DINGHY SPARS

MANUFACTURE, CHOICE AND CARE

SELDÉN

for sailing

SELDÉN FOR SAILING

Seldén are the world's largest spar maker, producing masts and rigging for all types of dinghies, keelboats and yachts from 8ft to 80ft. We have production facilities in Europe, USA and Asia. We manufacture all our carbon spars and most of our aluminium dinghy spars at our UK factory, while spars for the most popular US classes are assembled at our facility in Charleston, South Carolina. We also produce an extensive range of deck hardware including blocks, cleats and travellers as well as many bespoke hull fittings for leading dinghy manufacturers.

WHY CHOOSE SELDÉN?

Seldén produce more spars and win more races than any other dinghy mast manufacturer. The reason for this is that we have expert knowledge, cutting edge technology and more resource that allows us to use our volume to produce a better product for our customers. In 1996 Seldén bought Proctor Masts who at the time were the market leader in dinghy spars. We improved, automated and refined the Proctor range into the world beating products we sell today.

CONSISTENCY IS KING

Seldén manufactures the most consistent dinghy spars available. By minimising variation in our processes and products we are helping sailors to achieve consistent rig tune that is imperative when there are so many other variables involved in the sport of sailing.

If you are buying a mast as a spare you need to be able to use both spars on the same rig settings. If you are buying a mast to be the same as someone you think is faster than you, you need to know your new spar is as close as possible to theirs. If you are using your sailmakers tuning guide, you need to know your mast is consistent with the mast they used. And finally, if you are buying a spar for recreational sailing, you need to be confident your mast is as close as possible to our design specification to provide you with many years of enjoyable sailing.

HOW DO WE DO THIS?

The aluminium extrusion we use is made using tooling which, with use, wears away. As it wears the wall thickness of the tube increases and the extrusion loses dimensional accuracy. We change our tooling on a regular basis so our section is more likely to be in the middle of our tolerance.

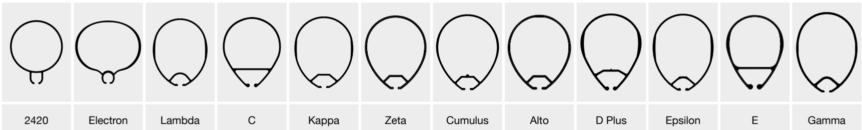
We have more control over our tapering process with CNC (Computer Numerical Controlled) cutting, automatic welding and data logging with our heat treatment.

Finally, our CNC drilling equipment is far more accurate than hand measuring meaning that fittings position such as shroud attachment points, are accurate and symmetrical. For carbon spars our process uses CNC controlled equipment to lay aerospace grade pre-preg fibre. This unique method ensures that fibre with the correct resin content is laid in exactly the same place, every time.

ALUMINIUM MAST SECTIONS

The Seldén range of dinghy sections covers boats from 8ft to 18ft.

Profiled sections are aimed at more performance focused classes. They are stiffer fore/aft and are usually tapered to optimise sail shape, reduce weight and improve gust response. They also create less windage. Seldén's range follows logical steps in stiffness allowing sailors to select a section that best suits the requirement of their class of boat and crew weight.



Round sections are more often used on recreational or una-rigged boats. Although cheaper and simpler to produce, the demands on this type of spar are just as high as a tapered performance rig. This is why many manufactures and classes turn to Seldén for this type of spar.

USING YOUR SPAR

All dinghy rigs are 'dynamic' in that they are designed to bend to change the sail shape depending on the wind strength. By contrast yacht rigs are 'static' in that they are designed not to bend because as the wind increases the yacht sailor will reef their sails.

Due to the need for a dinghy mast to bend they often operate close to their yield point, the point where the mast is no longer able to recover to its original straight position, or if you have a carbon mast, the point that it breaks.

The result for an aluminium mast is the mast taking a permanent set. The yield point is dependent on the hardness of the aluminium. 6082T6 is the hardest easily available aluminium but Seldén XPS is harder still to try and combat this issue.

