

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Hydraulic Locking Cylinders

with type designation(s)
ø80/ø45 x S, ø60/ø32 x S

Issued to

JiangSu Hengli Hydraulic Co, Ltd.
Changzhou Jiangsu, China

is found to comply with
DNV GL class guideline DNVGL-CG-0194 – Hydraulic cylinders

Application :

Hydraulic cylinders approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Type	Design pressure (push)	Design pressure (pull)	Cylinder sizes
ø80/ø45 x S	250bar	250bar	see certificate
ø60/ø32 x S	250bar	250bar	see certificate

Issued at **Hamburg** on **2017-07-01**

This Certificate is valid until **2022-06-30**.

for **DNV GL**

DNV GL local station: **Nanjing**

Approval Engineer: **Frank Poetsch**

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Burkhard Lilienthal
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.



Product description

Double-acting hydraulic cylinders with an internal locking device at zero stroke.

General conditions:

Design temperature: -20°C to +80°C

Design pressure, push: 250bar

Design pressure, pull: 250bar

Dimensions:

Type	Cylinder OD (mm)	Cylinder ID (mm)	Rod OD (mm)	Maximum Stroke (mm)	Pressure (bar)
80/45xS	100	80	45	500	250
60/32xS	80	60	32	350	250

Material:

Bottom: Q345D(GB/T 1591-2008)

Cylinder tube: Q345D(GB/T 8162-2008)

Guide bush: Q345D(GB/T 1591-2008)

Rod: 1.4418(EN 10088-3)

Application/Limitation

The hydraulic cylinders are not approved to be used in subsea application.

The cylinder is to be hydraulically pressure tested to minimum 375 bar.

The material for the cylinder tube, piston rod and end eyes are to be delivered with 3.1 material certificates.

Each cylinder being marketed/sold as "Type Approved by DNV GL" is to be certified by DNVGL - Surveyor as outlined in Class Programme "DNVGL-CP-0484 DNV GL approval of service supplier scheme" and Class Guideline "DNVGL-CG-0194 Hydraulic Cylinders".

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

Type Approval documentation

Tests carried out

Endurance test, Static strength test.

Marking of product

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

- Manufacturers name or trade mark
- Type designation
- DNV GL product certificate number, if applicable

Periodical assessment

For retention of the Type Approval, a DNV GL surveyor shall perform an assessment after 2 years and after 3.5 years to verify that the conditions of the type approval are complied with. A renewal assessment will be performed at renewal of the certificate.



Job Id: **262.1-014773-3**
Certificate No: **TAP00001B8**

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

In cases where the Type Approved product is manufactured at other companies, the Periodical Assessment shall verify that the Type Approval applicant has a quality control system for consistent production at their licensees/subcontractors. Furthermore Periodical Assessment shall be carried out randomly at these companies.

When a Type Approved product is manufactured at other companies, the Type Approval applicant takes the sole responsibility for the conformity of the product to the applicable requirements.

END OF CERTIFICATE