

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Pipe Couplings, Bite and Compression Type**

with type designation(s)

Bite - DIN 2353 Type tube fitting

Issued to

Hansun Engineering Co., Ltd.
Busan, Republic of Korea

is found to comply with

DNV GL class programme DNVGL-CP-0185 – Type approval – Mechanical joints**DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018****DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems****Application :****Products approved by this certificate are accepted for installation on vessels classed by DNV GL.****Temperature range:** -60°C to +550°C**Max. working press.:** 70 to 630 bar**Sizes:** 4 to 42 mmIssued at **Høvik** on **2020-08-31**This Certificate is valid until **2023-06-30**.DNV GL local station: **Gimhae Station**for **DNV GL**Approval Engineer: **Adel Samiei**

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.



Product description

Bite and compression type tube fitting according to DIN2353.

Materials:

Carbon steel	DIN 3859
Brass	CuZn35Ni2 according to DIN17660/17672
Stainless steel	X6CrNiMoTo 17122 according to DIN 17122/17440 ASTM A479 TP316

Application/Limitation

Couplings covered by this certificate are only to be used in piping classes I, II and III in below applications: (couplings without non-metallic sealings shall be considered fire resistant type)

1) Flammable fluids (flash point $\leq 60^{\circ}\text{C}$) - Cargo oil lines ⁽³⁾ - Crude oil washing lines ⁽³⁾ - Vent lines ⁽²⁾ 2) Inert gas - Water seal effluent lines - Scrubber effluent lines - Main lines ⁽³⁾ - Distributions lines ⁽³⁾ 3) Flammable fluids (flash point $> 60^{\circ}\text{C}$) - Cargo oil lines ⁽³⁾ - Fuel oil lines ⁽²⁾ - Lubricating oil lines ⁽²⁾ - Hydraulic oil ⁽²⁾ - Thermal oil ⁽²⁾ 4) Fresh water - Cooling water system ⁽¹⁾ - Condensate return ⁽¹⁾ - Non-essential system 5) Sanitary/drains/scuppers - Deck drains (internal) ⁽⁴⁾ - Sanitary drains	6) Sea water ⁽⁵⁾ - Bilge lines ⁽¹⁾ - Water filled fire extinguishing systems, e.g. sprinkler systems ⁽²⁾ - Non water filled fire extinguishing systems, e.g. foam, drencher systems ⁽²⁾ - Fire main (not permanently filled) ⁽²⁾ - Ballast system ⁽¹⁾ - Cooling water system ⁽¹⁾ - Tank cleaning services - Non-essential systems 7) Sounding/vent - Water tanks/dry spaces - Oil tanks (f.p. $> 60^{\circ}\text{C}$) ⁽²⁾ 8) Miscellaneous - Starting/control air ⁽¹⁾ - Service air (non-essential) - Brine - CO₂ system ⁽¹⁾ - Steam
(1) Inside machinery spaces of category A - only approved fire-resistant types. (2) Approved fire-resistant types except in cases where such mechanical joints are installed on exposed open decks, as defined in SOLAS II-2/Reg. 9.2.3.3.2.2(10) and not used for fuel oil lines. (3) Only in pump rooms and open decks - only approved fire-resistant types. (4) Only above bulkhead deck of passenger ships and freeboard deck of cargo ships. (5) Only brass couplings are allowed to be used in seawater applications	

Max. working pressure and sizes:

Series	Tube O.D (mm)	Max. Working Pressure (bar)		
		Stainless Steel	Carbon steel	Brass
Very Light (LL)	4, 8	100	100	70
Light (L)	6, 8, 10, 12, 15	250	315	221
	18, 20, 22	160	-	-
	28, 30, 35, 38, 42	100	160	112
Heavy (S)	6, 8, 10, 12, 14	630	630	441
	16, 20, 25	400	400	280
	30, 38	315	315	221

Job Id: **262.1-016385-3**
Certificate No: **TAP00001J1**

Temperature range is dependent to the used material as below:

Material	Temperature Range	Material	Temperature range
Carbon Steel	-40°C to +120°C	FKM	-20°C up to +180°C
Brass	-54°C to +204°C	NBR	-23°C up to +120°C
Stainless Steel	-60°C to +550°C	PTFE	-60°C up to +240°C

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

Temperature °C	≤20	50	100	120	150	200	250	300	350	400	450	500	550
Carbon Steel	1	1	1	0.94	-	-	-	-	-	-	-	-	-
Stainless Steel	1	0.95	0.85	-	0.77	0.71	0.67	0.63	0.60	0.58	0.57	0.56	0.55
Brass	1	0.90	0.80	-	0.75	0.65	-	-	-	-	-	-	-

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

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.

Type Approval documentation

Tests carried out

Tightness test, repeated assembly test, burst pressure test, pull-out test, vibration endurance test, and pressure pulsation test.

Marking of product

For traceability to this type approval, each valve is to be marked with:

- Manufacturer's name:
- Type designation
- Size

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.