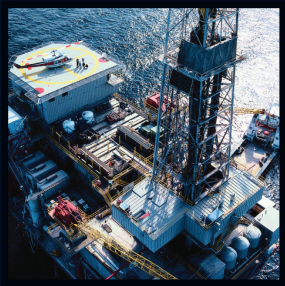


MarineTuff Offshore and Marine Cable Solutions



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WE GET IT
24/7 Emergency Material Access

Belden offers the industry's largest selection of industrial cables for offshore and marine certified applications

Whether you are handling oil, natural gas or petrochemicals, working onshore or offshore, Belden's cable, connectivity and networking solutions will solve your toughest problems.



MarineTuff

Offshore and Marine Cable Solutions



MarineTuff

About Our MarineTuff Cable Offering



MarineTuff - Safe, Robust Cable for Offshore Applications

Thank you for choosing Belden's MarineTuff cables for your offshore cable needs. Belden is known for providing highly reliable, rugged signal transmission solutions for some of the most demanding applications. With the MarineTuff line of cables, Belden's heritage of rugged signal transmission solutions now extends to offshore applications.

All MarineTuff cables are certified by the American Bureau of Shipping (ABS).

The American Bureau of Shipping (ABS) is one of the governing bodies overseeing the safe construction and operation of ABS-classed vessels, modular offshore drilling units (MODUs) or facilities. Belden MarineTuff cables meet or exceed the requirements set for by ABS for offshore applications.

In addition to ABS certification, our HaloarrestXLink (low smoke zero halogen) cables meet numerous requirements for harsh offshore environments. These include UL 1309 (Marine Shipboard Cable), IEEE 1580 Type P insulation (IEEE Recommended Practice for Marine Cable for Use on Shipboard and Fixed or Floating Facilities) UL Oil Resistance II, IEEE 1202 & FT4 (Flame Resistance), IEC 60754-1 (Compliant for Halogen Content), and IEC 60754-2 (Compliant for Acid Gas Emissions). In other words, we make the toughest cables around and we've got the certifications to prove it!

For complete details on all of the certifications each product family meets, please see the individual sections contained later in this catalog.

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff

About Belden



DNV·GL



Peace of Mind with Zero Downtime

Belden is a long-time leader in offering high-performance data and signal transmission solutions for the industrial environment where reliability is absolutely required to maintain safe operations with zero unplanned downtime.

That's why solutions for the industrial environment – one that imposes harsh or severe working conditions on active devices and media installations – are vital. At one time or another, the signaling components at these facilities will have to withstand the destructive effects of temperature extremes, humidity/moisture, dust, oil and solvents, and the potentially corrosive effects of chemicals. As if those weren't enough, add to the list ultraviolet radiation caused by extensive sunlight, electromagnetic interference and the ever-present danger of fire and explosion.

Whether you are handling oil, natural gas or petrochemicals, working onshore or offshore, Belden's cable, connectivity and networking solutions will solve your toughest problems.

Always the Right Solution

Belden is the world's leading supplier of signal transmission solutions including cable, connectivity and active components for mission-critical applications ranging from industrial automation and alternative power generation through to professional broadcasting. Belden offers an extensive portfolio of highly specialized products for steering, control and field level, which the company produces and markets under its proprietary Belden®, Hirschmann™, and Lumberg Automation™ brands. We would be glad to introduce to you our integrated product palette for industrial applications and the worldwide Belden Service.

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff

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MarineTuff

Offshore and Marine Cable Solutions

MarineTuff Product Characteristic Symbols



Type P Insulation



Zero Halogen Jacket



Flame Retardant



Oil Resistant



Low Toxicity



Low Smoke



Low Corrosion

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff

Industrial Fiber Cables



The demand for enhanced security and high quality data, audio, and video is increasing in the offshore environment. Therefore, the quality and reliability of your fiber optic cables is of increasing importance. MarineTuff fiber products offer quality data, audio, and video functions for offshore structures. For instance, in the event of an electromagnetic surge, fiber guarantees 100% of your communication and the network infrastructure remains available. Furthermore, fiber decreases latency and better supports the high bandwidth demands of your growing auxiliary and surveillance networks. Cost efficiency with bidirectional fiber decreases latency and expenditures of commissioning expansive networks.

In addition to offshore rigs and control room applications, Belden products are widely used in separator stations, metering stations, pumping/compressor stations, LNG processing plants, transportation/storage, refining facilities and shipboards.

The MarineTuff fiber line features all-dielectric cable, but metallic armoring can be added when needed for a specific installation. Cable designs feature flame retardant, thermoplastic buffers/tubes, aramid yarn strength members, optional aluminum armor, overall water-blocking tape and low smoke zero halogen jackets (LSZH).

Key Attributes

- Low smoke zero halogen jacketed
- Aluminum interlock (for tight buffer) or steel corrugated (for loose tube) armoring optional
- Flame retardant
- 10 year warranty

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff Industrial Fiber Cables

Loose Tube Indoor/Outdoor
Low Smoke Zero Halogen (LSZH)

Featured Options:

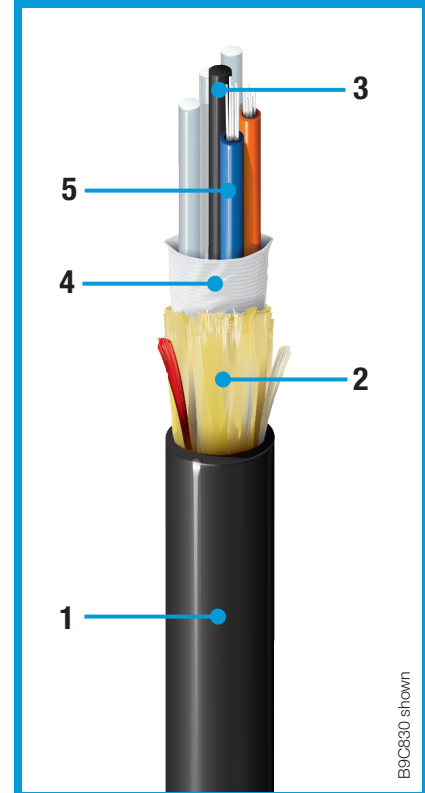
- Sunlight resistance
- Fully water-blocked
- Singlemode and multimode riser rated LSZH

Certifications/Compliance

- NEC/CEC
- UL Type OFNR/OFRCR
- cUL OFNR/OFRCR FT-4
- Marine approvals: ABS type approval

Construction:

1. LSZH Outer Jacket
2. Aramid Yarn
3. Central E-Glass Strength Member
4. Water Blocking Tape
5. Blue Buffer Tube



No. of Fibers	Fibers/Bundle	Part No.					OD (Nom)	
		OM1 (62.5/125) Std. 1Gb	OM2 (50/125) Std. 1 Gb	OM3 (50/125) 10 Gb - 300 m	OM4 (50/125) 10 Gb - 550 m	OS2 Single-mode Enhanced	Inch	mm
6	6	B9B830*	B9A830	B9C830*	B9E830	B9W830		
12	12	B9B831*	B9A831	B9C831*	B9E831	B9W831*	.38	9.65
24	12	B9B832	B9A832	B9C832	B9E832	B9W832		
36	12	B9B833	B9A833	B9C833	B9E833	B9W833		
48	12	B9B834	B9A834	B9C834	B9E834	B9W834*	.48	12.18

* Indicates common part numbers.

Standard Jacket Color: Black (non-standard jacket colors are available).

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff Industrial Fiber Cables

Breakout Style Cable

Tight Buffer - LSZH Indoor/Outdoor

Featured Options:

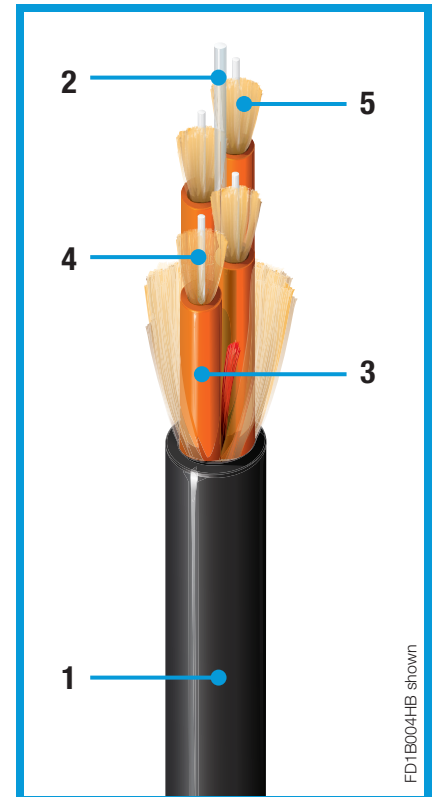
- LSZH
- 900 um tight buffer fibers
- Flame retardant
- Direct connectorization
- Also available in a 2.5mm sub-unit

Certifications/Compliance

- NEC/CEC
- UL Type OFNR (unarmored)/OFCR (armored)
- cUL OFNR/OFCR FT-4
- Marine approvals: ABS type approval

Construction:

1. Black Outer Jacket
2. Central E-Glass Strength Member
3. 2.0mm Subunits
4. 900 Micron Tight Buffered Fiber
5. Aramid Yarn



No of Fibers	Fibers/ Bundle	Part No.				OD (Nom)	
		OM1 (62.5/125) Std. 1Gb	OM3 (50/125) 10 Gb - 300m	OM4 (50/125) 10 Gb - 550m	"OS2 Single-mode Enhanced"	Inch	mm
2	1	FD1B002LB	FD3B002LB	FD4B002LB	FDSB002LB	.260	6.60
4	1	FD1B004LB	FD3B004LB	FD4B004LB	FDSB004LB	.321	8.15
6	1	FD1B006LB	FD3B006LB	FD4B006LB	FDSB006LB	.358	9.09
10	1	FD1B010LB	FD3B010LB	FD4B010LB	FDSB010LB	.455	11.56
12	1	FD1B012LB	FD3B012LB	FD4B012LB	FDSB012LB	.514	13.06

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff

Industrial Ethernet Cables



Only Belden offers the most comprehensive range of Industrial Ethernet cabling solutions available in the world today – all specifically engineered and ruggedly constructed to ensure optimum network performance and uptime, even in the harshest settings. Belden Industrial Ethernet cables, the DataTuff cable line, are far and away the industry's top choice for signal transmission integrity and consistently reliable electrical performance. Unlike commercial off-the-shelf (COTS) Ethernet cabling, our Category 6 copper-based cables are built Belden-tough to withstand the harsh environmental conditions and mechanical stresses typically present in offshore environments.

Belden Bonded-Pair Cables feature a patented design that bonds individual conductors along their longitudinal axis. This assures an extremely uniform spacing within each twisted pair which is a key factor in maintaining consistent electrical performance and providing optimal RFI immunity. Ideally, this distance should remain fixed and stable along the length of the twisted pair. Installation and termination of cable disturbs this relationship and therefore also affects the cable's electrical performance. Even minor disturbances in the spacing can have a significant impact on the electrical performance, particularly impedance, return loss and crosstalk. Since the two conductors of a Bonded-Pair cable are bonded together, gaps cannot form in between the conductors. The physical integrity of the pair is maintained, resulting in consistent electrical performance.

The normal cable installation stresses routing around and through tight passages typical of offshore facilities can impact cable reliability. In a recent survey, contractors indicated that Bonded-Pair cables maintain their physical integrity (and electrical performance) requiring less troubleshooting and re-work.

The performance of the entire network in a marine vessel or offshore facility depends on the integrity and reliability of the cables connecting network devices. A weak or compromised section of the cabling puts the entire network in jeopardy. The MarineTuff suite of Industrial Ethernet cabling is the best choice to meet these challenges.

Key Attributes

- LSZH jackets on all cables and options
- Bronze braid options on all cables and options
- ABS certified, DNV certified
- 10 year warranty
- Consistently reliable electrical performance
- Bonded Pair Technology

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff Industrial Ethernet Cables

Category 6, DataTuff® Cables
Unshielded, 4-Pair, 23 AWG



Features:

- Sunlight and Oil resistant
- Bonded Pairs
- Oil Res II (Thermoset)

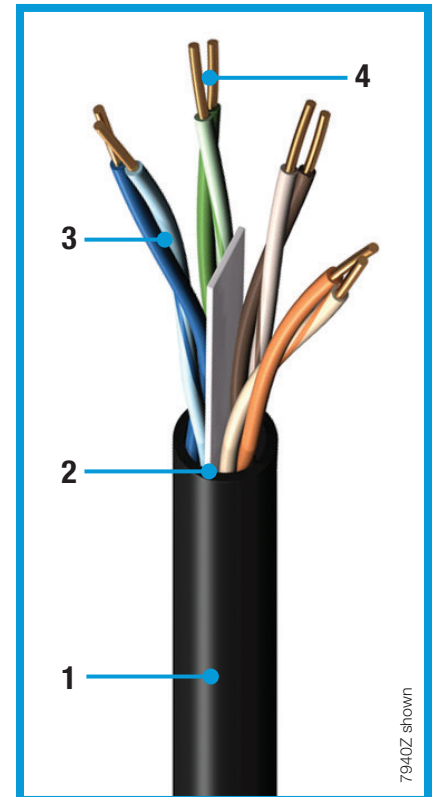
Certifications/Compliance

- ABS certified
- DNV certified
- NEC: CMG
- CEC: CMG
- EtherNet/IP compliant
- FT4/IEEE 1202
- IEC 60332-3-22
- IEC 60754-1 (Jacket)
- IEC 60754-2 (Jacket)

Construction:

1. **LSZH Thermoplastic or Thermoset Jacket**
2. **Internal Tape Separator**
3. **Four Bonded Pairs**
4. **Solid Copper Conductor**

NOTE: Also available on all options, bronze braid armor with LSZH second jacket not pictured



MarineTuff

Offshore and Marine Cable Solutions

MarineTuff Industrial Ethernet Cables

Category 6, DataTuff® Cables

Shielded and Unshielded, 4-Pair, 23 AWG



Part No.	Nominal OD		Additional Features/Ratings
	Inch	mm	
23 AWG, Shielded			
Category 6 with Overall Beldfoil Shielding • LSZH Jacket • Cable Design Under Development			
<i>Thermoset Jacket</i>			
7953Z		Under development	CMG-LS, Category 6
<i>Thermoplastic Jacket</i>			
7953T		Under development	
23 AWG, Unshielded			
Solid BC Conductors • Polyolefin Insulation • LSZH Outer Jacket			
<i>Thermoset Jacket</i>			
7940Z	0.295	7.4	CMG-LS, Category 6
<i>Thermoplastic Jacket</i>			
7940T	0.295	7.4	
23 AWG, Shielded with Bronze Braid Armor			
Category 6 with Overall Beldfoil Shielding • LSZH Jacket • Cable Design Under Development			
<i>Thermoset Jacket</i>			
977953Z		Under development	CMG-LS, Category 6
<i>Thermoplastic Jacket</i>			
777953T		Under development	
23 AWG, Unshielded with Bronze Braid Armor			
Solid BC Conductors • Polyolefin Insulation • Double LSZH Outer Jackets			
<i>Thermoset Jacket</i>			
977940Z	0.43	11.1	CMG-LS, Category 6
<i>Thermoplastic Jacket</i>			
777940T	0.43	11.1	

Conductor Color Codes: Pair 1: White/Blue Stripe & Blue • Pair 2: White/Orange Stripe & Orange • Pair 3: White/Green Stripe & Green • Pair 4: White/Brown Stripe & Brown

All reels of Bonded Pair cable come with bonded pair separator tool (part no. 1797B)

BC = Bare Copper

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff

UL Control and Instrumentation Cables



MarineTuff certified Belden instrumentation and control cables bring reliable, safety conscious wiring solutions to offshore platforms, equipment suppliers and commercial shipbuilders. These ABS-certified cables offer physical toughness and the safety benefits of low smoke and zero halogen (LSZH) jackets to provide a no-compromise solution that can withstand the harshest offshore environments. Belden's MarineTuff certified cables are highly reliable, rugged solutions that will function in a variety of challenging offshore activities: mobile drilling, fixed platform, floating production, storage and offloading (FPSO), marine vessels.

Oil and Gas platforms must continuously achieve optimal performance, while operating in harsh environments under mission-critical conditions. Demands on communication networks include safety, availability, reliability and durability in environments where vibration, corrosion, fluctuating temperature, splash water, and pollution occur. The MarineTuff instrumentation and control cables are designed to operate in these conditions.

The MarineTuff instrumentation and control line features 600V TC-ER rated multiconductor, paired, and triad cables. They feature XLP conductors appropriate for 90 degrees C wet/dry demands, class I and II / Division 2 hazardous location ratings, and HaloarrestXLink low smoke zero halogen jackets (LSZH).

Key Attributes

- Type P rated insulations on all cables and options
- LSZH jackets on all cables and options
- Bronze braid or continuous aluminum armoring available
- ABS and DNV certified
- 10 year warranty

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff UL Control Cable

600 V Type TC (or MC) Cables

DNV·GL



Featured Options:

- Bronze Braid Armoring
- Continuous Aluminum Armor (ABS) - Type MC
- LSZH Thermoset Jacket (Standard)
- Type P Rated Insulations
- Sunlight and Oil Resistant

Construction:

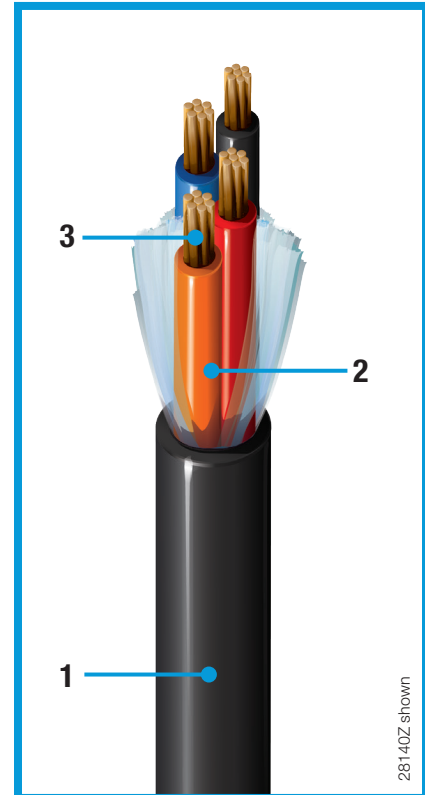
1. **LSZH Thermoset Jacket**
2. **XLP Insulation**
3. **Flexible Stranded Tinned Copper Conductors**
4. **Round and Smooth**

NOTE: Also available on all options, foil shield, bronze braid armor with LSZH second jacket, continuous aluminum armor with LSZH second jacket (not pictured).

