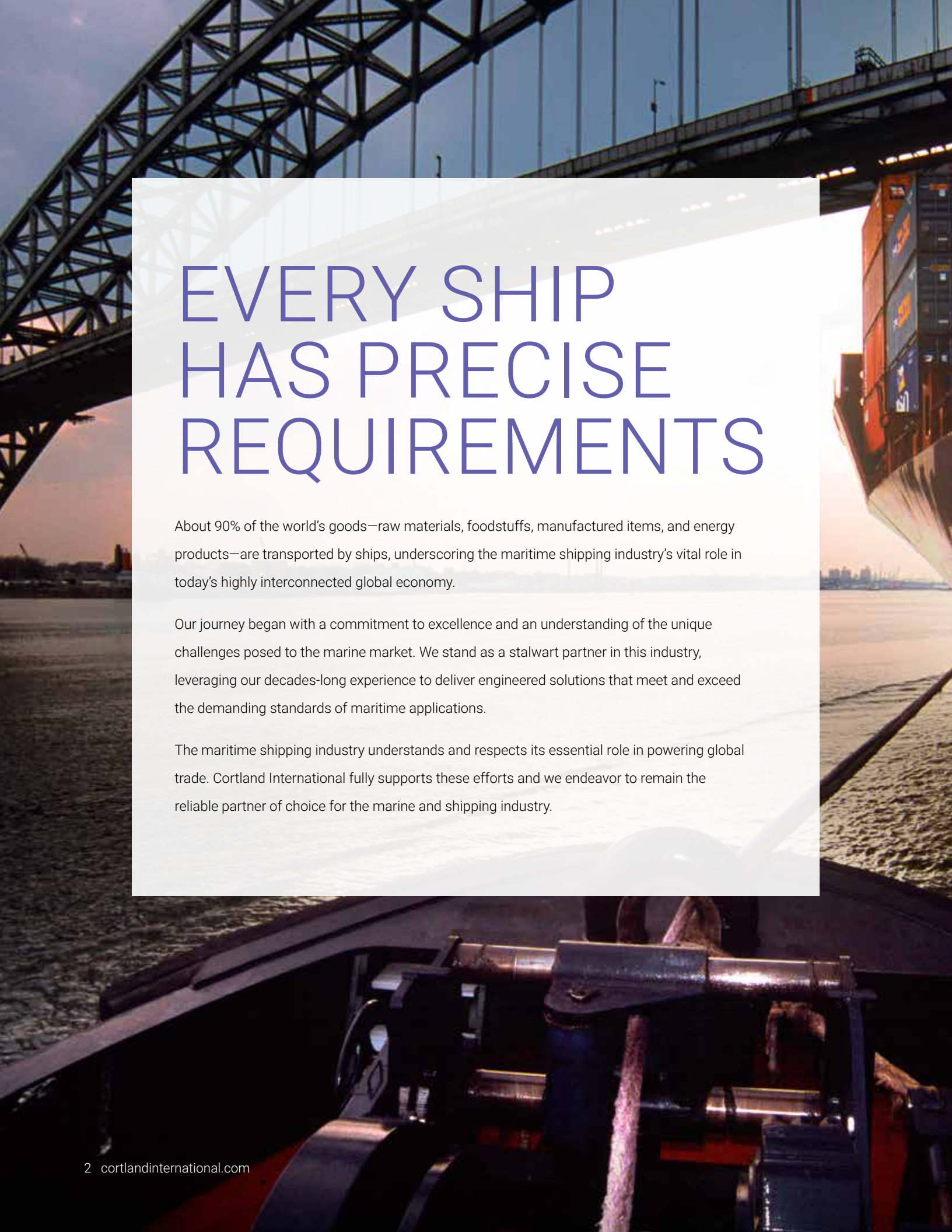
CATALOG

MARINE & SHIPPING

CORTLAND INTERNATIONAL™



EVERY SHIP HAS PRECISE REQUIREMENTS

About 90% of the world's goods—raw materials, foodstuffs, manufactured items, and energy products—are transported by ships, underscoring the maritime shipping industry's vital role in today's highly interconnected global economy.

Our journey began with a commitment to excellence and an understanding of the unique challenges posed to the marine market. We stand as a stalwart partner in this industry, leveraging our decades-long experience to deliver engineered solutions that meet and exceed the demanding standards of maritime applications.

The maritime shipping industry understands and respects its essential role in powering global trade. Cortland International fully supports these efforts and we endeavor to remain the reliable partner of choice for the marine and shipping industry.

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RELIABLE TOWING MADE EASY

In towing and salvage, the entire operation relies on the strength and dependability of your towline

No matter if you specialize in offshore, harbor or river operations, the connection between ship and tug—the towline—is of primary importance. In recent years, the industry has seen an expanded global acceptance of high performance synthetic tow lines, offering greater safety, reliability and performance for tug and salvage operators. Cortland International has delivered synthetic lines made from high modulus polyethylene (HMPE) for more than 25 years, specializing in our 12x12 braiding technique and Plasma® fiber.

As an originator of fiber braiding technology, Cortland offers a full range of high-performance synthetic line and pendant combinations. Our specialized fiber process and construction is size-for-size equal or greater in strength and 86% lighter than steel wire rope. Fiber towlines will not rust or fish-hook and offer superior flexibility in salt or fresh water.

Lighter lines are easier to handle than steel, which translates to fewer stress-related injuries, lower recoil risk and quicker 'made' times on each operation.

Our success is based on close interaction with tug operators. Years of global tug, berthing, lifting and mooring experience means you can trust Cortland for the complete engineering package, analysis and design of trusted synthetic fiber lines.

MOORING LINES AND TAILS

Over the past 30 years, we have carefully engineered and manufactured mooring lines using an appropriate combination of raw materials, construction processes especially suited to marine and shipping applications.
Our products allow for high strength, low stretch solutions across a variety of applications. Our products are designed specifically for rugged outdoor use and withstand extreme weather conditions.

These are customized to suit many stringent applications for greater safety. Offering guaranteed safe and cost-effective solutions which are suitable across the globe in a wide variety of industry segments including buoy mooring systems, tug and salvage lines, offshore working and lifting lines, shipping barge mooring lines, inland river lines, utility and winch lines, emergency tow packages and so on.

Global locations to serve customers in any geographic area

A dedicated team of more than 2,500 trained personnel

Manufacturing strength which allows us to produce 35000 MT of rope a year

ISO

Absolutely stringent quality checks in accordance with international standards, which have earned us several certifications including the ISO 9001:2015

We serve a vast array of line applications across the marine and shipping industries

Delivering Quality and Safety for the Marine & Shipping Industry

One of our core areas of expertise lies in supplying high-quality mooring lines to the marine & shipping Industry. Mooring lines are a critical component in maritime operations, ensuring the safe and secure berthing of vessels in ports, terminals, and offshore locations. We understand the diverse needs of our clients, which is why we offer a wide range of mooring lines tailored to meet specific operational requirements.

Our product portfolio includes both high-performance HMPE (High Modulus Polyethylene) lines and Class 1 lines, which are composed of a blend of polyester and polyolefin fibers. HMPE lines are renowned for their exceptional strength, lightweight properties, and resistance to abrasion, making them ideal for demanding applications where performance and durability are paramount. On the other hand, Class 1 lines provide a cost-effective solution without compromising on quality, offering a reliable option for standard mooring operations.

For those seeking a balance between quality and affordability, our mooring lines are designed to deliver the best of both worlds. We pride ourselves on offering competitive pricing while maintaining the highest standards of safety and performance. Safety is at the heart of everything we do, and our mooring lines are engineered to ensure secure handling, reducing the risk of accidents and enhancing operational efficiency.

Whether you require advanced HMPE lines for high-stress environments or dependable Class 1 lines for everyday use, we have the right solution for your needs. Our commitment to quality, safety, and customer satisfaction makes us a trusted partner in the marine & shipping Industry.

If you're looking for mooring lines that combine reliability, performance, and value, we invite you to explore our range of products. Let us help you find the perfect mooring solution for your operations, ensuring safety and efficiency every step of the way.

CERTIFICATIONS

DNV

OCIMF

impa International Marine Purchasing Association

MEG4 APPROVED

ISO 9001:2015

TESTING, INSPECTION AND TRAINING

We can provide comprehensive testing and inspection services to ensure the integrity and performance of lines while offering training programs to enhance safety and knowledge among users.

Cortland International's synthetic products have been instrumental in improving operational efficiency and safety in a diverse range of critical operations. To help customers safely manage through the lifecycle of these products, we work closely with clients to better understand long term use and retirement criteria.

Services focus on destructive testing and recertification of synthetic fiber ropes and slings up to 600 metric tonnes. Test equipment offers a 14 foot (4.2m) stroke to accommodate testing of a broad range of products. In conjunction with tensile testing, we have the capability to conduct tension-tension fatigue testing up to full machine capacity thanks to high fatigue rated components.

Testing Services

- Residual strength testing: Test the remaining breaking strength in the rope.
- Max tension/tension and break load 600 metric tonnes
- Full capacity testing to 30 meters in overall length
- 200HP pump offers full capacity cyclic RAM speed of 44 in/min, 1.1m/min
- Fully comply with all relevant legislative and internally recognized testing standards
- Test report: After testing, provide a comprehensive report containing all the aspects of the rope tested.

Inspection Services

- Regular inspections: Conduct routine visual inspections to identify wear, damage, and degradation. This includes checking for fraying, cuts, and signs of UV damage.
- Inspection report: After inspection, provide a comprehensive report containing all the aspects of the rope inspected.

