Certificate no.:
TAS00004FZ

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Lifting Gear

with type designation(s)
Sheaves E220228 and E220254

issued to
Ropeblock B.V.
Oldenzaal, Overijssel, Netherlands

is found to comply with
DNV standard DNV-ST-0378 – Offshore and platform lifting appliances

Application:

See next page

Issued at **Høvik** on **2024-10-30**
This Certificate is valid until **2029-10-29**.
DNV local unit: **Netherlands CMC**

for **DNV**

Approval Engineer: **Fredrik Per Olof Höglund**

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 AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") 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 USD 300 000.

Product description

The sheaves covered by this Type Approval certificate are to be installed permanently on a lifting appliance.
They shall not be used as sub-components for loose gear.

The Type Approval covers two sheaves:

- SHEAVE ø400/ø80 R12
  drawing numbers
  04G.400.5016.12 rev. 02-B
  E220228 rev. 00

- SHEAVE ø1110/ø170 R18
  drawing numbers
  E220254.04 rev. 00-C
  E220254 rev. 00

Reference standards

F.E.M., Rules for the Design of Hoisting Appliances, 3rd Ed. 1998

Application/Limitation

Sheave	**E220228**	**E220254**
Min design temperature [°C]	-20	-20
Outer diameter [mm]	460	1260
Wire rope diameter [mm]	22	34
Load condition		
Maximum static line pull [kN]	79	197
Dynamic factor	1.6	1.6
Maximum dynamic line pull [kN]	126	315
Maximum fleet angle in/out [deg]	2/2	2/2
Wrap angle [deg]	20 - 90	180
F.E.M. 1.001 component group	N.A.	E8*
Maximum number of rotational cycles	8 000	8 000 000
Design safety factor	1.5	1.5

* E8 is based on Spectrum factor: 0.25 & Number of cycles: 8 million. Considered fleet angle for component group E8 is 1 deg. at inlet and outlet.

Application/Limitation

1. All materials are to be delivered with 3.1 certificates, documenting mechanical properties and chemical composition in accordance with the Type Approval documentation.
2. The sheave bearings are not covered by this Type Approval.
3. Sheave bearings are to be delivered with manufacturer's CoC, confirming sufficient strength and capacity. Proper lubrication of the bearings is to be guaranteed during operation and use of the sheaves.

Type Approval documentation

Tests to be carried out

1. If a DNV Product Certificate is required, each sheave shall be subjected to overload testing as per DNV-ST-0378 Table 14-1 and 14.2.3.4.
2. NDT as specified in the Type Approval Documentation are to be carried out by certified personnel.
3. Testing shall be witnessed by DNV representative.

Note: sheaves are exempt from impact testing.

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNV-CP-0338.

This certificate is only valid if required periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in https://approvalfinder.dnv.com.

END OF CERTIFICATE