Certifications/Compliance

- ABS (American Bureau of Shipping)
- DNV (Det Norske Veritas)*
- IEEE 45 Electrical Installation on Shipboard
- IEEE 1580 Type P insulations (recommended practice for marine cables for use on shipboard in fixed or floating facilities)
- UL 1309 marine shipboard cables
- IEC 60811-2-1 compliant for hydrocarbon resistance
- IEC 60754-1 compliant jacket for halogen content
- IEC 60754-2 compliant jacket for acid gas emissions
- IEC 60092-350 electrical installations on ships)
- UL 1277 TC-ER crush and impact resistant (UL TC for 2-conductor cables)
- IEEE 1202 and FT4 flame-resistant
- IEC 60332-3-22

* excludes continuous armored constructions



MarineTuff

Offshore and Marine Cable Solutions



MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 18 AWG, Unshielded, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm

18 AWG • Unshielded • Thermoset Jacket • Type TC

Flexible Stranded (16 x 30) TC Conductors • XLPE Insulation • LSZH Jacket									
27916Z	2	E2	44	3.20	81.3	.21 x 0.31	5.3 x 7.9	0.05	1.1
27325Z	2	E2	44	3.10	78.7	0.31	7.9	0.05	1.1
28334Z	3	E2	66	3.30	83.8	0.33	8.4	0.05	1.1
28326Z	4	E2	88	3.60	91.4	0.36	9.1	0.05	1.1
28335Z	5	E2	110	3.90	99.1	0.39	9.9	0.05	1.1
28600Z	6	E2	132	4.20	106.7	0.41	10.4	0.05	1.1
28327Z	7	E2	154	4.30	109.2	0.42	10.7	0.05	1.1
28601Z	8	E2	176	4.50	114.3	0.45	11.4	0.05	1.1
28336Z	9	E2	198	4.90	124.5	0.49	12.4	0.05	1.1
28328Z	10	E2	220	5.70	144.8	0.56	14.2	0.06	1.5
28602Z	11	E2	242	5.80	147.3	0.58	14.7	0.06	1.5
28329Z	12	E2	264	5.80	147.3	0.58	14.7	0.06	1.5
28603Z	13	E2	286	6.10	154.9	0.61	15.5	0.06	1.5
28604Z	14	E2	308	6.10	154.9	0.61	15.5	0.06	1.5
28605Z	15	E2	330	6.40	162.6	0.64	16.3	0.06	1.5
28606Z	16	E2	352	6.40	162.6	0.64	16.3	0.06	1.5
28607Z	17	E2	374	6.80	172.7	0.67	17.0	0.06	1.5
28608Z	18	E2	396	6.80	172.7	0.67	17.0	0.06	1.5
28609Z	19	E2	418	6.80	172.7	0.67	17.0	0.06	1.5
28610Z	20	E2	440	7.10	180.3	0.70	17.8	0.06	1.5
28611Z	25	E2	550	8.00	203.2	0.80	20.3	0.06	1.5
28612Z	30	E2	660	8.30	210.8	0.82	20.8	0.06	1.5
28613Z	37	E2	814	9.40	238.8	0.93	23.6	0.08	2.0
28614Z	50	E2	1100	10.90	276.9	1.09	27.7	0.08	2.0
28632Z	60	E2	1320	11.70	297.2	1.17	29.7	0.08	2.0

Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

18 AWG • Unshielded • Double Thermoset Jackets • Bronze Braid Armor • Type TC (continued next page)

Flexible Stranded (16 x 30) TC Conductors • XLPE Insulation • Double LSZH Jackets											
Z27916Z	2	E2	44	4.13	105.0	0.45	8.7	0.05	1.1	0.06	1.4
Z27325Z	2	E2	44	5.45	105.0	0.45	8.7	0.05	1.1	0.06	1.4
Z28334Z	3	E2	66	5.69	111.1	0.47	9.3	0.05	1.1	0.06	1.4
Z28326Z	4	E2	88	6.05	120.2	0.50	10.0	0.05	1.1	0.06	1.4
Z28335Z	5	E2	110	6.41	129.4	0.53	10.8	0.05	1.1	0.06	1.4
Z28600Z	6	E2	132	6.86	140.7	0.57	11.7	0.05	1.1	0.06	1.4
Z28327Z	7	E2	154	6.98	143.8	0.58	12.0	0.05	1.1	0.06	1.4
Z28601Z	8	E2	176	7.34	152.9	0.61	12.7	0.05	1.1	0.06	1.4
Z28336Z	9	E2	198	7.82	165.1	0.65	13.8	0.05	1.1	0.06	1.4

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 18 AWG, Unshielded, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

18 AWG • Unshielded • Double Thermoset Jackets • Bronze Braid Armor • Type TC (continued from previous page)

Flexible Stranded (16 x 30) TC Conductors • XLPE Insulation • Double LSZH Jackets											
Z28328Z	10	E2	220	8.66	186.4	0.72	15.5	0.06	1.5	0.06	1.4
Z28602Z	11	E2	242	8.90	192.5	0.74	16.0	0.06	1.5	0.06	1.4
Z28329Z	12	E2	264	8.90	192.5	0.74	16.0	0.06	1.5	0.06	1.4
Z28603Z	13	E2	286	9.26	201.7	0.77	16.8	0.06	1.5	0.06	1.4
Z28604Z	14	E2	308	9.26	201.7	0.77	16.8	0.06	1.5	0.06	1.4
Z28605Z	15	E2	330	9.62	210.8	0.80	17.6	0.06	1.5	0.06	1.4
Z28606Z	16	E2	352	9.62	210.8	0.80	17.6	0.06	1.5	0.06	1.4
Z28607Z	17	E2	374	9.98	220.0	0.83	18.3	0.06	1.5	0.06	1.4
Z28608Z	18	E2	396	9.98	220.0	0.83	18.3	0.06	1.5	0.06	1.4
Z28609Z	19	E2	418	9.98	220.0	0.83	18.3	0.06	1.5	0.06	1.4
Z28610Z	20	E2	440	10.34	229.1	0.86	19.1	0.06	1.5	0.06	1.4
Z28611Z	25	E2	550	11.54	259.6	0.96	21.6	0.06	1.5	0.06	1.4
Z28612Z	30	E2	660	11.78	265.7	0.98	22.1	0.06	1.5	0.06	1.4
Z28613Z	37	E2	814	13.10	299.2	1.09	24.9	0.08	2.0	0.06	1.4
Z28614Z	50	E2	1100	15.02	348.0	1.25	29.0	0.08	2.0	0.06	1.4

Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

18 AWG • Unshielded • Continuous Armor • Double Thermoset Jackets • Type MC (continued next page)

Flexible Stranded (16 x 30) TC Conductors • XLPE Insulation • Double LSZH Jackets											
											NOTE: Continuous armor cables are not DNV rated
W27916Z	2	E2	44	6.98	177.4	0.58	14.8	0.05	1.1	0.06	1.4
W27325Z	2	E2	44	6.98	177.4	0.58	14.8	0.05	1.1	0.06	1.4
W28334Z	3	E2	66	7.22	183.5	0.60	15.3	0.05	1.1	0.06	1.4
W28326Z	4	E2	88	7.58	192.6	0.63	16.1	0.05	1.1	0.06	1.4
W28335Z	5	E2	110	7.94	201.8	0.66	16.8	0.05	1.1	0.06	1.4
W28600Z	6	E2	132	8.18	207.9	0.68	17.3	0.05	1.1	0.06	1.4
W28327Z	7	E2	154	8.30	210.9	0.69	17.6	0.05	1.1	0.06	1.4
W28601Z	8	E2	176	8.66	220.1	0.72	18.3	0.05	1.1	0.06	1.4
W28336Z	9	E2	198	9.14	232.3	0.76	19.4	0.05	1.1	0.06	1.4
W28328Z	10	E2	220	9.98	253.6	0.83	21.1	0.06	1.5	0.06	1.4
W28602Z	11	E2	242	10.22	259.7	0.85	21.6	0.06	1.5	0.06	1.4
W28329Z	12	E2	264	10.22	259.7	0.85	21.6	0.06	1.5	0.06	1.4
W28603Z	13	E2	286	10.58	268.8	0.88	22.4	0.06	1.5	0.06	1.4
W28604Z	14	E2	308	10.58	268.8	0.88	22.4	0.06	1.5	0.06	1.4
W28605Z	15	E2	330	10.94	278.0	0.91	23.2	0.06	1.5	0.06	1.4
W28606Z	16	E2	352	10.94	278.0	0.91	23.2	0.06	1.5	0.06	1.4
W28607Z	17	E2	374	11.30	287.1	0.94	23.9	0.06	1.5	0.06	1.4

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 18 AWG, Unshielded and Shielded, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

18 AWG • Unshielded • Continuous Armor • Double Thermoset Jackets • Type MC (continued from previous page)

Flexible Stranded (16 x 30) TC Conductors • XLPE Insulation • Double LSZH Jackets											NOTE: Continuous armor cables are not DNV rated
W28608Z	18	E2	396	11.30	287.1	0.94	23.9	0.06	1.5	0.06	1.4
W28609Z	19	E2	418	11.30	287.1	0.94	23.9	0.06	1.5	0.06	1.4
W28610Z	20	E2	440	11.66	296.3	0.97	24.7	0.06	1.5	0.06	1.4
W28611Z	25	E2	550	12.86	326.7	1.07	27.2	0.06	1.5	0.06	1.4
W28612Z	30	E2	660	13.10	332.8	1.09	27.7	0.06	1.5	0.06	1.4
W28613Z	37	E2	814	14.42	366.4	1.20	30.5	0.08	2.0	0.06	1.4

Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm

18 AWG • Shielded 100%, Beldfoil • Thermoset Jacket • Type TC

Flexible Stranded (16 x 30) TC Conductors • XLPE Insulation • LSZH Jacket										
27325ZS	2	E2	67	3.13	79.5	0.31	8.0	0.05	1.1	
28334ZS	3	E2	90	3.33	84.6	0.33	8.5	0.05	1.1	
28326ZS	4	E2	112	3.63	92.2	0.36	9.2	0.05	1.1	

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MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 16 AWG, Unshielded, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm

16 AWG • Unshielded • Thermoset Jacket • Type TC

Flexible Stranded (26 x 30) TC Conductors • XLPE Insulation • LSZH Jacket									
27917Z	2	E2	44	3.30	83.8	.212 x .330	5.38 x 8.38	0.05	1.1
27337Z	2	E2	44	3.50	88.9	0.34	8.6	0.05	1.1
28331Z	3	E2	66	3.60	91.4	0.35	8.9	0.05	1.1
28338Z	4	E2	88	3.90	99.1	0.39	9.9	0.05	1.1
28339Z	5	E2	110	4.30	109.2	0.42	10.7	0.05	1.1
28615Z	6	E2	132	4.60	116.8	0.46	11.7	0.05	1.1
28323Z	7	E2	154	4.60	116.8	0.46	11.7	0.05	1.1
28616Z	8	E2	176	5.00	127.0	0.49	12.4	0.05	1.1
28340Z	9	E2	198	5.70	144.8	0.56	14.2	0.05	1.1
28617Z	10	E2	220	6.10	154.9	0.61	15.5	0.05	1.1
28618Z	11	E2	242	6.30	160.0	0.63	16.0	0.05	1.1
28341Z	12	E2	264	6.30	160.0	0.63	16.0	0.05	1.1
28619Z	13	E2	286	6.60	167.6	0.66	16.8	0.05	1.1
28620Z	14	E2	308	6.60	167.6	0.66	16.8	0.05	1.1
28621Z	15	E2	330	7.00	177.8	0.69	17.5	0.06	1.5
28330Z	16	E2	352	7.00	177.8	0.69	17.5	0.06	1.5
28622Z	17	E2	374	7.40	188.0	0.73	18.5	0.06	1.5
28623Z	18	E2	396	7.40	188.0	0.73	18.5	0.06	1.5
28624Z	19	E2	418	7.40	188.0	0.73	18.5	0.06	1.5
28625Z	20	E2	440	7.70	195.6	0.77	19.6	0.06	1.5
28324Z	25	E2	550	9.20	233.7	0.91	23.1	0.08	2.0
28626Z	30	E2	660	9.50	241.3	0.95	24.1	0.08	2.0
28627Z	37	E2	814	10.20	259.1	1.02	25.9	0.08	2.0
28628Z	50	E2	1100	11.90	302.3	1.19	30.2	0.08	2.0

Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

16 AWG • Unshielded • Double Thermoset Jackets • Bronze Braid Armor • Type TC *(continued next page)*

Flexible Stranded (26 x 30) TC Conductors • XLPE Insulation • Double LSZH Jackets											
Z27917Z	2	E2	44	5.69	144.6	0.47	12.0	0.05	1.1	0.06	1.4
Z27337Z	2	E2	44	5.81	147.7	0.48	12.3	0.05	1.1	0.06	1.4
Z28331Z	3	E2	66	5.93	150.7	0.49	12.6	0.05	1.1	0.06	1.4
Z28338Z	4	E2	88	6.41	162.9	0.53	13.6	0.05	1.1	0.06	1.4
Z28339Z	5	E2	110	6.98	177.3	0.58	14.8	0.05	1.1	0.06	1.4
Z28615Z	6	E2	132	7.46	189.5	0.62	15.8	0.05	1.1	0.06	1.4
Z28323Z	7	E2	154	7.46	189.5	0.62	15.8	0.05	1.1	0.06	1.4
Z28616Z	8	E2	176	7.82	198.6	0.65	16.6	0.05	1.1	0.06	1.4
Z28340Z	9	E2	198	8.66	220.0	0.72	18.3	0.05	1.1	0.06	1.4
Z28617Z	10	E2	220	9.26	235.2	0.77	19.6	0.05	1.1	0.06	1.4

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Offshore and Marine Cable Solutions



MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 16 AWG, Unshielded, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

16 AWG • Unshielded • Double Thermoset Jackets • Bronze Braid Armor • Type TC (continued from previous page)

Flexible Stranded (26 x 30) TC Conductors • XLPE Insulation • Double LSZH Jackets											
Z28618Z	11	E2	242	9.50	241.3	0.79	20.1	0.05	1.1	0.06	1.4
Z28341Z	12	E2	264	9.50	241.3	0.79	20.1	0.05	1.1	0.06	1.4
Z28619Z	13	E2	286	9.86	250.4	0.82	20.9	0.05	1.1	0.06	1.4
Z28620Z	14	E2	308	9.86	250.4	0.82	20.9	0.05	1.1	0.06	1.4
Z28621Z	15	E2	330	10.22	259.6	0.85	21.6	0.06	1.5	0.06	1.4
Z28330Z	16	E2	352	10.22	259.6	0.85	21.6	0.06	1.5	0.06	1.4
Z28622Z	17	E2	374	10.70	271.8	0.89	22.6	0.06	1.5	0.06	1.4
Z28623Z	18	E2	396	10.70	271.8	0.89	22.6	0.06	1.5	0.06	1.4
Z28624Z	19	E2	418	10.70	271.8	0.89	22.6	0.06	1.5	0.06	1.4
Z28625Z	20	E2	440	11.18	284.0	0.93	23.7	0.06	1.5	0.06	1.4
Z28324Z	25	E2	550	12.86	326.6	1.07	27.2	0.08	2.0	0.06	1.4
Z28626Z	30	E2	660	13.34	338.8	1.11	28.2	0.08	2.0	0.06	1.4
Z28627Z	37	E2	814	14.18	360.2	1.18	30.0	0.08	2.0	0.06	1.4

Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

16 AWG • Unshielded • Continuous Armor • Double Thermoset Jackets • Type MC (continued next page)

Flexible Stranded (26 x 30) TC Conductors • XLPE Insulation • Double LSZH Jackets											
NOTE: Continuous armor cables are not DNV rated											
W27917Z	2	E2	44	7.22	183.5	0.60	15.3	0.05	1.1	0.06	1.4
W27337Z	2	E2	44	7.34	186.5	0.61	15.5	0.05	1.1	0.06	1.4
W28331Z	3	E2	66	7.46	189.6	0.62	15.8	0.05	1.1	0.06	1.4
W28338Z	4	E2	88	7.94	201.8	0.66	16.8	0.05	1.1	0.06	1.4
W28339Z	5	E2	110	8.30	210.9	0.69	17.6	0.05	1.1	0.06	1.4
W28615Z	6	E2	132	8.78	223.1	0.73	18.6	0.05	1.1	0.06	1.4
W28323Z	7	E2	154	8.78	223.1	0.73	18.6	0.05	1.1	0.06	1.4
W28616Z	8	E2	176	9.14	232.3	0.76	19.4	0.05	1.1	0.06	1.4
W28340Z	9	E2	198	9.98	253.6	0.83	21.1	0.05	1.1	0.06	1.4
W28617Z	10	E2	220	10.58	268.8	0.88	22.4	0.05	1.1	0.06	1.4
W28618Z	11	E2	242	10.82	274.9	0.90	22.9	0.05	1.1	0.06	1.4
W28341Z	12	E2	264	10.82	274.9	0.90	22.9	0.05	1.1	0.06	1.4
W28619Z	13	E2	286	11.18	284.1	0.93	23.7	0.05	1.1	0.06	1.4
W28620Z	14	E2	308	11.18	284.1	0.93	23.7	0.05	1.1	0.06	1.4
W28621Z	15	E2	330	11.54	293.2	0.96	24.4	0.06	1.5	0.06	1.4
W28330Z	16	E2	352	11.54	293.2	0.96	24.4	0.06	1.5	0.06	1.4
W28622Z	17	E2	374	12.02	305.4	1.00	25.5	0.06	1.5	0.06	1.4
W28623Z	18	E2	396	12.02	305.4	1.00	25.5	0.06	1.5	0.06	1.4
W28624Z	19	E2	418	12.02	305.4	1.00	25.5	0.06	1.5	0.06	1.4
W28625Z	20	E2	440	12.50	317.6	1.04	26.5	0.06	1.5	0.06	1.4

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Offshore and Marine Cable Solutions

MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 16 AWG, Unshielded and Shielded, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

