

CERTIFICATE OF APPROVAL
No. ME0091

This is to certify that the referenced products of

Sat Insulation Materials Industry LLC

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have been assessed against the requirements of the *warringtonfire – mideast certification scheme* and are approved for use within the scope of any test and/or assessment report(s) referenced.

SAT PHENOLIC Ducting Panel

The product, a flame retardant grade phenolic foam insulation board faced on one side with a lacquered, decoratively embossed aluminium foil and the other side with a reinforced aluminium foil is fully described in the test reports listed below, and in Annex 1 to this Certificate of Approval.

This Approval has been prepared from test data summarised below and derived from the test reports referenced below. Full details of the product, justification for the conclusions given, along with validity statements are given in those reports.

Test Evidence

WF Report No: 160903	BS 476: Part 6: 1989	Fire propagation index, I = 4.7 subindex, i ₁ = 2.5 subindex, i ₂ = 1.3 subindex, i ₃ = 0.9																																																									
WF Report No: 160900	BS 476: Part 7: 1997	Class 1 surface spread of flame																																																									
WF Report No: 160906	IMO Resolution MSC.61(67) Part 2, Annex 1.	<table border="1"> <thead> <tr> <th colspan="2" rowspan="2">GAS</th> <th rowspan="2">Limit (ppm)</th> <th colspan="3">Reading (ppm)</th> </tr> <tr> <th>Condition 1</th> <th>Condition 2</th> <th>Condition 3</th> </tr> </thead> <tbody> <tr> <td>Carbon Monoxide</td> <td>CO</td> <td>1450</td> <td>60</td> <td>37</td> <td>151</td> </tr> <tr> <td>Hydrochloric Acid</td> <td>HCl</td> <td>600</td> <td>ND</td> <td>17</td> <td>32</td> </tr> <tr> <td>Hydrogen Bromide</td> <td>HBr</td> <td>600</td> <td>ND</td> <td>ND</td> <td>ND</td> </tr> <tr> <td>Hydrogen Fluoride</td> <td>HF</td> <td>600</td> <td>ND</td> <td>ND</td> <td>ND</td> </tr> <tr> <td>Hydrogen Cyanide</td> <td>HCN</td> <td>140</td> <td>ND</td> <td>ND</td> <td>1</td> </tr> <tr> <td>Nitrous Fumes</td> <td>NOx</td> <td>350</td> <td>10</td> <td>1</td> <td>1</td> </tr> <tr> <td>Sulphur Dioxide</td> <td>SO2</td> <td>120</td> <td>2</td> <td>6</td> <td>24</td> </tr> <tr> <td colspan="2">Averaged Specific Optical Density</td> <td>200</td> <td>0</td> <td>1</td> <td>3</td> </tr> </tbody> </table>	GAS		Limit (ppm)	Reading (ppm)			Condition 1	Condition 2	Condition 3	Carbon Monoxide	CO	1450	60	37	151	Hydrochloric Acid	HCl	600	ND	17	32	Hydrogen Bromide	HBr	600	ND	ND	ND	Hydrogen Fluoride	HF	600	ND	ND	ND	Hydrogen Cyanide	HCN	140	ND	ND	1	Nitrous Fumes	NOx	350	10	1	1	Sulphur Dioxide	SO2	120	2	6	24	Averaged Specific Optical Density		200	0	1	3
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Test Evidence

WF Report No: 160905	IMO Resolution MSC.61(67) Part 2, Annex 1.	GAS		Limit (ppm)	Reading (ppm)		
					Condition 1	Condition 2	Condition 3
		Carbon Monoxide	CO	1450	54	16	120
		Hydrochloric Acid	HCl	600	ND	ND	ND
		Hydrogen Bromide	HBr	600	ND	ND	ND
		Hydrogen Fluoride	HF	600	ND	ND	ND
		Hydrogen Cyanide	HCN	140	ND	ND	1
		Nitrous Fumes	NOx	350	12	ND	ND
		Sulphur Dioxide	SO2	120	1	1	17
		Averaged Specific Optical Density		200	0	0	3

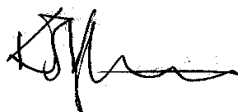
SAT PHENOLIC Ducting Panel

The flame retardant grade phenolic foam insulation board has been appraised as having a Class 0 performance when fire tested and assessed by warringtonfire to BS 476: Part 6: 1989 'Method of test for fire propagation of products' and BS 476: Part 7: 1997 'Surface spread of flame test for materials' as defined in paragraph A13(b) of Approved Document B, 'Fire Safety', to the Building Regulations 2006.

Both faces of the product were also tested in accordance IMO Resolution MSC.61(67) Part 2, Annex 1. The Resolution details a classification system based on the maximum specific optical density of smoke occurring during the test, averaged over three replicate tests, carried out in each of three test conditions. In addition, the Resolution specifies limits for 7 toxic gases which must not be exceeded in any of the three test conditions. The product achieved the criteria for smoke generation and toxicity for bulkhead, wall and ceiling linings as specified in the Resolution for IMO applications.

