



MARINE DIVISION

Certificate number: 29152/A0 BV

File number: ACM 135/2704/01

Product code: 2170H

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

Tube-Mac Industries LTD

Ontario - CANADA

for the type of product

PIPE COUPLING WITH O-RING SEAL

PYPLOK Compression coupling swage type

Requirements:

- BUREAU VERITAS Rules for the Classification of Steel Ships
- BUREAU VERITAS Rules for the Classification of Offshore Units
- BUREAU VERITAS Rules for the Classification of Naval Ships

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: 27 Sep 2017

For BUREAU VERITAS,

At BV PORT EVERGLADES CENTRE, on 27 Sep 2012,

Flavio Rosas



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 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.

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

PYPLOK Compression coupling swage type with 2 O-ring seals each end

1.1 Max Operating Pressure rating acc. type of pipe and size - psi(bar)

| Tube/Pipe (Inch) | 1/4" | 3/8" | 1/2" | 5/8" | 3/4" | 1" | 1-1/4 " | 1-1/2" | 2" |
|-------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| NPS Carbon Steel | 3701 (255) | 3701 (255) | 3669 (254) | - | 3628 (250) | 3570 (246) | 3541 (244) | 3541 (244) | 3047 (210) |
| NPS SS316 | 4500 (310) | 4500 (310) | 4426 (305) | - | 4355 (300) | 4282 (295) | 4253 (293) | 4253 (293) | 3628 (250) |
| NPS Cu/Ni | 2830 (195) | 2830 (195) | 2830 (195) | - | 2830 (195) | 2772 (191) | 2758 (190) | 2685 (185) | 2322 (160) |
| O.D. Carbon Steel | 4355 (300) | 3628 (250) | 3817 (263) | 381 (263) | 3711 (259) | 3628 (250) | 3628 (250) | 3542 (244) | 3048 (210) |
| O.D. SS316 | 5226 (360) | 4355 (300) | 4573 (315) | 4573 (315) | 4514 (311) | 4282 (295) | 4355 (300) | 4253 (293) | 3628 (250) |
| O.D. Cu/Ni | 3411 (235) | 2830 (195) | 2975 (205) | 2975 (205) | 2932 (202) | 2830 (195) | 2830 (195) | 2758 (190) | 2322 (160) |

| Tube/Pipe (mm) | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 30 | 35 |
|---------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Metric Carbon Steel | 4065 (280) | 3876 (267) | 3760 (259) | 3629 (250) | 3629 (250) | 3542 (244) | 3542 (244) | 3542 (244) | 3542 (244) |
| Metric SS316 | 4863 (335) | 4660 (321) | 4515 (311) | 4355 (300) | 4355 (300) | 4253 (293) | 4253 (293) | 4253 (293) | 4253 (293) |
| Metric Cu/Ni | 3150 (217) | 3034 (209) | 2932 (202) | 2831 (195) | 2831 (195) | 2758 (190) | 2758 (190) | 2758 (190) | 2758 (190) |

| Tube/Pipe (mm) | 38 | 42 | 45 | 50 | 57 | 60 | 56 | 66 |
|---------------------|-----------|-----------|---------|-----------|---------|------------|-----------|-----------|
| Metric Carbon Steel | 3542(244) | 3542(244) | - | 3194(220) | - | 3005(207) | 2816(194) | 2540(175) |
| Metric SS316 | 4253(293) | 4253(293) | - | 3832(264) | - | 36261(249) | 3382(233) | 3121(215) |
| Metric Cu/Ni | 2758(190) | 2758(190) | 450(31) | 2482(171) | 450(31) | 2337(161) | 2206(152) | 2032(140) |

1.2 Temperature range (°C) depending on sealing material according to manufacturer's recommendation

| O-ring seal | Temperature °C |
|-------------|----------------|
| Perbunan | -20°C / +180°C |
| Viton | -20°C / +200°C |

1.3 Material specification

| | |
|--------|--|
| Pipes | Carbon Steel / Stainless Steel / Cu/Ni 70/30 |
| O-ring | Perbunan / Viton |

2. DOCUMENTS AND DRAWINGS

- Catalogue PYPLOK Fittings - 2010
- Drawings N° DS232-16 Rev 2 dated 07/07/2010
- Drawings N° DM80001K35 Rev 0 dated 12/05/2010
- Drawings N° DM80001K16 Rev 0 dated 19/05/2009
- Drawings N° DS232-25 Rev 2 dated 04/08/2010
- Drawings N° DS232-35 Rev 4 dated 29/04/2010
- Drawings N° DM80001K25 Rev 0 dated 20/05/2009

The drawings listed above are only a small sample set of fittings from Pyplok's product line. All Pyplok mechanically attached fittings, within the size range noted in section 1.1 "Product Description-Ratings" are to be recognized as being Type Approved – unless otherwise noted.

