

LABORATORY TEST REPORT

November 3, 1992

SUBJECT: Pyrocrete 241 Thermal Transmission by the UL1709 Time/Temperature Fire Curve

REFERENCE: L361-174, 177 and 180

DOCUMENT ACCESS NO: 08066

PURPOSE: Determine the thermal transmission of Pyrocrete 241 when exposed to the UL1709 time/temperature fire curve including the thickness vs. time relationship for a 250°F (average) or 325°F (single point) above ambient backside temperature.

CONCLUSIONS: 1. The following thickness of Pyrocrete 241 are recommended for 250°F (average) or 325°F (single point) above ambient thermal transmission endpoints:

<u>Thickness</u>	<u>Time</u>
3/4"	1/2 hour
1-1/8"	1 hour
1-3/8"	1-1/2 hours
1-1/2"	2 hours
1-3/4"	3 hours
2"	4 hours

2. The following thicknesses are recommended for 200°F and 300°F above ambient (average backside temperature) thermal transmission endpoints:

<u>Thickness</u>		<u>Time</u>
<u>(200°F)</u>	<u>(300°F)</u>	
13/16"	11/16"	1/2 hour
1-1/16"	1-1/16"	1 hour
1-7/16"	1-5/16"	1-1/2 hour
1-9/16"	1-7/16"	2 hours
1-13/16"	1-11/16"	3 hours
2-1/16"	1-7/8"	4 hours

PROCEDURE:

I. SYSTEMS

- A. Pyrocrete 241 applied at 1/2", 1", and 2" (thickness measured to the surface of the lath).
- B. 27" x 27" 16 gauge steel panels.
- C. 3.4 pound per square yard diamond galvanized lath reinforcement secured tightly on back of panel.

From the Carboline Research & Development Laboratory

0092434.rm

The technical data furnished are true and accurate to the best of our knowledge. However, no guarantee of accuracy is given or implied.

TEST-012480-1 A



350 HANLEY INDUSTRIAL CT, ST LOUIS, MO 63144

Pyrocrete 241 spray applied with moyno pump and troweled smooth to thickness on lath reinforced steel panels as per Pyrocrete 241 product data sheet.

Memorandum

To: III. TESTING

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From: A. All panels were fire tested in the Carboline Beam Furnace by a simulated hydrocarbon fire curve (UL1709 time/temperature fire curve). Date:

Subject: B. The backside temperatures of all panels were measured by type K thermocouples. The thermocouple ends were twisted together and placed directly on the steel at the back of the panel underneath a refractory pad with a two pound weight holding them in place. Five thermocouples were placed on each panel. The thermocouples were placed in the center of the panel and in the center of each of the four quadrants formed by dividing the panel into four equal areas.

C. Thermocouple outputs were measured with a Doric Digitrend 235 digital recorder and Leeds and Northrup chart recorder.

RESULTS:

I. Table I

Average Backside Temperature Endpoint vs. Time and Thickness

Endpoint Temperature (°F above ambient)	Pyrocrete Thickness		
	1/2"	1"	2"
	(Time to Endpoint)		
200	19.37 min.	42.42 min.	275.45 min.
250	21.42 min.	46.39 min.	300.00 min.
300	23.25 min.	50.61 min.	345.00 min.
350	25.08 min.	55.78 min.	---
400	26.97 min.	61.50 min.	---
450	28.86 min.	67.97 min.	---
500	30.84 min.	77.59 min.	---
550	32.94 min.	85.00 min.	---
600	35.15 min.	---	---
650	41.78 min.	---	---
700	62.50 min.	---	---
Ambient (°F)	77	88	73

Note: 1/2" panel failed by single point (325°F above ambient) criteria at 20 min. 1" and 2" panels failed by average (250°F above ambient) criteria.

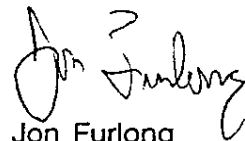
Memorandum

To: A. Graph I
 The graph shows the average backside temperatures for Pyrocrete 241
 UL1709 curve thermal transmission fire tests.

From: B. Graph II
 The graph shows recommended thicknesses and best fit curves for
 Pyrocrete 241 UL1709 fire curve thermal transmission.

Subject: C. Graph III
 The graph shows the UL1709 time/temperature fire curve and furnace
 temperatures.

