

# TYPE APPROVAL CERTIFICATE

DNV·GL

This is to certify that the undernoted product(s) has/have been tested in accordance with the relevant requirements of the DNV GL Type Approval System.

Certificate No. **13 557 - 14 HH**

Company **Hansun Engineering Co., Ltd.**  
**27, Noksansandan 361-ro**  
**Busan 618-819, REPUBLIC OF KOREA**

Product Description **Tube Fittings**

Type **S-LOK - Metallic Sealing**

Environmental Category **None**

Technical Data /  
Range of Application **Temperature Range for Fitting Material with Metallic Seal:**  
**Steel: -20°C - +120°C; Brass: -60°C - +175°C; Stainless Steel: -60°C - +300°C**  
**Working Pressure: 1.500 psi up to 10.900 psi**  
**Size of Tube O.D.: 3 mm - 38 mm / 1/8" - 1 1/2"**  
**Material of Fittings:**  
**Carbon Steel: JIS G4051, S20C-S48C;**  
**Stainless Steel: ASTM A479, ASTM A276, JIS G4303, ASTM A182 F316/316L,**  
**JIS G3214;**  
**Brass: ASTM B16, Alloy 360, ASTM B453, Alloy 345, JIS H3250, Alloy C3604,**  
**Alloy 377, Alloy C3771.**  
**For the selection of the tube fittings the service pressure specified in the**  
**catalogue is to be observed.**  
**Pressure reduction factors: refer to page 2**

Test Standard **VI-7-8 Test Requirements for Components and Systems of Mechanical**  
**Engineering and Offshore Technology, Edition 2013.**

Documents **GL Approval RefNo.: 13-098877, Audit Report dated 2014-03-20, ISO**  
**9001:2009 Certificate 122404-2012-AQ-KOR-RvA.**

Remarks **refer to page 2**

Valid until **2020-01-19**  
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File No. **II.C.05**  
**Hamburg, 2015-05-26**

Type Approval Symbol



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Olaf Drews

  
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## Pressure Reduction Factors:

| Temperature °C: | Carbon Steel | Stainless Steel | Brass |
|-----------------|--------------|-----------------|-------|
| 20              | 1.00         | 1.00            | 1.00  |
| 50              | 1.00         | 0.95            | 0.90  |
| 100             | 1.00         | 0.85            | 0.80  |
| 120             | 0.94         | 0.77            | 0.75  |
| 175             | ---          | 0.71            | 0.65  |
| 250             | ---          | 0.67            | ---   |
| 300             | ---          | 0.63            | ---   |

**S-LOK TYPE TUBE TO TUBE UNION:** Union(SU), Union Elbow(SL), Reducing Union(SUR), Union Tee(ST), Union Cross(SX), Bulkhead Union(SUB). **TUBE TO MALE PIPE:** Male Connector(SMC-N,SMC-R), Thermocouple Connector(SMCT), Male Connector for Bonded Seal(SMC-G), Male Connector for Metal Gasket(SOM), Bulkhead Male Connector(SMCB), 45° Male Elbow(SLBM), Male Elbow(SLM), Male Run Tee(STRM), Male Branch Tee(STBM). **TUBE TO FEMALE PIPE:** Female Connector(SCF), Gauge Connector(SCG), Bulkhead Female Connector(SCBF), Female Elbow(SLF), Female Run Tee(STRF), Female Branch Tee(STBF). **STUB TUBE CONNECTOR:** Reducer(SR), Bulkhead Adapter(SAB), Male Adapter(SAM), Female Adapter(SAF), Female Adapter(SAG), Port Connector(SCP), Reducing Port Connector(SCRCP). **TUBE TO AN TUBE:** AN Union(SUA), AN Bulkhead Union(SUBA), AN Adapter(SAA). **TUBE TO SAE O-RING SEAL:** SAE Male Connector(SMCS), Positionable SAE Male Elbow(SLS), Positionable 45° SAE Male Elbow(SLBS), Positionable SAE Male Run Tee(STRS), Positionable SAE Male Branch Tee(STBS), O-Seal Straight Thread Connector(SCOS), O-Seal Pipe Thread Connector(SCOP). **TUBE TO WELD END:** Male Pipe Weld Connector(SCW), Male Pipe Weld Elbow(SLW), Tube Socket Weld Connector(SCSW), Tube Socket Weld Elbow(SLSW), Welding Bulkhead Union(SBUW). **PLUG and CAP:** Plug(SP), Cap(SC).

The Tube Fitting is type approved for applications in piping systems as specified in rules I-1-2, Section 11-D, see Table 11.14.

**Limitation:** Application of Fittings of Type SMCB, SCBF, SAB, SUBA is not approved through tank walls and watertight deck- and bulkheads. For this application Welding Bulkhead Union of type SBUW shall be used.

This certificate does not cover tube fittings with soft seals.

**Scope of Tests:** Tightness & Leakage Test, Bursting Pressure Test, Repeated Assembly Test, Pull-Out Test, Vibration & Pressure Pulsation Test, Vacuum Test.

**Marking of Product:** For Traceability to this Type Approval each product is to be marked with Manufacturer's name or trade mark, size and type designation.

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