

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Pipe Couplings, Bite and Compression Type**

with type designation(s)

Twin Ferrule Compression Coupling (Brand Name : Iy-Lok)

Issued to

**Ihsung Tech Co., Ltd.
Gyeonggi-do, Republic of Korea**

is found to comply with

Det Norske Veritas' Standards for Certification 2.9 No. 5-792.20**Det Norske Veritas' Rules for Classification of Ships Pt.4, Ch.6 "Piping Systems"****Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Temperature range:** -20°C to +300°C**Max. working press.:** 200 bar**Sizes:** 1/8" to 1" and 2mm to 25mmThis Certificate is valid until **2018-12-31**.Issued at **Høvik** on **2015-07-29**for **DNV GL**DNV GL local station: **Seoul**Approval Engineer: **Adel Samiei**

On behalf of 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.

Product description

- Twin Ferrule Compression Coupling
- Materials:
 - Barstock: Stainless steel ASTM A479, ASTM A276 Type 316.
 - Forging: Stainless steel ASTM A182 F316.
- Configurations:
Male Connector, Thermocouple Male Connector, Male Gauge Connector, Male Connector (for Metal Gasket), Male Elbow, Male Branch Tee, Male Run Tee, Male Adaptor, 45° Male Elbow, Bulkhead Male Connector, Bulkhead Female Connector, Female Connector, Gauge Connector, Female Elbow, Female Branch Tee, Female Run Tee, Female Adaptor, Union, Reducing Union, Bulkhead Union, Union Elbow, Union Tee, Union Cross, An Union, An Bulkhead Union, An Adaptor, SAE/MS Male Connector, SAE/MS Male Elbow, SAE/MS 45 Male Elbow, SAE/MS Male Branch Tee, SAE/MSA Male Run Tee, O-Seal Straight Thread Connector, O-Seal Pipe Thread Connector, Reducer, Bulkhead Reducer, Male Pipe Weld Connector, Male Pipe Weld Elbow, Tube Socket Weld Connector, Tube Socket Weld Elbow, Port Connector, Reducing Port Connector, Cap, Plug, Tube Insert, Tube Adaptor

Application/Limitation

- Couplings with O-rings are not to be used where fire resistance is required according to DNV rules for Ships Pt. 4 Ch. 6 Sec. 6 Table E3 and IACS UR P2.7.4 Table 7.
- Couplings can be used in the following systems:
 - Flammable fluids (Flash point ≤ 60 °C)
 - Cargo oil lines
 - Crude oil washing lines
 - Vent lines
 - Inert Gas
 - Water seal effluent lines
 - Scrubber effluent lines
 - Main lines
 - Distribution lines
 - Flammable fluids (Flash point > 60 °C)
 - Cargo oil lines
 - Fuel oil lines
 - Lubrication oil lines
 - Hydraulic oil
 - Thermal oil
 - Fresh water
 - Cooling water system
 - Condensate return
 - Non-essential system
 - Sanitary/Drains/Scuppers
 - Deck drains (internal)
 - Sanitary drains
 - Scuppers and discharge (overboard)
 - Sounding/ vent
 - Water tanks/Dry spaces
 - Oil tanks (flash point > 60 °C)
 - Miscellaneous
 - Starting/control air
 - Service air (non-essential)
 - Brine
 - CO2 system
 - Steam

Job Id: **262.1-000388-3**
Certificate No: **TAP0000022**

- The approval is only valid when the couplings are assembled with tubing of correct temper and tolerances as recommended by the manufacturer.
- Each coupling is to be hydraulic pressure tested to at 1.5 times of maximum working pressure.

Type Approval documentation

- Test reports: (according to DNV type approval programme 5-792.20 November 2001):
20091008-01, -02, -03 / 08-2009-00857/ 08-2009-00858 / 08-2009-00837 / 08-2009-00836 / 200100416-01.
- Tightness test report no. 20141020-1 dated 2014-10-20 witnessed by DNV GL Seoul station
- Repeated assembly test report no. 20141020-2 dated 2014-10-20 witnessed by DNV GL Seoul local station
- Burst test report no. 20141020-3 dated 2014-10-20 witnessed by DNV GL Seoul local station
- Pull-out report no. 20141020-4 dated 2014-10-20 witnessed by DNV GL Seoul local station
- Report no. 14-056836-01-1/2/3/4 (Pull-out test) dated 2014-11-24 witnessed by DNV GL Seoul local station done by Korea Testing Laboratory (kti)
- Report no. 14-053646-01-2 (Vibration & pressure pulsation test) dated 2014-11-28 witnessed by DNV GL Seoul local station done by Korea Testing Laboratory (kti)

Tests carried out

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

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

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform a periodical assessment – 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 of samples of couplings selected at random from stock or from the running production.

END OF CERTIFICATE