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CHEMISTRY AND CHEMICAL ENGINEERING DIVISION
DEPARTMENT OF FIRE TECHNOLOGY
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September 28, 2001

Mr. Pascal Gicquel
Newmat USA
25 Surryhill Place
Huntington, NY 11743

Re: SwRI™ Project No. 01.04020.01.035a
Test for Evaluating the Behavior of Materials in a
Vertical Tube Furnace at 750°C (ASTM E 136)
(Consisting of 2 Pages and Appendix A)

FINAL REPORT

Dear Mr. Gicquel:

This letter constitutes our final report presenting the results of a furnace test in accordance with ASTM E 136-99^{e1}, "Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C," tested at Southwest Research Institute's (SwRI) Department of Fire Technology in San Antonio, TX. The values and observations for the response of the material in this report were obtained in general accordance with the standard. A semi solid sample was tested rather than a complete solid. Sample pieces were stacked to provide the correct specimen dimensions.

Samples identified as *Newmat Aluminum Rail* were received on August 23, 2001, from Newmat USA of Huntington, NY. The material was 1.8 mm thick and was received unpainted. Newmat USA described the grey samples as "L-shaped aluminum extrusion". SwRI technicians cut the specimens to fit into the sample holder as required by ASTM E 136. Figure 1 on the next page shows the laid up sample where the grooved "L-shaped" sides were interlocked to provide the maximum amount of sample for testing. The test specimens were conditioned in a controlled environment at $23 \pm 3^\circ\text{C}$ and $50 \pm 5\%$ relative humidity from the day they were received until specimen preparation and again until just prior to testing. Tests were conducted August 29, 2001.

ASTM E 136-99^{e1} covers the performance of elementary building materials when exposed to 750°C (1382°F), to indicate those materials that do not act to aid combustion or add appreciable heat to an ambient fire. It is not intended to apply to laminated or coated materials. It should be used to measure and describe properties of materials, products or systems in response to heat and flame under controlled laboratory conditions and should not be used for the description or appraisal of the fire hazards of materials, products or systems under actual fire conditions.

The $38 \times 38 \times 51 \pm 2.5$ -mm sample is exposed to a temperature of $750 \pm 5.5^\circ\text{C}$ ($1382 \pm 1^\circ\text{F}$) in the center of an air stream in a furnace tube at an air velocity of 3 m/min (10 ft/min) $\pm 20\%$ until maximum temperatures inside and outside the specimen are reached, or until it is clearly evident that the specimen does not pass the test. The internal and external temperatures of the sample are measured wherever possible. For impenetrable solids, the thermocouple is placed next to the sample. The weight loss is also measured.

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. THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF SWRI. NEITHER THIS REPORT NOR THE NAME OF THE INSTITUTE SHALL BE USED IN PUBLICITY OR ADVERTISING.



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Figure 1. Post Test Unpainted *Newmat Aluminum Rail* Showing Interlocking Pieces Used to Form Complete Sample. (Note white ash covering sample – typical of all four runs.)

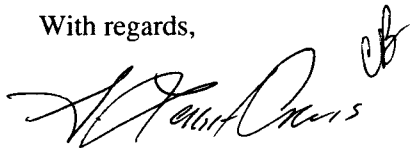
ASTM E 136-99^{e1} cites pass/fail criteria in which a passing value from at least three of four specimens tested in reported when

1. No flaming is observed after the first 30 s.
2. The average weight loss is less than 50%.
3. The interior and exterior sample temperature shall not increase more than 30°C (54°F) above the furnace temperature at the beginning of the test.

In all four runs and all three conditions, the *Newmat Aluminum Rail* material passes the ASTM E 136-99^{e1} test. Test results are summarized in tabular and graphical form in the standard SwRI ASTM E 136 data sheets provided in Appendix A. The test results apply specifically to the specimens tested, in the manner tested, and not to the entire production of these or similar materials, nor to the performance when used in combination with other materials.

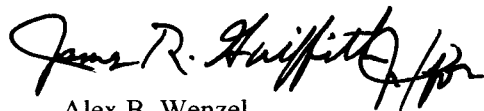
Please find enclosed a second copy of the final report in accordance with the contract. If you have any questions or if I can be of further assistance, please feel free to contact me at 210/522-3726, by fax at 210/522-3377, or send e-mail to lorvis@swri.org. If you have any further questions regarding SwRI's fire testing, listing and labeling, or applied research services, please visit our website at www.fire.swri.org.

With regards,



A. Leigh Orvis, M.S.
Research Scientist
Material Flammability Section

Approved by,



Alex B. Wenzel
Director
Department of Fire Technology

ALO/II

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cc: Record Copy A (DFT)

APPENDIX A
ASTM E 136-99²¹ FURNACE TEST REPORTS
(Consisting of 2 Pages)

SOUTHWEST RESEARCH INSTITUTE
ASTM E 136-99⁶¹ FURNACE TEST REPORT

<i>Client:</i> Newmat USA	<i>Color:</i> Grey
<i>Operator:</i> E. Vergara	<i>Thickness:</i> 1.8 mm (0.07 in.)
<i>Test Date(s):</i> August 29, 2001	<i>Receipt Date:</i> August 23, 2001
<i>Material ID*:</i> Newmat Aluminum Rail	<i>Date Prepared by SwRI:</i> August 29, 2001
<i>Description*:</i> Unpainted L-shaped aluminum extrusion	* Information/instructions provided by the Client

RESULTS

Test ID	Initial Mass (g)	Final Mass (g)	Mass Loss (g)	Mass Loss (%)	Furnace Temp _{INITIAL} (°C)	Furnace Temp _{FINAL} (°C)	Furnace Temp _{MAX} (°C)
2411-N-1	72.61	72.57	0.04	0.1	750	753	754
2411-N-2	73.67	73.56	0.11	0.1	753	754	754
2411-N-3	74.91	74.84	0.07	0.1	753	754	754
2411-N-4	72.95	72.66	0.29	0.4	754	754	754
Average	73.54	73.41	0.13	0.2	753	754	754

Test ID	Air Temp _{INI} (°C)	Air Temp _{FIN} (°C)	Air Temp _{MAX} (°C)	Surface Temp _{INI} (°C)	Surface Temp _{FIN} (°C)	Surface Temp _{MAX} (°C)	Time to Surface _{MAX} (min)	Air Temp Rise _{MAX} (°C)	Sample Temp Rise Over Initial Furnace Temp. (°C)
2411-N-1	30	752	753	750	742	743	44.5	723	-7
2411-N-2	29	750	750	751	741	741	50.0	721	-12
2411-N-3	27	750	750	753	741	741	36.5	723	-12
2411-N-4	33	752	753	751	742	743	50.2	720	-11
Average	30	751	752	751	742	742	45.3	722	-11

Test ID	Insertion Time (sec)	Time to Flaming Combustion (min:sec)	Time to Observed Soot (min:sec)	Time to Observed Smoke (min:sec)	Notes and Observations
2411-N-1	18	None	None	None	Glowing observed in all samples 18 min. Samples covered in ash after test.
2411-N-2	20	None	None	None	
2411-N-3	90	None	None	None	
2411-N-4	20	None	None	None	
Average	37	-	-	-	

PASS/FAIL CRITERIA

- No flaming observed (Time to Flaming Combustion above) after the first 30 s **PASS**

- Average weight loss (Mass Loss % above) less than 50 % **PASS**

- Interior and exterior sample temperature (Surf. Temp Rise_{MAX} above) shall not increase more than 30°C above furnace temperature at beginning of test **PASS**