16 AWG • Unshielded • Continuous Armor • Double Thermoset Jackets • Type MC (continued from previous page)

Flexible Stranded (26 x 30) TC Conductors • XLPE Insulation • Double LSZH Jackets							NOTE: Continuous armor cables are not DNV rated				
W28324Z	25	E2	550	14.18	360.3	1.18	30.0	0.08	2.0	0.06	1.4
W28626Z	30	E2	660	14.66	372.5	1.22	31.0	0.08	2.0	0.06	1.4
W28627Z	37	E2	814	15.50	393.8	1.29	32.8	0.08	2.0	0.06	1.4

Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm

16 AWG • Shielded 100%, Beldfoil • Thermoset Jacket • Type TC

Flexible Stranded (26 x 30) TC Conductors • XLPE Insulation • LSZH Jacket											
27337ZS	2	E2	94	3.43	87.1	0.34	8.7	0.05	1.1		
28331ZS	3	E2	130	3.53	89.7	0.35	9.0	0.05	1.1		

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Offshore and Marine Cable Solutions



MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 14 AWG, Unshielded, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm

14 AWG • Unshielded • Thermoset Jacket • Type TC

Flexible Stranded (41 x 30) TC Conductors • XLPE Insulation • LSZH Jacket									
27080Z	2	E2	108	3.70	94.0	.24 x .37	6.1 x 9.4	0.05	1.1
27636Z	2	E2	108	3.70	94.0	0.36	9.1	0.05	1.1
28081Z	3	E2	162	3.80	96.5	0.38	9.7	0.05	1.1
28082Z	4	E2	216	4.20	106.7	0.42	10.7	0.05	1.1
28083Z	5	E2	270	4.60	116.8	0.45	11.4	0.05	1.1
28084Z	6	E2	324	5.00	127.0	0.50	12.7	0.05	1.1
28085Z	7	E2	378	5.00	127.0	0.50	12.7	0.05	1.1
28086Z	8	E2	432	5.70	144.8	0.57	14.5	0.05	1.1
28087Z	9	E2	486	6.20	157.5	0.62	15.7	0.05	1.1
28088Z	10	E2	540	6.70	170.2	0.66	16.8	0.06	1.5
28089Z	11	E2	594	6.90	175.3	0.68	17.3	0.06	1.5
28090Z	12	E2	648	6.90	175.3	0.68	17.3	0.06	1.5
28091Z	13	E2	702	7.20	182.9	0.72	18.3	0.06	1.5
28092Z	14	E2	756	7.20	182.9	0.72	18.3	0.06	1.5
28093Z	15	E2	810	7.60	193.0	0.76	19.3	0.06	1.5
28094Z	16	E2	864	7.60	193.0	0.76	19.3	0.06	1.5
28095Z	17	E2	918	8.00	203.2	0.80	20.3	0.06	1.5
28096Z	18	E2	972	8.00	203.2	0.80	20.3	0.06	1.5
28097Z	19	E2	1026	8.00	203.2	0.80	20.3	0.06	1.5
28098Z	20	E2	1080	8.90	226.1	0.88	22.4	0.06	1.5
28099Z	21	E2	1134	8.90	226.1	0.88	22.4	0.06	1.5
28100Z	22	E2	1188	9.30	236.2	0.92	23.4	0.06	1.5
28101Z	23	E2	1242	9.30	236.2	0.92	23.4	0.06	1.5
28102Z	24	E2	1296	9.80	248.9	0.97	24.6	0.06	1.5
28103Z	25	E2	1350	10.00	254.0	0.99	25.1	0.06	1.5
28104Z	26	E2	1404	10.00	254.0	0.99	25.1	0.06	1.5
28105Z	27	E2	1458	10.00	254.0	0.99	25.1	0.08	2.0
28106Z	28	E2	1512	10.30	261.6	1.03	26.2	0.08	2.0
28107Z	29	E2	1566	10.30	261.6	1.03	26.2	0.08	2.0
28108Z	30	E2	1620	10.30	261.6	1.03	26.2	0.08	2.0
28629Z	37	E2	1998	11.10	281.9	1.11	28.2	0.08	2.0
28912Z	50	E2	2700	13.00	330.2	1.30	33.0	0.08	2.0

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 14 AWG, Unshielded, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

14 AWG • Unshielded • Double Thermoset Jackets • Bronze Braid Armor • Type TC

Flexible Stranded (41 x 30) TC Conductors • XLPE Insulation • Double LSZH Jackets											
Z27080Z	2	E2	108	6.17	156.8	0.51	13.1	0.05	1.1	0.06	1.4
Z27636Z	2	E2	108	6.05	153.8	0.50	12.8	0.05	1.1	0.06	1.4
Z28081Z	3	E2	162	6.29	159.9	0.52	13.3	0.05	1.1	0.06	1.4
Z28082Z	4	E2	216	6.98	177.3	0.58	14.8	0.05	1.1	0.06	1.4
Z28083Z	5	E2	270	7.34	186.4	0.61	15.5	0.05	1.1	0.06	1.4
Z28084Z	6	E2	324	7.94	201.7	0.66	16.8	0.05	1.1	0.06	1.4
Z28085Z	7	E2	378	7.94	201.7	0.66	16.8	0.05	1.1	0.06	1.4
Z28086Z	8	E2	432	8.78	223.0	0.73	18.6	0.05	1.1	0.06	1.4
Z28087Z	9	E2	486	9.38	238.3	0.78	19.9	0.05	1.1	0.06	1.4
Z28088Z	10	E2	540	9.86	250.4	0.82	20.9	0.06	1.5	0.06	1.4
Z28089Z	11	E2	594	10.10	256.5	0.84	21.4	0.06	1.5	0.06	1.4
Z28090Z	12	E2	648	10.10	256.5	0.84	21.4	0.06	1.5	0.06	1.4
Z28091Z	13	E2	702	10.58	268.7	0.88	22.4	0.06	1.5	0.06	1.4
Z28092Z	14	E2	756	10.58	268.7	0.88	22.4	0.06	1.5	0.06	1.4
Z28093Z	15	E2	810	11.06	280.9	0.92	23.4	0.06	1.5	0.06	1.4
Z28094Z	16	E2	864	11.06	280.9	0.92	23.4	0.06	1.5	0.06	1.4
Z28095Z	17	E2	918	11.54	293.1	0.96	24.4	0.06	1.5	0.06	1.4
Z28096Z	18	E2	972	11.54	293.1	0.96	24.4	0.06	1.5	0.06	1.4
Z28097Z	19	E2	1026	11.54	293.1	0.96	24.4	0.06	1.5	0.06	1.4
Z28098Z	20	E2	1080	12.50	317.5	1.04	26.5	0.06	1.5	0.06	1.4
Z28099Z	21	E2	1134	12.50	317.5	1.04	26.5	0.06	1.5	0.06	1.4
Z28100Z	22	E2	1188	12.98	329.7	1.08	27.5	0.06	1.5	0.06	1.4
Z28101Z	23	E2	1242	12.98	329.7	1.08	27.5	0.06	1.5	0.06	1.4
Z28102Z	24	E2	1296	13.58	344.9	1.13	28.7	0.06	1.5	0.06	1.4
Z28103Z	25	E2	1350	13.82	351.0	1.15	29.3	0.06	1.5	0.06	1.4
Z28104Z	26	E2	1404	13.82	351.0	1.15	29.3	0.06	1.5	0.06	1.4
Z28105Z	27	E2	1458	13.82	351.0	1.15	29.3	0.08	2.0	0.06	1.4
Z28106Z	28	E2	1512	14.30	363.2	1.19	30.3	0.08	2.0	0.06	1.4
Z28107Z	29	E2	1566	14.30	363.2	1.19	30.3	0.08	2.0	0.06	1.4
Z28108Z	30	E2	1620	14.30	363.2	1.19	30.3	0.08	2.0	0.06	1.4

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 14 AWG, Unshielded and Shielded, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

14 AWG • Unshielded • Continuous Armor • Double Thermoset Jackets • Type MC

Flexible Stranded (41 x 30) TC Conductors • XLPE Insulation • Double LSZH Jackets											
											NOTE: Continuous armor cables are not DNV rated
W27080Z	2	E2	108	7.70	195.7	0.64	16.3	0.05	1.1	0.06	1.4
W27636Z	2	E2	108	7.58	192.6	0.63	16.1	0.05	1.1	0.06	1.4
W28081Z	3	E2	162	7.82	198.7	0.65	16.6	0.05	1.1	0.06	1.4
W28082Z	4	E2	216	8.30	210.9	0.69	17.6	0.05	1.1	0.06	1.4
W28083Z	5	E2	270	8.66	220.1	0.72	18.3	0.05	1.1	0.06	1.4
W28084Z	6	E2	324	9.26	235.3	0.77	19.6	0.05	1.1	0.06	1.4
W28085Z	7	E2	378	9.26	235.3	0.77	19.6	0.05	1.1	0.06	1.4
W28086Z	8	E2	432	10.10	256.6	0.84	21.4	0.05	1.1	0.06	1.4
W28087Z	9	E2	486	10.70	271.9	0.89	22.7	0.05	1.1	0.06	1.4
W28088Z	10	E2	540	11.18	284.1	0.93	23.7	0.06	1.5	0.06	1.4
W28089Z	11	E2	594	11.42	290.2	0.95	24.2	0.06	1.5	0.06	1.4
W28090Z	12	E2	648	11.42	290.2	0.95	24.2	0.06	1.5	0.06	1.4
W28091Z	13	E2	702	11.90	302.4	0.99	25.2	0.06	1.5	0.06	1.4
W28092Z	14	E2	756	11.90	302.4	0.99	25.2	0.06	1.5	0.06	1.4
W28093Z	15	E2	810	12.38	314.6	1.03	26.2	0.06	1.5	0.06	1.4
W28094Z	16	E2	864	12.38	314.6	1.03	26.2	0.06	1.5	0.06	1.4
W28095Z	17	E2	918	12.86	326.7	1.07	27.2	0.06	1.5	0.06	1.4
W28096Z	18	E2	972	12.86	326.7	1.07	27.2	0.06	1.5	0.06	1.4
W28097Z	19	E2	1026	12.86	326.7	1.07	27.2	0.06	1.5	0.06	1.4
W28098Z	20	E2	1080	13.82	351.1	1.15	29.3	0.06	1.5	0.06	1.4
W28099Z	21	E2	1134	13.82	351.1	1.15	29.3	0.06	1.5	0.06	1.4
W28100Z	22	E2	1188	14.30	363.3	1.19	30.3	0.06	1.5	0.06	1.4
W28101Z	23	E2	1242	14.30	363.3	1.19	30.3	0.06	1.5	0.06	1.4
W28102Z	24	E2	1296	14.90	378.6	1.24	31.5	0.06	1.5	0.06	1.4
W28103Z	25	E2	1350	15.14	384.7	1.26	32.1	0.06	1.5	0.06	1.4
W28104Z	26	E2	1404	15.14	384.7	1.26	32.1	0.06	1.5	0.06	1.4
W28105Z	27	E2	1458	15.14	384.7	1.26	32.1	0.08	2.0	0.06	1.4
W28106Z	28	E2	1512	15.62	396.8	1.30	33.1	0.08	2.0	0.06	1.4
W28107Z	29	E2	1566	15.62	396.8	1.30	33.1	0.08	2.0	0.06	1.4
W28108Z	30	E2	1620	15.62	396.8	1.30	33.1	0.08	2.0	0.06	1.4

Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm

14 AWG • Shielded 100%, Beldfoil • Thermoset Jacket • Type TC

Flexible Stranded (41 x 30) TC Conductors • XLPE Insulation • LSZH Jacket										
28081ZS	3	E2	99	3.83	97.3	0.38	9.7	0.05	1.1	
28082ZS	4	E2	273	4.23	107.4	0.42	10.7	0.05	1.1	

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MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 12 AWG, Unshielded, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm

12 AWG • Unshielded • Thermoset Jacket • Type TC

Flexible Stranded (65 x 30) TC Conductors • XLPE Insulation • LSZH Jacket									
27109Z	2	E2	172	4.10	104.1	0.40	10.2	0.05	1.1
27641Z	2	E2	172	4.10	104.1	0.40	10.2	0.05	1.1
28110Z	3	E2	258	4.20	106.7	0.42	10.7	0.05	1.1
28111Z	4	E2	344	4.60	116.8	0.46	11.7	0.05	1.1
28112Z	5	E2	430	5.00	127.0	0.50	12.7	0.05	1.1
28113Z	6	E2	516	6.00	152.4	0.59	15.0	0.05	1.1
28114Z	7	E2	602	6.00	152.4	0.59	15.0	0.05	1.1
28115Z	8	E2	688	6.40	162.6	0.64	16.3	0.06	1.5
28116Z	9	E2	774	6.90	175.3	0.69	17.5	0.06	1.5
28117Z	10	E2	860	7.50	190.5	0.75	19.1	0.06	1.5
28118Z	11	E2	946	7.70	195.6	0.77	19.6	0.06	1.5
28119Z	12	E2	1032	7.70	195.6	0.77	19.6	0.06	1.5
28120Z	13	E2	1118	8.10	205.7	0.81	20.6	0.06	1.5
28121Z	14	E2	1204	8.20	208.3	0.81	20.6	0.06	1.5
28122Z	15	E2	1290	9.00	228.6	0.90	22.9	0.06	1.5
28123Z	16	E2	1376	9.00	228.6	0.90	22.9	0.06	1.5
28124Z	17	E2	1462	9.50	241.3	0.95	24.1	0.06	1.5
28125Z	18	E2	1548	9.50	241.3	0.95	24.1	0.06	1.5
28126Z	19	E2	1634	9.50	241.3	0.95	24.1	0.06	1.5
28127Z	20	E2	1720	10.00	254.0	0.99	25.1	0.08	2.0
28128Z	21	E2	1806	10.00	254.0	0.99	25.1	0.08	2.0
28129Z	22	E2	1892	10.50	266.7	1.04	26.4	0.08	2.0
28130Z	23	E2	1978	10.50	266.7	1.04	26.4	0.08	2.0
28131Z	24	E2	2064	11.00	279.4	1.10	27.9	0.08	2.0
28132Z	25	E2	2150	11.30	287.0	1.12	28.4	0.08	2.0
28133Z	26	E2	2236	11.30	287.0	1.12	28.4	0.08	2.0
28134Z	27	E2	2322	11.30	287.0	1.12	28.4	0.08	2.0
28135Z	28	E2	2408	11.70	297.2	1.16	29.5	0.08	2.0
28136Z	29	E2	2494	11.70	297.2	1.16	29.5	0.08	2.0
28137Z	30	E2	2580	11.70	297.2	1.16	29.5	0.08	2.0
28630Z	37	E2	3182	12.60	320.0	1.26	32.0	0.08	2.0
28634Z	50	E2	4300	14.80	375.9	1.47	37.3	0.08	2.0

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Offshore and Marine Cable Solutions



MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 12 AWG, Unshielded, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

12 AWG • Unshielded • Double Thermoset Jackets • Bronze Braid Armor • Type TC

Flexible Stranded (65 x 30) TC Conductors • XLPE Insulation • Double LSZH Jackets											
Z27109Z	2	E2	172	6.64	171.2	0.55	14.3	0.05	1.1	0.06	1.4
Z27641Z	2	E2	172	6.64	171.2	0.55	14.3	0.05	1.1	0.06	1.4
Z28110Z	3	E2	258	6.87	177.3	0.57	14.8	0.05	1.1	0.06	1.4
Z28111Z	4	E2	344	7.34	189.5	0.61	15.8	0.05	1.1	0.06	1.4
Z28112Z	5	E2	430	7.82	201.7	0.65	16.8	0.05	1.1	0.06	1.4
Z28113Z	6	E2	516	8.88	229.1	0.74	19.1	0.05	1.1	0.06	1.4
Z28114Z	7	E2	602	8.88	229.1	0.74	19.1	0.05	1.1	0.06	1.4
Z28115Z	8	E2	688	9.47	244.4	0.79	20.4	0.06	1.5	0.06	1.4
Z28116Z	9	E2	774	10.06	259.6	0.84	21.6	0.06	1.5	0.06	1.4
Z28117Z	10	E2	860	10.77	277.9	0.90	23.2	0.06	1.5	0.06	1.4
Z28118Z	11	E2	946	11.01	284.0	0.92	23.7	0.06	1.5	0.06	1.4
Z28119Z	12	E2	1032	11.01	284.0	0.92	23.7	0.06	1.5	0.06	1.4
Z28120Z	13	E2	1118	11.48	296.2	0.96	24.7	0.06	1.5	0.06	1.4
Z28121Z	14	E2	1204	11.48	296.2	0.96	24.7	0.06	1.5	0.06	1.4
Z28122Z	15	E2	1290	12.54	323.6	1.05	27.0	0.06	1.5	0.06	1.4
Z28123Z	16	E2	1376	12.54	323.6	1.05	27.0	0.06	1.5	0.06	1.4
Z28124Z	17	E2	1462	13.13	338.8	1.09	28.2	0.06	1.5	0.06	1.4
Z28125Z	18	E2	1548	13.13	338.8	1.09	28.2	0.06	1.5	0.06	1.4
Z28126Z	19	E2	1634	13.13	338.8	1.09	28.2	0.06	1.5	0.06	1.4
Z28127Z	20	E2	1720	13.61	351.0	1.13	29.3	0.08	2.0	0.06	1.4
Z28128Z	21	E2	1806	13.61	351.0	1.13	29.3	0.08	2.0	0.06	1.4
Z28129Z	22	E2	1892	14.20	366.3	1.18	30.5	0.08	2.0	0.06	1.4
Z28130Z	23	E2	1978	14.20	366.3	1.18	30.5	0.08	2.0	0.06	1.4
Z28131Z	24	E2	2064	14.91	384.6	1.24	32.0	0.08	2.0	0.06	1.4

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Offshore and Marine Cable Solutions

MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 12 AWG, Unshielded, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

