

Things to Know About Anchor Chain

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One of the cool things about running this site is that gear manufacturers are now beginning to recognise the purchasing power and general clout that you, our readers, wield. So now when I ask a whole bunch of questions about a manufacturer's products—many of them dumb, I'm sure—they are more likely to find the time to educate me than they once were.

This seems to be true of most all of the manufacturers we contact these days, but the good folks at Peerless Chain, manufacturers of Acco Chain, bent over backwards to educate me and sort out

many of my misconceptions about chain by providing not just one, but three experts during a recent conference call I had with them.

Here are some useful things we learned.

Strength

There are three ways chain strength is specified:

Working Load Limit (WLL)

This is the number quoted in most catalogues and is the load on the chain that should not be exceeded in normal use.

Proof Test

Every link of a reputable manufacturer's chain is subjected to a load test during manufacturing that is, at least at Peerless, twice the working load limit—lots of safety margin here. By the way, a good way to check if you are being sold good quality chain is to ask for a proof certificate on the *actual piece* of chain that you are buying—if you get excuses, run a mile.

Minimum Break Load (MBL)

At Peerless Chain a small piece of each 2000-foot manufacturing lot is removed and tested to destruction. Minimum break load is the lowest load reading they get that causes one of these samples to start distorting. For non-heat treated chain like BBB or G43 the MBL is three times the WLL and for heat treated chain the safety margin is a very conservative 4:1.

Chain Grades

There are a whole bunch of industry standard chain grades, but here are the three that are relevant to us voyaging sailors:

BBB and Proof Coil (30)

Both BBB and proof coil chain are grade 30 and made from 1008 carbon steel, the lowest grade chain recommended for anchoring. The difference between the two is that BBB has a shorter link size.

High Test (43)

There is a lot of confusion out there in the market about this grade and there's a lot of chain labelled as high tensile or high test that is not really very strong at all. To clarify, real high test chain is classified in the industry as grade 43. If you get it from Peerless, every single link is

stamped “P4”. If you don’t see that stamp, you might be having your chain yanked (ouch, sorry, I couldn’t help myself).

Grade 43 is simply made with a higher quality 1022 steel than BBB/proof coil which is what gives it its greater strength. It is not heat treated—more on why that distinction is important later.

Grade 70

This chain does not appear in the Peerless/Acco chain catalogue as suitable for anchoring, but some voyaging sailors, most notably [Steve Dashew](#), have used it for years with success. Grade 70 is made with the same 1022 steel as grade 43 high test, but it is then heat treated, which makes it stronger still. All grade 70 from Peerless is stamped “P7” on every link.

Galvanizing

All three chain grades can be supplied galvanized. With grades 30 and 43 this process has no deleterious effect on strength. However, because grade 70 is already heat treated, the heat in the galvanizing process causes it to lose about 10% of its strength, both WLL and MBL.

By the way, contrary to a widely held opinion, re-galvanizing does not reduce the strength of any of the three grades—no, not even grade 70—because the effect of heating in the galvanizing process is not cumulative. But this is only true provided said re-galvanizing is *done properly*.

The last caveat is the problem. Unless you can talk Peerless into re-galvanizing your chain (and you won’t be able to since it’s cost prohibitive for them when compared to new chain) you will have no way of knowing what damage was done to your chain by mistakes in the galvanizing process. (If Peerless did it, they would re-proof it.)

So we stick by our recommendation that re-galvanizing the link that attaches you to your best insurance policy (your anchor) is simply not worth the risk, even though new chain is anything but cheap.

Toughness

Many sailors, including me until enlightened, think that the stronger chains such as G43 and G70 are more brittle than weaker ones like BBB and therefore more prone to shock induced failure. This is not true.

While it is correct to say that BBB is more ductile and therefore will distort more before breaking than its stronger cousins, the G43 and G70 chains are each tougher (the term that the engineers at Peerless prefer when comparing chains) and therefore will withstand higher loads than BBB before ultimate failure no matter how that load is applied. Also, each step up the strength/toughness scale also gives you a chain that is more resistant to abrasion damage.

Don’t Shock Load

Having said the above, the folks at Peerless repeatedly cautioned me that it is vital to mitigate shock loads since all of their design and testing is done with slowly increasing static loads, not shocks.

This confirms our recommendation that a nylon rope snubber should be used at all times. And that this snubber should be of sufficient length—we say *minimum* 30-feet (10 meters)—to provide some real shock damping. Forget those 6-foot snubbers you see so often.

Best Chain for Anchoring?

So which chain do we use and why? This post is getting long enough, so we will tackle that in the next post.

Further Reading

- [The Peerless Chain Catalogue](#)
- [Lots more articles on anchoring](#)
- [More on snubbers](#)