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facnor[®]
CUSTOM SYSTEMS

a **Wichard** Group Company

FACNOR CUSTOM PRODUCTS

Photo : MC3 / Jesús Renedo

Conception : Facnor - Drawings : P. Lameille / facnor - Photo crédit : EB / Facnor unless specific mention - Cover : V. Curutchet (1) & J. Renedo (4) - 2013

Photo : V. Curutchet

facnor[®]
CUSTOM SYSTEMS

Marine experience

Custom projects for ocean cruising or racing maxi-yachts require high tech means: computerised design, technical knowledge in metallurgy and composite materials, and a constant updated data-base. In a logic of sustainable development, our team gives full priority to first class customer service, technical solutions crossing innovation and reliability as well as effective shipping management all around the globe.



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Non contractual document :
The information and specifications contained in this custom catalogue are subject to change without prior notice.

TAILOR MADE

Quality Production

- > Wide production capacity within our group;
- > Anodizing baths among the longest in the world (Sparcraft US) and Europe (Sparcraft);
- > Electrostatic powder painting box (Sparcraft-US);
- > Plasma CNC cutting machine;
- > CNC and traditional machining
- > Complementary production means in plastic processing and hot forging (affiliate company of Wichard Group).



Photo © Wichard



Photo - Nicolas Juizi

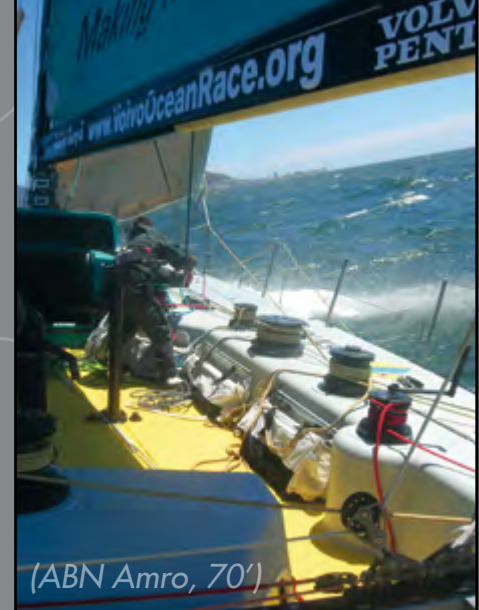
Since 1980



ENGINEERING EXPERIENCE

Marine experience

- > Experience of over 30 years in marine industry;
- > An in-depth study of needs and a rigorous management of the specifications;
- > A synergy of means in computerised design and production;
- > Human resources based on skills and dynamism;
- > Products tested in extreme conditions by the most experienced ocean skippers.



(ABN Amro, 70')

Photo - D. Yan

Innovative

- > Design and conception of new tailor made equipment with higher performance: load, resistance, weight, handling...
- > Measurement and simulation of all the parameters our research and development means;
- > Permanent technology watch and constant complementary cooperation with our partners.



(Oracle - Photo G. Grenier)

DESIGN & CONCEPTION





Photo : Hetairos / Baltic 197' - Peter Neumann / YPS, Hamburg

MAXI-YACHTS EXCELLENCE

> Experience of over 30 years in manufacturing furling systems has raised Facnor to a high-level of expertise. Its focus on R&D and its close partnership with ocean or maxi yacht skippers has pushed Facnor to become even more specialized in tailor made solutions.

> From its own experience gained in ocean races, Facnor has been offering Maxi yacht skippers tailor made equipment. The high level of specialisation on these projects, must be carefully carried out: "Haute couture Furlers for upper-level cruising".

> Facnor is well-known for its reliable and sturdy products. This led it to participate in some outstanding architectural projects. Recently Facnor refitted *Club Med II* furlers (the biggest cruising-sailing yacht, 620 feet long).

