



Arctic Offshore Master Links

For the Toughest Conditions



GUNNEBO
Industries

Arctic Offshore Master Links

Type Approved to DNV 2.7-1



Adverse weather and rough sea conditions - sometimes in combination with extremely low temperatures - must be included in the design and safety factor of container lifting sets. The heat treatment of the components must ensure proper ductility and strength to sustain shock loads which may be imposed when the container is lifted from the deck of a vessel.

The lifting sets and its included components must be specially designed for the purpose to lift offshore containers. One of the main differences compared to the onshore standard or specification, is that it allows for the dynamic forces at sea by adding an extra enhancement factor to increase the level of safety. Another difference is that the requirements and testing of materials that will be used in cold environments, are more extensive.

Arctic Offshore Master Link MT



Arctic Offshore Master Link M



Engineered to Excellence

The Master Links have been engineered to be resistant towards environmental hydrogen embrittlement failures which is always a risk due to the corrosive environment present at sea. High quality steel that is homogenous with favorable microstructure, small grain size and low amount of impurities is being used in order to produce this high end component. In addition the hardness of the Master Links is below 38 on the Rockwell C scale giving high impact strength even at low operating temperatures ($\geq 27J$ at $-40^\circ C$ in the weld) and increased resistance towards hydrogen embrittlement failures in an offshore environment.

100% Proof Loading

All lifts require reliable products with the highest safety to ensure a safe working environment as well as to protect the load. Gunnebo Industries perform rigorous testing in their factories before the product is released. Every single one of the components are proof loaded 2.5 times their working load limit and visually inspected by competent personnel. This is done without exception to guarantee highest quality and safety for the end user. To make the master links as suitable as possible for the harsh marine environment, an additional stress relieving heat treatment is performed before the master link is delivered to the end user. This is executed in order to remove stresses that might have formed during the proof loading, which could decrease the life length of the product.

Improved Working Load Limits

The Arctic Offshore Master Links comes in an optimized range where each Master Link will have a wider and higher working load limit span than the old range. This makes it easier from a purchasing point of view, as well as decreasing the risk of incorrect use. A table for the container ratings and recommended master links can be found at the back of this leaflet.

Design Temperature $-40^\circ C$

The Arctic Offshore Master Links are highly suitable to withstand shock loads and fatigue, even in extremely cold conditions. The new master link range has a design temperature of $-40^\circ C$, making it suitable for even the harshest weather conditions such as in the North Sea.

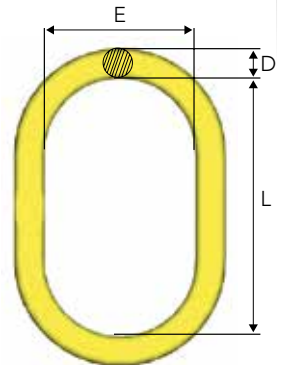
NEW

Arctic Offshore Master Link M

DNV 2.7-1 and DNV 2.7-3 Type Approved.

Art. no.	Code	Working Load Limits				L	E	D	Weight kgs
		DNV 2.7-1		EN 1677-4 EN 13414-1	A-952/A952M ASME B30.26				
		(tonnes)	Max. Container rating* (kgs)	SF 5:1 (tonnes)	SF 5:1 (tonnes)				
Z101486	M-9T- OS	9.3	4 500	9.3	9.3	270	140	25	3.0
Z101487	M-12T- OS	12.5	7 500	12.5	12.5	270	140	28	3.8
Z101488	M-18T- OS	18.5	13 500	18.5	18.5	270	140	32	5.1
Z101489	M-24T- OS	24.0	21 000	24.0	24.0	270	140	36	6.5
Z101490	M-30T- OS	30.5	25 000	30.5	30.5	270	140	40	8.2
Z101491	M-40T- OS	40.0	N/A	40.0	40.0	300	180	45	11.9
Z101492	M-50T- OS	50.0	N/A	50.0	50.0	300	200	50	15.3
Z101493	M-65T- OS	65.0	N/A	65.0	65.0	350	200	55	20.7
Z101494	M-90T- OS	90.0	N/A	90.0	90.0	450	250	70	42.7
Z101495	M-125T- OS	125.0	N/A	125.0	125.0	450	260	80	57.5

* For further information, see DNV 2.7-1

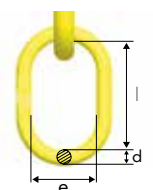
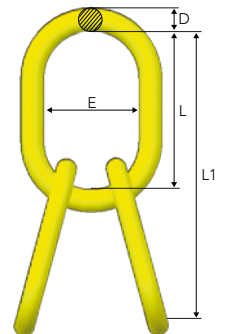


Arctic Offshore Master Link MT

DNV 2.7-1 and DNV 2.7-3 Type Approved.

