

# NAVTEC<sup>®</sup>

Rigging Solutions<sup>SM</sup>

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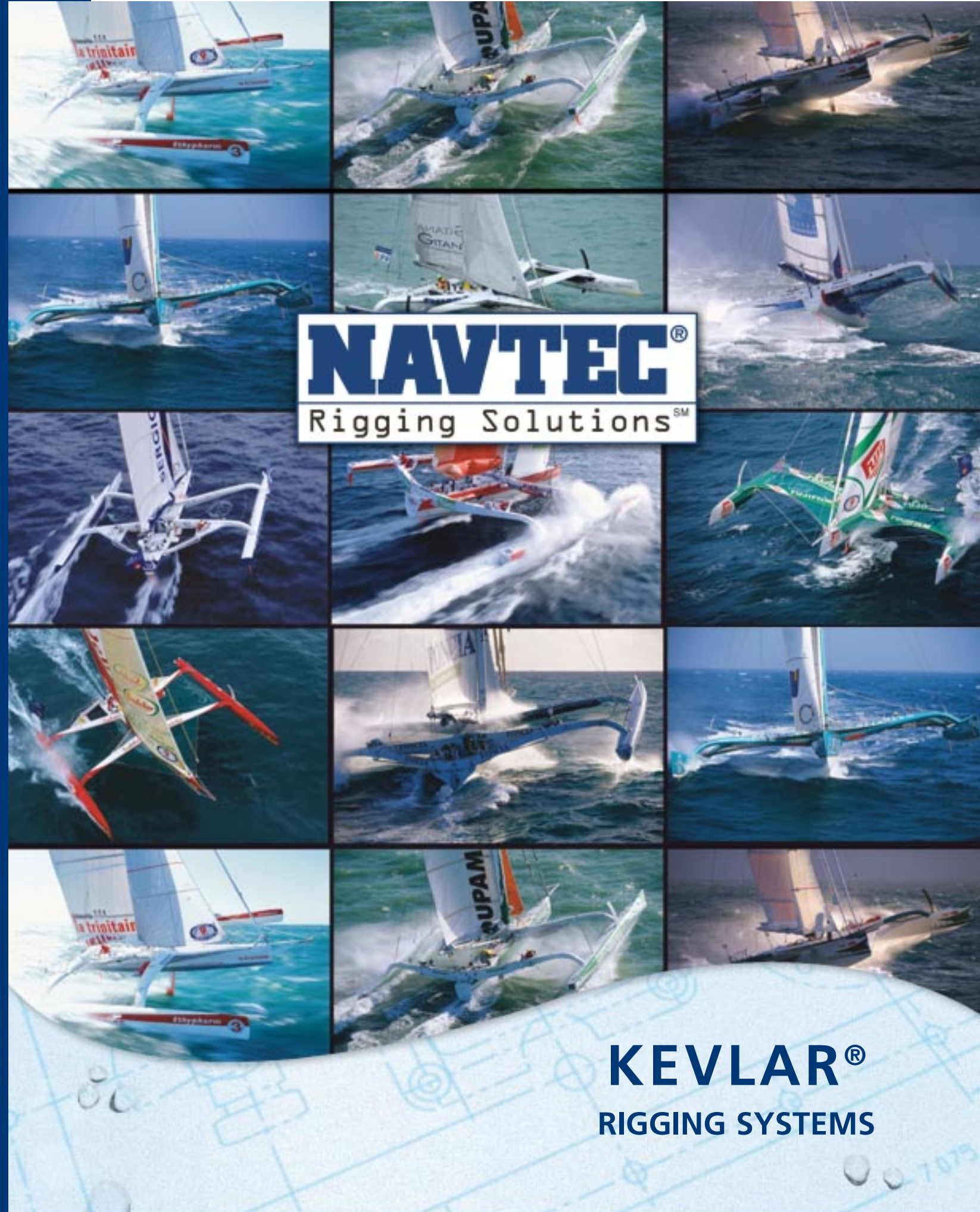
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# NAVTEC<sup>®</sup>

Rigging Solutions<sup>SM</sup>

KEVLAR<sup>®</sup>  
RIGGING SYSTEMS

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## Who uses NAVTEC Kevlar Rigging Systems?

