YALE CORDAGE

Performance. Passion. Possibilities.

PRODUCTS FOR TREE CARE PROFESSIONALS

- Climbing
- Rigging
- Winch Lines
- Accessories & Tools
- Usage & Inspection

From Our Owner

Yale Synthetic Cable & Rope Technology has never lost a customer to a competitor based on quality, nor have we sought customers on the basis of price alone. We have always embraced new fiber technologies and have been the first manufacturer to incorporate them in rope and cable products when they provide the best value to the customer.

Yale has continuously developed unique custom and modified machinery to maintain its advantage in processing fibers to their fullest potential. We do this every day to the very best of our abilities in Maine and North Carolina ... nowhere else.

Yale is proud of its support of the Arborist Trade, from its introduction of high-tech synthetic fibers for heat resistance, to setting up a working arborist rope-making machine at TCI. We want to make your job easier and safer.

Tom Yale

Contents

Constructions

3-Strand

The simplest type of rope is formed by twisting fiber into a strand, and then twisting three strands into rope. Its conversion efficiency is relatively low since this construction technique is the hardest on fiber.

Yale does not produce 3-Strand ropes because they do not meet our exacting standards for quality performance and durability.

Single Braid

This construction leaves a void in the center and utilizes strand counts of eight, 12 or 16. The hollow is instrumental in making it easy to splice. Hollow braids are nonrotating and are an extremely efficient way to utilize fiber.

Yale's economical XTC 12 climbing and XTR 12 rigging line and its Ultrex and Maxibraid winch lines are single-braid ropes.

Double Braid

This is really two separate ropes in one: the core, which is a single braid, is over-braided with a sleeve. This construction allows the rope to be used for more applications; the same or dissimilar fibers can be engineered into a rope suited to any of many specific applications. This construction entirely shields one of the two elements in the rope from abrasion.

Yale's major objective in manufacturing ropes is to effectively convert high-tenacity yarns into finished braided ropes. Yale maintains an aggressive quality assurance program that covers every aspect of production, from the inspection of incoming yarn, machine setups, random inspections during processing and final testing of the finished product.

Certainly one key element in efficiently converting filament into rope is careful control of yarn tension in every stage of production. It is of little use to buy high-grade fiber without making the commitment to high converting standards. Strands braided at different tensions or with varying twist levels do not work together equally in the finished product, causing weak ropes that wear out quickly since a small percentage of the rope's fibers are always forced to work harder than they should.

Yale's exclusive Machten processing ensures the yarn is always tensioned and under control, from the time the yarn is removed from the supplier's package until it is a completed product. The result is a finished rope that has aesthetic perfection and exemplary performance. The photographs show examples of good and bad processing.

XTC 12

XTC 12

Key Features

- Commercial grade
- Single-braid construction eliminates the core
- Nubby construction for hand climbers

XTC 12 is a “nubbier” hollow braid offering lower weight and excellent abrasion resistance. Built to be round and stay round, XTC 12 is a 12-strand single braid of polyester/“Para-ep” Olefin. This all-synthetic rope resists rot and mildew, and performs equally well in both wet and dry conditions. XTC 12 is identified by one yellow tracer. XTC 12 is a commercial-grade single-braid construction that eliminates the core and adds nubby construction for hand climbers. It is an economical choice for a range of climbing needs.

Buzzz Line is available in 100% orange solution dyed polyester or solid white. The strand is laid, much like our 16-strand products, which maximizes abrasion resistance. The braid is tight to prevent snagging but supple enough to make handling and throwing a snap. 100% polyester construction maximizes the tensile strength, while offering an enhanced ability to absorb shock over our other 12-stranded products.

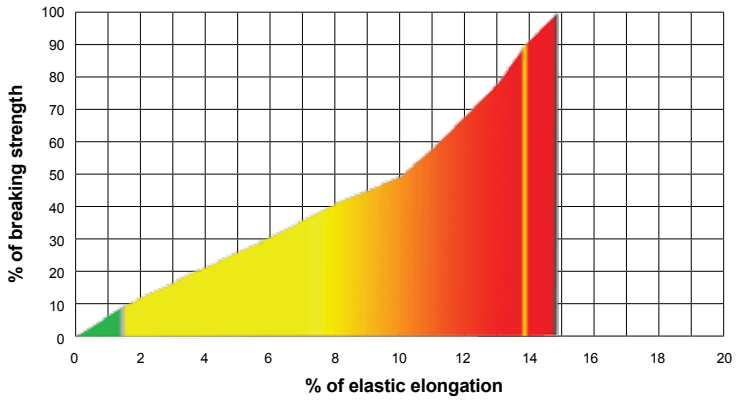
XTC 12 meets:
ANSI Z133

Specifications

Product	Diameter		Average Break Strength*		Suggested Design Factor** 10:1		Weight	
	Inches	(mm)	Lbs	Kg	Lbs	Kg	Lbs/100ft	Kg/100m
XTC 12	1/2	(13)	6,000	2,722	600	272	6.7	10.0
Buzzz Line	1/2	(13)	7,400	3,357	740	336	8.0	12.3

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope’s suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.



Energy Absorption
The colored area under the curve represents the rope’s ability to do “work” and is expressed in foot-pounds per pound of rope in tension.

- Green working 414 ft. lbs./lb.
- Red ultimate 7,500 ft. lbs./lb.

Suggested Design Factor
Minimum Break Strength
Average Break Strength

Specific Gravity: 1.25

XTC 16

Key Features

- Professional grade
- Smoother cover runs well through cammed devices
- Tightest cover braid in the industry

White – The economical alternative – This rope was designed specifically for the demanding needs of the professional arborist. XTC 16 is a tight braid consisting of 16 individual strands of polyester. A high-twist core of torque-balanced polyester keeps the construction firm and round, providing an extra measure of safety. XTC 16 is an excellent choice for both climbing line and bull rope due to its no snagging, abrasion-resistant construction and excellent energy absorption characteristics.

Plus and Spearmint – Our finest and most popular – incorporating all of the characteristics of the White, and adding visibility. Half of the cover strands are of bright red or bright green extrusion-dyed polyester, resulting in permanent coloration that won't fade or run with use. In addition to strength and performance, Plus and Spearmint are ideal for color coding, reducing confusion and increasing the safety of each job.

Fire – Hi-visibility – now introducing the highest-visibility climbing line ever seen in the industry. Fire is specifically designed for the demanding needs of arborists, embodying the same characteristics of XTC 16 ropes Yale has made for the last two decades.

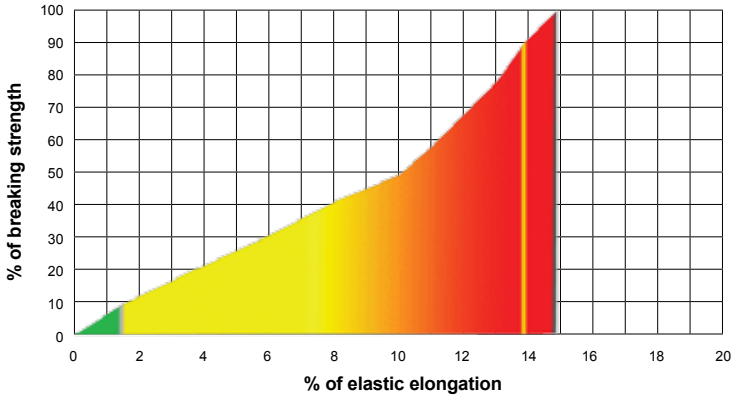
XTC 16 meets:
ANSI Z133
CE0598 EN1891 – Type B

Specifications

Diameter		Average Break Strength*		Suggested Design Factor** 10:1		Weight	
Inches	(mm)	Lbs	Kg	Lbs	Kg	Lbs/100ft	Kg/100m
1/2	(13)	6,200	2,812	620	281	7.5	11.2

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope's suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.



Energy Absorption
The colored area under the curve represents the rope's ability to do "work" and is expressed in foot-pounds per pound of rope in tension.

- Green working 299 ft. lbs./lb.
- Red ultimate 5,029 ft. lbs./lb.

Suggested Design Factor
Minimum Break Strength
Average Break Strength

Specific Gravity: 1.38

XTC 24

Key Features

- Competition grade
- Smoothest cover for mechanical ascension
- Lowest elongation results in minimal bounce
- Smaller diameters are also favorable for recreational climbers

Blaze and Bandit – innovative lightweight – a unique 11mm, spliceable, double-braided rope construction boasting a smooth 24-strand braided cover of high-tenacity solution-dyed yarns with ultimate visibility and runs well in mechanical devices.

