



## Calibrated Chain for Anchor Windlasses

When you buy a calibrated chain for your new boat or when you need to replace your existing anchor chain, it's important to know what chain suits your windlass for the best fit. The majority of windlasses require chain in accordance with either DIN 766 or ISO 4565. DIN 766 (DIN = German Institute for Standardization), this standard is for calibrated and tested chains using Grade 3 material. ISO 4565 (International Organisation for Standardisation) or EN 24565 or BS 7160, these are all the same standard which covers anchor chains for small crafts.

### Grade 3 / 4 Calibrated Short Link Chain

Material: Mild Steel / High Tensile Carbon Steel

Finish: Hot Dip Galvanized

Part Code	Grade	A	B	C	Compatibility		Weight Per M (Kg)	Proof Force (kN)	Minimum Breaking Force (kN)
		Chain Size (mm)	Pitch (mm)	Max. outer width (mm)	ISO 4565	DIN 766			
2.060.G30	3	6	18.5	21.6	Yes	Yes	0.80	10.00	18.0
2.060.G40	4	6	18.5	21.6	Yes	Yes	0.80	10.00	20.0
2.070.G30	3	7	22.0	23.8	No	Yes	1.15	16.00	25.0
2.070.G40	4	7	22.0	23.8	No	Yes	1.15	16.00	30.0
2.080.G30	3	8	24.0	28.8	Yes	Yes	1.40	20.00	32.0
2.080.G40	4	8	24.0	28.8	Yes	Yes	1.40	20.00	40.0
2.100.G30	3	10	30.0	36.0	Yes	No	2.25	32.00	50.0
2.100.G40	4	10	30.0	36.0	Yes	No	2.25	32.00	63.0
2.100.D766	4	10	28.0	36.0	No	Yes	2.20	32.00	63.0
2.120.G30	3	12	36.0	43.2	Yes	No	3.25	35.00	71.0
2.130.G30	3	13	36.0	47.0	No	Yes	3.90	50.00	80.0
2.140.G30	3	14	41.0	50.0	No	Yes	4.40	63.00	100.0
2.140.G40	4	14	41.0	50.0	No	Yes	4.40	63.00	121.0
2.160.G30	3	16	45.0	58.0	No	Yes	5.80	80.00	125.0

### Grade 4 Calibrated Stainless Steel Short Link Chain

Material: AISI 316 / 316L Stainless Steel

Finish: Polished

Part Code	A	B	C	Compatibility		Weight Per M (Kg)	Proof Force (kN)	Minimum Breaking Force (kN)
	Chain Size (mm)	Pitch (mm)	Max. outer width (mm)	ISO 4565	DIN 766			
IS1.060.5	6	18.5	21.6	Yes	Yes	0.8	11.00	22.0
IS1.080.5	8	24.0	28.8	Yes	Yes	1.4	20.00	40.0
IS1.100.5	10	30.0	36.0	Yes	No	2.2	32.00	63.0
IS1.100.D766	10	28.0	36.0	No	Yes	2.2	32.00	63.0
IS1.120.5	12	36.0	43.2	Yes	No	3.2	47.5	95.0
IS1.140.5	14	41.0	50.0	No	Yes	4.4	63.00	100.0
IS1.160.5	16	45.0	58.0	No	Yes	5.8	80.00	125.0



### Grade 5 Calibrated Stainless Steel Short Link Chain

Material: AISI 316L / 1.4404 Stainless Steel

Finish: Polished

Part Code	A	B	C	Compatibility		Weight Per M (Kg)	Proof Force (kN)	Minimum Breaking Force (kN)
	Chain Size (mm)	Pitch (mm)	Max. outer width (mm)	ISO 4565	DIN 766			
ISS.060.5	6	18.5	21.6	Yes	Yes	0.8	18.43	30.0
ISS.070.5	7	21.0	23.8	No	Yes	1.1	24.51	40.0
ISS.080.5	8	24.0	28.8	Yes	Yes	1.4	30.64	50.0
ISS.100.5	10	30.0	36.0	Yes	No	2.2	49.00	80.0

The majority of these chains are manufactured from Grade 3 (30) material which is a mild steel chain based on BS 6405:1984, although William Hackett offer more sizes in Grade 4 (40) material offering better ductility and a higher minimum breaking load. A combination of wire diameter, link outside width and most importantly the chain pitch (inside link length) must be consistent throughout the length of the chain to ensure the best fit in the gypsy.

