

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Thruster Components**

with type designation(s)
Pinions for Thruster steering

Issued to

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

is found to comply with
DNV GL rules for classification – Ships
DNV GL rules for classification – High speed and light craft

Application :

Pinions for Thruster steering (see page 2 for details)

Products approved by this certificate is accepted for installation on all vessels classed by DNV GL.

This Certificate is valid until **2026-03-03**.

Issued at **Hamburg** on **2021-03-04**

DNV GL local station: **Venice**

for **DNV GL**

Approval Engineer: **Christof Kotzmann-Bendrien**

.....
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.

Job Id: **262.1-015981-7**
Certificate No: **TAM000002Y**
Revision No: **5**

Product description

Pinions for Thruster steering

Application/Limitation

The pinions are approved for the following rating :

Gearbox unit	Gear module	Gearmesh	Max pinion torque (relief valve setting) [kNm]	Max / Nominal pinion torque [kNm]	Max steering column torque/pinion [kNm]	Rotational speed, wheel [rpm]
RE 240 DBS	6,5	15/120	2,48	1,77	0,71	3
RE 510 FS	8	15/84	4,37	3,13	1,25	3
RE 810 TR3	9	15/120	4,51	3,22	1,30	3
RE 810 T	9	15/120	7,58	5,41	2,16	3
RE 810 TR3	10	15/138	9,13	6,52	2,61	3
RE 810 TR3	10	15/146	6,27	4,48	1,79	2
RE 810 T	10	15/138	9,13	6,52	2,61	3
RE 810 TR3	12	14/147	7,56	5,40	2,16	2
RE 1020 DBS4	12	15/136	10,62	7,59	3,03	2
RE 1520 DBS	12	17/162	17,81	12,72	5,09	3
RE 1520 DBS	13	15/120	12,25	8,75	3,50	2
RE 1023 DBS4	14	15/151	13,77	9,83	3,93	2

Type Approval documentation

Gearbox unit	Gear module	Pinion drw	Revision
RE 240 DBS	6,5	022610176	06
RE 510 FS	8	025710352	00
RE 810 T	9	022610204	05
RE 810 TR3	9	022610424	01
RE 810 T	10	022610206	07
RE 810 TR3	10	022610281	03
RE 810 TR3	10	022610500	00
RE 810 T	10	022610411	04
RE 810 TR3	12	022610446	00
RE 1020 DBS4	12	022610330	02
RE 1520 DBS	12	022610189	04
RE 1520 DBS	13	022610209	06
RE 1023 DBS4	14	022610406	02

and other documents, including gear data sheet received in email:

2017/10/11, DNVGL ref.:J-39
2017/07/05, DNVGL ref.:J-33
2016/10/18, DNVGL ref.:J-28
2015/10/01, DNVGL ref.:J-21
2013/08/08, DNVGL ref.:J-5
2013/09/19, DNVGL ref.:J-9

Marking of product

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

Periodical Assessment

For retention of the Type Approval, a DNV GL surveyor shall perform an assessment after 2 years and after 3.5 years to verify that the conditions of the type approval are complied with. A renewal assessment will be performed at renewal of the certificate.

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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.

In cases where the Type Approved product is manufactured at other companies, the Periodical Assessment shall verify that the Type Approval applicant has a quality control system for consistent production at their licensees/subcontractors. Furthermore Periodical Assessment shall be carried out randomly at these companies.

When a Type Approved product is manufactured at other companies, the Type Approval applicant takes the sole responsibility for the conformity of the product to the applicable requirements.

Other Conditions

Slewing ring is not included in this certificate and shall be submitted for approval for each installation with relevant gear data sheet for gear calculation.

END OF CERTIFICATE