Blue Moon – larger in the hand – same peak performance – A true 11.7mm diameter that combines the lightweight characteristics of 11mm ropes and the more conventional sizing of the 1/2″ climbing lines. Blue Moon incorporates our 24-strand “Tite-Braid” cover that virtually eliminates cover milking. The braided-filament polyester core creates a firm rope that provides superior working-flex service life without work hardening.

Blaze and Bandit meet:
ANSI Z133
CE0598 EN1891 Type-B

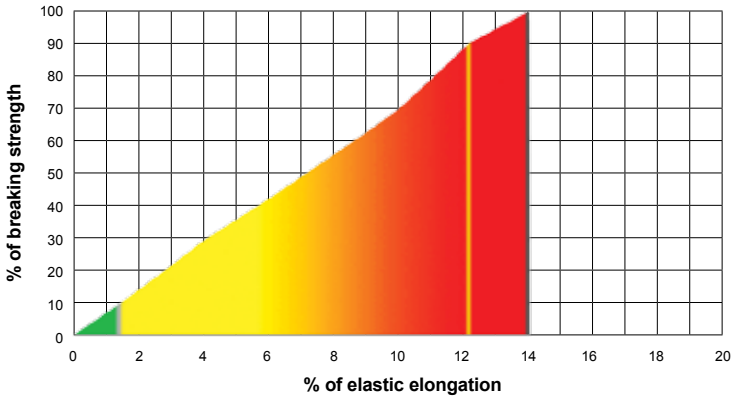
Blue Moon meets:
ANSI Z133

Specifications

Product	Diameter	Average Break Strength*		Suggested Design Factor** 10:1		Weight	
	mm	Lbs	Kg	Lbs	Kg	Lbs/100ft	Kg/100m
Blaze / Bandit	11	5,600	2,540	560	254	6.0	8.9
Blue Moon	11.7	6,500	2,948	650	295	6.5	9.7

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope's suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.



Energy Absorption
The colored area under the curve represents the rope's ability to do “work” and is expressed in foot-pounds per pound of rope in tension.

- Green working 263 ft. lbs./lb.
- Red ultimate 7,050 ft. lbs./lb.

Suggested Design Factor
Minimum Break Strength
Average Break Strength

Specific Gravity: 1.38

XTC 24

Key Features

- Competition grade
- Enhanced grip for better ergonomics

Sunburst – A similar climbing line to Blue Moon and its construction, only with a nylon core. Available in higher-visibility colors of orange and yellow.

IMORI (eee-mor-lee) means “Good Forest” in Japanese.Yale Cordage has incorporated a new type of taslanized (textured) fiber into the rope structure that provides bulk and, therefore, an enhanced grip for better ergonomics. This fiber is blended with a 100% solution-dyed filament polyester into the construction. This unique blend allows the fibers to be exposed on both the outer sheath and also on the inside of the sheath, providing more friction to the inner core, which helps to minimize excessive elongation while providing superior unsurpassed grip for the climber.

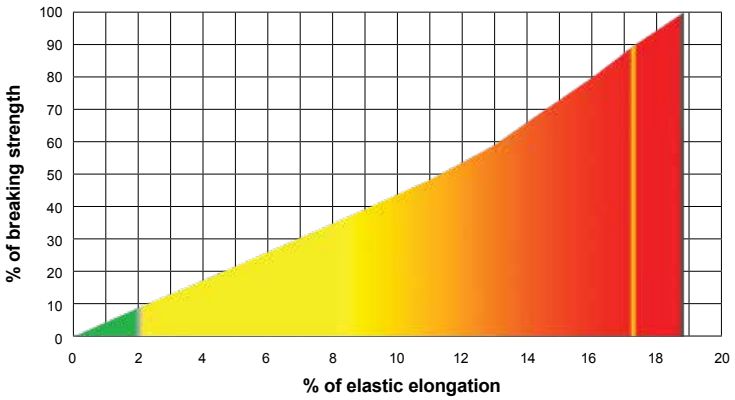
Sunburst and IMORI meet:
ANSI Z133
CE0598 EN1891 Type-A

Specifications

Product	Diameter	Average Break Strength*		Suggested Design Factor** 10:1		Weight	
	mm	Lbs	Kg	Lbs	Kg	Lbs/100ft	Kg/100m
Sunburst	11.7	6,500	2,948	650	295	6.5	9.7
Imori	12	6,200	2,812	620	281	7.0	10.4

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope’s suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.



Energy Absorption
The colored area under the curve represents the rope’s ability to do “work” and is expressed in foot-pounds per pound of rope in tension.

- Green working 263 ft. lbs./lb.
- Red ultimate 7,050 ft. lbs./lb.

Suggested Design Factor
Minimum Break Strength
Average Break Strength

Specific Gravity: 1.24

XTC 48

Kernmaster

Key Features

- Professional grade
- Static feel with energy-absorbtion capabilities

Static-rappelling **Kernmaster** line is constructed with a traditional "mantle" sleeve consisting of 48 strands of polyester. The inside, or "kern," is a braided core of energy-absorbing nylon. The core is fully steam-stabilized to enhance the rope's flexibility and prevent hardening in service; the braid also bends more easily and with less fatiguing of the core when cycled over sheaves or dropped over a parapet. Sleeve is either white or solution-cast fiber (color added prior to yarn production), which makes for lasting colors and enhanced wear resistance.

7/16" and 1/2" meet:
ANSI Z133
CE0598 EN1891 Type-A

Scandere

Key Features

- Optimized for mechanical ascension
- Static feel with energy-absorbtion capabilities
- Transitions well from SRT to DRT
- Improved sleeve durability

Scandere, meaning "to climb" is constructed with 48 strands of high-tenacity polyester tightly braided over a core of steam-stabalized nylon. With its solution-cast fiber and broad construction, the sleeve offers superior visibility, abrasion resistance and longevity while the stabilized core promotes flexibility, prevents stiffness and maximizes energy absorption. Capturing the finest features of a traditional kernmantle line and combining them with the essential toughness needed to get the job done, Scandere is easy to handle and highly compatible with mechanical devices.

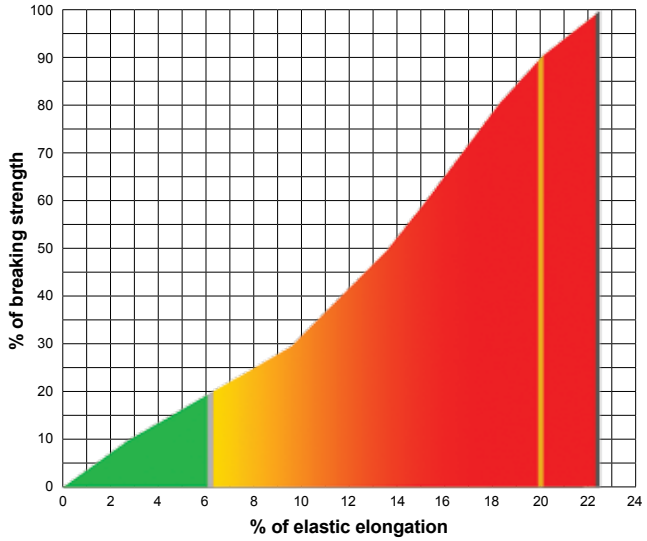
Scandere meets:
ANSI Z133
CE0598 EN1891 Type-A

Specifications

Product	Diameter		Average Break Strength*		Suggested Design Factor** 10:1		Weight	
	Inches	(mm)	Lbs	Kg	Lbs	Kg	Lbs/100ft	Kg/100m
Kernmaster	3/8	(10)	4,000	1,815	400	181	4.0	6.0
Kernmaster	7/16	(11.7)	7,100	3,220	710	322	5.5	8.2
Kernmaster	1/2	(13)	9,200	4,173	920	417	7.6	11.3
Kernmaster	5/8	(16)	12,500	5,670	1,250	567	11.4	17.0
Scandere	7/16	(11.7)	7,100	3,220	710	322	6.5	9.7

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope's suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.



Energy Absorption
The colored area under the curve represents the rope's energy-absorption capability.

- Green working 622 ft. lbs./lb.
- Red ultimate 9,775 ft. lbs./lb.

Dielectric Strength: The maximum allowable leakage for clean, dry Kernmaster and Scandere is 500 micro- amperes when tested at 100kV per Yale Method 712-1701 Rev 1 "Routine ProductionTest." Absorbed and entrained moisture or impurities will increase rope's conductivity dramatically.

