

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Pipe Couplings, Bite and Compression Type**with type designation(s)
SUPERLOK Compression Tube Fitting

Issued to

BMT Co., Ltd.
Yongsan-si, Gyeongsangnam-do, Republic of Korea

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018
DNV GL class programme DNVGL-CP-0185 – Type approval – Mechanical joints**Application :****Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.****Temperature range:** -55 °C to + 400 °C
Max. working press.: 2000 to 15300 psi
Sizes: 1/16" to 1 1/2" - 3 to 25 mmIssued at **Høvik** on **2020-12-17**for **DNV GL**This Certificate is valid until **2024-06-30**.DNV GL local station: **Busan**Approval Engineer: **Andreas Hansen****Zeinab Sharifi**
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 GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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.



Job Id: **262.1-011527-8**
 Certificate No: **TAP000021X**
 Revision No: **1**

Product description

SUPERLOK, bite type compression tube fitting in inch and metric size made of stainless steel SUS316, ASTM A276 and JIS G4303.

Application/Limitation

Maximum working pressure and sizes:

Tube O.D [Inch]	Tube wall thickness [Inch]															
	.010	.012	.014	.016	.020	.028	.035	.049	.065	.083	.095	.109	.120	.134	.156	.188
1/16	5600	6800	8100	9400	12000	-	-	-	-	-	-	-	-	-	-	-
1/8	-	-	-	-	-	8500	10900	-	-	-	-	-	-	-	-	-
3/16	-	-	-	-	-	5400	7000	10200	-	-	-	-	-	-	-	-
1/4	-	-	-	-	-	4000	5100	7500	10200	-	-	-	-	-	-	-
5/16	-	-	-	-	-	-	4000	5800	8000	-	-	-	-	-	-	-
3/8	-	-	-	-	-	-	3300	4800	6500	-	-	-	-	-	-	-
1/2	-	-	-	-	-	-	2600	3700	5100	6700	-	-	-	-	-	-
5/8	-	-	-	-	-	-	-	2900	4000	5200	6000	-	-	-	-	-
3/4	-	-	-	-	-	-	-	2400	3300	4200	4900	5800	-	-	-	-
7/8	-	-	-	-	-	-	-	2000	2800	3600	4200	4800	-	-	-	-
1	-	-	-	-	-	-	-	-	2400	3100	3600	4200	4700	-	-	-
1 1/2	-	-	-	-	-	-	-	-	-	-	2300	2700	3000	3400	4000	4900

Tube O.D [mm]	Tube wall thickness [mm]													
	0.71	0.89	1.00	1.25	1.50	1.65	2.00	2.11	2.41	2.50	2.77	3.00	3.05	
3	10800	13800	15300	-	-	-	-	-	-	-	-	-	-	
4	7900	10100	11500	14400	-	-	-	-	-	-	-	-	-	
6	5000	6500	7400	9400	11500	12700	-	-	-	-	-	-	-	
8	-	4700	5800	6800	8400	9300	-	-	-	-	-	-	-	
10	-	3700	4200	5300	6500	7300	-	-	-	-	-	-	-	
12	-	3000	3400	4400	5300	5900	6800	7200	-	-	-	-	-	
16	-	-	2500	3200	3900	4300	5300	5700	6600	6800	-	-	-	
18	-	-	-	2800	3400	3800	4700	5000	5800	6000	6700	-	-	
20	-	-	-	2500	3000	3400	4200	4400	5100	5300	6000	-	-	
22	-	-	-	2300	2800	3000	3800	4000	4600	4800	5400	-	-	
25	-	-	-	2000	2400	2700	3300	3500	4000	4200	4700	5100	5200	

For elevated temperatures, the maximum working pressure shall be reduced with the following factors:

Temperature °C	≤20	50	100	150	200	250	300	350	400
Correction factor	1	0,95	0,85	0,77	0,71	0,67	0,63	0,6	0,58

Couplings covered by this certificate are only to be used in piping classes I, II and III in below applications ⁽³⁾:

