

## Fire Rated Field Conditions (Missed Fastener)

### Introduction:

In March of 2015 the Wall & Ceiling Conference (WCC) contracted with Intertek laboratories to determine how “typical” field conditions impact a 1-hour fire rated gypsum board assembly. The assembly was built and tested per ASTM E-119, *Standard Methods for Fire Test of Building Materials*, and included a missed fastener that was removed and covered with joint compound in gypsum board assembly. The intent of this test was to determine how the rating of an approved 1-hour wall assembly might be impacted by this condition.

### Test Sample:

#### Framing Members

3-5/8” deep, 25EQ (25 GA “equivalent”) steel studs spaced 24” o.c. The top and bottom track were also 25 EQ.

#### Interior and Exterior Cladding

One layer of 4’ x 10’ x 5/8” ASTM C1396 equivalent type X gypsum board oriented vertically secured using 1-1/4” self-drilling drywall screws spaced 8” o.c. around the perimeter and 12” o.c. in the field. Exposed seams were covered with joint tape, and the tape and fasteners received 2 layers of joint compound.

The missed fastener was removed and covered with joint compound, this was applied to both the exposed and unexposed surfaces to accommodate a symmetrical test result.

### Testing and Evaluation Methods:

The missed fastener removed and covered with joint compound was instrumented by a 24 GA, Type K, fiberglass jacketed thermocouple. The output of the thermocouple and furnace probes was monitored by a 100-channel Yokogawa, Inc., Darwin Data Acquisition Unit. The computer was programmed to scan and record data every 30 seconds. The ambient temperature at the time of the test was 56° F and the humidity was 81% R.H.

#### Analysis

Location	Max Temp Reached (°F)	Max Allowed (°F)
Missed fastener	250	381

The individual temperature rise criteria as listed in the table above were based on the ASTM E119 requirements of 325°F above the initial temperature. 56°F at the start of the test for a maximum allowable temperature rise of 381°F.

### Conclusion:

If a missed fastener occurs, the fastener shall be removed and the area is to be treated with joint compound to a minimum of a level 2 gypsum board finish as tested. There was no evidence of reduced fire resistance due to the addition of the missed fastener removed and covered with joint compound within the tested assembly. For a full copy of the test report, please visit [www.wccinfo.org](http://www.wccinfo.org), click on the library tab and select the fire test. For further details and or clarification please do not hesitate to contact WCC.