Training Programs

- Workshops: Offer training workshops for crew members and staff, focusing on safe handling, proper usage, and maintenance of lines.
- Best practices: Educate participants on recognizing signs of wear and understanding the importance of timely inspections and replacements.

Product Specifications and Tolerances

The specifications presented in this catalogue are based on industry standards (Cordage Institute and ISO) for the determination of tensile strength, nominal diameter and other performance properties. End user safety factors and design requirements may vary by market segment, vessel type, operator preference and relevant industry regulatory requirements.

Towing systems – mainlines and stretchers are commonly selected in accordance with a chosen IACS requirement (based on operator class preferences and regions). These typically result in towline factors of safety between 2.5:1 and 5:1, which can be used to identify and select appropriately sized towing system components.

Vessel mooring systems – most operators defer to compliance with OCIMF's MEG4 guidelines which have been harmonized with recent updates to IMO's SOLAS requirements. Performance properties for our mooring lines and tails are defined in accordance with OCIMF MEG4 testing guidelines and results have been endorsed by DNV as noted in the relevant product Base Design Certificates, available upon request.

Physical tolerances - Diameters stated are all nominal values. Lengths are supplied +/-5% for Class 1 ropes and +5/-0% for HMPE ropes. Linear density (kg/m) specifications are supplied with tolerance of +/-5%.

For unique applications with more precise finished length or diameter tolerances, please contact your Cortland Sales Representative to discuss appropriate solutions to ensure your specifications are properly understood and documented.

PLASMA® 12-STRAND

Plasma® 12-Strand ropes are the culmination of 25 years of engineering expertise in the HMPE industry. Our dedication to providing customers with industry-leading synthetic line is and always has been the goal. Our continued innovation and unwavering desire are to provide the strongest and most reliable product available.

Plasma 12-Strand is delivered standard with a polyurethane finish and is easily spliced using a simple lockstitch type splice, 5-4-3 tuck splice. Its soft, torque free braided construction provides easy handling.

Features & Benefits

- Highest strength
- Lowest stretch
- Low creep
- Soft hand
- Torque-free
- Easy splicing
- Floats
- Select sizes are ABS & DNV type approved
- Sizes 16mm–36mm are MEG4 approved

Applications

- Vessel mooring lines
- Inland river barge lines
- Lifting slings
- Replacement for wire rope

Type approved product

DNV

ABS TYPE APPROVED PRODUCT

OCIMF

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MEG4 APPROVED

Nominal Diameter		Size (circ in.)	Approximate Weight		Minimum Tensile Strength Spliced Rope/LDBF		Minimum Tensile Strength ISO Unspliced Rope	
inch	mm		lbs/ 100ft	kg/ 100m	lbs	MT (tonnes)	lbs	MT (tonnes)
0.04	1	**0.12**	**0.05**	0.1	**270**	0.1	**300**	0.13
0.05	1.25	**0.15**	**0.07**	0.1	**390**	0.2	**430**	0.20
0.06	1.5	**0.18**	**0.1**	0.1	**475**	0.2	**525**	0.23
0.07	1.75	**0.21**	**0.14**	0.2	**750**	0.3	**830**	0.38
0.1	2.5	**0.3**	**0.27**	0.4	**1,400**	0.6	**1,550**	0.7
1/8	3	**3/8**	**0.54**	0.8	**2,800**	1.3	**3,100**	1.4
3/16	5	**9/16**	**1.12**	1.7	**5,500**	2.5	**6,100**	2.8
1/4	6	**3/4**	**1.6**	2.4	**8,000**	3.6	**8,890**	4.0
5/16	8	**15/16**	**2.5**	3.7	**11,700**	5.3	**13,000**	5.9
3/8	9	**1-1/8**	**3.7**	5.5	**17,500**	7.9	**19,400**	8.8
ABS and DNV Type Approved Sizes								
7/16	11	**1-1/4**	**4.2**	6.3	**21,000**	9.5	**23,400**	10.6
1/2	12	**1-1/2**	**6.4**	9.5	**31,300**	14.2	**34,800**	15.8
9/16	14	**1-3/4**	**7.9**	11.8	**37,900**	17.2	**42,100**	19.1
5/8	16	**2**	**10.6**	15.8	**51,400**	23.3	**57,100**	25.9
3/4	18	**2-1/4**	**13.3**	19.8	**68,500**	31.1	**76,300**	34.6
13/16	20	**2-1/2**	**15.9**	23.7	**74,000**	33.6	**82,200**	37.2
7/8	22	**2-3/4**	**19.6**	29.2	**92,600**	42.0	**102,900**	46.7
1	24	**3**	**23.4**	34.8	**110,000**	49.9	**122,100**	55.4
1-1/16	26	**3-1/4**	**27.5**	40.9	**129,200**	58.6	**143,500**	65.1
1-1/8	28	**3-1/2**	**31.9**	47.5	**147,000**	66.7	**163,300**	74.1
1-1/4	30	**3-3/4**	**36.2**	53.9	**165,000**	74.9	**183,100**	83.1
1-5/16	32	**4**	**41.7**	62.1	**196,000**	88.9	**217,800**	98.8
1-1/2	36	**4-1/2**	**51.7**	76.9	**221,000**	100.3	**245,500**	111.3

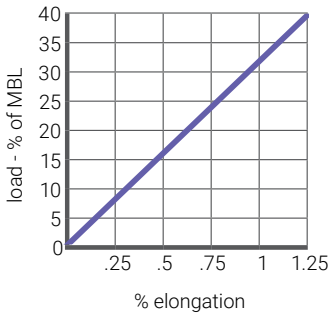
Tensile strengths are determined in accordance with Cordage Institute 1500.2. Test Methods for Fiber Rope. Minimum Tensile Strength (MTS) published assumes spliced eye terminations at each end of the rope. Weights actually calculated at linear density under stated preload (200d^2) plus 4%. Diameter and circumference size published is nominal and reflects rope size after loading (10 cycles) to 50% of MTS.

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	**excellent**
Wet abrasion	**excellent**
Dry abrasion	**excellent**

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

Plasma® 12-Strand Elongation (%)



PLASMA® 12X12

Plasma® 12x12 is a 12-strand braided rope in which each of the 12 strands is, in turn, a 12-strand rope, or braided primary strand. This construction addresses the most critical properties of the fibers to provide a very high strength translation efficiency for larger ropes. The design also provides superior snag resistance compared to other 12x12 designs which is important when dragging the rope. Plasma 12x12 is supplied with our standard polyurethane finish, although other coatings can be applied to suit specific applications.

Cortland's Plasma 12x12 ropes are the culmination of 25+ years of engineering expertise in the HMPE industry. Our dedication to providing customers with industry-leading synthetic line is and always has been the goal. Our continued innovation and unwavering desire are to provide the strongest and most reliable product available.

Features & Benefits

- World's strongest rope for its weight
- Long lengths available
- High flex fatigue and abrasion resistance
- Easy to splice, inspect, and repair
- Neutrally buoyant in water
- Select sizes are ABS & DNV type approved
- Sizes 40mm–64mm are MEG4 approved

Applications

- Tug vessel assist lines
- Vessel mooring lines
- Offshore working ropes
- Lashings
- Replacement for wire rope heavy lift slings

Type approved product

DNV

ABS TYPE APPROVED PRODUCT

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OCIMF

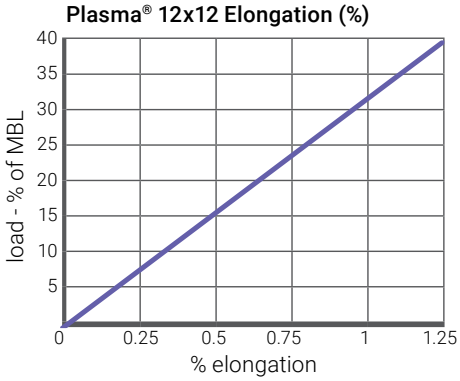
Nominal Diameter		Size (circ in.)	Approximate Weight		Minimum Tensile Strength Spliced Rope/LDBF		Minimum Tensile Strength ISO Unspliced Rope	
inch	mm		lbs/ 100ft	kg/ 100m	lbs	MT (tonnes)	lbs	MT (tonnes)
ABS and DNV type approved sizes – up to 4" diameter (96 mm)								
1-5/8	40	5	66	98	291,000	132	323,300	147
1-3/4	44	5-1/2	78	117	314,000	142	348,900	158
2	48	6	91	136	355,000	161	392,450	178
2-1/8	52	6-1/2	109	162	428,000	194	475,600	216
2-1/4	56	7	122	182	481,000	218	534,400	242
2-1/2	60	7-1/2	148	220	530,000	240	588,900	267
2-5/8	64	8	167	249	596,000	270	662,200	300
2-3/4	68	8-1/2	187	278	660,000	299	733,300	333
3	72	9	214	319	780,000	354	866,700	393
3-1/8	76	9-1/2	235	350	850,000	386	944,400	428
3-1/4	80	10	261	388	940,000	426	1,045,400	474
3-1/2	84	10-1/2	298	443	1,108,000	503	1,231,000	559
3-5/8	88	11	324	482	1,250,000	567	1,388,900	630
3-3/4	92	11-1/2	343	510	1,317,000	598	1,463,000	664
4	96	12	394	586	1,520,000	690	1,689,000	766
4-1/8	100	12-1/2	457	679	1,622,000	736	1,802,000	818
4-1/4	104	13	514	765	1,697,000	770	1,886,000	856
4-1/2	108	13-1/2	530	789	1,827,000	829	2,030,000	921
4-5/8	112	14	546	812	1,880,000	853	2,089,000	948
4-3/4	116	14-1/2	587	873	1,927,000	874	2,141,000	971
5	120	15	606	902	2,069,500	939	2,299,000	1043
5-1/8	124	15-1/2	657	978	2,212,000	1004	2,458,000	1115
5-1/4	128	16	703	1046	2,355,000	1069	2,617,000	1187
5-1/2	132	16-1/2	749	1114	2,497,500	1133	2,775,000	1259
5-5/8	136	17	813	1210	2,640,000	1198	2,933,000	1331
5-3/4	140	17-1/2	871	1296	2,782,500	1262	3,092,000	1403
6	144	18	932	1386	2,925,000	1327	3,250,000	1475
6-1/8	148	18-1/2	985	1465	3,068,000	1392	3,409,000	1547
6-1/4	152	19	1038	1545	3,210,500	1457	3,567,000	1618
6-1/2	156	19-1/2	1103	1642	3,353,000	1521	3,726,000	1691
6-5/8	160	20	1159	1725	3,496,000	1586	3,884,000	1762
6-3/4	164	20-1/2	1227	1827	3,638,500	1651	4,043,000	1834
7	168	21	1284	1911	3,781,000	1716	4,201,000	1906
7-1/8	172	21-1/2	1334	1986	3,963,500	1798	4,404,000	1998
7-1/4	176	22	1392	2072	4,066,000	1845	4,518,000	2050
7-1/2	180	22-1/2	1452	2161	4,209,000	1910	4,677,000	2122
7-5/8	184	23	1527	2272	4,351,500	1974	4,835,000	2194
7-3/4	188	23-1/2	1589	2365	4,494,000	2039	4,993,000	2265
8	192	24	1653	2459	4,637,000	2104	5,152,000	2338
8-1/8	196	24-1/2	1732	2578	4,779,000	2168	5,310,000	2409
8-1/4	200	25	1798	2677	4,922,000	2233	5,469,000	2481