Suggested Design Factor
Minimum Break Strength
Average Break Strength

Specific Gravity: 1.23

Tech-Kern

Tech-Kern is a Kernmantle-style rope consisting of a braided Technora Aramid core covered by a 48-strand Technora sleeve. Tech-Kern was designed to bring the highest heat resistance to the market, as Technora has a high melting point and acts as a heat sink when used in frictional applications. If heat is on your mind, consider Tech-Kern.

Technora® The power of Aramid

R.I.N.G Rope

R.I.N.G Rope was designed in collaboration with scientists conducting survey work on remote volcanic islands in the Pacific. R.I.N.G Rope is engineered with superior durability and ease of inspection in mind. The modified Technora over-braid is designed to maximize cut and abrasion resistance. Inside, you'll find a modified Kernmantle construction. The red polyester sub-sleeve is easily identifiable if the rope becomes compromised due to wear and tear. If the red damage indicator is exposed, just remember "Red-Is-No-Go!"

Technora® The power of Aramid

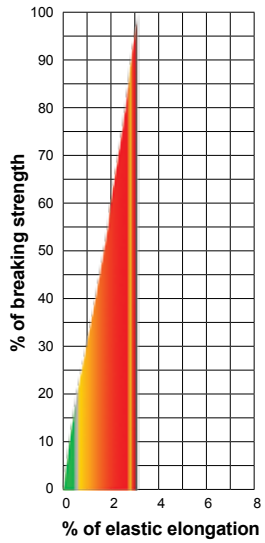
Specifications

Product	Diameter	Average Spliced Break Strength*		Suggested Design Factor** 10:1		Weight	
	mm	Lbs	Kg	Lbs	Kg	Lbs/100ft	Kg/100m
Tech-Kern	11.4	21,000	9,530	2,100	953	7.6	11.3
R.I.N.G Rope	11.5	6,730	3,050	670	305	6.2	9.3

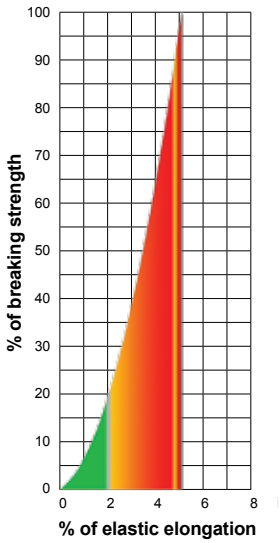
* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope's suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.

Tech-Kern



R.I.N.G. Rope



Energy Absorption

The colored area under the curve represents the rope's ability to do "work" and is expressed in foot-pounds per pound of rope in tension.

Tech-Kern

- Green working 233 ft. lbs./lb.
- Red ultimate 4,571 ft. lbs./lb.

R.I.N.G. Rope

- Green working 425 ft. lbs./lb.
- Red ultimate 8,334 ft. lbs./lb.

Dielectric Strength: Due to their moisture gain, high-dielectric applications are not recommended.

Maximum Working Load
Minimum Break Strength
Average Break Strength

Portland Braid

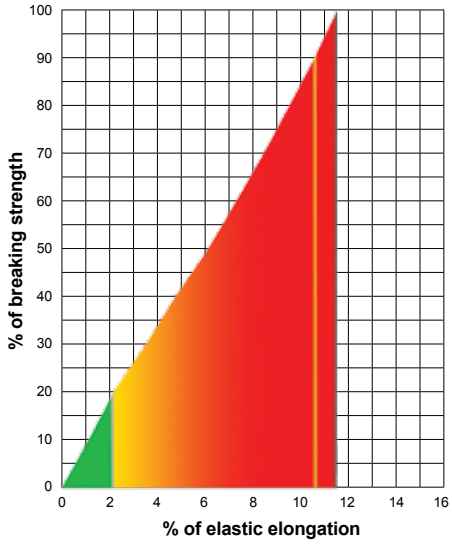
Portland Braid double-braided polyester offers high value at a very competitive price. Built in the same manner as our Double Esterlon, Portland Braid offers consistent performance at an economical price. The fiber used to produce Portland Braid is sourced from Yale's qualified suppliers. As with all of Yale's products, Portland Braid can be special ordered in ultra-long continuous lengths.

Specifications

Diameter		Average Break Strength*		Suggested Design Factor** 5:1		Weight	
Inches	(mm)	Lbs	Kg	Lbs	Kg	Lbs/100ft	Kg/100m
1/2	(13)	10,000	4,536	2,000	907	7.9	11.8
9/16	(14)	11,100	5,035	2,220	1,007	10.0	14.9
5/8	(16)	14,900	6,759	2,980	1,352	13.0	19.3
3/4	(19)	18,000	8,165	3,600	1,633	16.4	24.4
7/8	(22)	29,450	13,358	5,890	2,672	27.1	40.3

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope's suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.



Energy Absorption

The colored area under the curve represents the rope's ability to do "work" and is expressed in foot-pounds per pound of rope in tension.

- Green working 265 ft. lbs./lb.
- Red ultimate 5,929 ft. lbs./lb.

Dielectric Strength: The maximum allowable leakage for clean, dry Portland Braid is 500 micro- amperes when tested at 90KV per ASTM 1701-05 "Routine ProductionTest." Absorbed and entrained moisture or impurities will increase rope's conductivity dramatically.

Suggested Design Factor
Minimum Break Strength
Average Break Strength

Specific Gravity: 1.38

Double Esterlon

Double Esterlon is a double-braided rope constructed of high-tenacity polyester fiber, with a custom fiber finish. This yarn, with an average strength of 9.2 grams per denier, along with Yale's careful attention to converting machinery setup and the yarn's extraordinary lubricity, yields the highest-strength double-braid polyester available.

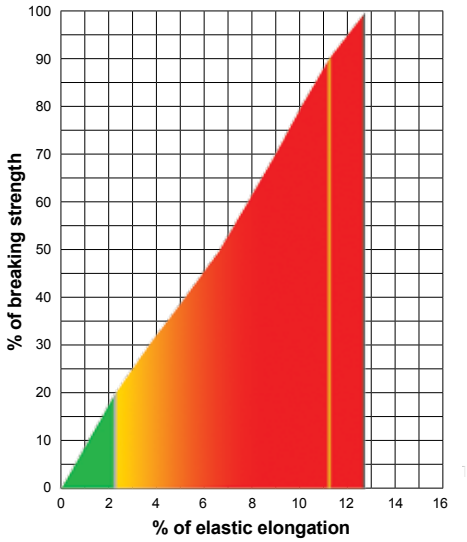
Double Esterlon has low stretch, high strength and excellent wear life and dielectric strength, and it is completely spliceable, delivering the cataloged strengths when spliced properly. It is identified by two green strands braided into the cover structure and is available with optional Maxijacket urethane coating to further enhance the rope's wear resistance.

Specifications

Diameter		Average Break Strength*		Suggested Design Factor** 5:1		Weight	
Inches	(mm)	Lbs	Kg	Lbs	Kg	Lbs/100ft	Kg/100m
1/2	(13)	10,800	4,899	2,160	980	7.8	11.6
9/16	(14)	13,290	6,028	2,658	1,206	9.6	14.3
5/8	(16)	17,000	7,711	3,400	1,542	13.7	20.4
3/4	(19)	20,800	9,435	4,160	1,887	16.7	24.8
7/8	(22)	31,000	14,061	6,200	2,812	24.0	35.7

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope's suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.



Energy Absorption

The colored area under the curve represents the rope's ability to do "work" and is expressed in foot-pounds per pound of rope in tension.

- Green working 291 ft. lbs./lb.
- Red ultimate 7,711 ft. lbs./lb.

Dielectric Strength: The maximum allowable leakage for clean, dry Double Esterlon is 100 micro-amperes when tested at 90KV per ASTM 1701-05 "Routine Production Test." Absorbed and entrained moisture or impurities will increase rope's conductivity dramatically.