- Maxi-yacht projects :
- Baltic 147' Visione,
 - Baltic 197' Hetairos,
 - Briand 108' Inoui,
 - Class J 121' Shamrock V,
 - Class J 131' Velsheda,
 - Finot Conq 100' Nomad IV,
 - Gun Boat 60', 62', 66', 90',
 - Maxi 147' Mari-Cha III,
 - Maxi 140' Mari-Cha IV,
 - Maxi 142' Sarissa & Mystere,
 - Maxi Open 115' Maiden Hong Kong,
 - Maxi 85' Winquest,
 - Perinavi 197',
 - Sarissa 142' Bill Trip design
 - Schooner 152' Windrose,
 - Schooner 203' Athos,
 - Superyacht 156' Hyperion,
 - Swan 80, 82, 100, 112,
 - Wally 80' and 82'
 - Wally 94' Y3K (94'),
 - Wally 96' Magic Carpet 2,
 - Wally 100' Magic Carpet 3,
 - Wally 100' Dark Shadow,
 - Wally 100' Alexia,
 - Wally 107' Kenora & Nariida....

Drawing : Dykstra Naval Architects - Hetairos / Baltic Yachts



108' Inoui



Wally 100'



Maricha III

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Photo : Hetairos / Baltic 197' - Peter Neumann / YPS, Hamburg

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MAXI-RACING



Photo : Mark Lloyd / Mod S.A.

> **Service:** Facnor team offers real guarantee of inspection, refit or improvement of the equipment with a professional after sales service.

RESPONSIVENESS

PERFORMANCE

From its experience in ocean racing equipment, Facnor has become the official supplier of the monotype MOD70 trimarans. A prestigious victory carried out by its willingness to except and take on new challenges.

> **Responsiveness:** Before departure, Ocean races require a meticulous preparation similar to Formula 1 teams. In this perspective, project managers and technical partners work closely together: this is race by race! Our teams take up technical challenges in order to cross both start and finish lines.



FACNOR CUSTOM PRODUCTS



PHOTO : Th.Martinez / Sea&Co / MOD S.A.

FACNOR CUSTOM PRODUCTS

> Facnor has worked on many different maxi racing sailboats projects, such as: VOR 70, Open 60, maxi trimarans (Groupama and Banque Populaire), Mega-yachts and today the MOD70. Our partnerships with skippers like Michel Desjoyeaux are set up on long-term basis. We have successfully gained the trust of our customers thanks to our responsiveness as well as our capacity in innovating and supplying constant high quality products. Facnor has become the official supplier of the MOD70 for furlers and halyard locks.

PHOTO : Th.Martinez / Sea&Co / MOD S.A.



STRUCTURAL FURLING SYSTEMS

Structural furlers support the mast rigging load and the head-sail: Genoa, Solent, Staysail or ORC. The structural system components are: a swivel fixed on the mast, a continuous line or standard drum fixed on the chain plate, and an anti-twist cable (PBO or Kevlar®) linking both mechanisms. This cable transfers efficiently the rotation from the drum to the swivel and is captive in the sail tape.

- > The sail is latched at the tack and halyard points;
- > The advantage of the system is the ultimate reduction of weight.

Furler model*	24 T	31 T	40 T	54 T	75 T	100 T
Boat length (feet)	50'	60'	60'-70'	70'	+70'	
ROD equivalence	-30	-40	-48	-60	-76 & -91	-115 & -150
Kevlar wire working loads (safety coefficient x 2)**	8 T	11 T	14 T	20 T	27 T	35 T

* model name = Kevlar stay breaking loads

** If we replace a metal wire or a rod forestay by a textile wire, this one will be largely over dimensioned, as the essential criteria to choose the model is not the solidity but the resistance against stretching. This is why the safety coefficient is so high.

70 ton structural furler on Rambler 100'



Two possible assemblies:
The structural furlers can be connected onto the textile stay with classic thimbles or threaded cone-shaped terminals (Navtec system)

2 drum configurations:
Continuous or discontinuous line drum

Discontinuous line drum on a Gunboat 60'

Photo : Pro Sail Asia Gun Boat

TOP OR BOTTOM TERMINAL OPTIONS

Different articulating parts such as :

- bottom ball joint eye,
- T-bones,
- twin hook / anchor,
- lashing soft eye,
- many other terminals.

Different materials :

- 17-4 PH Stainless Steel,
- Titanium (40% lighter than s/s),
- Other materials...



Spool fork



Eye terminal



Drum with Twin spool terminal

Interchangeable : the terminals are screwed into mechanisms. These articulating parts can be changed around.

