Architectural Testing

PERFORMANCE TEST REPORT

Rendered to:

VELUX AMERICA INC.

PRODUCT: Luran ASA

Report No: A6997.01-106-31
Report Date: 02/15/11
Expiration Date: 01/26/15

130 Derry Court
York, PA 17406-8405
phone: 717-764-7700
fax: 717-764-4129
www.archtest.com

Architectural Testing

PERFORMANCE TEST REPORT

Rendered to:

VELUX AMERICA INC.
P.O. Box 5001
Greenwood, South Carolina 29648

Report No:	A6997.01-106-31
Test Dates:	01/21/11
Through:	01/26/11
Report Date:	02/15/11
Expiration Date:	01/26/15

Product: Luran ASA

Project Summary: Architectural Testing, Inc. was contracted by VELUX America Inc. to perform testing on their Luran ASA material, for screening tests only. The samples tested successfully met the performance requirements listed in the referenced specification. Test specimens description and results are reported herein.

Test Methods: The test specimen was evaluated in accordance with the following:

ASTM D 2843-99, *Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics.*

ASTM D 1929-96 (2000)e01 , *Standard Test Method for Determining Ignition Temperature of Plastics.*

ASTM D 635-98, *Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.*

130 Derry Court
York, PA 17406-8405
phone: 717-764-7700
fax: 717-764-4129
www.archtest.com

Test Results: The results are reported in the following tables.

ASTM D 2843-99 - Smoke Density

A test specimen was exposed to a flame inside a Smoke Chamber. The horizontal light absorption was measured across the light beam path of a photoelectric cell, and the condition of the smoke chamber was observed.

Caveat: *This standard should be used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire-hazard or fire-risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire-hazard assessment or a fire risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard or fire-risk of a particular end use.*

Smoke Density

Specimen	Width (in)	Length (in)	Thickness (in)	Maximum Smoke Density (%)	Smoke Density Rating
1	0.945	0.918	0.192	99.5	91.3
2	0.945	0.947	0.192	99.7	92.2
3	0.932	0.923	0.192	92.5	76.6

Average Smoke Density Rating: **86.6**

Note: *During all smoke density tests, the letters on the exit sign were not visible and readable through the smoke.*

Test Results: (Continued)

ASTM D 1929-96(2000)e01 - Self Ignition

Self-ignition temperature is the minimum temperature at which the self-heating properties of the specimen lead to ignition or ignition occurs of itself, under test conditions, in the absence of any additional flame ignition source. Flash ignition temperature is the minimum temperature at which, under specified test conditions, sufficient flammable gases are emitted to ignite momentarily upon application of a small external pilot flame. These temperatures were determined by observing the test specimen at a known temperature utilizing a self-ignition furnace.

Caveat: *These test results relate only to the behavior of test specimens under the particular conditions of the test. They are not intended to be used, and shall not be used, to assess the potential fire hazards of a material in use.*

Self-Ignition

Specimen	Initial Mass (g)	Final Mass (g)	Mass Loss (g)	Initial Temperature (ºC)			Final Temperature (ºC)		
				Air	Furnace	Sample	Air	Furnace	Sample
1	3.3	1.9	1.4	380	415	338	382	415	387
2	3.4	1.2	2.2	420	456	436	420	456	432
3	3.3	0.2	3.1	460	498	479	510	512	493
4	3.4	0.2	3.2	450	484	467	484	494	475
5	3.4	0.2	3.2	440	470	414	446	472	456

Specimen	Ignition (min:sec)	Combustion Type	Observations (min:sec)					
			Char	Melt	Bubble	Foam	Smoke	Soot
1	None	None	:57	:10	3:00	-	1:22	None
2	None	None	1:00	:28	1:35	-	:53	None
3	2:09	Flame	:42	:15	1:05	-	:45	2:40
4	2:51	Flame	:45	:43	1:29	-	1:00	3:16
5	None	None	1:00	:50	2:00	-	1:09	None

Self Ignition Temperature: **450ºC**

Test Results: (Continued)

ASTM D 1929-10 - Flash Ignition
(Continued)

Flash Ignition

Specimen	Initial Mass (g)	Final Mass (g)	Mass Loss (g)	Initial Temperature (ºC)			Final Temperature (ºC)		
				Air	Furnace	Sample	Air	Furnace	Sample
1	3.5	0.0	3.5	430	469	449	480	483	483
2	3.5	0.6	2.9	390	420	401	420	423	418
3	3.5	2.8	0.7	350	380	360	350	380	360
4	3.5	0.9	2.6	370	402	484	416	403	405
5	3.5	1.7	1.8	360	390	372	408	390	397

Specimen	Ignition	Combustion Type	Observations (min:sec)					
			Char	Melt	Bubble	Foam	Smoke	Soot
1	1:44	Flame	:41	:13	:57	-	1:09	2:03
2	3:42	Flame	:48	:15	1:24	-	2:09	4:05
3	None	None	:45	:21	1:42	-	3:09	None
4	2:25	Flame	:41	:24	1:46	-	2:25	6:10
5	3:06	Flame	:46	:16	1:40	-	3:06	9:00

Flash Ignition Temperature: **360ºC**

Test Results: (Continued)

ASTM D 635-98 - Rate of Burn

A 6" (nominal 152 mm) long x 1/2" (nominal 13 mm) wide x 0.099" thick test specimen was supported horizontally at one end and the free end exposed to a gas flame for 30 seconds. After removal of the flame, the test specimen was observed for time and extent of burning. Photo No. 1 in Appendix B shows a typical set up of the test.

Caveat: *This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions but does not by itself incorporate all factors required for fire hazards or fire risk assessment of materials, products, or assemblies under actual fire conditions.*

Rate of Burn

Specimen	Initial Burn	Sustained Burn Beyond 30 sec or 25 mm	Length Burned, L (mm)	Time, t (sec)	Linear Burn Rate, V (mm/min)	Comments
1	Y	Y	75	203	22.2	Melting and Flaming Drips
2	Y	Y	75	240	18.8	Melting and Flaming Drips
3	Y	Y	75	225	20.0	Melting and Flaming Drips

Average Linear Burning Rate, V = 60L/t = 20 mm/min

Note: *20 mm/min linear burning rate corresponds to a Class CC2 product*

Data sheets, representative samples of test specimens, a copy of this test report will be retained by Architectural Testing, Inc. for a period of four years from the original test date. At the end of this retention period such materials shall be discarded without notice and the service life of this report by Architectural Testing will expire. Results obtained are tested values and were secured using the designated test methods. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimens tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.:

Digitally Signed by: Rodney E. Holland

Rodney E. Holland - Technician II
Components / Materials Testing

Digitally Signed by: Gary Hartman

Gary Hartman, P.E. - Director
Components / Materials Testing

REH:reh/nlb

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	02/15/11	N/A	Original report issue.