Suggested Design Factor
Minimum Break Strength
Average Break Strength

Specific Gravity: 1.38

Polydyne

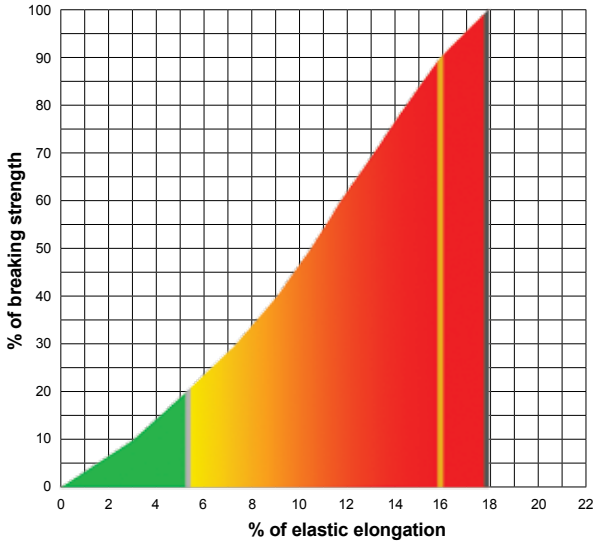
Polydyne is a double-braided rope that utilizes a polyester sleeve over a nylon core. Despite the dissimilar stretch characteristics of these fibers, Yale engineers have produced constructions where both fibers contribute. The resulting rope has high breaking strength and more stretch in its working load range, which in many applications is a plus. Polydyne is up to taking more dynamic abuse without being degraded prematurely. Take special note of the working energy-absorption rating, which is the amount of energy a rope absorbs before reaching its working load. The ultimate energy absorption of this rope is also correspondingly high. All this and a tough polyester jacket make this a long-wearing rope with extraordinary dynamic capabilities.

Specifications

Diameter		Average Break Strength*		Suggested Design Factor** 5:1		Weight	
Inches	(mm)	Lbs	Kg	Lbs	Kg	Lbs/100ft	Kg/100m
1/2	(13)	11,000	4,990	2,200	998	7.6	11.3
9/16	(14)	15,000	6,804	3,000	1,361	9.7	14.4
5/8	(16)	18,900	8,573	3,780	1,715	13.6	20.2
3/4	(19)	26,000	11,793	5,200	2,359	18.5	27.5
7/8	(22)	33,600	15,241	6,720	3,048	24.4	36.3

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope's suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.



Energy Absorption

The colored area under the curve represents the rope's ability to do "work" and is expressed in foot-pounds per pound of rope in tension.

- Green working 576 ft. lbs./lb.
- Red ultimate 11,187 ft. lbs./lb..

Dielectric Strength: The maximum allowable leakage for clean, dry Polydyne is 500 micro-amperes when tested at 90KV per ASTM 1701-05 "Routine Production Test." Absorbed and entrained moisture or impurities will increase rope's conductivity dramatically.

Suggested Design Factor
Minimum Break Strength
Average Break Strength

Specific Gravity: 1.24

XTR 12

Key Features

- Professional grade
- Light weight hollow braid
- Excellent flexibility

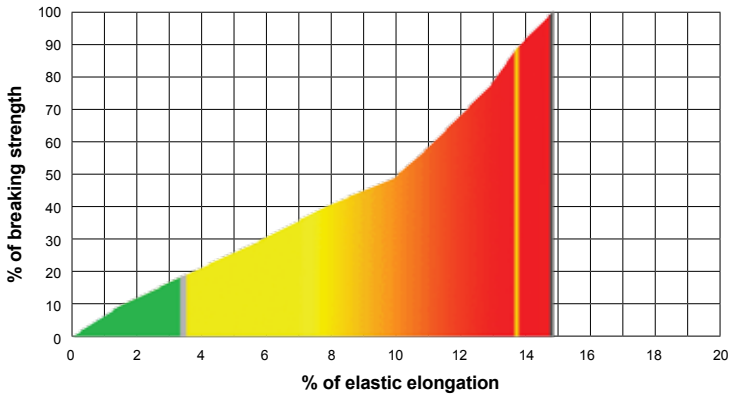
XTR 12 offers a “nubby” texture to allow for better control. Its construction yields a light yet strong line that provides lifetime flexibility while maintaining abrasion resistance. Built to be round and stay round, XTR 12 is a 12-strand single braid of polyester/“Para-ep” Olefin. This all-synthetic rope resists rot and mildew, and performs equally well in both wet and dry conditions. XTR 12 has a blended yellow strand along with diameter-specific color coding for easy identification.

Specifications

Color	Diameter		Average Break Strength*		Suggested Design Factor** 5:1		Weight	
	Inches	(mm)	Lbs	Kg	Lbs	Kg	Lbs/100ft	Kg/100m
Green	5/8	(16)	9,800	2,445	1,960	889	10.1	15.0
Blue	3/4	(18)	12,750	5,783	2,550	1,157	13.3	19.8

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope’s suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.



Energy Absorption

The colored area under the curve represents the rope’s ability to do “work” and is expressed in foot-pounds per pound of rope in tension.

- Green working 414 ft. lbs./lb.
- Red ultimate 7,500 ft. lbs./lb.

Suggested Design Factor
Minimum Break Strength
Average Break Strength

Specific Gravity: 1.25

XTR 16

XTR 16

Key Features

- Professional grade
- Abrasion resistance
- Resists snagging; increased durability

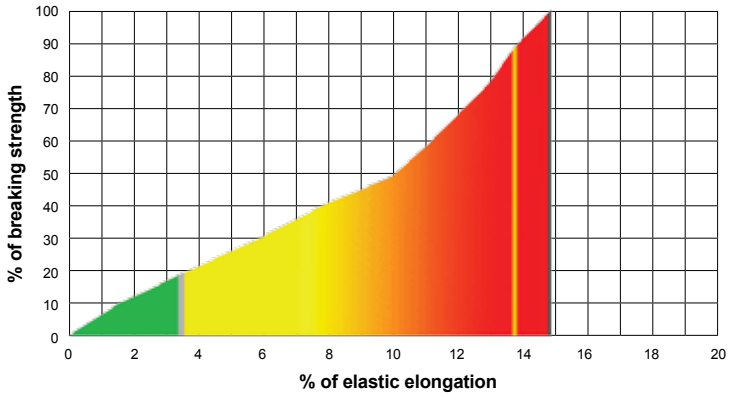
XTR 16 was designed specifically for the demanding needs of the professional arborist. The tight-braid polyester cover over a bundled parallel core gives a firm, round feel and offers high snag and abrasion resistance. The high-twist, torque-balanced polyester core provides excellent energy-absorbing capabilities. XTR 16 is color coded by diameter for easy identification.

Specifications

Color	Diameter		Average Break Strength*		Suggested Design Factor** 5:1		Weight	
	Inches	(mm)	Lbs	Kg	Lbs	Kg	Lbs/100ft	Kg/100m
Orange	9/16	(14)	7,800	3,538	1,560	708	9.7	14.4
Green	5/8	(16)	10,000	4,536	2,000	907	10.6	15.8
Blue	3/4	(19)	12,750	5,783	2,550	1,157	13.3	19.8

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope's suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.



Energy Absorption

The colored area under the curve represents the rope's ability to do "work" and is expressed in foot-pounds per pound of rope in tension.

- Green working 299 ft. lbs./lb.
- Red ultimate 5,029 ft. lbs./lb.

Suggested Design Factor
Minimum Break Strength
Average Break Strength

Specific Gravity: 1.38

Optimus

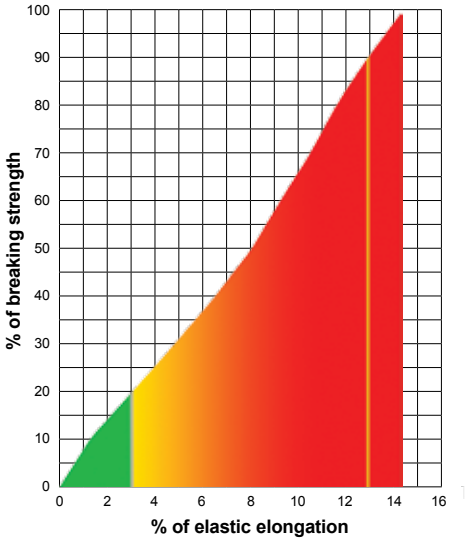
Optimus is manufactured from a solution-dyed polyester and coated with our riggers-grade, abrasion-resistant coating to maximize protection. The vibrant polyester colorfast fibers are resistant to fading and provide lifelong visibility. The Optimus provides optimal UV and weather resistance while maintaining its lightweight and flexible characteristics. Optimus is designed to be easily spliced for fabrication of custom rigging solutions. The Optimus is color coded by diameter for easy identification in the field.

