



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **P-14516**

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

with type designation(s)

Grooved Pipe Couplings and Fabricated Fittings: Grinnell Fig 705, 772, 577, 730, 71, 522, 210, 201, 221, 227, 250, 219, 260, 501, 510S, 519S

Manufactured by

Tyco Fire Suppression and Building Products
Subang Selangor, Malaysia

is found to comply with

Offshore Standard DNV-OS-D101, Marine and Machinery Systems and Equipment
Det Norske Veritas' Rules for Classification of Ships
Det Norske Veritas' Standards for Certification 2.9 No. 5-792.20

Application
See certificate

Temperature range: dep. on sealing, see cert.
Max. working press.: 400 psi, 375 psi and 250 psi - see cert.
Sizes: 1" to 12" (25 to 300 mm) - see cert.

This Certificate is valid until **2017-06-30**.

Issued at **Høvik** on **2013-07-22**

DNV local station: **Kuala Lumpur**

Approval Engineer: **Mohsen Mohebbi**

for **Det Norske Veritas AS**

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On behalf of - Marianne Spæren 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 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.

Product description

Design: The pipe is secured to the coupling by grooves. The clamp halves with 2 bolts. The sealing is provided by an EPDM or Nitrile gasket.

Materials:

Clamp halves : ASTM A536 Gr. 65-45-12 Ductile Iron
 Bolts : ASTM A183 Gr. 5, or ASTM F568M Gr. 9.8/8/8
 Nuts : ASTM A563M Class 9, or SAE J995 Gr. 5
 Fabricated Fittings : ASTM A53 Gr. B
 DIN2440, ISO4200 or BS1387
 Gasket : EPDM – Grade A & E
 Nitrile

Application/Limitation

The Tyco grooved couplings and fittings may be used for the following systems on board:

- Fire, sprinkler and deck wash lines
- Seawater and cooling water
- Fresh cooling water
- Bilge discharge systems
- Ballast systems in engine rooms, and outside engine rooms when the pipe lines are carried through pipe tunnels or ballast tanks
- Cargo oil pipelines on open deck and cargo oil tanks
- Fuel oil transfer lines on open deck
- Compressed air
- Heating and air conditioning (non-refrigerants)
- Vents and sound tubes
- Sanitary and potable water

Couplings are considered fire resistant where required by DNV rules Pt. 4 Ch. 6 Sec.6 Table E3.

The Tyco groove couplings and fittings may not be used in bilge lines carried through tanks

Temperature range for gasket materials:

- Nitrile 32 °F to 180 °F (0 °C to 82 °C)
- EPDM Grade A: Ambient to 151 °F (66 °C)
 Grade E: 32 °F to 230 °F (0 °C to 110 °C)

EPDM is not to be used for hydrocarbon applications.

Limitations for use of threaded connections depending upon piping class and pipe outer diameter (OD):

Type of Threaded Joints	Piping System Class		
	Class I	Class II	Class III
Tapered	OD _{max} 31 mm	OD _{max} 61 mm	OD _{max} 61 mm
Parallel	no	no	OD _{max} 61 mm

Maximum Working Pressures:

Figure	Component	Sizes	Pressure
705	Coupling	1"-12", 76.1 mm & 165.1 mm	400 psi
772	Coupling	1"-12", 76.1 mm & 165.1 mm	400 psi
577	Coupling	1"-12", 76.1 mm & 165.1 mm	400 psi
730	Mechanical tee	1"-12", 76.1 mm & 165.1 mm	400 psi
201	45° elbow	1"-12", 76.1 mm & 165.1 mm	400 psi
210	90° elbow	1"-12", 76.1 mm & 165.1 mm	400 psi
219	Tee	1"-12", 76.1 mm & 165.1 mm	375 psi
221	Reducing tee	2 x 1 ½ x 2 to 10 x 8 x10	375 psi
227	Cross	1 ¼"-12", 32 mm to 300 mm	375 psi
250	Grv x Grv concentric reducer	1-1/2" x 1" to 12" x 8"	375 psi
260	End Cap	1"-12", 76.1 mm & 165.1 mm	375 psi
501	45° Elbow	1-1/4"-12"	375 psi
510S	90° Elbow	2"-8"	375 psi
519S	Tee	2"-8"	375 psi
522	Outlet tee	1"-76.1 mm	375 psi
260	End cap	1"-12", 76.1 mm & 165.1 mm	250 psi
71	Flange adapter	1"-12", 76.1 mm & 165.1 mm	250 psi

Type Approval documentation

- Catalogue "Tyco, Fire & Building Products – Mechanical" TYCENMECH-7/04
- MPA test report 120002208-2 dated 2004-11-19
- FM test reports: , J.I. 1D2A4.AH , J.I. 3001408 , J.I. 1B9A8.AH, J.I. 2Y3A7.AH , J.I. 2Z1A7.AH , J.I. 0D6A6.AH , J.I. 1A6A2.AH , J.I. 2Y1AY.AH , J.I. 1D7A8.AH , J.I. 1D2A1.AH , J.I. 3000586 , J.I. OD8A3.AH, J.I. 2Z6A5.AH, J.I. 1Z1A3.AH,
- UL test reports: 97NK28058, 03NK12984, 03NK12984, 98NK43881, 97NK16296, 00NK33055
- DNV Type Approval Certification Survey No. NYK-04-2157 dated 17-Nov-2004
- BS6920 Test on effect of water quality, WRc-NSF Report No MTA/LAB 191K
- Fire test report dated 2010-08-12

Tests carried out

Type testing in accordance with Type Approval Programme 5-792.20, October 2002 and covering the following: repeated assembly, leakage, burst pressure, vibration, fire and pull-out.

Marking of product

For traceability to this type approval, the couplings shall be marked with:

- Manufacturer's name and trademark.
- Type Designation.
- Size.

Any additional marking at the manufacturer's discretion

Certificate Retention Survey

For retention of the Type Approval, a DNV Surveyor shall perform a survey – before the expiry date of this certificate to verify that the conditions for the type approval are complied with. The Surveyor shall perform the following tasks on samples selected at random from stock or from the running production:

- Verify that the dimensions of the couplings comply with the Type Approved documentation.
- Verify that the material composition complied with the Type Approved documentation.
- Witness burst pressure testing.