



Arctic Offshore Products

For the Toughest Conditions



GUNNEBO
Industries

Arctic Offshore Products

- **Reduced risk for stress corrosion and hydrogen embrittlement**

Our Master Links are designed to be resistant towards stress corrosion and hydrogen embrittlement. The risk of stress corrosion increases when the hardness of finished products is above 39 HRC - the hardness of our Arctic Offshore Master Links is therefore below 38 HRC.

To get a more resistant material towards hydrogen embrittlement we only work with high quality European manufacturers and the steel is produced to our specification; our steel is a homogenous material with good microstructure, small grain size, low amount of impurities and high fracture toughness.

- **Special stress relieving process**

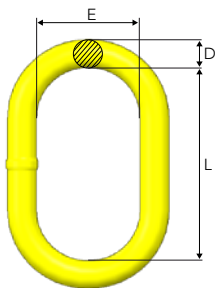
Every single master link in our arctic offshore range is proof loaded to 2.5 times the Working Load Limit. In order to remove potential residual and built in stresses, that could arise e.g. during proof loading, we have added an additional stress relieving process. This process includes an extra heat treatment that removes the residual tension in the links.

- **High toughness ensures ductile products at low temperatures**

All of our Arctic Offshore Master Links are type approved by DnV to DnV 2.7-1 and DnV 2.7-3 offshore container standards. This means, amongst others, that they are Charpy-V impact tested at -40 °C. To make sure that we provide products with good ductility and toughness our testing is always done at a design temperature of -40 °C.

Arctic Offshore Master Link M

DNV 2.7-1 and DNV 2.7-3 Type Approved. Design temperature: -40 °C.

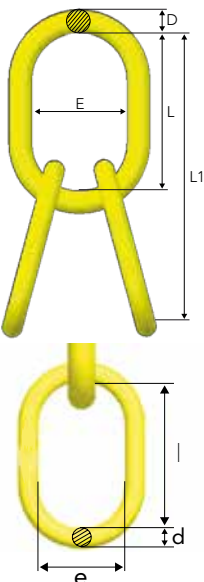


Art. no.	Code	Working Load Limits				L	E	D	Weight kgs
		DNV 2.7-1		EN1677-4					
		tonnes	Max. Container rating* kgs	SF 5:1 tonnes	SF 5:1 tonnes				
Z101486	M-9T- OS	9.3	4 500	9.3	9.3	275	145	25	3.1
Z101487	M-12T- OS	12.5	7 500	12.5	12.5	275	145	28	3.9
Z101488	M-18T- OS	18.5	13 500	18.5	18.5	275	145	32	5.2
Z101489	M-24T- OS	24.0	21 000	24.0	24.0	285	155	36	6.9
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	340	180	45	12.9
Z101492	M-50T- OS	50.0	N/A	50.0	50.0	300	200	50	15.2
Z101493	M-65T- OS	65.0	N/A	65.0	65.0	350	200	55	20.5
Z101494	M-90T- OS	90.0	N/A	90.0	90.0	450	250	70	42.4
Z101495	M-125T- OS	125.0	N/A	125.0	125.0	450	260	80	57.1

* For further information, see DNV 2.7-1

Arctic Offshore Master Link MT

DNV 2.7-1 and DNV 2.7-3 Type Approved. Design temperature: -40 °C.



Art. no.	Code	Working Load Limits				L1	L	E	D	l	e	d	Weight kgs
		DNV 2.7-1		EN 1677-4									
		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	435	275	145	25	160	95	22	6.1
Z101587	MT-12T- OS	12.5	7 500	12.5	12.5	435	275	145	28	160	95	25	7.8
Z101588	MT-18T- OS	18.5	13 500	18.5	18.5	465	275	145	32	190	110	28	11.0
Z101589	MT-24T- OS	24.0	21 000	24.0	24.0	560	285	155	36	275	145	32	17.3
Z101590	MT-30T- OS	30.5	25 000	30.5	30.5	555	270	140	40	285	155	36	22.0
Z101591	MT-40T- OS	40.0	N/A	40.0	40.0	610	340	180	45	270	140	40	29.3
Z101592	MT-50T- OS	50.0	N/A	50.0	50.0	640	300	200	50	340	180	45	41.0
Z101593	MT-65T- OS	65.0	N/A	65.0	65.0	650	350	200	55	300	200	50	50.9

* For further information, see DNV 2.7-1

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

Bow Shackle with Safety Bolt No 855

DNV 2.7-1 and DNV 2.7-3 Type Approved. Design temperature: -20 °C.

