

Tube-Mac Piping Technologies Ltd
Att: Mike Bell
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:	Our reference:	Your reference:	Job ID:
2017-08-28	MOANO378/SADEL/ 262.1-014271-J-39		262.1-014271-2

Subject: Extension Letter for type approval certificates P-14305 and P-14996

To whom it may concern

DNV GL and TUBE-MAC Piping Technologies Ltd are currently working together in order to renew two type approval certificates P-14305 and P-14996 which were expired on 30th of December 2016.

Until such a time that new certificates are issued, it is confirmed that the validity of two type approval certificates P-14305 and P-14996 are extended until 30th of June 2018.

Sincerely
for DNV GL AS

Marianne Spæren Marveng
Head of Section

Mobile: +47 934 04 051
Direct: +47 934 04 051
Marianne.Spaeren@dnvgl.com

Adel Samiei
Senior Approval Engineer

Mobile: +47 991 07 952
Direct: +47 991 07 952
Adel.Samiei@dnvgl.com

Copy To: Dan Hewson, Rob Mackay, Kai
Krieger

Certificate No:
P-14996
File No:
792.11
Job Id:
262.1-017491-1

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Pipe Couplings with Bolts Not Covered by a National Standard

with type designation(s)
RFC34, RFC64, RFC74, RFAC48, RFAC412-1000

Issued to

Tube-Mac Piping Technologies Ltd
Stoney Creek ON, Canada

is found to comply with
Det Norske Veritas' Rules for Classification of Ships Pt.4, Ch.6 "Piping Systems"
Offshore Standard DNV-OS-D101, Marine and Machinery Systems and Equipment

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. 10"

This Certificate is valid until **2016-12-31**.

Issued at **Høvik** on **2014-09-05**

DNV GL local station: **Montreal**

Approval Engineer: **Tom Berg-Nielsen**



for **DNV GL**
Digitally Signed By: **Marianne Spaeren Marveng**
Location: **DNV Høvik, Norway**
Signing Date: **2014-09-08**

Marianne Spaeren Marveng
Head of Section

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 proven to have been caused by any negligent act or omission of the Society, then the Society shall pay compensation to such person for his proven direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question. The maximum compensation shall never exceed USD 2 million. In this provision the "Society" shall mean DNV GL AS as well as all its direct and indirect owners, affiliates, subsidiaries, directors, officers, employees, agents and any other person or entity acting on behalf of DNV GL AS.

Certificate No: **P-14996**
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Product description

The coupling is designed with retain ring in grooved pipe, loose flange with o-ring seals in seal plate.

- Flanges RFC34, DN13-DN76 drilled to ISO 6162-1
- Flanges RFC64, DN13-DN51 drilled to ISO 6162-2
- Flanges RFC74, DN64-DN100 drilled to ISO 6164
- Flanges RFAC412-1000, 10 inches drilled to Sch. 160
- Flanges for RFAC 8 bolts TMI

Materials:

- Pipe: ST52.4/ STE460 DIN 2391C, AISI 316
- Flange: St52.3 AL DIN 17100, AISI C1045, ASTM A519 1026, AISI 316
- Retain Ring: AISI 302
- Bolt and nut: ISO898-1 Grade 10.9 min., SAE J429 Grade 8 min.
- Bolt and nut for 350 bar RFAC48-450/500/600/800: Brighton MET L9, min tensile 180 Ksi.
- 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
RFC34-050	13	350
RFC34-075	19	350
RFC34-100	25	350
RFC34-125	32	275
RFC34-150	38	210
RFC34-200	51	210
RFC34-250	64	175
RFC34-300	76	140
RFC64-050	13	420
RFC64-075	19	420
RFC64-100	25	420
RFC64-125	32	420
RFC64-150	38	420
RFC64-200	51	420
RFC74-250	64	400
RFC74-300	76	400
RFC74-400	100	400
RFAC48-450	115	275
RFAC48-450*(see note)	115*(see note)	350*(see note)
RFAC48-500	127	275
RFAC48-500*(see note)	127*(see note)	350*(See note)
RFAC48-600	152	255
RFAC48-600*(see note)	152*(see note)	350*(See note)
RFAC48-800	203	240
RFAC48-800*(see note)	203*(see note)	350*(See note)
RFAC412-1000	250	275

*Note: Accepted for 350 bar with special bolt quality only, see product description.

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.

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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.

Type Approval documentation

Assembly drawing No. RFC34-050-26mm

Assembly drawing No. RFC34-075-36mm

Assembly drawing No. RFC34-100-39mm

Assembly drawing No. RFC34-125-46mm

Assembly drawing No. RFC34-150-56mm

Assembly drawing No. RFC34-200-66mm

Assembly drawing No. RFC34-250-80mm

Assembly drawing No. RFC34-300-97mm

Assembly drawing No. RFC64-050-26mm

Assembly drawing No. RFC64-075-36mm

Assembly drawing No. RFC64-100-39mm

Assembly drawing No. RFC64-125-46mm

Assembly drawing No. RFC64-150-56mm

Assembly drawing No. RFC64-200-66mm

Assembly drawing No. RFC74-250-80mm

Assembly drawing No. RFC74-300-97mm

Assembly drawing No. RFC74-400-115mm

Assembly drawing No. RFAC48-450 ASSY

Assembly drawing No. RFAC48-500-SCHXXS

Assembly drawing No. RFAC48-600-SCHXXS

Assembly drawing No. RFAC48-800-SCHXXS

Type Approval Test Report, Burst Test, Impulse and Vibration Test, DNV witnessed (Jan. 15, 2003).

Fire Test Report SwRI project No. 01.10085.01.706d, April 14, 2004.

Fire Test Report SwRI project No. 01.10085.01.706e, April 14, 2004.

Fire Test Report SwRI project No. 01.10085.01.706f, April 14, 2004.

Fire Test Report SwRI project No. 01.19577.01.803, June 18, 2014

Test Results for Increased Pressure Rating for 5",6",8", dated August 12, 2008

Tests carried out

Hydraulic Proof Pressure Test, Hydraulic Burst Pressure Test, Simultaneous Pressure Pulsation and Vibration Test, 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

Periodical assessment

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