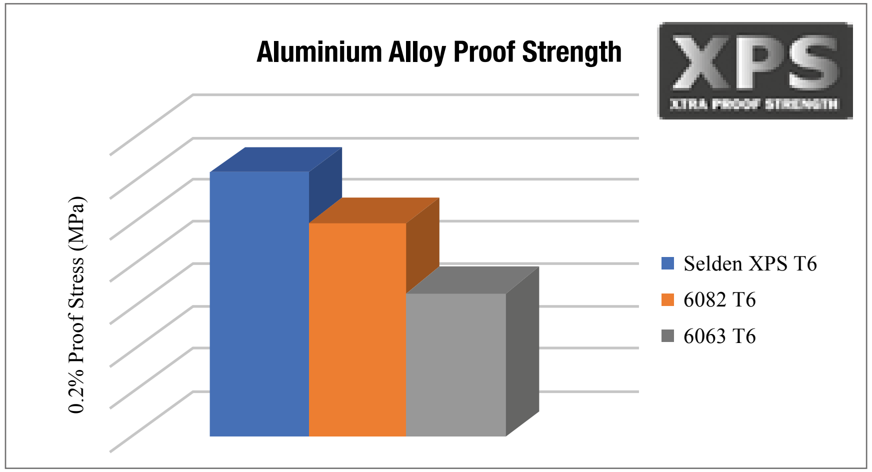
There are a few ways you can avoid overloading your rig:

- Tune your rig using your sailmaker guide
- Don't overload your boat as this increases the stress on the rig
- Don't sail in extreme conditions; there will be consequences!

THE ALUMINIUM COCKTAIL

Until recently all our aluminium masts have been made from 6082, a high magnesium alloy that is the best generally available material for dinghy mast extrusion. We have now introduced a new material, developed exclusively by our own engineers in partnership with the world's leading aluminium extruder.

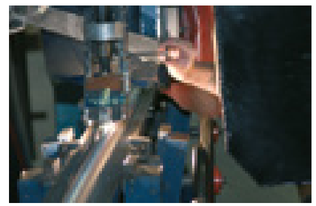
Seldén XPS alloy is the best aluminium dinghy spar material available in terms of hardness, durability and corrosion resistance. Only Seldén have the technology, know-how and volume to develop and specify XPS, our own unique blend of extra proof strength aluminium. This unique blend allows us to produce a selection of aluminium masts that are less likely to take a permanent bend.



CNC TAPERING

A tapered dinghy mast is smaller in section at the top than at the hounds. This allows the tip to bend more in gusts that flatten the sail and opens the leech to automatically depower the rig.

To taper the tube, we cut a 'V' section from the front of the mast section then press the cut closed. Finally, we weld the cut together to re-form the tube.



The load in a topmast decreases at a decreasing rate so we use a parabolic taper to ensure the topmast bends and recovers evenly. To achieve this, we CNC cut all our tapers. A straight taper will not bend evenly as there is a more sudden reduction in stiffness at the start of the taper.

AUTOMATIC WELDING

A straight and consistent taper is vital to the even bend of the taper. Only Seldén use automatic welding to achieve this.

HEAT TREATMENT

All our tapered spars are heat treated after welding to ensure the aluminium reaches full hardness. XPS aluminium requires a unique heat treatment cycle to realise the full benefit of the material, so within the oven heat sensors are attached to the tubes to ensure accuracy. Every cycle is checked and every tube is hardness tested to ensure your spar exhibits the maximum benefit of the alloy.

PEENING

All Seldén tapered spars are glass bead peened. This process cleans the surface and provides an even satin finish. The surface is also harder so resists scratches, and is easier to anodise improving corrosion resistance.

ANODISING

All our spars are anodised to AA25 standard to ensure corrosion resistance in salt water conditions.

CNC MILLING

Seldén are the only dinghy spar maker to use CNC controlled equipment for all fittings placement. All fittings, sail entries and T terminal positions on your spars will have been drilled or routered on our latest CNC equipment which is fast, accurate and consistent.

SCAN HERE

See the CNC milling machine in action!

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SPECIALIST FITTINGS

Almost all the fittings on your spars will have been designed by Seldén engineers. Our knowledge, experience and resource has allowed us to design fittings that are strong, reliable and provide many unique benefits to the sailor.

