STORK®
Materials Technology

Stork Twin City Testing Corporation

662 Cromwell Avenue
Saint Paul, MN 55114
USA

Telephone :(651) 645-3601
Toll Free :(888) 645-TEST
Telefax :(651) 659-7348
Website :www.storktct.com

Investigative Chemistry
Non Destructive Testing
Metallurgical Analysis

Geotechnical
Failure Analysis
Materials Testing

Construction Materials
Product Evaluation
Welder Qualification

JOB NUMBER: 30160 05-70285A
PAGE: 1 of 4
DATE: Oct. 4, 2005

COMARATIVE THERMAL RESISTANCE TESTING OF PILLOW FILL MATERIALS

Prepared for:
VYMAC CORP.
Attn: LANCE FLYNN
W3130 STATE ROUTE 59
WHITEWATER, WI 53190

Prepared By:

William E. Stegeman

William Stegeman
Project Manager
Product Testing Department
Phone: 651-659-7230

Reviewed By:

Brent L Larson

Brent L. Larson
Project Engineer
Product Testing Department
Phone: 651-659-7275

The test results contained in this report pertain only to the samples submitted for testing and not necessarily to all similar products.

JOB NUMBER: 30160 05-70285A **PAGE:** 2 of 4
DATE: Oct. 4, 2005

COMARATIVE THERMAL RESISTANCE TESTING OF PILLOW FILL MATERIALS

INTRODUCTION:

This report presents the results of Comparative Thermal Resistance tests conducted on samples of pillow fill. The testing was authorized by Mr. Flynn of VYMAC Corp. on Sept. 9th, 2005. The testing and data analysis were completed on Sept. 30th, 2005.

The scope of our work was limited to conducting Comparative Thermal Resistance tests on the samples submitted and reporting the results.

SUMMARY OF RESULTS:

Comparative Thermal Resistance

Material	Down	Everloft	Everlon	Polyester Cluster
Comparative R Value	8.5	4.8	4.0	5.7

SAMPLE IDENTIFICATION:

A single specimen of each sample was received and were identified as Down, Everloft, Everlon, and Polyester Cluster. All specimens were wood frames with bedding cloth covers stapled top and bottom to the wood frame and filled with pillow fill material. The original frames were 12 ¾" by 12 ¾" by 2". Due to equipment requirements the frames were cut down to 12" by 12" by 2". In order to accomplish this the frames were partially disassembled, fill removed, frame fully disassembled, wood cut, frame partially reassembled, filled and reassembled. There was some minor loss of fill materials during this process.

TEST METHOD(S):

The specimens were allowed to condition at standard laboratory conditions of 72 ± 4°F and 50 ± 5% relative humidity for at least 40 hours prior to testing. The comparative thermal resistance testing was conducted using ASTM Standard C518-04, "Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus" as a procedural guide.

The specimens were placed in a heat flow meter, model Rapid-K, manufactured by Holometrix, Inc. Steady-state heat flux measurements were made at a mean temperature of approximately 75°F using a hot face temperature of approximately 100°F and a cold face temperature of approximately 50°F. Specimen thermal resistance and thermal

conductivity were determined by comparing the heat flux measurements of the specimen to measurements made on a standard reference material of known thermal resistance and thermal conductivity. Resistance value obtained from the Rapid-K are best utilized for homogenous specimens, Pillow fill specimens were not homogenous and therefore results are only comparable between Pillow fill specimens tested.

CALIBRATED TEST EQUIPMENT:
Holometrix Heat Flow Meter, model Rapid-K, S# TCT-3, calibrated 11/04
Mitutoyo Calipers, model CD-6C, S# 7141983, ID MM160-016, calibrated 8/05
Sartorius Balance, model 1384, ID MM170-004, calibrated 7/05
Thermometer, range -10 to 260°C, calibrated 6/05

UNCALIBRATED TEST EQUIPMENT:
Neslab Chiller, model RTE-110, S# 89CML91040-7

TEST DATA:

Comparative Thermal Resistance

Test Dates:	Sept. 26 – 30, 2005						
Test Method: Procedure based on ASTM:C518							
Test Conditions:	Hot Plate = 38°C Cold Plate = 10°C						
	Calibration			Down	EverLoft	Everlon	Polyester
	1	2	**Average**				Cluster
DATA:							
Q, mV	0.421	0.420	0.421	0.459	0.736	0.909	0.656
Th, mV	1.534	1.537	1.536	1.536	1.510	1.531	1.523
Tc, mV	0.433	0.434	0.434	0.446	0.514	0.514	0.478
Mean Temp, mV	0.984	0.965	0.974	0.991	1.012	1.023	1.001
Change in Temp, mV	1.101	1.120	1.111	1.090	0.996	1.017	1.045
Thickness, in	2.087	2.087	2.087	1.890	1.806	1.842	1.890
TEST CONDITIONS:							
Mean Temperature, F	76.1	75.3	75.7	76.4	77.4	77.8	76.8
Temperature Range, F	49.0	49.8	49.4	48.5	44.3	45.2	46.5
RESULTS:							
Thermal Conductivity, Btu·in/(h·ft²·°F)	0.2	0.2	0.2	0.2	0.4	0.5	0.3
Thermal Conductance, Btu/(h·ft²·°F)				0.1	0.2	0.3	0.2
Thermal Resistively, °F·ft²·h/Btu/in				4.5	2.7	2.2	3.0
Thermal Resistance, °F·ft²·h/Btu				**8.5**	**4.8**	**4.0**	**5.7**

JOB NUMBER: 30160 05-70285A

DATE: Oct. 4, 2005

REMARKS:

This project had several variables that could be eliminated or reduced for a more accurate test. These variables were: reducing specimen size, fill density, frame materials and construction. A suggestion for future testing would be construct a square “pillow” with dimensions of 12” by12” by 2 or 3” thickness of the bedding cloth. The pillow, while still not homogenous would eliminate two of the materials in the current frames. Fill pillow specimens with a set weight or volume, based on manufactures knowledge.

The modified test specimens will be retained for 21 days from the date of this report and then discarded unless we receive written notification requesting otherwise.

F:\Product\MMFILES\WES\BL 70285 VYMAC\70285 Report.doc