



Certificate no.:
TAP000032R

TYPE APPROVAL CERTIFICATE

This is to certify:

that the **Hydraulic Cylinders**

with type designation(s)
VY120041251, VY120041249

issued to

VREMAC Cylinders B.V.
Apeldoorn, Gelderland, Netherlands

is found to comply with

DNV standard DNV-ST-0194 – Hydraulic cylinders

Application:

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

Type	Design pressure (push)	Design pressure (pull)
VY120041251	See second page	See second page
VY120041249	320 bar	320 bar

Issued at **Høvik** on **2025-12-03**

This Certificate is valid until **2030-12-02**.

for **DNV**

DNV local unit: **Netherlands CMC**

Approval Engineer: **Jane Lozanov**

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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	Outside diameter	Inside diameter	Piston rod diameter		Stroke	Design pressure
			Outside	Inside		Push / Pull
VY120041251	368 mm	300 mm	250 mm	0 mm	7500* mm	320* bar
VY120041249	323 mm	250 mm	180 mm	0 mm	1878 mm	320 bar

* Buckling design pressure according to drawing VY120041251 (208 bar at 7500 mm stroke).

Materials:

Type	Cylinder tube	Piston rod, End eye, Piston and Trunnion	End cover	Stuffing box
VY120041251	S355J2H+N (EN10210-1)	S355J2+N (EN10025-2)	S355J2G3+N (EN10025-2)	S355J2G3+N (EN10250-2)
VY120041249			S355J2+N (EN10025-2)	S355J2+N (EN10250-2)

All above materials shall fulfil requirements stated in DNV-ST-0194 section 2 [2.1] and Appendix B.

Application/Limitation

Design temperature (min/max): -20°/80°C

Test pressure

Type	Test pressure	
	Push	Pull
VY120041251	480 bar	480 bar
VY120041249	480 bar	480 bar

The following cylinders are limited to the following number of full load cycles over the life span:

Type	Number of cycles
VY120041251	40 000
VY120041249	40 000

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].

Type Approval documentation

Production test and Certification

Each cylinder is to be hydraulically pressure tested to 1.5 times of the design pressure and be delivered with a DNV product certificate. The test pressure is to be applied on both sides of the piston in sequence. Testing are to be in accordance with to DNV Standard ST-0194 - Hydraulic Cylinders in presence of DNV surveyor.

Materials for cylinder tube, piston rod, end covers, and end eyes shall be delivered with 3.1 material certificates.

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:

- manufacturer's name or trade mark
- 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.



Job ID: **262.1-043718-1**
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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>.