



MARINE DIVISION

Certificate number: 14034/B0 BV

File number: ACM 135/2630/01 and 02

Product code: 2161H

This certificate is not valid when presented without the full attached schedule composed of 7 sections

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TYPE APPROVAL CERTIFICATE

This certificate is issued to

DK TECH CORPORATION (Juchon)

Gimhae (Gyeongnam) - KOREA (REPUBLIC OF)

for the type of product

PIPE FITTINGS

Dk-Lok tube fittings and Bite Type tube fittings

Requirements:

- BUREAU VERITAS Requirements for the Classification of Steel Ships
- BUREAU VERITAS Requirements for the Classification of Offshore Units

This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 18 Jan 2015

For BUREAU VERITAS,

At BV PUSAN, on 18 Jan 2010,

Keum-Ho Lee



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine Division available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION :

Dk-Lok tube fittings and Bite Type tube fittings

1.1 Design

- The construction of Dk-Lok tube fittings consists of a body, a nut, a front ferrule and a back ferrule.
- The construction of Bite Type tube fittings consists of a body, a sleeve and a nut.

1.2 Range depending on tube wall-thickness per the manufacturer's catalogue

Dk-Lok tube fittings made of stainless steel (imperial tubing)

Tube O.D. (inches)	1/8"	3/16"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	2"
Max. working pressure (psi)	10,900	10,200	10,200	8,000	6,500	6,700	6,000	5,800	4,800	4,700	4,900	4,900	3,600

Dk-Lok tube fittings made of stainless steel (metric tubing)

Tube O.D. (mm)	6	8	10	12	14	15	16	18	20	22	25	28	30	32	38
Max. working pressure (bar)	710	520	400	470	430	400	370	370	380	340	320	330	310	330	310

Dk-Lok tube fittings made of brass

Tube O.D. (mm)	6	8	10	12	14	16	18	22	25
Max. working pressure (bar)	293	195	195	159	210	181	159	126	109

Bite Type tube fittings made of stainless steel

Tube O.D. (inches)	1/8"	3/16"	1/4"	5/16"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1-1/4"	1-1/2"	2"
Max. working pressure (bar)	766	717	717	562	457	436	422	408	330	330	337	345	253

Bite Type tube fittings made of cast steel

Tube O.D. (mm)	6-15	16-22	25-28	30-38	40-50
Max. working pressure (bar)	500	400	350	250	210

Bite Type tube fittings made of brass

Tube O.D. (mm)	4-5	6-22	25-28	30-38	40-50
Max. working pressure (bar)	250	210	170	150	120

The maximum allowable working pressure at high temperature will be in accordance with the manufacturer's de-rating factors.

1.3 Allowable working temperature

When elastomer seal is used in the fitting, care must be taken according to the manufacturer's recommendations.

- NBR (eg Perbunan ®)	-40 °C to 100 °C
- FKM (eg Viton ®)	-20 °C to 200 °C
- PTFE (eg Teflon ®)	-60 °C to 240 °C

1.4 Materials

Stainless steel, cast steel and brass depending on type.

Raw material	Bar stock body	Forged body	Tubing
Stainless Steel 316	ASTM A479, ASTM A276 JIS G4303	ASTM A182 F316, JIS G3214	ASTM A269, ASTM A213 ASTM A249
Cast steel	JIS G4051 S20C-S48C	JIS G4051 S20C-S48C	ASTM A161, ASTM A179 DIN 2391
Brass	ASTM B16, ASTM B453 JIS H3250, C3604	ASTM B124 JIS H3250, C3771	ASTM B68, ASTM B75 ASTM B88, DIN 1786

2. DOCUMENTS AND DRAWINGS :

- Manufacturer's catalogues N° 01~3, November 2001 and N° 02-2, November 2001
- Installation Guidelines

3. TEST REPORTS :

- 3.1 Qualification tests according to classification societies's program were carried out at the manufacturer's workshop.
- Assembly and leak test, bursting test, vacuum test, pull-out test, pressure pulsation test and vibration test
- 3.2 Test reports