Specifications

Color	Diameter		Average Break Strength*		Suggested Design Factor** 5:1		Weight	
	Inches	(mm)	Lbs	Kg	Lbs	Kg	Lbs/100ft	Kg/100m
Yellow	3/8	(10)	6,000	2,722	1,200	544	4.0	6.0
Green	1/2	(13)	13,500	6,123	2,700	1,225	9.2	13.7
Orange	5/8	(16)	19,000	8,618	3,800	1,724	11.7	17.4
Blue	3/4	(19)	25,000	11,340	5,000	2,268	16.0	23.8
Red	7/8	(22)	36,000	16,329	7,200	3,266	25.0	37.2

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope's suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.



Energy Absorption
The colored area under the curve represents the rope's ability to do "work" and is expressed in foot-pounds per pound of rope in tension.
- Green working 409 ft. lbs./lb.
- Red ultimate 10,700 ft. lbs./lb.

Dielectric Strength: The maximum allowable leakage for clean, dry Optimus is 100 micro-amperes when tested at 90KV per ASTM 1701-05 "Routine Production Test." Absorbed and entrained moisture or impurities will increase rope's conductivity dramatically.

Suggested Design Factor
Minimum Break Strength
Average Break Strength

Specific Gravity: 1.38

Yalex

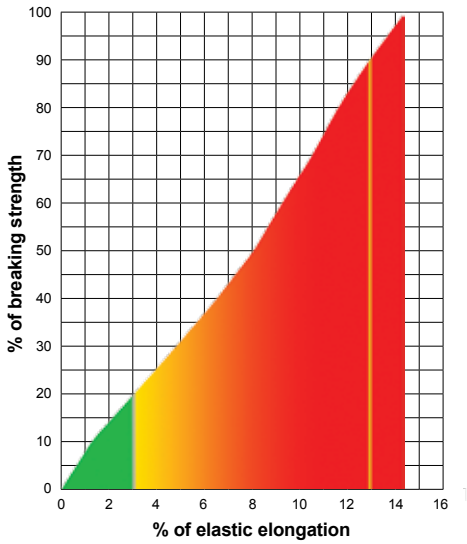
Yalex is a single-braid, 12-strand rope constructed of specially lubricated high-tenacity polyester. Yalex's two-end-per-carrier structure creates a larger void in the middle of the rope, which makes it easier to splice and makes used-rope splicing much easier to perform. Yalex is always coated with Yale's Maxijacket urethane coatings, which reduces the new rope's tendency to snag, greatly enhances abrasion resistance and is a great way to color code ropes for application or load rating.

Specifications

Diameter		Average Break Strength*		Suggested Design Factor** 5:1		Weight	
Inches	(mm)	Lbs	Kg	Lbs	Kg	Lbs/100ft	Kg/100m
3/8	(10)	6,000	2,722	1,200	544	4.0	6.0
1/2	(13)	12,000	5,443	2,400	1,089	9.0	13.4
5/8	(16)	18,500	8,391	3,700	1,678	12.1	18.0
3/4	(19)	24,000	10,886	4,800	2,177	17.0	25.3
7/8	(22)	35,500	16,103	7,100	3,221	25.6	38.1

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope's suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.



Energy Absorption

The colored area under the curve represents the rope's ability to do "work" and is expressed in foot-pounds per pound of rope in tension.

- Green working 409 ft. lbs./lb.
- Red ultimate 10,700 ft. lbs./lb.

Dielectric Strength: The maximum allowable leakage for clean, dry Yalex is 100 micro-amperes when tested at 90KV per ASTM 1701-05 "Routine Production Test." Absorbed and entrained moisture or impurities will increase rope's conductivity dramatically.

Suggested Design Factor
Minimum Break Strength
Average Break Strength

Specific Gravity: 1.38

Ultrex

Ultrex is a 12-strand single braid of 100% ultra-high-molecular-weight polyethylene (UHMPE) fiber enhanced with Yale's Maxijacket HP coating, supplying superior abrasion resistance. Ultrex's braid angles and twist level are designed to optimize break strength and keep stretch low. UHMPE is the most forgiving high-modulus fiber, giving better sheave-cycling capabilities than other high-tech fibers.

Ultrex has zero water absorption and maintains its flexibility even in freezing conditions. As is the case for all Yale ropes, the strengths shown in the charts are for spliced ropes, and the splice technique for Ultrex is very easily mastered.

Spectra fiber has a melting temperature of 293°F and loses strength quickly upon exposure to elevated temperatures. The maximum recommended use temperature of Spectra fiber ropes is 140°F. This temperature can be achieved quickly in fast-moving or high-friction systems such as lowering or high-speed winching. As such, Spectra ropes should be carefully monitored when used in situations where high temperatures may be a concern.

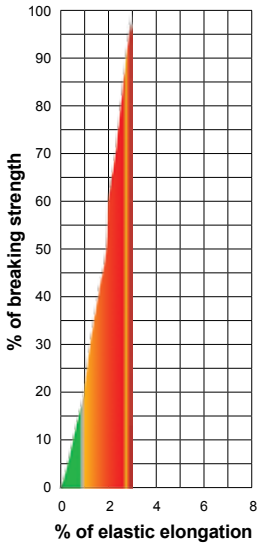
Honeywell Spectra® Fiber

Specifications

Diameter		Average Break Strength*		Suggested Design Factor** 5:1		Weight	
Inches	(mm)	Lbs	Kg	Lbs	Kg	Lbs/100ft	Kg/100m
5/16	(8)	13,500	6,125	2,700	1,225	2.4	3.6
3/8	(10)	20,000	9,080	4,000	1,816	3.5	5.2
7/16	(11)	25,700	11,665	5,140	2,333	4.6	6.8
1/2	(13)	37,400	16,975	7,480	3,395	6.2	9.2
9/16	(14)	45,000	20,430	9,000	4,086	7.5	11.2
5/8	(16)	53,000	24,060	10,600	4,812	9.0	13.4
3/4	(19)	75,000	34,050	15,000	6,810	12.2	18.2
7/8	(22)	98,000	44,490	19,600	8,898	17.6	26.2
1	(25)	120,000	54,480	24,000	10,896	21.2	31.6

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope's suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.



Energy Absorption

The colored area under the curve represents the rope's ability to do "work" and is expressed in foot-pounds per pound of rope in tension.

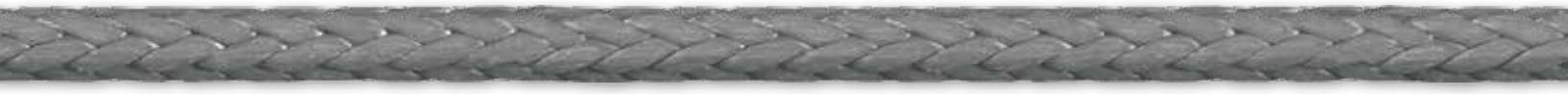
- Green working 317 ft. lbs./lb.
- Red ultimate 8,300 ft. lbs./lb.

Dielectric Strength: The maximum allowable leakage for clean, dry Ultrex is 75 micro-amperes when tested at 90KV per ASTM 1701-05 "Routine Production Test." Absorbed and entrained moisture or impurities will increase rope's conductivity dramatically.

Splice using Yale's splicing technique document #10015109 (all sizes), or technique document #10018009 (video) for 1-1/8" and larger.

Suggested Design Factor
Minimum Break Strength
Average Break Strength

Specific Gravity: 0.98



Maxibraid

Maxibraid is a 12-strand single-braid rope constructed from ultra-high-molecular-weight polyethylene fiber. UHMPE fiber has the highest strength-to-weight ratio of any synthetic or natural fiber, and it floats. The integral Maxijacket HP coating firms the construction, increases wear life and helps keep contaminants out of the rope. Maxibraid also has extremely low stretch and is laid firmer than Ultrex, sacrificing some tensile strength for longevity in tough field conditions. In many instances, we have found this firmer lay retains higher percentages of original breaking strength after use in the field for extended periods. Available in a variety of Maxijacket colors, which can help identify time in service, differentiate one rope from another or denote load ratings.

Spectra fiber has a melting temperature of 293°F and loses strength quickly upon exposure to elevated temperatures. The maximum recommended use temperature of Spectra fiber ropes is 140°F. This temperature can be achieved quickly in fast-moving or high-friction systems such as lowering or high-speed winching. As such, Spectra ropes should be carefully monitored when used in situations where high temperatures may be a concern.