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	**excellent**
Wet abrasion	**excellent**
Dry abrasion	**excellent**

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

Plasma® 12x12 Elongation (%)



Size: Diameter and circumference are nominal. A new unused rope in relaxed state will measure larger; loading and use compacts ropes, sets splices and lessens rope size. This is especially prevalent in sizes above 4" diameter. Published nominal sizes from 4-1/8" and larger represent stabilized or preloaded size.
Weights: Published weights of sizes 1-5/8"–4" diameter are calculated at linear density under stated preload (200d²) plus 4%. For this chart, sizes 4-1/8"–8-1/4" diameter represent un-cycled, (non-stabilized) weights.
Tensile Strengths: Tensile strength determined in accordance with Cordage Institute 1500 Test Methods for Fiber Ropes and ISO 2307.

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
- Sizes 16mm–36mm are MEG4 approved

Applications

- Vessel mooring lines
- Tug vessel assist lines
- Offshore working ropes
- Inland river barge lines
- Lifting slings
- Replacement for wire rope

Type approved product

DNV

ABS TYPE APPROVED PRODUCT

OCIMF

CERTIFIED BY DNV MARITIME

MEG4 APPROVED

Nominal Diameter		Size (circ in.)	Approximate Weight		Minimum Tensile Strength Spliced Rope/LDBF		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

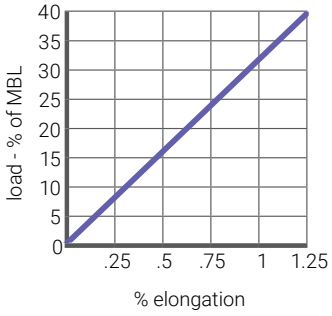
Tensile Strengths are determined in accordance with Cordage Institute CI 1500-02. Test Methods for Fiber Rope. Minimum Tensile Strength (MTS) published assumes spliced eye terminations at each end of the rope. Weights actually calculated at linear density under stated preload (200d2) plus 4%. Diameter and circumference size published is nominal and reflects rope size after loading (10 cycles) to 50% of MTS.

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	**excellent**
Wet abrasion	**excellent**
Dry abrasion	**excellent**

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

Toro® 12-Strand Elongation (%)



TORO® 12X12

Toro® 12x12 is a 12-strand braided rope in which each of the 12 strands is, in turn, a 12-strand rope, or braided primary strand. Toro is manufactured from high tenacity High Modulus Polyethylene (HMPE).

This construction addresses the most critical properties of the fibers to provide a very high strength translation efficiency for larger ropes. This design allows for long lay lengths, making rope that is more flexible for bending applications, easy to inspect, and can be quickly spliced using standard 12 strand splicing techniques. Toro 12x12 is supplied with our standard polyurethane finish, although other coatings can be applied to suit specific applications.

Features & Benefits

- Highest strength
- Very low stretch
- Lightweight
- Soft hand
- Torque free
- Easy splicing
- Floats
- Long lengths available
- High flex fatigue and abrasion resistance
- Moderate UV resistance
- Easy to inspect and repair
- Neutrally buoyant in water
- Sizes 40mm–64mm are MEG4 approved

Applications

- Tug vessel assist lines
- Vessel mooring lines
- Offshore working ropes
- Lashings
- Replacement for wire rope heavy lift slings

Type approved product

DNV · ABS TYPE APPROVED PRODUCT · OCIMF

CERTIFIED BY DNV MARITIME

MEG4 APPROVED

Nominal Diameter		Size (circ in.)	Approximate Weight		Minimum Tensile Strength Spliced Rope/LDBF		Minimum Tensile Strength ISO Unspliced Rope	
inch	mm		lbs/ 100ft	kg/ 100m	lbs	MT (tonnes)	lbs	MT (tonnes)
1-5/8	40	5	62.0	92.2	245,000	111	272,100	123
1-3/4	44	5-1/2	72.3	107.6	284,300	129	315,800	143
2	48	6	94.9	141.3	369,900	168	410,900	186
2-1/8	52	6-1/2	108.9	162.0	423,900	192	470,900	214
2-1/4	56	7	121.3	180.5	470,100	213	522,200	237
2-1/2	60	7-1/2	147.9	220.2	569,400	258	632,600	287
2-5/8	64	8	163.8	243.8	630,300	286	700,200	318
2-3/4	68	8-1/2	182.4	271.5	698,400	317	775,900	352
3	72	9	215.4	320.6	819,000	371	909,900	413
3-1/8	76	9-1/2	233.2	347.0	886,500	402	984,900	447
3-1/4	80	10	253.5	377.4	961,300	436	1,068,000	484
3-1/2	84	10-1/2	290.7	432.7	1,095,300	497	1,216,800	552
3-5/8	88	11	314.1	467.6	1,184,300	537	1,315,700	597
3-3/4	92	11-1/2	338.7	504.1	1,273,100	577	1,414,400	641
4	96	12	383.5	570.8	1,435,200	651	1,594,500	723
4-1/8	100	12-1/2	407.0	605.8	1,523,400	691	1,692,400	768
4-1/4	104	13	433.4	645.0	1,618,600	734	1,798,200	816

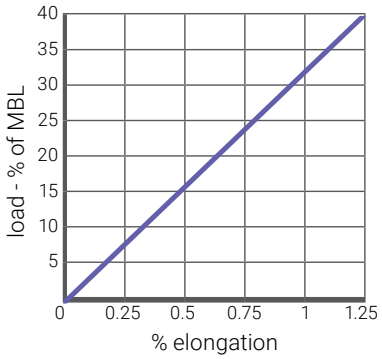
Size: Diameter and circumference are nominal. A new unused rope in relaxed state will measure larger; loading and use compacts ropes, sets splices and lessens rope size.
Weights: Published weights of sizes 1-5/8"–4-1/4" diameter are calculated at linear density under stated preload (200d²) plus 4%.
Tensile Strengths: Tensile strength determined in accordance with Cordage Institute 1500-02 Test Methods for Fiber Ropes and ISO 2307.

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	**excellent**
Wet abrasion	**excellent**
Dry abrasion	**excellent**

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

Toro® 12x12 Elongation (%)



SUPERTUF™ PLUS

Supertuf Plus lines from Cortland are manufactured from a high strength PE/PP blend. A perfect mooring line for large vessels, these ropes have a high strength to weight ratio, float and do not absorb water. Additionally, they have high resistance to abrasion and chemicals.

Supertuf Plus ropes are easily spliced using a standard tuck splice. Its torque free braided construction provides easy handling and prevents kinks and hockles.

Features & Benefits

- Floats
- Good strength to weight
- Excellent abrasion resistance
- Torque free
- Easy splicing

Applications

- Floating mooring lines for barges/vessels
- Floating winch lines
- Lashings

Type approved product

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MEG4 APPROVED

OCIMF

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)
3/4	18	2-1/4	10	15	13,691	6.2	15,212	6.9
1	24	3	17	26	24,405	11.1	27,117	12.3
DNV Type Approved Sizes								
1-5/8	40	5	48	72	65,477	29.7	72,752	33.0
1-3/4	44	5-1/2	61	90	78,374	35.6	87,082	39.5
2	48	6	70	104	91,766	41.6	101,963	46.3
2-1/8	52	6-1/2	82	122	105,953	48.1	117,726	53.4
2-1/4	56	7	95	142	120,636	54.7	134,040	60.8
2-1/2	60	7-1/2	110	163	137,699	62.5	152,999	69.4
2-5/8	64	8	124	185	156,846	71.5	174,274	79.1
2-3/4	68	8-1/2	141	209	177,084	80.3	196,761	89.3
3	72	9	157	234	196,231	89.0	218,035	98.9

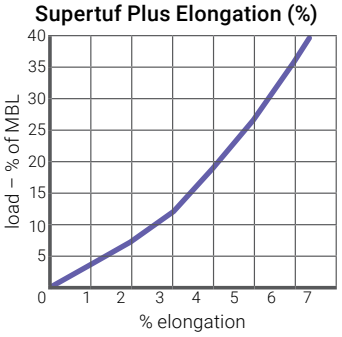
Tensile Strengths are determined in accordance with Cordage Institute 1500, Test Methods for Fiber Rope. Weights are calculated at linear density under standard preload (200d²) plus 4%.

