



TYPE APPROVAL CERTIFICATE

Certificate No:
TAP00000TV
Revision No:
1

This is to certify:

That the Tube Fittings

with type designation(s)
EMB-FS (form and seal)

Issued to

Gates Tube Fittings GmbH
Euskirchen, Nordrhein-Westfalen, Germany

is found to comply with

DNV class programme DNV-CP-0185 – Type approval – Mechanical joints
DNV rules for classification – Ships Pt.4 Ch.6 Piping systems

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Temperature range: **-35°C to +200°C**
Max. working press.: **800 bar**
Sizes: **6 mm up to 42 mm**

Issued at **Hamburg** on **2021-12-06**

for **DNV**

This Certificate is valid until **2026-12-05**.

DNV local station: **Essen**

Approval Engineer: **Christian Kaemmer**

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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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

Design:

The EMB FS system is a tube reshaping system that consists of the components nut, fitting, function-ring and tube. The mechanically reshaped tube end is connected by a fitting-body and a nut. The leakage path is sealed by the function ring with elastomer sealing and by a metallic seal (integral 24° cone of the tube). DIN 2353, ISO 8434-1/-4.

Tube reshaping machine:

EMB FS90, FS92 and FS93

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 to DIN EN 10305-4/DIN2391-1-C

Fitting-body, Nut, function ring FSR, FSSR:

Carbon steel

EN235N (St37.4)

DIN EN 10305-4

Stainless steel

1.4571/X6CrNiMoTi 17122

DIN EN 10216-5

Rubber sealing

NBR, FPM

Sizes: 6 mm to 42 mm

Application/Limitation

The EMB-FS-system is type approved for application in pipe class I, II and III-piping systems, as listed in DNV Ship Rules Pt. 4, Ch. 6, Sec. 9 Table 8 & 9, Classed as Compression Coupling, Flared-type, Fire resistant.

Size [mm]	Nominal pressure PN		Nominal pressure PN	
	L-Series		S-Series	
	Carbon Steel	Stainless Steel	Carbon Steel	Stainless Steel
6	500	315	800	630
8	500	315	800	630
10	500	315	800	630
12	400	315	630	630
14			630	630
15	400	315		
16			630	400
18	400	315		
20			400	400
22	250	160		
25			400	400
28	250	160		
30			400	400
35	250	160		
38			400	315
42	250	160		

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

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.
 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:

20°C - 50°C	-4%
50°C - 100°C	-11%
100°C - 200°C	-20%

Tube fittings with parallel thread are not approved for pipe class I and II.

Pipe couplings with tapered or parallel thread are 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 material 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 DNV Rules.

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

Type Approval documentation

EMB Product catalogue 2016/2012
 EMB-FS (form & seal) documentation
 Fire resistance tests No: 51/10, 52/10, 53/10122/10.
 Overview witness testing FS dated 2016-11-15
 Test report Gates EMB No: 12835 dated 2016-11-16
 Type Approval Assessment Report dated 2021-11-25
 Burst Pressure Test-Report dated 2021-11-25

Tests carried out

Repeated assembly, Leakage, Burst, Impulse, Vibration and Fire Test, Tightness test & Burst-pressure test

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, a DNV Surveyor shall perform periodical assessment to verify that the conditions for the Type Approval are complied with. Refer to the Class Programme DNV-CP-0338, Sec.4.

To check the validity of this certificate, please look it up in <https://approvalfinder.dnvgl.com>