

PB 231

Industrial Ethernet

Whether you specify copper or fiber optic cables, peak network efficiency and reliability are achieved with Belden® DataTuff® Industrial Ethernet cables. Bonded-Pair UTP and FTP versions also offer Installable Performance®.

Choose from a Complete Range of High-Quality, High-Reliability Industrial Ethernet Cables

Over the past five years or so, Ethernet has moved increasingly from the office environment into the industrial world – mainly for control and automation applications. But the two environments couldn't differ more: the office environment offers its cabling system a relatively safe harbor and should a signal transmission fault occur, retries are generally acceptable. The industrial world presents a different reality: the cabling system can be integral to a harsh and hazardous environment and yet there's no margin for error since the cables typically carry signals between devices to make events happen on a very exacting schedule.

To ensure successful Ethernet signal transmissions in an industrial environment you need high performance cables designed specifically for the environment. Commercial off-the-shelf (COTS) Cat 5e UTP Ethernet cable just can't stand up. It is quite fragile when compared to an industrial-grade cable, meaning that any number of stresses and challenges encountered in the industrial environment could result in one of the classic failure models: catastrophic failure, intermittent operation, incremental failure and degradation of performance. The result could be a loss of data, process downtime or a drop in the safety level of your operation.

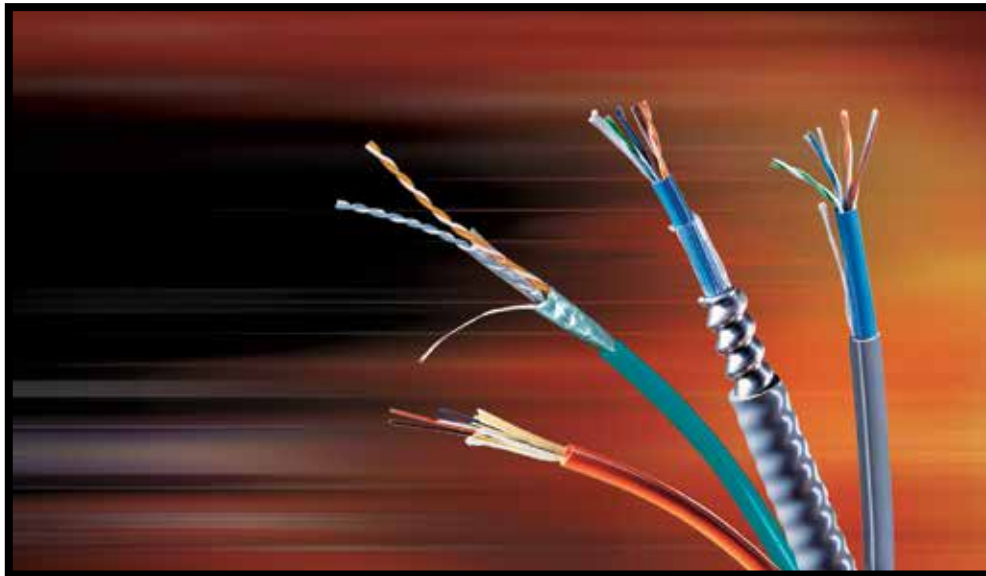
Belden's answer is to offer a complete range of high quality, high reliability DataTuff® Industrial Ethernet cables that have been designed for industrial use and tested using state-of-the-art testing equipment. Belden DataTuff cables are also field-proven relative to exceptional day-in/day-out performance.

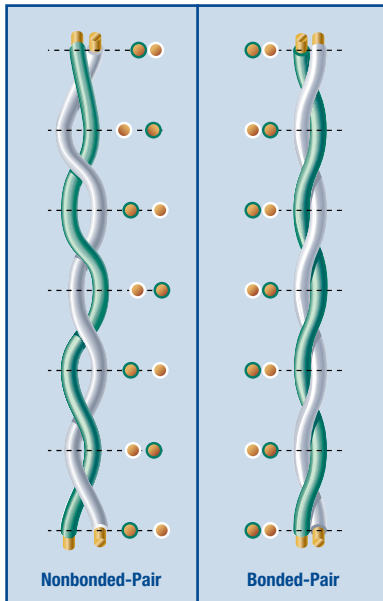
So, even if your cabling system is exposed to the following conditions you can turn to Belden for the right solution:

- Oil, sunlight and gasoline
- Temperature variations
- Abrasion, crushing and burial
- Flexing
- Presence of EMI/RFI (electromagnetic interference or radio frequency interference)
- MSHA mining approval
- Red jackets designating safety network

Only DataTuff Cables with Belden's Patented Bonded-Pair Technology Offer the Benefit of Installable Performance

Most versions of DataTuff cables feature Belden's patented Bonded-Pair technology. This construction feature affixes the conductor insulation of the cable pairs along their longitudinal axes to ensure that no performance-robbing gaps can develop between the conductor pairs. Since no gaps can occur, and the conductor-to-conductor spacing, or centricity, is always uniform, the cable offers excellent and consistently reliable electrical performance – even after the cable has been subjected to the bending, pulling and twisting that is inherent in the installation process. Belden calls this unique after-installation performance capability Installable Performance.





Installed and manipulated nonbonded-pairs (left) have a tendency to gap, varying the centricity of the two conductors. Bonded-Pairs (right) do not gap so the physical integrity of the pair is maintained.



A cable prep tool is included in each reel of Bonded-Pair products. The tool is sold separately as 1797B.

Additionally, when the nonbonded pairs gap, an impedance mismatch occurs. When the transmitted signal encounters this mismatch, portions of the signal are reflected back toward the receiver. This is called return loss, or RL. A cable with poor RL values can significantly impact the performance of an active network, reduce network efficiency and lead to excessive bit error rates.

In tests performed by Belden that simulate the effects of the installation process, both an industry-leading 350 MHz Cat 5e cable (a nonbonded-pair cable) and a Belden 350 MHz Cat 5e Bonded-Pair cable were tested right off the reel and then for the sake of comparison, they were subjected to an Installation Stress Test. This Stress Test simulated just some of the stresses that a cable experiences as it is installed (being bent around corners, creating a service loop and being stuffed into an outlet box). The results? The nonbonded-pair cable showed an RL degradation greater than 12 dB — over 15 times worse than its before-installation value. The Bonded-Pair cables showed little change in RL performance. (For more detailed information, request the Technical Bulletin TB-66 "The Impact of Installation Stresses on Cable Performance.")

TrayOptic® Cables Feature Laser Certified Fiber (LCF) and Water-blocking Capability

When the installation demands the combination of sophisticated fiber optic technology and rugged durability, look to Belden's line of TrayOptic indoor/outdoor fiber optic cables — now upgraded to include a water-blocking agent. All TrayOptic products also utilize Laser Certified Fiber to handle Gigabit Ethernet light sources and any expanded bandwidth requirements. For information on Belden's full line of fiber optic cables, including TrayOptic cables, contact Belden at 1.800.BELDEN.1 or visit www.belden.com.

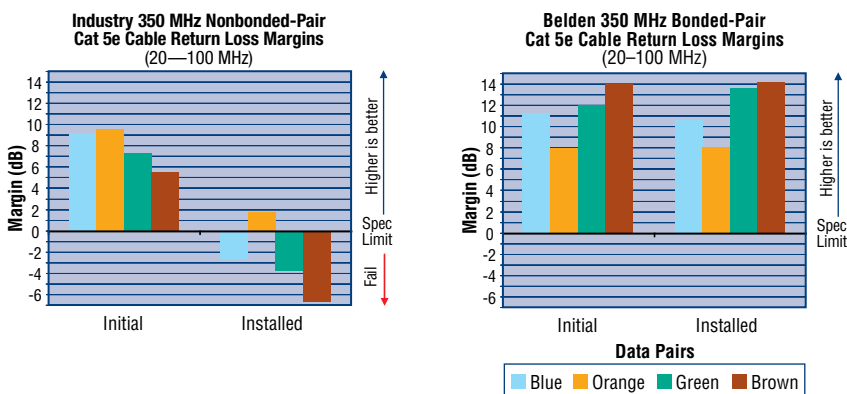
Quality You Can Trust

These Belden products are RoHS compliant, plus they are manufactured to the industry's highest standards of quality, utilizing the most advanced equipment, systems, controls and processes. In fact, Belden has long been a pioneer in production processes, such as statistical process control (SPC), that have become industry standards. And Belden was the first major designer and manufacturer of cable products to achieve ISO 9000 registration for the majority of its domestic and overseas facilities.



Belden Quality Means Uptime and Superior Safety Performance

Today's critical industrial networking applications can't afford data transmission errors that can cause downtime, delays, and even safety concerns. Belden quality gives you the performance and reliability you need on a day-by-day basis.



In an Installation Stress Test that simulates the installation process, the Cat 5e nonbonded-pair cables (left) showed an RL degradation of more than 12 dB. The Bonded-Pair cables (right) exhibited little change in RL performance.

