



Certificate No. 02-002812/024781

TYPE APPROVAL CERTIFICATE

This is to certify that this product complies with the Rules for the classification of ships, Part 1 - General requirements, Chapter 3 - Type approval of products.

TYPE AND DESCRIPTION OF PRODUCT:

Marine Reduction Gearboxes for Diesel Propulsion – type ZF W650

MANUFACTURER:

ZF Padova S.r.l.

Via Penghe 48
35030 Caselle di Selvazzano (PD)
Italia

THE PRODUCT MEETS FOLLOWING RULES/REGULATIONS:

CRS: Rules for the classification of ships, Part 9. - Machines.

FURTHER DETAILS OF THE PRODUCT AND CONDITIONS FOR CERTIFICATION ARE GIVEN OVERLEAF.

APPROVAL IS VALID UNTIL: **2023-08-30**

Place and date: Split, 2019-08-30

Seal _____

Marinko Popović, dipl.ing.

NOTE: This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Croatian Register of Shipping of any modification or changes to the product in order to obtain a valid certificate.

DETAILED PRODUCT DESCRIPTION:

Marine reduction gearboxes ZF W650, with built-in hydraulic clutch, direct and reverse drives, for continuous duty and multiple installation.

APPLICATION / LIMITATIONS:

The approval status is based on application factor 1,30.

Duty Ratio	Continuous @ 1800 rpm		Continuous @ 2100 rpm		Medium @ 2300 rpm	
	MCR, kW	Torque, Nm	MCR, kW	Torque, Nm	MCR, kW	Torque, Nm
3.605	448	2376.8	522	2374	592	2458.1
4.057	448	2376.8	522	2374	592	2458.1
4.531	448	2376.8	522	2374	592	2458.1
5.138	448	2376.8	522	2374	592	2458.1
5.357	448	2376.8	522	2374	592	2458.1
5.593	448	2376.8	522	2374	592	2458.1
6.120	405	2148.7	473	2151	564	2341.8
6.417	379	2010.8	442	2010	539	2238.0

TYPE APPROVAL DOCUMENTATION:

Drawings and calculations approved by CRS with letter: 1631/023149 (2011-08-30)
1343/023783 (2015-07-07)
2469/024781 (2019-08-30)

MARKING OF PRODUCT:

- manufacturer's mark
- serial No.
- location and year of final fitting
- CRS mark

CONDITIONS FOR CERTIFICATION:

The manufacturer shall make arrangements for the CRS Surveyor to attend the relevant tests and examinations at manufacturer's works or to perform the relevant audits in case an alternative survey scheme has been approved. Relevant CRS certificate for each particular reduction gearbox will be issued after satisfactory completion of the procedure.

Measuring devices, sensors and alarms shall be subject to CRS approval in each particular case and will depend on service applied and the degree of automation of the propulsion plant.