



Celotex Corporation
Testing Services

10301 Ninth Street North
St. Petersburg, Florida 33716
(813) 578-4316
Fax (813) 578-4280

PHYSICAL TESTING LABORATORY REPORT

December 17, 1997

Client: Tenneco Packaging - AVI
1411 Pidco Drive
Plymouth, IN 46563

MTS Job No.: 258218E

Metro Dade Notification No.: CAE 97205

Project: Corrosivity of Astro-Foil Reflective Insulation

Introduction:

This report presents the results of physical tests conducted on material submitted to our laboratory on August 26, 1997. Testing was completed between September 9th through 16th, 1997. The manufacture of the product was witnessed by J. Bridenstine on July 21, 1997 and documented in a P.E. sealed letter to R & D Services, Incorporated, dated July 23, 1997. The test was performed in accordance with the following test method.

ASTM D 3310-90, "Standard Test Method for Determining Corrosivity of Adhesive Materials"

Samples were conditioned in a temperature-controlled oven with and without water present. The test and control samples were designated as the product with and without adhesive exposure (polyethylene beads). Visual observations were performed and evaluated on the following scale.

1. Exposed sample less tarnished than control.
2. Exposed sample same as control.
3. Exposed sample slightly worse than control.
4. Exposed sample significantly worse than control.
5. Exposed sample badly corroded.

Sample Preparation:

Several 5/16 inch thick rolls of foil/bubble/bubble/foil reflective insulation material were submitted by the client and identified as Astro-Foil reflective insulation. Four (4) 1 by 3.5 by 5/16 inch samples were cut from the provided material. Polyethylene beads were provided as the adhesive material. Two (2) control and two (2) test specimen jar assemblies were prepared.

The control specimen jar assemblies contained no adhesive material. Cut samples were placed in a large glass jar with and without a half filled smaller open jar of distilled water. The test specimen jars were assembled in a similar manner, however, the cut samples were placed in small open jars half filled with 10 grams of the polyethylene bead material. The four (4) larger jars were sealed with TFE lined screw caps and placed in a forced draft circulating oven at $71 \pm 2^{\circ}\text{C}$ for 7 day conditioning.

This report is for the information of the client. It may be used in its entirety for the purpose of securing product acceptance from duly constituted approval authorities; however, this report or the name of Celotex Corporation shall not be used in publicity or advertising.

Client: Tenneco Packaging - AVI

MTS Job No.: 258218E

Results:

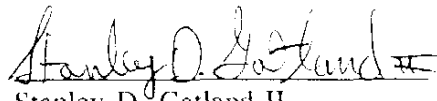
The samples were removed and examined after intervals of 1, 3 and 7 days in the oven. Visual observations were performed and evaluated on the previously detailed scale.

Astro-Foil Reflective Insulation

1 Day	2
3 Days	2
7 Days	2

There was no evidence of pitting or cracking in either sample after the exposure to high temperature and high humidity. Enclosed are the tested samples.

Prepared by:



Stanley D. Gatland II
Research Engineer

R. Amulder
12/19/97

LAB: Celotex Technical Center
 LE NAME: 208218C.S01
 TEST DATE: 12/16/97, 11:30 a.m.
 OPERATOR: Hutch Gwynn

TEST TYPE: CONSTANT TEMPERATURE at 360.0 deg C
 AIR FLOW: 25.40 mm/sec
 LIFT LIGHT: OFF Self Ignition Temperature

RECIPMENT ID: ASTRU-FULL
 RECIPMENT DESCRIPTION:

TEST DURATION: 617 seconds
 IGNITION TIME: 375 seconds
 FLAME DURATION: 0 seconds
 INITIAL MASS: 3.00 gm
 FINAL MASS: 0.00 gm
 MASS LOSS: 100.00 %

