

# TYPE APPROVAL CERTIFICATE

**This is to certify:**

**That the Lifting set for offshore containers and portable offshore units**

with type designation(s)  
**Master links A-344**  
**Master link assemblies A-347**

Issued to  
**Crosby Group LLC**  
**Tulsa, OK, USA**

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**  
**ISO 10855-2:2018 Offshore containers and associated liftings sets – Part 2: Design, manufacture and testing of lifting sets**  
**IMO/MSC Circular 860**  
**EN 1677-4 Components for slings – Safety – Part 4: Links, Grade 8**

**Application :**

**Grade 8 Master Links for offshore container and portable offshore unit lifting sets**

Issued at **Aberdeen** on **2020-07-07**

This Certificate is valid until **2025-07-05** .

for **DNV GL**

DNV GL local unit: **Houston**

Approval Engineer: **Ronald Quiballo**

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**Elisabeth Legg**  
**Principal Engineer**

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 GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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.



Job Id: **262.1-010705-4**  
Certificate No: **TAS00002KR**  
Revision No: **1**

## **Manufactured**

Crosby Zimmermann  
Boulay, France  
DNV GL local office: Antwerp

Crosby Group LLC 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.

## **Product description**

This type approval replaces TAS000001V and previous revisions of TAS00002KR.

Links and link assemblies for use in lifting sets certified in accordance with DNVGL-ST-E271 and DNVGL-ST-E273.

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

DNV GL has accepted some components with internal dimensions smaller than Table 2 in EN 1677-4. these are marked in Appendix 1.

## **Application/Limitation**

Tests to be carried out:


- Production testing: in accordance with DNVGL-ST-E271, EN 1677-4 and quality control procedure No. 4332, Rev. 4, in agreement with the DNV GL surveyor.
- Material to be Charpy impact tested in accordance with DNVGL-ST-E271 section 8.4.

For application of links the minimum working load limit (WLL) shall be decided in accordance with the strength requirements for lifting sets as given in DNVGL-ST-E271 section 8.

The manufacturer shall issue product certificates in accordance with DNVGL-ST-E271 section 8.5, using the certificate form . This certificate form shall only be used for links certified in accordance with this type approval.

### **For links manufactured in accordance with DNVGL-ST-E273**

Prior to selection of links the minimum required working load limit (WLL) shall be determined in accordance with strength requirements for master links as given in DNVGL-ST-E273 section 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. The DVR shall be available for the link manufacturer.



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## **Type Approval documentation**

### **Tests carried out**

Prototypes tested in accordance with DNVGL-ST-E271 and EN 1677-4.

### **Marking of product**

Marking shall be in accordance with DNVGL-ST-E271 section 8 and EN 1677-4.

### **Periodical assessment**

In order to maintain the validity of the type approval, periodic assessments shall be carried out by a DNV GL surveyor. Intervals between assessments shall not exceed 6 months.

## **END OF CERTIFICATE**

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## Appendix 1

Product description and details

### Welded master links type A-344

Type	Diameter [mm]	Size designation (D x W x L) [mm]	WLL [t]	MPF [kN]	MBF [kN]
344	12	12 x 60 x 120	1.6**	39	78
344	13	13 x 60 x 120	2.5**	61	123
344	17	17 x 90 x 160	4.1**	101	201
344	19	19 x 90 x 160	6.7**	164	329
344	20	20 x 80 x 150 *	6.7**	164	329
344	22	22 x 90 x 170 *	8.5	208	417
344	22	22 x 100 x 180	8.5	208	417
344	22	22 x 145 x 275	6.3	155	309
344	25	25 x 115 x 210	11.5	282	564
344	25	25 x 100 x 190 *	11.5	282	564
344	25	25 x 145 x 275	8.9	218	437
344	28	28 x 110 x 210 *	12.9	316	633
344	28	28 x 145 x 275	13.0	319	638
344	31	31 x 145 x 275	17.0	417	834
344	32	32 x 140 x 270	17.0	417	834
344	36	36 x 155 x 285	24.0	589	1177
344	38	38 x 140 x 270	31.5	773	1545
344	40	40 x 160 x 300	28.1	689	1378
344	45	45 x 140 x 250 *	32.0	785	1570
344	45	45 x 170 x 320	38.3	939	1879
344	45	45 x 180 x 340	38.3	939	1879
344	50	50 x 200 x 380	45.0	1104	2207
344	51	51 x 215 x 390	45.0	1104	2207
344	57	57 x 203 x 406	65.3	1601	3203

\*) This size has smaller dimensions than table 2 in EN 1677-4.

\*\*) In accordance with DNVGL-ST-E271 links with WLL <7 tonnes are not allowed to be used as master links in lifting sets for offshore containers. This size is only suitable for portable offshore units.

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**Welded Master link assemblies type 347**

Type	Diameter [mm]	Size designation (D x W x L) [mm]	WLL [t]	MPF [kN]	MBF [kN]
347	13/12	13 x 60 x 120 / 12 x 45 x 85	2.40**	59	118
347	17/13	17 x 90 x 160 / 13 x 60 x 120	4.10**	101	201
347	19/13	19 x 90 x 160 / 13 x 60 x 120	4.25**	104	208
347	22/16	22 x 145 x 275 / 16 x 60 x 120 *	5.80**	142	284
347	22/17	22 x 100 x 180 / 17 x 90 x 160	6.70**	164	329
347	22/20	22 x 90 x 170 * / 20 x 80 x 150	8.50	208	417
347	25/19	25 x 145 x 275 / 19 x 90 x 160	8.90	218	437
347	25/20	25 x 100 x 190 * / 20 x 80 x 150 *	10.7	262	525
347	28/22	28 x 110 x 210 / 22 x 90 x 170 *	12.9	316	633
347	28/22	28 x 145 x 275 / 22 x 100 x 180 *	14.5	356	711
347	31/25	31 x 145 x 275 / 25 x 115 x 210	17.0	417	834
347	32/25	32 x 140 x 270 / 25 x 100 x 190 *	17.0	417	834
347	36/28	36 x 145 x 275 / 28 x 100 x 190 *	23.6	579	1158
347	38/32	38 x 140 x 270 / 32 x 140 x 270 *	28.1	689	1378
347	40/31	40 x 160 x 300 / 31 x 145 x 275	28.1	689	1378
347	45/36	45 x 180 x 340 / 36 x 155 x 285	38.3	939	1879
347	45/38	45 x 170 x 320 / 38 x 140 x 270	38.3	939	1879
347	50/38	50 x 200 x 380 / 38 x 140 x 270 *	45.0	1104	2207
347	51/45	51 x 190 x 350 / 45 x 180 x 340	45.0	1104	2207
347	57/50	57 x 203 x 406 / 50 x 200 x 380	67.0	1643	3286

\*) This size has smaller dimensions than table 2 in EN 1677-4.

\*\*) In accordance with DNVGL-ST-E271 links with WLL <7 tonnes are not allowed to be used as master links in lifting sets for offshore containers. This size is only suitable for portable offshore units.