



Test Reports

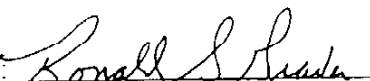
Compression Tests on a PET/Foil-Bubble-Bubble Sample Supplied by Innovative Energy, Inc.

Prepared For:

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Report: RD02114

Reviewed by: 
Ronald S. Graves
Vice President

January 30, 2002



Compression of "Insulation & Vapor Barrier -Tuff Stuff"

The following analysis is based on compression data for five nine square inch specimens of "PET/foil-bubble-bubble (FBB)" insulation identified as "tuff stuff". This product is manufactured by Innovative Energy. The data from the compression test are contained in report RD02114 produced by R&D Services, Inc. for Innovative Energy.

A determination was made of the decrease in thickness that will occur due to the weight of a concrete pad on top of the FBB insulation. The typical concrete pad was taken to be four-inches thick with a dry density of 125 lb/ft³. The maximum weight of weight concrete was taken to be 187.5 lb/ft³.

The average thickness of the uncompressed FBB was determined to be 0.30 inches. The calculated thickness decrease percentages are based on an uncompressed thickness of 0.30 inches. The dry pad represents a test-specimen compressive force on the test specimens of 2.60 lb_f while the wet pad represents a test-specimen compressive force of 3.91 lb_f. These compressive forces result in the following thickness decreases and percentage thickness decreases.

	<u>Dry Pad</u>	<u>Wet Pad</u>
Thickness Loss (in.)	0.031-0.037	0.040-0.046
Thickness Loss (%)	10 - 12	13 - 15

The predicted compression under a four-inch thick standard-weight concrete pad ranges from 10-15% of the initial thickness.

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Client: Innovative Energy, Inc.
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Date: January 30, 2002

Specimen: 1021020121-1

RD Test Number: RD021070CS

Project: Measurements for compressive strength of a "PET/ foil-bubble-bubble (FBB)" identified as "Tuff Stuff" and supplied by Innovative Energy.

Specimen Preparation:

Samples were cut into rectangles having a nominal dimension of 3 in x 3 in x specimen thickness. Specimens were conditioned at 70°F and 45 % RH. Five specimens were tested.

Test Method:

ASTM D 1621-00 -"Standard Test Method for Compressive Properties of Rigid Cellular Plastics", Procedure A

Procedure:

This report presents the results of physical tests conducted on a "PET/ foil-bubble-bubble (FBB)" supplied by Innovative Energy on January 21, 2002. Testing was completed on January 25, 2002.

Testing was completed using an Instron Universal Testing Machine, Model 4400R. Samples were measured to within 1%. Samples were compressed to 20%, and stress was reported at 10% compression.

Observations:

Sample	Maximum Load (lbf)	Displacement at Max. Load (in)	Load @ 10% deformation (lbf)	Stress @ 10% deformation or yield
1	6.953	0.059	2.255	0.25
2	7.275	0.062	2.255	0.25
3	6.470	0.057	2.034	0.23
4	6.658	0.060	2.228	0.25
5	6.282	0.061	2.004	0.22
Average	6.728	0.059	2.155	0.24
Standard Deviation	0.394	0.002	0.125	0.01

Ronald S. Swada

Reviewed By:

01-30-02

Date:

Test results reported apply only to the specimens tested.