DNV·GL

Certificate No:
TAP000004N

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Hydraulic Cylinders

with type designation(s)
Hydraulic cylinders for watertight door 40/28-1500 & 63/45-1440

Issued to
Winel B.V.
Assen, Netherlands

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV GL class guideline DNVGL-CG-0194 – Hydraulic cylinders
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 GL.

Design pressure (push)	**see page 2**
Design pressure (pull)	**see page 2**
Cylinder sizes	**40/28-1500, 63/45-1440**

This Certificate is valid until **2023-02-18**.

Issued at **Høvik** on **2018-02-19**
DNV GL local station: **Rotterdam** for **DNV GL**

Approval Engineer: **Adel Samiei**

Marianne Spæren Marveng
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.

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Job Id: **262.1-027211-1**
Certificate No: **TAP000004N**

Product description

Hydraulic cylinders with spherical bearings in cylinder end and threaded connection on the rod side

Hydraulic Cylinder	Tube		Rod		Stroke
	Outer diameter	Inside diameter	Outside diameter	Inside diameter	
40/28-1500	50 mm	40 mm	28 mm	0 mm	1500 mm
63/45-1440	75 mm	63 mm	45 mm	30 mm	1440 mm

Part	Tube	Rod			End Cap/End Eye/Piston
Material	E355 + SR EN 10305-1	20MnV6 / EN 1.5217	AISI431 / EN 1.4057	AISI329 / EN 1.4460	S355J2 EN10025-2

Manufacturer: A4 Hydrauliek B.V.

Application/Limitation

Hydraulic cylinders covered by this certificate are intended for operating watertight doors manufactured by Winel b.v in below working conditions:

- 40/28-1500 cylinders: pull pressure in first 20 mm stroke equal to 150 bar then drops to 10 bar
- 63/45-1440 cylinders: push pressure in last 20 mm stroke equal to 150 bar then drops to 10 bar
- Design temperature range is -20°C to +50°C

Mounting of cylinders is according to Type approval TAS000057 for watertight sliding doors.

All welding is to be carried out by qualified welders and according to approved welding procedures. Non-destructive testing of all welds are to be performed according to DNVGL-CG-0194 - Hydraulic Cylinders. Minimum requirement to NDT is UT and MT.

Cylinder tube, piston rod and end covers shall be Charpy tested. Transverse Charpy V-notch requirement (average) shall be 27J at minimum design temperature.

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).

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 GL 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 DNVGL class guideline CG-0194 - Hydraulic Cylinders in presence of DNV GL surveyor.

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 GL 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.