



Certificate no.:
TAP000033N

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Hydraulic Cylinders

with type designation(s)

issued to

VREMAC Cylinders B.V.
Apeldoorn, Gelderland, Netherlands

is found to comply with

Application:

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

Issued at **Høvik** on **2025-12-12**

This Certificate is valid until **2030-12-11**.

for **DNV**

DNV local unit: **Netherlands CMC**

Approval Engineer: **Jo Skjeggstad Rangnes**

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 USD 300 000.

Product description

Two types of double acting hydraulic cylinders designed according to DNV-ST-0194.

Dimensional data:

Type	Cylinder tube outside diameter	Cylinder tube inside diameter	Piston rod diameter	Stroke
VDW250	323.9 mm	250 mm	200 mm	3715 mm
VDW300	368 mm	300 mm	250 mm	4185 mm

Materials:

Type	Cylinder tube	Piston rod	Piston	End eye	End cover	Stuffing box
VDW250	S355J2H (EN10210-1)	19MnVS6 (EN 10267)	S355J2* (EN10025-2)	S355J2* (EN10025-2)	S355J2** (EN10025-2)	S355J2* (EN10025-2)
VDW300	S355J2H (EN10210-1)	19MnVS6 (EN 10267)	S355J2* (EN10025-2)	S355J2* (EN10025-2)	S355J2** (EN10025-2)	S355J2* (EN10025-2)

* The material shall be fine grain treated according to DNV-ST-0194 Table B-1.

** If the end cover is made from rolled plate it is to be tensile tested in the Z-direction.

Application/Limitation

Design temperature (min/max), test pressures, and the limiting number of full load cycles over the life span of the hydraulic cylinders:

Type	Design temperature (min/max)	Test pressure		Number of load cycles
		Push	Pull	
VDW250	-20°/80°C	480 bar	480 bar	40 000
VDW300	-20°/80°C	480 bar	480 bar	35 000

All welding is to be carried out by qualified welders and according to approved welding procedures. Non-destructive testing of all welds is to be performed according to DNV-ST-0194 [2.3].

Cylinder tube, piston rod, end covers, and end connections shall be Charpy-V impact tested at minimum design temperature. Minimum specified average energy value shall be according to DNV-ST-0194 [2.1.2].

Type Approval documentation

Production test and Certification

Each cylinder is to be hydraulically pressure tested according to DNV-ST-0194 [4.7.2] and be delivered with a DNV product certificate. Production testing shall be witnessed by DNV surveyor.

Materials for cylinder tube, piston rod, end covers, and end eyes shall be delivered with 3.1 material certificates (according to EN 10204 or equivalent).

Marking of product

Hydraulic cylinders shall be permanently marked in order to enable unique traceability to a product certificate or a type approval certificate. The marking shall at least consist of the following:

- manufacturers name or trademark
- design pressure
- type designation
- DNV product certificate number, if applicable
- charge number for the materials used in the cylinder tube and the piston rod.

Periodical assessment

This certificate is only valid if required periodical assessments are carried out with satisfactory results.

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.

To check the validity of this certificate, please look it up in <https://approvalfinder.dnv.com>.

Manufactured by: