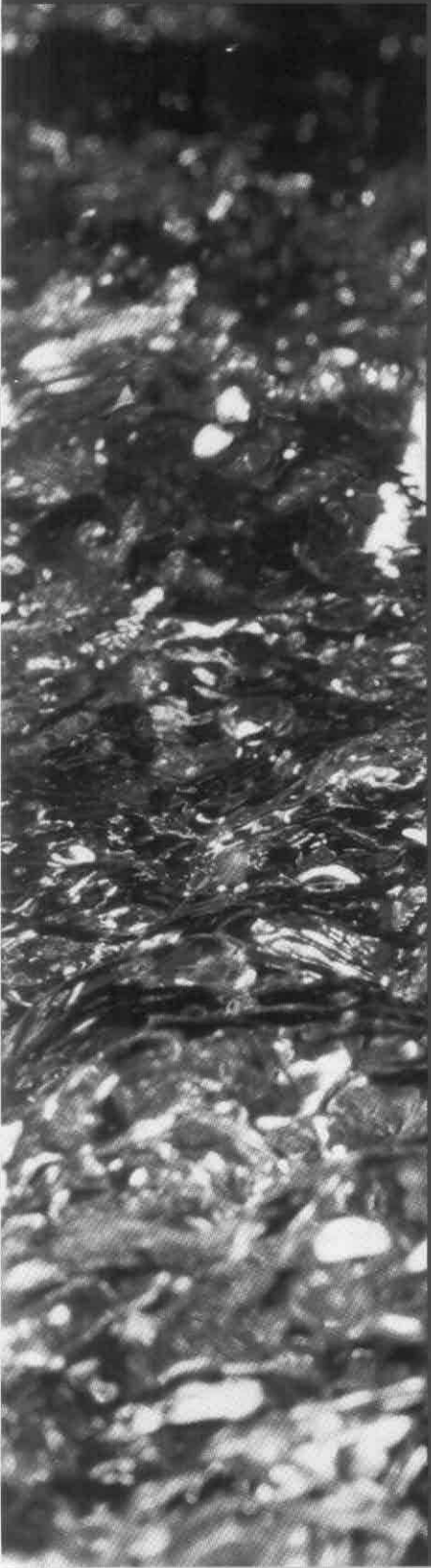


The “W” Factor



Firestop contractors analyze the UL 1479 W rating and its implications for architects, building owners and managers, and general and firestopping contractors.

By Bill McHugh and
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For several years, the firestop contractors have protected firestop systems with firestop products that are resistant to water. Whether it's a rainstorm in Chicago, Minneapolis or Miami, or water blown inside a building by wind or a pipe bursting after occupancy in Los Angeles, water resistance of firestop systems is important at all stages of construction to building owners and occupants.

To meet this need, Underwriters Laboratories (UL) recently published an Outline for Standard for the optional water resistance (W) rating part of the test for through-penetration firestop systems, UL 1479. W ratings are brand new—first published by UL in fall 2004. As with any new test method, the new W rating qualifies a product for use in specific applications.

At this point several questions in the industry need to be addressed to truly understand the suitability for use of this rating by architects specifying and contractors installing the new W-rated, water-resistant, firestop systems.

UL 1479, fire test of through-penetration firestop systems, evaluates the performance of firestop systems according to three ratings. Fire resistance—F ratings—stated in hours, simulate fire spread of flames through openings in compartmentation. Temperature ratings, also stated in hours,

when occupancy of lower floors can take place prior to construction completion above. The added bonus is that the owner can create income from the space sooner, decreasing the time needed to deliver a building to occupants. This reduces the time taken to construct portions of the building, further reducing construction loan periods, and saving money in the process. Additionally, washout resistance is needed to prevent callbacks for contractors who are under constant pressure to mobilize at the last minute before completion of construction, and several times during project operations as well to satisfy customer requirements.

