



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **P-14436**

This is to certify that the  
**Pipe Couplings, Flared or Welded Nipple Type**

with type designation(s)  
**AFOU, AFOMC, AFOL and AFOT**

Manufactured by  
**Hy-Lok Corporation (Kangseo Factory)**  
**Pusan, Republic of Korea**

is found to comply with  
**Det Norske Veritas' Rules for Classification of Ships**  
**Det Norske Veritas' Standards for Certification 2.9 No. 5-792.20**

### Application

**The couplings may be used in: hydraulic, compressed air, steam, condensate, fresh water, sea water (see certificate), fuel and lubricating oil (see certificate) and sanitary systems.**

**Temperature range:** Dep. on material, see certificate  
**Max. working press.:** 280 and 400 bar size dependant  
**Sizes:** Tube O.D: 12 - 30 mm

This Certificate is valid until **2016-12-31**.

Issued at **Høvik** on **2013-05-23**

DNV local station: **Pusan**

Approval Engineer: **Mohsen Mohebbi**

for **Det Norske Veritas AS**

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**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.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

## Product description

Designations:

AFOU:	Straight Union
AFOMC:	Straight connector
AFOL:	Union 90°C elbow
AFOT:	Union Tee

The design incorporates a rubber O-ring

Materials in body:

Stainless steel ASTM A182 F316 (forged)  
Stainless steel ASTM 479 T316

## Application/Limitation

Pressure rating:

Size range, mm:	Max. working pressure, bar:
12	400
16	400
18	400
20	400
25	280
30	280

Temperature range:      -20 °C to + 120 °C for design with O-ring  
                                  -196 °C to + 360 °C for design without O-ring

Couplings with O-rings may not be used in systems with hydrocarbons.

Couplings used for low temperature lines may only be used for accessory lines and instrumentation lines with external diameters of 25 mm and less. Reference is made to the Ship Rules Pt. 5, Ch. 5, Sec. 6, 509 point 3.

For other purposes than listed approval has to be obtained in each case.

The wall thickness and the material of the tubes to be in accordance with the current Rules of Det Norske Veritas.

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

## Type Approval documentation

The approval is based on the following documentation:

- Booklet with test report and information as received with DNV, Pusan's letter 96TN9609GBW.001/ejs dated 1996.06.26
- Test report No. PTR-03J-14D, DNV witnessed 2003-10-15
- Test reports TR-DNV-FLARELT-080717, TR-DNV-FLARERAT-080717, TR-DNV-DINBT-080717, TR-DNV-DINPOT-080717, dated 2008-07-17

## Tests carried out

Leakage, Repeated Assembly, Burst, Vibration, Pressure pulsation, Pull-Out

## Marking of product

For traceability to this type approval the couplings are marked:



## **Certificate Retention Survey**

Det Norske Veritas' Surveyor shall be given admission to the manufacturers premises on an audit before the expiry date of this certificate in order to survey the implementation of the quality control procedures for the production and to witness the following type testing of samples of couplings, - selected at random from stock or from the running production:

- Leakage test
- Repeated Assembly test
- Burst test

No product certificate is required.

**END OF CERTIFICATE**