Toro™ 12 Strand

Toro™ is a 12 Strand braided rope with high strength-to-weight ratio and, size-for-size, offers the same strength as steel. Toro 12 strand is manufactured from High Modulus Polyethylene (HMPE) and is an excellent wire rope replacement with low stretch, superior flex fatigue and wear resistance.

Toro 12 strand is delivered standard with a polyurethane finish and is easily spliced using a simple lockstitch bury splice, or tuck splice. Its soft, torque free braided construction provides easy handling and inspection.

Features & Benefits

- High strength
- Lowest stretch
- Low creep
- Soft hand
- Torque-free
- Easy splicing
- Floats

Applications

- Replacement for wire rope
- Vessel mooring lines
- Tug vessel assist lines
- Offshore working ropes
- Inland river barge lines
- Lifting slings
- Recreational vehicle winch lines
- Utility winch and pulling lines

Type approved product

DNV·GL

Nominal Diameter		Size (circ in.)	Approximate Weight		Minimum Tensile Strength Spliced Rope		Minimum Tensile Strength ISO Unspliced Rope	
inch	mm		lbs/ 100ft	kg/ 100m	lbs	MT (tonnes)	lbs	MT (tonnes)
1/8	3	3/8	0.69	1.03	2,800	1.27	3,110	1.41
3/16	5	9/16	1.20	1.79	5,500	2.49	6,110	2.77
1/4	6	3/4	1.7	2.6	8,000	3.63	8,880	4.0
5/16	8	15/16	2.6	3.8	11,700	5.31	12,990	5.9
3/8	9	1-1/8	3.6	5.3	17,500	7.94	19,440	8.8
7/16	11	1-1/4	4.8	7.1	22,000	10.0	24,400	11.1
1/2	12	1-1/2	6.1	9.1	30,500	13.8	33,800	15.4
9/16	14	1-3/4	7.6	11.3	36,500	16.6	40,500	18.4
5/8	16	2	9.4	14.1	47,800	21.7	53,100	24.1
3/4	18	2-1/4	13.5	20.1	61,800	28.0	68,600	31.1
13/16	20	2-1/2	15.8	23.5	74,000	33.6	82,200	37.3
7/8	22	2-3/4	18.5	27.5	84,300	38.2	93,600	42.5
1	24	3	23.7	35.3	105,000	47.6	116,600	52.9
1-1/16	26	3-1/4	26.9	40.0	121,600	55.1	135,000	61.3
1-1/8	28	3-1/2	30.3	45.1	137,000	62.1	152,200	69.0
1-1/4	30	3-3/4	37.2	55.4	157,000	71.2	174,400	79.1
1-5/16	32	4	41.1	61.2	176,400	80.0	195,900	88.9
1-1/2	36	4-1/2	53.8	80.1	215,000	97.5	238,800	108.3

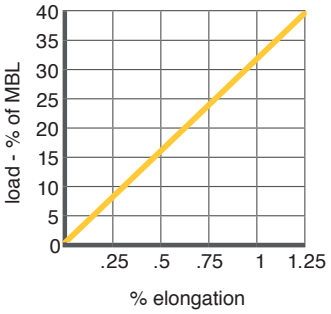
Tensile Strengths are determined in accordance with Cordage Institute CI 1500-02. Test Methods for Fiber Rope. Minimum Tensile Strength (MTS) published assumes spliced eye terminations at each end of the rope. Weights actually calculated at linear density under stated preload ($200d^2$) plus 4%. Diameter and circumference size published is nominal and reflects rope size after loading (10 cycles) to 50% of MTS. See reverse side for application and safety information.

Technical Information

Specific gravity	**0.98***
Melting point	**284°F (140°C)**
Critical temp.	**150°F (65°C)**
Coefficient of friction	**0.09–0.12***
Elongation at break	**3%–4%**
Fiber water absorption	**0%**
UV resistance	**moderate**
Wet abrasion	**superior**
Dry abrasion	**superior**

* value based on data supplied by the fiber manufacturer for new, dry fiber

Toro™ 12 Strand Elongation (%)



CORTLAND®

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Rope Specifications

Minimum Tensile Strength Minimum tensile strengths shown are for new (unused) rope and will decrease after use. All tests are performed in accordance with Cordage Institute Standard CI 1500-02. The rope strength will be reduced after use due to heat, abrasion, ultraviolet or chemical exposure. The tensile strengths may be further reduced by up to 50% as a result of knots or kinks. Minimum tensile strengths are defined as two standard deviations (typical about 10%) below the average.

Maximum Working Loads Maximum working loads are determined by dividing the tensile strength by the safety factor. The safety factor is a function of the physical properties of the rope, the age and history of the rope, the type of service it will be subjected to and the risks involved if failure occurs. For a rope manufacturer to give blanket working load recommendations would be like a car manufacturer giving the “safe driving speed” of their cars. Obviously the conditions of use far outweigh the design characteristics of the rope. Typically safety factors vary from 3:1 (for new rope used in applications with uniform loading and where failure would cause little or no risk to equipment or personnel) to 20:1 (for conditions involving moderate shock loading, possibility of snags or kinks or where failure could cause severe risk to equipment or personnel).

Rope Weights Rope weights shown are average and may vary plus or minus 5%.

Working Elongation Working elongation is shown from a preload tension of 200 times the diameter squared per the Cordage Institute Standard.

Special Requirements

Factory Splicing Various types are available for all of our ropes. Splices can be provided with various types of chafe protection or coatings.

Custom Lengths Special constructions are available on request.

Rope Terminations Cortland can provide custom terminations such as thimbles, links, rings and custom hardware. Terminations are available in plastic, bronze, stainless steel and galvanized steel. Please call, or email your requirements to cortland@cortlandcompany.com for a quotation.

Special Coatings Coatings such as polyurethane, polyethylene and vinylesters may be applied to any of the synthetic ropes to improve snag resistance, sunlight resistance or for color coding. Cortland can provide ropes with a variety of finishes to meet your needs.

Commercial and Military Specifications Certificates of compliance are supplied at no charge if requested when placing the order. Certified test reports can be provided at an additional charge when requested at the time of the order.