



Standard Test Method for Relative Evaporation Time of Halogenated Organic Solvents and Their Admixtures¹

This standard is issued under the fixed designation D 1901; 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 test method covers the measurement of the relative evaporation time of halogenated organic solvents and their admixtures. This test method is not applicable in the presence of excessive drafts or high-velocity air currents.

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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Terminology

2.1 Definition:

2.1.1 *admixture*—a blend of a halogenated hydrocarbon with a nonhalogenated hydrocarbon (for example, mineral spirits).

3. Summary of Test Method

3.1 The evaporation rate is determined by measuring the time required for complete evaporation of a thin film of the solvent from a sheet-metal panel in comparison with a reference standard solvent.

4. Significance and Use

4.1 This test method gives valid comparisons of the evaporation rates of the subject materials. These comparisons are required for the determination of the suitability of a proposed material for specific cleaning applications.

5. Apparatus

5.1 *Test Panel*²—A 1 by 100 by 150-mm (0.04 by 4 by 6-in.) panel of aluminum, AA Alloy 6061,³ Temper T4 or T6,

having a horizontal scribe mark across the width of the panel 25 mm (1 in.) from one 100-mm edge.

5.2 *Support Base* to hold the panel at $60 \pm 1^\circ$ from the horizontal.

5.3 *Stopwatch*, or electric interval timer.

5.4 *Graduate*, 10-mL, with pouring lip.

6. Reagents

6.1 *Perchloroethylene*, initial boiling point 121°C , boiling range 2°C , purity 99%.

6.2 *p-Xylene*, 99 %.

7. Procedure

7.1 Place a clean, water-break-free test panel on the support base at an angle of $60 \pm 1^\circ$ from the horizontal, with the scribe mark at the lower end of the panel (Note 1). Using the graduate, pour 10 mL of the material under test over the test panel, being sure to get complete coverage of the entire exposed surface. As soon as the 10 mL of test material has been poured, observe the upper edge of the panel for a break in the continuity of coverage. Start the timing at the first sign of a break in liquid film coverage on the upper edge of the panel. Stop the timing when the last portion of film has receded below the scribe mark (Note 2). This interval between the first sign of incomplete coverage and the receding of the last portion of film below the scribe mark is referred to as the “dry time.”

NOTE 1—By placing a double thickness of paper toweling under the test panel and support base, solvent runoff from the panel is absorbed. The use of fresh paper toweling after each individual test prevents saturation of the test area with solvent vapors and gives more reproducible results.

NOTE 2—Stray intermittent drafts *must* be avoided during the timing interval if reproducible results are to be obtained. Slight, steady air motion will not appreciably affect results. The operator must avoid exposure to excessive concentrations of the test solvent.

7.2 Run the test in triplicate, with alternate runs of the material under test and the referenced standard solvent (*p*-xylene or perchloroethylene). The choice of reference solvent shall be subject to agreement between the purchaser and the seller, but the results reported shall indicate which one was used.

¹ This test method is under the jurisdiction of ASTM Committee D26 on Halogenated Organic Solvents and Fire Extinguishing Agents and is the direct responsibility of Subcommittee D26.04 on Test Methods.

Current edition approved June 10, 2000. Published September 2000. Originally published as D 1901 – 61 T. Last previous edition D 1901 – 95.

² Test panels available from Corrosion Test Supplies, P. O. Box 233, French Settlement, LA, 70733, have been found satisfactory.

³ Aluminum Association alloy designation in accordance with ASTM Specification B 209, for Aluminum-Alloy Sheet and Plate, *Annual Book of ASTM Standards*, Vol 02.02.

NOTE 3—By running the test material against a reference standard, and thereby making the results a measure of relative evaporation time, the influences of changes in temperature, relative humidity, and slight drafts are minimized.

8. Calculation

8.1 Calculate the relative evaporation time of the test material as follows:

$$\begin{aligned} & \text{Relative evaporation time versus reference solvent} \\ & = \frac{\text{dry time of test material}}{\text{dry time of reference solvent}} \end{aligned} \quad (1)$$

9. Precision and Bias

9.1 *Repeatability*—Duplicate results by the same operator should not be considered suspect unless they differ by more than $\pm 4\%$.

9.2 *Reproducibility*—The result submitted by each of two laboratories should not be considered suspect unless the two results differ by more than $\pm 5\%$.

NOTE 4—The significance of this test method is not lessened by a lack of extreme precision.

9.3 *Bias*—The bias for this test method has not yet been determined due to a lack of known standards.

10. Keywords

10.1 evaporation time; relative evaporation time; water-break test

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).