DNV·GL

Certificate No:
TAP00000T4

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Pipe Couplings, Bite and Compression Type

with type designation(s)
DK-LOK tube fittings

Issued to
DK-Lok Corporation
Gimhae-si Gyeongsangnam-do, Republic of Korea

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV GL class programme DNVGL-CP-0185 – Type approval – Mechanical joints

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Temperature range:	**-20°C to +200°C**
Max. working press.:	**248 bar to 480 bar (see certificate)**
Sizes:	**1/4" to 2" (see certificate)**

This Certificate is valid until **2021-12-31**.

Issued at **Høvik** on **2017-04-27**
DNV GL local station: **Gimhae Station** for **DNV GL**

Approval Engineer: **Adel Samiei**

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.

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Job Id: **262.1-024441-1**
Certificate No: **TAP00000T4**

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	45º 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:

Body:	
Carbon steel:	Stainless steel:
Barstock: ASTM A675-GR.70, JIS G4051-S45C	Barstock: ASTM A479, ASTM A276, KS D3706, JIS-G4303
Forgings: ASTM A181-C.70, JIS G4051-S45C	Forging: ASTM A182, ASTM F316, JIS-G3214, KS D4115
O-ring:	
NBR for Brass and Carbon steel fittings	FKM for Stainless Steel fittings

Application/Limitation

Couplings covered by this certificate may be installed in piping system classes I, II & III in below applications:

- Flammable fluids (flash point ≤ 60°C)
  - Vent lines (1)
- Inert gas
  - Water seal effluent lines
  - Scrubber effluent lines
- Flammable fluids (flash point > 60°C)
  - Fuel oil lines (1) (2)
  - Lubricating oil lines (1) (2)
  - Hydraulic oil (1) (2)
  - Thermal oil (1) (2)
- Sea water
  - Bilge lines (3)
  - Water filled fire extinguishing systems, e.g. sprinkler systems (1)
  - Non water filled fire extinguishing systems, e.g. foam, drencher systems (1)
  - Fire main (not permanently filled) (1)
  - Ballast system (3)
  - Cooling water system (3)
  - Tank cleaning services
  - Non-essential systems
- Fresh water
  - Cooling water system (3)
  - Condensate return (3)
  - Non-essential system
- Sanitary/drains/scuppers
  - Deck drains (internal) (4)

  Sanitary drains

  Scuppers and discharge (overboard)
- Sounding/vent
  - Water tanks/Dry spaces
  - Oil tanks (f.p. > 60°C) (1) (2)
- Miscellaneous
  - Starting/Control air (3)
  - Service air (non-essential)
  - Brine
  - CO2 system (3)
  - Steam

(1) 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.

(2) Not inside machinery spaces of category A or accommodation spaces. May be accepted in other machinery spaces provided the joints are located in easily visible and accessible positions.
(3) Not inside machinery spaces of category A
(4) Only above bulkhead deck of passenger ships and freeboard deck of cargo ships.

Maximum allowable working pressure defined at 20°C:

For tube O.D size:		Max. allowable pressure	For tube O.D size:		Max. allowable pressure
Imperial	Metric		Imperial	Metric	
¼	6	480 bar	7/8	22	324 bar
5/16	8	480 bar	1	25	324 bar
3/8	10	480 bar	1¼	28	324 bar
½	12	445 bar	1½	28	248 bar
5/8	16	445 bar	2	38	248 bar
¾	20	350 bar			

The maximum allowable pressure have to be reduced at elevated temperatures according to DNVGL-CP-0185 Section 2 Table 1.

The temperature range is limited by sealing material as below:
- NBR -20°C to +100°C
- FKM -20°C to +200°C

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

Material in contact with seawater shall be properly protected. Surface preparation and coating shall be approved by society. Traditional stainless steel (grades 304, 304L, 316, 316L) shall not be considered as seawater resistant material.

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

Type Approval documentation

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

Marking of product
For traceability with this type approval, each fitting is at least to be marked with:
- Manufacturers name or trademark
- Size

Periodical assessment
For retention of the Type Approval, a DNV GL 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 and to witness burst testing on samples of fittings selected at random from stock or from the running production.