U
ncontrollable fires have ter-
ified communities for thou-
sands of years. Today’s
model, state and local build-
ing codes have evolved to pro-
tect the public from the effects
of unwanted fires in residen-
tial and commercial struc-
tures. The principle of public
protection upon which the
code provisions are based is
very laudable and as public
protectors should be immune
to purely special interest influ-
ences.

Unfortunately, attempts are
frequently made to subvert the
building code mechanism because
of competition between and among
construction product manufacturers
and industries. This is why the Gyp-
sum Association expends a consid-
erable amount of time, energy and
resources to monitor, challenge and
propose changes to the various
model, state and local building
codes where ever and whenever the
use of gypsum board is unreason-
ably threatened. While these efforts
are an integral part of the associa-
tion’s responsibility to the gypsum
producers, they also benefit drywall
contractors by protecting the contin-
ued acceptance and use of gypsum
board systems in fire-rated struc-
tures instead of more expensive and
cumbersome concrete blocks and
other masonry materials.

The gypsum industry has no rea-
son to engage in negative portrayals
of masonry in order to promote its
products. Contrary to the masonry
industry, negative advertising has
never been necessary by gypsum
manufacturers since the superiority
of gypsum products and preference
by knowledgeable builders and
designers makes such tactics unnec-
essary. The quality, performance in
the laboratory and the real world,
and economy of gypsum board has
enabled gypsum to seize a substan-
tial portion of market share from
masonry in area separation walls,
fire walls, party walls and similar
types of fire-rated construction.
Gypsum also enjoys other advan-
tages, such as ease and speed of
installation, uniformity and quality
of products certified by third-party
inspection and labeling services,
and all-weather installation.

Because of a substantial defi-
ciency in natural competitive quali-
ties of masonry materials when
compared to gypsum board, the
masonry industry has fought long
and hard and has used contro-
versial tactics in its attempts
to regain lost market share.
Fortunately, most of the build-
ing codes are adopted with the
input and judgment of highly
professional building officials
and fire protection experts
who almost always recognize
masonry’s proposed code
changes for what they
are-self-serving, thinly dis-
guised pleas for preferential
product treatment to tilt the
playing field toward masonry.
Building officials have almost
always rejected masonry’s pointless
proposals for code changes.

The Antiquated
Hose-Stream Test

All building codes in the United
States have their own criteria for
acceptance of test results or refer-
cence test protocols that are required
to be administered to a system in
order for certain materials to be used
in fire-rated construction. The test
generally referenced in the United
States and Canada is ASTM E 119.
This standard fire test presently has
two distinct and separate parts: a
fire-endurance test and a hose-
stream test.

The masonry industry has made
strong efforts to continue the use of the antiquated hose stream as part of the protocol because the hose stream naturally favors masonry materials in a laboratory setting. Objective and enlightened members of the fire protection community, however, have been advocating termination of the hose-stream portion of the fire test for over 40 years.

For example, S. H. Ingberg, a highly respected fire expert who spent many years at the Center for Fire Research of the National Bureau of Standards (now NIST), wrote to the ASTM E-5 committee members (responsible for the development of fire tests) in 1953 to explain why the hose-stream test was no longer needed:

“The history of hose-stream tests applied on floors indicates an unbroken record of freedom from collapse or passage of the hose-stream even when applied at the end of the fire endurance test. This should be expected since floor members and filling must sustain load and the top serves as a wearing surface. The cooling by the water will increase the load-carrying capacity and the eroding effect of the water has not proven of degree sufficient to penetrate the constructions. Hence from this standpoint, the test has been indicated as serving no purpose.”

Around the turn of the century, the hose stream was used primarily in tests for masonry materials. Later, the hose stream was routinely incorporated into the fire testing conventions (such as ASTM E 119) for partitions and walls, although plaster and gypsum board systems quickly became the fire-rated building material of choice as soon as the codes allowed. The hose stream was never technically validated as contributing to the assessment of fire resistive qualities of composite partition or wall materials. Nevertheless, it was incorporated into the original E 119 test standard, and...the groundwork for deleting hose stream entirely from fire tests was laid over 70 years ago.
ASTM E-5 committee members and others have not been able to change the perception by some, including the masonry special interests, that the hose stream test should be a normal part of partition fire testing protocol in the United States and Canada.

Notwithstanding masonry’s romance with the hose stream, historical evidence suggests that the inclusion of the hose stream as part of the testing methodology for walls and partitions made of gypsum was more by default than intentional design. The original rationale for the hose stream test was its application to cementitious floor systems and later to beams and columns to ascertain the effects of spalling on a system’s structural integrity and its capability to retain load-bearing characteristics after the fire endurance test.

Testing non-cementitious partitions and walls began years later, and the hose stream was automatically incorporated into these early partition protocols but with a very significant modification. When fire testing practices were formulated as an official fire-test standard, the test method provided that the hose stream was to be administered to a duplicate specimen, tested at one-half the rated time, up to one hour maximum.

Why Not the Walls, Too?

Thus, the groundwork for deleting hose stream entirely from fire tests was laid over 70 years ago. The fire protection experts of that time realized that the real item of interest was the ability of a system to resist fire; the information gleaned from a hose stream was of secondary and marginal value, if any, to field performance. The hose stream portion of E 119 was eventually dropped for floor-ceiling and roof-ceiling systems and from the tests of all other building elements except walls and partitions.

Additionally, the British fire test standard dropped the hose stream requirement entirely during the 1950s, as it was determined it had no bearing on the ability of construction materials to withstand the effects of heat. The modern international fire test standards embodied in ISO Standard 834 do not contain a hose stream provision.

In spite of the overwhelming evidence that the hose stream portion of the fire-test standard makes absolutely no contribution to knowledge concerning the performance of a fire-rated wall or partition in a laboratory or field setting, the masonry industry—and a few other product manufacturers—consistently press for retention of the hose-stream test and to even make it more stringent.

This is a patently spurious attempt to mandate an advantage for their products through manipulation of the building codes that were developed to provide a good measure of public safety without regard to product competition. If masonry’s efforts were to be successful, modern fire protection thought and engineering would be set back by 50 years. The masonry industry’s actions are a blatant attempt to keep an obviously irrelevant relic in the codes when it has no relation to the real world and
modem fire-protection philosophy. Product competitiveness has no place in the building code arena.

The obsolete hose stream requirement has also been used in the past by other product manufacturers to ensure the use of unnecessarily more expensive products in building construction. For example, regular joint compound performs perfectly well as a fire stop for through-penetrations, especially when used in combination with rock or slag wool.

Because a hose stream tends to wash out these materials after completion of the fire endurance test, such inexpensive and readily available yet effective materials are generally restricted by the codes. Washing out these materials (which are usually found around pipes, ducts, conduit and similar small openings) with a stream of water has absolutely nothing to do with a product’s ability to function as a fire-stop.

Fortunately, many knowledgeable code officials have a high level of confidence in the empirical performance of these materials under actual field conditions, and they exercise their professional judgment and prerogative to permit their use. Several listed gypsum-based fire stop systems are now available for use where joint compound is not allowed.

Here’s What You Can Do

The Gypsum Association and its member companies continue to fight to maintain gypsum’s rightful place in fire-rated construction. Drywall contractors can help us by getting in touch when they become aware of local masonry efforts to change a local building code to favor masonry over gypsum.

Let us hear from you at (202) 289-5440. CD

About the Author

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