



AFT Fire Wall Testing Procedure

TESTING REGULATION DETAILS

Section 703 of the International Building Code (IBC) states "The fire-resistance rating of building elements shall be determined in accordance with the test procedures set forth in ASTM E119 or in accordance with Section 703.3."

ASTM E119-07a "Fire Tests of Building Materials and Construction" is intended to register comparative performance to specific fire test conditions during the period of fire exposure. The ratings are expressed in hours and are applicable to floor-ceilings, roof-ceilings, beams, columns, walls, and partitions.

The ASTM E119 test procedure is identical or very similar to the following standard test methods: UL263, UBC7-1, NFPA 251, ANSI A2.1, and ULC S101.

This test should be conducted by NVLAP accredited laboratories such as Intertek Testing Services NA, Southwest Research Institute, UL, etc. Advanced Fiber Technology (AFT) uses Intertek Testing Services.

TESTING PROCEDURE DETAILS

A 10 foot x 10 foot wall assembly of the specific configuration was built and placed at the face of a gas-fired furnace. Thermocouples are placed in furnace area and on the unexposed side (opposite the furnace) drywall. The thermocouples are connected to a computer that records their temperature at specified time intervals.

The gas-fired furnace is controlled to parallel the time-temperature curve specified in ASTM E119. The hot side reaches a temperature of 1850 degree F during the two hour test. It is fitted with six propane/air burners positioned on the left and right side walls, designed to allow an even heat flux distribution across the face of the test specimen while allowing no direct flame impingement. Conditions of fire endurance acceptance are no passage of flame or gases hot enough to ignite cotton waste as well as temperature rise limitations on the unexposed surface. The average temperature of the thermocouples on the unexposed side cannot rise more than 250 degrees F from their initial temperature or no single thermocouple can rise more than 325 degrees F.



The furnace has observation windows on the sides and front. Within minutes of starting the test the interior of the gas-fired furnace turned "cherry red". The first noticeable observation is the drywall paper burning and subsequently the joints opening and the studs burning. As the test continues, the next observation is stress cracks forming in the drywall. Eventually the drywall falls as the studs behind have burned and no longer support the drywall. All that remains is the cellulose insulation adhering to the back walls as well as the studs in the back portion of this specific assembly.



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A hose stream test is conducted on a duplicate wall assembly immediately after being subjected to a fire endurance test for a time period of one-half the fire endurance classification period. The hose stream serves as an indicator for two important attributes:

- 1) the integrity of an assembly during fire exposure
and
- 2) the overall reliability of the material to perform its intended function.

While the hose stream apparatus is adapted from fire fighting equipment, its intent is to provide an impact, erosion, and cooling exposure applied in a specified manner as contained in ASTM E119. Pass / fail is based upon hose stream penetration through the unexposed side of the wall.

Intertek Test Report 3132554-1,2 issued 29 November 2007 contains the specific test details related to AFT's 2-hour fire wall classification. Unless you've physically seen the test it's hard to fully appreciate the severity of this test.

