

**UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND
CERTIFICATE OF TYPE APPROVAL**

(EC Certificate of Type Examination-96/98/EC Directive Module B)

Certificate Number: 164.112/1121/EWC MED0494TE

Applicant:- **AFS BORU SANAYI A.S**

Manufacturer:- AFS BORU SANAYI
A.S

Address:- **Ivedik Organize Sanayi Bölgesi 1468.
Cadde No:153 OSTIM ANKARA**

Ivedik Organize Sanayi Bölgesi
1468. Cadde No:153 OSTIM
ANKARA

This is to certify that the applicant has submitted details of a Surface Material with Low flame-spread and low smoke and toxic fume characteristics (Item Number A.1/3.18(f): combustible duct membrane) for use on bulkheads and decks, known and designated as:-

"SONOAFS-ALU.FB ECOSOFT MARINE"

having the technical specification given in the schedule of equipment on this certificate which has been tested and complies with the recommended criteria given in the following methods, published by the International Maritime Organisation, and which are contained in the relevant parts of the International Code for Application of Fire Test Procedures (FTP Code) namely:-

- IMO Resolution MSC 307(88) Annex 1 Part 5.
- Smoke and Toxicity is satisfied by meeting the total heat release (Q_t) and peak heat release (Q_p) requirement as stated Paragraph 2.2 of Annex 2 to IMO Resolution MSC 307(88).

This certificate is issued on behalf of the Maritime and Coastguard Agency (MCA). The system complies with the relevant international testing standards under which legislation (The Merchant Shipping Marine Equipment) Regulations 1999 and also the Marine Equipment Directive 2014/90/EU as amended, the certificate is issued.

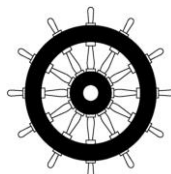
The manufacturer is allowed to affix the U.S. Coast Guard approval number 164.112/1121/EWC MED0494 as allowed by the "Agreement between the European Community and the United States of America on Mutual Recognition of Certificates of Conformity for Marine Equipment" signed February 27th, 2004.



P Duggan
Manager
Warrington Certification
Holmesfield Road
Warrington WA1 2DS

Date of Original Issue 9th November 2016
This certificate is valid until 8th November 2021

**This certificate is not valid for equipment, the design or manufacture
of which, has been varied or modified from the specimens tested.**



Certificate of Type Approval Schedule of Equipment

The applicant declared that the following comprises an accurate description of the system type to which this certificate applies.

General description		Acoustically & thermally insulated aluminium flexible air duct		
Product reference of overall composite		SONOAFS-ALU.FB ECOSOFT MARINE		
Name of manufacturer of overall composite		AFS BORU SANAYI A.S.		
Thickness of overall composite		25 – 50 mm 36.48mm (determined by Exova Warringtonfire)		
Weight per unit area of overall composite		629 g/m ² (stated by sponsor) 646.0g/m ² (determined by Exova Warringtonfire)		
Product configuration		<ul style="list-style-type: none"> • Flexible air duct (test face) (micro-perforated ALUAFS.F MARINE) • Barrier • Insulation • Jacket 		
Micro Perforated Flexible air duct	General description		Non-insulated aluminium flexible air duct	
	Product reference of overall composite		ALUAFS.F MARINE (micro-perforated)	
	Name of manufacturer of overall composite		AFS Boru Sanayi A.S.	
	Thickness of overall composite		74 micron	
	Density/weight per unit area of overall composite		153 g/m ²	
	Aluminium	Generic type		Aluminium foil
		Product reference		See Note 1
		Detailed description/composition details		Aluminium foil
		Name of manufacturer		See Note 1
		Thickness		16 micron
		Density/weight per unit area		2.72 g/cm ³
		Colour reference		Aluminium
		Trade name of flame retardant		See Note 2
		Generic type of flame retardant		See Note 2
		Amount of flame retardant		See Note 2
	Adhesive	Generic type		See Note 3
		Product reference		See Note 1
		Name of manufacturer		See Note 1
		Colour reference		transparent
		Application rate/thickness		See Note 1
		Application method		See Note 1
		Trade name of flame retardant		See Note 2
		Generic type of flame retardant		See Note 2
		Amount of flame retardant		See Note 2
		Curing process		See Note 1
	Poly	Generic type		Polyester film
		Product reference		See Note 1
		Detailed description/composition details		Polyester film
		Name of manufacturer		See Note 1



