3. GENERAL CLASSIFICATION

TPEs shall be identified by a symbol following the SAE J2558 specification number based on family type as found in Table 1.

Table 1 - Symbols for TPE families

Symbol	TPE Family Name
TECEA	Thermoplastic Elastomer - Chlorinated Ethylene Alloy
TEEE	Thermoplastic Elastomer, Ether-Ester
TES	Thermoplastic Elastomer Styrenic
TPO	Thermoplastic Polyolefin
TPV	Thermoplastic Vulcanizate
TPU	Thermoplastic Polyurethane

NOTE: TPV is a dynamically vulcanized alloy consisting mostly of fully cured thermoset rubber particles encapsulated in a thermoplastic matrix.

4. COMPOUND PROPERTIES

4.1 Suffix Letters

The suffix letters, which indicate additional tests, together with their meaning, appear in Table 2.

Table 2 - Meaning of suffix letters

Suffix Letter	Test Required
A	Heat Resistance
B	Compression Set Resistance
C	Ozone Resistance
D	Hardness
EA	Fluid Resistance (Aqueous)
EF	Fluid Resistance (Fuels)
EO	Fluid Resistance (Oils and Lubricants)
EL	Elongation
F	Low Temperature Resistance
G	Tear Resistance
H	Fogging Characteristics
J	Abrasion Resistance
M	Flammability Resistance
P	Staining Resistance
SR	Stress Relaxation
SG	Specific Gravity
T	Creep Resistance
TM	Tensile Stress at a Given Elongation
TS	Tensile Strength
WE	UV Resistance (Exterior)
WI	UV Resistance (Interior)
X	Bonding Strength for Overmold Applications
Z	Special Requirements

4.2 Heat Resistance (Suffix Letter A)

As determined by ISO 188. The first digit following the suffix letter A, in Table 3, shall designate the test time. The second digit following the suffix letter A, in Table 3, shall designate the test temperature.

Table 3 - Heat resistance suffix number designations

1st Digit	Time (hours)	2nd Digit	Temperature (°C)
1	22	1	23
2	70	2	70
3	168	3	100
4	1008	4	125
		5	135
		6	150