Ball joint eye top or bottom terminal. Different orientation angles.	Lashing soft eye (fitted above the swivel or underneath the drum) the lashing gives more flexibility to the articulation	Eye terminal for both top and bottom end	Twin hook / anchor (above swivel fitting with lashing) more flexible articulation – to be screwed or notched up	Soft solid sheaves help to build a 2-to-1 or 3-to-1 tensioning	Twin spool terminal fitted underneath the continuous line drum it keeps its attachment in position. (4-to-1)

ADAPTABILITY

FACNOR CUSTOM PRODUCTS

20T and 31T structural furlers on Hugo Boss 60'

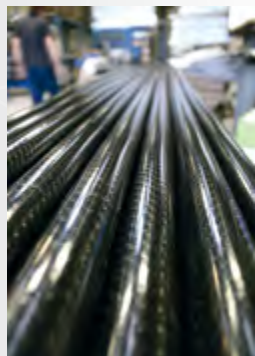
Carbon 3 - Tuco Marine

STRUCTURAL FURLING SYSTEMS

RESISTANCE

In comparison with existing products fitted with foil sections, carbon sections feature rigidity as well as lightness (40% lighter than foil sections). The «teardrop» shaped sections offer better aerodynamics. The installation is simple as the elements are assembled with epoxy adhesive (no screw). This improves the torque resistance of the connected sections.

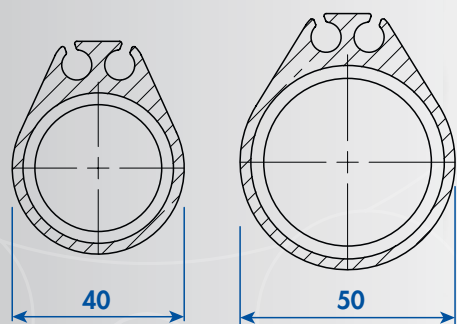
- > Unlike flying sails, this is not a in/out system and allows to reduce the sail.
- > Possibility to hoist different sails using the twin groove head section.
- > Rod or textile forestay.
- > Electric or hydraulic motorised.



LIGHTER CARBON

Model (extern. ø)	SC 40	SC 50
Mini inside diameter	28 mm	38 mm
Weight (g/meter)	695 g	820 g

40% lighter than foil sections



Two models : SC40 & SC50 - Section length : 4 meters.



Photo : Arzanà Navi 2013



MAINSAIL LOCKS

The mainsail locks reduce the mast compression, particularly on maxi-yachts on which working loads are tremendously high. Used on the MOD 70', the Facnor systems reliability has undoubtedly been proved. They can be adapted on existing tracks.

STURDINESS

- > Used for multihulls (high loads mainsail)
- > Made in different materials (titanium, stainless steel, aluminium,...)
- > Customized tracks adapted to your profiles

> **Functioning** : The package includes the track sections with the locking device. They would be fitted between existing tracks at the various altitudes on the mast (from head sail to each reef points).

Parameters / Lock model (= safe working load)	6 T _{swl}	8 -10 T _{swl}	16 - 20 T _{swl} and more
Track width	26 mm	30-32 mm	on request
Adaptation on tracks	Antal, Harken, other	Antal, Harken, other	on request

> **Full package**: The hook is central and is caught in the Facnor specific track sections.