1) Flammable fluids (flash point ≤ 60°C) <ul style="list-style-type: none"> - Cargo oil lines ⁽¹⁾ - Crude oil washing lines ⁽¹⁾ - Vent lines 2) Inert gas <ul style="list-style-type: none"> - Water seal effluent lines - Scrubber effluent lines - Main lines ⁽¹⁾ - Distributions lines ⁽¹⁾ 3) Flammable fluids (flash point > 60°C) <ul style="list-style-type: none"> - Cargo oil lines ⁽¹⁾ - Fuel oil lines - Lubricating oil lines - Hydraulic oil - Thermal oil 	4) Fresh water <ul style="list-style-type: none"> - Cooling water system - Condensate return - Non-essential system 5) Sanitary/drains/scuppers <ul style="list-style-type: none"> - Deck drains (internal) ⁽²⁾ - Sanitary drains 6) Sounding/vent <ul style="list-style-type: none"> - Water tanks/dry spaces - Oil tanks (f.p. > 60°C) 7) Miscellaneous <ul style="list-style-type: none"> - Starting/control air - Service air (non-essential) - Brine - CO₂ system - Steam
<p>(1) Only in pump rooms and open decks - only approved fire-resistant types. (2) Only above bulkhead deck of passenger ships and freeboard deck of cargo ships. (3) Not to be used in seawater applications</p>	

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Threaded connections where pressure-tight joints are made on the threads with parallel or tapered threads shall not be used for piping systems conveying toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur. For other applications threaded connections with pressure-tight joints on threads may be used for outside diameters:

- In CO2 systems shall be allowed only inside protected spaces and in CO2 cylinder rooms
- Threaded joints with tapered thread shall be allowed for:
 - o class I, outside diameter not more than 33.7 mm
 - o class II and class III, outside diameter not more than 60.3 mm
- Threaded joints with parallel thread shall be allowed for class III, outside diameter not more than 60.3 mm.

The approval is only valid when the couplings are assembled with tubing of correct temper and tolerances as recommended by the manufacturer. These couplings should not be used on tubes in cold fabricated (hard temper) conditions.

Couplings covered by this certificate shall not be installed in systems subject to pressure below atmospheric or vacuum conditions.

Type Approval documentation

Manufacturer's product catalogue (Superlok Tube fitting)

Manufacturer drawings:

SU-2 Dated (2002-11-27), SU-16 Dated (2003-01-13), FC 16-16N Dated (2002-07-12), SMC2-2N Dated (2002-11-27), MC16-16N Dated (2003-01-07), SFC2-2N Dated (2003-09-20), SUE-2 Dated (2003-07-04), UE-16 Dated (2002-02-06), UT-2 Dated (2003-05-29), UT-16 Dated (2002-04-19), UC-2 Dated (2003-07-04), UC-16 Dated (2005-05-06), R2-4 Dated (2003-04-28), SR 16-16 Dated (2005-03-10), PWC2-2P Dated (2005-08-11), SPWC16-16P Dated (2003-01-18), SN-2 Dated (2002-03-02), SN-16 Dated (2002-02-04), SFF-2 & SBF-2 Dated (2003-11-22), SFF-16 Dated (2003-12-10), Drawing no. 130730-03-123 Rev. A (2013-06-30)

Test Reports:

Burst pressure: BTR-S060327-03 (dated 2006-03-27), BTR-S060613-01 (dated 2006-06-13), PTR-190920-01 (dated 2019-09-20) / Vibration test: BTR-S060613-02 (dated 2006-06-13) / Pulsation test: BTR-S060613-03 (dated 2006-06-13) / Leakage test: BTR-S060613-04 (dated 2006-06-13) / Repeated assembly test: BTR-S060613-05 (dated 2006-06-13) / Pull-out test: BTR-S060613-06 (dated 2006-06-13), Type test report for 1 1/2" Coupling Doc. No. BMT-T2011-01

Tests carried out

Leakage, repeated assembly, burst pressure, pull-out, vibration & pressure pulsation 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

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.