



Standard Recommended Practice for RUBBER—MEASURING THE PRECISION OF ASTM TEST METHODS¹

This Standard is issued under the fixed designation D 3488; 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.

1. Scope

1.1 This recommended practice offers simplified guidelines for measuring and utilizing the precision of ASTM test methods for rubber and rubber products.

1.2 The two types of precision measured are the repeatability of a test and the reproducibility of a test or a multistep test procedure.

1.2.1 The test repeatability is intended to be relevant to within-laboratory problems concerning production specifications, quality control, and research. It measures the amount of agreement between test results obtained on different days in the same laboratory by the same technician (or the same set of technicians) using the same apparatus and technique on the same (or essentially the same) test specimen. The phrase “or the same set of technicians” refers to cases in which common laboratory practice is to use more than one technician to carry out a test procedure involving numerous steps or operations. The phrase “or essentially the same test specimen” refers to cases in which the test procedure is destructive of the original specimen.

1.2.2 The test reproducibility is intended to be relevant to between-laboratory problems concerning customer specifications, quality assurance, and industry standards. The reproducibility includes the repeatability plus a component of bias due to different apparatus, materials, ambient conditions, and technique between laboratories, and interactions between laboratories and materials.

1.3 The precision as measured by this practice may or may not correspond exactly to the results of a particular Analysis of Variance.

2. Planning an Interlaboratory Study

2.1 A preliminary study within one or more laboratories should first be performed to develop fully the test method and produce an unambiguous test procedure in order to justify the effort of a full interlaboratory study.

2.2 Detailed descriptions of this test development shall be available to all participating laboratories prior to the interlaboratory study.

2.3 Participating technicians should be experienced in the procedure prior to the interlaboratory study.

2.4 Data sheets that contain blanks for all the measurements that will be subjected to statistical analysis should be distributed to all participants. Space should be provided for participants to comment on ways to improve the precision and accuracy of the test method.

2.5 The number of participating laboratories should be large enough to assure that the results represent the actual variation within the industry (that is, seven to ten laboratories). The liberalized definition of “collaborating” laboratories given in the *ASTM Manual for Conducting an Interlaboratory Study of a Test Method*,² might be helpful in this respect. This allows different technicians using different apparatus and materials to qualify as different collaborating laboratories in a study even though they are working under the same

¹ This recommended practice is under the jurisdiction of ASTM Committee D-11 on Rubber and Rubber-Like Materials, and is the direct responsibility of Subcommittee D11.16 on Statistical Quality Control.

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² *ASTM STP 335*, available from University Microfilms, Inc., 300 N. Zeeb Rd., Ann Arbor, Mich. 48106.