Technical Information

Specific gravity	**0.92***
Melting point	**329°F (165°C)**
Critical temp.	**140°F (60°C)**
Coefficient of friction	**0.16–0.18***
Elongation at break	**15–20%**
Fiber water absorption	**0–1%**
UV resistance	**moderate**
Wet abrasion	**moderate**
Dry abrasion	**moderate**

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

Supertuf Plus Elongation (%)



SUPERTUF™ NXT

Supertuf NXT lines from Cortland are manufactured from a high strength PE/PP blend. A perfect mooring line for large vessels, these ropes have a high strength to weight ratio, float and do not absorb water. Additionally, they have high resistance to abrasion and chemicals.

Supertuf NXT ropes are easily spliced using a standard tuck splice. Its torque free braided construction provides easy handling and prevents kinks and hockles.

Features & Benefits

- Floats
- Good strength to weight
- Excellent abrasion resistance
- Torque free
- Easy splicing

Applications

- Floating mooring lines for barges/vessels
- Floating winch lines
- Lashings

Type approved product

CERTIFIED BY DNV MARITIME

MEG4 APPROVED

OCIMF

Size Diameter		Line Linear Density	Weight	Minimum Break Force		Line Design Break Force	
				Unspliced		Spliced	
inch	mm	kg/m	kg/ 220m	Ton	kN	Ton	kN
1	24	0.260	57.20	10.20	100	9.20	90
1-1/16	26	0.310	67.10	12.00	118	10.80	106
1-1/4	28	0.350	78.00	13.90	136	12.50	123
1-5/16	32	0.460	101.20	18.20	178	16.40	161
1-3/8	34	0.520	114.40	20.60	202	18.50	181
1-1/2	36	0.580	127.60	23.10	226	20.80	204
1-9/16	38	0.650	143.00	25.70	252	23.10	226
1-5/8	40	0.720	158.40	28.50	279	25.70	252
1-11/16	42	0.730	160.60	31.50	309	28.40	278
1-3/4	44	0.880	193.60	34.70	340	31.20	306
2	48	1.040	228.80	41.50	407	37.40	367
1-31/32	50	1.130	248.60	44.90	440	40.40	396
2-1/8	52	1.220	268.40	48.50	475	43.70	428
2-5/16	56	1.420	312.40	56.00	549	50.40	494
2-3/8	58	1.520	334.40	59.90	587	53.90	528
2-1/2	60	1.630	358.60	63.90	626	57.50	564
2-5/8	64	1.850	407.00	72.20	708	65.00	637
2-3/4	68	2.090	459.80	83.80	822	75.40	739
3	72	2.340	514.80	96.50	946	86.90	852
3-1/8	76	2.610	574.20	104.10	1021	93.70	919
3-1/4	80	2.900	638.00	111.50	1093	100.40	984
3-5/16	84	3.200	704.00	123.20	1208	110.90	1087
3-5/8	88	3.520	774.40	135.50	1328	122.00	1196
3-3/4	92	4.020	884.80	148.50	1456	133.70	1311
4	96	4.170	917.40	162.00	1588	145.80	1429
4-1/8	100	4.520	994.40	175.30	1719	157.80	1547
4-1/4	104	4.890	1075.80	189.00	1853	170.10	1668
4-3/8	108	5.290	1163.80	203.30	1993	183.00	1794
4-1/2	112	5.700	1254.00	218.00	2137	196.20	1924
4-3/4	116	6.100	1342.00	233.30	2287	210.00	2059
5	120	6.500	1430.00	249.00	2441	224.10	2197

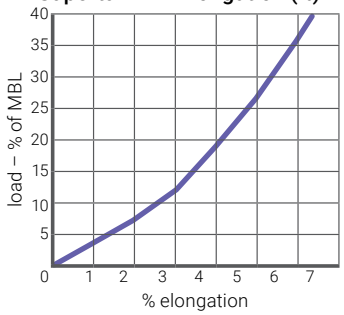
Tensile Strengths are determined in accordance with Cordage Institute 1500, Test Methods for Fiber Rope. Weights are calculated at linear density under standard preload (200d²) plus 4%.

Technical Information

Specific gravity	**0.92***
Melting point	**329°F (165°C)**
Critical temp.	**140°F (60°C)**
Coefficient of friction	**0.16–0.18***
Elongation at break	**15–20%**
Fiber water absorption	**0–1%**
UV resistance	**moderate**
Wet abrasion	**moderate**
Dry abrasion	**moderate**

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

Supertuf NXT Elongation (%)



TUFFLEX® LITE

Tufflex® Lite offers a high strength to weight ratio and is an excellent replacement for heavier polyester lines. It's unique blend of polyester and polypropylene in each strand makes for a highly efficient construction. Tufflex Lite is torque balanced, has excellent wear resistance, and is one of the quickest ropes to splice.

Tufflex Lite is an excellent choice as mooring, tie-up and pendant lines, tug assist lines and for general purpose heavy marine applications.

Features & Benefits

- Low stretch
- High strength
- Torque free
- Easy splicing
- Soft hand
- Excellent abrasion resistance
- Lighter than 100% polyester ropes

Applications

- Vessel mooring lines
- Tug assist lines
- General purpose heavy marine applications

Type approved product

CERTIFIED BY DNV MARITIME

MEG4 APPROVED

OCIMF

Size Dia.		Line Linear Density (LLD)	Coil Weight	Minimum Break Force		Line Design Break Force (LDBF)	
				Unspliced		Spliced	
inch	mm	kg/m	kg/220m	Ton	kN	Ton	kN
13/16	20	0.20	44	7.0	69	6.3	62
1	24	0.29	64	10.1	99	9.1	89
1-1/16	26	0.34	74	11.8	116	10.6	104
1-1/8	28	0.39	86	13.7	134	12.3	121
1-1/4	30	0.45	98	15.7	154	14.1	138
1-5/16	32	0.50	111	17.9	175	16.1	158
1-1/2	36	0.64	141	24.0	235	21.6	212
1-5/8	40	0.79	174	29.1	285	26.2	257
1-3/4	44	0.96	212	37.3	366	33.6	329
2	48	1.15	252	44.4	435	40.0	392
2-1/8	52	1.34	295	51.6	506	46.4	455
2-5/16	56	1.56	343	59.2	580	53.3	523
2-1/2	60	1.80	395	67.4	661	60.7	595
2-5/8	64	2.04	448	75.9	744	68.3	670
2-3/4	68	2.30	505	85.2	835	76.7	752
3	72	2.57	566	91.6	898	82.4	808
3-1/8	76	2.87	632	103.4	1014	93.1	913
3-1/4	80	3.19	701	116.0	1137	104.4	1024
3-3/8	84	3.52	774	127.7	1252	114.9	1126
3-5/8	88	3.86	850	140.0	1373	126.0	1235
3-3/4	92	4.21	927	152.5	1495	137.3	1346
3-7/8	94	4.40	967	158.9	1558	143.0	1402
4	96	4.58	1007	165.5	1623	149.0	1461
4-1/8	100	4.98	1096	178.9	1754	161.0	1578
4-1/4	104	5.40	1189	192.8	1890	173.5	1701
4-1/2	108	5.83	1283	207.5	2034	186.8	1831
4-5/8	112	6.27	1380	222.7	2183	200.4	1965
4-3/4	116	6.73	1480	238.6	2339	214.7	2105
5	120	7.20	1584	255.1	2501	229.6	2251

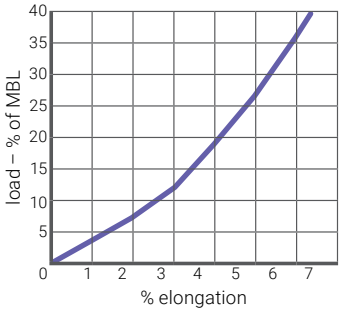
Tensile Strengths are determined in accordance with Cordage Institute 1500, Test Methods for Fiber Rope. Weights are calculated at linear density under standard preload (200d²) plus 5%. Additional sizes available upon request. Please visit cortlandinternational.com or contact your sales representative for full product data sheets.