12 AWG • Unshielded • Continuous Armor • Double Thermoset Jackets • Type MC

Flexible Stranded (65 x 30) TC Conductors • XLPE Insulation • Double LSZH Jackets			NOTE: Continuous armor cables are not DNV rated								
W27109Z	2	E2	172	8.06	204.8	0.67	17.1	0.05	1.1	0.06	1.4
W27641Z	2	E2	172	8.06	204.8	0.67	17.1	0.05	1.1	0.06	1.4
W28110Z	3	E2	258	8.30	210.9	0.69	17.6	0.05	1.1	0.06	1.4
W28111Z	4	E2	344	8.78	223.1	0.73	18.6	0.05	1.1	0.06	1.4
W28112Z	5	E2	430	9.26	235.3	0.77	19.6	0.05	1.1	0.06	1.4
W28113Z	6	E2	516	10.34	262.7	0.86	21.9	0.05	1.1	0.06	1.4
W28114Z	7	E2	602	10.34	262.7	0.86	21.9	0.05	1.1	0.06	1.4
W28115Z	8	E2	688	10.94	278.0	0.91	23.2	0.06	1.5	0.06	1.4
W28116Z	9	E2	774	11.54	293.2	0.96	24.4	0.06	1.5	0.06	1.4
W28117Z	10	E2	860	12.26	311.5	1.02	26.0	0.06	1.5	0.06	1.4
W28118Z	11	E2	946	12.50	317.6	1.04	26.5	0.06	1.5	0.06	1.4
W28119Z	12	E2	1032	12.50	317.6	1.04	26.5	0.06	1.5	0.06	1.4
W28120Z	13	E2	1118	12.98	329.8	1.08	27.5	0.06	1.5	0.06	1.4
W28121Z	14	E2	1204	12.98	329.8	1.08	27.5	0.06	1.5	0.06	1.4
W28122Z	15	E2	1290	14.06	357.2	1.17	29.8	0.06	1.5	0.06	1.4
W28123Z	16	E2	1376	14.06	357.2	1.17	29.8	0.06	1.5	0.06	1.4
W28124Z	17	E2	1462	14.66	372.5	1.22	31.0	0.06	1.5	0.06	1.4
W28125Z	18	E2	1548	14.66	372.5	1.22	31.0	0.06	1.5	0.06	1.4
W28126Z	19	E2	1634	14.66	372.5	1.22	31.0	0.06	1.5	0.06	1.4
W28127Z	20	E2	1720	15.14	384.7	1.26	32.1	0.08	2.0	0.06	1.4
W28128Z	21	E2	1806	15.14	384.7	1.26	32.1	0.08	2.0	0.06	1.4
W28129Z	22	E2	1892	15.74	399.9	1.31	33.3	0.08	2.0	0.06	1.4
W28130Z	23	E2	1978	15.74	399.9	1.31	33.3	0.08	2.0	0.06	1.4

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 10 AWG, Unshielded, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm

10 AWG • Unshielded • Thermoset Jacket • Type TC

Flexible Stranded (105 x 30) TC Conductors • XLPE Insulation • LSZH Jacket									
27138Z	2	E2	296	4.50	114.3	0.44	11.2	0.045	1.14
27643Z	2	E2	296	4.50	114.3	0.44	11.2	0.045	1.14
28139Z	3	E2	444	4.70	119.38	0.47	11.9	0.045	1.14
28140Z	4	E2	592	5.20	132.08	0.51	13.0	0.045	1.14
28141Z	5	E2	740	6.00	152.4	0.60	15.2	0.06	1.52
28142Z	6	E2	888	6.60	167.64	0.65	16.5	0.06	1.52
28143Z	7	E2	1036	6.60	167.64	0.65	16.5	0.06	1.52
28144Z	8	E2	1184	7.10	180.34	0.71	18.0	0.06	1.52
28145Z	9	E2	1332	7.60	193.04	0.76	19.3	0.06	1.52
28146Z	10	E2	1480	8.70	220.98	0.87	22.1	0.06	1.52
28147Z	11	E2	1628	9.00	228.6	0.90	22.9	0.06	1.52
28148Z	12	E2	1776	9.00	228.6	0.90	22.9	0.08	2.03

Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

10 AWG • Unshielded • Double Thermoset Jackets • Bronze Braid Armor • Type TC

Flexible Stranded (105 x 30) TC Conductors • XLPE Insulation • Double LSZH Jackets											
Z27138Z	2	E2	296	7.22	183.4	0.60	15.3	0.045	1.14	0.06	1.4
Z27643Z	2	E2	296	7.22	183.4	0.60	15.3	0.045	1.14	0.06	1.4
Z28139Z	3	E2	444	7.58	192.5	0.63	16.0	0.045	1.14	0.06	1.4
Z28140Z	4	E2	592	8.06	204.7	0.67	17.1	0.045	1.14	0.06	1.4
Z28141Z	5	E2	740	9.14	232.2	0.76	19.3	0.06	1.52	0.06	1.4
Z28142Z	6	E2	888	9.74	247.4	0.81	20.6	0.06	1.52	0.06	1.4
Z28143Z	7	E2	1036	9.74	247.4	0.81	20.6	0.06	1.52	0.06	1.4
Z28144Z	8	E2	1184	10.46	265.7	0.87	22.1	0.06	1.52	0.06	1.4
Z28145Z	9	E2	1332	11.06	280.9	0.92	23.4	0.06	1.52	0.06	1.4
Z28146Z	10	E2	1480	12.38	314.5	1.03	26.2	0.06	1.52	0.06	1.4
Z28147Z	11	E2	1628	12.74	323.6	1.06	27.0	0.06	1.52	0.06	1.4
Z28148Z	12	E2	1776	12.74	323.6	1.06	27.0	0.08	2.03	0.06	1.4

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Offshore and Marine Cable Solutions

MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 10 AWG, Unshielded, Thermoset Jacket



DNV·GL



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

10 AWG • Unshielded • Continuous Armor • Double Thermoset Jackets • Type MC

Flexible Stranded (105 x 30) TC Conductors • XLPE Insulation • Double LSZH Jackets			NOTE: Continuous armor cables are not DNV rated								
W27138Z	2	E2	296	8.54	217.0	0.71	18.1	0.045	1.14	0.06	1.4
W27643Z	2	E2	296	8.54	217.0	0.71	18.1	0.045	1.14	0.06	1.4
W28139Z	3	E2	444	8.90	226.2	0.74	18.8	0.045	1.14	0.06	1.4
W28140Z	4	E2	592	9.38	238.4	0.78	19.9	0.045	1.14	0.06	1.4
W28141Z	5	E2	740	10.46	265.8	0.87	22.1	0.06	1.52	0.06	1.4
W28142Z	6	E2	888	11.06	281.0	0.92	23.4	0.06	1.52	0.06	1.4
W28143Z	7	E2	1036	11.06	281.0	0.92	23.4	0.06	1.52	0.06	1.4
W28144Z	8	E2	1184	11.78	299.3	0.98	24.9	0.06	1.52	0.06	1.4
W28145Z	9	E2	1332	12.38	314.6	1.03	26.2	0.06	1.52	0.06	1.4
W28146Z	10	E2	1480	13.70	348.1	1.14	29.0	0.06	1.52	0.06	1.4
W28147Z	11	E2	1628	14.06	357.2	1.17	29.8	0.06	1.52	0.06	1.4
W28148Z	12	E2	1776	14.06	357.2	1.17	29.8	0.08	2.03	0.06	1.4

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 8 AWG, Unshielded - 10 AWG
Uninsulated Ground Wire, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm

8 AWG • Unshielded - 10 AWG Uninsulated Ground Wire • Thermoset Jacket • Type TC

Flexible Stranded (7 x 19 x 29) TC Conductors • XLPE Insulation • LSZH Jacket										
28149Z	2	E2	384	6.00	152.4	0.60	15.2	0.06	1.52	
28150Z	3	E2	576	6.40	162.6	0.63	16.0	0.06	1.52	
28151Z	4	E2	768	7.00	177.8	0.69	17.5	0.06	1.52	

Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

8 AWG • Unshielded - 10 AWG Uninsulated Ground Wire • Bronze Braid Armor • Double Thermoset Jackets • Type TC

Flexible Stranded (7 x 19 x 29) TC Conductors • XLPE Insulation • Double LSZH Jackets											
Z28149Z	2	E2	296	9.14	232.2	0.76	19.3	0.06	1.52	0.06	1.4
Z28150Z	3	E2	296	9.50	241.3	0.79	20.1	0.06	1.52	0.06	1.4
Z28151Z	4	E2	444	10.22	259.6	0.85	21.6	0.06	1.52	0.06	1.4

Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

8 AWG • Unshielded - 10 AWG Uninsulated Ground Wire • Continuous Armor • Double Thermoset Jackets • Type MC

Flexible Stranded (7 x 19 x 29) TC Conductors • XLPE Insulation • Double LSZH Jackets											
W28149Z	2	E2	296	10.46	265.8	0.87	22.1	0.06	1.52	0.06	1.4
W28150Z	3	E2	296	10.82	274.9	0.90	22.9	0.06	1.52	0.06	1.4
W28151Z	4	E2	444	11.54	293.2	0.96	24.4	0.06	1.52	0.06	1.4

NOTE: Continuous armor cables are not DNV rated

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 6 AWG, Unshielded - 8 AWG
Uninsulated Ground Wire, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm

6 AWG • Unshielded - 8 AWG Uninsulated Ground Wire • Thermoset Jacket • Type TC

Flexible Stranded (7 x 19 x 27) TC Conductors • XLPE Insulation • LSZH Jacket									
28152Z	2	E2	610	6.8	172.7	0.67	17.0	0.06	1.52
28153Z	3	E2	915	7.2	182.9	0.71	18.0	0.06	1.52
28154Z	4	E2	1220	7.9	200.7	0.78	19.8	0.06	1.52

Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

6 AWG • Unshielded - 8 AWG Uninsulated Ground Wire • Bronze Braid Armor • Double Thermoset Jackets • Type TC

Flexible Stranded (7 x 19 x 27) TC Conductors • XLPE Insulation • Double LSZH Jackets											
Z28152Z	2	E2	296	9.98	253.5	0.83	21.1	0.06	1.52	0.06	1.4
Z28153Z	2	E2	296	10.46	265.7	0.87	22.1	0.06	1.52	0.06	1.4
Z28154Z	3	E2	444	11.30	287.0	0.94	23.9	0.06	1.52	0.06	1.4

Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

6 AWG • Unshielded - 8 AWG Uninsulated Ground Wire • Continuous Armor • Double Thermoset Jackets • Type MC

Flexible Stranded (7 x 19 x 27) TC Conductors • XLPE Insulation • Double LSZH Jackets											
W28152Z	2	E2	296	11.30	287.1	0.94	23.9	0.06	1.52	0.06	1.4
W28153Z	2	E2	296	11.78	299.3	0.98	24.9	0.06	1.52	0.06	1.4
W28154Z	3	E2	444	12.62	320.6	1.05	26.7	0.06	1.52	0.06	1.4

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Offshore and Marine Cable Solutions



MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 4 AWG, Unshielded - 8 AWG
Uninsulated Ground Wire, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm

4 AWG • Unshielded - 8 AWG Uninsulated Ground Wire • Thermoset Jacket • Type TC

Flexible Stranded (7 x 19 x 25) TC Conductors • XLPE Insulation • LSZH Jacket										
28155Z	2	E2	970	7.7	195.6	0.77	19.6	0.06	1.52	
28156Z	3	E2	1455	8.2	208.3	0.81	20.6	0.08	2.03	
28157Z	4	E2	1940	9.5	241.3	0.94	23.9	0.08	2.03	

Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

4 AWG • Unshielded - 8 AWG Uninsulated Ground Wire • Bronze Braid Armor • Double Thermoset Jackets • Type TC

Flexible Stranded (7 x 19 x 25) TC Conductors • XLPE Insulation • Double LSZH Jackets											
Z28155Z	2	E2	970	11.18	284.0	0.93	23.7	0.06	1.52	0.06	1.4
Z28156Z	2	E2	1455	11.66	296.2	0.97	24.7	0.08	2.03	0.06	1.4
Z28157Z	3	E2	1940	13.22	335.8	1.10	28.0	0.08	2.03	0.06	1.4

Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

4 AWG • Unshielded - 8 AWG Uninsulated Ground Wire • Continuous Armor • Double Thermoset Jackets • Type MC

Flexible Stranded (7 x 19 x 25) TC Conductors • XLPE Insulation • Double LSZH Jackets											
W28155Z	2	E2	970	12.50	317.6	1.04	26.5	0.06	1.52	0.06	1.4
W28156Z	2	E2	1455	12.98	329.8	1.08	27.5	0.08	2.03	0.06	1.4
W28157Z	3	E2	1940	14.54	369.4	1.21	30.8	0.08	2.03	0.06	1.4

NOTE: Continuous armor cables are not DNV rated

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 2 AWG, Unshielded - 6 AWG
Uninsulated Ground Wire, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm

2 AWG • Unshielded - 6 AWG Uninsulated Ground Wire • Thermoset Jacket • Type TC

Flexible Stranded (7 x 19 x 23) TC Conductors • XLPE Insulation • LSZH Jacket									
28158Z	2	E2	1544	9.3	236.2	0.93	23.6	0.08	2.03
28159Z	3	E2	2316	9.8	248.9	0.98	24.9	0.08	2.03

Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

2 AWG • Unshielded - 6 AWG Uninsulated Ground Wire • Bronze Braid Armor • Double Thermoset Jackets • Type TC

Flexible Stranded (7 x 19 x 23) TC Conductors • XLPE Insulation • Double LSZH Jackets											
Z28158Z	2	E2	1544	13.10	332.7	1.09	27.7	0.08	2.03	0.06	1.4
Z28159Z	2	E2	2316	13.70	348.0	1.14	29.0	0.08	2.03	0.06	1.4

Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

2 AWG • Unshielded - 6 AWG Uninsulated Ground Wire • Continuous Armor • Double Thermoset Jackets • Type MC

Flexible Stranded (7 x 19 x 23) TC Conductors • XLPE Insulation • Double LSZH Jackets											
W28158Z	2	E2	1544	14.42	366.4	1.20	30.5	0.08	2.03	0.06	1.4
W28159Z	2	E2	2316	15.02	381.6	1.25	31.8	0.08	2.03	0.06	1.4

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MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 1 AWG to 4/0 AWG, Unshielded, Thermoset Jacket



Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm
1 AWG • Unshielded - 6AWG Uninsulated Ground Wire • Thermoset Jacket • Type TC											
Flexible Stranded (7 x 19 x 22) TC Conductors • XLPE Insulation • LSZH Jacket											
28161Z	2	E2	2919	12.00	304.8	1.19	30.2	0.08	2.0	-	-
1/0 AWG • Unshielded - 6AWG Uninsulated Ground Wire • Thermoset Jacket • Type TC											
Flexible Stranded (7 x 19 x 21) TC Conductors • XLPE Insulation • LSZH Jacket											
28167Z	2	E2	1690	11.40	289.6	1.13	28.7	0.08	2.0	-	-
28168Z	3	E2	2535	12.10	307.3	1.21	30.7	0.08	2.1	-	-
28169Z	4	E2	3380	13.20	335.3	1.32	33.5	0.08	2.1	-	-
2/0 AWG • Unshielded - 6AWG Uninsulated Ground Wire • Thermoset Jacket • Type TC											
Flexible Stranded (7 x 19 x 20) TC Conductors • XLPE Insulation • LSZH Jacket											
28170Z	2	E2	2130	12.20	309.9	1.21	30.7	0.08	2.1	-	-
28171Z	3	E2	3195	13.00	330.2	1.30	33.0	0.08	2.1	-	-
28172Z	4	E2	4260	14.30	363.2	1.43	36.3	0.08	2.1	-	-

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DNV·GL

MarineTuff UL Control Cable

600 V Type TC (or MC) Cables, 1 AWG to 4/0 AWG, Unshielded, Thermoset Jacket

Part No.	Conductors	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

3/0 AWG • Unshielded - 6AWG Uninsulated Ground Wire • Thermoset Jacket • Type TC

Flexible Stranded (7 x 19 x 19) TC Conductors • XLPE Insulation • LSZH Jacket											
28173Z	2	E2	2686	14.20	360.7	1.41	35.8	0.08	2.1	-	-
28174Z	3	E2	4029	15.20	386.1	1.51	38.4	0.08	2.1	-	-
28175Z	4	E2	5372	15.50	393.7	1.55	39.4	0.08	2.1	-	-

4/0 AWG • Unshielded - 6AWG Uninsulated Ground Wire • Thermoset Jacket • Type TC

Flexible Stranded (7 x 19 x 18) TC Conductors • XLPE Insulation • LSZH Jacket											
28176Z	2	E2	3386	13.20	335.3	1.31	33.3	0.08	2.1	-	-
28177Z	3	E2	5078	15.20	386.1	1.51	38.4	0.08	2.1	-	-
28178Z	4	E2	6771	17.50	444.5	1.75	44.5	0.12	3.0	-	-

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Offshore and Marine Cable Solutions



MarineTuff UL Instrumentation Cable

600 V Type TC (or MC) Cables



Featured Options:

- Bronze Braid Armoring
- Continuous Aluminum Armor (ABS) - Type MC
- LSZH Thermoset Jacket (Standard)
- Type P Rated Insulations
- Sunlight and Oil Resistant
- Unshielded, overall shield, or individually shielded

Construction:

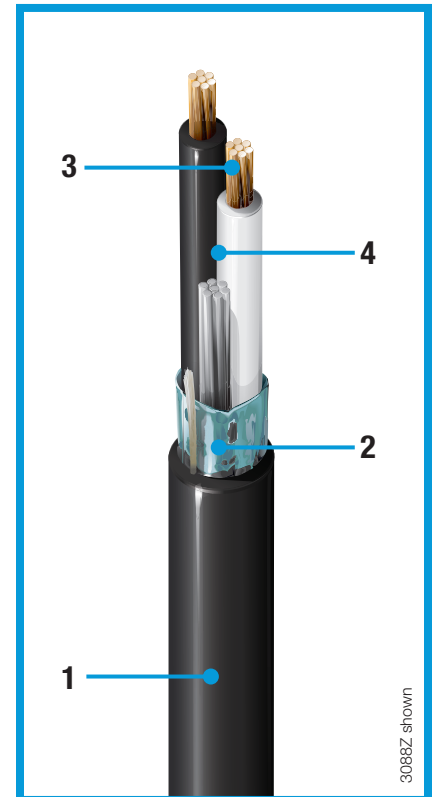
1. **LSZH Thermoset Jacket**
2. **Beldfoil Shield**
3. **Flexible Stranded Tinned Copper Conductors**
4. **XLP Insulation**

NOTE: Also available on all options, bronze braid armor with LSZH second jacket, continuous armor with LSZH second jacket, overall foil shield 100% coverage (not pictured).

