DNV·GL

Certificate No:
TAP00000FA

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Pipe Couplings, Flared or Welded Nipple Type

with type designation(s)
ISO6162-1 Flaring Flange Body, ISO6162-2 Flaring Flange Body, ISO6164 Flaring Flange Body

Issued to
Marinetec development(Shanghai) Limited
Shanghai, China

is found to comply with
DNV GL rules for classification – Ships
DNV GL rules for classification – Yachts
DNV GL rules for classification – Offshore units

Application :

Mineral oil, lubricating oil, water-glycol and phosphate ester, sea water, compressed air. Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Temperature range:	**-45 to +200°C (material dependent, see cert.)**
Max. working press.:	**50 to 420 bar (size dependent, see cert.)**
Sizes:	**1/2 to 5 inches**

This Certificate is valid until **2021-07-31**.

Issued at **Hamburg** on **2016-08-01**

for **DNV GL**

DNV GL local station: **Shanghai**

Approval Engineer: **Hagen Markus**

Olaf Drews
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.

Job Id: **262.1-012333-2**
Certificate No: **TAP00000FA**

Product description

The flared configuration is based on flaring pipe ends to 37° by flaring machine and utilizing flange and internal cones. The 37° flare flange connection consists of pipe with elastomeric seals and bolting hardware made of C and C-Mn steel & stainless steel, according to ISO 6162-1/-2 and ISO 6164.
For selection of the pipe coupling the pressure rating as specified by the manufacturer's specification is to be observed.

Material designation: 45# carbon steel and 316L stainless steel
Sealing material: NBR for steel -and FKM for stainless steel connectors

Application

Temperature range

Rubber Type	Minimum temperature [°C]	Maximum temperature [°C]		
		Dry air	Freshwater / Steam	Hydrocarbons
NBR	Down to -30	Up to 100	Up to 90	Up to 90
FKM	Down to -45	Up to 200	Up to 150	Up to 170

Working pressures

Size [inch	Series	Type Carbon	Type Stainless Steel	Max. Working Pressure [bar]	Bolt type
1/2	ISO 6162-1 Flaring Flange Body	MD-FF3-**-050	MD-FF3-**-050SS	350	M8
3/4		MD-FF3-**-075	MD-FF3-**-075SS	350	M10
1		MD-FF3-**-100	MD-FF3-**-100SS	350	M10
1 1/4		MD-FF3-**-125	MD-FF3-**-125SS	275	M10
1 1/2		MD-FF3-**-150	MD-FF3-**-150SS	210	M12
2		MD-FF3-**-200	MD-FF3-**-200SS	210	M12
2 1/2		MD-FF3-**-250	MD-FF3-**-250SS	175	M12
3		MD-FF3-**-300	MD-FF3-**-300SS	140	M16
4		MD-FF3-**-400	MD-FF3-**-400SS	50	M16
5		MD-FF3-**-500	MD-FF3-**-500SS	50	M16
1/2	ISO 6162-2 Flaring Flange Body	MD-FF6-**-050	MD-FF6-**-050SS	420	M8
3/4		MD-FF6-**-075	MD-FF6-**-075SS	420	M10
1		MD-FF6-**-100	MD-FF6-**-100SS	420	M12
1 1/4		MD-FF6-**-125	MD-FF6-**-125SS	420	M12
1 1/2		MD-FF6-**-150	MD-FF6-**-150SS	420	M16
2		MD-FF6-**-200	MD-FF6-**-200SS	420	M20
2 1/2	ISO 6164 Flaring Flange Body	MD-FF4-**-250	MD-FF4-**-250SS	400	M20
3		MD-FF4-**-300	MD-FF4-**-300SS	400	M24

MD: Manufacturer`s Mark, FF : Flare Flange, 3: ISO 6162-1, 6: ISO6162-2, 4: ISO 6164
**: Outside diameter x wall thickness

For selection of the tubes the following is to be observed:
- The wall thickness and material properties and certification are to be in accordance with the current DNVGL Rules
- The pipe tolerances shall be in compliance with manufacturer specification

Limitation

The pipe couplings are not approved for:
- on tubes in cold fabricated (hard temper) conditions
- piping for high pressure fuel injection systems

Sea water systems
For application in sea water systems austenitic stainless steels qualities shall be used which are proven in respect to intercrystalline corrosion. Material certificate shall include appropriate confirmation tests according to ASTM A262, Practice E, Copper - Copper Sulphate - Sulphuric Acid Test, or to another recognised standard. Refer to DNVGL Rules Part 2 Section 3 – Corrosion testing.

Type Approval documentation

Drawings

Series	Drawing No.
ISO 6162-1 Flaring Flange Boby	FF3-050, FF3-075, FF3-100, FF3-125, FF3-150, FF3-200, FF3-250, FF3-300, FF3-400, FF3-500.
ISO 6162-2 Flaring Flange Boby	FF6-050, FF6-075, FF6-100, FF6-125, FF6-150, FF6-200.
ISO 6164 Flaring Flange Boby	FF4-250, FF4-300
Cone- O Ring Face	MD-DO-20x2.5-050, MD-DO-25x3-075, MD-DO-30x4-100, MD-DO-42x3-125, MD-DO-50x3-150, MD-DO-60x3-200, MD-DO-SCH80-250, MD-DO-90x5-300, MD-DO-114.3x6.02-400, MD-DO-140x4.5-500.
Cone- Flat Face	MD-DF-20x2.5-050, MD-DF-25x2.5-075, MD-DF-30x4-100, MD-DF-38x4-125, MD-DF-50x5-150, MD-DF-60x5-200, MD-DF-75x5-250, MD-DF-90x5-300, MD-DF-114.3x46.02-400, MD-DF-140X4.5-500.
O-Ring	O-Ring OR General drawing

Test reports

- Test reports according to DNV Type Approval Programme No. 5-792.20, dated 2011.09.15
- Application for type approval certificate from DNV Shanghai, China, dated 2011.09.22
- Initial survey report from DNV Shanghai, China, dated 2011.09.22
- Assessment report dated 2016-06-21

Tests carried out

Following tests according to DNV Type Approval Programme No. 5-792.20, dated 2011.09.15
- Burst pressure test, witnessed by Dalian DNV Surveyor
- Leakage test
- Repeated assembly test
- Pull-out test
- Vibration test
- Pressure pulsation test
- Fire test

Marking of product

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

- Manufacturer's name or trade mark
- Type designation

Periodical assessment

For retention of the type approval certificate periodical assessments shall be carried out at production place.
The objective of the periodical assessment is to verify that the design and production conditions for the relief valves have not been altered.
Main scope of the assessment:
— verification of the production and quality control system
— review of quality control documentation of recent deliveries
— review of the type approval documentation and that this is still the basis for the production
— review of design changes , pre- material and performance of the product
— verification of the product marking