Certificate No:
**TAP000027A**

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Pressure Vessel**

with type designation(s)
**OSO Hotwater Marine Vessels (Ø500 - Ø1800)**

Issued to
## OSO Hotwater AS
**Hokksund**, **Norway**

is found to comply with
**DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment**
**DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018**

## Application :

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

| | |
|---|---|
| **Max. working temp.:** | **-20°C to 90°C** |
| **Design pressure:** | **8 bar** |
| **Operating Medium** | **Fresh water** |

Issued at **Høvik** on **2021-07-05**

This Certificate is valid until **2026-07-04**.

for **DNV**

DNV local station: **Oslo Maritime and CAP**

Approval Engineer: **Andreas Hansen**

**Zeinab Sharifi**
**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

Class III pressure vessels designed according to DNVGL-RU-SHIP Pt.4 Ch.7 and EN 13445-3, delivered in horizontal or vertical configuration.

| **Outer diameter [mm]** | 500 | 650 | 800 | 1100 | 1300 | 1500 | 1800 |
|---|---|---|---|---|---|---|---|
| **Volume [litre]** | 400 | 800 | 1000 | 2500 | 3500 | 5000 | 15000 |

Materials:

| **Component** | **Material no.** | **Standard** |
|---|---|---|
| Shell | 1.4404 / 1.4462 | EN 10028-7 |
| Dished end | 1.4404 / 1.4462 | EN 10028-7 |
| Flanges | 1.4404 / 1.4462 | EN 10028-7 |
| Nozzles | 1.4404 / 1.4462 | EN 10028-7 / EN 10217-7 |
| Bolting | 1.4307 / 1.4404 | EN 10269 |

Manufacturing location:

OSO Manufacturing AB
Forsbrogatan 10
662 34 Åmål, Sweden

## Application/Limitation

| Model | OSO Hotwater Marine Vessel |
|---|---|
| Medium | Fresh water |
| Design pressure (bar) | 8 |
| Test pressure (bar) | 12 |
| Design temperature (°C) | -20/90 |
| DNV GL Pressure vessel class | III |
| Joint efficiency | 0.7 |
| Corrosion allowance (mm) | 0 |

Vertical acceleration: 14.715 m/s$^2$
Horizontal acceleration: 6.94 m/s$^2$

## Type Approval documentation

## Production Testing and Certification

Production Testing and Certification for the actual intended application shall follow the latest applicable edition of the Rules (as mentioned on the front page of this certificate).

## Marking of product

Each pressure vessel shall be permanently and legibly marked on the pressure part or on a nameplate permanently attached to a principal pressure part to show its identity and origin.

The marking of the pressure vessel shall show at least the following particulars:

- manufacturer's name and address;
- type designation and serial number;
- year of manufacture;
- maximum allowable working pressure;
- hydrostatic test pressure;
- design temperature range.

## Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.