Certifications/Compliance

- ABS (American Bureau of Shipping)
- DNV (Det Norske Veritas)*
- IEEE 45 Electrical Installation on Shipboard
- IEEE 1580 Type P insulations (recommended practice for marine cables for use on shipboard in fixed or floating facilities)
- UL 1309 marine shipboard cables
- IEC 60811-2-1 compliant for hydrocarbon resistance
- IEC 60754-1 compliant jacket for halogen content
- IEC 60754-2 compliant for acid gas emissions
- IEC 60092-350 electrical installation on ships
- UL 1277 TC-ER crush and impact resistance (UL TC for 2-conductor cables)
- IEEE 1202 and FT4 flame-resistance
- IEC 60332-3-22

*excludes continuous armored constructions



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Offshore and Marine Cable Solutions

MarineTuff UL Instrumentation Cable

600 V Type TC (or MC) Cables, 18 AWG, Shielded, Thermoset Jacket



Part No.	Pairs	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm

18 AWG • Individually Shielded Pairs + Overall Shield 100% Beldfoil • Thermoset Jacket • Type TC

Flexible Stranded TC Conductors • XLPE Insulation • LSZH Jacket									
Part No.	Pairs	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm
1120Z	1	E2	59	3.20	81.3	0.32	8.1	0.05	1.2
3088Z	1	E1	67	3.20	81.3	0.32	8.1	0.05	1.2
1048Z	2	E1	140	5.10	129.5	0.51	13.0	0.05	1.2
1049Z	4	E1	258	6.30	160.0	0.63	16.0	0.05	1.3
1050Z	8	E1	350	8.00	203.2	0.79	20.1	0.06	1.6
1051Z	12	E1	728	10.10	256.5	1.01	25.7	0.06	1.6
1052Z	16	E1	963	11.30	287.0	1.12	28.4	0.08	2.1
1053Z	24	E1	1434	13.90	353.1	1.38	35.1	0.08	2.1
1054Z	36	E1	2139	15.90	403.9	1.58	40.1	0.08	2.1
1038Z	50	E1	2962	19.40	492.8	1.94	49.3	0.08	2.1

Part No.	Pairs	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

18 AWG • Individually Shielded Pairs + Overall Shield 100% Beldfoil • Bronze Braid Armor • Double Thermoset Jackets • Type TC

Flexible Stranded TC Conductors • XLPE Insulation • Double LSZH Jackets											
Part No.	Pairs	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm
Z1120Z	1	E2	59	5.57	141.6	0.46	11.8	0.05	1.2	0.06	1.4
Z3088Z	1	E1	67	5.57	141.6	0.46	11.8	0.05	1.2	0.06	1.4
Z1048Z	2	E1	140	7.85	199.5	0.65	16.6	0.05	1.2	0.06	1.4
Z1049Z	4	E1	258	9.29	236.1	0.77	19.7	0.05	1.3	0.06	1.4
Z1050Z	8	E1	350	11.21	284.8	0.93	23.7	0.06	1.6	0.06	1.4
Z1051Z	12	E1	728	13.85	351.9	1.15	29.3	0.06	1.6	0.06	1.4

Part No.	Pairs	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

18 AWG • Individually Shielded Pairs + Overall Shield 100% Beldfoil • Continuous Armor • Double Thermoset Jackets • Type MC

Flexible Stranded TC Conductors • XLPE Insulation • Double LSZH Jackets											
Part No.	Pairs	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm
W1120Z	1	E2	59	7.10	180.4	0.59	15.0	0.05	1.2	0.06	1.4
W3088Z	1	E1	67	7.10	180.4	0.59	15.0	0.05	1.2	0.06	1.4
W1048Z	2	E1	140	9.38	238.4	0.78	19.9	0.05	1.2	0.06	1.4
W1049Z	4	E1	258	10.82	274.9	0.90	22.9	0.05	1.3	0.06	1.4
W1050Z	8	E1	350	12.74	323.7	1.06	27.0	0.06	1.6	0.06	1.4
W1051Z	12	E1	728	15.38	390.8	1.28	32.6	0.06	1.6	0.06	1.4

NOTE: Continuous armor cables are not DNV rated

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff UL Instrumentation Cable

600 V Type TC (or MC) Cables, 18 AWG, Shielded, Thermoset Jacket



Part No.	Triads	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm

18 AWG • Individually Shielded Triads + Overall Shield 100% Beldfoil • Thermoset Jacket • Type TC

Flexible Stranded TC Conductors • XLPE Insulation • LSZH Jacket									
Part No.	Triads	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm
1121Z	1	E2	81	3.30	83.8	0.32	8.1	0.05	1.2
3089Z	1	E1	90	3.30	83.8	0.32	8.1	0.05	1.2
3064Z	2	E1	185	6.00	152.4	0.59	15.0	0.05	1.2
1093Z	4	E1	347	6.90	175.3	0.68	17.3	0.06	1.6
1094Z	8	E1	672	9.40	238.8	0.94	23.9	0.06	1.6
1095Z	12	E1	997	11.30	287.0	1.13	28.7	0.08	2.1
1096Z	24	E1	1971	15.60	396.2	1.56	39.6	0.08	2.1

Part No.	Triads	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

18 AWG • Individually Shielded Triads + Overall Shield 100% Beldfoil • Bronze Braid Armor • Double Thermoset Jackets • Type TC

Flexible Stranded TC Conductors • XLPE Insulation • Double LSZH Jackets											
Part No.	Triads	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm
Z1121Z	1	E2	81	5.57	141.6	0.46	11.8	0.05	1.2	0.055	1.4
Z3089Z	1	E1	90	5.57	141.6	0.46	11.8	0.05	1.2	0.055	1.4
Z3064Z	2	E1	185	8.81	223.9	0.73	18.7	0.05	1.2	0.055	1.4
Z1093Z	4	E1	347	9.89	251.3	0.82	20.9	0.06	1.6	0.055	1.4
Z1094Z	8	E1	672	13.01	330.5	1.08	27.5	0.06	1.6	0.055	1.4

Part No.	Triads	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

18 AWG • Individually Shielded Triads + Overall Shield 100% Beldfoil • Continuous Armor • Double Thermoset Jackets • Type MC

Flexible Stranded TC Conductors • XLPE Insulation • Double LSZH Jackets											
Part No.	Triads	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm
W1121Z	1	E2	81	7.10	180.4	0.59	15.0	0.05	1.2	0.06	1.4
W3089Z	1	E1	90	7.10	180.4	0.59	15.0	0.05	1.2	0.06	1.4
W3064Z	2	E1	185	10.34	262.7	0.86	21.9	0.05	1.2	0.06	1.4
W1093Z	4	E1	347	11.42	290.2	0.95	24.2	0.06	1.6	0.06	1.4
W1094Z	8	E1	672	14.54	369.4	1.21	30.8	0.06	1.6	0.06	1.4

NOTE: Continuous armor cables are not DNV rated

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff UL Instrumentation Cable 600 V Type TC (or MC) Cables, 16 AWG, Shielded, Thermoset Jacket



Part No.	Pairs	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm

16 AWG • Individually Shielded Pairs + Overall Shield 100% Beldfoil • Thermoset Jacket • Type TC

Flexible Stranded TC Conductors • XLPE Insulation • LSZH Jacket									
1118Z	1	E2	105	3.50	88.9	0.34	8.64	0.05	1.2
3090Z	1	E1	105	3.50	88.9	0.34	8.64	0.05	1.2
1055Z	2	E1	223	5.90	149.9	0.58	14.73	0.05	1.2
1037Z	3	E1	290	6.20	157.5	0.62	15.75	0.05	1.2
1039Z	4	E1	411	6.80	172.7	0.68	17.27	0.06	1.6
1040Z	6	E1	428	8.00	203.2	0.80	20.32	0.06	1.6
1041Z	8	E1	786	9.00	228.6	0.90	22.86	0.06	1.6
1042Z	12	E1	1161	11.00	279.4	1.10	27.94	0.09	2.2
1043Z	16	E1	1537	12.30	312.4	1.22	30.99	0.09	2.2
1044Z	20	E1	1912	13.60	345.4	1.36	34.54	0.09	2.2
1045Z	24	E1	2287	15.20	386.1	1.51	38.35	0.09	2.2
1046Z	36	E1	3413	18.10	459.7	1.80	45.72	0.09	2.2
1047Z	50	E1	4726	21.20	538.5	2.12	53.85	0.12	3.0

Part No.	Pairs	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

16 AWG • Individually Shielded Pairs + Overall Shield 100% Beldfoil • Bronze Braid Armor • Double Thermoset Jackets • Type TC

Flexible Stranded TC Conductors • XLPE Insulation • Double LSZH Jackets											
Z1118Z	1	E2	105	5.81	147.7	0.48	12.3	0.05	1.2	0.06	1.4
Z3090Z	1	E1	105	5.81	147.7	0.48	12.3	0.05	1.2	0.06	1.4
Z1055Z	2	E1	223	8.69	220.8	0.72	18.4	0.05	1.2	0.06	1.4
Z1037Z	3	E1	290	9.17	233.0	0.76	19.4	0.05	1.2	0.06	1.4
Z1039Z	4	E1	411	9.89	251.3	0.82	20.9	0.06	1.6	0.06	1.4
Z1040Z	6	E1	428	11.33	287.9	0.94	24.0	0.06	1.6	0.06	1.4
Z1041Z	8	E1	786	12.53	318.3	1.04	26.5	0.06	1.6	0.06	1.4
Z1042Z	12	E1	1161	14.93	379.3	1.24	31.6	0.09	2.2	0.06	1.4

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff UL Instrumentation Cable

600 V Type TC (or MC) Cables, 16 AWG, Shielded, Thermoset Jacket



Part No.	Pairs	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

16 AWG • Individually Shielded Pairs + Overall Shield 100% Beldfoil • Continuous Armor • Double Thermoset Jackets • Type MC

Flexible Stranded TC Conductors • XLPE Insulation • Double LSZH Jackets			NOTE: Continuous armor cables are not DNV rated								
W1118Z	1	E2	105	7.34	186.5	0.61	15.5	0.05	1.2	0.06	1.4
W3090Z	1	E1	105	7.34	186.5	0.61	15.5	0.05	1.2	0.06	1.4
W1055Z	2	E1	223	10.22	259.7	0.85	21.6	0.05	1.2	0.06	1.4
W1037Z	3	E1	290	10.70	271.9	0.89	22.7	0.05	1.2	0.06	1.4
W1039Z	4	E1	411	11.42	290.2	0.95	24.2	0.06	1.6	0.06	1.4
W1040Z	6	E1	428	12.86	326.7	1.07	27.2	0.06	1.6	0.06	1.4
W1041Z	8	E1	786	14.06	357.2	1.17	29.8	0.06	1.6	0.06	1.4

Part No.	Triads	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm

16 AWG • Individually Shielded Triads + Overall Shield 100% Beldfoil • Thermoset Jacket • Type TC

Flexible Stranded TC Conductors • XLPE Insulation • LSZH Jacket											
1119Z	1	E2	129	3.60	91.4	0.35	8.9	0.05	1.2		
3091Z	1	E1	129	3.60	91.4	0.35	8.9	0.05	1.2		
1097Z	4	E1	554	7.40	188.0	0.74	18.8	0.06	1.6		
1098Z	8	E1	1072	10.20	259.1	1.02	25.9	0.09	2.2		
1099Z	12	E1	1590	12.40	315.0	1.24	31.5	0.09	2.2		
3118Z	16	E1	1771	15.10	383.5	1.51	38.4	0.09	2.2		
1100Z	24	E1	3144	17.90	454.7	1.78	45.2	0.09	2.2		
3130Z	36	E1	3600	22.60	574.0	2.26	57.4	0.11	2.8		

Part No.	Triads	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

16 AWG • Individually Shielded Triads + Overall Shield 100% Beldfoil • Bronze Braid Armor • Double Thermoset Jackets • Type TC

Flexible Stranded TC Conductors • XLPE Insulation • Double LSZH Jackets											
Z1119Z	1	E2	129	9.77	248.0	0.38	9.8	0.05	1.2	0.06	1.4
Z3091Z	1	E1	129	9.77	248.0	0.38	9.8	0.05	1.2	0.06	1.4
Z1097Z	4	E1	554	20.11	510.8	0.79	20.1	0.06	1.6	0.06	1.4
Z1098Z	8	E1	1072	27.22	691.4	1.07	27.2	0.09	2.2	0.06	1.4

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff UL Instrumentation Cable

600 V Type TC (or MC) Cables, 16 AWG, Shielded,
Thermoset Jacket



DNV·GL



Part No.	Triads	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

16 AWG • Individually Shielded Triads + Overall Shield 100% Beldfoil • Continuous Armor • Double Thermoset Jackets • Type MC

Flexible Stranded TC Conductors • XLPE Insulation • Double LSZH Jackets			NOTE: Continuous armor cables are not DNV rated								
W1119Z	1	E2	129	13.00	330.3	0.51	13.0	0.05	1.2	0.06	1.4
W3091Z	1	E1	129	13.00	330.3	0.51	13.0	0.05	1.2	0.06	1.4
W1097Z	4	E1	554	22.91	581.9	0.90	22.9	0.06	1.6	0.06	1.4
W1098Z	8	E1	1072	30.02	762.6	1.18	30.0	0.09	2.2	0.06	1.4

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff UL Instrumentation Cable

600 V Type TC (or MC) Cables, 14 AWG, Shielded, Thermoset Jacket



Part No.	Pairs	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

14 AWG • Overall Shield 100% Beldfoil • Thermoset Jacket • Type TC

Flexible Stranded TC Conductors • XLPE Insulation • LSZH Jacket											
3080Z	1	E1	160	3.70	94.0	0.37	9.4	0.05	1.2	-	-

14 AWG • Overall Shield 100% Beldfoil • Bronze Braid Armor • Double Thermoset Jackets • Type TC

Flexible Stranded TC Conductors • XLPE Insulation • Double LSZH Jackets											
Z3080Z	1	E1	160	6.17	0.6	0.51	13.1	0.05	1.2	0.06	1.4

14 AWG • Individually Shielded Pairs + Overall Shield 100% Beldfoil • Continuous Armor • Double Thermoset Jackets • Type MC

Flexible Stranded TC Conductors • XLPE Insulation • Double LSZH Jackets											
W3080Z	1	E1	160	7.70	195.7	0.64	16.3	0.05	1.2	0.06	1.4

NOTE: Continuous armor cables are not DNV rated

Part No.	Triads	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

14 AWG • Overall Shield 100% Beldfoil Triads • Thermoset Jacket • Type TC

Flexible Stranded TC Conductors • XLPE Insulation • LSZH Jacket											
3081Z	1	E1	200	3.80	96.5	0.38	9.7	0.05	1.2	-	-

14 AWG • Overall Shield 100% Beldfoil Triads • Bronze Braid Armor • Double Thermoset Jackets • Type TC

Flexible Stranded TC Conductors • XLPE Insulation • Double LSZH Jackets											
Z3081Z	1	E1	200	6.29	159.9	0.52	13.3	0.05	1.2	0.055	1.4

14 AWG • Individually Shielded Triads + Overall Shield 100% Beldfoil • Continuous Armor • Double Thermoset Jackets • Type MC

Flexible Stranded TC Conductors • XLPE Insulation • Double LSZH Jackets											
W3081Z	1	E1	200	7.82	198.7	0.65	16.6	0.05	1.2	0.055	1.4

NOTE: Continuous armor cables are not DNV rated

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff UL Instrumentation Cable

600 V Type TC (or MC) Cables, 12 AWG, Shielded,
Thermoset Jacket



Part No.	Pairs	Color Code	Pull Tension (Max)	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
			Lbs	Inch	mm	Inch	mm	Inch	mm	Inch	mm

12 AWG • Overall Shield 100% Beldfoil • Thermoset Jacket • Type TC

Flexible Stranded TC Conductors • XLPE Insulation • LSZH Jacket											
3103Z	1	E1	253	4.10	104.1	0.41	10.4	0.05	1.2	-	-

12 AWG • Overall Shield 100% Beldfoil • Bronze Braid Armor • Double Thermoset Jackets • Type TC

Flexible Stranded TC Conductors • XLPE Insulation • Double LSZH Jackets											
Z3103Z	1	E1	253	6.86	174.2	0.57	14.5	0.05	1.2	0.06	1.4

14 AWG • Individually Shielded Pairs + Overall Shield 100% Beldfoil • Continuous Armor • Double Thermoset Jackets • Type MC

Flexible Stranded TC Conductors • XLPE Insulation • Double LSZH Jackets											
W3103Z	1	E1	253	8.18	14.6	0.68	17.3	0.05	1.2	0.06	1.4

NOTE: Continuous armor cables are not DNV rated

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff

Variable Frequency Drive (VFD) Cables



It is important to select a motor drive cable that has been properly designed and engineered to address all the key technical issues that such a component faces.

In offshore environments with multiple drives, increased vulnerability to noise exists. This noise emission can sometimes be difficult to track down and eliminate and is likely the single most significant problem associated with VFD systems today. Unless a proper cable shielding design is present to control it, noise emission from a drive system cable can disrupt operations. Moreover, because a longer cable radiates more noise, the length of cable runs must be limited. That, in turn, puts a limitation on your shipboard layout. Choosing well-designed, robust VFD cables ensures motor uptime and reliability of the VFD system and also provides protection for any sensitive instrumentation and adjacent control systems.

- The MarineTuff VFD line features XLP conductors appropriate for 90°C wet/dry demands, Class I and II / Division 2 hazardous location ratings, and HaloarrestXLink™ low smoke zero halogen jackets (LSZH).
- All options are rated 600V UL 1277 TC-ER and 1000V UL Flexible Motor Supply, UL 1309, IEEE 1580 Type P, UL 1685 Vertical Tray Flame tested, RoHS compliant and CE approved.