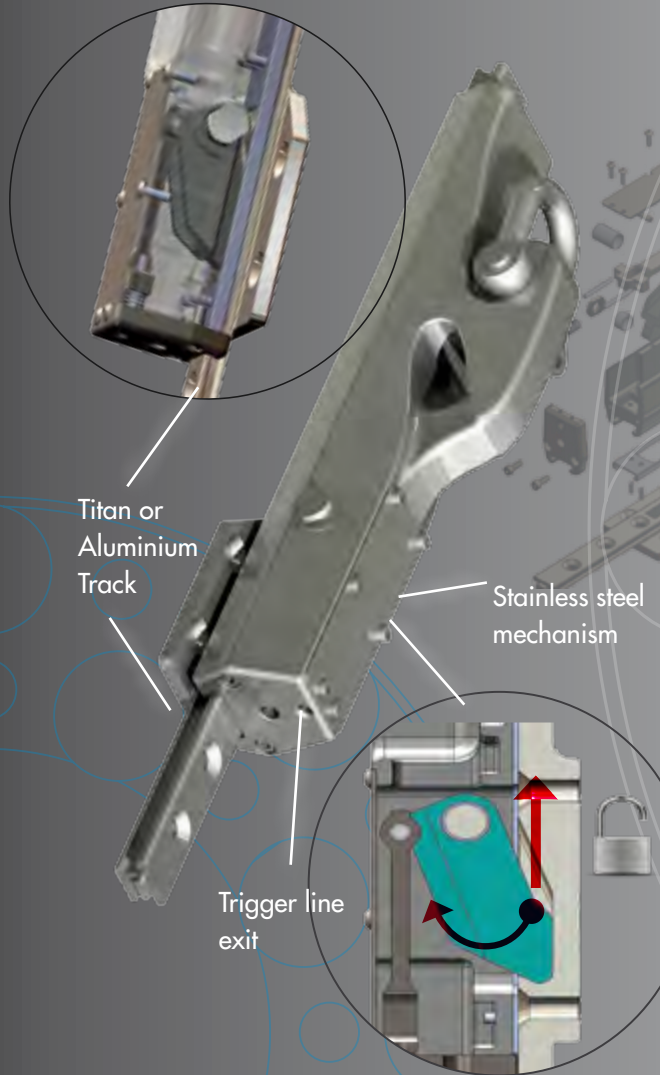
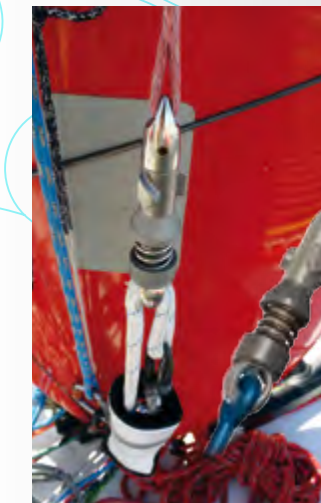


Photo : H. Giorsetti - Sixteam / 60' BEL

> **Less compression in the mast**

> **Reliable mechanism**



Halyard locks improve flying sail use (Staysail/Gennaker) saving weight and reducing mast compression loads. This simple and efficient device makes the halyard locking/unlocking easy and safe. The Facnor lock tremendously eases the handling of flying forestays (2-to-1 no longer required). The halyard lock can be fitted either inside or outside the mast.

INTERNAL HALYARD LOCKS

> **Optimum integration into the mast** :

- device fitted from outside the mast;
- mast cut accurately using a jig;
- thanks to a clever design, the integrated part that takes the sail load is fixed on the mast face using only two screws.

> **Various applications** :

- Gennaker or code zero;
- Staysail fitted on textile forestay;
- Staysail fitted on furler with flying wire forestay.

> **Technical features**:

Lock model (= working load)	3T	5T	7T	10T	12T	More
Equivalent Kevlar wire	10T	14T	20T	30T	40T	On Request
Equivalent ROD	-12	-17	-22	-40	-48	

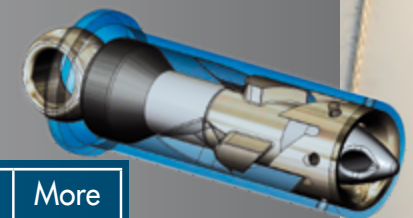


Photo : Marstrom
Internal halyard lock on a Gunboat 60'

