

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Reduction Gear for Propulsion

with type designation(s)
ZF 2000 Family

Issued to

ZF Friedrichshafen AG
Friedrichshafen Baden-Württemberg, Germany

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.4 Rotating machinery – power transmission
DNV GL rules for classification – High speed and light craft

Application :

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

Input torque **see page 2**
Input speed **see page 2**
Reduction ratio **see page 2**

Issued at **Hamburg** on **2017-09-29**

This Certificate is valid until **2022-09-28**.

DNV GL local station: **Augsburg**

for **DNV GL**

Approval Engineer: **Christof Kotzmann-Bendrien**

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Burkhard Lilienthal
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.



Product description

Standard marine reduction gears ZF 2000, ZF 2050, ZF 2060, ZF 2070, ZF 2075, ZF 2150 (NR, NR2) with built-in hydraulic clutch.

- NR – non-reversing, engine wise or counter engine wise rotation
- NR2 – non reversing with only two shafts, no intermediate shaft, only counter engine wise rotation.

Application/Limitation

The Type Approval according to DNV GL Rules is valid for the following ratings:

Maximum Input Torque (Nm)			
Gear Ratio	Max Input Speed [RPM]	Commercial Applications	LC Naval, Patrol, Yacht and Crew Applications
1.000	2600	4185	4750
1,086	2600	4185	5263
1,191	2600	4185	5263
1,250	2600	4185	5263
1,350	2600	4185	5263
1,436	2600	4185	5263
1,500	2600	4185	5263
1,639	2600	4185	5263
1,765	2600	4185	5263
1,879	2600	4185	5263
1,938	2600	4185	5165
2,032	2600	4185	4990
2,276	2600	3975	4335
2,519	2600	3756	4090
2,760	2600	3370	3670
2,958	2600	2995	3265

Maximum application factor, $K_A = 1,2$
Minimum lubrication oil FZG load stage = 12

Type Approval documentation

Marking of product

Manufacturer's name or trademark, type designation and serial number.

Periodical Assessment

For retention of the Type Approval, a DNV GL surveyor shall perform a survey after 2 and 3,5 years and also before the expiry date of this certificate to verify that the conditions of the type approval are complied with.

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:

Job Id: **262.1-001024-8**
Certificate No: **TAM00000R4**

- 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 whole responsibility for the conformity of the product to the applicable requirements.

Other conditions

The present Type Approval is valid in connection with the "Special Agreements" between ZF Friedrichshafen und DNVGL, Revision 0 dated 2016-06-20, Supplement 01 to MSA0000AF4.

The following is not included in this Type Approval and has to be submitted for approval case-by-case:

- connection to external input shafts
- fastening arrangement

Single installation to be provided with standby oil pump.

This certificate replaces certificate no. M-12319.

END OF CERTIFICATE