Key Attributes

- Thermoset LSZH jacket standard
- Bronze braid armoring available as option
- ABS and DNV certified
- 10 year warranty

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff VFD Cable

Classic Foil/Braid Design Thermoset Low Smoke Zero Halogen

DNV·GL

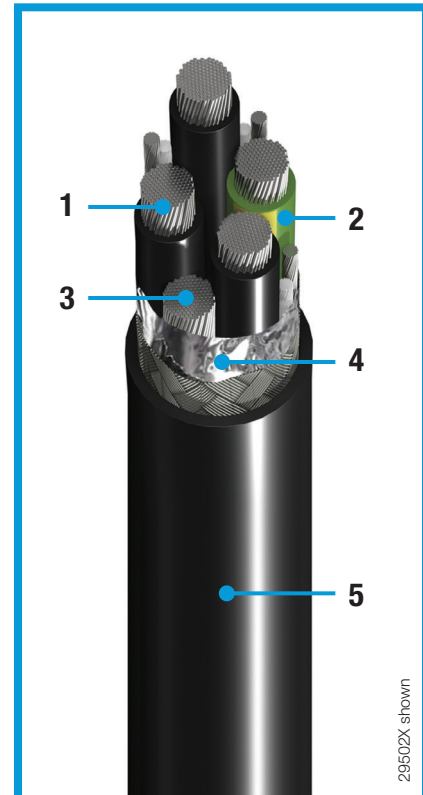


Features:

- Low Smoke Zero Halogen (LSZH) jacketed, Type P insulations
- 300% ground for enhanced system reliability and human safety. Approximately 300% of 1 full-sized conductor in ground potential copper
- Finely stranded tinned copper conductors for ease of cable installation, high frequency performance, vibration, corrosion and heat resistance
- Low capacitance XLP insulation protects motor by reducing magnitude of reflected wave
- Foil/Braid shielding enables noise control, improves common mode current containment and prevents capacitive coupling

Certifications/Compliance:

- ABS (American Bureau of Shipping)
- DNV (Det Norske Veritas)*
- IEEE 45 Electrical Installation on Shipboard
- IEEE 1580 Type P insulations IEEE recommended practice for use on shipboard in fixed or floating facilities
- UL 1309 marine shipboard cables
- IEC 60811-2-1 Hydrocarbon Resistant
- IEC 60754-1,-2 (acid gas emissions)
- 600V UL 1277 Type TC-ER
- 1000V UL Flexible Motor Supply
- IEEE 1202/383, CSA FT4 Flame Tests
- IEC 60332-3-22 Cat A Flame Test
- -40°C Cold Bend
- RHW-2/XHHW-2 Rated Conductors (16 AWG XHHW-2 only)
- 90°C Wet/Dry
- Oil Res II
- Sunlight Resistant



Construction:

1. 16 to 2 AWG - Three Finely-Stranded Tinned Copper (TC) Circuit Conductors with XLP Insulation
2. One Full-Sized Green/Yellow XLP Insulated Ground (Same AWG as Circuit Conductors)
3. One Full-Sized, Tinned, Uninsulated Ground/Drain
4. Overall Duofoil® Shield + 85% TC Braid
5. LSZH Thermoset Jacket

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff VFD Cable

Classic Foil/Braid Design Thermoset Low Smoke Zero Halogen

DNV·GL



Part No.	Conductor		Pulling Tension (Max) Lbs	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
	AWG	Stranding		Inch	mm	Inch	mm	Lbs	mm	Inch	mm
16 to 2 AWG • Thermoset Jacket											
29500X	16	26x30	128	4.3	109.2	0.53	13.5	0.07	1.85	-	-
29501X	14	41x30	212	4.8	121.9	0.60	15.2	0.07	1.85	-	-
29502X	12	65x30	336	5.2	132	0.65	16.5	0.07	1.85	-	-
29503X	10	105x30	592	5.5	139.7	0.69	17.5	0.07	1.85	-	-
29504X	8	7x19x29	768	7.5	190.5	0.93	23.6	0.09	2.36	-	-
29505X	6	7x19x27	1220	8.0	203.2	1.02	25.9	0.09	2.36	-	-
29506X	4	7x19x25	1940	9.3	236.2	1.16	29.5	0.09	2.36	-	-
29507X	2	7x19x23	3088	10.8	273.1	1.31	33.3	0.09	2.36	-	-

Conductor Color Coding: ICEA Method 4: Black and Numbered, Green/Yellow Ground.

Part No.	Conductor		Pulling Tension (Max) Lbs	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
	AWG	Stranding		Inch	mm	Inch	mm	Lbs	mm	Inch	mm
16 to 2 AWG • Bronze Braid Armor • Double Thermoset Jackets											
Z29500X	16	26x30	128	8.30	210.8	0.69	17.6	0.07	1.85	0.06	1.4
Z29501X	14	41x30	212	9.14	232.2	0.76	19.3	0.07	1.85	0.06	1.4
Z29502X	12	65x30	336	9.74	247.4	0.81	20.6	0.07	1.85	0.06	1.4
Z29503X	10	105x30	592	10.22	259.6	0.85	21.6	0.07	1.85	0.06	1.4
Z29504X	8	7x19x29	768	13.10	332.7	1.09	27.7	0.09	2.36	0.06	1.4
Z29505X	6	7x19x27	1220	14.18	360.2	1.18	30.0	0.09	2.36	0.06	1.4

Conductor Color Coding: ICEA Method 4: Black and Numbered, Green/Yellow Ground.

Part No.	Conductor		Pulling Tension (Max) Lbs	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
	AWG	Stranding		Inch	mm	Inch	mm	Lbs	mm	Inch	mm
16 to 2 AWG • Continuous Armor • Double Thermoset Jackets											
W29500X	16	26x30	128	9.62	244.4	0.80	20.4	0.07	1.85	0.06	1.4
W29501X	14	41x30	212	10.46	265.8	0.87	22.1	0.07	1.85	0.06	1.4
W29502X	12	65x30	336	11.06	281.0	0.92	23.4	0.07	1.85	0.06	1.4
W29503X	10	105x30	592	11.54	293.2	0.96	24.4	0.07	1.85	0.06	1.4
W29504X	8	7x19x29	768	14.42	366.4	1.20	30.5	0.09	2.36	0.06	1.4
W29505X	6	7x19x27	1220	15.50	393.8	1.29	32.8	0.09	2.36	0.06	1.4

Conductor Color Coding: ICEA Method 4: Black and Numbered, Green/Yellow Ground. NOTE: Continuous armor cables are not DNV rated

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff VFD Cable

Classic Symmetrical Design Thermoset Low Smoke
Zero Halogen

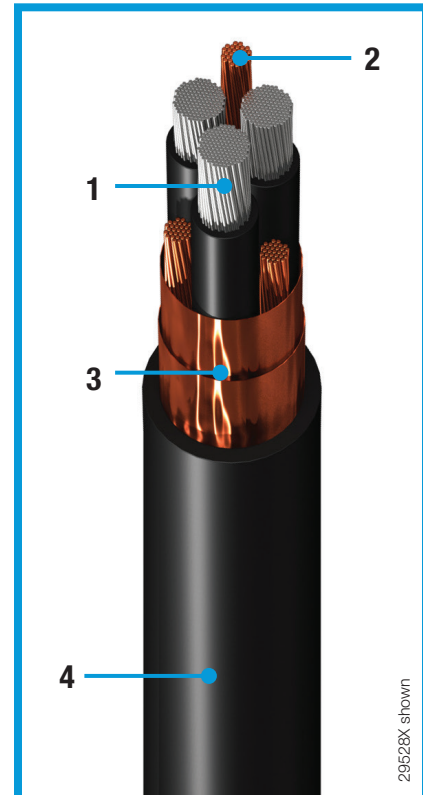


Features:

- Low Smoke Zero Halogen (LSZH) jacketed, Type P insulations
- 100% Ground - 3 Symmetrical Ground Conductors
- Finely stranded tinned copper conductors for ease of cable installation, high frequency performance, vibration, corrosion and heat resistance
- Low capacitance XLP insulation protects motor by reducing magnitude of reflected wave
- 100% Dual copper tape shielding for enhanced flexibility and noise control

Certifications/Compliance:

- ABS (American Bureau of Shipping)
- DNV (Det Norske Veritas)*
- IEEE 45 Electrical Installation on Shipboard
- IEEE 1580 Type P Insulations IEEE recommended practice for use on shipboard in fixed or floating facilities
- UL 1309 marine shipboard cables
- IEC 60811-2-1 Hydrocarbon Resistant
- IEC 60754-1,-2 (acid gas emissions)
- 600V UL 1277 Type TC-ER
- 1000V UL Flexible Motor Supply
- IEEE 1202/383, CSA FT4 Flame Tests
- IEC 60332-3-22 Cat A Flame Test
- -40C Cold Bend
- XHHW-2 Rated Conductors
- 90°C Wet/Dry
- Oil Res II
- Sunlight Resistant



Construction:

1. 1 to 4/0 AWG - Three Finely-Stranded Tinned Copper (TC) Circuit Conductors with XLP Insulation
2. Three Symmetrical Bare Copper (BC) Uninsulated Grounds (equivalent to 1 full-sized ground)
3. Two Spiral Copper Tape Shields (100% Coverage)
4. LSZH Thermoset Jacket

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff VFD Cable

Classic Symmetrical Design Thermoset Low Smoke
Zero Halogen



Part No.	Conductor		Pulling Tension (Max) Lbs	Bend Radius (Min)		OD (Nom)		Jacket Thickness		Outer Jacket Thickness	
	AWG	Stranding		Inch	mm	Inch	mm	Lbs	mm	Inch	mm
1 to 4/0 AWG • Thermoset Jacket											
29528X	1	7X19X22	2650	12.00	304.8	1.20	30.5	0.08	2.1	-	-
29529X	1/0	7X19X21	3537	12.90	327.7	1.29	32.8	0.08	2.1	-	-
29530X	2/0	7X19X20	4200	14.00	355.6	1.40	35.6	0.08	2.1	-	-
29531X	3/0	7X19X19	5025	15.20	386.1	1.52	38.6	0.08	2.1	-	-
29532X	4/0	7X19X18	6670	16.80	426.7	1.68	42.7	0.08	2.1	-	-

Conductor Color Coding: ICEA Method 4: Black and Numbered, 3 Symmetrical Bare Copper Grounds.

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff

Foundation Fieldbus Cables



FOUNDATION Fieldbus is the dominant industrial network in offshore environments. Belden Fieldbus cables are designed to withstand the destructive effects of temperature extremes, humidity/moisture, dust and oil. In harsh environments such as oil and gas extraction ultraviolet radiation from extensive exposure to the sun can shorten cable life. With the high cost of downtime in such remote locations, investing in cable with proven performance and reliability can significantly reduce the likelihood of system failure.

Key Attributes

- Type P ratings on all 600V insulations and options
- LSZH jackets on all cables and options
- Bronze braid option on all cables
- ABS and DNV certified
- 10 year warranty
- Compliant with Fieldbus Spec IEC 61158-2 (ISA/SP-50)
- Excellent electrical characteristics
- Versions in 18 and 16 AWG stranded tinned copper conductors
- Standard multi-pair cables available in 2 to 12 pairs. Higher pair counts available upon request
- PLTC/ITC-ER, PLTC, and TC-ER versions
- C(UL) CIC Type TC on 600V XLP insulated products
- Suitable for use in Class 1, Div. 2 applications
- RoHS compliant and CE approved

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff FOUNDATION Fieldbus Cable

300V and 600V, 18 AWG Paired Cable, Type A,
Thermoset/Thermoplastic with or without Bronze Armoring

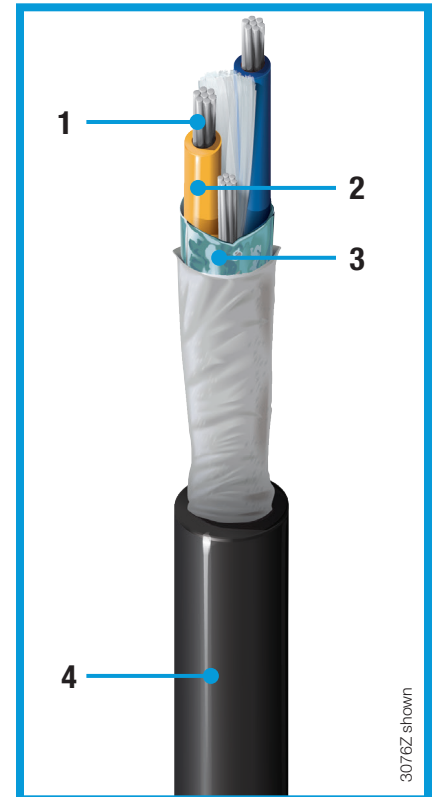


Featured Options:

- Low Smoke Zero Halogen - Both Thermoplastic and Thermoset Options
- Bronze braid armoring
- Additional AWG sizes and pair counts available upon request
- Sun Res
- Oil Res II (Thermoset)

Certifications/Compliance

- ABS (American Bureau of Shipping)
- DNV (Det Norske Veritas)*
- IEEE 1580 Type P Insulations - 600V Constructions
- UL 1277 Type TC-ER - 600V Constructions
- PLTC/ITC-ER - 300V Constructions
- NEC: CMG - 300V Constructions
- CEC: CMG FT4 - 300V Constructions
- IEC 60332-3-24 (Cat C)
- FT4/IEEE 1202
- IEC 60332-3-22
- IEC 60754-1 (Jacket)
- IEC 60754-2 (Jacket)



Construction:

1. 18 or 16 AWG Stranded Tinned Copper Conductors
2. XLP Insulation - 600V
Polyolefin Insulation - 300V
3. 100% Overall Foil Shield Coverage
Plus Individually Shielded Pairs on Multi-Pair Constructions
4. LSZH Thermoset or Thermoplastic Jacket

NOTE: Also available on all options, bronze braid armor with LSZH second jacket not pictured



MarineTuff

Offshore and Marine Cable Solutions

MarineTuff FOUNDATION Fieldbus Cable

300V and 600V, 18 AWG Paired Cable, Type A,
Thermoset/Thermoplastic with or without Bronze Armoring



Part No.	AWG	Pairs	OD (Nom)		Additional Features/Ratings	
			Inch	mm		
300V, 18 AWG Foundation Fieldbus						
Stranded (7 x 26) TC Conductors • Polyolefin Insulation • LSZH Jacket • TC Drain Wire • Beldfoil® Shielding						
<i>Thermoset Jacket</i>						
3076Z	18	1	0.38	9.7	CMG, PLTC-ER, ITC-ER, Direct Burial	
<i>Thermoplastic Jacket</i>						
3076T	18	1	0.38	9.7		
300V, 18 AWG Foundation Fieldbus, Bronze Armored						
Stranded (7 x 26) TC Conductors • Polyolefin Insulation • Double LSZH Jackets • TC Drain Wire • Beldfoil® Shielding						
<i>Thermoset Jacket</i>						
973076Z	18	1	0.52	13.3	CMG, PLTC-ER, ITC-ER, Direct Burial	
<i>Thermoplastic Jacket</i>						
773076T	18	1	0.52	13.3		
600 V, 18 AWG Foundation Fieldbus						
Stranded (7 x 26) TC Conductors • XLP Insulation • LSZH Jacket • TC Drain Wire • Beldfoil® Shielding						
<i>Thermoset Jacket</i>						
2118Z	18	1	0.35	8.8	TC-ER, ITC-ER, Direct Burial	
2119Z	18	2	0.60	15.2		
2120Z	18	5	0.75	19.0		
2121Z	18	8	0.93	23.6		
2122Z	18	12	1.12	28.5		
<i>Thermoplastic Jacket</i>						
2118T	18	1	0.35	8.8		
2119T	18	2	0.60	15.2		
2120T	18	5	0.75	19.0		
2121T	18	8	0.93	23.6		
2122T	18	12	1.12	28.5		

Conductor Color Code: Blue, Orange, Numbered Pairs.

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff FOUNDATION Fieldbus Cable

600V, 18 AWG Paired Cable, Type A



DNV·GL

Part No.	AWG	Pairs	OD (Nom)		Additional Features/Ratings	
			Inch	mm		
600V, 18 AWG Foundation Fieldbus - Bronze Armored						
Stranded (7x26) TC Conductors • XLP Insulation • Double LSZH Jackets • TC Drain Wire • Individually shielded pairs and overall Beldfoil Shielding						
<i>Thermoset Jacket</i>						
972118Z	18	1	0.48	12.5	TC-ER, ITC-ER, Direct Burial	
972119Z	18	2	0.75	19.3		
972120Z	18	5	0.90	23.1		
972121Z	18	8	1.09	27.7		
<i>Thermoplastic Jacket</i>						
772118T	18	1	0.49	12.5		
772119T	18	2	0.76	19.3		
772120T	18	5	0.91	23.1		
772121T	18	8	1.09	27.7		

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff FOUNDATION Fieldbus Cable

600V, 16 AWG Paired Cable, Type A



DNV·GL



Part No.	AWG	Pairs	OD (Nom)		Additional Features/Ratings
			Inch	mm	

600V, 16 AWG Foundation Fieldbus

Stranded (7x24) TC Conductors • XLP Insulation • LSZH Jacket • TC Drain Wire • Individually shielded pairs and overall Beldfoil Shielding

Thermoset Jacket

2127Z	16	1	0.37	9.5	TC-ER, ITC-ER, Direct Burial
2128Z	16	2	0.65	16.4	
2129Z	16	5	0.81	20.6	
2130Z	16	8	1.01	25.6	
2131Z	16	12	1.22	31.0	

Thermoplastic Jacket

2127T	16	1	0.37	9.5	TC-ER, ITC-ER, Direct Burial
2128T	16	2	0.65	16.4	
2129T	16	5	0.81	20.6	
2130T	16	8	1.01	25.6	
2131T	16	12	1.22	31.0	

600V, 16 AWG Foundation Fieldbus - Bronze Armored

Stranded (7x24) TC Conductors - XLP Insulation - Double LSZH Jackets - TC Drain Wire - Individually shielded pairs and overall Beldfoil Shielding

Thermoset Jacket

972127Z	16	1	0.52	13.2	TC-ER, ITC-ER, Direct Burial
972128Z	16	2	0.81	20.5	
972129Z	16	5	0.97	24.7	
972130Z	16	8	1.17	29.7	

Thermoplastic Jacket

772127T	16	1	0.51	13.2	TC-ER, ITC-ER, Direct Burial
772128T	16	2	0.80	20.5	
772129T	16	5	0.97	24.7	
772130T	16	8	1.16	29.7	

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff

PROFIBUS-DP Cables



PROFIBUS is one of the largest open industrial fieldbuses in the world. As with most fieldbus systems, PROFIBUS can reduce operating costs, increase productivity, decrease time to market for new products, and improve product quality. And unlike standard 4-20mA controls, PROFIBUS can support up to 32 devices per segment — up to a total of 126 devices, depending on total system current.