7 T Internal halyard lock on a MOD70'



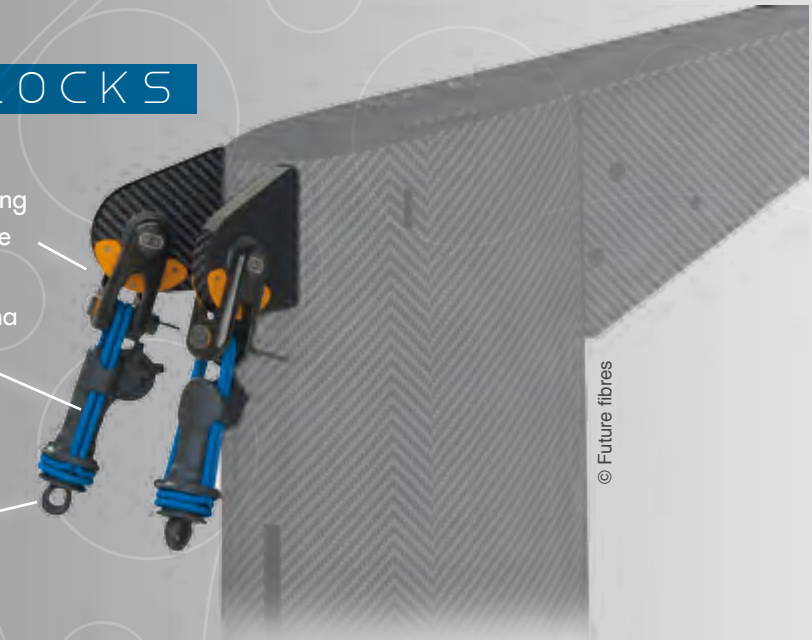
Photo : Southern Spars

EXTERNAL HALYARD LOCKS

RELIABLE MECHANISM



Existing toggle
 Loop with Deenema cover (on request)
 high resistant body



© Future fibres

- > **Easy & simply fitted** : it can be fixed onto one head attachment with an articulated device (toggle, latching, Unibal ball or others).
- > **Externally fitted lock** : In this case, a small diameter sheave is integrated in the locking system. The halyard can then run down inside or outside the mast.



Parameters / Lock model (= working load)	3T	5T	7T	10T	12T	16T	24T	30T +
Equivalent Kevlar wire	10T	14T	20T	30T	40T	54T	75T	100T
Equivalent ROD	-12	-17	-22	-40	-48	-60	-76 / -90	-115 / -150



16 ton lock for Maricha III (147') Code zero

Photo : D. Durchon / Maricha III.



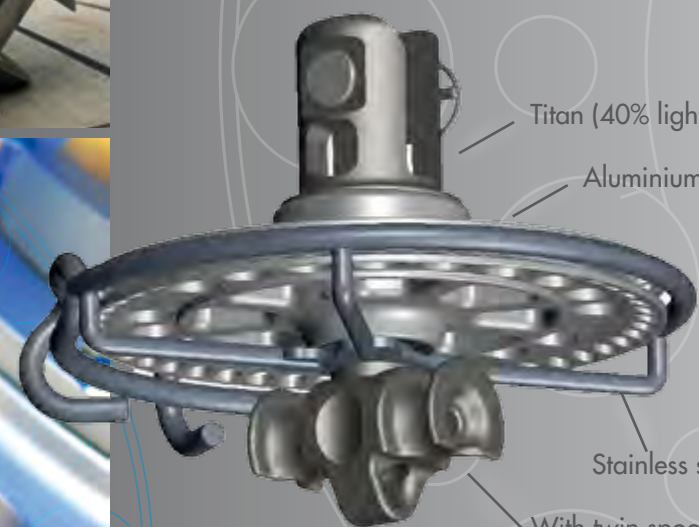
FACNOR CUSTOM PRODUCTS

Photo : MC3 / Jesús Renedo

CODE ZERO & GENNAKER FURLER

FACNOR is «the» precursor in manufacturing continuous line Code zero & Gennaker furlers (supplied since 1998). Most 60' monohulls and multihulls are now equipped with Facnor flying sail furlers: reliable and safe. They are designed to support high loads of over 500m² Gennakers with working loads up to 40 tons.

- > **Efficient grip** : The clever alignment of the outer holes ensures a very secure grip of the furling line.
- > **Facnor guide concept** : Thanks to the Facnor concept, the continuous line can be quickly removed without any complication.



Titan (40% lighter) or aluminium

Aluminium

> **Sturdy drum**

The drum is made of one aluminium wheel that is CNC machined (more resistant than a casting part). The structural body is made of Titanium.

Stainless steel guide

With twin spool terminal (see p.9)
Titanium or aluminium



Photo : J. D'Esthève

Maricha IV

PIONNIER

Michel Desjoyeaux, with Facnor since his first Vendée Globe



Photo : M. Lefèvre © Mathéophoto

A long experience

Leading in Gennaker furler manufacturing Facnor has acquired a long experience on this type of products - tested during ocean races in extremely tough conditions.

