

Tube-Mac Piping Technologies Ltd
853 Arvin Ave.
STONEY CREEK ON L8E 5N8
Canada

DNV GL AS
Offshore Class Approval
Pressure Equipment
P.O. Box 300
1322 Høvik
Norway
Tel: +47 67 57 99 00

Date: 2017-01-24
Our reference: MOANO378/SADEL/
262.1-014271-J-17

Your reference:

Job ID: 262.1-014271-3

**TUBE-MAC PIPING TECHNOLOGIES LTD; TA CERTIFICATE P-14304, P-14305, P-14996
RENEWAL, Id. No. 262.1-014271**

Extension Letter

To whom it may concern,

DNV GL and Tube-MAC are currently working together in order to renew type approval certificates P-14304, P-14305 & P-14996. Until such a time that a new certificate is issued, this letter may be used to confirm that the validity of these certificates extended until 15th of March 2017.

Sincerely
for DNV GL AS

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Head of Section

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DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. P-14305

This is to certify that the
Pipe Couplings with Bolts Not Covered by a National Standard

with type designation(s)
FFC34, FFC64, FFC74


Manufactured by
Tube-Mac Industries Ltd.
STONEY CREEK, Canada

is found to comply with
Offshore Standard DNV-OS-D101, Marine and Machinery Systems and Equipment
Det Norske Veritas' Rules for Classification of Ships

Application
May be used for: Hydraulic systems, Fuel Oil Systems, Lubricating Oil Systems, Cooling Water Systems, Compressed air/gas, sanitary.

Temperature range: - 23°C to + 150°C depending on seal
Max. working press.: 420 bar, see certificate
Sizes: DN 13, 19, 25, 32, 38, 51, 64, 76.


Høvik, 2013-01-03
for Det Norske Veritas AS


Giorgio Saia
Head of Section



DNV local office:
Montreal

This Certificate is valid until
2016-12-31


Tom Berg-Nielsen
Surveyor

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.
If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



Certificate No.: P-14305
File No.: 792.11
Job Id.: 262.1-014271-1

Product description

The coupling is designed with 37 degrees flared pipe ends, loose flared flange, internal cone with o-ring seals in flat face and cone face.

Flanges DN13-DN76 drilled to ISO 6162-1
Flanges DN13-DN51 drilled to ISO 6162-2
Flanges DN63-DN76 drilled to ISO 6164

Materials:

Pipe: carbon steel ST52.4 /STE 460 DIN 2391C, AISI 316
Flange: St52.3 AL DIN 17100, AISI C1045, AISI 316
Cone: AISI C1045, AISI 316
Bolt and nut: ISO898-1 Grade 10.9 min., SAE J429 Grade 8 min.

O-ring material: Nitrile (Buna N), Fluoroelastomer (Viton)

Application/Limitation

May be used on ships and offshore installations with a max. working pressure:

| Part No. | Size DN | Pressure Rating Bar |
|-----------|---------|---------------------|
| FFC34-050 | 13 | 350 |
| FFC34-075 | 19 | 350 |
| FFC34-100 | 25 | 350 |
| FFC34-125 | 32 | 275 |
| FFC34-150 | 38 | 210 |
| FFC34-200 | 51 | 210 |
| FFC34-250 | 64 | 175 |
| FFC34-300 | 76 | 140 |
| | | |
| FFC64-050 | 13 | 420 |
| FFC64-075 | 19 | 420 |
| FFC64-100 | 25 | 420 |
| FFC64-125 | 32 | 420 |
| FFC64-150 | 38 | 420 |
| FFC64-200 | 51 | 420 |
| | | |
| FFC74-250 | 64 | 310 |
| FFC74-300 | 76 | 270 |

The couplings may be used in the following systems:

Hydraulic systems, Fuel Oil Systems, Lubricating Oil Systems, Cooling Water Systems, Compressed air/gas, sanitary.

May not be used in high pressure fuel injection.

If the working temperature is below -10°C a product certificate including information about material properties at working temperature is to accompany each product/delivery.

For working temperatures below -10°C and down to -55°C the flanges, welding sockets and bolts are either to be made of standard materials suitable for such temperatures, or the materials are to be Charpy V-notch impact tested and satisfy DNV's specified requirements.

The flange necks must be of approximately the same diameters as the pipes for which they are used.

No product certificate is otherwise required.



Certificate No.: P-14305
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Type Approval documentation

Assembly drawing No. FFC34-050-TMP52-SCH40, ½"
Assembly drawing No. FFC34-075-TMP52-SCH40, ¾"
Assembly drawing No. FFC34-100-TMP52-SCH40, 1"
Assembly drawing No. FFC34-125-TMP52-SCH40, 1 ¼"
Assembly drawing No. FFC34-150-TMP52-SCH40, 1 ½"
Assembly drawing No. FFC34-200-TMP52-SCH40, 2"
Assembly drawing No. FFC34-250-TMP52-SCH40, 2 ½"
Assembly drawing No. FFC34-300-TMP52-SCH40, 3"
Assembly drawing No. FFC64-050-TMP52-SCH80, ½"
Assembly drawing No. FFC64-075-TMP52-SCH80, ¾"
Assembly drawing No. FFC64-100-TMP52-SCH80, 1"
Assembly drawing No. FFC64-125-TMP52-SCH80, 1 ¼"
Assembly drawing No. FFC64-150-TMP52-SCH80, 1 ½"
Assembly drawing No. FFC64-200-TMP52-SCH80, 2"
Assembly drawing No. FFC74-250-TMP52-SCH80, 2 ½"
Assembly drawing No. FFC74-300-TMP52-SCH80, 3"
Type Approval Test Report, Burst Test, Impulse and Vibration Test, DNV witnessed.
Fire Test Report SwRI project No. 01.10085.01.706a, April 14, 2004.
Fire Test Report SwRI project No. 01.10085.01.706b, April 14, 2004.
Fire Test Report SwRI project No. 01.10085.01.706c, April 14, 2004.
Retention survey report 2009-02-03

Tests carried out

Hydraulic Proof Pressure Test, Hydraulic Burst Pressure Test, Hydraulic Impulse Test, Hydraulic Impulse and Vibration Test, Pressure pulsation, Fire tests.

Marking of product

For traceability to this type approval the products are to be marked with:

- Manufacturer's name or trade mark
- Type designation and dimension

Certificate Retention Survey

For retention of the Type Approval, DNV Surveyor shall perform a survey every second year, to verify that the conditions for the type approval are complied with.

END OF CERTIFICATE