- **Movement**—The cycling of piping and cable penetrating items is also not part of the test procedure. Therefore, piping systems that move due to water hammer, installation adjustments or temperature variation may cause failure. Movement of any kind in the assembly may result in water leakage through the firestopping. It is not part of the test protocol. UL has stated that its 1479 Standards Technical Panel is working on this important issue.
- **Aging**—Since the product has only been conditioned for a short time (seven to 30 days), the aged performance (water exposure after several years inside a building) is not judged during this test procedure. UL has again assigned development of this part of testing to the UL 1479 Standards Technical Panel.
- **Depths Greater Than 3 Feet**—Water accumulation in an area is not to exceed 3 feet, which actually simulates a 12-inch depth of water. For applications where a greater head pressure of water is needed, there have been products tested to marine applications where a 20- or 57.5-foot head of water exposure takes place. This may be especially important where electrical conduits feed high-rise buildings, and firestopping in sub-basements where water resistance may be needed from underneath the firestopping assembly, rather than from a pipe break that feeds water from above.

Architects, engineers, building owners and managers need to understand these limitations when specifying the new W rating from UL. General contractors and firestop contractors also need to understand these limitations when discussing jobs with their customers and in construction contracts and documentation.

New Precautions For Firestop Installers

The firestop systems installation operation has always been critical for fire, air, and water-resistant systems. Manufacturer's instructions for installation become even more sensitive when exposed to water-resistance testing. Listed below are some important issues to consider when effectively applying firestopping to result in W ratings.

- **Surface Preparation**— It is imperative for contractors and installation personnel to remember to prepare surfaces for adequate bond of firestopping sealants. Piping, concrete, cable and other surfaces must be clean, dry and free of contaminants before application of firestop systems to achieve adhesion to metal and concrete surfaces.
- **Tooling**—Firestop systems, like sealants, must be in complete contact with surfaces to provide adhesion necessary for effective water resistance. Tooling assists with the wetting in of the sealant to the substrate. Secondly, tooling reduces voids in sealant areas, preventing water from seeping through the firestopping assembly.

- **Damage**—Once installed, physical damage to firestopping, gaps created by movement of piping or other systems, cuts, or other physical damage may cause leakage of water through the W-rated firestop assembly. Damage, left unchecked, could affect both the W water-resistance and L air-leakage rating of the firestop system. Therefore, thorough inspection by the firestopping contractor during the construction process, verified by post-destructive testing per ASTM E2174 and E2393, standards for the inspection of installed firestop systems, becomes critical to performance. Additionally, maintenance per the Firestop Contractors International Association's Effective Compartmentation Protocol is crucial.

- **Leakage at Unprotected Areas**—Firestopping contractors will need to exclude certain areas from contracts to avoid others' liability. For instance, a duct with an overlap seam a few inches above a firestopped opening may pass the W rating test at the firestop, but not at the joint where water may seep into the ductwork. Perimeter or shaft areas may not be accessible in older, retrofit applications. Therefore, firestop contractors should exclude protecting those areas that are not part of their direct responsibilities.

Liability Questions

Contractors can reduce risk through quality application procedures and accurate, efficient operations. Incorporating thorough surface preparation procedures, tooling, further inspection in the installation process and exclusion of work outside the firestop contractors' scope may help minimize risk. Additionally, accurate labeling and clear pictures in project documentation may reduce the contractor's risk.

Most importantly, understanding the limitations of the W rating is very important for designers, building owners and managers, in addition to general and firestop contractors. Since the W rating does not include testing non-cured firestop sealants and systems, washout due to rain or other water exposure after installation, but before cure, may not be protected by these new W-rated firestop systems. Contact firestop systems material manufacturers about materials that might be suitable for use in applications where washout resistance is needed.

The firestopping industry has not seen manufacturers take responsibility for water resistance through a warranty program, similar to that of installed waterproofing and roofing assemblies. In the roofing and waterproofing industries, manufacturers warrant their installed products against leaks for a specified period of time, with exclusions of course. Time will tell how manufacturer programs evolve in this arena.

Firestop systems technology is moving quickly as an industry. Leaders from the Firestop Contractors International Association and firestopping product manufacturers will continue to develop standards to address field conditions, and most importantly, fire and life safety for our families in buildings worldwide. ☺

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