- Optional halyard lock - to keep your main hoisted to the measurement band
- Ball bearing sheaves - to reduce friction between sheave and pin allowing higher line speeds
- A range of jib halyard boxes are available to suit different typical halyard loads
- Fully adjustable spreaders with lock system - for the ultimate in adjustment and rig control
- Standard or extended goose neck – to reduce weight and increase strength and functionality
- Heels with multiple sheave options - for easier installation and retrofitting
- Heavy duty mast step - for sheer strength and durability
- Vernier shroud adjusters - for adjusting the length of shrouds to exact measurements






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Learn more about our range of dinghy mast fittings

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CARBON MAST SECTIONS

Seldén carbon masts are at the cutting edge of dinghy spar technology. They are found on World Championship winning skiffs, foiling Moths and production One-Designs.

The weight and stiffness of a mast can greatly affect sailing performance. If you want to decrease the weight but not compromise on the stiffness and strength of your mast a carbon mast is the answer.

Carbon Fibre is 50% stiffer than aluminium which allows our engineers to design lighter, stiffer and smaller section masts that are more durable than aluminium.

LIGHTER, STIFFER, SMALLER

Lessening the weight in the rig reduces pitching moment of the boat making you faster through waves. It also increases your righting moment making the boat less likely to heel over and easier to right after a capsize.

Increasing stiffness improves control of mast bend enhancing sail shape leading to better performance.

Reduced section size reduces windage and drag that makes the mainsail more efficient.

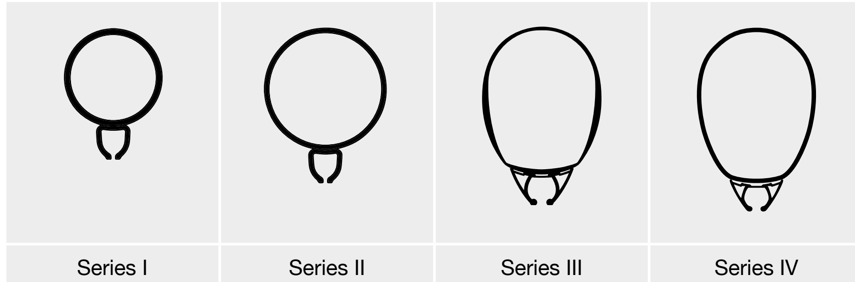
Our engineers have worked with top teams to optimise the stiffness/weight/section balance based on the needs of individual classes. For example, some skiffs are more concerned with gaining stiffness as this allows them to carry ‘fat top’ mainsails, while other classes gain most performance by minimising section size, even if this leads to a slightly heavier mast.

Carbon masts are stiffer for the same weight.

STRONGER

Carbon spars are also stronger than aluminium masts meaning they can bend further without breaking. This allows carbon rigs to be more dynamic in that they can bend further to depower the sails. They can also withstand more extreme use such as the demands of high performance skiffs.

The investment in a sophisticated carbon filament moulding machine and autoclave has enabled Seldén to produce a new generation of carbon spars.



The following steps ensure that Seldén manufactures the best performing and most consistent spars on the market.

IN-HOUSE SPECIALIST DESIGN TEAMS

Seldén has the design expertise and software to enable us to create a mast to meet exacting performance requirements. During the design process the position and alignment of each fibre is precisely calculated to meet the required bend characteristics. Unlike aluminium, we can vary the stiffness of the masts along its length by laying more or less carbon is specific areas. For example, our designers may use a much thinner laminate in the top mast of a hiking boat to produce a soft tip and gust response.

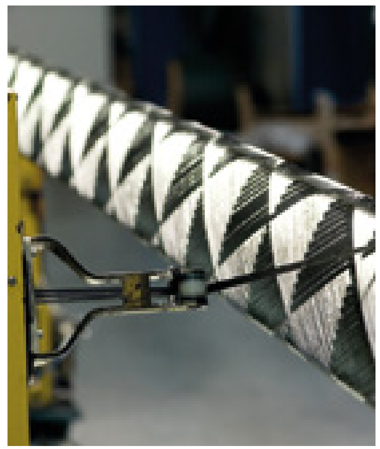
The detailed design is then used to program and control our filament winding equipment. Mandrel Filament Moulding (MFM) is a process unique to Seldén. Our custom made CNC fibre laying machines are fast, efficient and equipped with a delivery system designed and fitted by Seldén to provide the finished spar with unrivalled accuracy and precision.

