



## HA MASTER LINKS OS+ Zinc Tough

The HA range of Grade 8 master links and quad assemblies are global industry leaders and are widely used for offshore rigging as well as container lifting sets.

Certified to International Standards: DNV2.7-1, DNV2.7-3, BSEN ISO 10855-2, EN1677-4, ASME B30.26 and API-2CCU – Aug.2017.

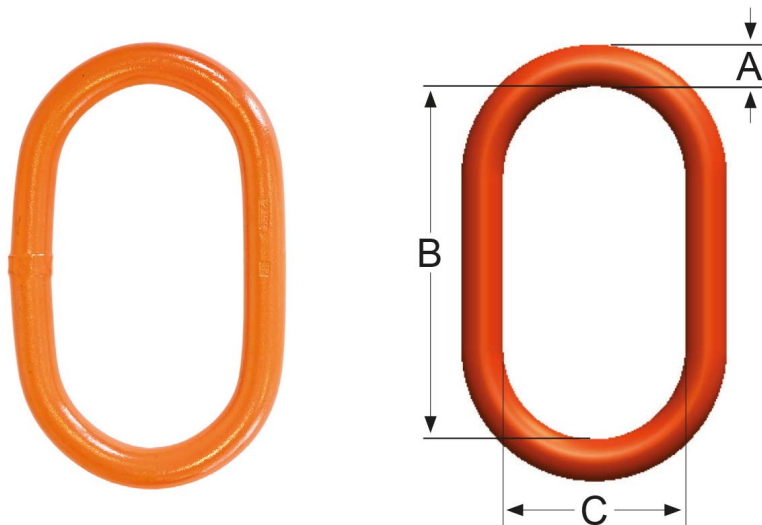
- DNV GL Type Approval TAS00001BN Rev 2.
- Product available in diameters from 22mm up to 75mm and working load limits from 7 tonnes to 100 tonnes.
- The master link and quad assemblies are individually proof load tested to 2.5 times working load limit and 100% MPI.
- MPF (Manufacturing Proof Force): based on  $2.5 \times 9.81 \times \text{Working Load Limit (kN)}$  (min.)
- BF (Break Force):  $\text{WLL} \times \text{Factor of Safety}$ .
- WLL (Working Load Limit) @ 45° to vertical.
- Factor of Safety: 5:1.
- Embossing provides product identity plus individual manufacturing batch and date.
- Average impact energy (charpy) 42 Joules minimum impact resistance at -40°C up to 50mm diameter.
- Operational temperature range is -40°C to + 200°C.
- Incorporating Zinc Tough™ Technology.

## Zinc-Tough™ Technology

The Zinc-Tough™ Technology HA range of Grade 8 Master Links and Quad Assemblies provide superior protection from Hydrogen embrittlement and stress corrosion cracking - making them perfect for lifting operations in offshore environments.

Hydrogen embrittlement is the process by which metals such as steel become brittle and fracture under stress due to the introduction and subsequent diffusion of hydrogen into the metal - it can also be described as hydrogen assisted stress cracking and is particularly prevalent in the extreme conditions of the offshore environment where corrosion is a consistent threat. William Hackett and McKinnon Chain combined their technical knowledge and worked alongside a wide range of stakeholders, including several major oil and gas operators, to develop **Zinc Tough™ Technology**.

This unique manufacturing process delivers a master link with the tensile strength requirements to deliver a 5:1 safety factor with a hardness value as low as 34-36 HRC. The DNV charpy impact values are achieved at -40C, making the links ability to withstand a shock load at any operating temperature.



## SPECIFICATIONS - Metric

### DNV GL Type Approval TAS00001BN Rev. 2

Part Code	Description	A mm	B mm	C mm	WLL t	MPF kN	MBL kN	Mass Kg
330.220+	HA22ML OS+ ZT	22.0	270	140	7.00	172	343	2.28
330.250+	HA25ML OS+ ZT	25.5	270	140	9.30	229	456	3.11
330.280+	HA28ML OS+ ZT	28.0	270	140	14.50	356	711	3.78
330.320+	HA32ML OS+ ZT	32.0	270	140	19.00	466	932	5.02
330.360+	HA36ML OS+ ZT	36.0	270	140	26.00	638	1275	6.46
330.400+	HA40ML OS+ ZT	40.0	280	155	30.50	749	1496	8.46
330.450+	HA45ML OS+ ZT	45.0	320	175	40.00	981	1962	12.18
330.500+	HA50ML OS+ ZT	50.0	350	195	51.00	1251	2502	16.54
330.650+	HA65ML OS+ ZT	65.0	410	220	75.00	1840	3679	33.02
330.750+	HA75ML OS+ ZT	75.0	450	250	100.00	2453	4905	48.98

## SPECIFICATIONS - Imperial

### DNV GL Type Approval TAS00001BN Rev. 2

Part Code	Description	A inches	B inches	C inches	WLL lbs	MPF lbs	MBL lbs	Mass lbs
330.220+	HA22ML OS+ ZT	7/8"	10-3/4"	5-5/8"	15,432	38,667	77,109	5.03
330.250+	HA25ML OS+ ZT	1"	10-3/4"	5-5/8"	20,503	51,481	102,512	6.86
330.280+	HA28ML OS+ ZT	1-1/8"	10-3/4"	5-5/8"	31,967	80,031	159,838	8.33
330.320+	HA32ML OS+ ZT	1-1/4"	10-3/4"	5-5/8"	41,887	104,760	209,521	11.07
330.360+	HA36ML OS+ ZT	1-7/16"	10-3/4"	5-5/8"	57,320	143,427	286,630	14.29
330.400+	HA40ML OS+ ZT	1-9/16"	11"	6"	67,240	168,381	336,313	18.65
330.450+	HA45ML OS+ ZT	1-3/4"	12-3/4"	7"	88,184	220,537	441,074	26.85
330.500+	HA50ML OS+ ZT	2"	14"	7-3/4"	112,436	281,235	562,470	36.46
330.650+	HA65ML OS+ ZT	2-9/16"	16-9/64"	8-21/32"	165,347	413,647	827,070	72.80
330.750+	HA75ML OS+ ZT	2-61/64"	18"	10"	220,462	551,455	1,102,685	108.00



**William Hackett**

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