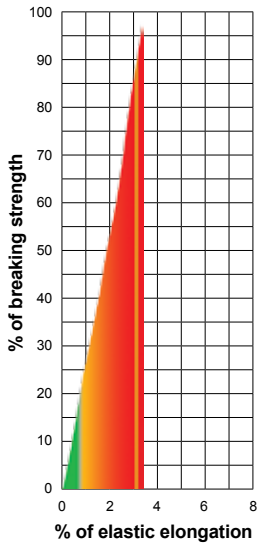
Honeywell Spectra® Fiber

Specifications

Diameter		Average Break Strength*		Suggested Design Factor** 5:1		Weight	
Inches	(mm)	Lbs	Kg	Lbs	Kg	Lbs/100ft	Kg/100m
5/16	(8)	9,800	4,445	1,960	889	2.4	3.6
3/8	(10)	14,300	6,490	2,860	1,298	3.5	5.2
7/16	(11)	18,000	8,170	3,600	1,634	4.0	6.0
1/2	(13)	26,500	12,030	5,300	2,406	6.5	9.7
9/16	(14)	32,000	14,525	6,400	2,905	7.5	11.2
5/8	(16)	39,500	17,930	7,900	3,586	9.2	13.7
3/4	(19)	49,000	22,245	9,800	4,449	12.7	18.9
7/8	(22)	69,000	31,325	13,800	6,265	17.2	25.6
1	(25)	82,000	37,225	16,400	7,445	21.0	31.3

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope's suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.



Energy Absorption

The colored area under the curve represents the rope's ability to do "work" and is expressed in foot-pounds per pound of rope in tension.

- Green working 226 ft. lbs./lb.
- Red ultimate 6,342 ft. lbs./lb.

Dielectric Strength: The maximum allowable leakage for clean, dry Maxibraid is 75 micro-amperes when tested at 90KV per ASTM 1701-05 "Routine Production Test". Absorbed and entrained moisture or impurities will increase rope's conductivity dramatically.

Splice using Yale's splicing technique document #10015109 (all sizes), or technique document #10018009 (video) for 1-1/8" and larger.

Suggested Design Factor
Minimum Break Strength
Average Break Strength

Specific Gravity: 0.98

Ultrex Chook

The Ultrex winch line featuring the Chook is the leading solution for your chipper winch needs. We created the Chook to succeed the traditional steel hook that is generally used with chipper winch lines.

This revolutionary connector allows users to easily choke off the load, either directly to the winch line, or preferably by use in conjunction with a sling. The Chook is made from a high-density polymer, creating a 2,200-pound working load and decreasing the potential of equipment damage. As with any chipper hook, proper and safe practices are required when the Chook is in use.

Ultrex and Chook are are offered in 5/16 and 3/8-inch diameters in lengths of 100, 150 and 200 feet to work with your existing arrangement. The complete assembly comes standard with movable chafe for added abrasion resistance where you need it most and a stowage sling for safe storage while in transit.

Patent Pending #14/392, 051

Guardian Brace

Guardian Brace is an excellent fiber alternative to steel cable. It is easy to splice and easy to adjust in the field. Guardian dramatically reduces your installation costs because there is no hardware required. It is also much lighter and easier to work with.

Diameter		Average Break Strength*		Weight		
Inches	(mm)	Lbs	Kg	Lbs/100ft	Kg/100m	Tons
5/8	(16)	4,000	1,814	7.5	11.2	2
3/4	(19)	8,000	3,629	8.3	12.3	4

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

Bee-Line Prussic

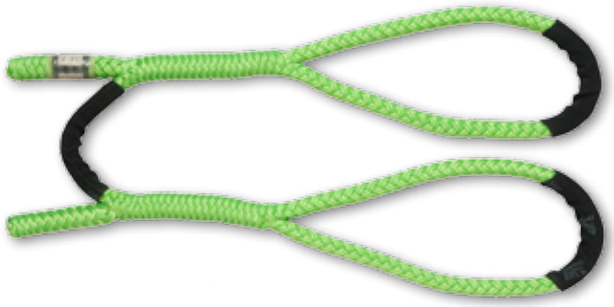
Bee-Line offers high heat resistance provided by its Vectran core and a 75% / 25 % Technora / Polyester braided cover. Bee Line has one of the highest heat-resistant covers available in the market. Our prefabricated assemblies have a small 1-inch eye with clear Maxijacket coating for enhanced wear resistance and added rigidity for installing carabiners through the eyes. The 5/16" diameter is perfectly compatible with 11mm and 11.7mm climbing lines. The 3/8" is also used on 11.7mm, along with 12mm+ climbing lines.

Diameter		Average Break Strength*		Suggested Design Factor** 10:1		Weight	
Inches	(mm)	Lbs	Kg	Lbs	Kg	Lbs/100ft	Kg/100m
5/16	(8)	8,000	3,629	800	363	3.7	5.5
3/8	(10)	11,000	4,990	1,100	499	4.8	7.1

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope's suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.

Optimus Adjustable Slings



Optimus Adjustable Slings

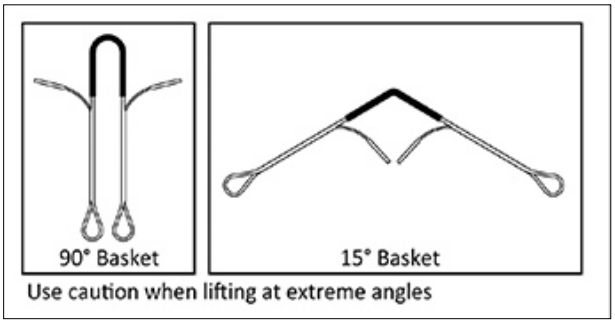
Optimus is the optimal solution for your lifting needs.

- Solution-dyed polyester, single braid
- Vibrant, colorfast fiber, resistant to fading
- Available with adjustable eyes on one or both ends
- Adapts to varying loads
- Infinite adjustability
- Weather and UV resistant
- Lightweight
- Treated with abrasion-resistant Maxijacket to extend service life
- Lifting portion protected by chafe sleeve
- Customized options available
- Available with additional chafe protection

Specifications

Diameter	Minimum Adjustment		Average Working Load Configurations*						2 Eye Adjustable Sling	
			Vertical		Choker		Basket		Basket 15 Deg	
Inches	Inches	(mm)	Lbs	Kg	Lbs	Kg	Lbs	Kg	Lbs	Kg
3/8	20	(508)	1,055	479	845	384	2,110	958	675	306
1/2	26	(660)	2,220	1,008	1,780	808	4,440	2,016	1,400	635
5/8	32	(813)	3,205	1,455	2,560	1,163	6,410	2,911	2,100	953
3/4	38	(965)	4,225	1,919	3,380	1,535	8,450	3,837	2,700	1,225
7/8	46	(1,168)	6,250	2,838	5,000	2,271	12,500	5,677	4,000	1,814

* Working load is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope's rated working load constitute hazardous shock load and would void the normal working load recommendation.



Dead Eye Slings

Manufactured with Maxijacket-coated Double Esterlon or Polydyne, each unit has a chafe sleeve-covered small or large eye. Dead Eye slings, as with rigging lines, are color coded for easy identification, in the field.

Specifications

Product	Diameter		Average Break Strength*	
	Inches	(mm)	Lbs	Kg
Double Esterlon	5/8	(16)	17,000	7,711
Double Esterlon	3/4	(19)	20,800	9,435
Polydyne	5/8	(16)	18,900	8,573
Polydyne	3/4	(19)	26,000	11,793

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor. The end user is responsible for choosing the correct design factor for their application.

LOUPS™

Key Features

- Easy to inspect
- 100% Spectra UHMPE construction
- Resistant to chemicals
- Flexible and easy to install in rigging systems
- Available with additional chafe protection

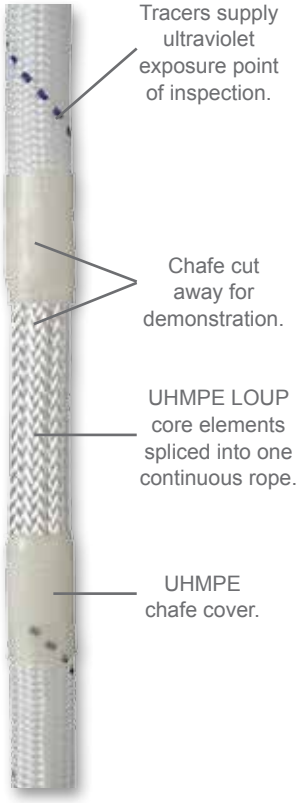
LOUPS™ high-modulus endless slings, by Yale Cordage or a Yale Cordage licensee, are the most efficient synthetic slings available and far lighter than steel or conventional round slings. LOUPS bend gracefully and are covered with a cut resistant UHMWPE sleeve. All LOUPS up to 1 inch undergo Yale's proprietary annealing process, which increases tensile strength and efficiency. LOUPS are available in a range of configurations, lengths, and capacities exceeding 2 million pounds! For more information contact Yale Cordage or a Yale authorized distributor.