Date:



Jon Furlong
Developmental Chemist
Fireproofing Products Division

THERMAL TRANSMISSION PYROCRETE 241 (HL RISE)

Memorandum

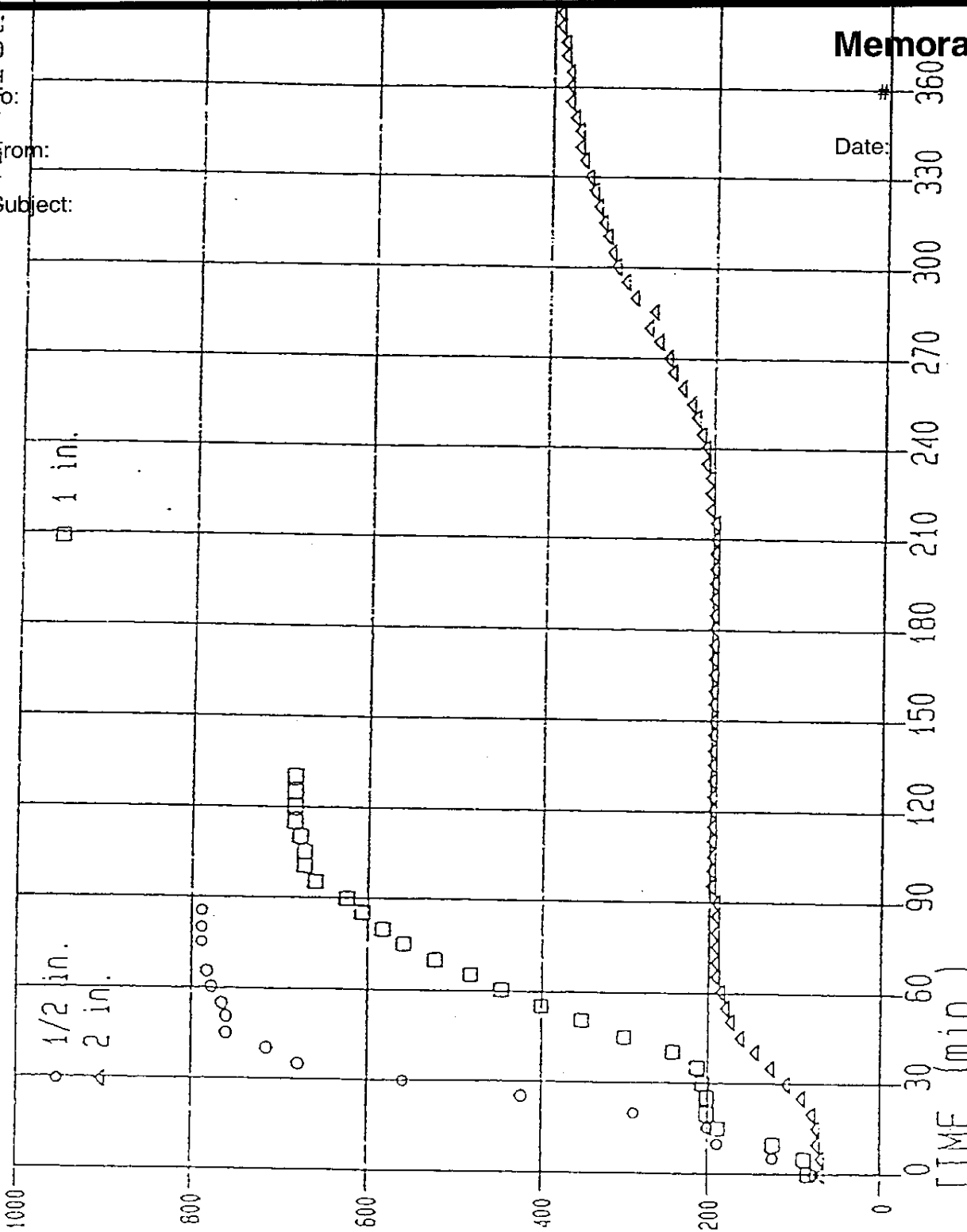
To:

From:

Subject:

Date:

360



TEMPERATURE (deg. F.)

TIME (min.)

PYROCRETE 241 THERMAL TRANSMISSION (HI-RISE)

To:
From:
Subject:

Memorandum

Date:

