

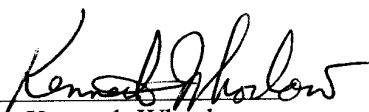
**TUTCO SCIENTIFIC CORPORATION
676 PEONY DRIVE
GRAND JUNCTION, CO 81503
970 245 7763**

e-mail: tutco@gj.net web page: www.gj.net/~tutco

REPORT ON
PHYSICAL and CHEMICAL
PROPERTY TESTS
FOR
einsulation.com, inc
MINERAL FIBER
PIPE INSULATION

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

TUTCO SCIENTIFIC REPORT NO. E-INS\MIN-P.902
September 26, 2002

Reported by 
Kenneth Whorlow
President of Operations

Project: Determine several chemical and physical property characteristics of Mineral Fiber Pipe Insulation submitted by einsulation.com, inc.

Samples: The samples were received from einsulation.com and designated e-insulation.

Test Methods: The following ASTM test procedures were used:

Chemical Tests - Chloride only - single sample (C 871)
Steady State Heat Flux Measurements and Thermal Transmission Properties by
Means of the Guarded-End Pipe Apparatus (C 335)
Water Vapor Sorption (C1104)
Shot Content - including heat treatment at 1100 ° F (C1335)

Data:

Chemical Tests - Chloride only - single sample (C 871),

Chloride - equipment - Amperometric-coulometric titrator

Test Results: Given in parts per million(mg/kg).

Chloride = <12 (4)*

* Less than the accurate low determination level for the analytical techniques and equipment used

Steady State Heat Flux Measurements and Thermal Transmission Properties by
Means of the Guarded-End Pipe Apparatus (C 335)

Full Report under separate cover (Tutco Scientific Report E-INS\335.902

Thermal Conductivity Calculated Using ASTM C1045

English-driven: $k = 2.178 \text{ E-01} + 2.7479 \text{ E-04}(\text{Mean}) + 5.0057 \text{ E-07}(\text{Mean})(\text{Mean})$

<u>Mean</u> <u>Temperature</u>	<u>1045 calculated Apparent</u> <u>Thermal Conductivity*</u>	<u>C547</u> <u>Maximum*</u>
100 °F	0.250	0.25
200 °F	0.293	0.31
300 °F	0.345	0.37
400 °F	0.408	0.45
500 °F	0.480	0.54
600 °F	0.563	0.65
700 °F	0.655	0.77

* (Btu-in./h-ft-°F)

Measured points #1 - 0.26 @124 °F, #2 - 0.27 @145 °F, #3 - 0.29 @179 °F, #4 - 0.36 @311 °F
 #5 - 0.45 @442 °F, #6 - 0.56 @559 °F, #7 - 0.68 @681 °F, #8 - 0.70 @704 °F

Water Vapor Sorption (C1104)

3 samples at 120 ° for 96 hours

Results expressed as % of weight

<u>Sample</u>	<u>% gain</u>
1	0.34
2	0.45
3	0.30

Average	0.36
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ASTM C547 Maximum 5.0%.

Shot Content - including heat treatment at 1100 ° F (C1335)

Procedure 7.2 - Manual Operation

Results expressed as % of weight after heat treatment

Sample	20 mesh	50 mesh	100 mesh	Total
1	0	1.8	11.7	13.6
2	0.3	2.0	12.5	14.8
3	0.3	1.9	12.5	14.7
Average	0.2	1.9	12.2	14.3

ASTM C547 Maximum 30%.

Summary

The einsulation Mineral Fiber Pipe Insulation submitted by einsulation.com, inc. met all of the specification requirements for the tests conducted.