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Standard Specification for Natural Rubber (NR) Technical Grades[1]

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This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This specification covers minimum physical and chemical quality requirements or specifications for five grades of raw natural rubber.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1278 Test Methods for Rubber from Natural Sources—Chemical Analysis

D1485 Practice for Rubber from Natural Sources—Sampling and Sample Preparation

D1646 Test Methods for Rubber—Viscosity, Stress Relaxation, and Pre-Vulcanization Characteristics (Mooney Viscometer)

D3157 Test Method for Rubber from Natural Sources—Color

D3194 Test Method for Rubber From Natural Sources—Plasticity Retention Index (PRI)

D3533 Test Method for Rubber—Nitrogen Content (Withdrawn 2006)[3]

3. Detailed Requirements for Grades

3.1 The rubber shall conform to the requirements in Table 1.

3.2 Any rubber not meeting all the requirements for one of the five grades in Table 1 cannot be considered a technically graded rubber.

4. Significance and Use

4.1 The general end-use quality of manufactured rubber products depends on the physical and chemical properties of the rubber.

5. Classification

5.1 *Types*—Table 1 covers the physical and chemical requirements for five grades of natural rubber: Grades L, CV, 5, 10, and 20.

6. Sampling

6.1 The sampling and sample preparation shall be in accordance with Practice D1485.

7. Test Methods

7.1 Determine the properties enumerated in this specification in accordance with Test Methods D1278, D3533, D3194, D3157, and D1646.

8. Keywords

8.1 natural rubber (NR); technical grade

[1] This specification is under the jurisdiction of ASTM Committee D11 on Rubber and is the direct responsibility of Subcommittee D11.22 on Natural Rubber.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] The last approved version of this historical standard is referenced on www.astm.org.

TABLE 1 Specifications For Technically Graded Natural Rubber

Property	Rubber Grade[A]				
	Grade L	Grade CV[B]	Grade 5	Grade 10	Grade 20
Dirt, retained on 45 µm sieve, % max	0.050	0.050	0.050	0.100	0.200
Ash, % max	0.60	0.60	0.60	0.75	1.00
Volatile matter, % max	0.80	0.80	0.80	0.80	0.80
Nitrogen, % max	0.60	0.60	0.60	0.60	0.60
Initial plasticity, min	30	...	30	30	30
Plasticity retention index, min	60	60	60	50	40
Color index, max	6.0	...	...	...	...
Mooney viscosity	...	60±5	...	...	...

[A] Skim rubber is not permitted in any grade, and Grades L, CV, and 5 must be produced from intentionally coagulated latex.
[B] Other Mooney ranges of Grade CV are available, CV- 50 ± 5 and CV- 70 ± 5. CV without suffix is the 60 ± 5 as shown in the table.