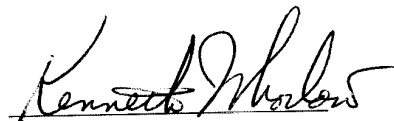


TUTCO SCIENTIFIC CORPORATION
676 PEONY DRIVE
GRAND JUNCTION, CO 81503
970-245-7763; e-mail tutco@gj.net; www/gj.net/~tutco

REPORT ON
THERMAL PROPERTIES OF
einsulation
MINERAL FIBER PIPE INSULATION

PREPARED FOR
einsulation.com, inc
508 North Second St.
Fairfield, IA 52556

TUTCO SCIENTIFIC REPORT NO. E-INS\335.902
September 27, 2002


Kenneth Whorlow
President of Operations

Thermal Conductivity Data

Sample: e insulation

Material: Mineral Fiber

Sample Data: Length (in)=35.9375, Nominal Thickness (in)=2.0, Circum.(in)=23.75,
Weight (g)=2693, Density = 8.2 pcf (calculated using circumference and nominal pipe size)

Test Method: The thermal conductivity was determined on 3N2 pipe cover, using the ASTM C335 test apparatus at eight temperatures. The calculated Apparent Thermal Conductivity values were adjusted by the computer program as required using ASTM C1045 to compensate for large hot and cold surface temperature differentials.

Observed Data (temperatures in °F) - See Figures 1 and 3

Data Point	Hot Surf.	Cold Surf.	T Diff.	T Mean	Measured Cond.*
1	164.3	84.1	80.31	124.2	0.259
2	203.9	86.4	117.4	145.2	0.266
3	264.7	92.3	173.4	179.6	0.290
4	511.0	110.6	400.4	310.8	0.356
5	750.1	134.3	615.8	442.2	0.450
6	953.0	164.2	788.9	558.6	0.557
7	1165.8	196.1	969.7	680.9	0.676
8	1206.4	201.9	1004.5	704.2	0.702

Thermal Conductivity Calculated Using ASTM C1045 - See Figures 2 and 3

$$k = 2.178E-01 + 2.7479E-04(\text{mean}) + 5.0057E-07(\text{mean}^2)$$

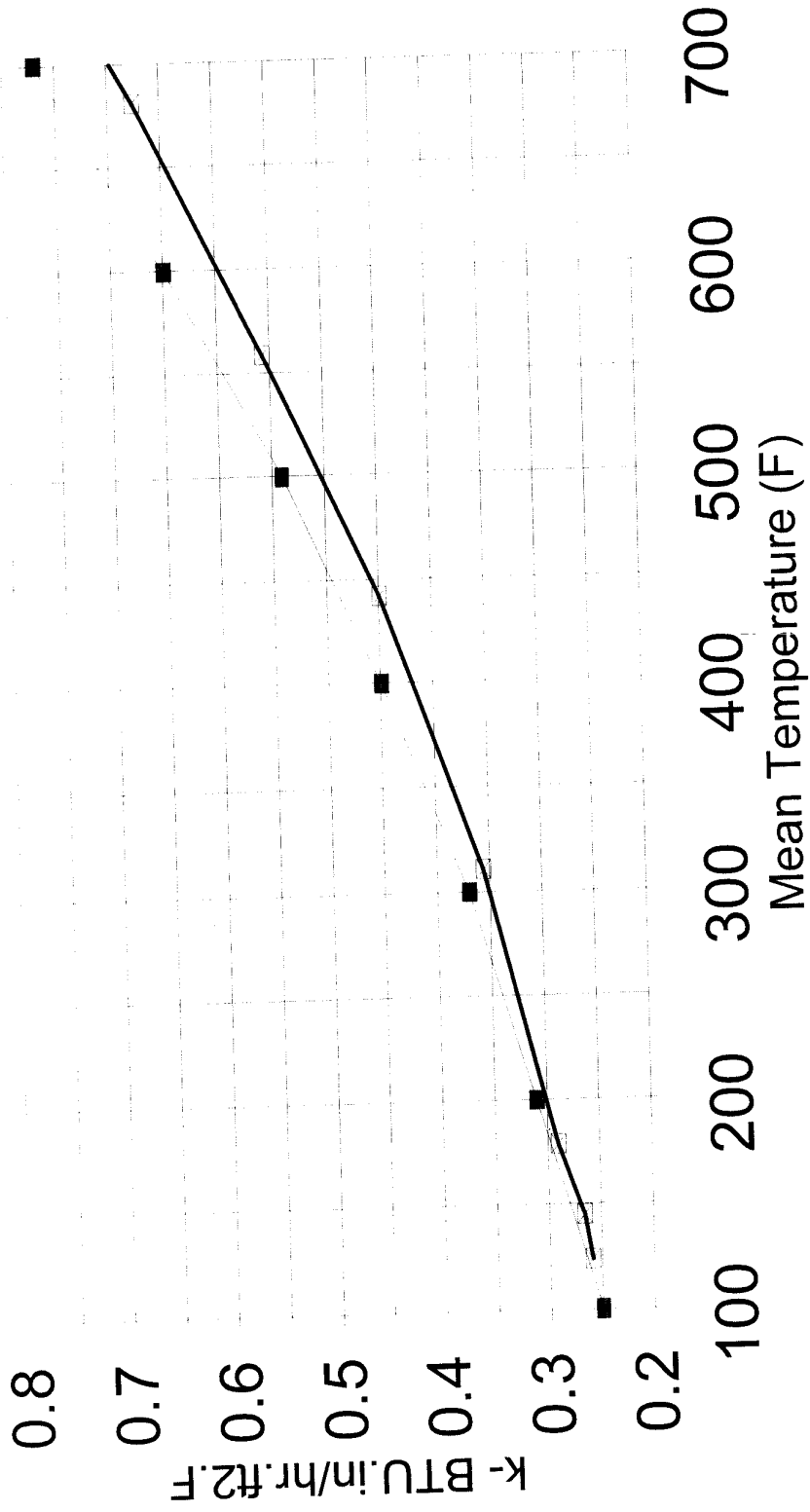
Mean Temp.,F (C)	Apparent Cond.,* (**)	Maximum ASTM C547 (Type II & III),* (**)
100 (38)	0.250 (36.1)	0.25
200 (93)	0.293 (42.3)	0.31
300 (149)	0.345 (49.7)	0.37
400 (204)	0.408 (58.8)	0.45
500 (260)	0.480 (69.2)	0.54
600 (316)	0.563 (81.2)	0.65
700 (371)	0.655 (94.5)	0.77