Honeywell Spectra® Fiber

Specifications

Model	Diameter	Vertical Capacity*	Choker Capacity*	Basket Capacity*	Minimum Length
	Inches	Lbs	Lbs	Lbs	Feet
4A03	0.39	4,280	3,638	8,560	2
4A04	0.44	5,700	4,845	11,400	2
4A05	0.48	7,140	6,069	14,280	2
7A02	0.54	8,560	7,276	17,120	2
7A03	0.67	12,800	10,880	25,600	4
7A04	0.71	17,100	14,535	34,200	4
7A06	0.83	25,600	21,760	51,200	4

* Rated capacity is based on 5:1 Design Factor



Spectra® Synthetic Shackle

Spectra® Synthetic Shackle

The Spectra Synthetic Shackle is made from our Ultrex™ 12-strand ultra-high-molecular-weight polyethylene (UHMPE) fiber and is HP coated for structural firmness and increased abrasion resistance. It is lightweight and offers a quick connection with no tools required.

Spectra fiber has a melting temperature of 293°F and loses strength quickly upon exposure to elevated temperatures. The maximum recommended use temperature of Spectra fiber ropes is 140°F. This temperature can be achieved quickly in fast-moving or high-friction systems such as lowering or high-speed winching. As such, Spectra ropes should be carefully monitored when used in situations where high temperatures may be a concern.

Honeywell Spectra® Fiber

Specifications

Diameter	Minimum Open Length*	Minimum Increment	Knot Diameter	Maximum Diameter**	Average Break Strength		Average Working Load	
Inches	Inches	Inches	Inches	Inches	Lbs	Kg	Lbs	
1/4	7	2	1.1	1.2	11,200	5,080	2,240	1,016
5/16	9	2	1.4	1.5	23,000	10,433	4,600	2,087
3/8	11	2	1.7	1.8	34,000	15,422	6,800	3,084
7/16	12	4	2.0	2.0	43,700	19,822	8,740	3,964
1/2	14	4	2.2	2.5	63,600	28,848	12,720	5,770
9/16	16	4	2.5	2.8	76,500	34,700	15,300	6,940
5/8	18	4	2.8	3.1	90,100	40,869	18,020	8,174

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope's suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.

*Open length of the shackle describes the length as shown in the image above, omitting the knot.

Maxi-Flip Lines

Key Features

- Free Flex Flemish eye splice
- Lightweight
- Utilizes the best hardware available

Maxi-Flip wire core flip lines have Free Flex end terminations to minimize the in-use wire rope axial fatigue. This provides the climber with the safest possible end termination. The Maxi-Flip is available with a heavy duty standard or swivel snap on one or both ends. Maxi-Flip flip lines are available in many lengths and three diameters 1/2″, 5/8″, and 3/4″ and are coated in Maxijacket orange to maximize abrasion resistance.

The **Maxi-Flip Sport** wire core flip line offers a 16-strand cover which works great with mechanical hardware and is 25% lighter than the standard Maxi-Flip. Sticking to our guns, the Flemish eye splice is the safest end splice for wire core. The Sport is available with four choices of hardware including a swiveling carabineer or aluminum snap. Available in 1/2″ diameter and coated with Maxijacket red to maximize abrasion resistance.

R.I.N.G Lanyard/Accessory Cord

Identical in construction to the larger R.I.N.G Rope, the durable 10.5mm R.I.N.G lanyard/accessory cord has been designed as a light-weight alternative to the 11.5mm product. 10.5mm R.I.N.G can be stitched for fabricating flip lines and lanyards. With a break strength of over 7,300 pounds, this smaller diameter product is also ideally suited as a descent and rappel line.

Technora®
The power of Aramid

Specifications

Product	Diameter		Average Break Strength*		Suggested Design Factor** 10:1	
	Inches	(mm)	Lbs	Kg	Lbs	Kg
Max-Flip	1/2	(13)	5,600	2,950	560	254
Max-Flip	5/8	(16)	5,600	2,950	560	254
Max-Flip	3/4	(19)	5,600	2,950	560	254
R.I.N.G Rope		(10.5)	7,300	3,310	730	330

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope's suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.

Split Tails

Split Tails are used to form a bridge from the climber's saddle to the running end of the rope where it is tied off with a suitable friction hitch. A 16-strand rope is fabricated for use as a split tail friction knot. Its firm but flexible construction creates a positive-control sliding friction knot. Each unit has a 1-inch soft eye on one end and is whip locked and heat sealed at the end. Split Tails are manufactured with XTC 16 and meet CE0120 EN1891 Type-A.

Specifications

Diameter		Average Spliced Break Strength*		Working Load		Weight	
Inches	(mm)	Lbs	Kg	Lbs	Kg	Lbs/100ft	Kg/100m
1/2	(13)	6,200	2,812	620	281	7.5	11.2

* Average break strength is based on spliced rope or capstans samples. Knots and abrupt bends significantly reduce the strength of all ropes and lower the design factor

** Suggested design factor is based on static or moderately dynamic lifting/pulling operations. Instantaneous changes in load, up or down, in excess of 10% of the rope's suggested design factor constitute hazardous shock load and would void the suggested design factor recommendation. The end user is responsible for choosing the correct design factor specific to their application.

Long Shot Throw Line

Long Shot throw line is a UHMPE (Spectra) fiber that has been Maxijacket coated for toughness and anti-snagging commonly found in other throw lines. Long Shot is a solid-braid structure, creating a firmer, rounder construction, creating less friction on the surface area of the branch to line. Long Shot is 1.8mm.

Coatings


Red


Blue


Green


Yellow


Orange


Black


Gray


Clear

Yale Maxijacket

This is a spliceable urethane coating that is applied after the rope is braided. Maxijacket firms the rope, increases snag resistance, improves abrasion resistance and helps keep contaminants from entering the rope. Unlimited lengths may be processed at our facility through our automated coaters, which apply and control the polymer penetration, curing the coating at precisely controlled temperatures. Maxijacket maintains the rope's splicing characteristics and is available in a range of colors for rapid line identification. The colors are also useful to track time in service, to color code for load rating, for phase identification or to make the rope more visible. The coating is also available in clear or white.

Maxijacket cans

A water-based urethane, premixed with color pigment for hand application.

Available Colors: Red, Blue, Green, Yellow, Orange, Black, Gray and Clear

All colors available in quart or gallon can sizes.

Shipping Weights:

Quart: 2.5 lbs.

Gallon: 9.5 lbs.

High-Performance Maxijacket (HP)

Maxijacket HP is a new urethane technology originating in Europe. It brings an innovative toughness to our high-modulus rope offerings. This new material is harder, penetrates better and is twice as abrasion resistant as our traditional Maxijacket coating. Maxijacket HP is available in the same color choices as our Maxijacket offering. It is applied as the standard coating of choice on all high-modulus single braids and can be requested as a special-order option on any other products. The extra toughness will make splicing more difficult, so it is not recommended for any products where spliceability is an important factor.

Available Colors: Red, Blue, Green, Yellow, Orange, Black, Gray and Clear

All colors are available in quart or gallon can sizes.

Shipping Weights:

Quart: 2.5 lbs.

Gallon: 9.5 lbs.

Storage and Care

All rope should be stored clean, dry, out of direct sunlight and away from extreme heat. Some synthetic rope may be severely weakened by prolonged exposure to ultraviolet (UV) rays, unless specifically stabilized and/or pigmented to increase its UV resistance. UV degradation is indicated by discoloration and the presence of splinters and slivers on the surface of the rope. To properly unreel rope, a shaft should be inserted through the center of the reel, and the rope should be pulled off the top while the reel is free to rotate.

