



Designation: D6801 – 07 (Reapproved 2021)

Standard Test Method for Measuring Maximum Spontaneous Heating Temperature of Art and Other Materials¹

This standard is issued under the fixed designation D6801; 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 a small-scale laboratory procedure to determine the self heating tendency of oil-based materials by exposure to elevated temperatures in air in a controlled semi-adiabatic system.

1.2 This test method has been developed to address an urgent need to identify oil-based materials that may require labeling for spontaneous heating tendency. Studies based on this test method may allow the development of a practice to identify such oil-based materials.

1.3 The values stated in SI units are to be regarded as standard. The values given in parentheses are for information only.

1.4 *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.* For safety concerns specific to disposal of solvent-soaked rags, see [Appendix X1](#).

1.5 *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

[E633 Guide for Use of Thermocouples in Elevated-Temperature Mechanical Testing](#)

¹ This test method is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.57 on Artist Paints and Related Materials.

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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.

[E771 Test Method for Spontaneous Heating Tendency of Materials](#) (Withdrawn 2001)³

3. Terminology

3.1 Definitions:

3.1.1 *maximum spontaneous heating temperature, n*—maximum temperature reached during spontaneous heating under the specified test conditions.

3.1.2 *oil-based materials, n*—seed and nut oils or materials that contain such oils.

3.1.3 *spontaneous heating, n*—exothermic reaction of a material due to slow or incomplete reaction that results in a temperature rise above that of its surroundings (see Test Method [E771](#)); also called *self heating*.

3.2 Symbols:

3.2.1 T_D —difference between maximum spontaneous heating temperature and control temperature.

3.2.2 T_S —maximum spontaneous heating temperature.

3.2.3 T_C —control temperature or maximum spontaneous temperature measured over 1 h immediately preceding the beginning of an experiment.

4. Summary of Test Method

4.1 A non-woven paper cloth is covered uniformly in 9.0 mL of test material mixed with 0.25 mL of 6 to 10 % manganese drier. This covered pad is then put in a small stainless steel holder with air holes in the sides. This holder is placed in a larger chamber, which is opened to the air from the top and heated until peak temperature is reached. The maximum spontaneous heating temperature inside the soaked paper cloth is recorded with a K thermocouple and maximum temperature recorder with the base temperature adjusted to $70 \pm 2^\circ\text{C}$.

5. Significance and Use

5.1 This test method provides a means of accelerating the tendency of a material toward spontaneous heating that may eventually lead to a fire. It is applicable to liquids and pastes.

³ The last approved version of this historical standard is referenced on www.astm.org.