The MarineTuff Profibus offering includes a 150-ohm twinax (twisted pair) cable that matches the impedance of your offshore system, allowing for maximum signal transmission. The cable incorporates an overall Beldfoil® shield plus a 65% tinned copper braid for maximum shielding effectiveness. It also carries a UL NEC Type PLTC listing to achieve maximum installation versatility. The stranded option provides additional flexibility during installation and in use. With the additional ABS rating and armoring options, the MarineTuff Profibus line will meet all the demands of your Marine applications.

Key Attributes

- LSZH jackets on all cable options
- UL NEC Type PLTC
- ABS and DNV certified
- Overall Beldfoil shield plus 65% tinned copper braid
- Optimized for maximum signal transmission
- 10 year warranty

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff PROFIBUS-DP Cable

22 AWG, PLTC, Thermoset/Thermoplastic with or without Bronze Armoring



Featured Options:

- Low Smoke Zero Halogen jacket – Both Thermoplastic and Thermoset Options
- Multiple armoring options
- Sun Res
- Oil Res II (Thermoset)

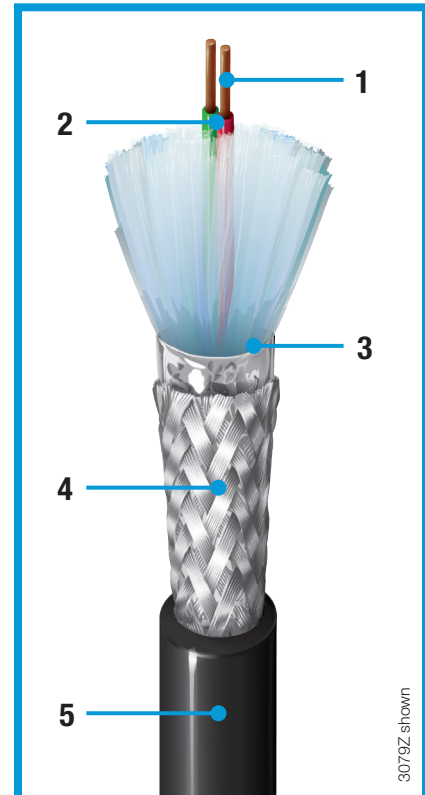
Certifications/Compliance

- ABS (American Bureau of Shipping)
- DNV (Det Norske Veritas)*
- NEC: PLTC CMG
- CEC: CMG FT4
- FT4/IEEE 1202
- IEC 60332-3-22
- IEC 60754-1 (Jacket)
- IEC 60754-2 (Jacket)

Construction:

1. 22 AWG Bare Copper Conductors
2. Flame Retardant Foam Polyethylene Insulation
3. Overall Beldfoil® Shield (100% coverage)
4. Tinned Copper Braid Shield (65% coverage)
5. LSZH Thermoset or Thermoplastic Jacket

NOTE: Also available on all options, bronze braid armor with LSZH second jacket not pictured



MarineTuff

Offshore and Marine Cable Solutions



MarineTuff PROFIBUS-DP Cable

22 AWG, PLTC, Thermoset/Thermoplastic with or without Bronze Armoring



Part No.	OD (Nom)		Additional Features/Ratings
	Inch	mm	
22 AWG, 300V Single Pair Databus ISA/SP-50 Profibus Cable			
Solid BC Conductors • FRFPE Insulation • Overall Beldfoil® Shielding, plus Overall Tinned Copper Braid (65% coverage) • LSZH Outer Jacket			
<i>Thermoset Jacket</i>			
3079Z	0.43	10.9	PLTC-LS, CMG-LS
<i>Thermoplastic Jacket</i>			
3079T	0.43	10.9	
22 AWG, 300V Single Pair DataBus ISA/SP-50 Profibus Cable - with Bronze Armoring			
Solid BC Conductors • FRFPE Insulation • Overall Beldfoil® Shielding, plus Overall Tinned Copper Braid (65% coverage) • Double LSZH Outer Jackets			
<i>Thermoset Jacket</i>			
973079Z	0.59	15.0	PLTC-LS, CMG-LS
<i>Thermoplastic Jacket</i>			
773079T	0.59	15.0	

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff

RS-485 Cables



As a part of Belden's comprehensive portfolio of Industrial Ethernet cables, the MarineTuff RS-485 provides reliable connections as a standard from the control room to metering and pumping/compressor stations. RS-485 cables provide serial data transmission in offshore industrial environments and are PLTC and CMG rated allowing for installation in 300V power limited cable trays. For plenum installations, MarineTuff RS-485 should be routed through conduit.

With manufacturing in ISO certified manufacturing facilities, Belden's state-of-the-art processes ensure quality in each product. Product consistency is a mainstay of our products.

Key Attributes

- LSZH jackets on all cable options
- UL NEC Type PLTC/CMG
- ABS and DNV certified
- High foam density polyethylene insulation (FHDPE)
- Overall Beldfoil shield plus 65% tinned copper braid
- 10 year warranty

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff RS-485 Cable

PLTC/CM, Thermoset/Thermoplastic with or without Bronze Armoring



Featured Options:

- Low Smoke Zero Halogen jacket – both Thermoplastic and Thermoset Options
- Sun Res
- Oil Res II (Thermoset)

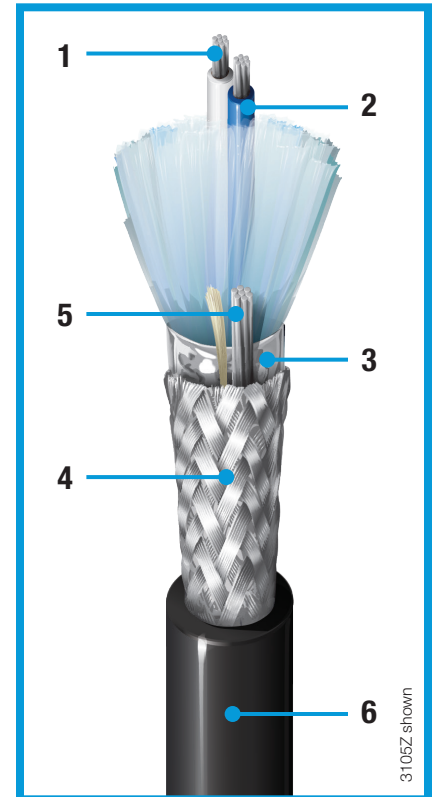
Certifications/Compliance

- ABS (American Bureau of Shipping)
- DNV (Det Norske Veritas)*
- NEC: CMG, PLTC
- CEC/C(UL): CMG FT4
- FT4/IEEE 1202
- IEC 60332-3-22
- IEC 60754-1 (Jacket)
- IEC 60754-2 (Jacket)

Construction:

1. 22 AWG Stranded Tinned Copper (TC) Conductors
2. Datalene® Insulation
3. Overall Beldfoil® Shield (100% coverage)
4. Tinned Copper Braid Shield (65% coverage)
5. Stranded Tinned Copper Drain Wire
6. LSZH Thermoset or Thermoplastic Jacket

NOTE: Also available on all options, bronze braid armor with LSZH second jacket not pictured



MarineTuff

Offshore and Marine Cable Solutions

MarineTuff RS-485 Cable

PLTC/CM, Thermoset/Thermoplastic with or without Bronze Armoring



Part No.	Pairs	OD (Nom)		Additional Features/Ratings
		Inch	mm	
RS-485				
22 AWG (7x30) Stranded TC Conductors • Datalene Insulation • TC Drain Wire - Overall Beldfoil Shielding plus an overall tinned copper braid (65% coverage) • LSZH Outer Jacket				
<i>Thermoset Jacket</i>				
3105Z	1	0.40	10.2	
3107Z	2	0.44	11.2	
3108Z	3	0.47	11.9	
3109Z	4	0.49	12.4	
<i>Thermoplastic Jacket</i>				
				CMG-LS, PLTC-LS
3105T	1	0.45	11.4	
3107T	2	0.49	12.4	
3108T	3	0.52	13.2	
3109T	4	0.49	12.4	
RS-485 - Bronze Armored				
22 AWG (7x30) Stranded TC Conductors • Datalene Insulation • TC Drain Wire - Overall Beldfoil Shielding plus an overall tinned copper braid (65% coverage) • Double LSZH Outer Jackets				
<i>Thermoset Jacket</i>				
973105Z	1	0.56	14.3	
973107Z	2	0.60	15.3	
973108Z	3	0.63	16.0	
973109Z	4	0.65	16.6	
<i>Thermoplastic Jacket</i>				
				CMG-LS, PLTC-LS
773105T	1	0.61	15.5	
773107T	2	0.65	16.6	
773108T	3	0.68	17.3	
773109T	4	0.70	17.8	

BC = Bare Copper • PVC = Polyvinyl Chloride

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff

ControlNet™



To ensure that Belden's ControlBus™ cables meet the high-speed, time-critical requirements for the operation of ControlNet offshore systems, these low-loss RG-6/U Type coaxial cables incorporate a Duobond Quad Shield for maximum signal integrity and run length. All products are sweep tested across a wide frequency range, ensuring that return loss, impedance and other critical performance features, meet the requirements of the ControlNet physical layer specification. ControlBus cables can be supplied with a bronze braid, aluminum or steel interlocked armor. Belden manufactures variations of the cable for different applications, identification needs, and environments.

Key Attributes

- Excellent electrical characteristics
- RoHS compliant and CE approved
- ABS and DNV certified
- ABS certified, DNV
- Low Smoke Zero Halogen (LSZH) jackets on all cables
- Bronze Braid Optional
- 10-Year Warranty

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff ControlNet™ Cable

18 AWG, Duobond®-Quad Shielded Coaxial, Type RG6/U,
Thermoset/Thermoplastic with or without Bronze Armoring



Featured Options:

- Low Smoke Zero Halogen Jacket - Both Thermoplastic and Thermoset Options
- Multiple armoring options
- Sun Res
- Oil Res II (Thermoset)

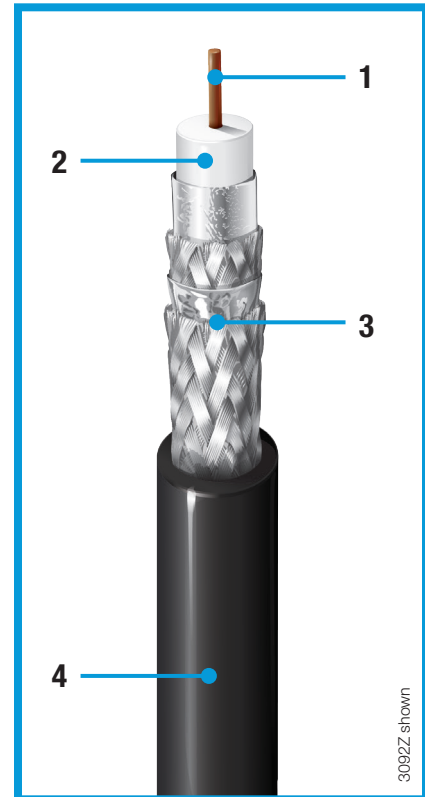
Certifications/Compliance

- ABS (American Bureau of Shipping)
- DNV (Det Norske Veritas)*
- NEC: CMG CL2
- CEC: CMG FT4
- FT4/IEEE 1202
- IEC 60332-3-22
- IEC 60754-1 (Jacket)
- IEC 60754-2 (Jacket)

Construction:

1. Type RG6/U 18 AWG Solid Copper Covered Steel Conductors or 20 AWG Finely Stranded BC Conductor (High Flex)
2. Polyolefin Insulation
3. Quad-Shield Coverage (Foil Braid/Foil Braid)
4. LSZH Thermoset or Thermoplastic Jacket

NOTE: Also available on all options, bronze braid armor with LSZH second jacket not pictured



MarineTuff

Offshore and Marine Cable Solutions



MarineTuff ControlNet™ Cable

18 AWG, Duobond®-Quad Shielded Coaxial, Type RG6/U,
Thermoset/Thermoplastic with or without Bronze Armoring



Part No.	AWG	OD (Nom)		Additional Features/Ratings
		Inch	mm	
Solid - Quad Shielded Coaxial, Type RG6/U				
18 AWG Solid BC-Covered Steel Conductor • Polyolefin Insulation • Duobond QuadShield • LSZH Jacket				
<i>Thermoset Jacket</i>				
3092Z	18	0.30	7.6	CMG-LS, CL2
<i>Thermoplastic Jacket</i>				
3092T	18	0.30	7.6	
Solid - Quad Shielded Coaxial, Type RG6/U - Bronze Armored				
18 AWG Solid BC-Covered Steel Conductor • Polyolefin Insulation • Duobond QuadShield • Double LSZH Jackets				
<i>Thermoset Jacket</i>				
973092Z	18	0.44	11.3	CMG-LS, CL2
<i>Thermoplastic Jacket</i>				
773092T	18	0.44	11.3	
Stranded - Quad Shielded Coaxial, Type RG6/U				
18 AWG Stranded (105x40) BC Conductor • Polyolefin Insulation • Duobond QuadShield • LSZH Jacket				
<i>Thermoset Jacket</i>				
3092FZ	20	0.31	7.7	CMG-LS, CL2
<i>Thermoplastic Jacket</i>				
3092FT	20	0.31	7.7	
Stranded - Quad Shielded Coaxial, Type RG6/U - Bronze Armored				
18 AWG Stranded (105x40) BC Conductor • Polyolefin Insulation • Duobond QuadShield • Double LSZH Jackets				
<i>Thermoset Jacket</i>				
973092F	20	0.45	11.4	CMG-LS, CL2
<i>Thermoplastic Jacket</i>				
773092F	20	0.45	11.4	

*Duobond IV is a four-layer shield: (1) Duobond II Foil, (2) TC Braid (94%), (3) Duofoil® Foil, (4) TC Braid (90%).

BC = Bare Copper • PVC = Polyvinyl Chloride

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff

Blue Hose Cables



DNV·GL



The needs of real-time, high-throughput applications can be routinely met by the control network and the use of Belden Blue Hose cable. These cables are a robust physical media for the transmission of PLC/DCS signals. Backed by years of research and development, each Belden Blue Hose cable is manufactured to exacting quality standards. Belden Blue Hose cables are designed to give you unprecedented installation flexibility for Data Highway, SY/Net and many other PLC-I/O networks.

Key Attributes

- LSZH jackets on all cables and options
- Bronze braid options on all cables and options
- ABS and DNV certified
- 10 year warranty

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff Blue Hose Cable

18 AWG, 600V Twinaxial Cable Thermoset/Thermoplastic Jackets with or without Bronze Braid Armoring



Featured Options:

- Low Smoke Zero Halogen jacket – standard on all products
- Sunlight and Oil resistance
- Direct Burial
- Bronze braid armoring
- Sun Res
- Oil Res II (Thermoset)

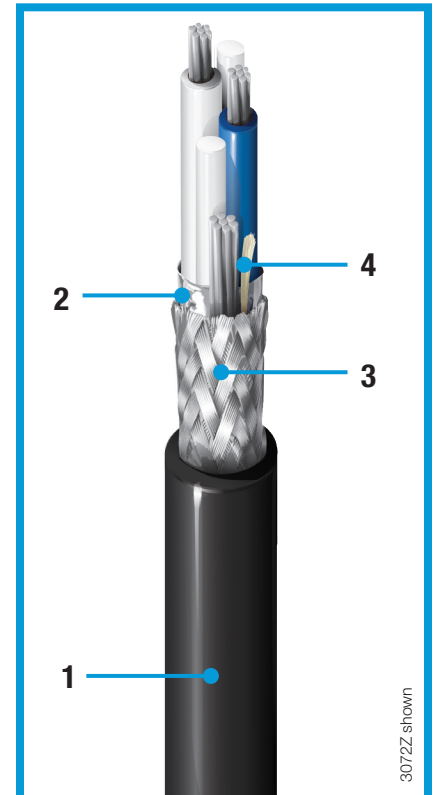
Certifications/Compliance

- ABS (American Bureau of Shipping)
- DNV (Det Norske Veritas)*
- NEC/UL: CMG, TC
- C(UL): CMG
- FT4/IEEE 1202
- IEC 60332-3-22
- IEC 60754-1 (Jacket)
- IEC 60754-2 (Jacket)

Construction:

1. LSZH Thermoset Jacket
2. 100% Foil Shield Coverage
3. 55% tinned copper braid
4. Drain wire

NOTE: Also available on all options, bronze braid armor with LSZH second jacket not pictured



MarineTuff

Offshore and Marine Cable Solutions

MarineTuff Blue Hose Cable

18 AWG, 600V Twinaxial Cable Thermoset/Thermoplastic Jackets with or without Bronze Braid Armoring



Part No.	OD (Nom)		Additional Features/Ratings	
	Inch	mm		
18 AWG, 600V Twinaxial Cable				
Stranded TC Conductors (7x26) • Polyolefin Insulation • Overall Beldfoil Shielding • LSZH Outer Jacket				
<i>Thermoset Jacket</i>				
3072Z	0.42	10.6	TC-LS, CMG-LS, ITC-LS	
<i>Thermoplastic Jacket</i>				
3072T	0.42	10.6		
18 AWG, 600V Twinaxial Cable - with Bronze Braid Armor				
Stranded TC Conductors (7x26) • Polyolefin Insulation • Overall Beldfoil Shielding • Double LSZH Outer Jackets				
<i>Thermoset Jacket</i>				
973072Z	0.57	14.7	TC-LS, CMG-LS, ITC-LS	
<i>Thermoplastic Jacket</i>				
773072T	0.57	14.7		

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff

DeviceNet™



Widely used for maritime electronics, the MarineTuff Devicenet cables' rugged design will support your offshore DeviceNet ODVA requirements. These cables provide device designers with the ability to implement desired network behavior of several communication objects into a device while the durable design allows these networks to run in the harshest environments. Whether connecting sensors or switching devices, the MarineTuff DeviceNet cables will offer the reliability you demand.

