Certificate No:
**TAP00002E6**

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Pipe Coupling With O-Ring Seal**

with type designation(s)
**Pusnes Blind Flange BLC20**

Issued to
**MacGregor Norway AS**
**Arendal**, **Norway**

is found to comply with
**DNV rules for classification – Ships Pt.6 Ch.4 Sec.1 Offshore loading arrangements – Bow loading and STL**

## Application :

**The blind flange serves as a protection for Pusnes Bow Loading Coupler when the coupler is disconnected. It also serves as a blind flange designed for withstanding a hydrostatic test pressure of 15bar.**

| | |
|---|---|
| **Temperature range:** | **-20°C to 50°C** |
| **Max. working press.:** | **10 bar** |
| **Sizes:** | **20"** |

Issued at **Høvik** on **2021-08-24**
This Certificate is valid until **2026-08-23**.
DNV local station: **Norway CMC, West**

Approval Engineer: **Chenyu Sun**

for **DNV**

**Inger-Helene Hals**
**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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

## Product description

Blind flange for pressure testing and protection of Bow Loading Coupler. The blind flange may be equipped with handles.

## Application/Limitation

| | |
|---|---|
| Design code: | ASME VIII div.2 |
| Design pressure: 10 bar | |
| Design temperature: | -20°C to +50°C |
| Test pressure: | 15 bar |
| Material in flange: | Titanium grade 5 to ASTM B381 F5 with minimum specified yield strength of 800 MPa and ultimate tensile strength of minimum 900 MPa. |
| Material in bolts: | Austenitic stainless steel A4 gr.80 |
| Bolt configuration: | 12 off head bolts M12 |
| Bolt pre-load requirement: | 24.6 kN |
| O-ring quality: | Nitrile 70 shore A |
| Material certification: | Flange material to carry EN 10204 3.1 certificate<br>Bolt material to carry EN 10204 2.2 certificate |

The Pusnes BLC20" will be produced by the following sub-contractors to Macgregor Norway AS:

| **Name of company** | **Address** |
|---|---|
| Towimor SA | Torun, Poland |
| Regional Marine & Engineering | Singapore |
| OnSteel Oy | Karstula, Finland |
| Panterra AS | Arendal, Norway |
| Macgregor Pusnes Korea Ltd. | Busan, S.Korea |

## Type Approval documentation

## Marking of product

The marking shall consist of manufacturer's name, type designation (BLC20), nominal size (20"), pressure class (PN10), material designation (B381 F5) and heat number.

## Periodical assessment

For retention of this Type Approval, a DNV surveyor shall perform a periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days). The objective of the periodical assessment is to verify that the conditions for the Type Approval have not been altered. (Ref DNVGL-CP-0338 Type approval scheme).