Reverse rope ends regularly to promote even wear and assure a longer life. Apply a steady, even pull to achieve full strength from rope or synthetic cable. Formulas to determine reel and storage capacities (use inch reel dimensions):

$$\text{Rope length} = \frac{(\text{traverse width})\,(\text{flange diameter}^2 - \text{barrel diameter}^2)}{(16)\,(\text{rope diameter}^2)} \text{ feet}$$

Formulas to determine bin capacity: $V=(C)^2 \times (L) \times (R)$

V = volume in cubic inches

C = rope circumference in inches

L = length of rope in feet

R = 1.58 for carefully stored rope or 2.0 for random packing

CAUTIONS

Overloading and Use of Working Loads

Because of the wide range of rope use, exposure to the several factors affecting rope behavior and the degree of risk to life and property involved, it is impossible to make blanket recommendations as to working loads. However, to provide guidelines, working loads are tabulated for rope in good condition with appropriate splices, in noncritical applications and under normal service conditions.

A higher working load may be selected only with expert knowledge of conditions and professional estimate of risk, and if the rope has not been subject to dynamic loading or other excessive use; if the rope has been inspected and found to be in good condition, and is to be used in the recommended manner: and if the applications do not involve elevated temperatures, extended periods under load or obvious dynamic loading, such as sudden drops, snubs or pickups. For all such applications, consult Yale.

Many uses of rope involve serious risk of injury to personnel or damage to valuable property. ***This danger is often obvious, as when a heavy load is supported above one or more workers. An equally dangerous situation occurs if personnel are in line with a rope under tension. Should the rope fail, it may recoil with lethal force. Persons should be warned against the serious danger of standing in line with any rope under tension.*** In all cases where such risks are present, or there is any question about the loads involved or the conditions of use, the working load should be substantially reduced.

Minimum breaking strength is based on test data of new, unused rope and is a value not greater than two standard deviations below the mean.

Dynamic Loading Voids Normal Working Load

Normal working loads are not applicable when rope is subject to significant dynamic loading. Instantaneous changes in load, up or down, in excess of 10% of the line's rated working load constitute hazardous shock load and would void the normal working loads.

Whenever a load is picked up, stopped or swung, there is an increased force due to such dynamic loading. The more rapidly actions occur, the greater the increase will be. In extreme cases, the force put on the rope may be two, three or even more times the normal load involved and may result in the rope parting. Examples could be picking up a tow on a slack line or using a rope to stop a falling object. Therefore, in all dynamic applications, working loads as given do not apply.

Users should be aware that dynamic effects are greater on a low-elongation, high-modulus rope such as Aramid and lesser on a higher-elongation, nylon-based product. Dynamic effects are greater on a shorter rope than on a longer one. The working load ratios listed contain provision for very modest dynamic loads. This means, however, that when the working load has been used to select a rope, the load must be handled slowly and smoothly to minimize effect and avoid exceeding provision for it.

Example 1:

We will use 5/8 diameter Double Esterlon line rigged into a tree with a block, in such a way that 25 ft. of line is required to arrest a 500 lb section of trunk falling 5 ft. From the Double Esterlon specification table and energy graph we will need weight of 13.7 lbs/100 ft or .137 lbs/ft, its green working energy absorption maximum of 544 ft lb per lb of rope in use, and its maximum recommended working load of 3,400 lbs.

First, we will calculate the ft lbs of energy needed to arrest the 500 lb trunk section falling 5 ft. The simple equation of the weight multiplied by the fall will get the result within 1%, so 500 lb x 5 ft = 2500 ft lbs.

Next, we will calculate the line's energy absorption capacity for a 25 foot length 25 ft x 544 ft/lb x .137 lb/ft = 1863 ft lbs.

From these two calculations we can see that in this scenario the maximum recommended energy absorption is exceeded by 637 ft lbs or 34% (2500 ft lbs / 1863 ft lbs).

We can also estimate the load reached in the line by multiplying the maximum recommended working load by 134% or 3400 x 1.34 = 4,556 lbs.

To illustrate the importance of energy capacity of ropes we will take a look at using a high energy absorption line.

Example 2:
We will substitute a 5/8 diameter Polydyne. Same diameter, but very different energy capacity.

Doing the same calculations with Polydyne's physicals we get the following: 500 lb x 5 ft. = 2,500 ft lbs. required 25 ft x 1040 ft/lb x .133 lb/ft = 3,458 ft lbs. capacity. In this case, we have reserve energy absorbing capacity of 958 ft lbs and the peak load in the line is estimated at: (2500/3458) x 3600 lbs = 2,602 lbs.

The more area in the stress strain graphs (green working and red ultimate) the higher the ropes ability to absorb dynamic loads.

Abrasion: Avoid all abrasive situations. Rope can be severely damaged if subjected to rough surfaces or sharp edges. Chocks, bits, winches, drums and other surfaces must be kept in good condition and free of burrs and rust. Sheaves must be free to rotate and should be of proper size to avoid excessive wear. Clamps and similar devices will damage and weaken the rope and should be used with extreme caution. Do not drag rope over rough ground. Dirt and grit picked up by rope can work into the strands, cutting the inside fibers and reducing the rope's strength.

Chemicals: Avoid chemical exposure, as rope is apt to be damaged. Consult Yale for recommendations when a rope will be used where chemical exposure can occur.

Temperature: The tensile strength charts apply to ropes tested at normal room temperature (70°F). Ropes have lower tensile strengths at higher temperatures. Continued exposure at elevated temperatures can melt and part synthetic ropes or cause permanent damage.

Dielectric Strength, as shown in the catalog, is offered as a guideline to help you compare various fibers and constructions. We recommend that you consider all ropes, regardless of their initial new rated dielectric strength, as conductive in service. A short video on our highest-dielectric rope, Hy-Dee, is available via our website: www.yalecordage.com/videos.

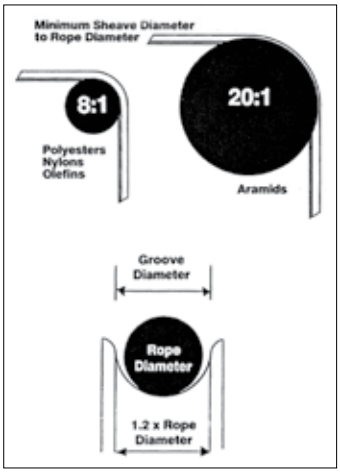
Splicing: Join rope by splicing. Use Yale's recommended splices for maximum efficiency. The strengths shown in this catalog are for spliced lengths. Other terminations can be used, but their strength loss with a particular type of rope and construction should be determined and not assumed.

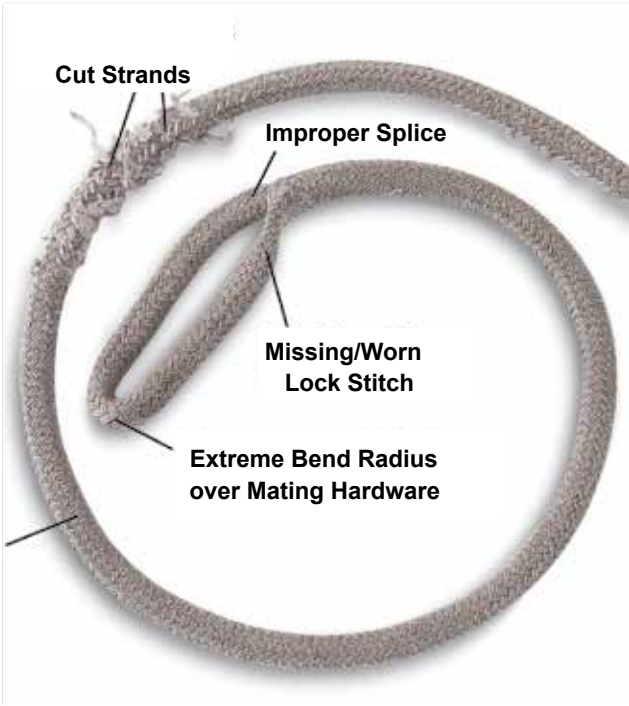
Knots and abrupt bends significantly reduce the strength of all ropes and lower the maximum working load.

Inspection

Avoid using rope that shows signs of aging and wear. If there is any question, destroy the used rope. No type of visual inspection can be guaranteed to accurately and precisely determine actual residual strength. When the fibers show wear in any given area, the rope should be respliced, eliminating the damaged area; downgraded; or replaced. Check the line regularly for frayed strands and broken yarn. Pulled strands should be rethreaded into the rope if possible. A pulled strand can snag during a rope operation. Both the outer and inner rope fibers contribute to the strength of rope. When either is worn, or the rope is compacted or hard, this indicates reduced strength. The dielectric strength of rope in this condition is also reduced.

See our full inspection guide at: www.yalecordage.com/inspection-guide.





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