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

- PYPLOK Type test programme dated 20/08/2009
- Hydraulic Proof Pressure test N°C5126A dated 31/07/2009
- Hydraulic Proof Pressure test N°C7513A dated 01/08/2009
- Gas leakage test N°C5126C dated 01/08/2009
- Gas leakage test N°C7513C dated 01/08/2009
- Minimum Hydraulic Burst Pressure test N° C5126B dated 31/07/2009
- Minimum Hydraulic Burst Pressure test N° C7513B dated 01/08/2009
- Hydraulic Impulse/Fatigue test N° C5126D dated 01/08/2009
- Hydraulic Impulse/Fatigue test N° C7513D dated 01/08/2009
- Vibration test N° C5126E dated 01/08/2009
- Vibration test N° C7513E dated 01/08/2009
- Fire Resistance test (acc ISO 15540) N°01.14432.01.205a&b dated 27/04/2009 and 19/05/2009

4. APPLICATION / LIMITATION

4.1 The couplings with O-ring may be used for piping system of Class I, II, & III :

- Inert gas: Water seal effluent lines, Scrubber effluent lines, Main lines 2+5, Distributions lines 5
- Flammable fluids (Flash point > 60°C): Cargo oil lines 5, Fuel oil lines 2+3, Lubricating oil lines 2+3, Hydraulic oil 2+3, Thermal oil 2+3
- Fresh Water : Cooling water system 1, Condensate return 1, Non-essential system
- Sanitary/Drains/Scuppers: Deck drains (internal) 4, Sanitary drains, Pool drains
- Sounding/Vent: Water tanks/Dry spaces, Oil tanks 2+3 (flash point >60°C)
- Miscellaneous: Starting/Control air 1, Service air (non-essential), Brine, CO2 system 1, air conditioning systems (media: condensed water, ethylene glycol), Heating system, Closed cargo oil heating system

Footnotes:

1- Inside machinery spaces of category A - only approved fire resistant type

2- Not inside machinery spaces of category A or accommodation spaces. May be accepted in other machinery spaces provided the joints are located in easily visible and accessible positions

3- Approved fire resistant type

4- Above free board deck only

5- In pump rooms and open decks - only approved fire resistant type

4.2 The sealing material is to be compatible with the fluid to be conveyed and the maximum working temperature in accordance with the manufacturer's instructions.

4.3 The use of stainless steel is to be restricted as per the requirements of the Bureau Veritas Rules.

4.4 The use of copper-nickel alloy is to be restricted as per the requirements of the Bureau Veritas Rules.

4.5 In all cases, the associated pipes are to be suitably supported and anchored. The joints are to be at any time accessible, excepting inside tanks where permitted by the Bureau Veritas rules.

4.6 Couplings and O-rings are to be assembled with pipes in accordance with the assembly instructions given by the manufacturer.

4.7 The approval does not cover any pipes penetration through watertight bulkheads and fire divisions.

5. PRODUCTION SURVEY REQUIREMENTS

5.1 The products are to be manufactured, examined and tested by the manufacturer in accordance with the approved type described in this certificate and Requirements stated on the front page of this certificate.

5.2 Production sites are to be recognized by Bureau Veritas as per NR 320 for HBV products. To this end, the manufacturer has to make the necessary arrangements for a Society's Surveyor to perform visits and product audits at the production sites.

5.3 The manufacturer has declared to Bureau Veritas that the products detailed in this certificate are manufactured at the production site stated on the front page of this certificate.

5.4 Bureau Veritas certificate is not required for the product to be fitted on board units to be classed with Bureau Veritas.

6. MARKING OF PRODUCT

Each product is to be clearly marked with at least:

- Manufacturer's name or logo
- Type designation
- Size

7. OTHERS

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

*** END OF CERTIFICATE ***