

**TYPE APPROVAL CERTIFICATE****This is to certify:****That the Lifting set for Offshore containers and Portable Offshore Units**with type designation(s)  
**Offshore Chain Type ENORM K**Issued to  
**J.D. Theile GmbH & Co. KG**  
**Schwerte Nordrhein-Westfalen, Germany**is found to comply with  
**DNV GL standard DNVGL-ST-E271 – 2.7-1 Offshore containers, August 2017**  
**DNV GL standard DNVGL-ST-E273 – 2.7-3 Portable offshore units, December 2016**  
**PAS 1061 Round steel link chain slings, Grade 10**  
**EN 818-2 Short link chain for lifting purposes – Safety – Part 2: Medium tolerance chain for chain for chain slings – Grade 8**  
**EN 12079-2 Offshore containers and associated lifting sets – Part 2: Lifting sets Design, manufacture and marking**  
**IMO/MSC Circular 860****Application :****ENORM Grade 10 - Short Link Chain for Lifting Sets for Offshore Containers and Portable Offshore Units excluding subsea use**Issued at **Høvik** on **2017-12-21**for **DNV GL**This Certificate is valid until **2021-12-17**.DNV GL local station: **Essen**Approval Engineer: **Nina Thorvaldsen Moberg****Inger-Helene Hals**  
**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: **262.1-020100-2**  
Certificate No: **TAS0000028**  
Revision No: **1**

## Product description

This Type Approval Certificate is revision 1 of Type Approval Certificate TAS0000028, and replaces previous revision.

This Type Approval Certificate covers welded chain, manufactured by J.D. Theile GmbH & Co. KG, in accordance to the requirements in standard DNV GL-ST-E271 - 2.7-1 Offshore Containers (DNV GL 2.7-1) or standard DNVGL-ST-E273 - 2.7-3 Portable Offshore Units (DNV GL 2.7-3), EN 818-2 and relevant parts from PAS 1061.

Detailed product information and range of certified products covered by this Type Approval are listed in Appendix 1 of this Type Approval Certificate. Sizes are according to EN 818-2.

## Application/Limitation

All production testing to be according to J.D. Theile's procedure FFE11, DNV GL 2.7-1, EN 818-1, and relevant parts from EN 818-2. Material to be impact tested by Charpy impact method according to DNV GL 2.7-1, Section 8.4.

The manufacturer shall issue product certificates according to Section 8.5 in DNV GL 2.7-1 or Section 7.5 in DNV GL 2.7-3, using the certificate form FQW32 rev. 0. This certificate form is only to be used for chains certified according to this Type Approval Certificate.

For application of chains the minimum working load limit (WLL) shall be decided according to the strength requirements for lifting sets on offshore containers as given in DNV GL 2.7-1, Section 8 or DNV GL 2.7-3 Section 7.

### For chains certified according to DNV GL 2.7-3

Prior to selection of chain the minimum required working load limit (WLL) shall be decided according to the strength requirements for lifting sets on portable offshore units as given in DNV GL 2.7-3, Section 7.3.2 and must be approved by DNV GL. Resulting sling force (RSF) can be found in the Design Verification Report (DVR) issued by DNV GL for the Portable Offshore Unit. The DVR shall be available for the chain manufacturer.

This product is not approved for subsea use.

## Type Approval documentation

Document No.	Rev.	Title
FQW32	0	Certificate form - J.D. Theile GmbH & Co. KG product certificate for offshore chain
DNV TA 002	1	Offshore chain type ENORM K
DNV TA 003	3	Manufacturing process - Offshore slings
DNV TA 004	00	Test equipment for Offshore chain sling
DNV TA 005	00	Manufacturing equipment for Offshore chain slings
FFE 10	3	JDT Offshore material specification
FFE 11	5	Control plan offshore slings and single links acc. To DNV GL 2.7-1
5500-002	04	Wärmebehandlung von Offshore - Gehängen nach DNVGL-ST-E271 (2.7-1)
2700-002	04	Eingangsprüfungen des Vormaterials
2700-004	07	Zwischenprüfungen an Kettenprodukten
2700-005	02	Zwischenprüfung an Einzelkettengliedern
2700-007	01	Rissprüfung nach dem Magnetstreifflussverfahren- Anweisung an die Prüfer
2700-011	04	Endprüfung an Kettenprodukten
2700-026	02	Position Kerbschlagproben - Offshore
3200-003	00	Fertigungsmaße für widerstandsgeschweißte Ketten

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113443-2012-AQ-GER-DAkks		Management System Certificate - ISO 9001:2008 – by DNV GL
SZMF-ED-PB-2017-0215		Stress corrosion testing using slow strain rate tensile test according to DIN EN ISO 7539-7 on material 1.6795 from heat no. 444751 and heat no. 215132 – by Salzgitter Mannesmann Forschung – dated 2017-08-08 -
08217 (14 pages)		Charpy impact test on different links and chains acc. to DNVGL-ST-371. The test was performed at company "Werkstoffprüfung Berg". Original documents enclosed. – dated 2017-10-26
10717 (11 pages)		Test report of ENORM chain by JDT – dated 2017-10-27 – witnessed by DNV GL Essen
10117 (25 pages)		Test report of ENORM chain by JDT – dated 2017-10-17
A0372395		Audit report endorsed by DNV GL Essen dated 2017-04-04

### Tests carried out

Prototype strength tested according to standards.

### Marking of product

Marking should be according to DNV GL 2.7-1, Section 8 and EN 818-1 with "Grade 10".

### Periodical assessment

For retention of the Type Approval, a DNV GL surveyor shall perform a survey every 6 months and before the expiry date of this certificate to verify that the type approval is complied with.

END OF CERTIFICATE

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## Appendix 1

Product description and details

Chain type ENORM

Type	Dia. [mm]	WLL [t]	MPF [kN]	Min. BF [kN]
ENORM K8 *	8	2,3	56,6	90,4
ENORM K10	10	3,6	88,4	141
ENORM K13	13	6,1	149	239
ENORM K16	16	9,2	226	362
ENORM K18	18	11,7	286	458
ENORM K20	20	14,4	354	565
ENORM K22	22	17,4	428	684
ENORM K26	26	24,3	598	955

\*This size is only to be used for Portable Offshore Units.