Be Certain with Belden



Industrial Data Solutions® – Industrial Ethernet

Category 5e DataTuff® Twisted Pair Cables, 2-Pair
Heavy-Duty Sunlight and Oil-Resistant Jackets

Description	Part No.	UL NEC/ C(UL) CEC Type	No. of Pairs	Standard Lengths		Standard Unit Wt.		Nominal OD		Freq. (MHz)	Max. Atten. (dB/ 100m)	Min. PSUM NEXT (dB)	Min. PSUM ACR (dB/ 100m)	Min. PSUM ELFEXT (dB/ 100m)	Input Imped. (Ω)	Min. RL (dB)
				Ft.	m	Lbs.	kg	Inch	mm							

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC • Rip Cord • See Color Code Chart: Page 5

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- & Oil-resistant Black, Red or Teal PVC Jacket

EtherNet/IP Compliant  Rip Cord		7932A	NEC:	2	1000	304.8	19.0	8.62	.207	5.26	1	2.0	65.3	63.3	60.8	100±12	20.0	
			CMR		2000†	609.6	38.0	17.25				4	4.0	56.3	52.3	48.7	100±12	23.6
			CEC:									8	5.7	51.8	46.1	42.7	100±12	25.4
			CMR FT4									10	6.4	50.3	43.9	40.8	100±12	26.0
												16	8.1	47.3	39.1	36.7	100±12	26.0
												25	10.3	44.3	34.1	32.8	100±15	25.5
												31.25	11.6	42.9	31.3	30.9	100±15	25.0
												62.5	16.8	38.4	21.6	24.8	100±15	23.5
												100	21.7	35.3	17.1	20.8	100±15	22.5
												155	27.7	32.5	4.7	16.9	100±18	19.0
												200	32.0	30.8	3.0	14.7	100±20	19.0
												250	36.4	29.3	—	12.8	100±20	18.0
												350	44.3	27.2	—	9.9	100±22	17.0

Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C*

M-12 or RJ-45 Compatible • U.S. Patents 5,606,151 and 5,734,126 • Cable passes -40°C Cold Bend per UL1581

Jacket sequentially marked at 2 ft. intervals. • Third party verified to TIA/EIA-568-B.2 Category 5e

Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C*
M-12 or RJ-45 Compatible • U.S. Patents 5,606,151 and 5,734,126 • Cable passes -40°C Cold Bend per UL1581
Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2, Category 5e

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC • Overall Beldfoil® Shield • Drain Wire • See Color Code Chart: Page 5

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- & Oil-resistant Black or Teal PVC Jacket

EtherNet/IP Compliant Shielded 		7933A	NEC:	2	1000	304.8	32.0	14.5	.227	5.77	1	2.0	62.3	60.3	60.8	100±15	20.0
			CMR		2000†	609.6	64.8	29.4			4	4.1	53.3	49.2	48.7	100±15	23.6
			CEC:								10	6.5	47.3	40.8	40.8	100±15	26.0
			CMR FT4								16	8.2	44.3	36.1	36.7	100±15	26.0
											31.25	11.7	39.9	28.2	30.9	100±15	25.0
											62.5	17.0	35.4	18.4	24.8	100±15	23.5
											100	22.0	32.3	10.3	20.8	100±15	22.5
											200	32.4	27.8	1.0	14.7	100±25	15.0

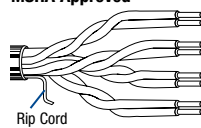
Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C*
M-12 or RJ-45 Compatible†† • U.S. Patents 5,606,151 and 5,734,126 • Cable passes -40°C Cold Bend per UL1581
Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2, Category 5e • Shield is bonded to jacket inner wall for electrical stability

Category 5e DataTuff® Twisted Pair Cables, 4-Pair
Heavy-Duty Sunlight and Oil-Resistant Jackets

Description	Part No.	UL NEC/ C(UL) CEC Type	No. of Pairs	Standard Lengths		Standard Unit Wt.		Nominal OD		Freq. (MHz)	Max. Atten. (dB/ 100m)	Min. PSUM NEXT (dB)	Min. PSUM ACR (dB/ 100m)	Min. PSUM ELFEXT (dB/ 100m)	Input Imped. (Ω)	Min. RL (dB)
				Ft.	m	Lbs.	kg	Inch	mm							

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC • Rip Cord • See Color Code Chart: Page 5

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black, Blue, Gray, Red or Teal PVC Jacket

EtherNet/IP Compliant MSHA Approved  Rip Cord		7923A	NEC:	4	1000	304.8	28.0	12.7	.230	5.84	1	2.0	65.3	63.3	60.8	100±12	20.0
			CMR,		2000†	609.6	54.0	24.5	4	4.0	56.3	52.3	48.7	100±12	23.6		
			CMX-		5000†	1524.0	130.0	59.0	8	5.7	51.8	46.1	42.7	100±12	25.4		
			Outdoor						10	6.4	50.3	43.9	40.8	100±12	26.0		
			CEC:						16	8.1	47.3	39.1	36.7	100±12	26.0		
			CMR FT4						25	10.3	44.3	34.1	32.8	100±15	25.5		
									31.25	11.6	42.9	31.3	30.9	100±15	25.0		
									62.5	16.8	38.4	21.6	24.8	100±15	23.5		
									100	21.7	35.3	17.1	20.8	100±15	22.5		
									155	27.7	32.5	4.7	16.9	100±18	19.0		
									200	32.0	30.8	3.0	14.7	100±20	19.0		
									250	36.4	29.3	—	12.8	100±20	18.0		
									350	44.3	27.2	—	9.9	100±22	17.0		

Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C*

† 1000 ft. (305 m) Cable Length; 2000 ft. (610 m) Cable Length; 5000 ft. (1524 m) Cable Length; 7000 ft. (2134 m) Cable Length; 10000 ft. (3048 m) Cable Length; 15000 ft. (4572 m) Cable Length; 20000 ft. (6096 m) Cable Length; 30000 ft. (9144 m) Cable Length; 40000 ft. (12192 m) Cable Length; 50000 ft. (15240 m) Cable Length; 60000 ft. (18288 m) Cable Length; 70000 ft. (21336 m) Cable Length; 80000 ft. (24384 m) Cable Length; 90000 ft. (27432 m) Cable Length; 100000 ft. (30480 m) Cable Length; 150000 ft. (45720 m) Cable Length; 200000 ft. (60960 m) Cable Length; 300000 ft. (91440 m) Cable Length; 400000 ft. (121920 m) Cable Length; 500000 ft. (152400 m) Cable Length; 600000 ft. (182880 m) Cable Length; 700000 ft. (213360 m) Cable Length; 800000 ft. (243840 m) Cable Length; 900000 ft. (274320 m) Cable Length; 1000000 ft. (304800 m) Cable Length; 1500000 ft. (457200 m) Cable Length; 2000000 ft. (609600 m) Cable Length; 3000000 ft. (914400 m) Cable Length; 4000000 ft. 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Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C*
RJ-45 Compatible • U.S. Patents 5,606,151 and 5,734,126 • Cable passes -40°C Cold Bend per UL1581
Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2, Category 5e

ACR = Attenuation Crosstalk Ratio • BC = Bare Copper • ELFEXT = Equal Level Far-end Crosstalk • NEXT = Near-end Crosstalk • PSUM = Power Sum • RL = Return Loss
*Subject to length de-rating.

†† Pennsylvania Department of Environmental Resources and United States Mine Safety and Health Administration Certification

†2000 ft. put-up available in Black only.

†5000 ft. put-up available in Black only.

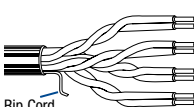
†† Special RJ-45 plugs required, see www.belden.com-tools-connector cross reference

Category 5e DataTuff® Twisted Pair Cables, 4-Pair (continued) Heavy-Duty Sunlight and Oil-Resistant Jackets

Description	Part No.	UL NEC/ C(UL) CEC Type	No. of Pairs	Standard Lengths		Standard Unit Wt.		Nominal OD		Freq. (MHz)	Max. Atten. (dB/ 100m)	Min. PSUM NEXT (dB)	Min. PSUM ACR (dB/ 100m)	Min. PSUM ELFEXT (dB/ 100m)	Input Imped. (Ω)	Min. RL (dB)
				Ft.	m	Lbs.	kg	Inch	mm							

Cat 5e • 24 AWG Solid BC • Twisted Pairs • Rip Cord • See Color Code Chart: Page 5

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black or Blue PVC Jacket

	7918A	NEC: CMR, CMX- Outdoor CEC: CMR FT4	4	1000	304.8	28.0	12.7	.230	5.84	1	2.0	62.3	60.3	60.8	100±15	20.0
				2000†	609.6	52.0	23.6			4	4.1	53.3	49.2	48.7	100±15	23.0
										10	6.5	47.3	40.8	40.8	100±15	25.0
										16	8.2	44.3	36.1	36.7	100±15	25.0
										31.25	11.7	39.9	28.2	30.9	100±15	23.6
										62.5	17.0	35.4	18.4	24.8	100±15	21.5
										100	22.0	32.3	10.3	20.8	100±15	20.1
										200	32.4	27.8	1.0	14.7	100±25	15.0

