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400 Commonwealth Drive, Warrendale, PA 15096-0001

SURFACE VEHICLE STANDARD

SAE J19

REV. AUG1997

Issued 1960-09
Revised 1997-08

Superseding J19 JAN85

An American National Standard

(R) Latex-Dipped Goods and Coatings for Automotive Applications

1. Scope

1.1 These specifications cover 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 Tables 1 and 2 are grouped into 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 3, 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 test 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.

TABLE 1—PHYSICAL REQUIREMENTS OF TYPE LR COMPOUNDS, NON-OIL RESISTANT

CHARACTERISTIC	REQUIREMENT
Grade Number	LR 420
Durometer Hardness	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 points	±5
Tensile Strength, Min MPa (psi)	10.5 (1500)
Ultimate Elongation, Min %	400
Permanent Set at 400% Elongation, Max %	10

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TABLE 2—PHYSICAL REQUIREMENTS OF TYPE LS COMPOUNDS, CLASS LSC, OIL RESISTANT

CHARACTERISTIC	REQUIREMENT
Grade Number	LSC 515
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, Volume Change, Max %	80
Heat Aged 70 h at 100 °C (212 °F)	
Change in Durometer Hardness, Max Points	+10
Tensile Strength, Min MPa (psi)	8.5 (1200)
Ultimate Elongation, Min %	300
Permanent Set at 300% Elongation, Max %	20
Added Requirements	
Suffix E2, 22 h at 100 °C (212 °F) in ASTM Oil	
No. 2, Volume Change, Max %	50

2. References

2.1 Applicable Publications—The following publications form a part of this specification to the extent specified herein.

2.1.1 ASTM PUBLICATIONS—Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 412—Tests for Rubber Properties in Tension
ASTM D 471—Test for Rubber Property—Effect of Liquids
ASTM D 573—Test for Rubber Deterioration in an Air Oven
ASTM D 925—Test for Rubber Property—Staining of Surfaces (Contact, Migration, and Diffusion)
ASTM D 2137—Test for Rubber Property—Brittleness Point of Flexible Polymers and Coated Fabrics
ASTM D 2240—Test for Rubber Property—Durometer Hardness

3. Types, Classes, and Grades of Compounds

3.1 Types—These specifications cover 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 rubberlike 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 rubberlike materials for services where specific resistance to the action of petroleum-base fluids is required.

3.2 Classes—Type LR compounds are of one class only. Type LS compounds were divided into two classes, LSB and LSC. Class LSB has since been deleted.

3.2.1 CLASS LSC—Compounds made from synthetic rubber or rubberlike materials having medium volume swell in low aniline point oils.

3.3 Grades—Each 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—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 requirements 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. See Table 3.

TABLE 3—SUFFIX LETTERS AND TEST REQUIRED

Suffix Letters	Test Required
C1	Ozone Resistance
E2	Oil Resistance—ASTM Oil No. 2
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
P	Nonstaining
Z	Special Requirements

4. Materials and Workmanship—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.

5. Color—Unless otherwise specified, these compounds shall be black and free from objectionable bloom.

6. Methods of Testing—The properties enumerated in these specifications shall be determined in accordance with the following methods of the American Society for Testing and Materials, except as modified in accordance with certain provisions stated herein. All exposure periods and temperatures prescribed in Tables 1 and 2 shall be given preference over those specified in the ASTM methods (latest issue).

6.1 Standard Test Film Preparation—Standard test films shall be prepared 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).

6.2 Durometer Hardness—ASTM D 2240, Test for Rubber Property—Durometer Hardness, (Type A), except plied up thickness of test specimen to be between 4.5 and 6.3 mm (0.175 and 0.250 in).

6.3 Tensile Strength, Elongation, and Tension Set—ASTM D 412, Tests for Rubber Properties in Tension, using Die C. Film thickness to be 0.63 to 0.75 mm (0.025 to 0.030 in).

6.4 Immersion, Including Suffix E2—ASTM D 471, Test for Rubber Property—Effect of Liquids.

6.5 Heat Aging—ASTM D 573, Test for Rubber Deterioration in an Air Oven.

6.6 Low-Temperature Brittleness—Suffix F1—ASTM D 2137, nonbrittle after 3 min at –40 °C except specimen thickness to be 0.63 to 0.75 mm (0.025 to 0.030 in).

6.7 **Non-Staining, Suffix P—**ASTM D 925, Tests for Rubber Property—Staining of Surfaces (Contact, Migration, and Diffusion).

7. Sampling and Inspection

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

7.2 Sampling and inspection of the material shall be agreed upon by the purchaser and the supplier as part of the purchase contract.

8. Notes

8.1 **Marginal Indicia—**The change bar (l) located in the left margin is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. An (R) symbol to the left of the document title indicates a complete revision of the report.

PREPARED BY THE SAE COMMITTEE ON AUTOMOTIVE RUBBER SPECIFICATIONS