DNV·GL

Certificate No:
TAP000025E

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Hydraulic Cylinders

with type designation(s)
63/40 x S, 80/50 x S

Issued to
JiangSu Hengli Hydraulic Co, Ltd.
Changzhou, Jiangsu, China

is found to comply with
DNV GL standard DNVGL-ST-0194 – Hydraulic cylinders

Application :

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

Type	Design pressure (push)	Design pressure (pull)	Cylinder sizes
63/40 x S	**see page 2**	**see page 2**	**see page 2**
80/50 x S	**see page 2**	**see page 2**	**see page 2**

Issued at **Hamburg** on **2021-02-26**
This Certificate is valid until **2026-02-25**.
DNV GL local station: **Nanjing NB & CMC**

Approval Engineer: **Christof Kotzmann-Bendrien**

for **DNV GL**

Olaf Drews
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 GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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.

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Product description

Two Hydraulic cylinders with internal mechanical locking at full stroke:

Material:	
Cylinder tube:	Q345D
Piston rod:	1.4418
Piston	Q345D
Threaded bushing:	Q345D

Material is according to detail specifications on the drawings.

60/40*S:	
Tube diameter (outside/inside):	83mm / 63 mm
Rod diameter (outside/inside):	40 mm / 0
Stroke:	S (0 ≤ S ≤ 3000) mm
Minimum cylinder length (end eyes center to center):	293 mm + S (≤ 3000) mm

80/50*S:	
Tube diameter (outside/inside):	98 mm / 80 mm
Rod diameter (outside/inside):	50 mm / 0
Stroke:	S (0 ≤ S ≤ 3600) mm
Minimum cylinder length (end eyes center to center):	340 mm + S (≤ 3600) mm

Application/Limitation

- Design Data:
  - Maximum working Pressure (Push & Pull): 250 bar at cylinders min. stroke
    Max. allowable pressure in any case as in acc. to cylinder design based on the detailed specification on the drawing depending on the chosen stroke.
  - Design Pressure (Push & Pull) : 280 bar at max. working pressure
  - Test Pressure: 420 bar at max. working/design pressure (Tests carried out are to be in accordance with DNVGL-ST-0194 - Hydraulic Cylinders)
  - Design Temperature (min/max): -20°C/90°C
  - Corrosion allowance: 0.3 mm

- Materials for the cylinder tube, piston rods and end connections are to be delivered with material works certificate. All of these materials have to be supplied from an approved manufacturer of DNV GL for the type and grade of steel being supplied and for the relevant steelmaking and processing route.

- Each cylinder is to be certified by DNVGL Surveyor as outlined in the Type Approval Program.

- A product certificate endorsed or issued by the DNVGL Surveyor is to accompany each cylinder/delivery.

- This type approval does not cover Subsea applications. If the cylinders are going to be used for this application, they are subject to case-by-case approval.

- The cylinders are not to be used for ship steering applications.

- Manufacturing, workmanship and testing of each cylinder shall be done according to DNVGL type approval program.

Type Approval documentation

Tests carried out

Hydraulic Test, Endurance test, Static strength test

Marking of product

Hydraulic cylinders shall be permanently marked in order to enable unique traceability to this type approval the products with:

- Manufacturer's name or trademark
- Type designation/Serial no.

Periodical assessment

For retention of the Type Approval, a DNV GL surveyor shall perform a survey after 2 and 3,5 years and also before the expiry date of this certificate to verify that the conditions of the type approval are complied with.

The objective of the Periodical Assessment is to verify that the conditions for the Type Approval are not altered since the Type Approval Certificate was issued.
The main scope of the Periodical Assessment will normally include:

- Verification of the Type Approval applicant’s production and quality system w.r.t. ensuring continued consistent production of the Type Approved products at the Type Approval applicant’s own premises and at other companies that are given the responsibility for manufacturing of the products.
- Review of the Type Approval documentation and that this is still used as basis for the production
- Review of possible changes to the design, the material and the performance of the product
- Verification of the product marking.

End of Certificate