- Bite type fittings made of stainless steel 316:

DK-20000418-053, -055	DK-20000413-058	DK-20000327-054
DK-20000414-056	DK-20000419-057	DK-010411-002, -003
DK-010523-001	DK-010601-002, -003, -004	DK-010511-002
DK-010521-004	DK-010604-002	DK-010531-002
DK-010608-001	DK-010511-001	DK-010430-002
DK-010504-002	DKQ-010525-001	DKQ-010518-003

- Dk-Lok fittings made of stainless steel 316: DK-20000418-047, -048, -049, -050, -051, -052.

- Bite type fittings made of cast steel S45C:

DKQ-010608-002	DK-010411-001	DKQ-010518-004
DK-010523-002	DK-010601-001	DK-010511-003
DK-010521-003	DK-010604-001	DK-010525-002
DK-010531-001	DK-010507-002	DK-20000418-041, -042, -043, -044, -045
DK-010504-001	DK-010430-001	

- Bite type fittings made of brass:

DKQ-030708-001	DK-030707-003	DKQ-030703-001, -003
DKQ-030711-002	DKQ-030806-003	DKQ-030813-003
DKQ-030726-002	DKQ-030806-001	DKQ-030813-001
DKQ-030730-001		

- Dk-Lok fittings made of brass:

DKQ-030711-001	DKQ-030806-004	DKQ-030730-002
DKQ-030813-004	DKQ-030726-001	DKQ-030707-002, -004
DKQ-030806-002	DKQ-030813-002	DKQ-030703-002, -004

4. APPLICATION / LIMITATION :

4.1 May be used on board for the services of class I, II, III piping systems:

- Hydraulic oil, fuel oil (not high pressure fuel oil injection), lubricating oil, compressed air, steam and condensate, fresh and sea water, sanitary systems.

4.2 The wall thickness of tubes is to be in accordance with the Bureau Veritas Rules.

4.3 The selection of pipes, fittings and seals must be compatible with the fluid to be conveyed and the maximum working temperature according to the manufacturer's recommendations.

4.4 The Dk-Lok and bite type fittings made of brass are not accepted where pressure pulsation is expected.

4.5 The Dk-Lok and bite type fittings with elastomer seals are not approved within machinery spaces for the use in flammable fluids, sea water and bilge lines. Only approved fire resistant types are accepted.

4.6 Threaded bulkhead unions are not to be used on watertight bulkheads.

4.7 In case of welded tube is used for manufacturing of fittings, the welded tubes are to be type approved by the Society.

4.8 Assembly instructions given by the manufacturer are to be complied with.

4.9 In all cases, the associated pipes are to be suitably adjusted, aligned and anchored.

5. PRODUCTION SURVEY REQUIREMENTS :

5.1 The products are to be manufactured, examined and tested by the manufacturer in accordance with the type described in this certificate and Bureau Veritas Requirements stated in the front of this certificate.

5.2 Production sites are to be recognized by Bureau Veritas as per NR320 for HBV products. To this end the manufacturer has to make the necessary arrangements for a Society's Surveyor to perform visits and product audits at the production sites.

5.3 The manufacturer has declared to Bureau Veritas that the type of product described in this certificate may be manufactured at production sites stated in the front of this certificate.

5.4 Bureau Veritas certificate is not required for the product to be fitted on board units to be classed with Bureau Veritas.

6. MARKING OF PRODUCT :

Each fitting is to be clearly marked to avoid any wrong utilization as per manufacturer's instructions:

- Manufacturer' name or logo
- Pipe size
- Material

7. OTHERS :

7.1 This approval is given on the understanding that the Society reserves the right to require check test to be carried out on the products at any time and that the manufacturer will accept full responsibility for informing shipbuilders, shipowners or their sub-contractors of the proper methods of fitting and general maintenance of the products and of the conditions of this approval.

7.2 This certificate supersedes the Type Approval Certificate N° 14034/A1 BV issued on 18/11/2004 by the Society.

*** END OF CERTIFICATE ***

