The following questions have been presented to us via several e-mails, perhaps from several parties looking at the same job:

Q In using AWCI Technical Manual 12-B Standard Practice for the Testing and Inspection of Field Applied Thin-Film Intumescent Fire-Resistive Materials; an Annotated Guide when testing for verification of dry film thickness, Section 6.4.1.9, C talks about “at each end of a 12-inch length.” What does this mean when you’re testing a 10- or 12-foot column?

In dealing with dry film thickness we have material that is not fully dried. What effect might this have on this testing method?

What effect do cold (below 32 degrees) temperatures have on material exposed to the elements?

A I read through the manual myself and found that the passage “at each end of a 12-inch length” could lend itself to a couple of interpretations. As fate would have it, the phone rang just as I was trying to puzzle this through, and it was George Cochran of Isolatek calling. Isolatek happens to market thin-film intumescent fire-resistive materials (or TFIFRM for short), so I asked him to explain the procedure to me. (And it took him a couple of tries-and a hand-drawn diagram that he faxed-for me to fully understand it.)

Once the test column has been randomly selected, two dry film thickness readings are taken on each of four sides of a tubular column, or each of 12 on an I-shaped column. The first reading on any given side typically occurs somewhere between waist and shoulder height, primarily because this will minimize bending or stretching and facilitates the reading of the measuring device. The second reading on the same surface is taken 12 inches away from the first to ensure that the film is a uniform thickness. Or to say the same thing another way, first take a reading at 60 inches above the floor, and then another reading on the same surface at either 48 or 72 inches above the floor.

As far as determining the thickness of a not-yet-dried film, the test is not valid unless the film is completely dry. The film will not be its final thickness until the volatile ingredients have dissipated. In other words, the film is likely to read thicker while still partially wet than it will once eventually dry and all volatile materials have gone away. The temperature of the substrate, the ambient temperature and the humidity affect the drying time of the TFIFRM. If the temperatures are low and/or the humidity is high, the volatile materials in the film will take longer to dissipate.

This ties into the next part of the discussion. A minimum substrate temperature of 40 degrees Fahrenheit must be maintained during and for at least 24 hours after the application of TFIFRM. This, of course, is to ensure that the TFIFRM dries and cures properly. Assuming that the temperature does not fall below the 40-degree mark within the first 24 hours, testing the film thickness at a temperature of 32 degrees later on should not present a problem with the TFIFRM; however, the person performing the testing would be well advised to bundle up, especially if it’s a good-size job. This assumes that the film has had ample time to really dry and, if exposed to the elements, had been top-coated or protected so that excessive moisture didn’t damage the TFIFRM.

About the Author
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