

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Lifting set for Offshore containers and Portable Offshore Units**with type designation(s)
Masterlinks type AW, AOS and MW
Transition links type BW and BOSIssued to
PEWAG Austria GmbH
Graz Steiermark, Austriais found to comply with
DNV 2.7-1 Offshore Containers (2013)
EN 12079-2 Offshore containers and associated lifting sets Part 2: Lifting sets Design, manufacture and marking
IMO/MSC Circular 860
EN 1677-4 Components for slings - Safety - Part 4: Links, Grade 8
DNV Standard for Certification No. 2.7-3 Portable Offshore Units (2011)**Application :****Grade 8 Links for Lifting Sets for Offshore Containers and Portable Offshore Units**This Certificate is valid until **2018-06-30**.Issued at **Høvik** on **2014-11-06**DNV GL local station: **Essen**Approval Engineer: **Nina Thorvaldsen**for **DNV GL**

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. If any person suffers loss or damage which is proven to have been caused by any negligent act or omission of the Society, then the Society shall pay compensation to such person for his proven direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question. The maximum compensation shall never exceed USD 2 million. In this provision the "Society" shall mean DNV GL AS as well as all its direct and indirect owners, affiliates, subsidiaries, directors, officers, employees, agents and any other person or entity acting on behalf of DNV GL AS.

Certificate No: **S-8254**
File No: **911.53**
Job Id: **262.1-017149-1**

Product description

This Type Approval Certificate replaces Type Approval Certificate S-6212.

Links for use in Lifting Sets for Offshore Containers certified to DNV 2.7-1 Offshore Containers or Portable Offshore Units certified according to DNV 2.7-3 Portable Offshore Units.

Detailed product information and range of certified products covered by this Type Approval are listed in Appendix 1 of this Type Approval Certificate.

DNV GL has accepted some components with internal dimension smaller than table 2 in EN 1677-4. These are marked in Appendix 1.

Manufactured by

Pewag s.r.o., Vamberk, Czech Republic
Local office: DNV GL Czech Republic

Acciaierie Valcanale, Tarvisio, Italy
Local office: DNV GL Venice

Pewag Austria GmbH takes responsibility that both design and production are in compliance with the Rules, Standards and/or Regulations listed on page 1 of this Type Approval Certificate.

Application/Limitation

Tests to be carried out:

- Production testing: According to DNV Standard for Certification No. 2.7-1 and EN 1677-4 "Components for slings Safety - Part 4; Links, Grade 8" in agreement with the DNV GL surveyor.
- Material to be impact tested by Charpy impact method according to DNV 2.7-1 Offshore Containers, Chapter 8.4 or 2.7-3 Portable Offshore Units Chapter 7.4.

For application of links the minimum working load limit (WLL) shall be decided according to the strength requirements for lifting sets on offshore containers as given in DNV 2.7-1 Offshore Containers, Chapter 8 and .

The manufacturer shall issue product certificates according to Sec. 8.5 in DNV 2.7-1, using the certificate form 01-2AD.04.13/G-F_components. This certificate form is only to be used for links certified according to this Type Approval.

Links covered by this Type Approval certificate may be delivered with design temperature of -20°C or -40°C. Links with design temperature -40°C will have special marking.

For links manufactured according to DNV 2.7-3 Portable Offshore Units

Prior to selection of links 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 2.7-3, Chapter 7.3.5. Resulting sling force (RSF) can be found in the Design Verification Report (DVR) issued by DNV GL for the Portable Offshore Unit.

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Type Approval documentation

| Drawing No. | Rev. | |
|---------------------------------|------------------------|--|
| 10706-1 | 98.04.08. | Document folder from Pewag Austria US master links type M-PWH grade 8 |
| | Reviewed 2010.06.10 | Updated product description for chains, links and transition links |
| 01-2AD.04.13/G- F_components | | Inspection Certificate acc. to EN 10204 3.1 for type approved chains, rings and assemblies for Offshore containers and Portable Offshore Units |
| QU1530710/01 QU1530710/03 | | ISO 9001:2008 and ISO 14001:2009 by TÜV SÜD for Graz ISO 9001:2008 and ISO 14001:2009 by TÜV SÜD for Varmberk |
| 86074-2010-AQ-ITA- SINCERT | | ISO 9001:2008 by DNV for Acciaierie Valcanale |
| 18095-3 | 3 | Master links AW (..)-DNV 2.7-1 for Offshore |
| 18096-2 | 2 | Master links MW (..)-DNV 2.7-1 for Offshore |
| 5719-22 | 22 | Transition Links BW G10 |
| 19508-4 | 4 | Master Links BOS and AOS for Offshore |
| 16433-7 | 7 | Assemblies Type VAMW (..)-DNV 2.7-1 acc. to DNV for Offshore |
| 10558-16 | 16 | Assemblies Type VW G10 |
| 19509-3 | 3 | Assemblies Type VOS (..)-DNV 2.7-1 acc. to DNV for Offshore |
| PWDNV001 | 0 | Offshore Lifting Set Components Pewag -Links- grade 8 |

Test report from DNV Linz, Ord.No. 21860033.

Tests reports No. 1363 to 1368 dated 2001-08-30, witnessed by DNV.

Tests reports No. 2688 and 2689 dated 2006-02-15, witnessed by DNV.

