

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Hydraulic Cylinders

with type designation(s)

**Hydraulic cylinder for watertight doors, type 370360, Hydraulic cylinder for watertight doors, type 370102,
Hydraulic cylinder for watertight doors, type 370126, Hydraulic cylinder for watertight doors, type 370165**

Issued to

IMS Technologies AS
Akland, Norway

is found to comply with

DNV standard DNV-ST-0194 – Hydraulic cylinders

DNV rules for classification – Ships Pt.4 Ch.6 Piping systems

DNV-OS-D101 – Marine and machinery systems and equipment, Edition July 2021

Application :

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

Type	Design pressure (push)	Design pressure (pull)	Cylinder sizes
Hydraulic cylinder for watertight doors, type 370360	75 bar	200 bar	35/25 mm
Hydraulic cylinder for watertight doors, type 370102	120 bar	200 bar	45/35 mm
Hydraulic cylinder for watertight doors, type 370126	120 bar	200 bar	50/40 mm
Hydraulic cylinder for watertight doors, type 370165	120 bar	200 bar	50/35 mm

Issued at **Høvik** on **2022-05-06**

This Certificate is valid until **2027-05-05**.

for **DNV**

DNV local station: **Kristiansand S**

Approval Engineer: **Renata Rossi**

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

4 types of hydraulic cylinders for watertight doors. The cylinders may have custom lengths. The cylinder tube shall be supported at both ends.

Dimensional data:

Type	Outside diameter	Inside diameter	Piston rod diameter	Maximum stroke
370360	45 mm	35 mm	25 mm	1262 mm* / 2062 mm
370102	55 mm	45 mm	35 mm	1260 mm* / 2060 mm
370126	60 mm	50 mm	40 mm	1260 mm* / 2060 mm
370165	60 mm	50 mm	35 mm	1500 mm

*For stroke lengths shorter than this, the cylinder tube may be supported only at the end cap.

Materials:

Cylinder tube	Piston rod	Piston	End cap	Packing box
Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel

Application/Limitation

Hydraulic cylinders covered by this certificate are approved to be used in hydraulic systems for watertight doors for a maximum working pressure of 200 bar and a temperature range of -30°C to +60°C.

Materials for the pressure containing parts (cylinder tube, piston rods and end covers) shall be Charpy impact tested at the minimum design temperature with an average test result of 27J from 3 test samples. No single values below 24J.

Manufacturing, workmanship and testing of each cylinder shall be done according to DNV-ST-0194. Each hydraulic cylinder is to be hydraulically pressure tested to 1.5 times design pressure before paint or any coating is applied on the cylinders.

Each cylinder is to be certified by DNV Surveyor as outlined in DNV-ST-0194. A product certificate shall be issued by the DNV Surveyor for each cylinder.

Materials for cylinder tube, piston rod, end cap and packing box are certified as specified in the type drawing. (3.1 material certificates according to EN 10204 or equivalent).

Type Approval documentation

Marking of product

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

- Manufacturer's name or trade mark
- Type designation

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 DNV-CP-0338.