



Marine & Offshore
Division

Certificate number: 21665/B0 BV

File number: ACM 135/2669/02

Product code: 2080H

This certificate is not valid when presented without the full attached schedule composed of 7 sections

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TYPE APPROVAL CERTIFICATE

This certificate is issued to

Thermaflex Isolatie B.V.
Waalwijk - NETHERLANDS

for the type of product

THERMOPLASTIC MATERIAL PIPES AND FITTINGS

Pre-Insulated pipes Flexalen 600 / Flexalen 1000+ / Flexalen 60

Requirements:

- BUREAU VERITAS Rules for the Classification of Steel Ships
- BUREAU VERITAS Rules for the Classification of Offshore Units
- IMO Resolution A.753(18)

This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 23 Jul 2019

For BUREAU VERITAS,

At BV GRONINGEN, on 23 Jul 2014,

John Mondt



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine & Offshore Division available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

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BV Mod, Ad.E 530 May 2009

This certificate consists of 3 page(s)

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

Pre-Insulated pipes Flexalen 600 / Flexalen 1000+ / Flexalen 60 (PB pipe + TPE foam + Plastic casing)

1.1 Technical Characteristics

Type	Flexalen 600 (1)	Flexalen 1000+ (2)	Flexalen 60
DN (mm)	20 to 100	15 to 50	16 to 32
Casing Pipe O.D. (mm)	125 to 200	125 to 200	Insulation (13 mm)
Min. Wall thickness of Pipe (mm)	2,3 to 10,0	2,3 to 5,8	2,2 to 3,0
Temperature range (°C)	-15 to +95	-15 to +95	-15 to +95
Service Pressure at 20 °C (bar)	16	16	16

(1) Single pipe (25 mm - 110 mm O.D.) or twin pipe (25 mm - 63 mm O.D.)

(2) Multi pipe

1.2 Raw material specification

Pipe	Polybutene PB
Insulation	Polyurethane / Extruded polyolefin TPE Foam (colour: Anthracite)
Outer casing	Polyethylene / ribbed HDPE (colour: Black)

2. DOCUMENTS AND DRAWINGS

- Manufacturer catalogue: Flexalen Product guide
- Technical document
- Installation manual

No departure from the above documents shall be made without the prior consent of the Society. The manufacturer must inform the Society of any modification or changes to these documents and drawings.

3. TEST REPORTS

- Product approval type testing in accordance with IMO Resolution A.753 (18) without fire endurance test
- Flame spread test reports (Flexalen 60) N° 2007-Efectis-R0501 and -R0502 of July 2007 according to ASTM D-635-06
- Flame spread test report (Flexalen 600/1000+) N° 2007-Efectis-R0503 of July 2007 according to ASTM D-635-06

4. APPLICATION / LIMITATION

4.1 Pre-insulated pipes systems are approved for use in locations and for non-essential applications where no fire endurance test is required according to Pt C, Ch 1, App 3 [2.3.1] of Bureau Veritas Rules or appendix 4 of IMO Resolution A.753 (18) when the abbreviations "O or NA" are specified:

- Domestic water system (cold sea and fresh water), chilled and potable water systems, heating systems, non-essential systems

4.2 The use of PB pipes and fittings with Flexalen pre-insulated system is restricted to cold service piping less than 15°C as stated in SOLAS 74 Convention, as amended.

4.3 Detailed drawings of piping system for each application on board ships are to be submitted for review of compliance with the Bureau Veritas Rules and the applicable regulations.

4.4 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.

4.5 The integrity of watertight bulkheads and fire division is not to be impaired.

4.6 Pre-insulated pipes systems have not been type tested for fire endurance, smoke generation and toxicity.

5. PRODUCTION SURVEY REQUIREMENTS

5.1 The products are to be supplied by **Thermaflex Isolatie B.V.** in compliance with the type described in this certificate and in compliance with the requirements stated on the front page of this certificate. This type of product is within the category HBV of Bureau Veritas Rule Note NR 320.

5.2 **Thermaflex Isolatie B.V.** has to make the necessary arrangements to have its works recognised by Bureau Veritas in compliance with the requirements of NR 320 for HBV products.

5.3 Each pipe and fitting is to be tested by the manufacturer at a hydrostatic pressure not less than 1.5 times the nominal pressure. Other recognised national or international standard may be accepted for pipes and fittings not employing hand lay up techniques. Depending upon the intended application the Society may require the pressure testing of each pipe and/or fitting.

5.4 No Bureau Veritas certificate is required.

Place of production

Thermaflex Isolatie B.V.

Veerweg 1

P.O.Box 531

5140 AM Waalwijk

NETHERLANDS

6. MARKING OF PRODUCT

Pre-insulated pipes system shall be marked with at least:

- Manufacturer's name or logo
- Type and size of the product
- Pressure rating
- Design standard
- Raw material

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

7. OTHERS

This approval is given with the understanding that the manufacturer will accept full responsibility for informing shipbuilders or their sub-contractors of the proper method of fitting and general maintenance of the products and of the conditions of this approval.

This certificate supersedes the Type Approval Certificate N° 21665/A0 BV issued on 22/05/2009 by the Society.

***** END OF CERTIFICATE *****