

# TYPE APPROVAL CERTIFICATE

**This is to certify:****That the Couplings for LNG/LPG**

with type designation(s)

**Cryogenic Break-away Couplings (CBC), -196°C to +80°C**

Issued to

**Mann Teknik AB  
MARIESTAD, Sweden**

is found to comply with

**DNV GL rules for classification – Ships Pt.5 Ch.7 Liquefied gas tankers****Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**

|                            |                                 |                           |
|----------------------------|---------------------------------|---------------------------|
| <b>Max. working temp.:</b> | <b>Max. working press.:</b>     | <b>Sizes:</b>             |
| <b>-196°C to +80°C</b>     | <b>10 bar / 16 bar / 25 bar</b> | <b>DN 25/50/65/80/100</b> |
| <b>-196°C to +80°C</b>     | <b>10 bar / 16 bar</b>          | <b>150</b>                |

This Certificate is valid until **2022-01-12**.Issued at **Høvik** on **2017-01-13**for **DNV GL**DNV GL local station: **Gothenburg**Approval Engineer: **Adel Samiei**

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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.

Job Id:  
Certificate No: **TAP00000RW**

## Product description

Cryogenic Break-Away Coupling  
Flange Connection: Flange EN 1092 (PN10/PN16/PN25/PN40) , ANSI B16.5 (Class 150)  
Material of housing and check valve: 1.4404 EN 10272 – 1.4401+AT  
Material of spring 1.4401 EN 10270

## Application/Limitation

Components covered by this certificate may be used for transfer of LNG/LPG into tanks within limits of maximum working pressure and temperature range mentioned on the front page.

Components covered by this certificate (except size DN150) may be installed where fire safe applications are required.

The couplings shall always be installed according to the manufacturer's instructions.

The couplings shall always be assembled with tubing of correct temper and tolerances as recommended by the manufacturer.

The couplings shall not be installed in systems where vibration may occur.

Each coupling is before delivery to be hydraulic pressure tested to 1.5 times the maximum working pressure. In addition, seat leakage test at a pressure equal to 1.1 times the maximum working pressure on each component shall be performed before each delivery.

Furthermore cryogenic testing consisting of functionality and leakage verification for a minimum of 10% of each type and size of couplings intended to be used at a working temperature below -55°C have to be carried out.

Products covered by this certificate shall be delivered with a product certificate when the minimum design temperature is less than -55°C or for DN150.

## Type Approval documentation

### Tests carried out

Tightness test, Functionality test, Burst test, Fire test

## Marking of product

For traceability to this type approval each product is at least to be marked with:

- Manufacturer's name
- Maximum working pressure
- Size

## Periodical assessment

For retention of the Type Approval, a DNV GL surveyor shall perform periodical assessment every second year and before the expiry date of this certificate. The scope of the periodical assessment survey is to verify that the conditions stipulated for the type approval is complied with and that no alterations are made to the product design or choice of materials.