Key Attributes

- 600V Class 1 ODVA
- LSZH jackets on all cable options
- ABS and DNV certified
- UL NEC TC-ER
- Overall Beldfoil shield plus 65% tinned copper braid
- XLPE insulation on the power pairs and F-R Polypropylene on the data pairs
- Able to occupy the same tray/conduit as 600V cables
- 10 year warranty

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff DeviceNet™ Cable

16 AWG, 600V Thermoset/Thermoplastic Jackets with or without Bronze Braid Armoring



Featured Options:

- Low Smoke Zero Halogen jacket – standard on all products
- Multiple armoring options
- Sun Res
- Oil Res II (Thermoset)

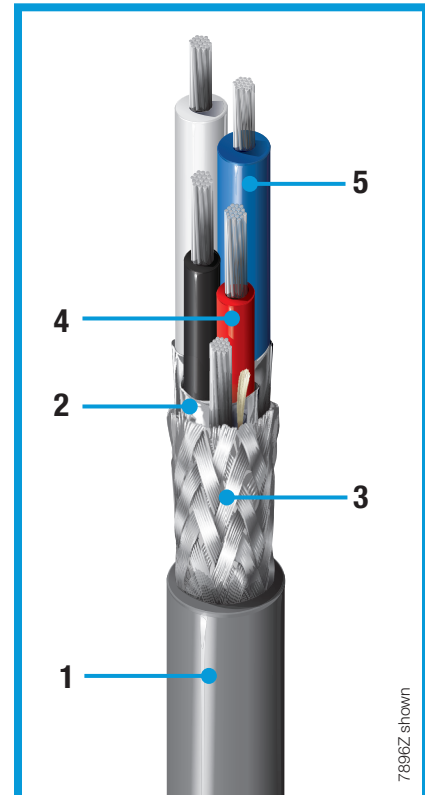
Certifications/Compliance

- ABS (American Bureau of Shipping)
- DNV (Det Norske Veritas)*
- C(UL) AWM I/II A/B (Thermoset Only)
- NEC: TC-ER
- CEC: FT4
- FT4/IEEE 1202
- IEC 60332-3-22
- IEC 60754-1 (Jacket)
- IEC 60754-2 (Jacket)

Construction:

1. LSZH Thermoset Jacket
2. 100% Foil Shield Coverage
3. TC Braid Shield (65% coverage)
4. 18 AWG Data
5. 16 AWG Power

NOTE: Also available on all options, bronze braid armor with LSZH second jacket not pictured



MarineTuff

Offshore and Marine Cable Solutions



MarineTuff DeviceNet™ Cable

16 AWG, 600V Thermoset/Thermoplastic Jackets with or without Bronze Braid Armoring



Part No.	Pairs	OD (Nom)		Additional Features/Ratings
		Inch	mm	
16 AWG, 600V DeviceBus for ODVA DeviceNet				
Stranded TC Conductors (19x29) • XLPE Insulation (Thermoset) • PE Insulation (Thermoplastic) • Overall Beldfoil Shielding plus Overall Tinned Copper Braid (65% coverage) • LSZH Outer Jacket				
<i>Thermoset Jacket</i>				
7896Z	2	0.64	16.2	TC-LS, TC-ER, AWM I/II A/B
<i>Thermoplastic Jacket</i>				
7896T	2	0.64	16.2	TC-LS, TC-ER
16 AWG, 600V DeviceBus for ODVA DeviceNet				
Stranded TC Conductors (19x29) • XLPE Insulation (Thermoset) • PE Insulation (Thermoplastic) • Overall Beldfoil Shielding plus an overall tinned copper braid (65% coverage) • Double LSZH Outer Jackets				
<i>Thermoset Jacket</i>				
977896Z	2	0.80	19.8	TC-LS, TC-ER, AWM I/II A/B
<i>Thermoplastic Jacket</i>				
777896T	2	0.80	19.8	TC-LS, TC-ER

Conductor Color Coding: Data: Blue, White
Power: Red, Black

MarineTuff

Offshore and Marine Cable Solutions

MarineTuff A/V and Electronic Cable



Delivering high-end audio and video quality in shipboard environments is critical to enhancing shipboard safety and communications as well as crew and consumer experience. Belden's ABS-rated audiovisual and electronic cables enable connectivity for the same wide range of application options available on dry land including audio, video, security, networking and control. Marine A/V cables use standard connectors, with no special installation techniques allowing for a fast and easy installation.

Products Include

- Electronic Audio, Control, and Instrumentation
- Audio and Speaker Cable
- Coaxial Broadcast AV
- DataTwist Nonbonded-Pair
- Security Composite

Key Attributes

- ABS certified
- LSZH jackets on all cables and options
- 10 year warranty

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff Electronic Audio, Control and Instrumentation Cable



Featured Options:

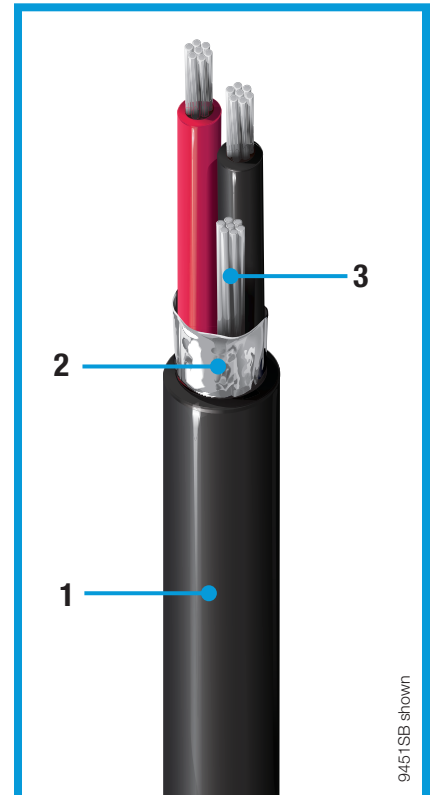
- Low Smoke Zero Halogen jacket – standard on all products
- RS-232 Cable (9451SB)
- Audio/Control Cables
- Multimedia control cable for AMX® and Crestron systems with both RS-485® and power in one cable (1502SB)

Certifications/Compliance

- ABS Certified
- Compliant with IEEE 45 and applicable sections of IEC 60092-376
- NEC/CEC CMG-LS
- FT4
- RoHS compliant

Construction:

1. LSZH Thermoplastic Jacket
2. 100% Foil Shield Coverage
3. Drain Wires



MarineTuff

Offshore and Marine Cable Solutions



MarineTuff Electronic Audio, Control and Instrumentation Cable

Part No.	AWG	Pairs	Insulation	Shield	OD (Nom)		Additional Features/Ratings
					Inch	mm	
Electronic Audio, Control, and Instrumentation Single- and Multi-pair Cables							
Standard (7x) TC Conductors • Thermoplastic LSZH Jacket							
9451SB*	22	1	PP	Beldfoil	0.16	4.1	300V RMS, NEC/CEC CMG-LS, FT4
8723SB*	22	2	PP	Individual Beldfoil	0.20	5.0	
8777SB	22	3	PP	Individual Beldfoil	0.27	6.9	UL AWM Style 2919, NEC/CEC CMG-LS, FT4
Electronic Audio, Control, and Instrumentation Multimedia Control Cable							
Standard (7x) TC Conductors • Thermoplastic LSZH Jacket							
1502SB	22	1 + 2C	FPR (data) F-R PVC (Power)	Beldfoil (data), Unshielded (power)	0.26	6.5	NEC/CEC CMG-LS, FT4

* Indicates common part numbers, LSZH, Thermoplastic

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff Audio and Speaker Cable



Featured Options:

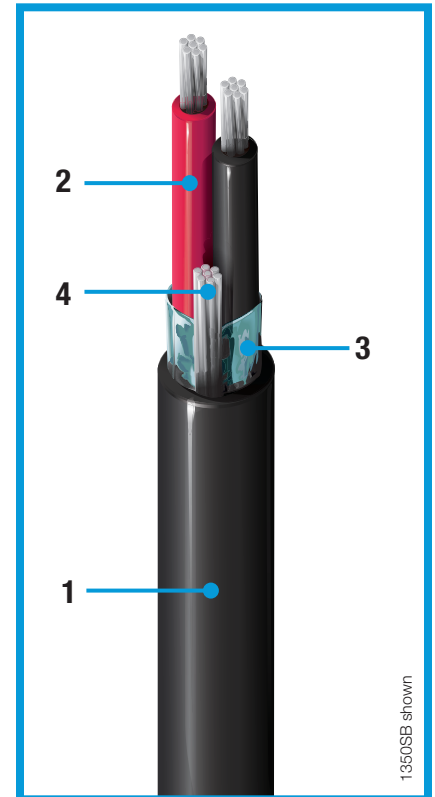
- Low Smoke Zero Halogen thermoplastic jacket – standard on all products
- AES/EBU Audio Cable
- High-strand Speaker Cable

Certifications/Compliance

- ABS Certified
- Compliant with IEEE 45 and applicable sections of IEC 60092-376
- NEC/CEC CMG-LS
- FT4
- RoHS compliant
- High Flex/High Purity (Fine Stranding) on 1314SB-1317SB

Construction:

1. LSZH Thermoplastic Jacket
2. Datalene or Polypropylene Insulation
3. 100% Foil Shield Coverage (where applicable)
4. Drain Wires



MarineTuff

Offshore and Marine Cable Solutions



MarineTuff Audio and Speaker Cable

Part No.	AWG	Conductors	Insulation	Shield	OD (Nom)		Additional Features/Ratings
					Inch	mm	
AES/EBU Digital Audio Cable							
Standard TC Conductors • Thermoplastic LSZH Jacket							
1350SB*	24	1 PR	Datalene	Beldfoil	0.18	4.6	NEC/CEC CMG-LS, FT4
High Strand Speaker Cable for Unshielded Audio and Control; High-Flex and High-Purity							
Standard TC Conductors • Thermoplastic LSZH Jacket							
1314SB*	14	2	PP	Unshielded	0.30	7.6	NEC/CEC CMG-LS, FT4
1315SB	14	4	PP	Unshielded	0.34	8.6	
1316SB*	12	2	PP	Unshielded	0.34	8.6	
1317SB	12	4	PP	Unshielded	0.39	9.9	

* Indicates common part numbers, LSZH, Thermoplastic

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff Coaxial Broadcast AV Cable

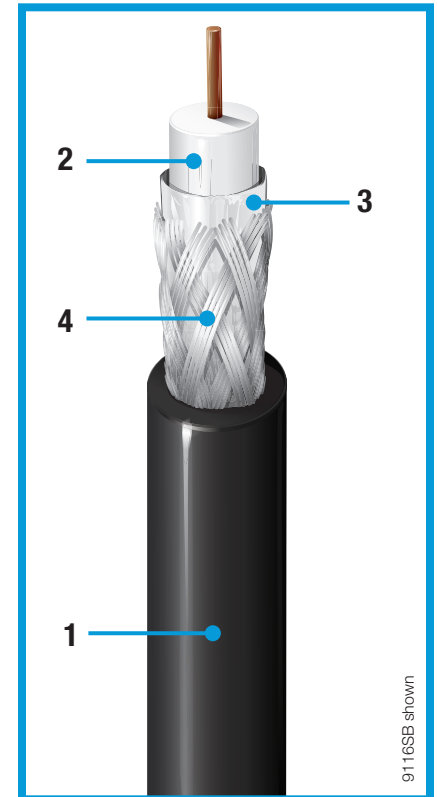


Featured Options:

- Low Smoke Zero Halogen thermoplastic jacket – standard on all products
- CATV, Series
- RG-8 Type Low Loss 50 Ohm Wireless RF Transmission
- RG-6/U Type Digital Low Loss Serial
- RG-11/U Type Low Loss Serial
- Aluminum or Tinned Copper Braid Shielding

Certifications/Compliance

- ABS Certified
- Compliant with IEEE 45 and applicable sections of IEC 60092-376
- NEC/CEC CMG-LS
- FT4
- RoHS compliant



Construction:

1. LSZH Thermoplastic Jacket
2. Foam Polyethylene or Foam High-Density Polyethylene Insulation
3. 100% Duobond II® or Duofoil® Shield Coverage
4. 60% or 95% Braid Shield Coverage



MarineTuff

Offshore and Marine Cable Solutions



MarineTuff Coaxial Broadcast AV Cable

Part No.	AWG	Pairs	Insulation	Shield	OD (Nom)		Additional Features/Ratings
					Inch	mm	
Broadband Coaxial; CATV Series 6							
Thermoplastic LSZH Jacket							
9116SB*	18	Coax	Foam PE	Duobond®II + Aluminum Braid Shield	0.27	7.0	NEC/CEC CMG-LS, FT4
Low Loss 50 Ohm Wireless RF Transmission Cable; RG-8 Type							
Thermoplastic LSZH Jacket							
7810SB	10	Coax	Foam HDPE	Duobond®II + TC Braid	0.41	10.3	RF400, NEC/CEC CMG-LS, FT4
Precision Video Cable for Analog and Digital; Low Loss Serial Digital Coax; RG-6/U Type							
Thermoplastic LSZH Jacket							
1694SB*	18	Coax	Foam HDPE	Duofoil® + TC Braid	0.27	7.0	SDI/HDTV Digital Video, NEC/CEC CMG-LS, FT4
Precision Video Cable for Analog and Digital; Low Loss Serial Digital Coax; RG-11/U Type							
Thermoplastic LSZH Jacket							
7731SB	14	Coax	Foam HDPE	Duofoil® + TC Braid	0.40	10.2	SDI/HDTV Digital Video, NEC/CEC CMG-LS, FT4

* Indicates common part numbers, LSZH, Thermoplastic

MarineTuff

Offshore and Marine Cable Solutions



MarineTuff DataTwist® Nonbonded Pair



Featured Options:

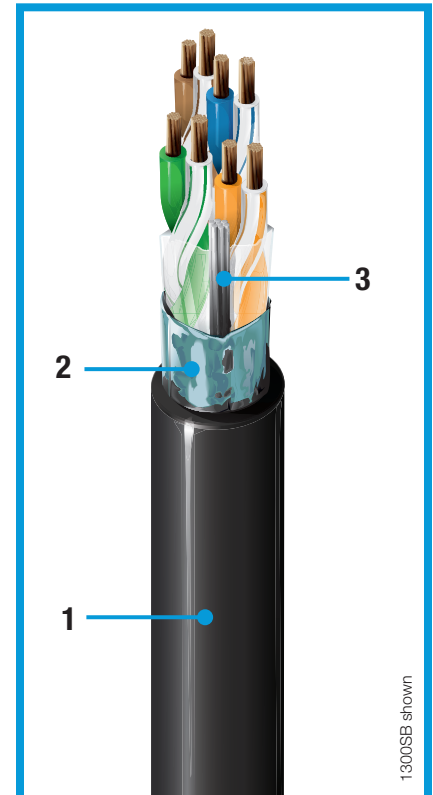
- Low Smoke Zero Halogen thermoplastic jacket – standard on all products
- Category 5e or Category 6
- Multimedia control cable for AMX® and Crestron systems with both RS-485® and power in one cable (1502SB)
- Shielded or Unshielded (depending on construction)
- RJ-45 Compatible

Certifications/Compliance

- ABS Certified
- TIA/EIA-568-B.2 or B.2.1
- Compliant with IEEE 45 and applicable sections of IEC 60092-376
- NEC/CEC CMG-LS
- FT4
- RoHS compliant

Construction:

1. LSZH Thermoplastic Jacket
2. 100% Foil Shield Coverage (for shielded)
3. Drain Wire (for shielded)
4. Rip Cord (for unshielded)



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MarineTuff DataTwist Nonbonded Pair

Part No.	AWG	Pairs	Insulation	Shield	OD (Nom)		Additional Features/Ratings
					Inch	mm	
Category 5e; TIA/EIA-568-B.2							
Solid BC Conductors • Thermoplastic LSZH Jacket							
1300SB*	24	4	PO	Beldfoil	0.26	6.6	
1633ESB*	24	4	PO	Beldfoil + TC Braid	0.25	6.3	NEC/CEC CMG-LS, FT4
1318SB	24	4	PO	Unshielded	0.29	7.4	
Category 6; TIA/EIA-568-B.2.1							
Standard TC Conductors • Thermoplastic LSZH Jacket							
1319SB*	23	4	PO	Unshielded	0.29	7.4	NEC/CEC CMG-LS, FT4

* Indicates common part numbers, LSZH, Thermoplastic

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MarineTuff Security Composite Cable



Featured Options:

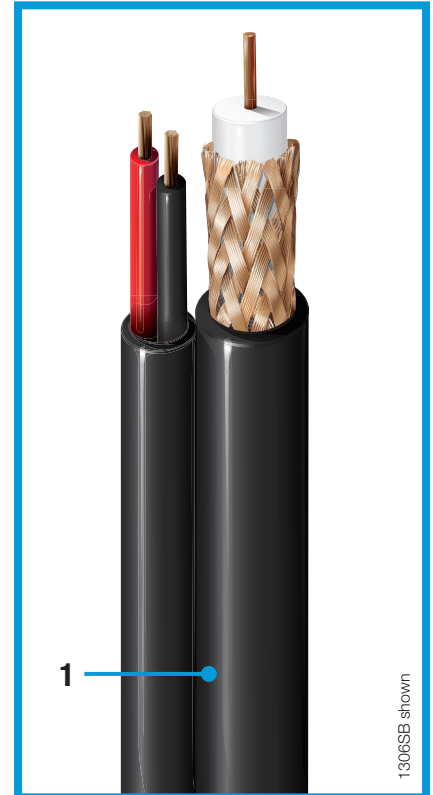
- Low Smoke Zero Halogen thermoplastic jacket – standard
- RG-6 Coax Plus Twisted Pair
- CCTV Plus Audio or Pan/Tilt/Zoom CCTV Control Applications

Certifications/Compliance

- ABS Certified
- NEC/CEC CMG-LS
- FT4
- RoHS compliant

Construction:

1. LSZH Thermoplastic Jacket



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MarineTuff Security Composite Cable

Part No.	AWG	Conductors	Insulation	Shield	OD (Nom)		Additional Features/Ratings
					Inch	mm	
CCTV plus Audio or Pan/Tilt/Zoom CCTV Control Applications							
RG6 Coax plus Twisted Pair - Siamese Construction							
1306SB*	18 (Coax) 18 (Pair)	1PR + Coax	FPE (Coax), PO (Pair)	BC Braid (Coax) Unshielded (Pair)	.28 x .51	7.0 x 13.1	NEC/CEC CMG-LS, FT4

* Indicates common part numbers, LSZH, Thermoplastic

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1306SB	78	3130Z	39	28113Z	24	28177Z	34
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1350SB	72	7953T	12	28120Z	24	28328Z	15
1502SB	70	7953Z	12	28121Z	24	28329Z	15
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