* BTU•in/hr•ft²•°F

** mW/mK

Thermal Conductivity (C335)

insulation Mineral Fiber Pipe

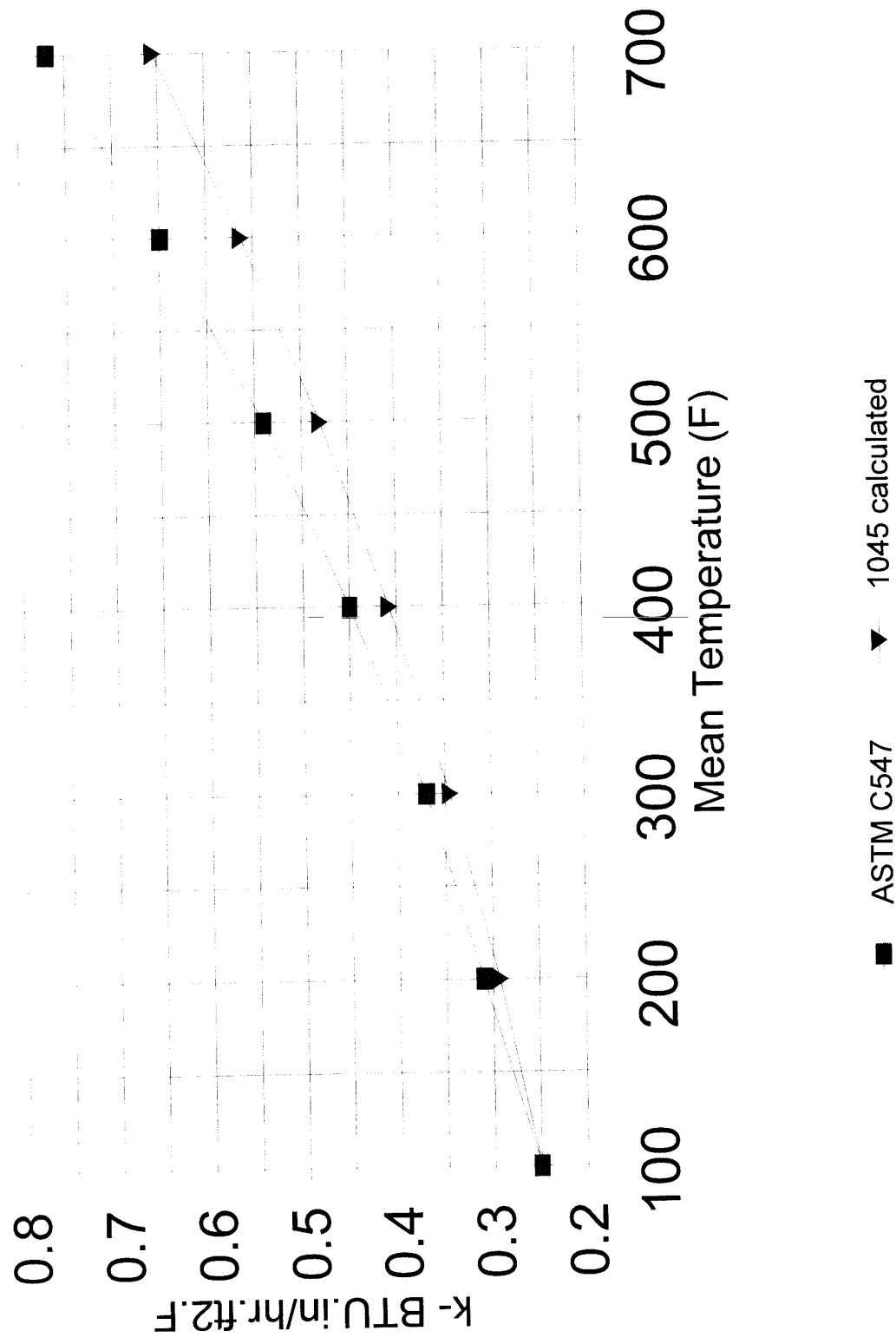


■ ASTM C547 — C335-measured data

Figure-1

Figure-2

Thermal Conductivity (C335) insulation Mineral Fiber Pipe



Thermal Conductivity (C335)

insulation Mineral Fiber Pipe

Figure-3