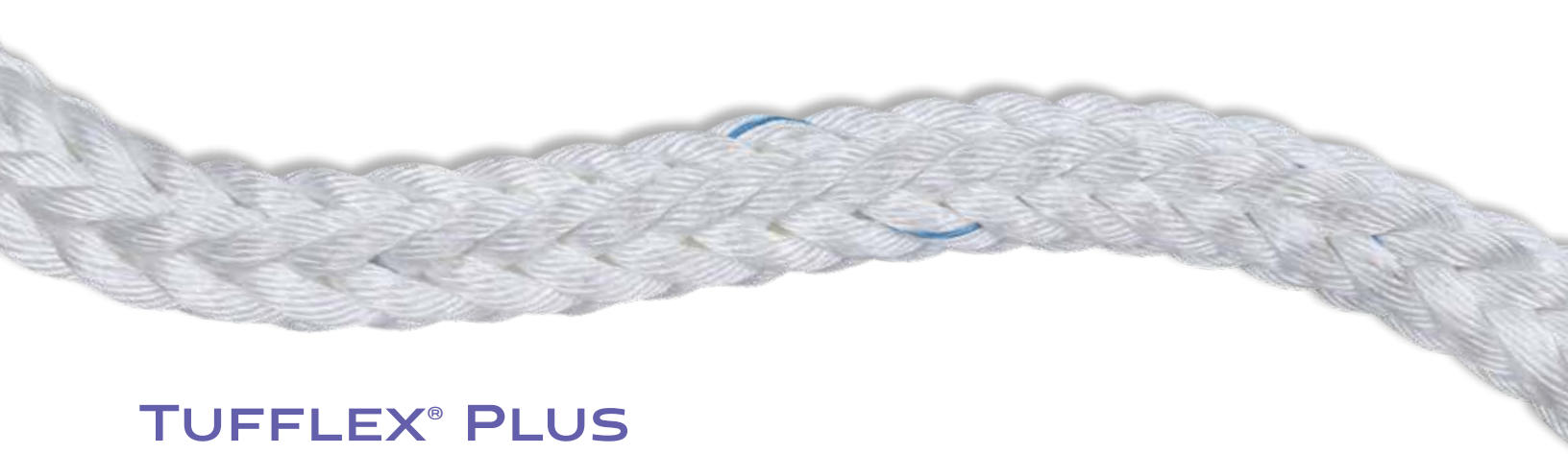
Technical Information

Specific gravity	**0.98***
Melting point	**329°F (165°C)**
Critical temp.	**140°F (60°C)**
Coefficient of friction	**0.12–0.15***
Elongation at break	**15–20%**
Fiber water absorption	**0–1%**
UV resistance	**good**
Wet abrasion	**good**
Dry abrasion	**good**

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

Tufflex Lite Elongation (%)





TUFFLEX® PLUS

Tufflex® Plus offers a high strength to weight ratio and is an excellent replacement for heavier copolymer lines. It's unique blend of polyester and copolymer in each strand makes for a highly efficient construction. Tufflex Plus is torque balanced, has excellent wear resistance, and is one of the quickest ropes to splice.

Tufflex Plus is an excellent choice as mooring, tie-up and pendant lines, tug assist lines and for general purpose heavy marine applications.

Features & Benefits

- Moderate stretch
- Torque free
- Easy splicing
- Soft hand
- Excellent abrasion resistance
- Floats

Applications

- Vessel mooring lines
- Tug assist lines
- General purpose heavy marine applications

Type approved product

CERTIFIED BY DNV MARITIME

MEG4 APPROVED

OCIMF

Size Dia.		Line Linear Density (LLD)	Weight	Minimum Break Force		Line Design Break Force (LDBF)	
				Unspliced		Spliced	
inch	mm	kg/m	kg/ 220m	Ton	kN	Ton	kN
1	24	**0.39**	85	**14.8**	145	**13.3**	130
1-1/16	26	**0.45**	99	**17.4**	171	**15.7**	154
1-1/4	28	**0.52**	114	**20.1**	197	**18.1**	177
1-3/16	30	**0.60**	131	**23.1**	226	**20.8**	204
1-5/16	32	**0.68**	149	**26.3**	258	**23.7**	232
1-3/8	34	**0.74**	163	**29.6**	290	**26.6**	261
1-1/2	36	**0.80**	176	**33.0**	324	**29.7**	291
1-9/16	38	**0.89**	196	**37.7**	370	**33.9**	332
1-5/8	40	**0.98**	216	**42.9**	421	**38.6**	378
1-11/16	42	**1.08**	238	**47.2**	463	**42.5**	417
1-3/4	44	**1.19**	262	**51.8**	508	**46.6**	457
2	48	**1.41**	310	**62.0**	608	**55.8**	547
2-1/8	52	**1.66**	365	**73.4**	720	**66.1**	648
2-5/16	56	**1.92**	422	**84.6**	829	**76.1**	746
2-3/8	58	**2.06**	453	**87.4**	857	**78.7**	772
2-1/2	60	**2.21**	486	**95.8**	939	**86.2**	845
2-5/8	64	**2.51**	552	**107.8**	1057	**97.0**	951
2-3/4	68	**2.83**	623	**122.1**	1197	**109.9**	1077
3	72	**3.18**	700	**137.4**	1347	**123.7**	1213
3-1/8	76	**3.54**	779	**152.1**	1491	**136.9**	1342
3-1/4	80	**3.92**	862	**167.4**	1641	**150.7**	1477
3-5/16	84	**4.32**	951	**181.2**	1776	**163.1**	1599
3-5/8	88	**4.75**	1045	**195.0**	1912	**175.5**	1721
3-3/4	92	**5.19**	1142	**212.2**	2080	**191.0**	1873
4	96	**5.65**	1243	**230.0**	2255	**207.0**	2029
4-1/8	100	**6.13**	1349	**249.6**	2447	**224.6**	2202
4-1/4	104	**6.63**	1459	**270.0**	2647	**243.0**	2382

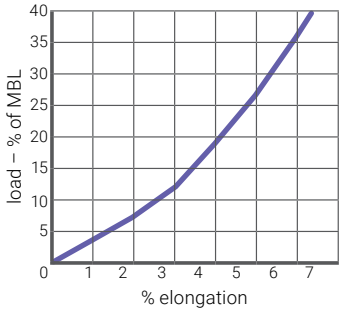
Tensile Strengths are determined in accordance with Cordage Institute 1500, Test Methods for Fiber Rope. Weights are calculated at linear density under standard preload (200d^2) plus 5%. Additional sizes available upon request. Please visit cortlandinternational.com or contact your sales representative for full product data sheets.

Technical Information

Specific gravity	**0.98***
Melting point	**329°F (165°C)**
Critical temp.	**140°F (60°C)**
Coefficient of friction	**0.12–0.15***
Elongation at break	**15–20%**
Fiber water absorption	**0–1%**
UV resistance	**good**
Wet abrasion	**good**
Dry abrasion	**good**

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

Tufflex Plus Elongation (%)



TUFFLEX® LITE MOORING TAILS

Mooring tails are commonly utilized with high performance mooring lines to provide elasticity in the mooring system. This elasticity helps maintain loads at acceptable levels for the deck equipment and operational limits. Tails should be specified based on overall vessel mooring system design requirements. Tail breaking strength is defined as Tail Design Breaking Force and are specified in accordance with OCIMF's Mooring Equipment Guidelines (MEG4). Tails are provided as fabricated units at 11m and 22m overall length, as standard. If your vessel requires unique lengths, please contact Cortland International to discuss appropriate solutions.

Each of Cortland's tail products offer specific features and benefits that address the trade off between strength, durability, elasticity and cost. They are all MEG4 approved and supplied with Tail Base Design Certificates upon request.

Size Dia.		Tail Linear Density (TLD)	11m tail weight (kg)	Minimum Break Force Unspliced		Tail Design Break Force (TDBF) Spliced	
inch	mm			Ton	kN	Ton	kN
2	48	**1.15**	16.4	**44.4**	435	**40.0**	392
2-1/16	50	**1.24**	17.9	**47.9**	470	**43.1**	423
2-1/8	52	**1.34**	19.4	**51.6**	506	**46.4**	455
2-1/4	56	**1.56**	22.7	**59.2**	580	**53.3**	523
2-1/2	60	**1.80**	26.4	**67.4**	661	**60.7**	595
2-5/8	64	**2.04**	30.1	**75.9**	744	**68.3**	670
2-3/4	68	**2.30**	34.2	**85.2**	835	**76.7**	752
3	72	**2.57**	38.6	**91.6**	898	**82.4**	808
3-1/8	76	**2.87**	43.5	**103.4**	1014	**93.1**	913
3-1/4	80	**3.19**	48.6	**116.0**	1137	**104.4**	1024
3-3/8	84	**3.52**	54.0	**127.7**	1252	**114.9**	1126
3-5/8	88	**3.86**	59.7	**140.0**	1373	**126.0**	1235
3-3/4	92	**4.21**	65.6	**152.5**	1495	**137.3**	1346
4	96	**4.58**	71.8	**165.5**	1623	**149.0**	1461
4-1/8	100	**4.98**	78.7	**178.9**	1754	**161.0**	1578
4-1/4	104	**5.40**	86.0	**192.8**	1890	**173.5**	1701
4-1/2	108	**5.83**	93.3	**207.5**	2034	**186.8**	1831
4-5/8	112	**6.27**	101.2	**222.7**	2183	**200.4**	1965
4-3/4	116	**6.73**	109.3	**238.6**	2339	**214.7**	2105
5	120	**7.20**	117.8	**255.1**	2501	**229.6**	2251

Additional sizes available upon request. Please visit cortlandinternational.com or contact your sales representative for full product data sheets.

Tufflex® Plus Mooring Tails

Tufflex® Plus mooring tails are an exceptional choice for mooring applications, offering a high strength-to-weight ratio that ensures durability and reliability in demanding marine environments.

These mooring tails are crafted from a specialized blend of polyester and copolymer, combining the best properties of both materials to provide superior performance. Designed specifically for use as a mooring tail, it introduces the necessary elongation into your mooring configuration, enhancing shock absorption and reducing stress on the main mooring line.