The combination of meticulous care, long experience and exact specifications enable us to achieve optimum performance for minimum weight.

COMPUTER CONTROLLED LAMINATE LAY UP

Carbon filaments are wound around a mandrel (male mould), under controlled tension, via the designated winding program supplied by the design team.

Computer controlled filament winding guarantees consistent and accurate filament fibre orientation from spar to spar. Carbon filaments can be laid at different angles to produce a wide range of bend characteristics. This accurate alignment of composite is vital to the performance characteristics of your carbon spar.



This process gives a Seldén spar a level of tube consistency unattainable via any other composite manufacturing technique; the mast you buy will perform as well for you as it will for a world champion sailor!

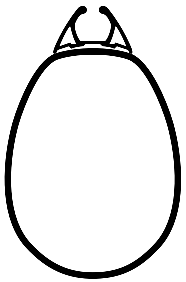
USE OF PRE-PREG CARBON

Only the highest grade pre-preg tows of carbon fibre are used to give sailors the best stiffness-to-weight spar. This, in combination with our filament winding process, enables the highest fibre to resin content of pre-preg to be used. The aerospace grade pre-preg has a UV stabaliser in the resin system to give your spar a guaranteed long life, even in the sunniest climates. More fibres and less resin, mean lighter, stiffer masts.

AUTOCLAVE CURED

The consolidation of the material to form a ready to assemble carbon tube is completed in our in-house 20-metre long autoclave. The combination of heat and pressure to cure the resin and consolidate the pre-preg material ensures strong and consistent final product.

SECTIONS

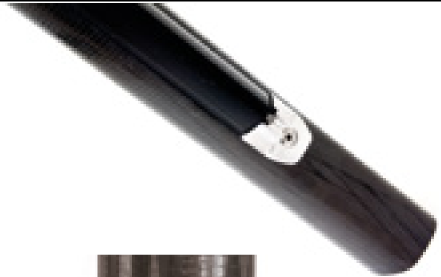


Series III and Series IV Seldén spars have teardrop shapes instead of the round tubes commonly available on the dinghy market. The teardrop profile gives the spar the required stiffness ratios fore and aft to counteract upwind kicker loads and to support ‘fat head’ mainsails.

Series II and Series I are round sections designed for classes with more traditional sail plans and focus on reduced windage. The top has a flat back and a tapered front unlike other brands that have a cone which tapers on the front and the back. This can lead to a distorted sail shape.

EXTERNAL PATCHING

All Seldén carbon masts are externally reinforced using pre-preg woven carbon cloth to ensure localised reinforcement at high-load areas and the secure attachment of fittings.



CUSTOM DESIGNED PVC TRACK

Seldén carbon masts have a custom-made track that is shaped to extend the profile. It is extruded from a light weight plastic that offers excellent heat and UV stability as well as high wear resistance.
The track has a large bonding surface for attachment to the mast. This helps to increase its strength and durability.

CARBON TRACK

A carbon sail track can be specified as an option on some masts. Bonded to the back of the main spar tube, a carbon track further increases the fore/aft stiffness of the spar. It is also very weight efficient compared to the standard PVC track.

SCAN HERE
To see Seldén carbon filament winding

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A RANGE OF CUSTOM DESIGNED FITTINGS

Although Seldén carbon dinghy spars are designed to fit the same range of fittings developed for the aluminium range, they also feature some custom designed parts for carbon applications. These include our stainless steel sail feeder, carbon gooseneck and carbon fully adjustable spreader system.

SPINNAKER POLES

Seldén dinghy spinnaker poles are both light and stiff, and available in aluminium and carbon. Our spinnaker pole end has been designed for ease of operation and strength. The more powerful spring gives positive operation and the plunger is designed to engage in a recess in the beak that provides the strength needed for high load applications.

