

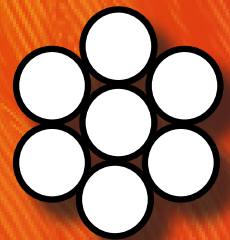
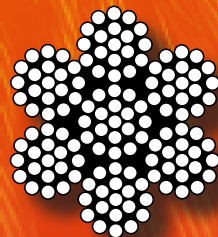
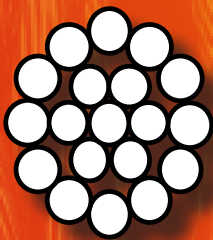


Pinnacle Wire Ropes

Marine Products Catalog

ALPS WIRE ROPE CORPORATION

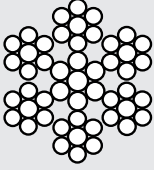
"THE PINNACLE OF QUALITY"



CABLE

7 X 7

STAINLESS STEEL T302/304

7 X 7	Diameter in Inches	Nominal Breaking Strength - Lbs	Lbs. Per 1000'
	1/32	150	2.21
	3/64	270	4.5
	1/16	480	7.5
	3/32	920	16
	1/8	1,760	28
	5/32	2,400	42
	3/16	3,700	62

- MATERIAL MANUFACTURED TO FED SPEC RR-W-410 TYPE VI CLASS 2

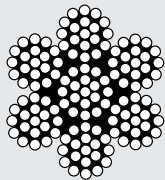


CABLE

7 X 19

STAINLESS STEEL T302/304



7 X 19	Diameter in Inches	Nominal Breaking Strength - Lbs	Lbs. Per 1000'
	3/32	920	17
	1/8	1,760	29
	5/32	2,400	45
	3/16	3,700	65
	7/32	5,000	86
	1/4	6,400	110
	9/32	7,800	139
	5/16	9,000	173
	3/8	12,000	243

*MATERIAL MANUFACTURED TO FED SPEC RR-W-410 TYPE VI CLASS 3

Stainless Steel Chemical Compositions (Common to Wire Ropes)

AISI GRADE	C	SI	MN	P	S	NI	CR	MO
302	≤0.15	≤1.00	≤2.00	≤0.045	≤0.030	8.00-10.00	17.00-19.00	--
304	≤0.08	≤1.00	≤2.00	≤0.045	≤0.030	8.00-10.50	18.00-20.00	--
305	≤0.12	≤1.00	≤2.00	≤0.045	≤0.030	10.50-13.00	17.00-19.00	--
316	≤0.08	≤1.00	≤2.00	≤0.045	≤0.030	10.00-14.00	16.00-18.00	2.00-3.00

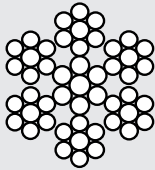
Corrosion Loss in Sea Water

Materials	Dip Time (days)	Corrosion Loss (oz./day)	Maximum Depth of Etching Pit (inch)
AISI 304	685	.0000013	.06902
AISI 316	1923	.0000009	.007008

CABLE

7X7

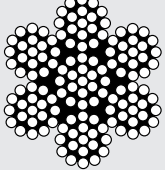
STAINLESS STEEL T316

7 X 7	Diameter in Inches	Nominal Breaking Strength- Lbs.	Lbs. Per 1000'
	3/64	188	4
	1/16	335	7.3
	5/64	500	11.4
	3/32	806	16
	1/8	1,434	29
	5/32	2,211	43
	3/16	3,218	61
	7/32	4,410	83
	1/4	5,728	113
	9/32	7,255	134
	5/16	8,090	171
	3/8	11,494	243
	7/16	15,299	342
	1/2	18,232	432



CABLE

7X19
STAINLESS STEEL T316

7 X 19	Diameter in Inches	Nominal Breaking Strength- Lbs.	Lbs. Per 1000'
	3/32	700	17
	1/8	1,328	29
	5/32	2,074	45
	3/16	2,963	65
	7/32	4,056	86
	1/4	5,308	110
	9/32	6,727	150
	5/16	8,290	173
	3/8	11,951	243

