



Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems¹

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INTRODUCTION

Heating, Ventilation, Air Conditioning (HVAC) duct systems may be subjected to fire- exposure conditions. ISO 6944 is a standard test method used to evaluate ventilation ducts. However, ISO 6944 does not address all of the fire resistive attributes deemed necessary by some authorities having jurisdiction, for example, (1) the fire-resistive, combustibility, flame spread and smoke generation, and durability properties of the fire-resistive materials protecting the HVAC duct, (2) the transition from the horizontal to a vertical HVAC duct, (3) the attachment of the HVAC duct's supports to the fire-separating elements, (4) the termination of an HVAC duct system and the protection of its ends, (5) the effects of rapid cooling and erosion upon the HVAC duct system, (6) the use of fire dampers and (7) the effect of the HVAC duct system on its supporting construction. Many types of fire-resistive materials are used to protect HVAC ducts. These fire-resistive materials are either applied to HVAC ducts in the field or are fabricated as an integral part of the HVAC duct system when shipped from the factory. Evaluating fire-resistive materials used to protect a HVAC duct from fire is an aid for predicting their fire performance and helps to establish uniformity in requirements of various authorities. To do this it is necessary that the fire-resistance properties of HVAC ducts protected with fire-resistive materials be measured and specified according to a common standard expressed in terms that are applicable alike to a wide variety of materials, situations, and conditions of exposure.

1. Scope*

NOTE 1—Use of the standard designation ISO 6944 refers to both ISO 6944:1985 and ISO 6944-1:2008.

1.1 These test methods evaluate the fire-resistive materials and the HVAC duct systems surface burning characteristics, non-combustibility, fire resistance, durability, and fire-engulfment with horizontal and vertical through-penetration firestops.

NOTE 2—The intent of these test methods is to provide authorities having jurisdiction a means to evaluate the fire performance of HVAC duct systems to enable their application and use.

1.2 These test methods evaluate the fire performance of HVAC ducts, including both supply (pressurized: Condition A – Horizontal and Condition B – Vertical) and return (exhaust: Condition C – Horizontal and Condition D – Vertical).

1.3 These test methods evaluate the ability of a HVAC duct system to resist the spread of fire from one compartment to other compartments separated by a fire resistance rated con-

struction when the HVAC duct system is exposed to fire under one or more of the following conditions:

1.3.1 *Condition A*—Fire exposure from the outside of the horizontal HVAC duct system without openings,

1.3.2 *Condition B*—Fire exposure from the outside of the vertical HVAC duct system without openings,

1.3.3 *Condition C*—Fire exposure from the outside with hot gases entering the inside of the horizontal HVAC duct system with unprotected openings, and

NOTE 3—Unprotected openings are openings that are not protected by fire dampers.

1.3.4 *Condition D*—Fire exposure from the outside with hot gases entering the inside of the vertical HVAC duct system with unprotected openings.

1.4 These test methods provide a means for determining the fire-resistance of vertical and horizontal HVAC duct systems, when subjected to the standard time-temperature curve of Test Methods E119.

1.4.1 *Condition A*—These test methods provide a means for evaluating a horizontal HVAC duct system, without openings exposed to fire, passing through a vertical fire-separating element.

1.4.2 *Condition B*—These test methods provide a means for evaluating a vertical HVAC duct system, without openings

¹ These test methods are under the jurisdiction of ASTM Committee E05 on Fire Standards and are the direct responsibility of Subcommittee E05.11 on Fire Resistance.

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