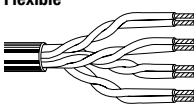
Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C*

RJ-45 Compatible • Cable passes -40°C Cold Bend per UL1581 • Jacket sequentially marked at 2 ft. intervals

Third party verified to TIA/EIA-568-B.2, Category 5e • P-07-KA060003-MSHA**

Enhanced Cat 5e • 24 AWG Bonded-Pairs Stranded TC (7x32) • See Color Code Chart: Page 5

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black, Blue, Gray, Red or Teal PVC Jacket

	7924A	NEC: CMR, CMX- Outdoor CEC: CMR FT4	4	1000	304.8	30.0	13.6	.242	6.15	1	2.4	65.3	62.9	60.8	100±12	20.0
				2000†	609.6	58.0	26.3			4	4.8	56.3	51.5	48.7	100±12	23.6
				5000†	1524.0	145.0	65.7			8	6.8	51.8	45.0	42.7	100±12	25.4
										10	7.7	50.3	42.6	40.8	100±12	26.0
										16	9.7	47.3	37.5	36.7	100±12	26.0
										25	12.4	44.3	31.9	32.8	100±15	25.5
										31.25	13.9	38.4	29.0	30.9	100±15	25.0
										62.5	20.2	35.3	18.3	24.8	100±15	23.5
										100	26.0	32.5	9.2	20.8	100±18	22.5
										155	33.2	30.8	—	16.9	100±18	19.0
										200	38.4	29.3	—	14.7	100±20	19.0
										250	43.7	27.2	—	12.8	100±20	18.0
										350	53.2	—	—	9.9	100±22	17.0

†5000 ft. put-up available in Black only.

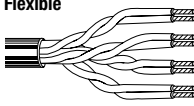
Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C*

RJ-45 Compatible • Cable passes -40°C Cold Bend per UL1581 • U.S. Patents 5,606,151; 5,734,126 and 5,763,823

Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2, Category 5e

Cat 5e • 24 AWG Stranded BC (7x32) • Twisted Pairs • See Color Code Chart: Page 5

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black PVC Jacket

	7930A	NEC: CMR, CMX- Outdoor CEC: CMR FT4	4	1000	304.8	29.0	13.2	.240	6.09	1	2.5	62.3	59.8	60.8	100±15	20.0
				2000	609.6	56.0	25.4			4	4.9	53.3	48.4	48.7	100±15	23.0
										10	7.8	47.3	39.5	40.8	100±15	25.0
										16	9.9	44.3	34.4	36.7	100±15	25.0
										31.25	14.1	39.9	25.8	30.9	100±15	23.6
										62.5	20.4	35.4	15.0	24.8	100±15	21.5
										100	26.4	32.3	5.9	20.8	100±15	20.1
										200	38.9	27.8	—	14.7	100±25	15.0

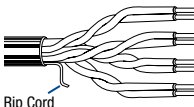
Installation Temperature: -10°C to +75°C; Operating Temperature: -25°C to +75°C*

RJ-45 Compatible • Cable passes -25°C Cold Bend per UL1581 • Jacket sequentially marked at 2 ft. intervals

• Third party verified to TIA/EIA-568-B.2, Category 5e

Enhanced Cat 5e • 22 AWG Bonded-Pairs Solid BC • Rip Cord • See Color Code Chart: Page 5

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black, Blue or Gray PVC Jacket

	7922A	NEC: PLTC, CMR, CMX- Outdoor CEC: CMR FT4	4	1000	304.8	46.3	21.0	.301	7.65	1	2.0	65.3	63.3	60.8	100±12	20.0
				2000†	609.6	92.5	42.0			4	4.0	56.3	52.3	48.7	100±12	23.0
				5000	1524.0	235.0	106.6			8	5.7	51.8	46.1	42.7	100±12	24.5
										10	6.4	50.3	43.9	40.8	100±12	25.0
										16	8.1	47.3	39.1	36.7	100±12	25.0
										25	10.3	44.3	34.1	32.8	100±15	24.3
										31.25	11.6	42.9	31.3	30.9	100±15	23.6
										62.5	16.8	38.4	21.6	24.8	100±15	21.5
										100	21.7	35.3	17.1	20.8	100±15	20.1
										155	27.7	32.5	4.7	16.9	100±18	19.0
										200	32.0	30.8	3.0	14.7	100±20	19.0
										250	36.4	29.3	—	12.8	100±20	18.0
										350	44.3	27.2	—	9.9	100±22	17.0

Installation Temperature: -10°C to +75°C; Operating Temperature: -25°C to +75°C*

Cable passes -25°C Cold Bend per UL1581 • Jacket sequentially marked at 2 ft. intervals

U.S. Patents 5,606,151 and 5,734,126 • Third party verified to TIA/EIA-568-B.2, Category 5e

ACR = Attenuation Crosstalk Ratio • BC = Bare Copper • ELFEXT = Equal Level Far-end Crosstalk • NEXT = Near-end Crosstalk • PSUM = Power Sum • RL = Return Loss

* Subject to length de-rating.

** Pennsylvania Department of Environmental Resources and United States Mine Safety and Health Administration Certification

† 2000 ft. put-up available in Black only.

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Category 5e DataTuff® Twisted Pair Cables, 4-Pair (continued)

Description	Part No.	UL NEC/ C(UL) CEC Type	No. of Pairs	Standard Lengths		Standard Unit Wt.		Nominal OD		Freq. (MHz)	Max. Atten. (dB/ 100m)	Min. PSUM NEXT (dB)	Min. PSUM ACR (dB/ 100m)	Min. PSUM ELFEXT (dB/100m)	Input Imped. (Ω)	Min. RL (dB)
				ft.	m	Lbs.	kg	Inch	mm							

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC • Rip Cord • See Color Code Chart

Non-Plenum • Polyolefin Insulation • Waterblocked • Sunlight- and Oil-resistant Black Polyethylene Jacket

EtherNet/IP Compliant Halogen Free Waterblocked Burial  Rip Cord		7934A	—	4	1000	304.8	25.0	11.4	.230	5.84	1	2.0	62.3	60.0	60.8	100±15	20.0
					4	4.1	53.3	49.0	48.7	100±15	23.6						
					8	5.8	48.8	43.0	42.7	100±15	25.4						
					10	6.5	47.3	41.0	40.8	100±15	26.0						
					16	8.2	44.3	36.0	36.7	100±15	26.0						
					20	9.3	42.8	33.5	34.7	100±15	26.0						
					25	10.4	41.3	30.9	32.8	100±15	25.5						
					31.25	11.7	39.9	28.0	30.9	100±15	25.0						
					62.5	17.0	35.4	19.0	24.8	100±15	23.5						
					100	22.0	32.3	11.0	20.8	100±15	22.5						
					155	28.1	29.5	1.4	16.9	100±25	15.8						
					200	32.0	27.8	1.0	14.7	100±25	15.0						

Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C*

Waterblocked per Telcordia, IEC and ICEA • U.S. Patents 5,606,151 and 5,734,126 • Third party verified to TIA/EIA-568-B.2, Category 5e

RJ-45 Compatible • Cable passes -40°C Cold Bend per UL1581 • Jacket sequentially marked at 3 ft. intervals

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC • See Color Code Chart

Plenum • FEP Insulation • Sunlight-, Oil- and Gas-resistant Black FEP Jacket

EtherNet/IP Compliant High & Low Temp Oil Res I & II Gas Res 	 7928A	NEC:	4	1000	304.8	24.0	10.9	.187	4.75	1	2.0	65.3	63.3	60.8	100±12	20.0
		Limited		5000	1524.0	120.0	54.3			4	4.0	56.3	52.3	48.7	100±12	23.0
		Combustible								8	5.7	51.8	46.1	42.7	100±12	25.0
		FHC 25/50								10	6.4	50.3	43.9	40.8	100±12	26.0
		CMP								16	8.1	47.3	39.1	36.7	100±12	26.0
		CEC:								25	10.3	44.3	34.1	32.8	100±15	25.0
		CMP FT6								31.25	11.6	42.9	31.3	30.9	100±15	25.0
										62.5	16.8	38.4	21.6	24.8	100±15	23.0
										100	21.7	35.3	17.1	20.8	100±15	22.0
										155	27.7	32.5	4.7	16.9	100±18	19.0
										200	32.0	30.8	3.0	14.7	100±20	19.0
										250	36.4	29.3	—	12.8	100±20	18.0
										350	44.3	27.2	—	9.9	100±22	17.0

Installation Temperature: -55°C to +150°C*; Operating Temperature: -70°C to +150°C*

U.S. Patents 5,606,151 and 5,734,126 • Third party verified to TIA/EIA-568-B.2 Category 5e

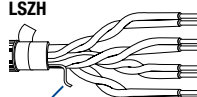
Installation Temperature: -55°C to +150°C; Operating Temperature: -70°C to +150°C*

U.S. Patents 5,606,151 and 5,734,126 • Third party verified to TIA/EIA-568-B.2, Category 5e

