DNV·GL

Certificate No:
TAS00000NE

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Gears

with type designation(s)
Gearbox RE series

Issued to
Dinamic Oil S.p.A.
Bomporto MO, Italy

is found to comply with
Standard for Certification 2.22 Lifting Appliances, 2008
DNV GL standard DNVGL-ST-0377 – Standard for shipboard lifting appliances
DNV GL standard DNVGL-ST-0378 – Standard for offshore and platform lifting appliances

Application :

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

This Certificate is valid until **2020-11-28**.

Issued at **Høvik** on **2016-11-29**

for **DNV GL**

DNV GL local station: **Venice**

Approval Engineer: **Harald Jensen**

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.

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Product description

Planetary gear unit with 3 stages and rotating housing. If other output speed is required, the number of hours is to be interpolated. Load spectrum and class of utilisation (based on principles according to F.E.M. 1.001 3rd edition) are defined below.

Gearbox RE 3513
Definition of load spectrum:

Class	Torque (Nm)	Load in % of max	Fraction of total time
L1	30925.00	100	3
	18555.00	60	10
	15462.50	50	52
	8968.25	29	35

STAGE 1	STAGE 2	STAGE 3	RATIO
RE 3510 (3,84)	RE 1020 (3,56)	RE 510 (5,33)	72.86

Output speed: 19 rpm

Service Life in Hours (T2): 800 hours

Brakes (F608) with Max braking torque: 596,00 Nm

Gearbox RE 3513 HRS
Definition of load spectrum:

Class	Torque (Nm)	Load in % of max	Fraction of total time
L2	64000	100	2
	38400	60	65
	32000	50	23
	25600	40	10

STAGE 1	STAGE 2	STAGE 3	RATIO
RE 3510 (5,44)	RE 1020 (5,10)	RE 510 (7,5)	208,08

Output speed: 25 rpm

Service Life in Hours (T2): 800 hours

Brakes (F606) with Max braking torque: 629,00 Nm

Standard multi-disc failsafe brake design. The number of lamella and spring packages is adjusted to obtain the correct brake torque for the specific application. The given friction coefficients have not been evaluated.

Application/Limitation

1. Materials with 3.1 certificates are to be used when manufacturing load carrying parts. Traceability is assumed taken care of by the manufacturer's quality system.

2. Upon final installation of gear unit to foundation/frame the fastening bolts are to be pre-stressed according to procedures acceptable to the attending surveyor. We have assumed that the load carrying bolts are of 8.8 quality or higher.

3. Our gear calculations are based on that optimum hardening depths have been achieved according to recognised standards and manufacturer's experience. Material fatigue values based on 90% reliability of survival have been applied according to the requirements for lifting appliances in our rules. Load distribution factors as stated by the manufacturer have been used and we have not considered these.

4. The bearing lifetime is not evaluated in this Type Approval. It is assumed that the manufacturer delivers bearings with sufficient capacity for the class of utilization.

5. Freewheel sprag clutch is to be delivered with the manufacturers certificate documenting sufficient capacity.

Type Approval documentation

Tests carried out

After completion the gears are to be function and pressure tested prior to issuance of a DNV product certificate.

Marking of product

The product to be marked with manufacturer's name or trademark and type number identification

Periodical assessment

Job Id:
Certificate No: **TAS00000NE**

For retention of the Type Approval, a DNV surveyor shall perform a survey every second year and before expire date of this certificates to verify that the conditions for the type approval are complied with.