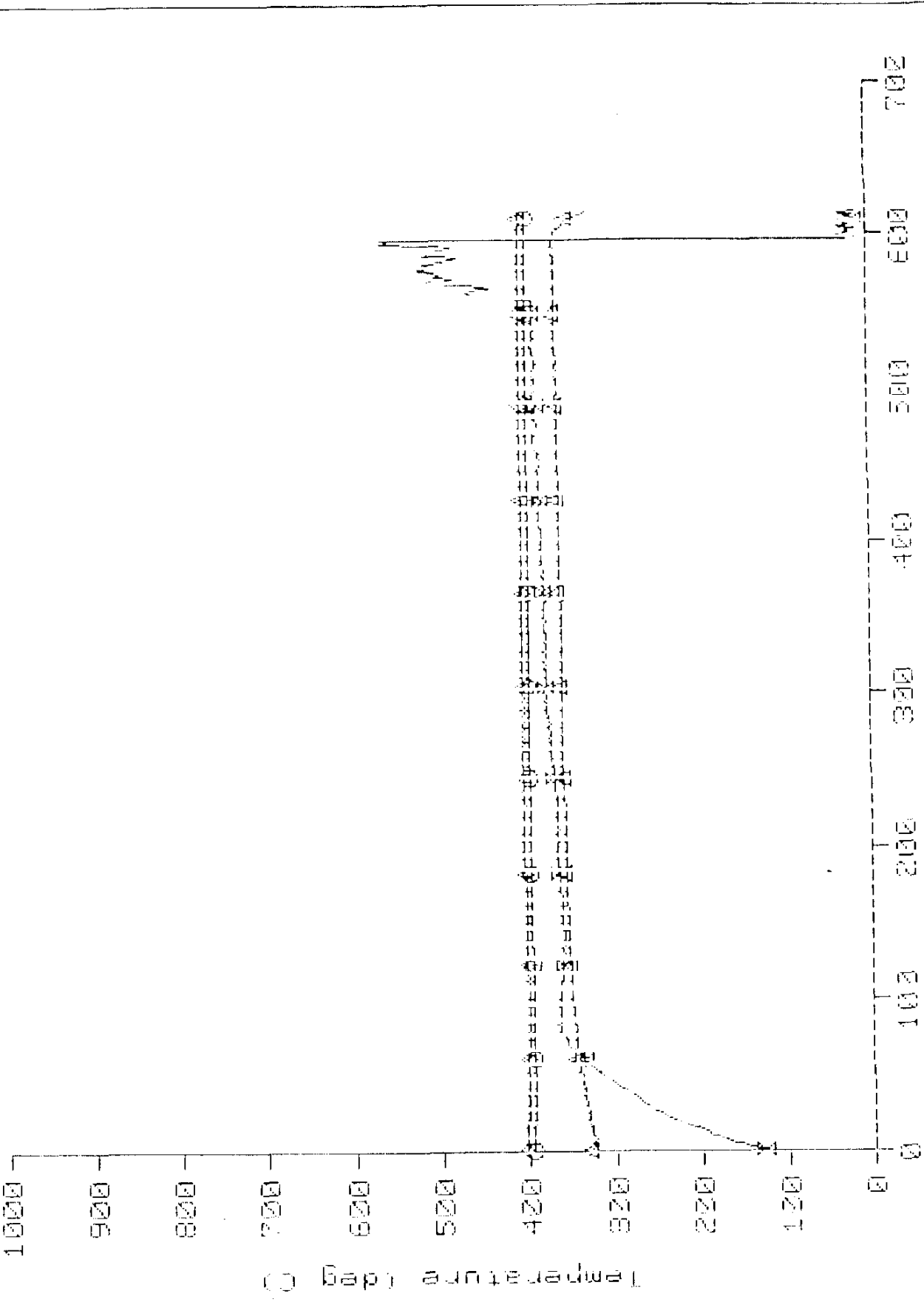
IGNITION TEMPERATURES:
 Air temp at sample. (12) : 362.81 deg C
 Annular space temp. : 403.98 deg C
 Sample temp. (11) : 300.98 deg C
 Heating Coil temp. (13) : 395.33 deg C

INITIAL TEMPERATURES:
 Air temp at sample. (12) : 328.00 deg C
 Annular space temp. : 404.00 deg C
 Sample Temp. (11) : 127.00 deg C
 Heating Coil temp. (13) : 395.00 deg C

FINAL TEMPERATURES:
 Air temp at sample. (12) : 322.00 deg C
 Annular space temp. : 404.00 deg C
 Sample temp. (11) : 122.00 deg C
 Heating Coil temp. (13) : 395.00 deg C

MAXIMUM TEMPERATURES:
 Air temp at sample. (12) : 364.36 deg C
 Annular space temp. : 405.19 deg C
 Sample temp. (11) : 362.53 deg C
 Heating Coil temp. (13) : 396.48 deg C

TEMPERATURE RISES:
 Air temp at sample. (12) : 36.36 deg C
 Annular space temp. : 1.19 deg C
 Sample temp. (11) : 435.53 deg C
 Heating Coil temp. (13) : 1.48 deg C



Air temp at sample, (T2) - Δ , Arruler Space temp. - \square , Sample Temp. (T1) - \bullet , Heatl...