Certification is awarded on the basis of initial type testing to BS 476: Part 6 & BS 476: Part 7 and IMO Resolution MSC.61(67) Part 2, Annex 1 as appropriate, initial inspection and ongoing surveillance of factory production control, and ongoing compliance with the scheme requirements including labelling of the product as specified. The currency of the certification may be verified at www.warringtonfire.net/mideast.

Signed for and on behalf of Warrington Certification



Sir Ken Knight
Chairman - Management Council

Issued: 14th December 2007
Valid to: 13th December 2012

Annex 1

General description		A flame retardant grade phenolic foam insulation board faced on one side with a lacquered, decoratively embossed aluminium foil and the other side with a reinforced aluminium foil
Product reference of composite		"SAT DUCT & PANEL PHENOLIC"
Name of manufacturer of composite		SAT Insulation Materials Industry LLC
Overall thickness of composite		21 mm
Density		60-65kg/m ³
Typical panel size		1.2m x 4m
Component configuration		1 - Lacquer 2 - 80 micron foil facing (decoratively embossed) 3 - Lacquer 4 - Phenolic foam insulation board 5 - Glass fibre layer 6 - Glass mesh 7 - Low density polyethylene (LDPE) 8 - 24 micron foil facing
Lacquer (component 1)	Generic type	Polyester epoxy lacquer
	Product reference	<u>See Note 1 below</u>
	Name of manufacturer	<u>See Note 1 below</u>
	Colour	"Clear"
	Number of coats	One
	Application rate	3.0g/m ²
	Application method	Vertical line coating
	Specific gravity	1.2
Flame retardant details	<u>See Note 2 below</u>	
Curing process	Oven dried at a temperature of 120°C for a duration of 180 seconds	
80 micron foil facing (component 2)	Generic type	A decoratively embossed aluminium foil facing incorporating non-embossed areas that formed the letter "S". This letter was distributed at regular intervals over the surface of the facing.
	Product reference	<u>See Note 1 below</u>
	Name of manufacturer	<u>See Note 1 below</u>
	Colour	"Silver"
	Weight per unit area	220g/m ²
	Thickness	80 microns
	Composition details	100% aluminium foil
Flame retardant details	The product is inherently flame retardant	
Lacquer (component 3)	Generic type	Epoxy modified lacquer
	Product reference	<u>See Note 1 below</u>
	Name of manufacturer	<u>See Note 1 below</u>
	Colour	"Pink"
	Number of coats	One
	Application rate	5g/m ²
	Application method	Vertical line coating
	Specific gravity	1.2
Flame retardant details	<u>See Note 2 below</u>	
Curing process	Oven dried at a temperature of 120°C for a duration of 180 seconds	
Phenolic foam insulation board (component 4)	Generic type	Chlorofluorocarbon (CFC) & Halogen free, flame retardant grade phenolic foam
	Product reference	"Phenolic"
	Name of manufacturer	SAT
	Thickness	21mm
	Density	60-65kg/m ³
	Colour	"Pink"
	Generic type of flame retardant	Phosphorus
	Trade name of flame retardant	The sponsor has stated that the flame retardant additive does not have a specific product reference
Amount of flame retardant	<u>See Note 1 below</u>	
Glass fibre layer (component 5)	Generic type	Glass fibre tissue
	Product reference	<u>See Note 1 below</u>
	Name of manufacturer	<u>See Note 1 below</u>
	Colour	"White"
	Application rate	35g/m ²
	Application method	Lamination
Flame retardant details	<u>See Note 2 below</u>	

Glass mesh (component 6)	Generic type	Glass-fibre mesh
	Product reference	See Note 1 below
	Name of manufacturer	See Note 1 below
	Weight	15.4 g/m ²
	Fibre strand width	0.2mm
	Cell open area	5mm x 5mm
	Composition details	Glass fibre scrim
	Flame retardant details	See Note 2 below
LDPE (component 7)	Generic type	Low density polyethylene (LDPE)
	Product reference	See Note 1 below
	Name of manufacturer	See Note 1 below
	Colour	"Clear"
	Weight per unit area	33g/m ²
	Application method	Extrusion
	Flame retardant details	See Note 2 below
24 micron foil facing (component 8)	General description	Foil facing
	Product reference	See Note 1 below
	Name of manufacturer	See Note 1 below
	Colour	"Silver"
	Weight per unit area	32g/m ²
	Thickness	24 microns
	Composition details	100% aluminium foil
	Flame retardant details	The product is inherently flame retardant
Adhesion of facings to foam insulation board	The facings are thermally bonded to the foam insulation board during the manufacturing process	
Brief description of manufacturing process	Foam is sprayed between aluminium foils and dried in a continuous oven	

Note 1 - The sponsor of the test has provided this information but at the specific request of the sponsor, these details have been omitted from the report and are instead held on the confidential file relating to this investigation

Note 2 - The sponsor of the test has confirmed that no flame retardant additives were utilised in the production of the product / component