TOP DOWN SYSTEM FOR ASYMMETRICAL SPINNAKERS

For top down furling, the sail tack must be free in rotation. Facnor has developed a single mechanism for asymmetric Spinnaker that can be adapted on existing Facnor Gennaker and code zero furler drums.

- > **Functioning** : includes rotating tak point. The furling starts from the top of the cable. Can be fitted between standard cable terminals and furling unit.
- > **Adaptability** : Facnor systems are designed and dimensioned using the textile forestay specifications.

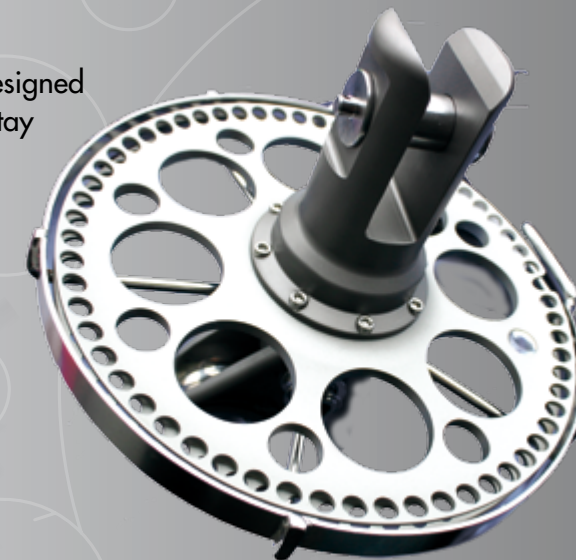


Photo : Gun Boat



Gun Boat, 90'

Photo : Gun Boat



Bairdo VI, 113'



Photo : Y. Hobson / Bairdo

- > **Technical features**: Top down thimbles are sized according to cable specifications.



Inoui, 108'



Photo : Scott Zebny / North Sails

TERMINAL & SPECIAL OPTIONS TO TAILOR MADE REQUESTS...



Photo : G. Russo / North Sails

Tack plates on Magic Carpet III

Facnor has a large conception and production capacity thanks to a Design team and CNC machining facilities

- > Two-to-one blocks, textile shackles;
- > Lashing thimbles, blocks, padeyes, special pins;
- > Continuous line drum & swivel covers;
- > Diabolos, swivels and special pins for lashing;
- > Thimble fitting according to customer's cable;
- > Special fittings on request.

Customized terminal options
(see p. 9)



Diabolo swivel from 60' Macif

Spherical chain plate (Banque Pop V)

2-to1 block swivel

Friction block

Textile shackles

Swivel covers

Swivel with twin spool pin



FACNOR CUSTOM PRODUCTS

...REACTIVITY

- > Integrated manufacturing means : From the design office to the CNC machining center, the Computer Aided Manufacturing gives perfect and quick results;
- > From our experience, we know that the race starts before the starting line...
- > A highly efficient after sales service

SPECIAL FITTINGS FOR SPECIAL BOATS

ABN AMRO : an example of the Facnor reactivity

Thanks to conception and production capacity, this structural furler (two parts wheel) has been delivered at the second step of the Volvo ocean race in only two weeks.



Special split wheel for 70' volvo race boat



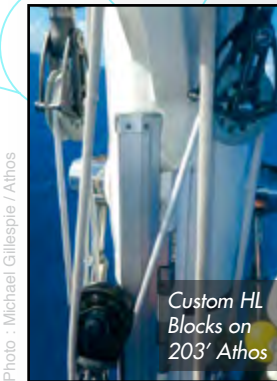
...& TAILOR MADE

SOLUTIONS

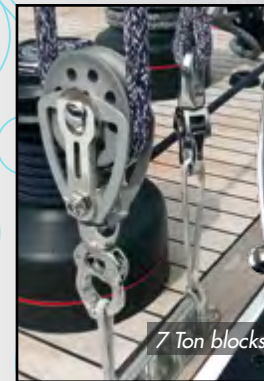
Custom High Load blocks

Titanium padeyes

TopDown thimbles for hydraulic furler



Custom HL Blocks on 203' Athos



7 Ton blocks

FACNOR CUSTOM PRODUCTS



Custom tack plate

YOUR NOTES...



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