

TYPE APPROVAL CERTIFICATE

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

with type designation(s)

Bite - JIS B 2351 Type Tube Fittings

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.: 147 - 500 bar
Sizes: 6 mm to 42 mmIssued at **Høvik** on **2020-08-31**for **DNV GL**This Certificate is valid until **2023-06-30**.DNV GL local station: **Gimhae Station**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 with type designation Bite - JIS B 2351.
 Materials:

Part	Carbon Steel coupling	Stainless Steel coupling	Brass coupling
Forged bodies	S20C-S48C	SUS316/L	C3771
Bar stock Bodies	S20C-S48C	SUS316/L	C3604
Cold Formed Nuts	S10C-S20C	-	-
Barstock Nuts	S20C-S48C	SUS304/L, SUS316/L	C3604
Sleeves	S10C	SUS304/L, SUS316/L	C3604
Sealing	FKM, PTFE (Teflon), NBR		

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)

<p>1) Flammable fluids (flash point ≤ 60°C)</p> <ul style="list-style-type: none"> - Cargo oil lines ⁽³⁾ - Crude oil washing lines ⁽³⁾ - Vent lines ⁽²⁾ <p>2) Inert gas</p> <ul style="list-style-type: none"> - Water seal effluent lines - Scrubber effluent lines - Main lines ⁽³⁾ - Distributions lines ⁽³⁾ <p>3) Flammable fluids (flash point > 60°C)</p> <ul style="list-style-type: none"> - Cargo oil lines ⁽³⁾ - Fuel oil lines ⁽²⁾ - Lubricating oil lines ⁽²⁾ - Hydraulic oil ⁽²⁾ - Thermal oil ⁽²⁾ <p>4) Fresh water</p> <ul style="list-style-type: none"> - Cooling water system ⁽¹⁾ - Condensate return ⁽¹⁾ - Non-essential system <p>5) Sanitary/drains/scuppers</p> <ul style="list-style-type: none"> - Deck drains (internal) ⁽⁴⁾ - Sanitary drains 	<p>6) Sea water ⁽⁵⁾</p> <ul style="list-style-type: none"> - 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 <p>7) Sounding/vent</p> <ul style="list-style-type: none"> - Water tanks/dry spaces - Oil tanks (f.p. > 60°C) ⁽²⁾ <p>8) Miscellaneous</p> <ul style="list-style-type: none"> - Starting/control air ⁽¹⁾ - Service air (non-essential) - Brine - CO₂ system ⁽¹⁾ - Steam
<p>(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</p>	

Tube size, OD (mm)	Maximum Working Pressure, bar		
	Carbon Steel	Stainless Steel	Brass
6, 8, 10, 12, 15	500	500	350
16, 18, 20, 22	400	400	280
25, 28	350	350	245
30, 32, 35, 38	250	250	178
40, 42	210	210	147

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.

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.

Type Approval documentation

Manufacturer's product catalogues: Hansun Engineering Co., Ltd. Catalogue_JIS_201207

Manufacturer's test reports numbers:

Tightness test: HSET-DNV-1304-002 & HSET-DNV-1911-002 SS, HSET-DNV-1305-002 & HSET-DNV-1912-002 CS, HSET-DNV-1306-002 & HSET-DNV-1912-011 Brass

Repeated assembly test: HSET-DNV-1304-005 & HSET-DNV-1911-005 SS, HSET-DNV-1305-005 & HSET-DNV-1912-005 CS, HSET-DNV-1306-005 & HSET-DNV-1912-014 Brass

Burst pressure test: HSET-DNV-1304-008 & HSET-DNV-1911-008 SS, HSET-DNV-1305-008 & HSET-DNV-1912-008 CS, HSET-DNV-1306-008 & HSET-DNV-1912-017 Brass

Pull-out test: HSET-DNV-1304-014 & HSET-DNV-2001-002 SS, HSET-DNV-1305-014 & HSET-DNV-2001-005 CS, HSET-DNV-1306-014 & HSET-DNV-2001-008 Brass

Vibration endurance & pressure pulsation test: HSET-DNV-1304-011 & HSET-DNV-2001-011 SS, HSET-DNV-1305-011 & HSET-DNV-2001-013 CS, HSET-DNV-1306-011 & HSET-DNV-2002-002 Brass

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 coupling 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.