There are cracks in the surface of the spray-applied fire-resistant material that we recently applied to structural steel. Do these cracks need to be repaired? If so, is it necessary to spray the repairs, or is there a simpler, less messy method?

SFRM is meant to prevent structural steel, steel floor decking and other building components from reaching the critical “martinizing” temperature—the temperature that would be hot enough to alter the structure of the steel—before the specified fire resistance rating in the event of a fire. If these steel components reach that temperature prematurely, the building’s occupants and firefighters may not have sufficient time to escape before the heat from the fire causes the steel to fail, and the building to collapse.

Hairline cracks (less than one-sixteenth of an inch wide) in SFRM’s surface may not affect the fireproofing’s performance. But cracks in the SFRM that go all the way down to the metal substrate must be repaired because they cause a “thermal short” during a fire that will cause the steel to reach the martinizing temperature before the rated time expires.

To check if a crack does penetrate down to the substrate, first check the depth of the crack by inserting the shaft of an SFRM thickness gauge, and determine how deep the crack is by stopping when the shaft meets resistance. Take another reading in an uncracked area an inch away, but measure through to the substrate. Subtract the first figure from the second, and the result is the approximate depth of the cracked material.

Whenever possible, repairs should be done with the identical material, employing the same application method in the manufacturer’s printed installation procedures. However, if using the spray equipment is no longer practical, the material can be trowel applied if UL approved for trowel application.

I have a detail of a “head of wall joint” specifying one inch of movement. The detail references a UL HW-D number. The listing in Vol. 2 of the UL Fire Resistance Directory states that the joint has an installed width of one inch, but only moves a percentage of the installed width. Can you explain this? —J.G., California

I found these listings mind-boggling myself. Fortunately, I happen to know a manufacturer of several of the listed designs, and he’s done his best to enlighten me. According to him, often only the installed width is considered and it is assumed that this width is also the movement capability of the joint. But there’s much more to it. The listing starts with the listing number: HW-D-???? The first line after the listing number refers to the installed width of the joint. The second line states the hourly rating of the joint. That rating can be one, two, three or four hours, or there may be several hourly ratings and a note for clarification.

The third line states the nominal joint width in inches. This is the installed width of the joint, not its movement capability. The fourth line gets technical. There are three: Class I (500 cycles at one CPM), Class 2 (500 cycles at 10 CPM) and Class 3 (100 cycles at 30 CPM). Next is the movement capability of the joint, normally expressed as a percentage of its nominal width, for example, 25 percent of one inch equals a quarter of an inch.

Finally comes compression and/or extension, both are normally necessary. Drawings then show the types of decks and the orientation to the decks that the joint has been tested with. The drawing notes also indicate whether the joint can be used for both roof and floor decks or floor decks only. For a more thorough explanation, check the beginning of the UL directory.

About the Author
Lee G. Jones is AWCI’s director of technical services. Send your questions to him in care of AWCI’s Construction Dimensions, or send your e-mail question to jones@awci.org.