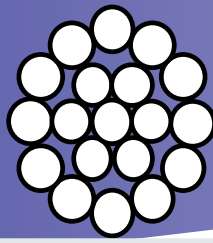
6 X 19 IWRC	Diameter in Inches	Nominal Breaking Strength- Lbs.	Lbs. Per 1000'
	7/16	15,000	356
	1/2	19,300	458
	9/16	24,300	590
	5/8	29,800	715
	3/4	50,000	922
	7/8	58,000	1,430
	1	80,000	1,870

Corrosion Resistant Rope Care for Marine Applications

Corrosion Resistant, or "Stainless Steel", rigging and ropes should be rinsed with fresh water on a regular basis. Using a water-soluble detergent will not harm the metal and may make general deck cleaning easier. Parts should be inspected after each use. Cables should be checked for wire breaks, misaligned swage fittings, and corrosion. Also, swaged fittings should be checked for cracks. Any other "stainless" parts can be inspected at the same time. "Stainless steel" can stain and corrode. It is an alloy, but it does still contain Carbon. So if you see extensive discoloration, or "pitting" the parts should be replaced. If a part requires scraping or grinding to remove corrosion it should be removed from service and replaced with new parts. Regular cleaning and inspections will assure the best possible service life for these parts.

Stainless Steel T316

An Austenitic Stainless Steel, from the 18-8 family, Type 316 Stainless Steel differs in that it contains 2 to 3% molybdenum. Molybdenum enhances the corrosion resistance, and enhances resistance to pitting and crevice corrosion in chloride solutions. Passivating films on stainless steels are not impervious to chlorine ions, and thus all stainless steels are subject to staining and pitting. Type 316, however, shows the greatest resistance to these effects among the standard grades of roping wires.



1x19 Stainless Steel Strand Imperial and Metric

Diameter (inch)	Diameter (mm)	Weight (Lbs/1000 ft)	AISI T304		AISI T316		<u>Corrosion Resistant Rope</u> <u>Care</u>
			NBS (Lbs.)	NBS (kgf)	NBS (Lbs.)	NBS (kgf)	
0.0197	0.50	1.7	52.0	23.6	46.3	21.0	Corrosion Resistant, or "Stainless Steel", rigging and ropes should be rinsed with fresh water on a regular basis. Using a water-soluble detergent will not harm the metal and may make general cleaning easier. Do not use chemical solvents for cleaning corrosion resistant strands, cables, ropes, hardware, or fittings.
1/32	0.80	2.3	133.4	60.5	118.6	53.8	
0.0394	1.00	3.4	208.3	94.5	185.2	84.0	
3/64	1.20	4.8	299.8	136.0	266.8	121.0	
0.0591	1.50	7.5	469.6	213.0	416.7	189.0	
1/16	1.60	8.5	533.5	242.0	474.0	215.0	
5/64	2.00	14	833.3	378.0	740.7	336.0	
3/32	2.40	19	1,201.5	545.0	1,067.0	484.0	
0.0984	2.50	21	1,302.9	591.0	1,157.4	525.0	
0.1181	3.00	30	1,876.1	851.0	1,666.7	756.0	
1/8	3.20	35	2,134.1	968.0	1,898.2	861.0	
0.1378	3.50	42	2,552.9	1,158.0	2,270.7	1,030.0	
9/64	3.56	43	2,641.1	1,198.0	2,347.9	1,065.0	
5/32	4.00	55	3,335.6	1,513.0	2,965.2	1,345.0	
0.1772	4.50	72	4,221.8	1,915.0	3,752.2	1,702.0	
3/16	4.80	77	4,801.6	2,178.0	4,268.1	1,936.0	
0.1969	5.00	90	5,211.7	2,364.0	4,631.9	2,101.0	
0.2165	5.50	108	6,305.2	2,860.0	5,610.7	2,545.0	
7/32	5.60	102	6,536.6	2,965.0	5,811.3	2,636.0	
0.2362	6.00	125	7,504.5	3,404.0	6,671.1	3,026.0	
1/4	6.40	135	8,538.4	3,873.0	7,588.2	3,442.0	Strands, Cables, Ropes, Hardware, and Fittings should be inspected after each use. They should also be checked for wire breaks, misaligned swage fittings, and corrosion. Swaged fittings should be checked for cracks. Any other "stainless" parts can be inspected at the same time.
0.2559	6.50	146	7,484.6	3,395.0	7,828.5	3,551.0	
0.2756	7.00	166	10,213.9	4,633.0	9,078.5	4,118.0	
9/32	7.20	170	10,804.7	4,901.0	9,605.4	4,357.0	
5/16	8.00	214	13,340.0	6,051.0	11,858.5	5,379.0	
0.3543	9.00	273	16,885.0	7,659.0	15,008.9	6,808.0	
0.3740	9.50	312	18,811.9	8,533.0	16,721.9	7,585.0	
3/8	9.60	314	19,210.9	8,714.0	17,076.8	7,746.0	
0.3937	10.00	350	20,844.5	9,455.0	18,527.5	8,404.0	
0.4331	11.00	406	25,222.8	11,441.0	22,418.6	10,169.0	
7/16	11.20	410	26,146.6	11,860.0	23,240.9	10,542.0	"Stainless steel" can stain and corrode. It is an alloy, but it does contain Carbon. If you see discoloration or "pitting" the parts should be replaced. If a part requires scraping or grinding to remove corrosion it should be removed from service and replaced with new parts. Regular cleaning and inspections will assure the best possible service life for these parts.
0.4724	12.00	511	30,015.6	13,615.0	26,680.1	12,102.0	
1/2	12.70	544	33,620.2	15,250.0	29,883.4	13,555.0	
0.5118	13.00	562	35,227.3	15,979.0	31,311.9	14,203.0	
0.5512	14.00	649	40,855.6	18,532.0	36,316.4	16,473.0	
9/16	14.30	671	42,623.7	19,334.0	37,888.3	17,186.0	
0.5906	15.00	749	46,900.7	21,274.0	41,689.0	18,910.0	
5/8	16.00	889	53,362.3	24,205.0	45,194.3	20,500.0	

“XXX” Strand

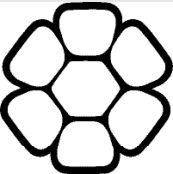


“XXX” STRAND has the following characteristics which distinguishes itself from conventional strands.

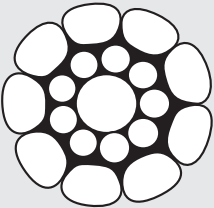
- Significantly lower stretch
- Excellent crush resistance and wear performance
- A modulus value & breaking load approximately 30% higher than a conventional one

“XXX” STRAND provides the marine and architectural industries with a quality strand that has outstanding smooth clean finish and superior luster which aesthetically meets the purpose of using a “compacted” strand.

(AISI 316)

1 x 7	Dia. (mm)	NBS		Approx. Weight	
		Kgf	Lbf	Kgs/100m	Lbs/100ft
	1.50	248	548	1.4	0.9
	2.00	442	974	2.4	1.6
	3.00	1,000	2,205	5.5	3.7
	4.00	1,780	3,924	9.8	6.5

(AISI 316)

1 x S(19)	Dia. (mm)	NBS		Approx. Weight	
		Kgf	Lbf	Kgs/100m	Lbs/100ft
	5.00	2,440	5,379	15.0	10.1
	6.00	3,550	7,826	21.8	14.7
	7.00	4,910	10,825	29.1	19.5
	8.00	6,150	13,558	38.1	25.6
	9.00	8,942	19,715	48.4	32.5
	10.00	9,770	21,539	59.9	40.2
	11.00	13,358	29,450	71.9	48.3
	12.00	14,400	31,747	81.1	54.4

