

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 15<sup>th</sup> of March 2017.

Sincerely  
for DNV GL AS

Marianne Spæren Marveng  
Head of Section

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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**  
File No: **792.11**  
Job Id: **262.1-017491-1**

## 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