RJ-45 Compatible • Cable passes -70°C Cold Bend per UL1581 • Jacket sequentially marked at 2 ft. intervals

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC Conductors • Rip Cord • See Color Code Chart

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight-resistant Black Low Smoke Zero Halogen Jacket

EtherNet/IP Compliant LSZH  Rip Cord IEC 60332-1 Installation Temperature: +5°C to +75°C; Operating Temperature: -10°C to +75°C*	 7935A	NEC:	4	1000	304.8	24.0	10.90	.230	5.84	1	2.0	65.3	63.3	60.8	100±12	20.0
		CM		2000	609.6	44.0	19.96			4	4.0	56.3	52.3	48.7	100±12	23.0
		CEC:								8	5.7	51.8	46.1	42.7	100±12	25.0
		CM FT1								10	6.4	50.3	43.9	40.8	100±12	26.0
										16	8.1	47.3	39.1	36.7	100±12	26.0
										25	10.3	44.3	34.1	32.8	100±15	25.0
										31.25	11.6	42.9	31.3	30.9	100±15	25.0
										62.5	16.8	38.4	21.6	24.8	100±15	23.0
										100	21.7	35.3	17.1	20.8	100±15	22.0
										155	27.7	32.5	4.7	16.9	100±18	19.0
										200	32.0	30.8	3.0	14.7	100±20	19.0
										250	36.4	29.3	—	12.8	100±20	18.0
										350	44.3	27.2	—	9.9	100±22	17.0

IEC 60332-1

Installation Temperature: +5°C to +75°C; Operating Temperature: -10°C to +75°C*

RJ-45 Compatible • U.S. Patents 5,606,151 and 5,734,126

Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2, Category 5e

ACR = Attenuation Crosstalk Ratio • BC = Bare Copper • ELFEXT = Equal Level Far-end Crosstalk • NEXT = Near-end Crosstalk • PSUM = Power Sum • RL = Return Loss

* Subject to length de-rating.

2-Pair Color Codes

Pair No.	Color Combination
1	White/Orange Stripe & Orange
2	White/Green Stripe & Green

4-Pair Color Codes

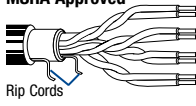
Pair No.	Color Combination
1	White/Blue Stripe & Blue
2	White/Orange Stripe & Orange
3	White/Green Stripe & Green
4	White/Brown Stripe & Brown

Category 5e DataTuff® Twisted Pair Cables, 4-Pair (continued)

Description	Part No.	UL NEC/ C(UL) CEC Type	No. of Pairs	Standard Lengths		Standard Unit Wt.		Nominal OD		Freq. (MHz)	Max. Atten. (dB/ 100m)	Min. PSUM NEXT (dB)	Min. PSUM ACR (dB/100m)	Min. PSUM ELFEXT (dB/100m)	Input Imped. (Ω)	Min. RL (dB)
				Ft.	m	Lbs.	kg	Inch	mm							

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC • Rip Cord • See Color Code Chart: Page 7

Non-Plenum • Polyolefin Insulation • PVC Inner Jacket • .035" Industrial Grade Black, Gray, Red, Teal or Blue PVC Outer Jacket

EtherNet/IP™ Compliant Upjacketed MSHA Approved 	11700A	NEC: CMR, CMX- Outdoor CEC: CMR FT4	4	1000	304.8	39.0	17.7	.285	7.24	1	2.0	65.3	63.3	60.8	100±12	20.0
				3000†	914.4	117.0	53.2			4	4.0	56.3	52.3	48.7	100±12	23.0
										8	5.7	51.8	46.1	42.7	100±12	25.4
										10	6.4	50.3	43.9	40.8	100±12	26.0
										16	8.1	47.3	39.1	36.7	100±12	26.0
								.200	5.08	25	10.3	44.3	34.1	32.8	100±15	25.0
										31.25	11.6	42.9	31.3	30.9	100±15	25.0
										62.5	16.8	38.4	21.6	24.8	100±15	23.0
										100	21.7	35.3	17.1	20.8	100±15	22.5
										155	27.7	32.5	4.7	16.9	100±18	19.0
										200	32.0	30.8	3.0	14.7	100±20	19.0
										250	36.4	29.3	—	12.8	100±20	18.0
										350	44.3	27.2	—	9.9	100±22	17.0

†3000 ft. put-up available in Black only.

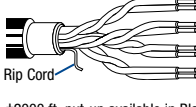
Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C* • P-07-KA060005-MSHA**

Cable passes -40°C Cold Bend per UL1581 • RJ-45 Compatible • U.S. Patents 5,606,151 and 5,734,126

Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2, Category 5e • Outer jacket is sunlight- and oil-resistant

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC • Rip Cord • See Color Code Chart: Page 7

Non-Plenum • Polyolefin Insulation • PVC Inner Jacket • .035" Industrial Grade Black or Blue PVC Outer Jacket

Oil Res I & II Upjacketed 	11700A2	NEC: CMR CEC: CMR FT4	4	1000	304.8	42.0	19.1	.285	7.24	1	2.0	65.3	63.3	60.8	100±12	20.0
				2000†	609.6	86.0	39.1			4	4.0	56.3	52.3	48.7	100±12	23.0
										8	5.7	51.8	46.1	42.7	100±12	24.5
										10	6.4	50.3	43.9	40.8	100±12	25.0
										16	8.1	47.3	39.1	36.7	100±12	25.0
								.200	5.08	25	10.3	44.3	34.1	32.8	100±15	24.3
										31.25	11.6	42.9	31.3	30.9	100±15	23.6
										62.5	16.8	38.4	21.6	24.8	100±15	21.5
										100	21.7	35.3	17.1	20.8	100±15	20.1
										155	27.7	32.5	4.7	16.9	100±18	19.0
										200	32.0	30.8	3.0	14.7	100±20	19.0
										250	36.4	29.3	—	12.8	100±20	18.0
										350	44.3	27.2	—	9.9	100±22	17.0

†2000 ft. put-up available in Black only.

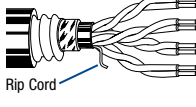
Installation Temperature: +5°C to +75°C; Operating Temperature: -10°C to +75°C*

Cable passes -10°C Cold Bend per UL1581 • RJ-45 Compatible • U.S. Patents 5,606,151 and 5,734,126

Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2, Category 5e • Outer jacket is also sunlight-resistant

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC • Polyester Wrap • Rip Cord • See Color Code Chart: Page 7

AL Interlocked Armor • Polyolefin Insulation • PVC Inner Jacket • .045" Industrial Grade Black, White or Gray PVC Outer Jacket

Interlocked AL Armor 	121700A	NEC: CM CEC: HL CMG FT4	4	1000	304.8	159.0	72.0	.530	13.46	1	2.0	65.3	63.3	60.8	100±12	20.0
				3000†	914.4	459.0	210.6			4	4.0	56.3	52.3	48.7	100±12	23.0
										8	5.7	51.8	46.1	42.7	100±12	24.5
										10	6.4	50.3	43.9	40.8	100±12	25.0
										16	8.1	47.3	39.1	36.7	100±12	25.0
								.200	5.08	25	10.3	44.3	34.1	32.8	100±15	24.3
										31.25	11.6	42.9	31.3	30.9	100±15	23.6
										62.5	16.8	38.4	21.6	24.8	100±15	21.5
										100	21.7	35.3	17.1	20.8	100±15	20.1
										155	27.7	32.5	4.7	16.9	100±18	19.0
										200	32.0	30.8	3.0	14.7	100±20	19.0
										250	36.4	29.3	—	12.8	100±20	18.0
										350	44.3	27.2	—	9.9	100±22	17.0

†3000 ft. put-up available in Black only.

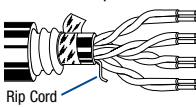
Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C* • RJ-45 Compatible

Cable passes -40°C Cold Bend per UL1581 • U.S. Patents 5,606,151 and 5,734,126 • Jacket sequentially marked at 1 meter intervals

Third party verified to TIA/EIA-568-B.2, Category 5e • Outer jacket is sunlight- and oil-resistant

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC • Polyester Wrap • Rip Cord • See Color Code Chart: Page 7

AL Interlocked Armor • Polyolefin Insulation • PVC Inner Jacket • .045" Industrial Grade Black or Blue PVC Outer Jacket

Interlocked AL Armor -40°C Cold Impact 	121700R	NEC: CM CEC: HL CMG FT4	4	1000	304.8	159.0	72.0	.530	13.46	1	2.0	65.3	63.3	60.8	100±12	20.0
				3000†	914.4	459.0	210.6			4	4.0	56.3	52.3	48.7	100±12	23.0
				5000†	1524.0	690.0	313.0			8	5.7	51.8	46.1	42.7	100±12	24.5
										10	6.4	50.3	43.9	40.8	100±12	25.0
										16	8.1	47.3	39.1	36.7	100±12	25.0
										25	10.3	44.3	34.1	32.8	100±15	24.3
								.200	5.08	31.25	11.6	42.9	31.3	30.9	100±15	23.6
										62.5	16.8	38.4	21.6	24.8	100±15	21.5
										100	21.7	35.3	17.1	20.8	100±15	20.1
										155	27.7	32.5	4.7	16.9	100±18	19.0
										200	32.0	30.8	3.0	14.7	100±20	19.0
										250	36.4	29.3	—	12.8	100±20	18.0
										350	44.3	27.2	—	9.9	100±22	17.0

†3000 ft. and 5000 ft. put-ups available in Blue only. • RJ-45 Compatible • Installation Temperature: -25°C to +75°C;

Operating Temperature: -40°C to +75°C* • Outer Jacket is sunlight and oil-resistant • Jacket sequentially marked at 1 meter intervals

Third party verified to TIA/EIA-568-B.2, Category 5e • U.S. Patents 5,606,151 and 5,734,126

ACR = Attenuation Crosstalk Ratio • AL = Aluminum • BC = Bare Copper • ELFEXT = Equal Level Far-end Crosstalk • NEXT = Near-end Crosstalk

PSUM = Power Sum • RL = Return Loss • TC = Tinned Copper

* Subject to length de-rating.

