

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Hydraulic Cylinders

with type designation(s)
Steering gear cylinder - Serie 25, 35, 45

Issued to
Kobelt Manufacturing Co. Ltd.
Surrey, BC, Canada

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.10 Steering gear
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.

Design pressure (push) see page 2
Design pressure (pull) see page 2
Cylinder sizes see page 2

Issued at **Hamburg** on

for **DNV GL**

This Certificate is valid until .

DNV GL local station: **Vancouver**

Approval Engineer: **Christof Kotzmann-Bendrien**

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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.



Product description

Steering Gear Differential Hydraulic Cylinder

Cylinder type / size	Bore (inch)	Diameter of piston rod (inch)	Stroke max. (inch)	Fully retracted (inch)	Mid stroke (inch)	Fully extended (inch)
Cyl. 2510	2.5	1.25	10.00	22.19	27.19	32.19
Cyl. 2512	2.5	1.25	12.00	24.19	30.19	36.19
Cyl. 2514	2.5	1.25	14.00	26.19	33.19	40.19
Cyl. 3512	3.5	1.75	12.00	27.28	33.28	39.28
Cyl. 3515	3.5	1.75	15.00	30.28	37.78	45.28
Cyl. 3518	3.5	1.75	18.00	33.28	42.28	51.28
Cyl. 4516	4.5	2.25	16.00	34.375	42.275	50.375
Cyl. 4520	4.5	2.25	20.00	38.375	48.375	58.375
Cyl. 4524	4.5	2.25	24.00	42.375	54.375	66.375

Application/Limitation

Valid for all cylinder type and size:

Maximum working Pressure (Push & Pull): 1600 psi / 110 bar
 Design Pressure (Push & Pull) : 2000 psi / 138 bar
 Test Pressure: 3000 psi / 207 bar (Tests carried in accordance with DNVGL-ST-0194)
 Design Temperature (min/max): 0°C to 45°C
 Corrosion allowance: 0.3 mm

Type Approval documentation

7802-0003- Rev.C - 25 Cylinder GA 7802-0003 revised to D. there is no change but adding metric units as an alternative.
 7802-0028- Rev.D - Cylinder 2510 7800-0028
 7802-0030- Rev.D - Cylinder 2512 7800-0030
 7802-0032- Rev.D - Cylinder 2514 7800-0032

7802-0001- Rev.C - 35 Cylinder GA
 7802-0006- Rev.D - Cylinder 3512 7800-0006
 7802-0008- Rev.D - Cylinder 3515 7800-0008
 7802-0010- Rev.D - Cylinder 3518 7800-0010

7802-0002- Rev.B - 45 Cylinder GA

Job Id: **262.1-034648-1**
Certificate No: **TAP000028C**

7802-0017- Rev.C - Cylinder 4516 7800-0017
7802-0019- Rev.C - Cylinder 4520 7800-0019
7802-0021- Rev.C - Cylinder 4524 7800-0021

Marking of product

The product is to be marked with

- manufacturer's name or trademark
- type approval number designation
- serial number
- year of construction
- design / test pressure in psi / bar

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.

Other conditions

This type approval does not cover:

- Crane cylinders
- Cylinders for life saving equipment

END OF CERTIFICATE