Most of the world's fastest racing boats of today require rigging systems that can withstand the punishing conditions of offshore racing as well as being optimized for inshore performance. An example is the French Multihull Grand Prix series which contains some of the most technically advanced boats of any fleet racing in the world today. Whether they are screaming through the Southern Ocean, racing around the world, or ripping around the buoys on the Mediterranean, these racers depend on the performance and reliability that NAVTEC Kevlar Rigging Systems provide.

These same NAVTEC Kevlar Rigging Systems are available to anyone who wants to take advantage of the superior strength and tenacity that Kevlar fibers provide. Contact your local NAVTEC agent to discuss converting your rigging system to a system that the pros trust to get the results they are all looking for – WINS!



## Why use NAVTEC Kevlar for rigging?

NAVTEC high modulus polyethylene covered (HMPE) Kevlar cable can be used for many different applications on a boat. The use of NAVTEC HMPE cable can provide a significant weight savings over rod or wire due to the superior weight to strength ratio of the Kevlar fibers.

NAVTEC Kevlar cables are composed of parallel high modulus Kevlar fibers held together in an extruded polyethylene jacket. The parallel core construction provides for the lowest possible stretch in the shroud. The smooth polyethylene jacket provides protection for sails as well as protection for the Kevlar fibers from the ultra-violet radiation that can cause the fibers to break down. The soft cable construction is also easier to handle. The cable can be coiled more easily than rod or wire shrouds and will be significantly lighter for the same strength.

A conversion to NAVTEC Kevlar runners, check stays and permanent backstays will represent a marked reduction in weight aloft, improving performance. The NAVTEC Kevlar rigging system uses a variety of standard fittings, allowing the average boat owner to convert to NAVTEC Kevlar rigging without making changes to his mast.

## How much weight will I save by using NAVTEC Kevlar for my rigging?

NAVTEC Kevlar is less than half the weight of comparable Nitronic 50 rod rigging or 1x19 wire rigging. The length and size of the shroud will determine the weight savings. The larger the wire or rod size the more the savings. For example, a 1/4" wire runner 50' long with eyes on both ends will weigh 6.88 lbs. A runner made from -6 rod would weigh 5.67 lbs. A runner made from NAVTEC 3.8T Kevlar cable with the same length and end fittings would weigh 2.34 lbs. Therefore, in this example, a pair of NAVTEC Kevlar runners would be 9.08 lbs lighter than 1x19 wire and 6.66 lbs lighter than -6 rod. This translates to a 66% weight savings over wire and a 59% weight savings over rod.

## Cable Sizes & Specifications

Kevlar Fiber Cable										
Cable Code	Diameter		Min. Strength		Weight		Stretch Equivalent		Stretch	
	mm	in	kg	lbs	kg/m	lb/ft	N-50 Rod	1x19 Wire	mm/mm/1000kg	in/in/1000lb
3T	8	0.315	3,060	6,730	0.027	0.018	na	3/16	0.005178	0.002354
3.8T	8.5	0.335	3,880	8,530	0.055	0.037	-4	5mm	0.004438	0.002017
5T	10	0.394	5,100	11,220	0.075	0.050	-6	6mm	0.003214	0.001461
7T	12	0.472	7,140	15,710	0.107	0.072	-8	7mm, 9/32	0.002219	0.001009
9T	13.1	0.516	9,180	20,200	0.127	0.085	-10	8mm, 5/16	0.001759	0.000799
12T	15	0.591	12,250	26,940	0.166	0.111	-12	3/8	0.001351	0.000614
15T	16.8	0.661	15,300	33,670	0.209	0.140	-17	10mm	0.001047	0.000476
20T	19.1	0.752	20,400	44,900	0.271	0.182	-22	12mm	0.000797	0.000362
25T	22	0.866	25,500	56,100	0.359	0.241	-30	14mm, 9/16	0.000590	0.000268
31T	25	0.984	31,600	69,600	0.465	0.312	-40	16mm, 5/8	0.000459	0.000209
43T	28.7	1.130	43,900	96,500	0.611	0.410	-48	19mm, 3/4	0.000333	0.000151
54T	32.3	1.272	55,100	121,200	0.775	0.520	-60	22mm, 7/8	0.000263	0.000120
75T	39.9	1.571	80,600	177,300	1.183	0.793	-91	26mm, 1	0.000166	0.000076