** Pennsylvania Department of Environmental Resources and United States Mine Safety and Health Administration Certification

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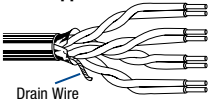


Category 5e DataTuff® Twisted Pair Cables, 4-Pair (continued)

Description	Part No.	UL NEC/ C(UL) CEC Type	No. of Pairs	Standard Lengths		Standard Unit Wt.		Nominal OD		Freq. (MHz)	Max. Atten. (dB/ 100m)	Min. PSUM NEXT (dB)	Min. PSUM ACR (dB/100m)	Min. PSUM ELFEXT (dB/100m)	Input Imped. (Ω)	Min. RL (dB)
				Ft.	m	Lbs.	kg	Inch	mm							

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC • Overall Beldfoil® Shield • 24 AWG Stranded TC Drain Wire • See Color Code Chart

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black, Blue, Red, Gray or Teal PVC Jacket

Shielded MSHA Approved 	7929A	NEC:	4	1000	304.8	37.0	16.8	.265	6.73	1	2.0	62.3	60.3	60.8	100±15	20.0
		CMR,		2000†	609.6	72.0	32.7			4	4.1	53.3	49.2	48.7	100±15	23.0
		CMX-		5000†	1524.0	170.0	77.1			10	6.5	47.3	40.8	40.8	100±15	25.0
		Outdoor								16	8.2	44.3	36.1	36.7	100±15	25.0
		CEC:								31.25	11.7	39.9	28.2	30.9	100±15	23.6
		CMR FT4								62.5	17.0	35.4	18.4	24.8	100±15	21.5
										100	22.0	32.3	10.3	20.8	100±15	20.1
										200	32.4	27.8	1.0	14.7	100±15	15.0

†2000 ft. and 5000 ft. put-up available in Black only.

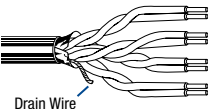
Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C* • P-07-KA060003-MSHA**

RJ-45 Compatible†† • Cable passes -40°C Cold Bend per UL1581 • U.S. Patents 5,606,151 and 5,734,126

Shield is bonded to jacket inner wall for electrical stability. • Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2, Category 5e

Cat 5e • 24 AWG Solid BC • Twisted Pairs • Overall Beldfoil® Shield • 24 AWG Stranded TC Drain Wire • See Color Code Chart

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black or Blue PVC Jacket

Shielded MSHA Approved 	7919A	NEC:	4	1000	304.8	35.0	15.9	.265	6.73	1	2.0	62.3	60.3	60.8	100±15	20.0
		CMR,		2000†	609.6	68.0	30.9			4	4.1	53.3	49.2	48.7	100±15	23.0
		CMX-		5000	1524.0	160.0	72.6			10	6.5	47.3	40.8	40.8	100±15	25.0
		Outdoor								16	8.2	44.3	36.1	36.7	100±15	25.0
		CEC:								31.25	11.7	39.9	28.2	30.9	100±15	23.6
		CMR FT4								62.5	17.0	35.4	18.4	24.8	100±15	21.5
										100	22.0	32.3	10.3	20.8	100±15	20.1

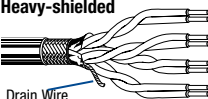
†2000 ft. put-up available in Black only.

Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C* • P-07-KA060004-MSHA** • Cable passes -40°C Cold Bend per UL1581

RJ-45 Compatible • Shield is bonded to jacket inner wall for electrical stability. • Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2, Category 5e

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC • Overall Beldfoil + 70% TC Braid • 24 AWG Solid Spiral Drain Wire • See Color Code Chart

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black, Red & Teal or Blue PVC Jacket

EtherNet/IP Compliant Heavy-shielded 	7921A	NEC:	4	1000	304.8	55.0	24.9	.330	8.38	1	2.0	62.3	60.3	60.8	100±15	20.0
		CMR,		2000†	609.6	106.0	48.1			4	4.1	53.3	49.2	48.7	100±15	23.6
		CMX-								10	6.5	47.3	40.8	40.8	100±15	26.0
		Outdoor								16	8.2	44.3	36.1	36.7	100±15	26.0
		CEC:								31.25	11.7	39.9	28.2	30.9	100±15	25.6
		CMR FT4								62.5	17.0	35.4	18.4	24.8	100±15	23.5
										100	22.0	32.3	10.3	20.8	100±15	22.5

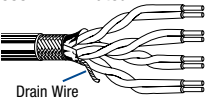
†2000 ft. put-up available in Black only.

Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C* • Cable passes -40°C Cold Bend per UL1581 • RJ-45 Compatible††

U.S. Patents 5,606,151 and 5,734,126 • Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2, Category 5e

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC • Overall Beldfoil + 70% TC Braid • 24 AWG Solid Spiral Drain Wire • See Color Code Chart

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black, Red, Gray, Blue or Teal PVC Jacket

EtherNet/IP Compliant Heavy-shielded 600V AWM Rated 	7957A	NEC:	4	1000	304.8	55.0	24.9	.330	8.38	1	2.0	62.3	60.3	60.8	100±15	20.0
		CMR,		2000†	609.6	106.0	48.1			4	4.1	53.3	49.2	48.7	100±15	23.6
		CMX-								10	6.5	47.3	40.8	40.8	100±15	26.0
		Outdoor								16	8.2	44.3	36.1	36.7	100±15	26.0
		CEC:								31.25	11.7	39.9	28.2	30.9	100±15	25.6
		CMR FT4								62.5	17.0	35.4	18.4	24.8	100±15	23.5
		AWM 21047								100	22.0	32.3	10.3	20.8	100±15	22.5

†2000 ft. put-up available in Black only.

Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C* • Cable passes -40°C Cold Bend per UL1581 • RJ-45 Compatible††

U.S. Patents 5,606,151 and 5,734,126 • Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2, Category 5e

ACR = Attenuation Crosstalk Ratio • AL = Aluminum • BC = Bare Copper • ELFEXT = Equal Level Far-end Crosstalk • NEXT = Near-end Crosstalk

PSUM = Power Sum • RL = Return Loss • TC = Tinned Copper

* Subject to length de-rating.

** Pennsylvania Department of Environmental Resources and United States Mine Safety and Health Administration Certification

†† Special RJ-45 plugs required, see www.belden.com-tools-connector cross reference

4-Pair Color Codes

Pair No.	Color Combination
1	White/Blue Stripe & Blue
2	White/Orange Stripe & Orange
3	White/Green Stripe & Green
4	White/Brown Stripe & Brown

Category 5e DataTuff® Twisted Pair Cables, 4-Pair (continued)

Description	Part No.	UL NEC/ C(UL) CEC Type	No. of Pairs	Standard Lengths		Standard Unit Wt.		Nominal OD		Freq. (MHz)	Max. Atten. (dB/ 100m)	Min. PSUM NEXT (dB)	Min. PSUM ACR (dB/ 100m)	Min. PSUM ELFEXT (dB/100m)	Input Imped. (Ω)	Min. RL (dB)
				Ft.	m	Lbs.	kg	Inch	mm							

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC • Overall Beldfoil Shield • 24 AWG Stranded TC Drain Wire • See Color Code Chart

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight-resistant Black Low Smoke Zero Halogen Jacket

Shielded LSZH		7936A	CEC: CMG FT4	4	1000	304.8	35.0	15.90	.265	6.73	1	2.0	62.3	60.3	60.8	100±15	20.0
					2000	609.6	76.0	34.50			4	4.1	53.3	49.2	48.7	100±15	23.0
											10	6.5	47.3	40.8	40.8	100±15	25.0
											16	8.2	44.3	36.1	36.7	100±15	25.0
											31.25	11.7	39.9	28.2	30.9	100±15	23.6
											62.5	17.0	35.4	18.4	24.8	100±15	21.5
											100	22.0	32.3	10.3	20.8	100±15	20.1

IEC 60332-3

Installation Temperature: +5°C to +75°C; Operating Temperature: -10°C to +75°C*

RJ-45 Compatible • U.S. Patents 5,606,151 and 5,734,126

Shield is bonded to jacket inner wall for electrical stability • Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2, Category 5e

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC • Overall Beldfoil Shield • 24 AWG Stranded TC Drain Wire

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black, Red, Gray, Blue or Teal PVC Jacket

EtherNet/IP™ Compliant Shielded 600V AWM Rated MSHA Approved		7958A	NEC: CMR, CMX- Outdoor CEC: CMR FT4 AWM 21047	4	1000	304.8	37.0	16.8	.265	6.73	1	2.0	62.3	60.3	60.8	100±15	20.0
					2000†	609.6	72.0	32.7			4	4.1	53.3	49.2	48.7	100±15	23.0
											10	6.5	47.3	40.8	40.8	100±15	25.0
											16	8.2	44.3	36.1	36.7	100±15	25.0
											31.25	11.7	39.9	28.2	30.9	100±15	23.6
											62.5	17.0	35.4	18.4	24.8	100±15	21.5
											100	22.0	32.3	10.3	20.8	100±15	20.1

†2000 ft. put-up available in Black only.

Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C* • P-07-KA060003-MSHA**

RJ-45 Compatible†† • Cable passes -40°C Cold Bend per UL1581 • U.S. Patents 5,606,151 and 5,734,126

Shield is bonded to jacket inner wall for electrical stability • Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2, Category 5e

Enhanced Cat 5e • 24 AWG Bonded-Pairs Solid BC • Overall Beldfoil Shield • 24 AWG Stranded TC Drain Wire • See Color Code Chart

Polyolefin Insulation • Waterblocked • PE Inner Jacket • Sunlight- and Oil-resistant Black PE Outer Jacket

Halogen Free Shielded Waterblocked Burial		7937A	—	4	1000	304.8	38.0	17.23	.276	7.01	1	2.0	62.3	60.3	60.8	100±15	20.0
											4	4.1	53.3	49.2	48.7	100±15	23.0
											10	6.5	47.3	40.8	40.8	100±15	25.0
											16	8.2	44.3	36.1	36.7	100±15	25.0
											31.25	11.7	39.9	28.2	30.9	100±15	23.6
											62.5	17.0	35.4	18.4	24.8	100±15	21.5
											100	22.0	32.3	10.3	20.8	100±15	20.1

†2000 ft. put-up available in Black only.

Installation Temperature: -25°C to +75°C • Operating Temperature: -40°C to +75°C*

Waterblocked per Telcordia, IEC and ICEA • RJ-45 Compatible • Cable passes -40°C Cold Bend per UL1581 • U.S. Patents 5,606,151 and 5,734,126 • Jacket sequentially marked at 2 ft. intervals

Cat 5e • 24 AWG Bonded-Pairs Stranded BC (7x32) • Overall Beldfoil Shield • 24 AWG Stranded TC Drain Wire • See Color Code Chart

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black, Red, Blue Gray or Teal PVC Jacket

Shielded, Stranded		7939A	NEC: CMR, CMX-Outdoor CEC: CMR FT4	4	1000	304.8	40.0	18.18	.315	8.00	1	2.5	62.3	59.8	60.8	100±15	20.0
					2000†	609.6	79.0	35.83			4	4.9	53.3	48.4	48.7	100±15	23.0
											8	6.9	48.8	41.9	42.7	100±15	24.5
											10	7.8	47.3	39.5	40.8	100±15	25.0
											16	9.9	44.3	34.4	36.7	100±15	25.0
											20	11.1	42.8	31.7	34.7	100±15	25.0
											25	12.5	41.3	28.8	32.8	100±15	24.3

†2000 ft. put-up available in Black only.

Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C*

Cable passes -40°C Cold Bend per UL1581 • RJ-45 Compatible†† • Jacket sequentially marked at 2 ft. intervals

ACR = Attenuation Crosstalk Ratio • BC = Bare Copper • Cu = Copper • ELFEXT = Equal Level Far-end Crosstalk • NEXT = Near-end Crosstalk • PSUM = Power Sum • RL = Return Loss

* Subject to length de-rating.

** Pennsylvania Department of Environmental Resources and United States Mine Safety and Health Administration Certification

†† Special RJ-45 plugs required, see www.belden.com-tools-connector cross reference

4-Pair Color Codes

Pair No.	Color Combination
1	White/Blue Stripe & Blue
2	White/Orange Stripe & Orange
3	White/Green Stripe & Green
4	White/Brown Stripe & Brown

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Category 5e DataTuff® Twisted Pair Cables, 4-Pair (continued)

Description	Part No.	UL NEC/ C(UL) CEC Type	No. of Pairs	Standard Lengths		Standard Unit Wt.		Nominal OD		Freq. (MHz)	Max. Atten. (dB/ 100m)	Min. PSUM NEXT (dB)	Min. PSUM ACR (dB/ 100m)	Min. PSUM ELFEXT (dB/100m)	Input Imped. (Ω)	Min. RL (dB)
				Ft.	m	Lbs.	kg	Inch	mm							

Cat 5e • 24 AWG Bonded-Pairs Stranded Cu Alloy Conductor (7x32) • Overall Beldfoil Shield + 85% TC Braid & Drain Wire • See Color Code Chart: Page 8

Non-Plenum • Polyolefin Insulation • TPE Inner Jacket • Sunlight-, Oil-, Weldsplatter-resistant Matte Black TPE Outer Jacket

Upjacket	7938A	FT1	4	500†	152.4	28	12.7	0.34	8.60	1	2.5	62.3	59.8	60.8	100±15	20.0
Shielded, Stranded		AWM 20626								4	4.9	53.3	48.4	48.7	100±15	23.0
Continuous Flex Rated:										10	7.8	47.3	39.5	40.8	100±15	25.0
10 Million Cycles										16	9.9	44.3	34.4	36.7	100±15	25.0
										31.25	14.1	39.9	25.8	30.9	100±15	23.6
										62.5	20.4	35.4	15.0	24.8	100±15	21.5
										100	26.4	32.3	5.9	20.8	100±15	20.1

Drain Wire

†Final one-piece put-up length may vary -0 to +10% from length shown.

Installation Temperature: -25°C to +80°C; Operating Temperature: -40°C to +80°C* • RJ-45 Compatible†† • Cable passes -40°C Cold Bend per UL1581 • Jacket sequentially marked at 2 ft. intervals

ACR = Attenuation Crosstalk Ratio • BC = Bare Copper • Cu = Copper • ELFEXT = Equal Level Far-end Crosstalk • NEXT = Near-end Crosstalk • PSUM = Power Sum • RL = Return Loss
• TC = Tinned Copper • TPE = Thermoplastic Elastomer

* Subject to length de-rating.

** Pennsylvania Department of Environmental Resources and United States Mine Safety and Health Administration Certification

†† Special RJ-45 plugs required, see www.belden.com-tools-connector cross reference

Industrial Data Solutions® – Industrial Ethernet

Category 6 DataTuff® Twisted Pair Cables, 4-Pair

Heavy-Duty Sunlight and Oil-Resistant Jackets

Cat 6 • 23 AWG Bonded-Pairs Solid BC • Internal Tape Separator • Rip Cord • See Color Code Chart: Page 8

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Red, Blue, Gray, Black or Teal PVC Jacket

EtherNet/IP Compliant	7940A	NEC: CMR CEC: CMR FT4 CMX Outdoor	4	1000 2000†	304.8 609.6	32.0 64.0	14.5 29.0	.250	6.35	1	2.0	72.3	70.3	64.8	100±15	20.0
										4	4.9	53.3	48.4	48.7	100±15	23.0
										8	5.3	58.8	53.4	46.7	100±17	24.5
										10	6.0	57.3	51.3	44.8	100±18	25.0
										16	7.6	54.3	46.7	40.7	100±19	25.0
										20	8.5	52.8	44.3	38.7	100±20	25.0
										25	9.5	51.3	41.8	36.8	100±21	24.3
										31.5	10.7	49.9	39.2	34.9	100±22	23.6
										62.5	15.4	45.4	30.0	28.8	100±23	21.5
										100	19.8	42.3	22.5	24.8	100±24	20.1
										155	25.2	39.5	14.3	20.9	100±25	18.8
										200	29.0	37.8	8.8	18.7	100±26	18.0
										250	32.8	36.3	3.5	16.8	100±27	17.3

†2000 ft. put-up available in Black only.

Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C*

RJ-45 Compatible†† • Cable passes -40°C Cold Bend per UL1581 • U.S. Patents 5,606,151; 5,734,126 and 5,821,467

Jacket sequentially marked at 2 ft. intervals • Verified to TIA/EIA-568-B.2-1, Category 6

Enhanced Cat 6 • 23 AWG Bonded-Pairs Solid BC • Patented E-Spline Center Member • Rip Cord • See Color Code Chart: Page 8

Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black PVC Jacket

	7927A	NEC: CMR CEC: CMR FT4	4	1000 2000	304.8 609.6	44.0 88.0	20.0 39.9	.251 x .339	6.38 x 8.61	1	10.9	80.3	78.5	70.8	100±12	20.0
										10	5.7	66.3	59.6	5.08	100±12	25.0
										31.25	10.2	57.9	47.7	40.9	100±15	25.0
										62.5	14.7	53.4	38.7	34.9	100±15	25.0
										100	18.9	50.3	31.4	30.8	100±15	25.0
										155	23.9	47.5	23.5	27.0	100±15	22.8
										200	27.5	45.8	18.3	24.8	100±15	21.7
										250	31.2	44.3	13.2	22.8	100±20	20.5
										350	37.7	40.2	4.5	19.9	100±22	19.8
										400	40.6	39.3	0.6	18.8	100±22	19.5
										500	46.2	37.8	>0.0**	16.8	100±22	18.4
										550	48.8	37.2	—	16.0	100±22	18.0
										250	32.8	36.3	—	15.2	100±22	17.6

**PSUM ACR >0 is guaranteed to 460 MHz.

Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C* • RJ-45 Compatible††

Cable passes -40°C Cold Bend per UL1581 • U.S. Patents 5,606,151; 5,734,126; 5,789,711 and 6,297,454-B1

Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2-1, Category 6

ACR = Attenuation Crosstalk Ratio • AL = Aluminum • BC = Bare Copper • ELFEXT = Equal Level Far-end Crosstalk • FRPO = Flame-Retardant Polyolefin • NEXT = Near-end Crosstalk • PSUM = Power Sum • RL = Return Loss

* Subject to length de-rating.

†† Special RJ-45 plugs required, see www.belden.com-tools-connector cross reference

Category 6 DataTuff® Twisted Pair Cables, 4-Pair (continued)

Description	Part No.	UL NEC/ C(UL) CEC Type	No. of Pairs	Standard Lengths		Standard Unit Wt.		Nominal OD		Freq. (MHz)	Max. Atten. (dB/ 100m)	Min. PSUM NEXT (dB)	Min. PSUM ACR (dB/ 100m)	Min. PSUM ELFEXT (dB/100m)	Input Imped. (Ω)	Min. RL (dB)
				Ft.	m	Lbs.	kg	Inch	mm							

Cat 6 • 23 AWG Bonded-Pairs Solid BC • See Color Code Chart: Page 8

Plenum • FEP Insulation • Sunlight-, Oil- and Gas-resistant Black FEP Jacket

High & Low Temp Oil Res I & II Gas Res 		7931A	NEC:	4	1000	304.8	35.0	15.9	.214	5.44	1	2.0	72.3	70.3	64.8	100±15	20.0	
			Limited									10	6.0	57.3	51.3	44.8	100±15	25.0
			Combustible									20	8.5	52.8	44.3	38.7	100±15	25.0
			FHC 25/50									31.25	10.7	49.9	39.2	34.9	100±15	23.6
			CMP									62.5	15.4	45.4	30.0	28.8	100±15	21.5
			CEC:									100	19.8	42.3	22.5	24.8	100±15	20.1
			CMP FT6									200	29.0	37.8	8.8	18.7	100±22	18.0
												250	32.8	36.3	3.5	16.8	100±32	17.3

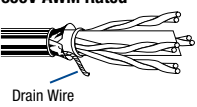
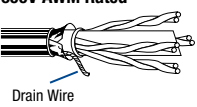
Installation Temperature: -55°C to +150°C; Operating Temperature: -70°C to +150°C*

RJ-45 Compatible • Cable passes -70°C Cold Bend per UL1581 • U.S. Patents 5,606,151 and 5,734,126

Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2-1, Category 6

Cat 6 • 23 AWG Bonded-Pairs Solid BC • Internal Tape Separator • Overall Beldfoil Shield • Rip Cord • See Color Code Chart: Page 8

Non-Plenum • Polyolefin Insulation • PVC Inner Jacket • .030" Industrial Grade Sunlight- and Oil-resistant Black, Red, Blue, Gray or Teal PVC Outer Jacket

EtherNet/IP Compliant Shielded 600V AWM Rated 		7953A	NEC: CMR CEC: CMR FT4 CMX Outdoor AWM 21047	4	1000 5000†	304.8 1524.0	32.0 260.0	14.5 117.9	.340	8.64	1	2.0	72.3	70.3	64.8	100±15	20.0
											4	3.8	63.3	59.5	52.7	100±16	23.0
											8	5.3	58.8	53.4	46.7	100±17	24.5
											10	6.0	57.3	51.3	44.8	100±18	25.0
											16	7.6	54.3	46.7	40.7	100±19	25.0
											20	8.5	52.8	44.3	38.7	100±20	25.0
											25	9.5	51.3	41.8	36.8	100±21	24.3
											31.5	10.7	49.9	39.2	34.9	100±22	23.6
											62.5	15.4	45.4	30.0	28.8	100±23	21.5
											100	19.8	42.3	22.5	24.8	100±24	20.1
											155	25.2	39.5	14.3	20.9	100±25	18.8
											200	29.0	37.8	8.8	18.7	100±26	18.0
											250	32.8	36.3	3.5	16.8	100±27	17.3

†5000 ft. put-up available in Black only. Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C*

RJ-45 Compatible†† • Cable passes -40°C Cold Bend per UL1581 • U.S. Patents 5,606,151, 5,734,126 and 5,821,467

†5000 ft. put-up available in Black only. Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C*

RJ-45 Compatible†† • Cable passes -40°C Cold Bend per UL1581 • U.S. Patents 5,606,151, 5,734,126 and 5,821,467

Jacket sequentially marked at 2 ft. intervals • Verified to TIA/EIA-568-B.2-1, Category 6

Enhanced Cat 6 • 23 AWG Bonded-Pairs Solid BC • Rip Cord • See Color Code Chart: Page 8

Non-Plenum • Polyolefin Insulation • PVC Inner Jacket • .035" Industrial Grade Black or Gray PVC Outer Jacket

Upjacketed  11872A NEC: CM CEC: CM FT1 	4	1000	304.8	66.0	30.0	.475	12.07	1	1.9	72.3	70	64.8	100±12	20.0			
						x	x	4	3.7	63.3	59	52.7	100±12	25.0			
						.265	6.73	10	5.9	57.3	51	44.8	100±12	25.0			
								16	7.5	54.3	46	40.7	100±12	25.0			
								31.25	10.63	49.9	39	34.9	100±15	23.6			
								62.5	15.4	45.4	30	28.8	100±15	21.5			
								100	19.8	42.3	25	24.8	100±15	21.0			
						.365	9.27	155	25.1	39.5	14	20.9	100±15	21.0			
						x	x	200	29.0	37.9	10	18.7	100±15	21.0			
						.165	4.19	310	37.1	34.9	—	14.9	100±20	18.0			
						x	x	350	39.8	34.2	—	13.9	100±22	17.0			
Value provided for information only.											400	43.0	33.3	—	12.7	100±32	14.0
Installation Temperature: -10°C to +75°C; Operating Temperature: -25°C to +75°C*											500***	49.0	31.8	—	10.8	100±32	14.0
Cable passes -25°C Cold Bend per UL 1581 • UL Patents 5,606,151 • 5,734,126 and 5,821,467																	

***Value provided for information only.

Installation Temperature: -10°C to +75°C; Operating Temperature: -25°C to +75°C*

Cable passes -25°C Cold Bend per UL1581 • U.S. Patents 5,606,151, 5,734,126 and 5,821,467

RJ-45 Compatible • Jacket sequentially marked at 2 ft. intervals

Enhanced Cat 6 • 23 AWG Bonded-Pairs Solid BC • Polyester Wrap • Rip Cord • See Color Code Chart: Page 8

Non-Plenum • Polyolefin Insulation • PVC Inner Jacket • .055" Industrial Grade Black or Gray PVC Outer Jacket

Interlocked AL Armor 		121872A NEC: CM CEC: HL CMG FT4	4	1000	304.8	222.0	100.6	.684	17.37	1	1.9	72.3	70	64.8	100±12	20.0
				5000†	1524.0	1160.0	526.2			4	3.7	63.3	59	52.7	100±12	23.0
										10	5.9	57.3	51	44.8	100±12	25.0
										16	7.5	54.3	46	40.7	100±12	25.0
										31.25	10.6	49.9	39	34.9	100±15	23.6
										62.5	15.4	45.4	30	28.8	100±15	21.5
										100	19.8	42.3	25	24.8	100±15	21.0
										155	25.1	39.5	14	20.9	100±15	21.0
										200	29.0	37.9	10	18.7	100±15	21.0
										310	37.1	34.9	—	14.9	100±20	18.0
										350	39.8	34.2	—	13.9	100±22	17.0
						400***	43.0	33.3	—	12.7	100±32	14.0				
						500***	49.0	31.8	—	10.8	100±32	14.0				

***Value provided for information only. †5000 ft. put-up available in Black only.

Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C*

RJ-45 Compatible • Cable passes -40°C Cold Bend per UL1581 • U.S. Patents 5,606,151, 5,734,126 and 5,821,467

***Value provided for information only. †5000 ft. put-up available in Black only.

Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C*

RJ-45 Compatible • Cable passes -40°C Cold Bend per UL1581 • U.S. Patents 5,606,151, 5,734,126 and 5,821,467

Jacket sequentially marked at 2 ft intervals

ACR = Attenuation Crosstalk Ratio • AL = Aluminum • BC = Bare Copper • ELFEXT = Equal Level Far-end Crosstalk • FRPO = Flame-Retardant Polyolefin • NEXT = Near-end Crosstalk • PSUM = Power Sum • RL = Return Loss

* Subject to length de-rating.

