



Designation: E2924 – 14 (Reapproved 2020)

Standard Practice for Intumescent Coatings¹

This standard is issued under the fixed designation E2924; 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 provides architects, specifiers and building owners various consensus recommendations to specify industry's best practices for *intumescent coatings*.

1.2 This practice covers the best practice for the following:

1.2.1 The manufacturing, testing, labeling, transportation, delivery, and storage, including shelf life, of *intumescent coatings*.

1.2.2 The *application* of the *intumescent coatings* to structural steel for the purposes of providing fire resistance.

1.2.3 The inspection, including safety and equipment, of *intumescent coatings* during and after the *application*.

1.3 *Standard Practice*—*This practice offers a set of instructions for performing one or more specific operations. This document cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this practice may be applicable in all circumstances. This ASTM standard is not intended to represent or replace the standard of care by which the adequacy of a given professional service must be judged, nor should this document be applied without consideration of a project's many unique aspects. The word "Standard" in the title means only that the document has been approved through the ASTM consensus process.*

1.4 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

1.5 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.6 *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 appro-*

¹ This practice is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.21 on Serviceability.

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priate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.

NOTE 1—This practice references fire-test-response standards and may involve hazardous tasks. Therefore, the following caveats are also referenced. This practice references tests used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire hazard or fire risk assessment of the materials, products, or assemblies under actual fire conditions. This practice references tests used to predict or provide a quantitative measure of the fire hazard from a specified set of fire conditions involving specific materials, products, or assemblies. This assessment does not necessarily predict the hazard of actual fires which involve conditions other than those assumed in the analysis. This practice references tests used to determine certain fire-test responses of materials, products, or assemblies to heat and flame under controlled conditions by using results obtained from fire-test-response standards. The results obtained from using this practice do not, by themselves, constitute measures of fire hazard or fire risk. Fire testing is inherently hazardous. Adequate safeguards for personnel and property shall be employed in conducting these tests.

1.7 *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

D2240 Test Method for Rubber Property—Durometer Hardness

D2794 Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)

D4060 Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser

D4541 Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers

E119 Test Methods for Fire Tests of Building Construction and Materials

E176 Terminology of Fire Standards

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.

E631 Terminology of Building Constructions

2.2 ISO Standards:³

ISO 834-1 Fire-resistance Tests—Elements of Building Construction—Part 1: General Requirements

ISO/IEC 17011 Conformity Assessment—General Requirements for Accreditation Bodies Accrediting Conformity Assessment Bodies

ISO/IEC 17020 General Criteria for the Operation of Various Types of Bodies Performing Inspection

ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration of Laboratories

ISO/IEC 17065 Conformity Assessment—Requirements for Bodies Certifying Products, Processes and Services

ISO/IEC Guide 65 General Requirements for Bodies Operating Product Certification Systems

2.3 Other Standards:

AWCI Technical Manual 12-B, Third Edition Standard Practice for the Testing and Inspecting of Field Applied Thin-Film Intumescent Fire-Resistive Materials; an Annotated Guide⁴

CAN/ULC-S101 Fire Endurance Tests of Building Construction and Materials⁵

UL 263 Fire Tests of Building Construction and Materials⁶

SSPC-PA2 Procedure for Determining Conformance to Dry Coating Thickness Requirements⁷

3. Terminology

3.1 Definitions:

3.1.1 For definitions of terms used in this practice and associated with fire issues, refer to the definitions contained in Terminology E176.

3.1.2 For definitions of terms used in this practice and associated with building issues, refer to the definitions contained in Terminology E631.

3.1.3 If there is a conflict between Terminology E176 and Terminology E631 definitions, Terminology E631 definitions shall apply.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *application, n*—an act of applying *intumescent coatings*.

3.2.2 *char, n*—a reacted (expanded) *intumescent material*, having low thermal conductivity, thus retarding heat transfer, that is quantified where no appreciable density changes occur during additional temperature rise.

3.2.3 *intumescent coating, n*—a material that produces an insulating *char* when activated by heat or flame.

³ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.

⁴ Available from Association of the Wall and Ceiling Industry (AWCI), 513 W. Broad Street, Suite 210, Falls Church, VA 22046, <http://www.awci.org>.

⁵ Available from ULC Standards, 171 Nepean Street, Suite 400, Ottawa, ON K2P 0B4, <https://canada.ul.com/>.

⁶ Available from Underwriters Laboratories (UL), 2600 N.W. Lake Rd., Camas, WA 98607-8542, <http://www.ul.com>.

⁷ Available from Society for Protective Coatings (SSPC), 800 Trumbull Dr., Pittsburgh, PA 15205, <http://www.sspc.org>.

4. Summary of Practice

4.1 This practice describes the best procedures for *intumescent coatings* related to the following:

4.1.1 The *application*, including safety and equipment, refers to Sections 8, 12, 13 and 14;

4.1.2 manufacturing, refer to 6.1;

4.1.3 testing, refer to 9.2.2;

4.1.4 labeling, refer to 6.2;

4.1.5 transportation, refer to 6.1;

4.1.6 delivery and storage (including shelf life), refer to 6.1 and Section 7; and

4.1.7 inspection (including safety and equipment), refer to Section 10 and Section 16.

5. Significance and Use

5.1 This practice is intended for use by material specifiers, general contractors, applicators, or any individual or group requiring information regarding the *application* of *intumescent coatings* to provide a fire resistance rating to structural steel.

5.2 This practice is not intended to replace the manufacturer's *application* instructions.

6. Materials

6.1 The *intumescent coating* shall be manufactured, transported, stored and installed in accordance with the manufacturer's specifications and quality control procedures.

6.2 Containers must be labeled in accordance with listing agency, which is either an internationally recognized:

6.2.1 certification body accredited to ISO/IEC Guide 65 or ISO/IEC 17065, or

6.2.2 test laboratory accredited to ISO/IEC 17025 and having an inspector or inspection agency accredited to ISO/IEC 17020 under Type A requirements.

NOTE 2—*Intumescent coatings* are sometimes referred to as fireproofing or intumescent paint. The term Labeled refers to *intumescent coatings* to which has been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the *intumescent coating* meets identified standards or has been tested and found suitable for a specified purpose.

NOTE 3—The term Listed refers to *intumescent coatings* included in a list or directory published by an organization acceptable to the *authority having jurisdiction (AHJ)* and concerned with evaluation of products that maintains periodic inspection of production of listed *intumescent coatings* and whose listing states either that the *intumescent coating* meets identified standards or has been tested and found suitable for a specified purpose.

6.2.3 The accrediting body overseeing the certification body in 6.2.1 or the test laboratory in 6.2.2 must be recognized as operating under the requirements of ISO/IEC 17011 by the International Accreditation Forum (IAF) for ISO/IEC Guide 65 or ISO/IEC 17065, or International Laboratory Accreditation Cooperation (ILAC) for ISO/IEC 17020 and ISO/IEC 17025.

7. Delivery and Shelf Life

7.1 All materials shall be delivered to the job site in clearly labeled unopened containers. Labels shall include the name of the product as well as the manufacturer name and contact information.