Type Approval Survey Report, ESN-10-31050-4 endorsed by DNV Essen, dated 2010-05-19

Type Approval Survey Report, ESN-14-30071-2 endorsed by DNV GL Essen, dated 2014-06-17

Test report from DNV GL Venice, dated 2014-06-10.

Test reports No. 01/OF/2014 to 21/OF/2014, witnessed by DNV GL Venice

Type Approval Survey Report, endorsed by DNV GL Venice, dated 2010-06-10

Type Approval Survey Report, endorsed by DNV GL Ostrava, dated 2014-06-29

Tests carried out

Prototype strength tested according to DNV 2.7-1 and EN1677-4.

Marking of product

Marking should be according to DNV 2.7-1 Offshore Containers, Chapter 8 or DNV 2.7-3 Portable Offshore Units Chapter 7 and EN 1677-4 "Components for slings Safety - Part 4; Links, Grade 8".

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

Master links type AW

| Type | Dia. [mm] | WLL [t] | MPF [kN] | Min. BF [kN] |
|-------------------|-----------|---------|----------|--------------|
| AW 16-DNV 2.7-1 | 16,5 | 3,5 | 85,8 | 137 |
| AW 18-DNV 2.7-1 | 19 | 5 | 123 | 196 |
| AW 22-DNV 2.7-1 | 23 | 7,6 | 186 | 298 |
| AW 26-DNV 2.7-1 * | 27 | 10,9 | 267 | 428 |
| AW 32-DNV 2.7-1 * | 33 | 16,4 | 402 | 644 |
| AW 36-DNV 2.7-1 | 36 | 25,6 | 628 | 1005 |
| AW 45-DNV 2.7-1 | 45 | 38,3 | 939 | 1503 |
| AW 50-DNV 2.7-1 | 50 | 50,56 | 1240 | 1984 |
| AW 56-DNV 2.7-1 * | 56 | 67 | 1643 | 2629 |
| AW 72-DNV 2.7-1 | 70 | 85 | 2085 | 3335 |

*) Non-standard sizes, see comment under Product Description.

Master links type MW

| Type | Dia. [mm] | WLL [t] | MPF [kN] | Min. BF [kN] |
|-------------------|-----------|---------|----------|--------------|
| MW 18-DNV 2.7-1 | 19 | 4,2 | 103 | 165 |
| MW 22-DNV 2.7-1 | 23 | 6,7 | 164 | 263 |
| MW 26-DNV 2.7-1 | 27 | 10,6 | 260 | 416 |
| MW 32-DNV 2.7-1 * | 33 | 16 | 392 | 628 |
| MW 36-DNV 2.7-1 * | 38 | 24 | 589 | 942 |

*) Non-standard sizes, see comment under Product Description.

Master links type AOS

| Type | Dia. [mm] | WLL [t] | MPF [kN] | Min. BF [kN] |
|----------|-----------|---------|----------|--------------|
| AOS 23 | 23 | 6,7 | 164 | 263 |
| AOS 25 | 25 | 8,9 | 218 | 349 |
| AOS 28 | 28 | 14,5 | 356 | 569 |
| AOS 33 * | 33 | 24,15 | 592 | 948 |
| AOS 36 | 36 | 28,91 | 709 | 1134 |
| AOS 40 | 40 | 34,27 | 840 | 1345 |
| AOS 45 | 45 | 38,3 | 939 | 1503 |
| AOS 50 | 50 | 50,56 | 1240 | 1984 |
| AOS 56 * | 56 | 67 | 1643 | 2629 |
| AOS 70 | 70 | 85 | 2085 | 3335 |

*) Non-standard sizes, see comment under Product Description.

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Transition links (terminal links) type BW:

| Type | Dia. [mm] | WLL [t] | MPF [kN] | Min. BF [kN] |
|-------|--------------|------------|-------------|-----------------|
| BW 10 | 10 | 2,0 | 49,1 | 78,6 |
| BW 13 | 12,7 | 3,15 | 77,3 | 124 |
| BW 16 | 16,5 | 5,4 | 133 | 212 |
| BW 20 | 19,5 | 8,5 | 208 | 334 |
| BW 22 | 23 | 11,4 | 280 | 447 |
| BW 23 | 23 | 11,4 | 280 | 447 |
| BW 26 | 27 | 16,0 | 392 | 628 |
| BW 27 | 27 | 16,0 | 392 | 628 |
| BW 32 | 33 | 22,4 | 549 | 879 |
| BW 36 | 36 | 30,0 | 736 | 1177 |
| BW 40 | 40 | 42,4 | 1040 | 1664 |
| BW 45 | 45 | 42,4 | 1040 | 1664 |
| BW 50 | 50 | 63,0 | 1545 | 2472 |

Transition links type BOS:

| Type | Dia. [mm] | WLL [t] | MPF [kN] | Min. BF [kN] |
|--------|--------------|------------|-------------|-----------------|
| BOS 17 | 17 | 5,06 | 124 | 199 |
| BOS 19 | 19 | 6,17 | 165 | 263 |
| BOS 23 | 23 | 10,94 | 268 | 429 |
| BOS 27 | 27 | 12,91 | 317 | 507 |
| BOS 30 | 30 | 18,57 | 455 | 729 |