

# TYPE APPROVAL CERTIFICATE

Certificate No:  
**TAP00000A3**  
Revision No:  
**1**

## This is to certify:

**That the Pipe Couplings, Bite and Compression Type**

with type designation(s)  
**Hy-Lok Tube Fittings**

Issued to

**Hy-Lok Corporation**  
**Busan, Republic of Korea**

is found to comply with

**DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**  
**DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018**  
**DNV GL class programme DNVGL-CP-0185 – Type approval – Mechanical joints**

## Application :

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

**Temperature range:** See page 2  
**Max. working press.:** 76 to 953 bar - size dependent  
**Sizes:** 1/8" to 1" imperial / 3 to 25 mm metric.

Issued at **Høvik** on **2021-07-16**

for **DNV**

This Certificate is valid until **2025-12-31**.

DNV local station: **Busan**

Approval Engineer: **Renata Rossi**

**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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



## Product description

Bite and compression type tube fittings

Type designation: Hy-Lok Tube Fittings

Design: Double ferrule bite and compression type tube fittings.

Materials:

- Brass ASTM B16 C36000 or B283 C37700
- Stainless Steel ASTM A479 Type 316 or A182 F316

| Allowable working pressure (bar) |                 |       |
|----------------------------------|-----------------|-------|
| Sizes (inch)                     | Stainless Steel | Brass |
| 1/8                              | 886             | 225   |
| 1/4                              | 820             | 194   |
| -                                | -               | -     |
| 3/8                              | 527             | 153   |
| 1/2                              | 503             | 123   |
| 5/8                              | 474             | 119   |
| 3/4                              | 434             | 103   |
| 7/8                              | 366             | 87    |
| 1                                | 352             | 76    |

| Allowable working pressure (bar) |                 |       |
|----------------------------------|-----------------|-------|
| Sizes (mm)                       | Stainless Steel | Brass |
| 3                                | 953             | 253   |
| 6                                | 795             | 198   |
| 8                                | 645             | 185   |
| 10                               | 504             | 144   |
| 12                               | 504             | 118   |
| 15                               | 456             | 118   |
| 20                               | 415             | 93    |
| -                                | -               | -     |
| 25                               | 362             | 93    |

## Application/Limitation

Couplings covered by this certificate are only to be used in piping classes I, II and III in below applications:

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| <p><b>1) Flammable fluids (flash point <math>\leq 60^{\circ}\text{C}</math>)</b></p> <ul style="list-style-type: none"> <li>- Cargo oil lines <sup>5)</sup></li> <li>- Crude oil washing lines <sup>5)</sup></li> <li>- Vent lines <sup>2)</sup></li> </ul> <p><b>2) Inert gas</b></p> <ul style="list-style-type: none"> <li>- Water seal effluent lines</li> <li>- Scrubber effluent lines</li> <li>- Main lines <sup>5)</sup></li> <li>- Distributions lines <sup>5)</sup></li> </ul> <p><b>3) Flammable fluids (flash point <math>&gt; 60^{\circ}\text{C}</math>)</b></p> <ul style="list-style-type: none"> <li>- Cargo oil lines <sup>5)</sup></li> <li>- Fuel oil lines <sup>2)</sup></li> <li>- Lubricating oil lines <sup>2)</sup></li> <li>- Hydraulic oil <sup>2)</sup></li> <li>- Thermal oil <sup>2)</sup></li> </ul> <p><b>4) Sea water <sup>4)</sup></b></p> <ul style="list-style-type: none"> <li>- Bilge lines <sup>1)</sup></li> <li>- Water filled fire extinguishing systems, e.g. sprinkler systems <sup>2)</sup></li> <li>- Non water filled fire extinguishing systems, e.g. foam, drencher systems <sup>2)</sup></li> </ul> | <ul style="list-style-type: none"> <li>- Fire main (not permanently filled) <sup>2)</sup></li> <li>- Ballast system <sup>1)</sup></li> <li>- Cooling water system <sup>1)</sup></li> <li>- Tank cleaning services</li> <li>- Non-essential systems</li> </ul> <p><b>5) Fresh water</b></p> <ul style="list-style-type: none"> <li>- Cooling water system <sup>1)</sup></li> <li>- Condensate return <sup>1)</sup></li> <li>- Non-essential system</li> </ul> <p><b>6) Sanitary/drains/scuppers</b></p> <ul style="list-style-type: none"> <li>- Deck drains (internal) <sup>3)</sup></li> <li>- Sanitary drains</li> </ul> <p><b>7) Sounding/vent</b></p> <ul style="list-style-type: none"> <li>- Water tanks/dry spaces</li> <li>- Oil tanks (f.p. <math>&gt; 60^{\circ}\text{C}</math>) <sup>2)</sup></li> </ul> <p><b>8) Miscellaneous</b></p> <ul style="list-style-type: none"> <li>- Starting/control air <sup>1)</sup></li> <li>- Service air (non-essential)</li> <li>- Brine</li> <li>- CO<sub>2</sub> system <sup>1)</sup></li> <li>- Steam</li> </ul> |
| <p>(1) Inside machinery spaces of category only types without O-ring<br/> (2) Only acceptable when installed on exposed open decks and not used for fuel oil lines<br/> (3) Only above bulkhead deck of passenger ships and freeboard deck of cargo ships.<br/> (4) Only for Brass Types – Not acceptable for stainless steel.<br/> (5) Only in pump rooms and open decks – only types without O-ring</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

Couplings covered by this type approval certificate shall not be installed in piping systems subject to pressure below atmospheric.

Temperature range:

- Brass -  $54^{\circ}\text{C}$  to  $+ 200^{\circ}\text{C}$
- Stainless steel -  $196^{\circ}\text{C}$  to  $+ 649^{\circ}\text{C}$
- Couplings with O-ring seal -  $20^{\circ}\text{C}$  to  $+ 100^{\circ}\text{C}$

Maximum allowable working pressure of stainless steel couplings at elevated temperatures shall be reduced with a reduction factor equal to ratio of allowable stress at elevated temperature to allowable stress at room temperature. (Reference to ASME B31.3 Table A-1)

Used material shall be delivered with material certificate in accordance with DNV GL Ship rules Pt.4 Ch.6 Sec. 2 Table 3.

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

- Test reports received with DNV-Pusan's letters dated 14.Jan. 1995.
- Manufacturer's catalogue Hy-Lok Tube Fittings no. H-200TF, Jan. 2014
- Test report TR-DNV-HYLOKPOT-071211, DNV witnessed 2007-12-11
- Burst pressure test, report No. TR-DNV-HYLOK-BPT-111130-1, DNV witnessed 2011-11-30
- Renewal burst pressure test, report no. TR-DNV-HYLOK-BPT-210708-1, DNV witnessed 2021-07-08

### Tests carried out

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

### Marking of product

For traceability to this type approval the couplings are to be marked with:

- Manufacturer's name or trademark
- Type designation
- Size

### Periodical assessment

For retention of the Type Approval, a DNV 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.