



Standard Specification for Rubber Latex Products for Automotive Applications¹

This standard is issued under the fixed designation D 1764; 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.

1. Scope

1.1 This specification covers dipped goods and coatings made from compounded latex. Products manufactured from this material include boots, coated clips, coated sponge parts, and coated fabrics for automotive applications.

1.2 The compounds listed in Table 1 and Table 2 are grouped in classifications based primarily on physical properties, which are prescribed in the tables. These values, together with any additional requirements indicated by suffix letters in the grade designations as described in Section 2, define the properties of the compounds after vulcanization. These values apply to test specimens obtained from standard laboratory-dipped films prepared in accordance with procedures described in the applicable ASTM methods. **Test results from finished products may not duplicate the values obtained from standard test films.** When differences due to the difficulty in obtaining suitable test specimens from the finished part arise, the purchaser and the supplier may agree on acceptable deviations. This can be done by comparing results obtained on standard test films with those obtained on actual parts.

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

2. Referenced Documents

2.1 ASTM Standards:

D 412 Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers—Tension²

D 471 Test Method for Rubber Property—Effect of Liquids²

D 573 Test Method for Rubber—Deterioration in an Air Oven²

D 746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact³

D 925 Test Methods for Rubber Property—Staining of Surfaces (Contact, Migration, and Diffusion)²

D 2240 Test Method for Rubber Property—Durometer Hardness²

¹ This specification is under the jurisdiction of ASTM Committee D-11 on Rubber and is the direct responsibility of Subcommittee D11.30 on Classification of Rubber Compounds.

Current edition approved Feb. 10, 1997. Published March 1997. Originally published as D 1764 – 60. Last previous edition D 1764 – 91.

² Annual Book of ASTM Standards, Vol 09.01.

³ Annual Book of ASTM Standards, Vol 08.01.

TABLE 1 Physical Requirements of Type LR Compounds, Non-Oil Resistant

	Grade No. LR420
Durometer hardness, points	45 ± 5
Tensile strength, min, MPa (psi)	14.0 (2000)
Ultimate elongation, min, %	500
Heat aged 70 h at 70°C (158°F)	
Change in durometer hardness, max	±5
Tensile strength, min, MPa (psi)	10.5 (1500)
Ultimate elongation, min, %	400
Permanent set, max at 400 % elongation, %	10

D 5964 Practice for Rubber IRM 902 and IRM 903 Replacement Oils for ASTM No. 2 and ASTM No. 3 Oils²

3. Types, Classes, and Grades of Compounds

3.1 *Types*—This specification covers two types of compounds designated by the prefix letters *LR* and *LS*, as follows:

3.1.1 *Type LR*—Compounds made from natural rubber, synthetic rubber, or rubber-like materials, alone or in combination, for services where specific resistance to the action of petroleum-base fluids is not required.

3.1.2 *Type LS*—Compounds made from synthetic rubber or rubber-like materials for services where specific resistance to the action of petroleum-base fluids is required.

TABLE 2 Physical Requirements of Type LS Compounds, Class LSC, Oil Resistant

	Grade No. LSC515
Basic requirements:	
Durometer hardness, points	55 ± 5
Tensile strength, min, MPa (psi)	10.5 (1500)
Ultimate elongation, min, %	400
Oil immersion 22 h at 100°C (212°F)— ASTM Oil No. 2: ⁵	80
Volume change, max, %	
Heat aged 70 h at 100°C (212°F)	+ 10
Change in durometer hardness, max	8.5 (1200)
Tensile strength, min, MPa (psi)	300
Ultimate elongation, min, %	20
Permanent set, max at 300 % elongation, %	
Added requirements:	50
Suffix E2, 22 h at 100°C (212°F) in ASTM Oil No. 2: ⁵	
Volume change, max, %	

3.2 *Classes*—Type *LR* compounds are of one class only. Type *LS* compounds are divided into two classes, *LSB*⁴ and *LSC*, as follows:

3.2.1 *Class LSB*—Compounds made from synthetic rubber or rubber-like materials having low volume swell in low aniline point oils⁵.

3.2.2 *Class LSC*—Compounds made from synthetic rubber or rubber-like materials having medium volume swell in low aniline point oils.

3.3 *Grades*—Each class of the compounds may have a number of different grades, each having different physical properties. The grade shall be designated by a grade number following the prefix letters and, when necessary, by suffix letters after the grade number.

3.4 *Suffix Letters* may be added singly or in combination after any grade number to indicate additional requirements beyond those specified in the tables as basic requirements for that particular grade. **If no value for the suffix letter requirement is specified in the table, or when no method of test is provided, agreement as to the required value and method of test must be arranged between the purchaser and the supplier.**

SIGNIFICANCE OF SUFFIX LETTERS

Suffix Letters

C1—Ozone Resistance
E2—Oil Resistance—ASTM Oil No. 2⁵
F1—Low-Temperature Brittleness at - 40°C (-40°F)
G—Tear Resistance
H—Flex Resistance
K1—Adhesion to Metal (Bond made during vulcanization)
K2—Adhesion (Cemented bond made after vulcanization)

⁴ No tables have been established for this class. This will be done at a later date when values become available.

⁵ ASTM Oil No. 2 has been replaced by IRM 902 Oil under D5964, Practice for Rubber, IRM 902 and IRM 903, Replacement Oils for ASTM No. 2 and No. 3 Oils in Test Method D 471.

Direct substitutability of IRM 902 for ASTM No. 2 Oil has not been established, as swelling characteristics may differ and affect compound classification.

P—Nonstaining
Z—Special Requirements

4. Workmanship, Finish, and Appearance

4.1 All materials and workmanship shall be in accordance with good commercial practice, and the resulting product shall be free of bubbles, voids, foreign matter, or other defects affecting serviceability.

4.2 Unless otherwise specified, these compounds shall be black and free from objectionable bloom.

5. Test Methods

5.1 Determine the properties enumerated in these specifications in accordance with the following methods, except as modified in accordance with certain provisions stated herein. All exposure periods and temperatures prescribed in Table 1 and Table 2 shall be given precedence over those specified in the ASTM methods:

5.1.1 *Standard Test Film Preparation*—Prepare standard test films using procedures (coagulation, leach, dry, and cure) identical to the preparation of production parts except thickness, which shall be 0.63 to 0.75 mm (0.025 to 0.030 in.).

5.1.2 *Durometer Hardness*—Test Method D 2240, except plied up thickness of test specimen shall be between 4.5 and 6.3 mm (0.175 and 0.250 in.).

5.1.3 *Tensile Strength, Elongation, and Tension Set*—Test Methods D 412, using Die C. Film thickness shall be 0.63 to 0.75 mm (0.025 to 0.030 in.).

5.1.4 *Immersion, Including Suffix E2*—Test Method D 471.

5.1.5 *Heat Aging*—Test Method D 573.

5.1.6 *Low-Temperature Brittleness, Suffix F1*—Test Method D 746, except specimen thickness shall be 0.63 to 0.75 mm (0.025 to 0.030 in.).

5.1.7 *Nonstaining, Suffix P*—Test Methods D 925.

6. Sampling and Inspection

6.1 A lot, unless otherwise specified, shall consist of all products of the same composition and same grade submitted for inspection at the same time.

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.