Tufflex Plus mooring tails are available in standard lengths of 11 and 22 meters. This design allows for easy and secure connection to the main line using a cow hitch, ensuring a quick and efficient mooring setup. With its combination of strength, flexibility, and resistance to abrasion, Tufflex Plus mooring tails provide a reliable solution for optimizing mooring performance and extending the lifespan of mooring systems.

Size Dia.		Tail Linear Density (TLD)	11m Tail weight (kg)	Minimum Break Force		Tail Design Break Force (TDBF)	
				Unspliced		Spliced	
inch	mm	kg/m		Ton	kN	Ton	kN
2	48	**1.41**	20.2	**62.0**	608	**55.8**	547
2-1/16	50	**1.53**	21.9	**67.6**	663	**60.8**	596
2-1/8	52	**1.66**	24.0	**73.4**	720	**66.1**	648
2-5/16	56	**1.92**	28.0	**84.6**	829	**76.1**	746
2-1/2	60	**2.21**	32.4	**95.8**	939	**86.2**	845
2-5/8	64	**2.51**	37.1	**107.8**	1057	**97.0**	951
2-3/4	68	**2.83**	42.2	**122.1**	1197	**109.9**	1077
3	72	**3.18**	47.8	**137.4**	1347	**123.7**	1213
3-1/8	76	**3.54**	53.6	**152.1**	1491	**136.9**	1342
3-1/4	80	**3.92**	59.7	**167.4**	1641	**150.7**	1477
3-5/16	84	**4.32**	66.3	**181.2**	1776	**163.1**	1599
3-5/8	88	**4.75**	73.5	**195.0**	1912	**175.5**	1721
3-3/4	92	**5.19**	80.8	**212.2**	2080	**191.0**	1873
4	96	**5.65**	88.6	**230.0**	2255	**207.0**	2029
4-1/8	100	**6.13**	96.9	**249.6**	2447	**224.6**	2202
4-1/4	104	**6.63**	105.5	**270.0**	2647	**243.0**	2382

Tensile Strengths are determined in accordance with Cordage Institute 1500, Test Methods for Fiber Rope. Weights are calculated at linear density under standard preload ($200d^2$) plus 5%. Additional sizes available upon request. Please visit cortlandinternational.com or contact your sales representative for full product data sheets.

Nylotuf Plus Mooring Tails

Nylotuf mooring tails are high-performance polyamide (nylon) ropes specifically designed to enhance mooring configurations by providing exceptional elongation and shock absorption. Due to their ability to stretch under load, they are particularly well-suited for use in open and exposed ports where significant swell and dynamic forces are present.

By effectively dissipating energy, Nylotuf mooring tails help reduce stress on the main mooring lines and the vessel, minimizing the risk of sudden load surges. These mooring tails are available in standard lengths of 11 and 22 meters. They comply with the OCIMF MEG 4 guidelines, which emphasize safety and reliability in mooring operations.

By incorporating Nylotuf tails into a mooring system, operators can significantly enhance safety for the crew while improving the overall stability of the vessel during berthing. With their superior shock absorption, durability, and compliance with industry best practices, Nylotuf mooring tails are an essential addition to mooring configurations, providing both performance and peace of mind in challenging maritime environments.

Size Dia.		Linear Density	11m tail weight (kg)	Minimum Break Force							
				DRY				WET			
				Unspliced		Spliced-TDBF		Unspliced		Spliced-TDBF	
inch	mm	kg/m		Kgf	Ton	Kgf	Ton	Kgf	Ton	Kgf	Ton
2	48	**1.42**	20.4	58700	**59**	53000	**53**	50000	**50**	45000	**45**
2-1/8	52	**1.69**	24.4	70000	**70**	63000	**63**	60000	**60**	54000	**54**
2-1/4	54	**1.83**	26.6	75000	**75**	68000	**68**	63300	**63**	57000	**57**
2-5/16	56	**1.93**	28.1	79500	**80**	72000	**72**	67800	**68**	61000	**61**
2-3/8	58	**2.07**	30.3	85000	**85**	77000	**77**	72200	**72**	65000	**65**
2-1/2	60	**2.22**	32.6	91200	**91**	82000	**82**	77800	**78**	70000	**70**
2-15/32	62	**2.36**	34.8	98000	**98**	88000	**88**	83300	**83**	75000	**75**
2-5/8	64	**2.52**	37.3	105500	**106**	95000	**95**	90000	**90**	81000	**81**
2-39/50	66	**2.72**	40.4	114000	**114**	103000	**103**	96700	**97**	87000	**87**
2-3/4	68	**2.85**	42.5	119000	**119**	107000	**107**	101100	**101**	91000	**91**
2-3/4	70	**3.01**	45.0	125000	**125**	113000	**113**	106700	**107**	96000	**96**
3	72	**3.19**	47.9	130600	**131**	118000	**118**	111100	**111**	100000	**100**
3-1/8	76	**3.56**	53.7	145000	**145**	131000	**131**	123300	**123**	111000	**111**
3-1/4	80	**3.94**	60.0	160000	**160**	144000	**144**	135500	**136**	122000	**122**
3-5/16	82	**4.14**	63.3	167000	**167**	150000	**150**	142200	**142**	128000	**128**
3-3/8	84	**4.35**	66.8	175000	**175**	158000	**158**	149000	**149**	134000	**134**
3-1/2	86	**4.56**	70.1	183000	**183**	165000	**165**	155600	**156**	140000	**140**
3-5/8	88	**4.71**	72.8	192000	**192**	173000	**173**	163300	**163**	147000	**147**
4	96	**5.74**	90.0	218000	**218**	196000	**196**	185600	**186**	167000	**167**
4-1/8	102	**6.28**	99.6	238000	**238**	214000	**214**	202200	**202**	182000	**182**
4-1/4	104	**6.53**	103.9	248000	**248**	223000	**223**	211100	**211**	190000	**190**
4-1/2	108	**7.18**	115.1	272000	**272**	245000	**245**	231200	**231**	208000	**208**
4-5/8	112	**7.80**	125.9	296000	**296**	266000	**266**	251000	**251**	226000	**226**

Additional sizes available upon request. Please visit cortlandinternational.com or contact your sales representative for full product data sheets.

G/T Composite Double Braid

G/T Composite ropes provide high strength, low stretch and superior abrasion resistance in a firm round jacketed construction.
The ropes are constructed with a braided Plasma® core. This core is encased in a tightly braided jacket of a new generation HMPE fiber that offers the highest abrasion resistance and durability.*

G/T Composite ropes can be used in mooring applications where a very high strength, firm and round torque free rope is desired. G/T Composite can also be used in commercial fishing as wire rope replacement. These ropes are available with a polyurethane finish in clear or any of six colors, and are designed to withstand drum compression on mooring winches.

Features & Benefits
- Highest strength
- Lowest stretch
- Low creep
- Firm hand
- Torque free

Applications
- Commercial fishing lines
- Vessel mooring lines

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)
ABS and DNV Type Approved Sizes								
3/4	18	**2-1/4**	**16.3**	24.3	**53,000**	24.0	**58,900**	26.7
7/8	22	**2-3/4**	**20.4**	30.4	**70,900**	32.2	**78,600**	35.7
1	24	**3**	**24.5**	36.5	**75,600**	34.3	**83,900**	38.1
1-1/8	28	**3-1/2**	**33.1**	49.3	**95,000**	43.1	**105,500**	47.9
1-1/4	30	**3-3/4**	**36.0**	53.6	**113,000**	51.3	**125,600**	57.0
1-5/16	32	**4**	**49.1**	73.1	**157,900**	71.6	**175,400**	79.6
1-1/2	36	**4-1/2**	**55.7**	82.9	**183,400**	83.2	**203,800**	92.5
1-5/8	40	**5**	**64.2**	95.5	**201,000**	91.2	**223,200**	101.3
1-3/4	44	**5-1/2**	**79.5**	118.3	**228,800**	103.8	**253,900**	115.2
2	48	**6**	**88.9**	132.3	**242,400**	110.0	**269,300**	122.2

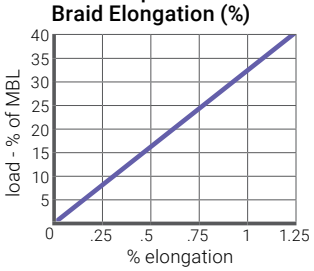
Tensile Strengths are determined in accordance with Cordage Institute CI-1500, Test Methods for Fiber Rope and ISO 2307. Published Minimum Tensile Strength (MTS) assumes spliced eye terminations at each end of the rope. Weights actually calculated at linear density under stated preload (200d[2]) plus 4%. Diameter and circumference size published are nominal and reflect rope size after loading (10 cycles) to 50% of MTS.

Technical Information

Specific gravity	**0.98***
Melting point	**284°F (140°C)**
Critical temp.	**150°F (65°C)**
Coefficient of friction	**0.12–0.15***
Elongation at break	**3%–4%**
Fiber water absorption	**0–1%**
UV resistance	**excellent**
Wet abrasion	**excellent**
Dry abrasion	**excellent**

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

G/T Composite Double Braid Elongation (%)



* GT Composite ropes can also be designed with materials other than HMPE for jacketing depending on application. Linear density & external fiber properties will change depending on jacketing material but the strength will remain the same on a per size basis. Please contact Cortland for further information.

