



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **P-14427**

This is to certify that the
Pipe Couplings, Bite and Compression Type

with type designation(s)

DK-LOK: DU, DUR, DL, DT, DUB, DMC-N, DMC-R, DMC-G, DMC-GB, DMCB-N, DLM, DLBM, DTRM, DTBM, DCF, DCF-GG, DCBF, DLF, DTRF, DTBF, DR, DAB, DAM, DAF, DUA, DUBA, DAA, DCW, DLW, DCSW, DLSW, DP, DC, DN, DFF, DFB

Manufactured by

DK Tech Corp
Kyungnam -, Republic of Korea

is found to comply with

Det Norske Veritas' Rules for Classification of Ships
Det Norske Veritas' Standards for Certification 2.9 No. 5-792.20

Application

May be used for ship piping systems as listed in certificate.

Temperature range: -20 °C to 300 °C

Max. working press.: Dep. on size and temp., see cert.

Sizes: For pipe O.D. 6 mm to 38 mm - 1/4" to 2" (see certificate)

This Certificate is valid until **2016-12-31**.

Issued at **Høvik** on **2013-08-09**

DNV local station: **Changwon**

Approval Engineer: **Tom Berg-Nielsen**

for **Det Norske Veritas AS**

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Marianne Spæren Marveng
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.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

Product description

Pipe couplings. Double bite type.

Type	Description	Type	Description	Type	Description
DU	Union	DAF	Female Adapter	DTRM	Male Run Tee
DT	Union Tee	DUBA	AN Bulkhead Union	DCF	Female Connector
DMC-N	Male Connector	DCW	Male Pipe Weld Connector	DCBF	Bulkhead Female Connector
DMC-G	Male Conn. for Bonded Seal	DCSW	Tube Socket Weld Connector	DTRF	Female Run Tee
DMCB-N	Bulkhead Male Connector	DP	Plug	DR	Reducer
DLBM	45° Male Elbow	DN	Nut	DAM	Male Adapter
DTBM	Male Branch Tee	DFB	Back Ferrule	DUA	AN Union
DCF-GG	Gauge Connector	DUR	Reducing Union	DAA	AN Adapter
DLF	Female Elbow	DUB	Bulkhead Union	DLW	Male Pipe Weld Elbow
DTBF	Female Branch Tee	DMC-R	Male Connector	DLSW	Tube Socket Weld Elbow
DAB	Bulkhead Adapter	DMC-GB	Male Conn. for Metal Seal	DC	Cap
DL	Union Elbow	DLM	Male Elbow	DFF	Front Ferrule

Materials:

Carbon steel:

Barstock: ASTM A675-GR.70, JIS G4051-S45C

Forgings: ASTM A181-C.70, JIS G4051-S45C

Stainless steel:

Barstock: ASTM A479, ASTM A276, KS D3706, JIS-G4303

Forging: ASTM A182, ASTM F316, JIS-G3214, KS D4115

Application/Limitation

The couplings may be used in the following piping systems:

Systems		Systems	
<u>Flammable fluids (Flash point ≤ 60 °C)</u>		<u>Fresh water</u>	
1	Cargo oil lines	21	Cooling water system
2	Crude oil washing lines	22	Condensate return
3	Vent lines	23	Non-essential system
<u>Inert gas</u>		<u>Sanitary/Drains/Scuppers</u>	
4	Water seal effluent lines	24	Deck drains (internal)
5	Scrubber effluent lines	25	Sanitary drains
6	Main lines	26	Scuppers and discharge (overboard)
7	Distribution lines		
<u>Flammable fluids (Flash point > 60 °C)</u>		<u>Sounding/ vent</u>	
8	Cargo oil lines	27	Water tanks/Dry spaces
9	Fuel oil lines	28	Oil tanks (flash point > 60 °C)
10	Lubrication oil lines		
11	Hydraulic oil		
12	Thermal oil		

<u>Sea Water</u>		<u>Miscellaneous</u>	
13	Bilge lines	29	Starting/control air
14	Fire main and water spray	30	Service air (non-essential)
15	Foam systems	31	Brine
16	Sprinkler system	32	CO2 system
17	Ballast system	33	Steam
18	Cooling water system		
19	Tank cleaning services		
20	Non-essential system		

Maximum allowable working pressure defined at 20°C:

For tube O.D size:		Norm. press. Bar	For tube O.D size:		Norm. press. Bar
Imperial	Metric		Imperial	Metric	
1/4	6	480	1/8	22	331
5/16	8	480	1	25	331
3/8	10	480	1 1/4	28	331
1/2	12	445	1 1/2	28	253
5/8	16	445	2	38	253
3/4	20	350			

At elevated temperatures the pressure will have to be derated. Consult manufacturer's catalogue for details.

Couplings used for low temperature gas may only be used for accessory lines and instrumentation lines with external diameters of 25 mm and less. DNV Rules Pt.5, Ch.5, Sec.6, C509

Threaded bulkhead unions type DUB, DMCB, DCBF, DAB and DUBA may not be used on watertight bulkheads.

The approval is only valid when the couplings are assembled with tubing of correct temper and tolerances as recommended by the manufacturer.

These couplings are not to be used on tubes in cold fabricated (hard temper) conditions.

The wall thickness and material of the tubes to be in accordance with the current Rules of Det Norske Veritas

Type Approval documentation

Tests carried out

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

Marking of product

For traceability to this type approval, each coupling is at least to be marked with:

- Manufacturer's trade mark
- Type designation
- Size

Certificate Retention Survey

For retention of the Type Approval, a DNV Surveyor shall perform a survey – every second year and before the expiry date of this certificate – to verify that the conditions for the type approval are complied with. The Surveyor shall perform the following tasks on samples selected at random from stock or from the running production:

- Verify that the dimensions of the couplings comply with Type Approved documentation.
- Verify that the material composition complies with Type Approved documentation.
- Witness burst testing.

Certificate No.: P-14427
File No.: 792.21
Job Id.: 262.1-014734-1

END OF CERTIFICATE