## End Fittings Available

NAVTEC Kevlar stays are available with a number of standard end fittings that have been chosen based on the strength of the Kevlar being used, as well as the strength of the rod or wire the Kevlar may be replacing. This ensures that if you upgrade your boat to a NAVTEC Kevlar rigging package you can be assured that the Kevlar cable and end fittings are going to allow you to use your NAVTEC Kevlar stay under the same load conditions you have used your rod or wire stays in the past. See the standard end fittings to the right that are available from NAVTEC. Also, contact NAVTEC if you require an end fitting that is not from our standard fitting group, and we can discuss custom fittings to fit your particular needs.



## NAVTEC Anti-Torsion Kevlar Cables

NAVTEC also offers a line of Kevlar Anti-Torsion cables to be used with some furling systems. These cables have a unique reinforced jacket construction which is designed to transfer the torque provided by the furling unit throughout the entire length of the stay resulting in a consistent furling action.

The NAVTEC Anti-Torsion Kevlar cables are designed to be used in cases where a sail is being stored (furled) or when the sail is being used in the fully open condition. These cables are not designed to be used in the reefed condition, to reduce sail area. Applying NAVTEC Anti-Torsion Kevlar cables in the case of a structural stay under permanent load, they can be applied based on the stretch equivalency of the rod being replaced. In the case of a movable stay (Code 0 or GK) you can apply the next smallest NAVTEC Anti-Torsion Kevlar cable size, which is a comparison of the stretch and strength of the stay. See the NAVTEC Anti-Torsion Kevlar cable specifications in the table below.

The end terminations will be delivered in stainless steel or titanium for the NAVTEC Anti-Torsion Kevlar cables. These end terminations have a threaded socket that can easily be adapted to a furling unit directly or using a custom attachment link.

As an example, if you were to replace a 50' long -22 N-50 rod in a furling headstay system that weighs approximately 18.8 lbs with a 19T NAVTEC Anti-Torsion Kevlar cable that weighs approximately 9.6 lbs, you would save 50% of the weight. Also, if you were to replace a 50' long Ø5/8" 1x19 wire in a furling headstay system that weighs approximately 33.6 lbs with a 30T NAVTEC Anti-Torsion Kevlar cable that weighs approximately 12.4 lbs, you would save 65% of the weight. As you can see, there is a clear advantage in replacing the rod or wire in your furling headstay system with a NAVTEC Anti-Torsion Kevlar cable.

Anti-Torsion Kevlar Fiber Cable								
Cable Code	Diameter		Min. Strength		Weight		Stretch Equivalent	
	mm	in	kg	lbs	kg/m	lb/ft	N-50 Rod	1x19 Wire
14T	19.2	0.756	14,000	30,870	0.232	0.156	-17	10mm
19T	21	0.827	19,000	41,900	0.285	0.192	-22	12mm
24T	22	0.866	24,000	52,900	0.350	0.235	-30	14mm, 9/16
30T	25	0.984	30,000	66,150	0.460	0.309	-40	16mm, 5/8
40T	28.9	1.138	40,000	88,200	0.610	0.410	-48	19mm, 3/4

## NAVTEC Kevlar Cable Installations

Over the years NAVTEC has applied its Kevlar Rigging Systems in most every sailboat rigging application. NAVTEC Kevlar is perfectly suited for an aft rigging application on high performance Maxi yachts all the way down to 30' daysailers that compete periodically. Since NAVTEC is able to obtain large quantities of pre-manufactured parallel fiber cable, and stock standard fittings that can be applied to a new project or integrated into a re-rig, we are able to offer a high-tech product for the Maxi programs as well as be a cost effective performance enhancement for smaller programs.

NAVTEC Kevlar cables have also been used as cap shrouds for the fastest multi-hulls in the world. These boats have since graduated to a higher performance product, NAVTEC PBO Rigging, and our Kevlar product line has been directed toward the new production multi's that are appearing all over the world.

Other growing applications for NAVTEC Kevlar Rigging Systems include those on large cruising or cruiser/racer projects. NAVTEC Kevlar offers a marked reduction (approximately 50%) in the weight aloft, which can be translated into a number of performance and cost-saving benefits.

