KYDEX THERMOPLASTIC SHEET

KYDEX® 6200 LTR Properties

For information applicable to KYDEX® FST please refer to 300 series technical briefs.

TB - 124-A

Introduction

KYDEX® 6200 LTR is a proprietary, high performance thermoplastic sheet designed for use on mass transit vehicles such as subways, vans, buses, and trains. KYDEX® 6200 LTR meets the recommended fire safety practices of both the Federal Transit Administration (FTA) and the Federal Rail Administration (FRA) for smoke emission and flammability as tested under ASTM E-662 and ASTM E-162. Additionally it meets the stringent flame-smoke-toxicity (FST) requirements required by the vehicle manufacturers and transit administrations such as SMP 800C.

Property Value Comparison

Low-Toxicity Materials					
Property	**Test Method**	**Unit Standard (Metric)**	**GRP$_3$ (25-45%)**	**Ultem 1668A**	**K6200 LTR**
PHYSICAL					
Specific Gravity	ASTM D-792	--	1.40-1.90	1.26-1.33	1.57
Density		g/cm^3 (lb/in^3)	1.40-1.9 (0.0506-0.0686)	1.40-1.9 (0.0455-0.048)	1.57 (0.0575)
Rockwell Hardness	ASTM D-785	--	--	--	78
Water Absorptions 24hrs	ASTM D-570	%-24 hrs	--	0.70	0.18
MECHANICAL$_1$					
Tensile Strength	ASTM D-638	MPa (psi)	76-160 (11-23ksi)	90.4 (13,000)	23.4 (3390)
Tensile Modulus	ASTM D-638	MPa (psi)	5600-12000 (820-1800ksi)	335K (2,312)	328K (2261)
Tensile Elongation	ASTM D-638	%	1-2%	35	3.2
Flexural Strength	ASTM D-790	MPa (psi)	140-260 (20-38ksi)	141 (20,400)	42.6 (6180)
Flexural Modulus	ASTM D-790	MPa (psi)	6900-14000 (1000-2000ksi)	3,174 (460K)	2,710 (393K)
Notched Izod Impact Resistance 23°C - (73°F)	ASTM D-256	J/m (ft-lbs/in)	--	74 (1.4)	106 (2.0)
Gardner Impact (Geometry GE)	ASTM D-5420	J (in-lbs)	--	--	8.1 (72)
THERMAL$_1$					
Heat Deflection Temperature 1.82MPa, 264psi (annealed)	ASTM D-648	°C (°F)	190-260 (375-500)	189 (373)	66.8 (152)
45MPa, 66psi (annealed)			--	--	82.3 (180)
FLAMMABILITY$_1$					
FMVSS 302	MVSS 302	--	--	--	Pass
Radiant Panel, FS	ASTM E-162	--	Pass	--	Pass$_2$
Smoke Generation, DS @ 4min	ASTM E-662	--	Pass	Pass	Pass$_2$
Toxicity	SMP 800-C	--	Pass	Pass	Pass$_2$

1 Reported values based on .125" gauge unless noted otherwise
2 Tested by an accredited 3rd party lab
3 GRP Specs Vary widely according to glass% and type of fiber. They are generally fire resistant and have excellent electrical properties.

KYDEX, LLC
ISO 9001 and 14001 Certified

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Test Results ASTM E 662-03e2

Flaming Mode	Test	#1	#2	#3	Average	Specified Maxima
Specific Optical Density at 1.5 minutes		12	12	11	12	100
Specific Optical Density at 4.0 minutes		101	81	76	86	200
Maximum Specific Optical Density		504	447	413	455	-
Maximum Corrected Optical Density		492	429	394	438	-

Non-Flaming Mode	Test	#1	#2	#3	Average	Specified Maxima
Specific Optical Density at 1.5 minutes		0	1	0	0	100
Specific Optical Density at 4.0 minutes		54	35	52	47	200
Maximum Specific Optical Density		386	382	385	384	-
Maximum Corrected Optical Density		376	375	375	375	-

Test Results According to SMP 800-C

Report Number 06-02-036(B)

Accreditation:

- Standards Council of Canada, Registration #1

Registration:

- ISO 9001:2000, registered by QMI, Registration #001109

Specifications of Order:

- Determine rate of smoke generation according to ASTM E 662 and toxic gas production according to Bombardier SMP 800-C

Identification:

- Thermoplastic material. approx. 3.2 mm in thickness, identified as "KYDEX® 6200 LTR (Lot No. RB9-72-2)" (BMTC sample identification number 05-02-S0039-2)

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Bombardier SMP 800-C

Toxic Gas Generation			
	Flaming Mode	Non-Flaming Mode	Specified Maxima
Carbon Monoxide (CO ppm)			
at 1.5 minutes	30	<10	-
at 4.0 minutes	375	<10	-
at maximum	2003	653	3500
Carbon Dioxide (CO_2 ppm)			
at 1.5 minutes	1350	<50	-
at 4.0 minutes	6750	<50	-
at maximum	29100	5050	90000
Nitrogen Oxides (as NO2 ppm)	5	6	100
Sulfur Dioxide (SO2 ppm)	<1	<1	100
Hydrogen Chloride (HCl ppm)	210	270	500
Hydrogen Fluoride (HF ppm)	6	4	100
Hydrogen Bromide (HBr ppm)	2	3	100
Hydrogen Cyanide (HCN ppm)	<1	<1	100
Original Weight (g)	28.5	29.6	-
Final Weight (g)	11.1	14.3	-
Weight Loss (g)	17.4	15.3	
Weight Loss (%)	61.01	51.77	-
Time to Ignition (s)	7	Did not ignite	-
Burning Duration (s)	Not Determinable	-	-

Toxic Gas Generation:

- Gases produced for analysis are generated in a specified, calibrated smoke chamber during standard rate of smoke generation testing (ASTM E 662), in both flaming combustion and non-flaming pyrolytic decomposition test modes.

Conclusions:

- The thermoplastic material identified in this report, when tested at an approximate thickness of 3.2mm, meets The Federal Railroad Administration requirements as they pertain to rate of smoke generation (ASTM E 662).

The thermoplastic meets Bombardier SMP 800-C requirements as they pertain to toxic gas production (Bombardier SMP 800-C).

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This information supersedes all previously published data.