DNV·GL

Certificate No:
TAP000009C

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Hydraulic Cylinders

with type designation(s)
6525-305, 6530-350, 8032-350, 9032-305, 9032-350

Issued to
Sleipner Motor AS
FREDRIKSTAD, Norway

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

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
6525-305	70	70	see certificate
6530-350	90	90	see certificate
8032-350	90	90	see certificate
9032-305	90	90	see certificate
9032-350	70	70	see certificate

This Certificate is valid until **2019-06-30**.

Issued at **Høvik** on **2016-03-16**

for **DNV GL**

DNV GL local station: **Fredrikstad**

Approval Engineer: **Tom Berg-Nielsen**

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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Product description

Five types of double acting hydraulic cylinders: 6525-305 / 6530-350 / 8032-350 / 9032-305 / 9032 – 350; with bolted end cap.

Material data:

- Cylinder tube: E355 + SR (SS2172) according to EN10305-1
- Piston Rod: 1.4418 according to EN10088-3
- End Cap: CuZn39Pb3 according to EN 12164
- Piston: S355N according to EN10025-3

Dimensional Data:

Type	Part number designation	Cylinder outside Diameter (mm)	Cylinder Inside Diameter (mm)	Rod Diameter (mm)	Maximum stroke (mm)
6525-305	6525-xxx-7-xx	75	65	25	305
6530-350	6530-xxx-9-xx	75	65	30	350
8032-350	8032-xxx-9-xx	90	80	32	350
9032-305	9032-xxx-9-xx	100	90	32	305
9032-350	9032-xxx-7-xx	100	90	32	350

Application/

The cylinders are approved for:
Steering Gear and Water Jet Steering on Ships and High Speed Light Craft classed by DNV GL.

Type	Maximum working Pressure (push/pull) (bar)	Design Pressure (push/pull) (bar)
6525-305	70	87.5
6530-350	90	112.5
8032-350	90	112.5
9032-305	90	112.5
9032-350	70	87.5

Design Temperature for all types : -20°C / 80°C
Corrosion allowance : 0.3 mm

The material for the cylinder tube & piston rod are to be delivered with VL Certificate (3.2 material certificates). In addition, material for the piston, end covers and end eyes are to be delivered with Material Works' Certificate (3.1 material certificates). All of these materials have to be supplied from a DNV GL approved steel works.

Limitation

Hydraulic cylinders are to be hydraulically pressure tested to minimum 1.5 times the design pressure before paint or any coating is applied on the cylinders. The test pressure is to be applied to both sides of the piston head in sequence.

Each cylinder is to be certified by a DNV GL Surveyor as outlined in CG-0194. A product certificate endorsed or issued by the DNV GL Surveyor is to accompany each cylinder/delivery.

This type approval does not cover the following use of the cylinders:

- Subsea applications
- Cleating application where the Rules require a mechanical lock of cleats.

If the cylinders are going to be used for above mentioned applications, they are subject to case-by-case approval.

Type Approval documentation

Tests carried out

None

Marking of product

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

- Manufacturer's name or trade mark
- Type designation/Serial no.
- Design pressure

Periodical assessment

For retention of the Type Approval, DNV GL Surveyor shall perform a periodical assessment before the expiry date of this certificate, to verify that the conditions for the type approval are complied with. The scope of the survey is to check that no alterations are made to the product design or choice of materials. The main elements of the assessment to be dealt with:

- Ensure that materials used comply with Type Approved documents in this certificate and/or referred material specifications.
- Review of possible changes in design, materials, and performance and make sure that such changes do not affect the type approval given.
- Review of the production process and make sure that any changes do not affect the type approval.
- Ensure traceability between manufacturer marking and the type approval certificate.
- Ensure that documentation is available.