AeroLock® Synthetic Connector

A safer, stronger, superior soft connector

Light, Safe, Secure

Meet the contender to knotted soft shackles. Introducing the AeroLock® Connector. With working load limits from 22,050–176,400 lbs. and a minimum breaking strength of 110,250–882,000 lbs., these products are ideal for a wide range of commercial marine towing applications. Patent pending and light and flexible, AeroLock Connectors can be opened and closed quickly without the need for any additional equipment and are self-locking under load. To address friction and abrasion, they feature a braided SX jacket for enhanced abrasion resistance, ensuring long-lasting durability in the toughest environments.

Backed by Extensive Testing

As with any new technology, rigorous testing for both safety and efficacy is essential. Testing on the AeroLock Connector included more than 15,000 cycles at WLL and 2.5x WLL at 1:1 D:d ratios. It also included tension fatigue testing and break testing to ensure reliability in all conditions. All testing was conducted with rope-on-rope connections to simulate field usage. During testing, Cortland's engineering team ensured that the ropes being connected did not lose strength due to being connected to the AeroLock as opposed to conventional soft shackles.

Features

- Safer than a steel or synthetic knot shackle
- More secure and reliable than a conventional soft shackle
- Lighter than a conventional soft shackle
- Patent pending UHMWPE fiber core construction design and technology**
- Thoroughly tested to meet design and safety standards
- Lightweight and flexible
- Easy to handle, install and remove
- Excellent energy absorption for safety
- The eye fits easily around the pin

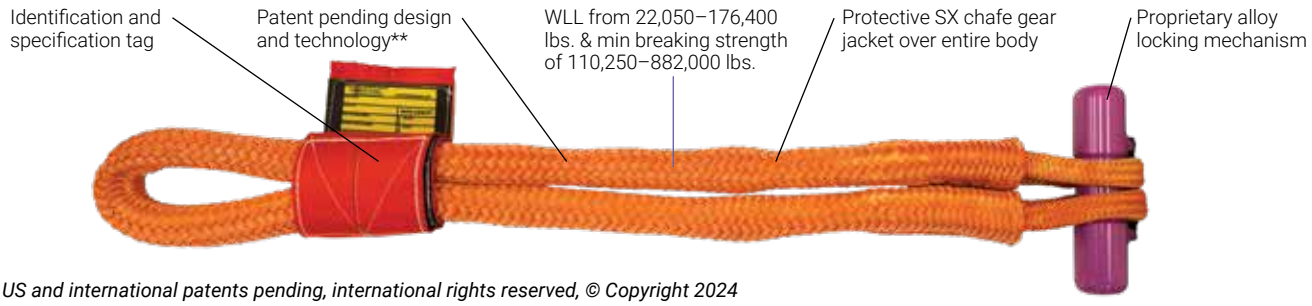
Applications

- Towing
- Winchline recovery
- This product has not been designed or specified for use in overhead lifting applications

AeroLock®
Synthetic Connector

	Working Load*		Min. Breaking Load**		Weight		Standard Length +		Leg Dia.		Min. Connection Dia.	
Part Number	MT (tonnes)	lbs	MT (tonnes)	lbs	kg	lbs	mm	in.	mm	in.	mm	in.
SYNTH CONN 10TE	10	22,050	50	110,250	1.2	2.7	305	12	29	1.15	29	1.15
SYNTH CONN 15TE	15	33,075	75	165,375	2.7	5.9	405	16	35	1.38	35	1.38
SYNTH CONN 25TE	25	55,125	125	275,625	4.8	10.5	510	20	48	1.88	48	1.88
SYNTH CONN 33TE	33	72,765	165	363,825	5.4	12.0	660	26	53	2.1	53	2.1
SYNTH CONN 45TE	45	99,225	225	496,125	9.6	21.2	660	26	58	2.3	58	2.3
SYNTH CONN 55TE	55	121,275	275	606,375	13.5	29.8	810	32	66	2.6	66	2.6
SYNTH CONN 80TE	80	176,400	400	882,000	21.1	46.6	960	38	80	3.1	80	3.1

** Based on 5:1 Factor of Safety*
*** Based on D:d of 1:1 - compare to competitive solutions at higher D:d*
+ Standard length measured from load bearing to load bearing points
Additional sizes available upon request



Wear Protection

for extended service life of fiber ropes

Cortland International's high performance ropes are manufactured using some of the most cut and abrasion resistant fibers available in the world today. Many users benefit from the ability to inspect a non-jacketed rope, such as Plasma®. However, when extra defense from heat, the elements, cutting, abrasion, or ingress of dirt, mud or particulates is needed, added wear protection can provide the solution. We offer several wear protection options as a sacrificial layer of protection, increasing the service life of a rope or sling and ensuring a safe and successful operation.

Each application has its own characteristic requirements. To address the various issues, Cortland International offers several different wear protection options which range in protective quality, weight, and cost. Contact your local Cortland technical sales representative or distributor for the proper wear protection for your specific application.

Wear gear protection types:
- SX
- Cortland Cage
- Asgard
- DXC
- XT
- PNW tubular
- PNW with hook-and-clasp securement

SX

SX wear protection is designed to offer the highest cut and abrasion resistance protection to your rope. Manufactured with HMPE (High Modulus Polyethylene), the SX wear protection is a braided tubular structure offering 100% protection to the rope. The HMPE fiber is lightweight, floats and has excellent cut resistance. SX wear protection does not absorb water and can be splice-terminated into Cortland International braided ropes.

Key benefits of SX wear protection:
- Superior wet & dry protection
- Lightweight
- Flexible
- Cut resistant
- HMPE fiber
- Low coefficient of friction
- UV resistant
- Easy to handle

Rope Size (diameter)		Part Number	
inches	**mm**	**In Eye**	**Over Splice**
1/4–3/8	6–9 mm	—	SX10
1/2–5/8	12–16 mm	SX10	SX14
3/4–7/8	18–22 mm	SX14	SX16
1–1-1/16	24–26 mm	SX16	SX18
1-1/8–1-1/4	28–30 mm	SX18	SX21
1-5/16–1-1/2	32–36 mm	SX21	SX32
1-5/8	40 mm	SX21	SX42

Rope Size (diameter)		Part Number	
inches	**mm**	**In Eye**	**Over Splice**
1-3/4–2-1/8	44–52 mm	SX32	SX42
2-1/4–2-3/4	56–68 mm	SX32	SX52
3	72 mm	SX42	SX64
3-1/8–3-1/2	76–84 mm	SX52	SX64
3-5/8–4	88–96 mm	SX64	SX72
4-1/8–4-1/4	100–104 mm	SX72	SX72

wear protection options

Cortland Cage

The **Cortland Cage** solution combines the lightweight, abrasion resistant, and non-water-absorbing properties of HMPE fiber in a braided cover sleeve. Cortland Cage can be secured in place by splice-termination or heavy duty whipping. The open braid pattern allows inspection of Plasma® 12x12 and reduces the total weight of the wear protection. Cortland Cage offers excellent cut and abrasion resistance of all braided wear protection. In addition a proprietary polyurethane coating provides added protection in challenging marine environments.

Key benefits of Cortland Cage:

- Extra protection against cutting and abrasion
- Open braid pattern allows inspection of rope
- Proprietary polyurethane coating
- Lightweight and floats

Rope Size (diameter)		Part Number	
inches	mm	In Eye	Over Splice
3/4–1-1/2	18–36 mm	SCAGE18	—
1–1-3/4	24–44 mm	SCAGE26	—

Rope Size (diameter)		Part Number	
inches	mm	In Eye	Over Splice
1-1/2–2-3/4	36–68 mm	SCAGE34	—
2-1/4–3-1/2	56–84 mm	SCAGE48	—

Asgard

Asgard wear protection is typically used for protection of lifting or mooring ropes and provides outstanding durability and resistance towards harsh operating conditions. The design features a strong, lightweight construction which is easy to install and retrofit on existing items. Asgard wear protection is designed according to a given diameter of the item to be protected and is provided in lengths according to client specifications.

Asgard wear protection is made from HMPE (High Modulus Polyethylene) and PNW (polyester and/or nylon) fibers in a woven, laminated and PU-coated construction and built in a layered design. The fibers utilized are the toughest of the traditional synthetic fibers. HMPE, for example, is used in personal armor products and PNW is used by the military for belts and webbing. Asgard wear protection can be delivered in a flat construction for protection of webbing, or in a circular construction, for use on mooring ropes for instance.

Asgard wear protection can be custom fabricated to other dimensions and configurations per customer requirements.

Key benefits of Asgard:

- Available with hook-and-clasp, or lace-on closures
- Custom fabricated to fit rope diameter and length requirements

Rope Size (diameter)		Part Number		
inches	mm	In Eye	Over Splice	Over Grommet
1/4–3/8	6–9 mm	AS-1.0	AS-1.0	AS-1.5
1/2–5/8	12–16 mm	AS-1.0	AS-1.5	AS-2.0
3/4–7/8	18–22 mm	AS-1.0	AS-1.5	AS-2.5
1	24 mm	AS-1.5	AS-2.0	AS-3.0
1-1/4	30 mm	AS-2.0	AS-2.0	AS-3.5
1-5/16–1-1/2	32–36 mm	AS-2.0	AS-2.5	AS-4.0

Rope Size (diameter)		Part Number		
inches	mm	In Eye	Over Splice	Over Grommet
1-5/8–1-3/4	40–44 mm	AS-2.5	AS-3.0	AS-4.5
1-3/4–6	44–152 mm	AS-2.5	AS-3.5	AS-5.0
7	177 mm	AS-2.5	AS-3.5	AS-6.0
8	203 mm	AS-3.0	AS-4.5	AS-7.0
9–10	228–254 mm	AS-3.5	AS-5.0	AS-9.0
11–13	279–330 mm	AS-5.0	AS-7.0	—

wear protection options

DXC

The DXC wear protection is a tightly braided tubular polyester sleeve with proprietary marine polyurethane coating for use in extreme applications. Excellent choice for placement in the eye or body of sling; DXC sleeves can be fabricated to be free-floating or fixed in place. The DXC sleeve covers rope sling sizes from 1/4" (6 mm) diameter through 4-1/4" (104 mm) diameter. Other sizes and colors available upon request.

