



Certificate No:  
**TAS00003TE**

# TYPE APPROVAL CERTIFICATE

**This is to certify:**

**That the Gears**

with type designation(s)  
**RE 3514**

Issued to

**Dinamic Oil S.p.A.**  
**Bomporto MO, Italy**

is found to comply with

**DNV standard DNV-ST-0378 – Offshore and platform lifting appliances**  
**DNV standard DNV-ST-0377 – Standard for shipboard lifting appliances**

**Application :**

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

Issued at **Høvik** on **2023-04-03**

This Certificate is valid until **2028-04-02**.

DNV local unit: **Italy/Malta CMC**

for **DNV**

Approval Engineer: **Sorina Thompson**

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**Per Esvall**  
**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 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 300,000 USD.



Form code: TA 251

Revision: 2022-12

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## Product description

4 stage planetary gearbox with output shaft  
Type: RE 3514  
Maximum output dynamic torque: 54000 Nm  
Maximum static torque 75000Nm  
Life time: 3200hrs

Load spectrum:

| Torque<br>Nm | speed<br>rpm | time<br>% |
|--------------|--------------|-----------|
| 54000        | 5,9          | 17        |
| 37800        | 5,9          | 17        |
| 27000        | 11,7         | 17        |
| 10800        | 11,7         | 48,9      |

Min design temperature -20deg C

## 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. For gearboxes delivered for lifting appliances, the static torque of the gearbox shall match the rated torque of the brake, which shall be 80% in excess of the torque generated from static load.
6. For gearboxes delivered as slewing gears for shipboard cranes, the requirements listed in DNV-ST-0377, section 9.4 shall be taken into consideration when assessing the maximum available torque.

## 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.

### Certificate Retention Survey

For retention of the Type Approval, DNV surveyor shall perform a survey every second year and before expiry date of this certificate in order to verify that the conditions of the type approval are complied with.  
END OF CERTIFICATE