



Standard Practice for Thermoplastic Elastomers—Terminology and Abbreviations¹

This standard is issued under the fixed designation D 5538; 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.

INTRODUCTION

During the past decade the use of special rubber-like polymers, designated as thermoplastic elastomers, has increased both in volume and in commercial importance. The number of unique polymers classified as thermoplastic elastomers that have been brought to commercial acceptance has also grown. (As explained below, these types of rubber-like polymers cannot be accommodated by the systematic nomenclature approach of the existing Practice D 1418.)

Practice D 1418 was initially published in 1956 with a systematic nomenclature procedure based on the chemical structure of the polymer. An attempt to incorporate the new thermoplastic elastomers into the nomenclature scheme of Practice D 1418 produces two serious problems: (1) the abbreviations and acronyms are not the same as the well established abbreviations and acronyms used for the new thermoplastic elastomers by the various producers of these polymers, and (2) the attempt generates a very cumbersome terminology system. Therefore it is necessary to depart from the systematic approach of Practice D 1418.

To avoid the confusion of attempting to revise Practice D 1418 and have conflicting nomenclature and abbreviation designation procedures in the same practice, this new practice devoted exclusively to thermoplastic elastomers is being published.

1. Scope

1.1 The purpose of this practice is to provide a uniform, consensus nomenclature approach for thermoplastic elastomers. This compilation is intended to accommodate and supplement any existing trade names and trademarks.

1.2 No attempt is made to develop an exclusively systematic process for nomenclature and abbreviations.

1.3 In technical papers and other technical or trade literature the full name of the thermoplastic elastomer should be given at its first appearance in the document along with its abbreviation in parentheses. In all subsequent references to the thermoplastic elastomer, the abbreviation may be given.

2. Referenced Documents

2.1 ASTM Standards:

D 1418 Practice for Rubber and Rubber Latices—Nomenclature²

D 1566 Terminology Relating to Rubber²

2.2 Other standards not specifically referenced in this document are important for a full appreciation of the use of thermoplastic elastomer abbreviations and terminology. They are listed in an appendix to this practice.

¹ This practice is under the jurisdiction of ASTM Committee D-11 on Rubber and is the direct responsibility of Subcommittee D11.08 on Terminology.

Current edition approved Nov. 10, 1998. Published December 1998. Originally published as D 5538-94. Last previous edition D 5538-94.

² Annual Book of ASTM Standards, Vol 09.01.

PART A—TERMINOLOGY

3. Terminology Definitions

3.1 *TPE (thermoplastic elastomer)*—the acronym or abbreviation, TPE, occupies a special place as a generic abbreviation term for all of the *thermoplastic elastomers* currently in use.

3.1.1 *Discussion*—Although the definitions given in 3.2, 3.3 and 3.4 also appear in Terminology D 1566, they are also given here for completeness of information in this practice.

3.2 *thermoplastic elastomer (TPE)*—a diverse family of rubber-like materials that, unlike conventional rubbers, can be processed and recycled like thermoplastic materials.

3.3 *thermoplastic vulcanizate (TPV)*—a thermoplastic elastomer with a chemically crosslinked rubbery phase, produced by dynamic vulcanization.

3.4 *dynamic vulcanization*—the process of intimate melt mixing a thermoplastic polymer with a suitable reactive rubbery polymer to generate a thermoplastic elastomer with chemically crosslinked rubbery phase, resulting in properties closer to those of a thermoset rubber when compared to the same uncrosslinked composition.

3.5 Other Term:

3.5.1 *alloy*—a unique composition of two or more polymers that has one or more of the polymers treated or processed in a special way to confer enhanced performance characteristics on the resulting material.

PART B—ABBREVIATIONS

4. Abbreviated Designations

FCEA—fully crosslinked elastomeric alloy
PEBA—thermoplastic elastomer, polyether block amide
SBS—styrene butadiene styrene block copolymer
SEBS—styrene ethylene/butylene styrene block copolymer
SEPS—styrene ethylene/propylene styrene block copolymer
SIS—styrene isoprene styrene block copolymer

TECEA—thermoplastic elastomer, chlorinated ethylene alloy

TEEE—thermoplastic elastomer, ether-ester
TEO—thermoplastic elastomer, olefinic
TES—thermoplastic elastomer, styrenic
TPU—thermoplastic polyurethane
TPV—thermoplastic vulcanizate

APPENDIX

(Nonmandatory Information)

X1. IMPORTANT STANDARDS FOR POTENTIAL REFERENCE FOR TPE NOMENCLATURE

ASTM Standards:

D 883 Terminology Relating to Plastics³
D 1600 Terminology of Abbreviated Terms Relating to Plastics³
D 4000 Classification System for Specifying Plastic Materials⁴
D 4474 Specification for Styrenic Thermoplastic Elastomer Injection Molding and Extrusion Materials (TES)⁵

D 4550 Specification for Thermoplastic Elastomer-Ether-Ester (TEEE)⁵
D 5021 Specification for Thermoplastic Elastomer—Chlorinated Ethylene Alloy (TECEA)⁵
D 5046 Specification for Fully Crosslinked Elastomeric Alloy (FCEA)⁵
D 5476 Classification for Thermoplastic Polyurethane Materials⁵
D 5593 Classification System for Thermoplastic Elastomers - Olefinic (TEO)⁵

³ Annual Book of ASTM Standards, Vol 08.01.

⁴ Annual Book of ASTM Standards, Vol 08.02.

⁵ Annual Book of ASTM Standards, Vol 08.03.

The American Society for Testing and Materials takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, 100 Barr Harbor Drive, West Conshohocken, PA 19428.