

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Pipe Couplings, Bite and Compression Type**with type designation(s)
DS / DSW

Issued to

Eifeler Maschinenbau GmbH
Euskirchen Nordrhein-Westfalen, Germany

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**DNV GL class programme DNVGL-CP-0185 – Type approval – Mechanical joints****Application :****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.****Temperature range:** -35°C to +200°C / material dependant**Max. working press.:** 100 bar to 800 bar**Sizes:** 4 to 42 mm / size dependantIssued at **Hamburg** on **2017-02-06**This Certificate is valid until **2022-02-05**.for **DNV GL**DNV GL local station: **Essen**Approval Engineer: **Christian Kaemmer**

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: **262.1-003916-6**
Certificate No: **TAP00000TX**

Product description

Bite type pipe coupling, consisting of basic component, compression ferrule and connecting nut manufactured acc. to DIN 2353 and EN ISO 8434-1/-4.
Cutting ring type DS or DSW (elastomer sealing).
Series LL (very light), Series L (light) and Series S (heavy).

Materials:

Tubes:

Seamless steel tube
Carbon steel E235N (St37.4) acc. to DIN EN 10305-4
Stainless steel 1.4571/ X6CrNiMoTi 17122, cold-drawn, heat-treated to DIN EN 10216-5
Tolerances of tube outside and inside diameter according to DIN EN 10305-4/DIN2391-1-C

Basic component, compression ferrule, connecting nut DS, DSW:

Carbon Steel: 11SMnPb30+C / 1.0718 / DIN EN 10277-3
Stainless Steel: X6CrNiMoTi17122 / 1.14571 / DIN EN 10088-3
Rubber sealing: NBR, FPM, PTFE

Sizes: 4 mm to 42 mm.

Application/Limitation

The pipe coupling system is type approved for application in pipe class I, II and III-piping systems, fire resistant type, as listed in DNV GL Ship Rules Pt. 4, Ch. 6, Sec. 9 Table 12 & 13 / Bite-type.
Regarding limitations refer to page 3.

Series	Pipe O.D. mm	Nominal Pressure PN
LL	4 - 8	100
L	22 - 42	250
	12 - 18	400
	6 - 10	500
S	20 - 38	400
	12 - 16	630
	6 - 10	800

Temperature range:

Metallic material	Temperature range
Carbon steel	-20°C to +120°C, (-40°C ambient)
Stainless steel	-60°C to +400°C
Sealing material	
NBR	-35°C to +100°C
FPM	-25°C to +200°C
PTFE	-60°C to +200°C

For application of carbon steel fittings below -10°C the pre- material is to be normalized.
The maximum service temperature (M.A.W.T.) arise out of the tube fitting and sealing material combination.

Example M.A.W.T.:

Carbon steel fitting (normalized) with NBR sealing, -20°C up to +120°C.

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Stainless steel in combination with FPM sealing, -25°C up to +200°C.

Pressure reduction factors:

Stainless Steel

For service temperatures above 50 °C the pressure is to be reduced in accordance with the manufacturer's pressure reduction factors:

50°C:	-4%
100°C:	-11%
200°C:	-20%
300°C:	-29%
400°C:	-33%

Pipe couplings with pipe thread that seal on the thread are limited in the application.

Pipe couplings with parallel thread are not approved for pipe class I and II and tapered or parallel thread is not approved for toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur.

Tube fittings made of stainless steel 1.4571 are not permitted in seawater systems.

A tube grade suitable for cold bending and flaring is to be used.

For the assembly and the installation of the joints manufacturer's instructions are to be observed.

The wall thickness of the tubes is to be in accordance with current DNVGL Rules.

Bulkhead connections of type K, L, are not approved through tank walls , fire divisions, watertight deck and bulkheads.

Type Approval documentation

Tests carried out

Lekage test, repeated assembly test, burst test, pressure pulsation and vibration test, fire resistance test, vacuum test. Tightness test & Burst-pressure test dated 2016-11-16.

Marking of product

For traceability to this Type Approval, the tube fittings are to be marked with:

- Manufacturer's name or trade mark
- Type designation
- Size

Periodical assessment

For retention of the type approval certificate periodical assessments shall be carried out at production places by local DNVGL Surveyor.

Prior to the expiry date of this certificate a renewal assessment is to be carried out to verify that the conditions for the type approval are complied with and to witness burst pressure testing on select sizes.

The objective of the periodical assessment is to verify that the design and production conditions for the type approval 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 drawings in production to verify any design changes which may have an impact on data specified in the type approval certificate, performance and range of application
- verification of the product marking.

End of certificate