Designation: D7050 – 04 (Reapproved 2019)

Standard Practice for Rubber from Natural Sources—Sampling and Sorting Bales Based on Predicted Processing Properties[1]

This standard is issued under the fixed designation D7050; 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 practice covers the sorting of natural rubber bales of TSR10 or TSR20 in the factory according to their predicted processing performance based on differences in viscoelastic properties.

1.2 This practice determines which bales should be used in factory compounds which benefit from using "soft" natural rubber versus which work better with "hard" natural rubber.

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

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

D2227 Specification for Natural Rubber (NR) Technical Grades

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

D6204 Test Method for Rubber—Measurement of Unvulcanized Rheological Properties Using Rotorless Shear Rheometers

3. Significance and Use

3.1 In accordance with Specification D2227, shipments of TSR10 and TSR20 must meet a minimum initial Wallace plasticity (Po) of 30 to be accepted. However, even with this minimum restriction, the uncured viscoelastic or "processability" properties are allowed to vary greatly. This variation in properties can significantly affect the quality and efficiency of a factory operation.

3.2 Bales of TSR10 or TSR20 which are lower in their uncured elastic quality ("soft" rubber) in some cases may impart better processing properties to tire innerliners, cushion gums, and sidewalls. "Soft" bales sometimes impart better building tack, better mold flow, and lower extrusion die swell with better dimensional stability. Also, these "soft" rubber bales may dissolve faster in solvents for adhesion dipping.

3.3 Bales of TSR10 or TSR20 that are higher in their uncured elastic quality ("hard" rubber) in some cases generate greater shearing during the initial stages of a factory mix, which result in a faster breakdown and a shorter mix cycle.

3.4 Therefore, in a factory operation, sometimes segregating TSR10 or TSR20 shipments into "soft" and "hard" categories can improve the efficiency and quality of a factory operation.

4. Sampling

4.1 *Sample Size*—The number of samples to be selected to represent the lot may be determined by the size of the lot as indicated in Practice D1485, Table 1.

4.2 Alternatively, five bales from a 36-bale pallet may be sampled.

4.3 Samples from these bales should be taken from within the bale, not from the edges, because bale surface exposure to the air will cause surface samples to not be representative of the rubber inside the bale.

5. Lot Sorting

5.1 The criteria for sorting should be based on a repeatable measure of uncured elasticity of the raw natural rubber.

5.2 Measuring uncured elastic modulus G' at 1 Hz, 100 % strain, 100°C in accordance with Test Method D6204, Part B, has been found to be an effective method for segregating "soft" natural rubber from "hard" natural rubber used in production. See also Test Method D3194.

5.3 The segregating elastic modulus value G'_{SEG} is established as the criteria for separating "soft" natural rubber from "hard" natural rubber as shown in Fig. 1.

[1] This practice is under the jurisdiction of ASTM Committee D11 on Rubber and Rubber-like Materials 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.