To produce a calibrated chain the manufacturer would normally weld the chain shorter than required. It would then be subjected to a further process of calibration. This process pulls each link to a constant length within a tolerance.

William Hackett have been supplying calibrated chains to the marine industry for many years, and work very closely with major gypsy and windlass suppliers to give a wide range of different calibrations.

Within our quality system we have a very detailed procedure for chain manufacture. Depending on size and pitch, our standard will be based upon a recognised international standard like BS 6405 or BS ISO 4565 but our tolerances are narrower and we also specify higher test loads. To produce to these standards, we ensure that the best material preparation is carried out, the quality of the weld also has to be good and the calibration tolerances adhered to. For this we specify that our calibrated chain is manufactured on high quality, fully automatic chain making machines.



All of our calibrated chain is supplied with a certificate of conformity and test. This confirms that the chain has been subjected to a proof load and our in-house batch testing ensures that the chain can withstand the minimum breaking load.

As part of our quality assurance system ISO 9001:2008, all our chains are inspected and tested to ensure that they meet our requirements. Our specifications are designed to exceed the minimum specified in the standards.

It is important that anchor chain is not only strong enough but has an even calibration throughout, this will ensure that the chain will run smoothly on the gypsy and be strong enough to withstand the anchoring loads it will be exposed to.

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### Calibration variants:

Chain Diameter (mm)	Chain Pitch over 11 Links	
	ISO 4565	DIN 766
6	198mm +/- 2%	203.5mm +0.9/-0.5
7	N/A	242mm +1.1/-0.5
8	264mm +/-2%	264mm +1.2/-0.6
10	330mm +/-2%	308mm +1.4/-0.7
12	396mm +/-2%	N/A
13	N/A	396mm +1.7/-0.9
14	N/A	451mm +2.0/-1.0
16	N/A	495mm +2.2/-1.1

### Pitch variants:

Chain Diameter (mm)	Relevant Standard	
	ISO 4565	DIN 766
6	18mm	18.5mm
7	N/A	22mm
8	24mm	24mm
10	30mm	28mm
12	36mm	N/A
13	N/A	36mm
14	N/A	41mm
16	N/A	45mm



### Quality Chain can be recognised by the following:

- The material diameter is consistent throughout. However, you might find some material reduction around the bends. This is normal. As most links are cold bent, some chain bending machines will also leave a 'tooling' mark on the back of each link.
- The ends of the links should be a consistent radius and the sides straight and parallel.
- There is normally a slight raised collar around the weld. When the link is welded and the upset pressure is applied, you will get an amount of excess metal. The chain machine will have a trimming mechanism that will remove this excess metal and leave a slightly raised collar. If the trimming setting is badly adjusted you may see gouges in this area.
- All calibrated chain supplied by William Hackett has a batch number marked approximately every 20th link, this ensures that we can maintain our traceability once the chain has been put into service.

For anchor chain the calibration is very important. A consistent pitch throughout the length of chain enables the chains to run smoothly on the gypsy. If the chain jumps it might be because the chain isn't correctly calibrated to suit the gypsy. All our chains are checked for consistency in calibration. We use a range of simple measuring tools to check that the calibration is consistent and we can also run them on our range of windlasses.

### Enlarged End Links / Rope Splicing / Anchor Packs

As an addition to supplying calibrated chain in standard lengths with plain ends, we also offer the facility to fit enlarged end links to better facilitate the anchor shackle (see below table).

We also have the ability to splice 3-strand nylon rope, in any length required, or supply a complete 'anchor pack' consisting of: anchor, anchor shackle, calibrated short link chain, 3-strand nylon rope.

All of these options are available on request.

### Enlarged Links to suit Grade 3/4 Chain

Chain Size (mm)	Link Diameter (mm)	Internal Length (mm)	Internal Width (mm)
6.0	8	38	20
7.0	9	48	20
8.0	9	48	20
9.5 / 10.0	12	63	22
12.0	14	50	25
13.0	16	64	24
14.0	16	64	24
16.0	20	76	28

### Enlarged Links to suit Stainless Steel Chain

Chain Size (mm)	Link Diameter (mm)	Internal Length (mm)	Internal Width (mm)
6.0	8	38	19
7.0	9	38	19
8.0	9	38	19
10.0	13	54	25
12.0	13	50	25
14.0	16	70	35
16.0	18	70	35