Manufactured by KOS



LIFE LINES

WHITE PVC COATED
7x7 Construction

CABLE DIAMETER	FINISHED OD	Minimum Break Strength- Cable		Lbs. Per 1000'
		T304	T316	
1/16	1/8	480	335	13.5
3/32	1/8	920	806	20
1/8	7/32	1,700	1,434	41
1/8	1/4	1,700	1,434	45
5/32	7/32	2,400	2,211	59
3/16	5/16	3,700	3,218	92
1/4	3/8	6,100	5,728	145

OTHER SIZES AVAILABLE UPON REQUEST

Vinyl is soft, flexible, and economical. It is the most common plastic extruded over steel cable. It offers good weathering resistance and outstanding resistance to ultra violet rays of the sun which degrades many plastics over time. Vinyl has good resistance to water and some resistance to acids and alkalis. Since it is softer than other plastics, vinyl is not a recommended choice when abrasion is a factor, such as over pulleys. Grades of vinyl are defined by the durometer, which is a measure of hardness. For cable extrusion an 80 to 90 durometer-rated vinyl is commonly used. The higher the durometer the harder the PVC. Under normal conditions, vinyl has a general operating temperature of -30° F to +180° F.

Rigging by BoatUS

New high-tech rigging designs may cause sailors to have a false sense of security concerning their sailboat hardware. Boaters still need to regularly inspect their rigging, particularly because these high-tech designs use new lightweight materials which are deceptively fragile.

Standing Rigging

Since stays, shrouds, terminals, and turnbuckles bear the total load of the mast, they should be inspected at least once a year. A good time to do this is when your boat is hauled for the winter or for painting. If you do not unstep the mast, have a surveyor or rigger climb the mast to inspect wire connections. (If doing your own climbing, be sure to use a bosun chair and have experienced help on deck.) Careful inspection can ensure maximum service life and safety from your rigging. Unless the rigging fails from drastic overloading, it will show warning signs before failure occurs. Such warning signs may include broken wires, heavy stains or corrosion, or small stress cracks in fittings—especially threaded portions. Use a magnifying glass and your fingernail to detect tiny cracks. A routine checkup could save you a breakdown while underway.

Unstepping the Mast

Use proper care and preparation when unstepping to prevent damaging the hardware you're trying to inspect.



Since trailered sailboats require more frequent unstepping than larger boats, regular procedures should be established and followed every time. If possible, hold the mast up by hand and release all shrouds and stays. This will avoid kinking, bending, crushing, and nicking when you bring it down. Make up a few pads of carpet and shock cord to wrap around the mast before securing halyards and standing rigging. Be sure to secure rigging and keep some tension on while trailering to prevent flapping. Always use twine to tie off coils and fasten tags; never use adhesive tape or wire! Remember your environment; if you are near salt water, the best place for your rigging is in a dry basement or attic away from the elements. And always

remember to rinse off all rigging with fresh water before storing. If you don't unstep your mast more than once every two years, you must still inspect the rigging hardware. Remember, if you go aloft, always use a main halyard with a backup halyard. Turnbuckles and chainplates must be angled so that loads are in a direct line with the stays and shrouds, otherwise the chainplate will bend slightly, which fatigues the metal. Cracking or distortion on the deck around the chainplate may indicate a misalignment problem and or a deck leak. Water leaking around chainplates typically enters the deck's core, which could eventually lead to structural problems.

Continued on next page

Rigging (cont'd)

An even more serious structural problem can occur if the leaking chainplate is attached to a wood bulkhead beneath the deck. Water entering the wood will cause rot, which weakens the bulkhead so that it will no longer support the chainplate and the rig's heavy loads. Rot is indicated by dark areas, delamination, and/or a dull sound when the bulkhead is tapped.