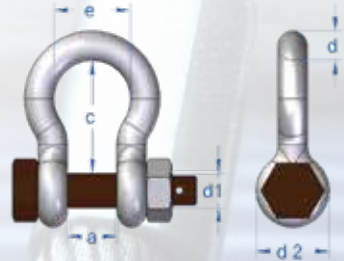


Art. no.	WLL tonnes 6:1	Dim. d1	d Trade size		inner width a*	inner length c*	Bow width e	Eye outer d2	Weight kgs
			mm	inch					
-	0,33	6	5	3/16"	10	22	16	13	-
A085506	0.5	8	6	1/4"	12	29	20	16	0.07
A085508	0.75	10	8	5/16"	13	32	21	20	0.13
A085509	1.0	11	9	3/8"	16	36	26	22	0.17
A085511	1.5	13	11	7/16"	18	43	29	26	0.25
A085513	2.0	16	13	1/2"	21	47	33	33	0.42
A085516	3.25	19	16	5/8"	27	60	42	40	0.70
A085519	4.75	22	19	3/4"	31	71	49	48	1.20
A085522	6.5	25	22	7/8"	37	84	60	52	1.70
A085525	8.5	28	25	1"	43	95	68	60	2.58
A085528	9.5	32	28	1 1/8"	46	108	74	64	3.40
A085532	12.0	35	32	1 1/4"	52	119	83	72	4.80
A085535	13.5	38	35	1 3/8"	57	132	89	76	7.00
A085538	17.0	42	38	1 1/2"	60	146	98	84	9.00
A085545	25.0	50	45	1 3/4"	74	178	127	105	15.00
A085552	35.0	57	50	2"	83	197	138	112	21.00
A085556	42.5	65	57	2 1/4"	95	222	160	132	28.50
A085564	55.0	70	65	2 1/2"	105	260	180	145	39.00
A085576	85.0	83	75	3"	127	330	190	162	62.00
**A085589	120 (5:1)	95	95	3 3/4"	146	400	235	208	110.00

* Forging tolerance: +/- 5% on inside width/length.

** Safety factor 5:1

Split pin included



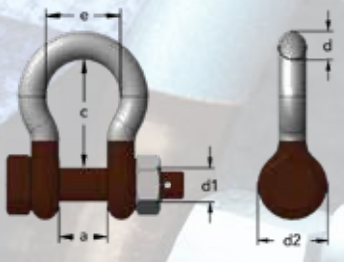
Arctic Shackle with Safety Bolt No 856

DNV 2.7-1 and DNV 2.7-3 Type Approved. Design temperature: -40 °C.



Art. no.	WLL tonnes	Dim. d1	d Trade size		a	c	d 2	e	Weight kgs	Safety factor
			mm	inch						
A085613	2.0	16	13	1/2"	21	47	33	33	0.42	8.00
A085616	3.25	19	16	5/8"	27	60	40	42	0.7	8.00
A085619	4.75	22	19	3/4"	31	71	48	49	1.2	8.00
A085622	6.5	25	22	7/8"	37	84	52	60	1.7	7.85
A085625	8.5	28	25	1"	43	95	60	68	2.5	7.25
A085628	9.5	32	28	1 1/8"	46	108	64	74	3.4	6.94
A085632	12.0	35	32	1 1/4"	52	119	72	83	4.8	6.40
A085635	13.5	38	35	1 3/8"	57	132	76	89	7	6.10
A085638	17.0	42	38	1 1/2"	60	146	84	98	9	6.00
A085645	25.0	50	45	1 3/4"	74	178	105	127	15	6.00
A085652	35.0	57	50	2"	83	197	116	138	21	6.00
A085664	55.0	70	65	2 1/2"	105	260	145	180	39	6.00
A085676	85.0	83	75	3"	127	330	162	190	62	6.00

Split pin included



Master Link Selection Chart

Reference: DNV 2.7-1, Table 8.1

Container rating (kgs)	Enhancement factor	Min. required WLL (t)	Recommended Master link M	Recommended Master link 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 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		

