

***** ABSTRACT ONLY *****

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INVESTIGATION OF CONDUCTION EFFECTS ON SPRINKLER ACTIVATION

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As part of a collaborative research project between the National Fire Protection Research Foundation and the Building and Fire Research Laboratory at NIST, the thermal response characteristics of a variety of large orifice and extra large orifice sprinklers were investigated. In addition to conducting the thermal sensitivity tests as outlined in UL 199, Automatic Sprinklers for Fire-Protection Service, the conductivity tests outlined in ISO6182-1, Fire Protection - Automatic Sprinkler Systems Part 1: Requirements and Test Methods for Sprinklers, were also conducted.

The BFRL thermal sensitivity oven or plunge test was modified to accommodate the conduction test. This task was challenging, since the ISO standard is performance based not prescriptive, i.e. it tells you what the test parameters should be, not how to attain them. This presentation describes a design for the water cooled mount required by the conduction test and the results of the response time index and conduction tests of the sprinklers. A comparison of the predicted activation times utilizing several modeling techniques versus activation times from full scale fire experiments is included.