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.

Designation: D5774 – 95 (Reapproved 2019)

Standard Test Methods for Rubber—Chemical Analysis of Extractables[1]

This standard is issued under the fixed designation D5774; 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 These test methods cover the chemical analysis of extractables from synthetic rubbers and are intended for general use on solid uncompounded styrene-butadiene copolymers commonly referred to as SBR. Analysis of other synthetic rubbers is also possible with some of these test methods. The test methods and the sections in which they are covered are as follows:

	Sections
Total Extractables	4 – 11
Organic Acid	12 – 19
Soap	20 – 26
Oil	27 – 42

NOTE 1—The nomenclature used in these test methods is in accordance with Practice D1418.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

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]

D297 Test Methods for Rubber Products—Chemical Analysis

D1418 Practice for Rubber and Rubber Latices—Nomenclature

D4483 Practice for Evaluating Precision for Test Method Standards in the Rubber and Carbon Black Manufacturing Industries

3. Reagents

3.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.[3] Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without decreasing the accuracy of the determination.

TEST METHOD A—TOTAL EXTRACTABLES

4. Summary of Test Method

4.1 Thin, narrow strips of the dried rubber are extracted three times with 100 cm^3 of hot solvent for 10, 20, and 40-min periods, respectively. The extracted rubber is then extracted for 5 min in 100 cm^3 of hot acetone to thoroughly remove the extraction solvent and aid drying of the rubber. The extracted rubber is then dried to constant mass. The difference in mass between the original sample and the extracted sample is the total extractables.

5. Significance and Use

5.1 This procedure is intended to determine the total extractable materials in rubber. It will give the combined amount of rosin and fatty acids, soaps, extender oils, defoamer tars, antioxidants, and other uncombined organic constituents that are extractable in the solvent used. The rubber hydrocarbon can be estimated by subtracting the sum of the total extract, the total ash, the volatile matter, and carbon black content (for carbon black masterbatch) from 100.

6. Apparatus

6.1 *Wide-Mouth Flask,* 400 to 500 cm^3.

6.2 *Hot Plate and Reflux Condenser.*

[1] These test methods are under the jurisdiction of ASTM Committee D11 on Rubber and Rubber-like Materials and are the direct responsibility of Subcommittee D11.11 on Chemical Analysis.

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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] *Reagent Chemicals, American Chemical Society Specifications*, American Chemical Society, Washington, DC. For Suggestions on the testing of reagents not listed by the American Chemical Society, see *Annual Standards for Laboratory Chemicals,* BDH Ltd., Poole, Dorset, U.K., and the *United States Pharmacopeia and National Formulary,* U.S. Pharmacopeial Convention, Inc. (USPC), Rockville, MD.

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