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To learn more about
Seldén Spinnaker Poles

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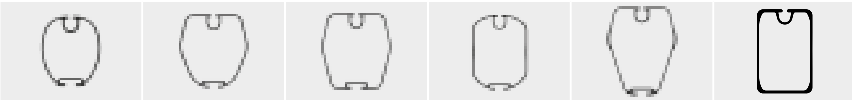
BOOMS

As with our mast sections, our booms also work with logical increases in stiffness. However, we also have sections that are optimised for specific classes such as 2229 for Europe and Ultima for 470. Again, we have used our knowledge and technology to add more fittings and functions to dinghy



2520	2628	Olympus	2229	2633	Ultima

boom design. For example, 2628 and 2633 can be supplied with GNAV systems that increase the amount of room in the cockpit and do away with the hazard of the conventional kicking strap. They can also be fitted with single line reefing that allows the safe and simple reduction of sail area.

Carbon booms are both lighter and stiffer than their aluminium equivalents. Lighter booms reduce the weight on the sail allowing a more open leech in light winds. They also make the boat easier to gybe as there is less momentum in the rig during the manoeuvre.

TUNING YOUR SELDÉN MAST

In order to optimise performance, you will need to correctly tune your rig. Due to the number of classes we supply, many with their own unique requirements, it is not possible for us to provide tuning guides. The best source of information is your sailmaker who should be able to provide you with information on how to tune your mast to match your sails.

TAKING CARE OF YOUR SPARS

With careful use and a small amount of care your mast will last many years. To help here are some dos, don'ts and things to check.

	DO wash your mast with fresh water whenever possible after sailing, particularly if you have capsized in salt water.
	DON'T store your mast in a mast bag. Mast bags are ideal to keep a mast clean when trailing but leaving a wet, salty mast in a bag is the ideal way to start corrosion.
CHECK	CHECK for dents in the section, especially at deck level on masts and at the shroud touch point on booms. Dents will be weak points that could lead to a failure.
	DO apply a small amount of mast polish at the start of every season to the mast surface.
	DON'T use any type of abrasive paper or cleaner as this could penetrate the anodising.
CHECK	CHECK all sheaves are running smoothly. Lubricate with a dry PTFE spray, replace worn sheaves.
	DO inspect the mast annually for worn sheaves, corrosion under fittings and cracks round high load areas such as shroud terminals.
	DON'T store your mast with stainless steel rigging touching the aluminium mast tube.
CHECK	CHECK stainless wire rigging for kinks. Rigging with major kinks or broken strands will need to be replaced.
	DO replace any split rings that have uncoiled and could catch.
CHECK	CHECK spreader ends are clamping the shroud so the spreader is at 90 degrees to the shroud.
	DO avoid drilling any extra holes in your spar, particularly at high load points such as close to the deck and gooseneck, or the kicking strap attachment point on the boom.
CHECK	CHECK Dyneema halyards for wear at the cleat point or tie-off knots. If needed, shorten the halyard slightly.

For carbon spars there are two important, extra precautions:

1. The wall thickness of carbon spars is highly optimised for weight reduction. Drilling extra holes can seriously compromise the structure of the rig. Consult your dealer before you modify your spar.
2. We use a UV resistant epoxy resin system but the cosmetic appearance of your carbon mast will still be effected by sunlight. With time it will lose its surface shine and over a longer period may appear ‘milky’. This will not affect performance. Carbon spars should be protected from UV when possible.

Longer term storage should be out of direct sunlight. A light rub down and a coat of a clear UV lacquer will restore the original shine. Consult your dealer for details.

SCAN HERE
To find your nearest Seldén Mast dinghy dealer or visit www.seldenmast.co.uk

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The Seldén Group is the world's leading manufacturer of mast and rigging systems in carbon and aluminium for dinghies, keelboats and yachts.

Our well known brands are Seldén and Furlex.
The worldwide success of Furlex has enabled us to build a network of over 750 authorised dealers covering the world's marine markets. So wherever you sail, you can be sure of fast access to our service, spare parts and know-how.

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