DNV·GL

Certificate No:
TAP0000066

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Hydraulic Locking Cylinders

with type designation(s)
60/32*S, 80/45*S

Issued to
JiangSu Hengli Highpressure Oil Cylinder Co, Ltd.
Changzhou Jiangsu, China

is found to comply with
DNV Standard for Certification 2.9, 5-778.93 Approval of hydraulic cylinders
Det Norske Veritas' Rules for Classification of Ships Pt.4, Ch.6 "Piping Systems"

Application :

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

Type	Max work press. push	Max work press. pull	Cylinder sizes
60/32*S	250 bar	250 bar	See Certificate
80/45*S	250 bar	250 bar	See certificate

This Certificate is valid until **2020-11-19**.

Issued at **Høvik** on **2015-11-20**

for **DNV GL**

DNV GL local station: **Nanjing**

Approval Engineer: **Mehdi Rowshan**

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: **262.1-017642-1**
Certificate No: **TAP0000066**

Product description

Two Hydraulic cylinders with internal mechanical locking at full stroke:

Material:	
Cylinder tube:	Q345D
Piston rod:	1.4418
Piston	42CrMo
Threaded bushing:	Q345D

Material is according to detail specifications on the drawings.

60/32*S:	
Tube diameter (outside/inside):	80 mm / 60 mm
Rod diameter (outside/inside):	32 mm / 0
Stroke:	S (≤350) mm
Minimum cylinder length (end eyes center to center):	280+ S (≤350) mm

80/45*S:	
Tube diameter (outside/inside):	100 mm / 80 mm
Rod diameter (outside/inside):	45 mm / 0
Stroke:	S (≤500) mm
Minimum cylinder length (end eyes center to center):	340+ S (≤500) mm

Application/Limitation

- Design Data: (For both types)
  - Maximum working Pressure (Push & Pull): 250 bar
  - Design Pressure (Push & Pull) : 250 bar
  - Test Pressure: 375 bar (Tests carried out are to be in accordance to DNV in Standard for Certification No. 2.9 Type approval programme 5-778.93 “Approval of hydraulic cylinders”.)
  - Design Temperature (min/max): -20°C/80°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 DNV GL Surveyor as outlined in Type Approval Program No. 5-778.93 "Approval of Hydraulic Cylinders" part 5.1.7. A product certificate endorsed or issued by the DNV GL 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 DNV type approval programme No. 5-778.93 clause 5.1.

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 trade mark
- Type designation/Serial no.

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment every second year and before the expiry date of this certificate. The scope of the periodical assessment survey, is to verify that the conditions stipulated for the Type Approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the certificate retention survey are:

- Review of Type Approval documentation
- Review of possible changes in design, materials and performance
- Ensure traceability between manufacturer’s product type marking and Type Approval Certificate.

END OF CERTIFICATE