

CLIENT: HACKER INDUSTRIES, INC.
1600 Newport Center Drive, Suite 275
Newport Beach, CA 92660

Test Report No: RJ5054F-2

Date: October 20, 2016

SAMPLE ID: The following test material was identified as: Firm Fill 3310+.
See photo on page 2.

SAMPLING DETAIL: Test samples were submitted to the laboratory directly by the client. No special sampling conditions or sample preparation were observed by QAI.

DATE OF RECEIPT: Samples were received on September 30, 2016.

AUTHORIZATION: Testing was authorized by John Duhl for proposal 16MB09093-2015-121801 signed September 23, 2016.

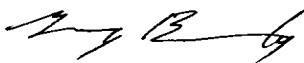
TESTING PERIOD: October 12 & 13, 2016.

TEST REQUESTED: ASTM E136-16 "Standard Test Method for Behavior of Materials in a Vertical Tube Furnace of 750°C". Option A.

TEST RESULTS: See detailed results on page 2.

CONCLUSION: The submitted sample **Passes** the test as specified in ASTM E136.
See requirements on page 2.

Prepared By



Greg Banasky
Senior Technician
Fire Technology

**Signed for and on behalf of
QAI Laboratories, Inc.**



Brian Ortega
Senior Analyst / Fire Technology

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CONDITIONING: Test samples were submitted in slabs, nominal 6" wide by 6" long by 1" thick. The laboratory cut the slabs into 1 1/2" by 1 1/2" pieces and stacked two of these pieces together to form a specimen, nominal 1.5" wide by 1.5" length by 2" high. The test specimens shall be dried at $60 \pm 3^{\circ}\text{C}$ ($140 \pm 5^{\circ}\text{F}$) for not less than 24 hr. but no more than 48 hr. Test specimens shall then be placed in a desiccator to cool at least 1 h before testing.

PROCEDURE: A *Vertical Hot-Air Ignition Furnace*, QAI Asset Number RG613, similar to that shown below in Fig. 1, consisting of an electrical heating unit and a specimen holder, was set at a temperature of $1382 \pm 10^{\circ}\text{F}$. Thermocouples were attached to the surface and geometric center of the specimen. The specimen is lowered into the furnace. Observations are made to the time of flaming of the specimen. The temperatures of the thermocouples are recorded. The test is continued until the temperature at the thermocouples has reached maxima, or until it is evident that the specimen does not pass this test.

TEST RESULTS:

<u>Specimen</u>	<u>Furnace Temperature, °F</u>	<u>Surface Temperature, °F</u>	<u>Interior Temperature, °F</u>	<u>Weight Loss %</u>	<u>Time of Flaming</u>
1	1384	1410	1382	13	0:00
2	1385	1405	1387	12	0:00
3	1386	1412	1392	12	0:00
3	1385	1409	1385	12	0:00

REQUIREMENTS: Record the material passing the test if at least three of the four specimens tested meet the individual test specimen criteria.

When the weight loss of the test specimen is 50% or less, the material passes the test if, the recorded temperatures of the surface and interior thermocouples do not at anytime during the test rise more than 30°C (54°F) above the stabilized furnace temperature and there is no flaming of the specimen after the first 30 seconds. If the weight loss of the specimen exceeds 50%, the material passes the test if, the recorded temperatures of the surface and interior thermocouples do not at anytime during the test rise above the stabilized furnace temperature and no flaming of the specimen is observed at any time during the test.



Specimen before exposure



Specimen after exposure

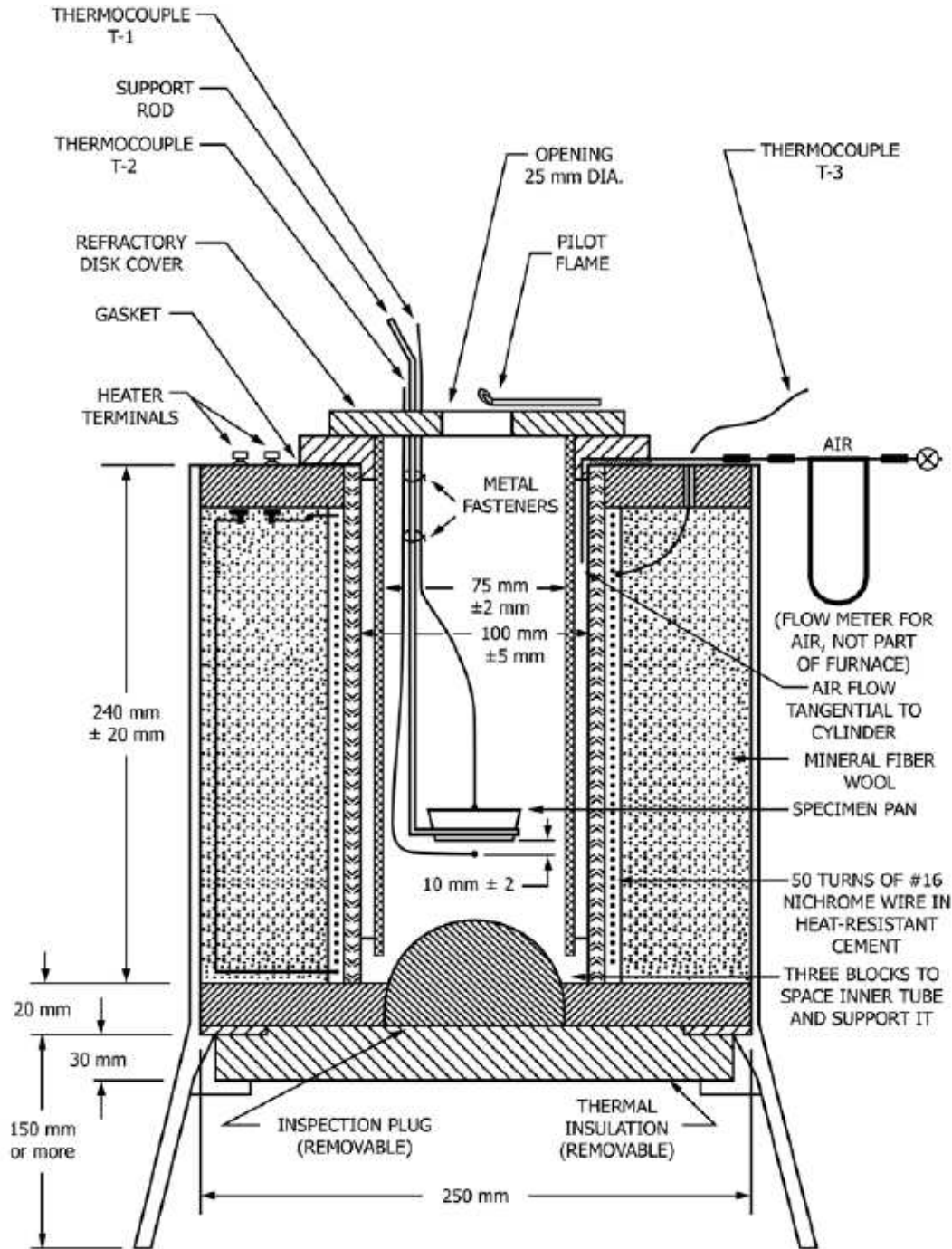


Figure 1: Vertical Hot-Air Ignition Furnace

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