Tip: Check all running lights, wiring, and plugs for damage before resteping the mast. It's much easier to repair and replace these items when the mast is horizontal.

Caring for Stainless Rigging

Be sure to rinse standing rigging regularly with fresh water. This can be done routinely when you hose down decks at the end of a day's sail. Use a water-soluble detergent. A mixer nozzle will make this easy and help clean areas beneath the standing rigging as well. Inspect all unusual stain and corrosion spots carefully—before, during, and after cleaning. Don't use steel wool to remove stubborn stains from cable or fittings. It will leave minute particles of steel embedded in the rigging, and these particles will rust. Instead of using abrasive scrubbing pads or bronze wool, use a regular cloth with polish on any stainless steel. If it is so rusted that it needs scraping, replace it. Check your tang/swage fitting alignment. Bad angular alignment puts a bending load on the end of the swage fitting. Ask your local rigging shop about any unusual signs of corrosion,



stress, or cracks in terminals. And finally, use commercial "spreader boots" and turnbuckle covers where protection from chafing or snagging is required.

Lifelines

Please note that special care must be taken for plastic-coated cables. Commonly used for lifelines, this is a construction of wire rope with a coating of hard, white vinyl. This cable has been carefully engineered to be durable even when exposed to saltwater. Good brands incorporate ultraviolet stabilizers to deter solar degradation. Avoid cleaning plastic coated cable with chemical cleaners unless you are sure they will not cause damage. Never use kerosene - it will dilute and spread the stain.

Running Rigging

Don't be fooled by the high-tech, lightweight features of your running rigging. Halyards, sheets, guys, and vang are subjected to



enormous abuse. They are generally turned around winches, subjected to extreme loads, and often used in applications where cyclical loading is the norm. Inspect them frequently, and replace them whenever they are

Rigging (cont'd)

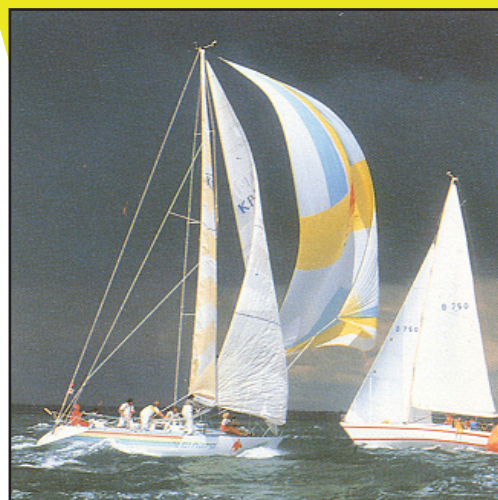
suspicious. If trailering, keep them neatly coiled. Where wire-to-rope splices exist, inspect more frequently to detect potential failure of the splice. Periodically wash and rinse blocks in fresh water to clean them thoroughly. In addition, all new polyester lines should be soaked in soapy water overnight before being put to use—this eliminates slipping on winch drums and is more supple. Blocks should be inspected on a regular basis. Items to look for are a slow-running sheave, shackle elongation, extreme rust, movement of metal (stretching), or plastic or metal cracks. Tropical sailing conditions are even more critical - carefully inspect more regularly. Blocks and rigging should not be put away wet with salt water; wash and rinse with fresh water. Lubricants such as dry Teflon and dry silicone sprays which will not attract dirt may be used.

If you follow these maintenance guidelines faithfully, and remember that even new high-tech rigging designs require careful routine inspections, your sailboat and its hardware will perform to their greatest abilities.

Special thanks to MacWhyte, Schaefer, and the BOAT/U.S. Marine Insurance publication *Seaworthy* for their contributions to this article.

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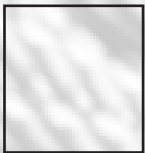


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