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Reaction to fire tests — Parallel panel test method for wall systems — Measurement of heat release and smoke production

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This document was prepared by Technical Committee ISO/TC 92, *Fire safety*, Subcommittee SC 1, *Fire initiation and growth*.

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Introduction

This large-scale fire test standard is developed for the purpose of measuring the heat release rate (HRR) and the smoke-production rate (SPR) of exterior and interior wall systems, exposed under severe fire scenarios using a parallel panel setup. Severe fire exposure to an exterior wall system can be either caused by spill plumes from a window, such as in a post-flashover compartment fire, or an exterior fire source such as in a dumpster, vehicle, or balcony storage. Some extreme scenarios for an exterior fire include city conflagration (e.g. after an earthquake) or wildland-urban-interface (WUI) fires. Severe interior wall fires can be caused by combustible storage located inside a facility, such as warehouse and manufacturing occupancies, close to the corners of wall system. A common factor of such fire scenarios is the absence or an inadequacy of the traditional active fire protection safeguards (e.g. sprinklers) leading to unmitigated heat exposures to wall systems.

A sufficiently high heat flux is required to simulate such fire exposures — a high heat flux can reveal the flammability of the encapsulated materials used in the wall systems, as well as the vulnerabilities of facers, joints and other components. Literature[1] shows that severe fire exposure to wall systems is in the order of 100 kW/m^2. For this purpose, three large-scale fire tests are known to simulate realistically severe fire exposures of about 100 kW/m^2, and are used to evaluate the performance of both exterior and interior wall systems[2]to[5]. These three large-scale fire tests include the 7,6 m (25-ft) high corner fire test, 15 m (50-ft) high corner fire test, and 4,9 m (16-ft) high parallel panel test of the ANSI/FM 4880 standard; the latter is henceforth abbreviated as 16-ft PPT. This document is based on the 16-ft PPT method. The literature background of the method is provided in Annex A.

The 16-ft PPT setup is placed under a large-scale (minimum 3,5 MW) calorimeter in an indoor facility and is therefore not affected by outdoor weather conditions. The HRR measured during the tests provides an objective evaluation to the fire performance of specimens. The test setup is further utilized to evaluate the smoke hazard of the wall systems used in smoke sensitive occupancies from property insurance perspective[3].

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