



Technical Features – Fire Construction Drywall Systems Endure, Trials By Fire

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The ultimate test of a fire-rated assembly, of course, is how it performs in a real fire. All the tests and all the theories are of little value to a building owner who discovers that a system chosen for his or her building has failed to provide the protection expected.

Two recent fires provided some interesting insight into what really happens to a particular fire-protection system when it is put to the ultimate test. One of the fires was in a 100,000 sq. ft. Montgomery Ward Co. warehouse in Bensenville, Ill. The other occurred in the office section of Dorn's West, an automobile accessory contractor in El Paso, Tex.

In the Montgomery Ward warehouse, the fire burned for six or seven hours, totally destroying the building, except for a concrete-block-enclosed computer room with a drywall ceiling. According to George Borre of H. Borre Sons Inc., the general contractor that built the warehouse, it was impossible to say how long the fire burned in proximity to the 2-hr. fire-rated drywall construction over the computer room. However, the owners, the building department and the fire department were all pleasantly surprised at the extraordinary performance of the drywall in resisting the fire. Computers and other equipment in the computer room were not only not destroyed, but they were able to go back into service immediately, without need of repairs.

The 2-hr. fire-rated ceiling consisted of two layers of 5/8-in. fire-resistant-core gypsum panels applied over and under 2x12-in. wood joists. The walls of the room consisted of 6-in. filled concrete block. The remainder of the warehouse was equipped with a sprinkler system. In the offices of Dorn's West, the fire started in a furnace alongside a 1-hr. fire-rated partition that enclosed a record storage room. Here, again, it is not certain how long the fire burned, but it completely destroyed glass-fiber-type ceiling tile, exposed glass-fiber-type exterior-wall insulation above the ceiling line and glass-fiber-type insulation used in other drywall partitions. The 1-hr. fire-rated partition enclosing the record storage room, however, not only was not breached by the fire, but the contents were not even damaged, except by smoke entering through the door. "My best guess is that the fire burned in the vicinity of the record storage room for at least two or three hours out of the six hours it was in progress," said Sheldon Hall, president of Blair-Hall Co., Inc., El Paso, the builder. "Because of the impressive performance of this construction compared to that of other materials in the fire, we plan to use the same products for the record storage room and other key partitions when we rebuild the building," Hall said.

The construction of this high-performance wall was 2x4-in. wood studs with 3-in. THERMAFIBER Insulating Blankets in the stud cavities and a layer of 5/8-in. SHEETROCK® FIRECODE Brand Gypsum Panels on each side. As a result of the fire, the outer layer of SHEETROCK® FIRECODE Brand Gypsum Panels was destroyed, but the insulation was only scorched, and the inner layer was unharmed. Since other partitions of 1/2-in. gypsum panels and glass-fiber-type insulation farther from the source of the fire were destroyed or at least breached, and a steel beam in the vicinity of the fire was deformed, it seems likely that the 1-hr. fire-rated partition withstood a much longer fire exposure than it could be normally expected to withstand without failure.

The 3-in. THERMAFIBER Insulating Blankets are likely to have been a significant factor in the wall withstanding two or three times the length of fire exposure that it was designed for. Since THERMAFIBER Insulation is a high-melt-point product (over 2,000°F), and since the high-performance THERMAFIBER Fire-Safety System products consist of the same basic material, it seems reasonable that THERMAFIBER Insulations significantly extend the fire-protection values of this fire-rated drywall assembly.

The lesson to be learned from these two fires is that there is no substitute for well-detailed fire-rated drywall ceiling and partition systems. And selecting the highest-quality components and systems for the construction of these fire-rated details may make the difference between an important space being protected or destroyed in a real fire.