		Thickness	9 micron
		Density/weight per unit area	1.40 g/m ²
		Colour reference	Transparent
		Trade name of flame retardant	See Note 2
		Generic type of flame retardant	See Note 2
		Amount of flame retardant	See Note 2
	Adhesive	Generic type	See Note 3
		Product reference	See Note 1
		Name of manufacturer	See Note 1
		Colour reference	transparent
		Application rate/thickness	See Note 1
		Application method	See Note 1
		Trade name of flame retardant	See Note 2
		Generic type of flame retardant	See Note 2
		Amount of flame retardant	See Note 2
	Curing process	See Note 1	
	Aluminium	Generic type	Aluminium foil
		Product reference	See Note 1
		Detailed description/composition details	Aluminium foil
		Name of manufacturer	See Note 1
		Thickness	16 micron
		Density/weight per unit area	2.72 g/cm ³
		Colour reference	Aluminium
		Trade name of flame retardant	See Note 2
		Generic type of flame retardant	See Note 2
		Amount of flame retardant	See Note 2
Adhesive	Generic type	See Note 3	
	Product reference	See Note 1	
	Name of manufacturer	See Note 1	
	Colour reference	transparent	
	Application rate/thickness	See Note 1	
	Application method	See Note 1	
	Trade name of flame retardant	See Note 2	
	Generic type of flame retardant	See Note 2	
	Amount of flame retardant	See Note 2	
Curing process	See Note 1		
Aluminium	Generic type	Aluminium foil	
	Product reference	See Note 1	
	Detailed description/composition details	Aluminium foil	
	Name of manufacturer	See Note 1	
	Thickness	16 micron	
	Density/weight per unit area	2.72 g/cm ³	
	Colour reference	Aluminium	
	Trade name of flame retardant	See Note 2	
	Generic type of flame retardant	See Note 2	
	Amount of flame retardant	See Note 2	
Brief description of manufacturing process		See Note 1	



Barrier	Generic type	Compact polyethylene barrier	
	Product reference	See Note 2	
	Name of manufacturer	See Note 3	
	Thickness	0.012 mm	
	Density	0.933 kg/m ³	
	Colour reference	Transparent	
	Flame retardant details	See Note 4	
Insulation	Generic type	Glass wool insulation	
	Product reference	See Note 2	
	Name of manufacturer	KNAUF INSULATION	
	Colour reference	Brown	
	Thickness	25 mm	
	Density	16 kg/m ³	
	Flame retardant details	See Note 4	
JACKET	Poly	Generic type	Polyester
		Product reference	See Note 1
		Name of manufacturer	See Note 1
		Thickness	12 micron
		Density	1.40 g/cm ³
		Colour reference	Transparent
		Flame retardant details	See Note 4
	Poly	Generic type	Polyester
		Product reference	See Note 1
		Name of manufacturer	See Note 1
		Thickness	12 micron
		Density	1.40 g/cm ³
		Colour reference	Transparent
		Flame retardant details	See Note 4
	Aluminium	Generic type	Aluminium foil
		Product reference	See Note 1
		Name of manufacturer	See Note 1
		Colour reference	Aluminium
		Thickness	9 micron
		Density / weight per unit area	2.72 g/cm ³
		Flame retardant details	See Note 4
Brief description of manufacturing process		See Note 1	

Note 1 - The sponsor was unwilling to provide this information.

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

Note 3. - 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.

The under noted documents have been approved for compliance with the relevant requirements of International Conventions and European Union Legislation for the EC Type examination of Marine Equipment for use on Ships Registered in the European Economic Area.



Approved Documents - Test Reports

- (1) WARRES No. 369728 (dated August 2016). Surface Flammability test to IMO Resolution MSC 307(88) Annex 1 Part 5 and annex 2 of the Fire Test Procedures Code.
- (2) Smoke and Toxicity is satisfied by meeting the total heat release (Q_t) and peak heat release (Q_p) as stated in IMO Fire Test Procedures Code, Annex 2 Section 2.2

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