Art. no.	Code	Working Load Limits				L1	L	E	D	I	e	d	Weight kgs
		DNV 2.7-1		EN 1677-4 EN 13414-1	A-952/A952M ASME B30.26								
		(tonnes)	Max. container rating* (kgs)	SF 5:1 (tonnes)	SF 5:1 (tonnes)								
Z101586	MT-9T- OS	9.3	4 500	9.3	9.3	430	270	140	25	160	95	22	6.0
Z101587	MT-12T- OS	12.5	7 500	12.5	12.5	430	270	140	28	160	95	25	7.8
Z101588	MT-18T- OS	18.5	13 500	18.5	18.5	460	270	140	32	190	110	28	10.8
Z101589	MT-24T- OS	24.0	21 000	24.0	24.0	540	270	140	36	270	140	32	16.7
Z101590	MT-30T- OS	30.5	25 000	30.5	30.5	540	270	140	40	270	140	36	21.2
Z101591	MT-40T- OS	40.0	N/A	40.0	40.0	570	300	180	45	270	140	40	28.3
Z101592	MT-50T- OS	50.0	N/A	50.0	50.0	600	300	200	50	300	180	45	39.1
Z101593	MT-65T- OS	65.0	N/A	65.0	65.0	650	350	200	55	300	200	50	51.2

* For further information, see DNV 2.7-1



All sublinks have a WLL of min. 75% of the top link

Master Link Selection Chart

Reference: DNV 2.7-1, Table 8.1

Container rating (kgs)	Enhancement factor	Min. required WLL (t)	Recommended Masterlink M	Recommended Masterlink MT
500	-	7.00		
1000	-	7.00		
1500	-	7.00		
2000	3.500	7.00		
2500	2.880	7.20	M-9T OS	MT-9T OS
3000	2.600	7.80		
3500	2.403	8.41		
4000	2.207	8.83		
4500	2.067	9.30		
5000	1.960	9.80		
5500	1.873	10.30		
6000	1.766	10.60	M-12T OS	MT-12T OS
6500	1.733	11.26		
7000	1.700	11.90		
7500	1.666	12.50		
8000	1.633	13.07		
8500	1.600	13.60		
9000	1.567	14.10		
9500	1.534	14.57		
10000	1.501	15.01		
10500	1.479	15.53	M-18T OS	MT-18T OS
11000	1.457	16.02		
11500	1.435	16.50		
12000	1.413	16.95		
12500	1.391	17.38		
13000	1.368	17.79		
13500	1.346	18.18		
14000	1.324	18.54		
14500	1.302	18.88		
15000	1.280	19.20		
15500	1.267	19.64		
16000	1.254	20.06		
16500	1.240	20.47		
17000	1.227	20.86		
17500	1.214	21.24	M-24T OS	MT-24T-10 OS
18000	1.201	21.61		
18500	1.188	21.97		
19000	1.174	22.31		
19500	1.161	22.64		
20000	1.148	22.96		
20500	1.143	23.44		
21000	1.139	23.92		
21500	1.135	24.39		
22000	1.130	24.86		
22500	1.126	25.33		
23000	1.121	25.79	M-30T OS	MT-30T OS
23500	1.117	26.25		
24000	1.112	26.70		
24500	1.108	27.15		
25000	1.104	27.59		

Offshore Shackle Range

Gunnebo Industries shackles are made from a range of steel qualities, including acid proof stainless steel and high grade alloy steel to comply with the most stringent specifications. Our workshops comprise all facilities and systems for the manufacturing and control of a top quality product, including tool design, an advanced tool shop, forging, heat treatment, machining, hot dip galvanizing and quality control. We offer a range of DNV 2.7-1 Type approved standard lifting shackles of offshore for containers, developed for the tough conditions of the offshore industry, where safety must be of highest priority at all times. The heat treatment of these products ensures the proper ductility and strength to sustain shock loads which may be imposed when the container is lifted from the deck of a vessel.

Standard Shackle No. 855

0.33 - 120 tonnes.



- Standard: DNV 2.7-1 Type-Approved, EN-13889 and U.S Fed. Spec. RR-C-271 Certificate no. S-7601
- Material: High Tensile Carbon Steel, Quenched and Tempered, Grade 6
- Finish: All parts hot dip galvanized, brown painted bolts on top of galv.
- Documentation: Test certificate and traceable raw material/inspection certificate acc. EN 10204 - 3.1
- Temperature: - 20 °C to 200 °C

Arctic Shackle No. 856

2 - 85 tonnes.



- Standard: DNV 2.7-1, U.S. Fed. Spec. RR.C-271 and EN-13889 Certificate no. S-7601
- Material: Special Alloy Steel, Quenched and Tempered, Grade 8
- Finish: All parts hot dip galvanized + brown colour marking
- Documentation: Test certificate and traceable raw material/ inspection certificate acc. EN-10204 - 3.1 All sizes can be supplied with DNV 2.7-1 Type Approval Certification.
- Temperature: - 40 °C to 200 °C

See our Product Catalog for further specifications of the shackle range.



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