

TUTCO SCIENTIFIC CORPORATION

714 East Aspen Ave.

Fruita CO 81521

p&f 970 858 3584; e-mail: tutco@bresnan.net

REPORT ON

THERMAL PROPERTIES OF

TEMP-COAT

LIQUID CERAMIC INSULATION

(TUTCO ID 8-25-10)

DETERMINED IN ACCORD WITH

ASTM C 335 and ASTM C1045

PREPARED FOR

Temp-Coat Brand Products LLC

301 West Airline Hwy

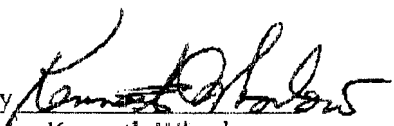
Suite 100

LaPlace, LA 70068

TUTCO SCIENTIFIC REPORT NO. 335\TempCoat.910

September 10, 2010

Reported by



Kenneth Whorlow

President

335\TempCoat.910

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Project: Determine the thermal conductivity (ASTM C335 - Steady State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-End Pipe Apparatus) of one sample of Temp-Coat Liquid Ceramic Insulation received from Temp-Coat Brand Products. The testing was conducted as requested by correspondence.

Sample: The sample received was described as Temp-Coat Liquid Ceramic Insulation used for thermal control and anti-sweat applications. The liquid ceramic insulation had been applied to a piece of fiberglass netting 27.5 inches wide x 47.5 inches long. The coating completely filled the netting mesh on both top and bottom surfaces. The sample was assigned Tutco Sample Number 8-25-10. It was tested as four layers wrapped around the center of the 48" test pipe with two 11.5" mineral fiber guard pieces on the ends.

Test Equipment: The 48" Tutco Scientific C335 Unit B Guarded-End Pipe Apparatus was used for the testing. The unit was verified as acceptable for use by test comparison to the ASTM Round Robin calcium silicate insulation samples used to develop the C335 Precision and Basis Data. The round robin results of the seven participating labs did not vary by more than 6.3% of the average. The Tutco apparatus was within the average variance. There is currently no NIST Traceable High Temperature Pipe Insulation Standard Material available for ASTM C335 equipment. The equipment was used at hot surface temperatures between 110 °F to 240 °F to obtain the five reported experimental observed data points.

Thermal Conductivity Data

Sample: Temp-Coat Liquid Ceramic Insulation applied to netting

Sample Data: Length(in)=27.5, Thk.(in)=0.16 (four layers), Circum.(in)=12 (four layers)

Test Method: The thermal conductivity was determined on the on the continuous 4 wrap installation, using the ASTM C335 test apparatus at five temperatures. The calculated Apparent Thermal Conductivity values were adjusted using a computer program as required using ASTM C1045 to compensate for large hot and cold surface temperature differentials. ASTM C1045 does not recommend extending the calculation beyond the lowest and highest mean temperature measured.

Material Installation: The leading edge of the insulation material was started on the pipe using tape. The insulation material was then wrapped around the affixed leading edge. The 4 layers of material were wrapped tight and were held in place on the pipe using tape.

Observed Data (temperatures in °F) - See Figure 1

Data Point	Hot Surf.	Cold Surf.	T Diff.	T Mean	Measured Cond.*
1	110.1	99.1	11.0	104.6	0.609
2	122.2	106.3	15.9	114.2	0.612
3	176.2	140.7	35.5	158.5	0.627
4	222.2	170.0	52.2	196.2	0.649
5	239.8	180.0	59.8	209.9	0.659

* BTU·in/hr·ft²·°F

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Thermal Conductivity Calculated Using ASTM C1045 - See Figure 1

$$k = 6.234E-01 - 4.34379E-04(\text{mean}) + 2.8655E-06(\text{mean}^2)$$

<u>Mean Temp., F (C)</u>	<u>Apparent Cond., * (**)</u>
75 (24)	0.607 (0.087) *
100 (38)	0.609 (0.088)
150 (66)	0.623 (0.090)
200 (93)	0.651 (0.094)
250 (121)	0.694 (0.100) *
300 (149)	0.751 (0.108) *

* This calculated value extends beyond that recommended for the observed data.