†† Special RJ-45 plugs required, see www.belden.com-tools-connector cross reference

Be Certain with Belden



DataTuff® Industrial Ethernet Cable Selection Guide

This chart is meant to help the user in proper cable selection.

Part No.	No. of Pairs	Shielding		Conductor		Installation		Environmental Issues										Industrial Grade Jacket		
		Unshielded	Shielded	Solid	Stranded	Installation Stress Resistance††	Pull Tension	Oil Resistance	UV Sunlight Resistance	Weld - Splatter Resistance	CMX/ Outdoor	Under-ground (burial)	Gasoline Resistance	LSZH	MSHA	Hi/Lo Temp	600V UL AWM Rated	Heavy	Upjacket	Armored
Category 5e Cable																				
7932A <i>EtherNet/IP</i>	2	•		•		•	20	•	•									•		
7933A <i>EtherNet/IP</i>	2		•	•		•	20	•	•									•		
7923A <i>EtherNet/IP</i>	4	•		•		•	40	•	•		•					•		•		
7918A	4	•		•			35	•	•		•					•		•		
7924A	4	•			•	•	40	•	•		•							•		
7930A	4	•			•		25	•	•		•							•		
7922A PLTC	4	•		•		•	40	•	•		•							•		
7934A <i>EtherNet/IP</i>	4	•		•		•	40	•	•			•						•		
7937A	4		•	•		•	40	•	•			•							•	
7939A	4		•		•	•	40	•	•		•							•		
7928A <i>EtherNet/IP</i>	4	•		•		•	40	•	•				•			•		•		
11700A <i>EtherNet/IP</i>	4	•		•		•	40	•	•		•				•				•	
11700A2 Oil Res I&II	4	•		•		•	40	•	•										•	
121700A	4	•		•		•	40	•	•											•
121700R	4	•		•		•	40	•	•											•
7929A	4		•	•		•	40	•	•		•					•		•		
7919A	4		•	•			25	•	•		•					•		•		
7921A <i>EtherNet/IP</i>	4		•	•		•	75	•	•		•							•		
7957A <i>EtherNet/IP</i>	4		•	•		•	75	•	•		•						•	•		
7935A <i>EtherNet/IP</i>	4	•		•		•	40		•					•				•		
7936A	4		•	•		•	40		•					•				•		
7958A <i>EtherNet/IP</i>	4		•	•		•	35	•	•		•				•		•	•		
7938A High Flex	4		•		•	•	40	•	•	•									•	
Category 6 Cable																				
7927A	4	•		•		•	45	•	•									•		
7931A	4	•		•		•	40	•	•				•			•		•		
7940A <i>EtherNet/IP</i>	4	•		•		•	40	•	•		•							•		
11872A	4	•		•		•	45												•	
7953A <i>EtherNet/IP</i>	4		•	•		•	40	•	•		•						•		•	
121872A	4	•		•		•	200		•											•

▲ Shielded products are recommended for high-noise environments.

▲▲ Stranded products are recommended where more flexibility is needed.

†† Products with Bonded-Pair technology provide Installable Performance® advantages — refer to Belden's Bonded-Pair Cable Bulletin #BP02

Field-Installable Metal Body Ruggedized Plug (RJ45). Cat 6. IP20



Belden Part No.	Description	Package Quantity
R301601 000S1	UTP/STP, T568A Plug	1
R301602 000S1	UTP/STP, T568B Plug	1

TrayOptic® Industrial, Heavy-Duty, All Dielectric Cable Loose Tube — Indoor/Outdoor Riser Rated

Applications

- Industrial and other harsh environment applications
- Factory automation
- Direct burial

Product Description

Laser Optimized Fiber to handle Gigabit Ethernet light sources and expanded bandwidth requirements. Passes IEEE 1202/583-2003 flame test. Waterblocking agent for moisture protection. CPE outer jacket option provides extra chemical or abrasion resistance.

Jacket Material	PVC or CPE
Strength Member	Aramid Yarn
Jacket Color	
Single-mode	Yellow
62.5/125 µm	Orange
50/125 µm / 1 Gb	Orange
50/125 µm / 10 Gb	Aqua

Ratings

Riser	OFNR
UL Type	cUL Type
Flame Resistance	IEEE 1202 / 383-2003

Complies to:

TIA/EIA-568-C.3
ICEA S-104-696

Functional Requirements of:

GR-20-CORE
GR-409-CORE

Specifications

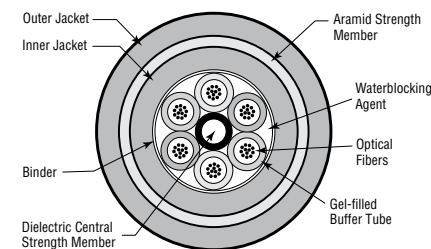
Temperature Range	
Storage	-40 to +70°C
Operating	-40 to +70°C
Crush Resistance (EIA-455-41)	
Impact Resistance (EIA-455-25)	2000 impacts @ 1.6N-m

Cyclic Flexing (EIA-455-104) 25 cycles, 12 lbs., 20 x OD radius min.

Min. Bend Radius
Installation 20 x OD
Long Term 15 x OD

Maximum Installation Load 600 lbs. (2700 N)

Fiber Bundle Detail



No. of Fibers	No. of Fibers Per Bundle	Belden Part Number					Outside Diameter		Weight		Max. Install Load	
		OM1 62.5 / 125 µm Std. / 1 Gb	OM2 50 / 125 µm Std. / 1 Gb	OM3 50 / 125 µm 10 Gb - 300 m	OM4 50 / 125 µm 10 Gb - 550 m	OS2 Single-mode Enhanced	Inch	mm	lb/1000 ft	kg/km	lb	N

TrayOptic Series



Riser (NEC/CEC OFNR/OFN FT.4) PVC Jacket Indoor/Outdoor

2	2	I100255	I1A0255	I1C0255	I1E0255	I1W0255	0.43	11	92	136	600	2700
4	4	I100455	I1A0455	I1C0455	I1E0455	I1W0455	0.43	11	92	136	600	2700
6	6	I100655	I1A0655	I1C0655	I1E0655	I1W0655	0.43	11	92	136	600	2700
8	4	I400855	I4A0855	I4C0855	I4E0855	I4W0855	0.43	11	92	136	600	2700
12	6	I601255	I6A1255	I6C1255	I6E1255	I6W1255	0.43	11	92	136	600	2700
18	6	I601855	I6A1855	I6C1855	I6E1855	I6W1855	0.43	11	92	136	600	2700
24	6	I602455	I6A2455	I6C2455	I6E2455	I6W2455	0.43	11	92	136	600	2700
36	6	I603655	I6A3655	I6C3655	I6E3655	I6W3655	0.43	11	92	136	600	2700
48	12	I604855	I6A4855	I6C4855	I6E4855	I6W4855	0.54	13.72	128	186	600	2700
60	12	I606055	I6A6055	I6C6055	I6E6055	I6W6055	0.54	13.72	128	186	600	2700
72	12	I607255	I6A7255	I6C7255	I6E7255	I6W7255	0.54	13.72	128	186	600	2700

Riser (NEC/CEC OFNR/OFN FT.4) CPE Jacket Indoor/Outdoor

2	2	I100266	I1A0266	I1C0266	I1E0266	I1W0266	0.43	10.9	89	124	600	2700
4	4	I100466	I1A0466	I1C0466	I1E0466	I1W0466	0.43	10.9	89	124	600	2700
6	6	I100666	I1A0666	I1C0666	I1E0666	I1W0666	0.43	10.9	89	124	600	2700
8	4	I400866	I4A0866	I4C0866	I4E0866	I4W0866	0.43	10.9	89	124	600	2700
12	6	I601266	I6A1266	I6C1266	I6E1266	I6W1266	0.43	10.9	89	124	600	2700
18	6	I601866	I6A1866	I6C1866	I6E1866	I6W1866	0.43	10.9	89	124	600	2700
24	6	I602466	I6A2466	I6C2466	I6E2466	I6W2466	0.43	10.9	89	124	600	2700
36	6	I603666	I6A3666	I6C3666	I6E3666	I6W3666	0.43	10.9	89	124	600	2700
48	12	I604866	I6A4866	I6C4866	I6E4866	I6W4866	0.54	13.72	125	192	600	2700
60	12	I606066	I6A6066	I6C6066	I6E6066	I6W6066	0.54	13.72	125	192	600	2700
72	12	I607266	I6A7266	I6C7266	I6E7266	I6W7266	0.54	13.72	125	192	600	2700