



# Standard Specification for Natural Rubber (NR) Technical Grades<sup>1</sup>

This standard is issued under the fixed designation D2227; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

*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*:<sup>2</sup>

[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[D3533 Test Method for Rubber—Nitrogen Content \(Withdrawn 2006\)](#)<sup>3</sup>

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D11 on Rubber and is the direct responsibility of Subcommittee D11.22 on Natural Rubber.

Current edition approved Sept. 1, 2015. Published December 2015. Originally approved in 1963. Last previous edition approved in 2011 as D2227 – 96 (2011). DOI: 10.1520/D2227-96R15.

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

<sup>3</sup> The last approved version of this historical standard is referenced on [www.astm.org](http://www.astm.org).

## 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

**TABLE 1 Specifications For Technically Graded Natural Rubber**

Property	Rubber Grade <sup>A</sup>				
	Grade L	Grade CV <sup>B</sup>	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	...	...	...

<sup>A</sup> Skim rubber is not permitted in any grade, and Grades L, CV, and 5 must be produced from intentionally coagulated latex.

<sup>B</sup> 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.

*ASTM International 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 International 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, at the address shown below.*

*This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org). Permission rights to photocopy the standard may also be secured from the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, Tel: (978) 646-2600; http://www.copyright.com/*