

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Hydraulic Cylinders**

with type designation(s)

D/E A160 S100 stroke 10-1000

Issued to

**OLEODINAMICA FORLIVESE SRL
FORLI', Italy**

is found to comply with

**DNV Standard for Certification 2.9, 5-778.93 Approval of hydraulic cylinders
Standard for Certification 2.22 Lifting Appliances, 2013****Application :****Hydraulic Cylinder for Lifting Appliances**

Max work press. push	210
Max work press. pull	210
Cylinder sizes	ø180x10 / ø100

This Certificate is valid until **2019-06-30**.Issued at **Høvik** on **2015-03-05**for **DNV GL**DNV GL local station: **Venice**Approval Engineer: **Iselinn Vindstad**

**Aldo Matteucci
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.

Certificate No: **P-15132**
File No: **778.93**
Job Id: **262.1-018720-1**

Product description

Hydraulic cylinder for use in lifting appliances with following main dimensions :

Tube Outer Diameter	Tube Inner Diameter	Rod Diameter	Stroke	Design Pressure, Push	Design Pressure, Pull
180 mm	160 mm	100 mm	10-1000 mm	210 bar	210 bar

	Tube	Rod	Piston
Material	E355 SR EN 10305-1	20Mn V6 EN 10267	C45 EN 10083

Design temperature range: -20°C to +60°C

Application/Limitation

1. All welding is to be carried out by qualified welders and according to approved welding procedures. Non-destructive testings of all welds are to be performed according to DNV Standard for Certification No. 2.9 Type Approval Program 5-778.93 'Approval of Hydraulic Cylinders'. Minimum requirement to NDT is UT and MT.
2. Material for pressure containing parts and end eye connections are to meet Charpy V-notch energy value of minimum 27J at minimum design temperature. These data are to be verified by DNVGL surveyor during the product certification.

Type Approval documentation

Draw. No.	Rev.	Title	Status
100000050	-	Technical Data	For Information
100000050	4	Hydraulic Cylinder D/E A160 S100 stroke 10-1000	Type Approved

Tests carried out

Each cylinder is to be hydraulically pressure tested to 1.3 times the listed design pressure. The test pressure is to be applied on both sides of the piston in sequence. Testings are to be in accordance with DNV Standard for Certification No. 2.9 Type Approval Program 5-778.93.

Marking of product

The hydraulic cylinders are to be marked with manufacturer's name or trademark, type designations and serial number. When required by applicable rules the surveyor is to stamp each unit with NV mark and DNVGL product certificate number. Reference to type approval number is preferable.

Periodical assessment

For retention of the Type Approval, a DNVGL surveyor shall perform a survey – every second year and before the expire date of the certificate – to verify that the conditions for the approval are complied with. Scope of the survey is to check that no alterations are made to the product design or choice of materials.