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**BUREAU
VERITAS**

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Certificate N°:

09160/B0 BV

The attached Schedule forms part of the certificate

File Number : ACM 135/2106/001

Product Code : 2080H

CERTIFICATE OF TYPE APPROVAL

This is to certify that the product identified below was found to be in compliance with the relevant hereunder stated Regulations & standards

THERMOPLASTIC MATERIAL PIPES AND FITTINGS
UNIPIPE PE-Xb/AL/PE-Xb and PE-RT/AL/PE-RT multi-layer composite pipes and fittings

MANUFACTURED BY:

Uponor Rohrsysteme GmbH
Hassfurt - GERMANY

SPECIFIED REGULATIONS & STANDARDS :

- BUREAU VERITAS Rules for the Classification of Steel Ships

The Approval is valid until : 02.12.2009

BUREAU VERITAS HAMBURG



At Paris la Défense, on : 02.12.2004

J.BENOIT
For the Secretary

This Certificate remains valid until the date stated on, hereunder, unless cancelled or revoked, provided the conditions in the attached schedule are complied with and the equipment remains satisfactory into service.

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

This Certificate is not valid without the stamp of the above mentioned BUREAU VERITAS Inspection Center.

The manufacturer should notify BUREAU VERITAS of any modification or changes to the equipment in order to obtain a valid Certificate.

The latest published Regulations or Standards referred to, above, and the Marine Division General Conditions are applicable.



THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION :

UNIPIPE PE-Xb/AL/PE-Xb and PE-RT/AL/PE-RT multi-layer composite pipes and fittings

1.1 Description pipe

UNIPIPE consists of a lap welded aluminium pipe with an inner and an outer polyethylene layer. All layers are permanently bonded together by means of an intermediate adhesive layer. The PE material is non-cross-linked polyethylene.

The pipes are connected by means of press and compression metal/composite fittings made of PPSU and brass.

1.2 Dimensions

UNIPIPE PE-Xb/AL/PE-Xb		UNIPIPE PE-RT/AL/PE-RT	
Outside Diameter (mm)	Wallthickness (mm)	Outside Diameter (mm)	Wallthickness (mm)
14	2	14	2
16	2	16	2
18	2	18	2
20	2.25	20	2.25
25	2.5	25	2.5
32	3	32	3
40	4	40	4
50	4.5	50	4.5
63	6	63	6
75	7.5	75	7.5

Maximum allowable working pressure 10 bar at max. 70°C

Maximum temperature 95°C

1.3 Fittings

Press fittings 14 to 75 mm

Composite fittings 16 to 32 mm

Compression fittings 14 to 25 mm

2. DESIGN DRAWINGS and/or SPECIFICATIONS

- CD Applications: E 459/1 P-06/04 Systems and E 417 P-07/04 Technical manual

- Product catalogue Edition September 2004

3. TYPE TEST REPORTS / LABORATORY RECOGNITION STATUS

3.1 UNIPIPE PE-Xb/AL/PE-Xb - SKZ test reports N° 30410/95-I dated 05/02/1997 and N° 30410/95-II dated 05/02/1997 and 23/03/1999.

3.2 UNIPIPE PE-RT/AL/PE-RT - Test reports N° 46656/01-III (M-fittings 16-32 mm); N° 49880/02 (PPSU-fittings 16-32 mm); N° 45587/01-I and N° 36262/98-III (Unipipe 63-75 mm); N° 45587/01-II (Fittings 40-75 mm).

3.3 The low flame spread test has not been carried out.

4. MATERIALS and/or COMPONENTS REQUIRED TO BE TYPE APPROVED

Not applicable.

5. OTHER MATERIALS and/or COMPONENTS

- Inner and outer layer: polyethylene (PE-RT) or cross linked polyethylene (PE-Xb)
- Inner longitudinally overlapped welded aluminium pipe
- Fittings made of PPSU and brass material

6. APPLICATION / LIMITATION OF USE

6.1 Pipes and fittings are approved for use in locations and non-essential applications where no fire endurance test is required in accordance with Bureau Veritas rules:

- Drinking water systems
- Hot and cold sanitary water systems
- Heating systems
- Non essential fresh water systems

6.2 Behaviour in case of fire (smoke generation and toxicity) is to be deemed satisfactory by the flag authorities of the vessel on board which the piping system is fitted.

7. PRODUCTION SURVEY REQUIREMENTS

7.1 Arrangements shall be made for a Society's Surveyor to carry out, on a periodic basis, visit of the manufacturer's premises and product audits according to the manufacturer's quality control plan.

7.2 Each pipe and fitting is to be tested by the manufacturer at a hydrostatic pressure not less than 1.5 times the nominal pressure.

8. ON BOARD INSTALLATION & MAINTENANCE REQUIREMENTS

8.1 Detailed drawings of each system are to be submitted for review of compliance with the Bureau Veritas Rules and the applicable regulations.

8.2 The pipes and fittings assembly is to be carried out in accordance with the manufacturer's instructions and the person performing these tasks is to be qualified to the satisfaction of the Society Surveyor.

9. MARKING FOR IDENTIFICATION

Pipes and fittings shall be marked with at least:

- Manufacturer's name or logo
- Type and size
- Design standard
- Production code

The permanent label shall remain legible under normal handling and installation practices.

10. OTHERS

10.1 The approval is given with the understanding that the manufacturers will accept full responsibility for informing shipbuilders or their sub-contractors of the proper methods of fitting and general maintenance of the approved products and of the conditions of this approval.

10.2 The fittings are manufactured at Sörberg GmbH & Co. KG, Hassfurt, Germany (Metallic type) and at Proplast Pexep Oy, Nastola, Finland (PPSU type).

10.3 This certificate supersedes the Type Approval Certificate N° 09160/A1 BV issued on 26/02/2001 by the Society.

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