DNV·GL

Certificate No:
**TAP00000KM**

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Pipe Couplings**

with type designation(s)
**37° flared flanged connections**

Issued to
**GS-HYDRO OY**
**Hämeenlinna, Finland**

is found to comply with
**Det Norske Veritas' Rules for Classification of Ships Pt.4, Ch.6 "Piping Systems"**
**Offshore Standard DNV-OS-D101, Marine and Machinery Systems and Equipment**

## Application :

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

| | |
|---|---|
| **Temperature range:** | **-40°C to +200°C (see certificate)** |
| **Max. working press.:** | **50 bar to 420 bar (see certificate)** |
| **Sizes:** | **1/2" to 12" (see certificate)** |

Issued at **Høvik** on **2017-03-16**
This Certificate is valid until **2018-06-30**.
DNV GL local station: **Helsinki**

for **DNV GL**

Approval Engineer: **Maheshraja Venkatesan**

**Marianne Spæren Marveng**
**Head of Section**

## Product description

37° Flared Flange Connection – compression coupling flared type.

Material of construction for flanges:

- Carbon steel: S355, P355
- Stainless steel: 1.4401, 1.4404, 1.4462 (UNS S32205) from EN 10028-7

Material of construction for flared tube:

- S235, ASTM A106
- Stainless steel: AISI 316, 1.4462 (UNS S32205) from EN 10028-7

Other steels with equivalent or superior properties may also be used.

O-ring material: NBR & FKM90

## Application/Limitation

Maximum working pressure:

| Type | Size ["] | Max. Working Pressure [bar] |
|---|---|---|
| 308F | ½ | 350 |
| 316F | 1 | 350 |
| 324F | 1 ½ | 280 |
| 340F | 2 ½ | 210 |
| 312F | ¾ | 350 |
| 320F | 1 ¼ | 280 |
| 332F | 2 | 280 |
| 348F | 3 | 210 |
| 424F | 1 ½ | 350 |
| 432F | 2 | 350 |
| 440F | 2 ½ | 350 |
| 448F | 3 | 350 |
| 456F | 4 | 350 |
| 608F | ½ | 420 |
| 612F | ¾ | 420 |
| 620F | 1 | 420 |
| 624F | 1 ¼ | 420 |
| 632F | 2 | 420 |
| 124F | 1 ½ | 50 |
| 132F | 2 | 50 |
| 140F | 2 ½ | 50 |
| 148F | 3 | 50 |
| 156F | 3 ½ | 50 |
| 164F | 4 | 50 |
| 180F | 5 | 50 |
| 196F | 6 | 50 |
| 228F | 8 | 50 |
| 260F | 10 | 50 |
| 292F | 12 | 50 |
| 164-64F | 4 | 64 |
| 180-64F | 5 | 64 |
| 196-64F | 6 | 64 |
| 228-64F | 8 | 64 |
| 260-64F | 10 | 64 |

| Type | Size ["] | Max. Working Pressure [bar] |
|---|---|---|
| 292-64F | 12 | 64 |
| GS280K15F/25 | ½ | 280 |
| GS280K20F/30 | ¾ | 280 |
| GS280K25F/38 | 1 | 280 |
| GS280K32F/42 | 1 ¼ | 280 |
| GS280K40F/50 | 1 ½ | 280 |
| GS280K50F/60 | 2 | 280 |
| GS280K65F/73 | 2 ½ | 280 |
| GS280K80F/90 | 3 | 280 |
| GS210SH15F/25 | ½ | 210 |
| GS210SH20F/30 | ¾ | 210 |
| GS210SH25F/38 | 1 | 210 |
| GS210SH32F/42 | 1 ¼ | 210 |
| GS210SH40F/50 | 1 ½ | 210 |
| GS210SH50F/60 | 2 | 210 |
| GS210SH65F/73 | 2 ½ | 210 |
| GS210SH80F/90 | 3 | 210 |
| GS210SS15F/25 | ½ | 210 |
| GS210SS20F/30 | ¾ | 210 |
| GS210SS25F/38 | 1 | 210 |
| GS210SS32F/42 | 1 ¼ | 210 |
| GS210SS40F/50 | 1 ½ | 210 |
| GS210SS50F/60 | 2 | 210 |
| GS210SS65F/73 | 2 ½ | 210 |
| GS210SS80F/90 | 3 | 210 |
| GS350K15F/25 | ½ | 350 |
| GS350K20F/30 | ¾ | 350 |
| GS350K25F/38 | 1 | 350 |
| GS350K32F/42 | 1 ¼ | 350 |
| GS350K40F/50 | 1 ½ | 350 |
| GS350K50F/60 | 2 | 350 |
| GS350K65F/73 | 2 ½ | 350 |
| GS350K80F/90 | 3 | 350 |

The temperature range is dependant on the sealing material as follows:

NBR : -25 to +100 °C
Viton : -40 to +200 °C

The couplings may be used according to latest requirements of governing rules in following applications:

a. Flammable fluids (flash point ≤ 60°C)
   - Cargo oil lines
   - Crude oil washing lines
   - Vent lines
b. Inert gas
   - Water seal effluent lines
   - Scrubber effluent lines
   - Main lines(1)
   - Distributions lines
c. Flammable fluids (flash point > 60°C)
   - Cargo oil lines
   - Fuel oil lines(1)
   - Lubricating oil lines(1)
   - Hydraulic oil(1)
   - Thermal oil(1)
d. Sanitary/drains/scuppers
   - Deck drains (internal)(2)
   - Sanitary drains
   - Scuppers and discharge (overboard)
e. Fresh water
   - Cooling water system
   - Condensate return
   - Non-essential system
f. Sounding/vent
   - Water tanks/Dry spaces
   - Oil tanks (f.p.> 60°C)(1)
g. Miscellaneous
   - Starting/Control air
   - Service air (non-essential)
   - Brine
   - $CO_2$ system
   - Steam

1) Not inside machinery spaces of category A or accommodation spaces. May be accepted in other machinery spaces provided the joints are located in easily visible and accessible positions.
2) Only above bulkhead deck of passenger ships and freeboard deck of cargo ships.

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.The installation of mechanical joints is to be in accordance with the manufacturer's assembly instructions.

For low temperature applications, impact testing requirements as given in relevant chapters of DNV GL Pt. 2 Ch. 2 shall be followed for the corresponding piping components (E.g., Flanges, bolts & nuts)

Austenitic stainless steel couplings (304/316/ 304L/ 316L) are not permitted in seawater systems.

## Type Approval documentation

### Tests carried out

Following tests are performed according to DNV TAP 5-792.20:
Burst test, fire, Pull out, impulse and vibration.

### Marking of product

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

- Manufacturer's name or trade mark (GS-PIPING)
- Type designation and dimension

### 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.