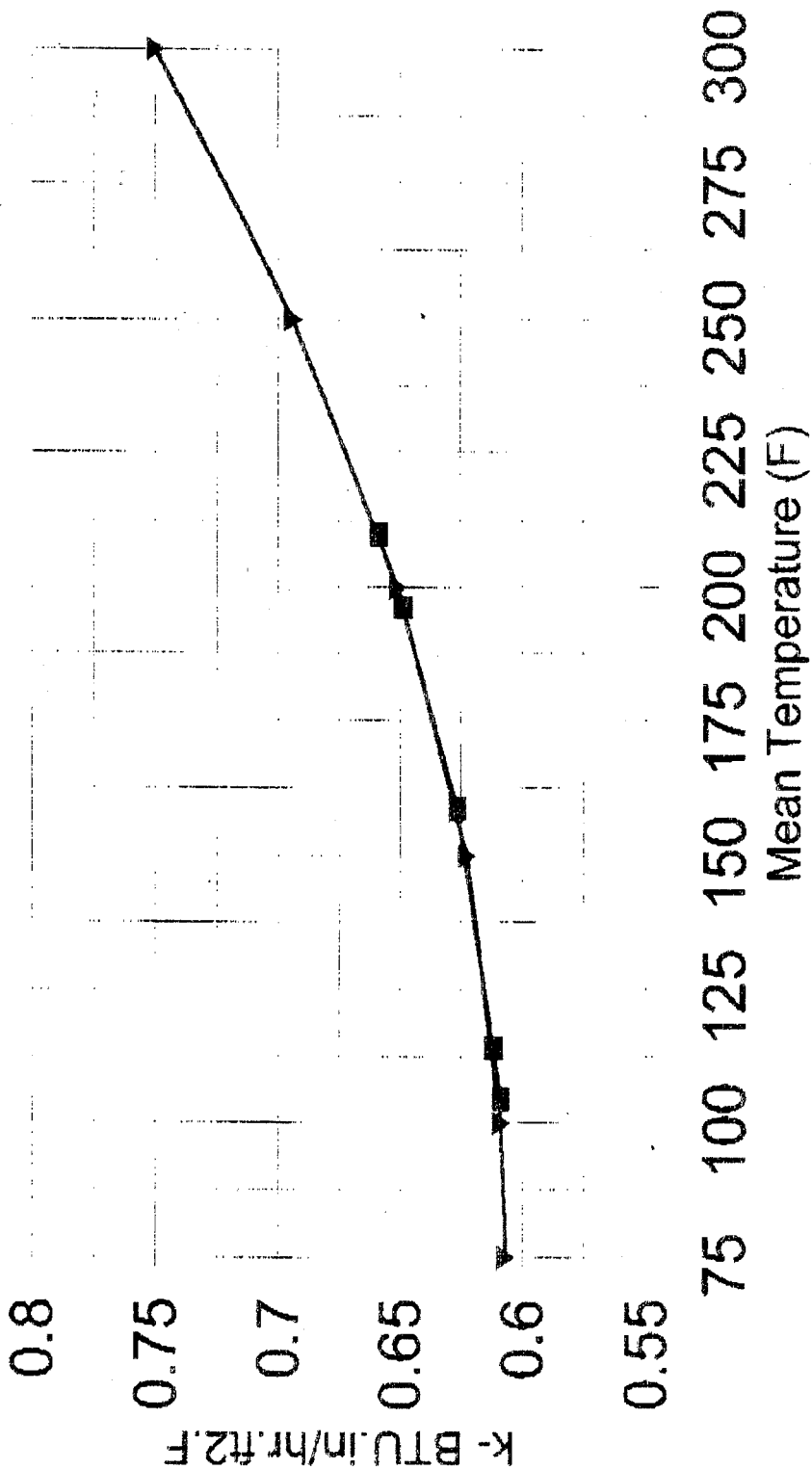
* BTU·in/hr·ft²·°F

** W/mK

Thermal Conductivity (C335)

TempCoat - 4 layers w/FG netting=0.16"

Figure-1
9-9-10



—■— Measured Data —▲— ASTM C1045

TUTCO SCIENTIFIC CORPORATION
714 East Aspen Ave.
Fruita CO 81521
970 858 3584

Invoice #TempCoat\335.910
Date: September 13, 2010

INVOICE

Tutco Scientific Corporation in account with
Temp-Coat Brand Products LLC, 301, West Airline Hwy, Suite 100, LaPlacc, LA 70068
For services on one sample of Temp-Coat Liquid Ceramic Insulation
as requested by Jason Meyer.

Test one sample of Temp-Coat Liquid Ceramic Insulation
received from Brand Products LLC; assigned sample lot # 8-25-10
Thermal Conductivity per ASTM C335
Measured 5 points @ \$300.00 per point
Special Contract Price -

\$1350

Discount for temperature points
all below 300F

-\$150

please pay

\$1200

THANK YOU FOR YOUR ORDER
YOUR BUSINESS IS APPRECIATED