Rope Size (diameter)		Part Number	
inches	mm	In Eye	Over Splice
1/4–3/8	6–9 mm	—	DX10
1/2–5/8	12–16 mm	DX10	DX14
3/4–7/8	18–22 mm	DX14	DX16
1–1-1/16	24–26 mm	DX16	DX18
1-1/8–1-1/4	28–30 mm	DX18	DX21
1-5/16–1-1/2	32–36 mm	DX21	DX32
1-5/8	40 mm	DX21	DX42
1-3/4–2-1/8	44–52 mm	DX32	DX42
2-1/4–2-3/4	56–68 mm	DX32	DX52
3	72 mm	DX42	DX64
3-1/8–3-1/2	76–84 mm	DX52	DX64
3-5/8–4	88–96 mm	DX64	DX72
4-1/8–4-1/4	100–104 mm	DX72	DX72

XT

XT wear protection is a tightly braided tubular polyester wear protection sleeve with proprietary heavy marine polyurethane coating for use in extreme applications. XT sleeves can be fabricated to be free-floating, or fixed in place. It is an excellent choice for eye terminations or selected area body placement, braid-spliced or seized in place. This wear protection option is not as flexible as SX or PNW.

Rope Size (diameter)		Part Number	
inches	mm	In Eye	Over Splice
1/4–3/8	6–9 mm	—	XT10
1/2–5/8	12–16 mm	XT14	XT14
3/4–7/8	18–22 mm	XT14	XT16
1–1-1/16	24–26 mm	XT16	XT18
1-1/8–1-1/4	28–30 mm	XT18	XT21
1-5/16–1-1/2	32–36 mm	XT21	XT32
1-5/8	40 mm	XT21	XT42
1-3/4–2-1/8	44–52 mm	XT32	XT42
2-1/4–2-3/4	56–68 mm	XT32	XT52
3	72 mm	XT42	XT64
3-1/8–3-1/2	76–84 mm	XT52	XT64
3-5/8–4	88–96 mm	XT64	XT72
4-1/8–4-1/4	100–104 mm	XT72	XT72

wear protection options

PNW tubular

PNW is a woven fiber material and is the most commonly used protection for abrasion. This wear protection is a permanent installation. PNW wear protection can be customized to meet the needs of any application. Standard colors are black or orange.

Rope Size (diameter)		Part Number		
inches	mm	In Eye	Over Splice	Over Grommet
1/4–3/8	6–9 mm	51650	51623	51623
1/2–5/8	12–16 mm	51623	51570	51570
3/4–7/8	18–22 mm	51231	51232	51232
1–1-1/16	24–26 mm	51232	51234	51234
1-1/8–1-1/4	28–30 mm	51233	51477	51477
1-5/16–1-1/2	32–36 mm	51446	51235	51235
1-5/8	40 mm	51234	51236	51236
1-3/4–2-1/8	44–52 mm	51477	51237	51237
2-1/4–2-3/4	56–68 mm	51236	51692	51692
3	72 mm	50403	—	
3-1/8–3-1/2	76–84 mm	51692	—	
3-5/8–4	88–96 mm	—	—	
4-1/8–4-1/4	100–104 mm	—	—	

PNW with hook-and-clasp securement

PNW is a woven fiber material and is the most commonly used protection for abrasion. PNW protection can be customized to meet the needs of any application. This is a removable or replaceable wear protection and is available in black or orange.

Rope Size (diameter)		Part Number		
inches	mm	In Eye	Over Splice	Over Grommet
1/4–3/8	6–9 mm	custom	SL-1.0	SL-1.5
1/2–5/8	12–16 mm	SL-1.0	SL-1.5	SL-2.0
3/4–7/8	18–22 mm	SL-1.5	SL-1.75	SL-2.5
1–1-1/16	24–26 mm	SL-1.75	SL-2.5	SL-3.5
1-1/8–1-1/4	28–30 mm	SL-25	SL-3.0	SL-3.5
1-5/16–1-1/2	32–36 mm	SL-2.5	SL-3.0	SL-4.0
1-5/8	40 mm	SL-3.0	SL-4.0	SL-5.0
1-3/4–2-1/8	44–52 mm	SL-3.5	SL-4.5	SL-6.0
2-1/4–2-3/4	56–68 mm	SL-4.5	SL-6.0	SL-8.0
3	72 mm	SL-5.0	SL-7.0	custom
3-1/8–3-1/2	76–84 mm	SL-6.5	SL-8.0	custom
3-5/8–4	88–96 mm	SL-8.0	custom	custom
4-1/8–4-1/4	100–104 mm	custom	custom	custom


Emergency Tow Packages

Easy, light, ready-to-go tow lines in one simple container

Cortland offers a full range of high performance synthetic rope solutions which are stronger, safer, lighter and easier to handle than wire rope.

One standard solution is Cortland's Emergency Tow Package system, containing all elements needed for quick response to tow and recovery needs. The ETS-450 and ETS-900 Emergency Tow Packages are complete rope assemblies consisting of a Plasma® Tow Line with thimbled eyes, HMPE floating pickup line and lighted buoy all stored inside a weather proof plastic container.

Tow Line
Cortland's floating tow lines are made with a soft, torque-free braided construction and high visibility urethane coating. Unlike Kevlar® lines, they do not require special large radius chocks or fairleads and can be handled in the same manner as regular towing hawsers.
ETS-450–56mm dia (7" circ) x 76 meter (250-ft) of Plasma® 12 Strand
ETS-900–80mm dia (10" circ) x 91 meter (300-ft) of Plasma® 12 Strand
The ETS-450 has a minimum break strength of 2,000 kN (450,000 lbs), meeting the requirements for tankers under 50,000 dwt. The ETS-900 has a minimum break strength of 4,000 kN (900,000 lbs) meeting the requirements for tankers over 50,000 dwt.

Pickup Line
The pick-up line is a high visibility HMPE 12 Strand floating rope with a minimum break strength of 200 kN (45,000 lbs): 22mm (7/8 inch) diameter x 122 meters (400-ft).

Lighted Buoy
An automatically activated lighted buoy, small enough to fit through any chock and that will accept the tow line thimbles, is also included.

Storage Box
All items arrive inside a heavy duty polypropylene storage container, which is ready to attach to the deck. The line is flaked into the container for easy attachment and deployment.

Features
- Complete assemblies, including a Plasma® tow line, HMPE floating pick up line, and lighted buoy
- Weights:
  550 lbs ETS-450
  1,100 lbs ETS-900
- All components in compliance with 1994 SOLAS Convention requirements
- Delivered in a ready-to-use weatherproof container

Innovative solutions. Custom built.
Call us for your next project or email us at contact@cortlandinternational.com.

Note: Rope specifications and emergency towing system requirements may vary by region. Please contact Cortland International to discuss custom requirements.

Our ESG Approach

Our ESG strategy is an integral part of our long-term, globally aligned strategic imperatives and operating priorities. It is deeply embedded in our vision, mission and values as an organization. We continuously seek to identify ways to broaden our commitments to ESG efforts and make progress on our goal of making life in our operations, in our communities, and on the planet better today and in the future. Through our engagement with stakeholders, we aim to seek diverse perspectives and foster an environment where we take the time to listen first, be present and strive to make others feel welcomed, valued, heard and respected.

Sustainable Products &

Operations

Committing to reducing emissions from our existing operations and investing in future lower-carbon energies. This ensures our journey to net-zero emissions is both transparent and effective and creates shared value throughout the product life cycle.

Supporting Our employees & Our Communities

Bringing purposeful innovation to our consumers and improving the environment for our employees and our communities.

Doing the Right Thing

Holding ourselves accountable and maintaining robust policies, procedures, and systems to ensure we live by our values.

WHO WE ARE

CORTLAND INTERNATIONAL™

Cortland International brings together industry leaders with decades of experience delivering superior quality synthetic rope products and customized solutions that provide unparalleled value for our customers. As the largest rope manufacturer in the world, we're growing, expanding our extensive portfolio, and accelerating innovation to create a safer, more secure, and sustainable way to work.

Our 30+ years of continuous innovation is fueled by deep technical expertise; delivering customized high-performance synthetic solutions that help solve the most complex challenges across diverse markets.

Inspired solutioneers, we are meeting the needs of diverse industries, connecting people with innovative, future ready products and solutions that make work, play and everyday life easier and safer.

We welcome your inquiries, email us at contact@cortlandinternational.com.

TUFROPES

Decades of experience in customer-centric rope and netting product development, Tufropes has one of the largest vertically integrated manufacturing facilities in the world with the capacity of 70,000 MT p.a. across 7 facilities and over 35,000 SKUs, delivered in 70+ countries.

CORTLAND INDUSTRIAL

A recognized industry-leader, with deep technical expertise, Cortland has been defining customized synthetic rope solutions for more than 30 years, that are stronger than steel, last longer, are safer by design and over 80% lighter than steel wire rope.

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Anacortes, WA – USA

Houston, TX – USA

Vadodara-Gujarat – India

Indore-M.P Unit – India

Masat-Silvassa Unit – India

Mumbai – India

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