



Certificate No:
TAD00001E6

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Hoisting, Rotation and Pipehandling Equipment

with type designation(s)
3-speed shift gearbox for multi-speed drawworks

Issued to
MHWirth GmbH
Erkelenz, Nordrhein-Westfalen, Germany

is found to comply with
DNVGL-OS-E101 – Drilling facilities, Edition January 2018

Application :

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

Issued at **Høvik** on **2021-06-22**

This Certificate is valid until **2026-06-21**.

DNV local station: **Essen**

for **DNV**

Approval Engineer: **Thomas Henrik Tranesen**

.....
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: 2021-03

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Product description

3-speed shift gearbox intended for multi-speed drawworks

Reference standards

API Specification 7K, Drilling and well servicing equipment, 2017
FEM 1.001, Rules for the design of hoisting appliances, 1999
DNVGL-RP-203, Fatigue design of offshore steel structures, 2019

Application/Limitation

Min design temperature	-20°C
Min operating temperature	0°C
Max operating temperature	55°C

Max input torque	13000Nm @ 900rpm / 1 st gear 11200Nm @ 900rpm / 2 and 3 rd gear
Transmission ratio	2.52 / 1.48 / 0.84 1 st / 2 nd / 3 rd gear
Max input speed	1600rpm

Max input torque ADS gear	62Nm @ 3600rpm
Max speed ADS gear	5220rpm
Gear ratio ADS	242:1

Design lifetime	20 years
On/off switch cycles	663 752
No of turns during static torque	10e9 cycles

Type Approval documentation

Tests carried out

- Impact charpy testing of the materials shall be carried out at or below minimum design temperature in accordance to DNVGL-OS-E101 Ch.2 Sec.2.
- Operation and functional testing shall be carried out in accordance with the function testing of the complete drawwork, ref. DNVGL-OS-E101 Ch.2 Sec.8.
- Non-destructive evaluation shall be carried out in accordance to DNVGL-OS-E101 Ch.2 Sec.8 §3.
- Each product is to be surveyed during fabrication in accordance with the requirements for equipment of Category I as defined in DNV GL's Offshore Standard DNVGL-OS-E101, followed by issuance of Product Certificate. If the intended installation is DNV GL classed, then this automatically means DNV GL Product Certificate. Fabrication records are to be maintained in accordance with DNVGL-OS-E101 Ch.3 Sec.3 §2.

Comments

- Bearings estimated lifetime varies from 7.9 to 116.9 years. Periodical replacements shall be carried out following the manufacturer's maintenance program.
- Clutches are not a scope of this Type Approval and shall be delivered with Product Certificate.

Marking of product

For traceability, following marking is to be applied on each product, as minimum:

- Part no.
- Serial no.
- Rated load capacity
- Manufacturer's name and mark

Periodical assessment

For retention of the Type Approval, DNV GL's representative shall carry out biennial Product Audits in accordance with DNVGL-CP-0338 Sept.2017, Sec.4.

END OF CERTIFICATE