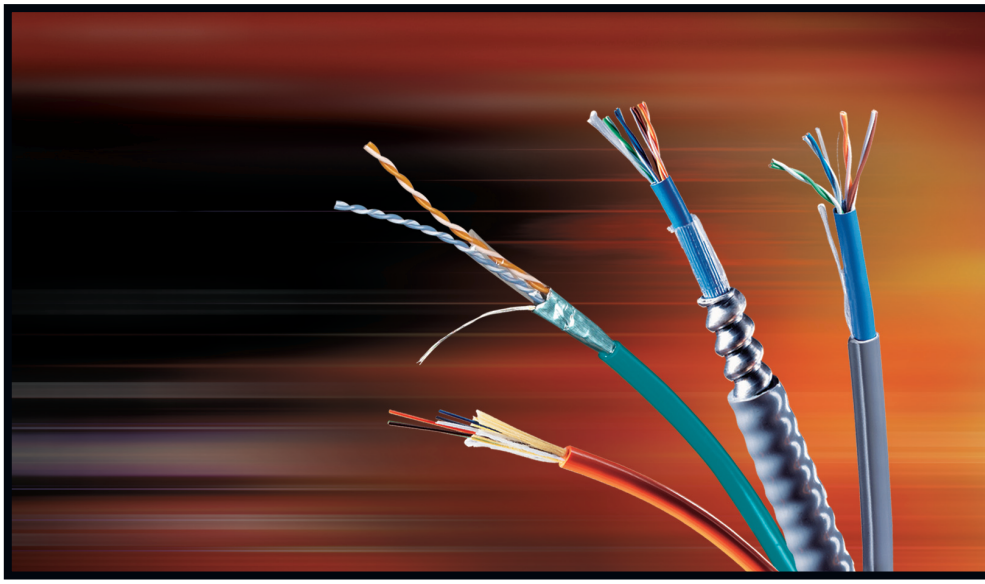
BELDEN

Product Bulletin

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.

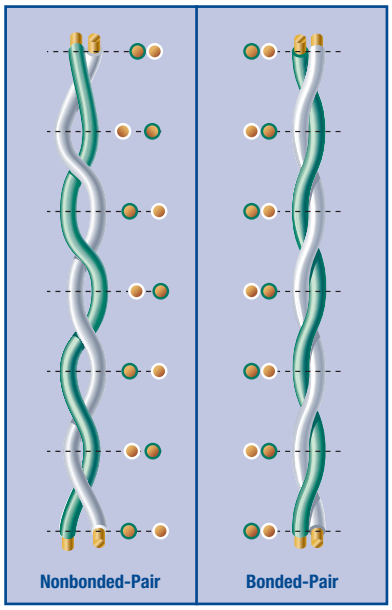
Belden's answer is to offer a complete range of high quality, high reliability DataTuff® Industrial Ethernet cables that have been designed for industrial use and tested using state-of-the-art testing equipment. Belden DataTuff cables are also field-proven relative to exceptional day-in/day-out performance.

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.

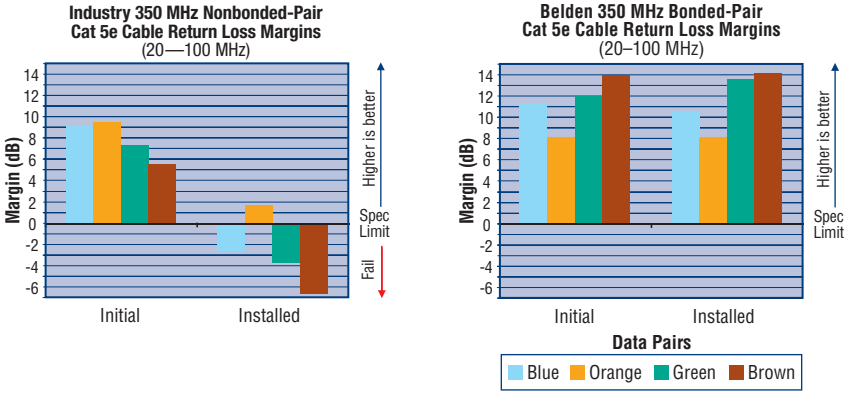


Installed and manipulated nonbonded-pairs (left) have a tendency to gap, varying the centricity of the two conductors. `Bonded-Pairs (right) do not gap so the physical integrity of the pair is maintained.

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.")*



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.

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.

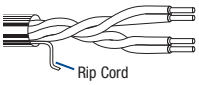
Belden Quality Means Uptime and Superior Safety Performance

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.

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	7932A	NEC: CMR CEC: CMR FT4	2	1000	304.8	19.0	8.62	.207	5.26	1	2.0	65.3	63.3	60.8	100±12	20.0
				2000†	609.6	38.0	17.25			4	4.0	56.3	52.3	48.7	100±12	23.6
										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
										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

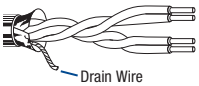


Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C*
M-12 or RJ-45 Compatible • U.S. Patents 5,606,151 and 5,734,126 • Cable passes -40°C Cold Bend per UL1581
Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2, Category 5e

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, Red or Teal PVC Jacket

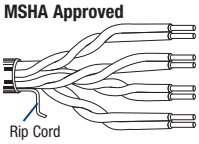
EtherNet/IP™ Compliant **Shielded**	7933A	NEC: CMR CEC: CMR FT4	2	1000	304.8	32.0	14.5	.227	5.77	1	2.0	62.3	60.3	60.8	100±15	20.0
				2000†	609.6	64.8	29.4			4	4.1	53.3	49.2	48.7	100±15	23.6
										10	6.5	47.3	40.8	40.8	100±15	26.0
										16	8.2	44.3	36.1	36.7	100±15	26.0
										31.25	11.7	39.9	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, Red or Teal PVC Jacket																
EtherNet/IP™ Compliant **MSHA Approved**	7923A	NEC: CMR, CMX-Outdoor CEC: CMR FT4	4	1000	304.8	28.0	12.7	.230	5.84	1	2.0	65.3	63.3	60.8	100±12	20.0
				2000†	609.6	54.0	24.5			4	4.0	56.3	52.3	48.7	100±12	23.6
										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
										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 • Shield is bonded to jacket inner wall for electrical stability

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

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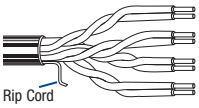
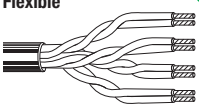
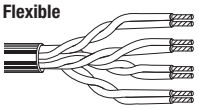
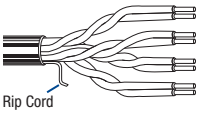
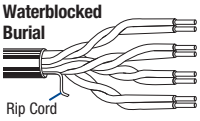
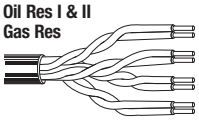
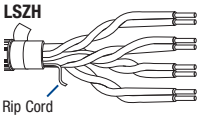
Category 5e DataTuff® Twisted Pair Cables, 4-Pair (continued)
Heavy-Duty Sunlight and Oil-Resistant Jackets

Description	Part No.	UL NEC/ C(UL) CEC Type	No. of Pairs	Standard Lengths Ft.	Standard Lengths m	Standard Unit Wt. Lbs.	Standard Unit Wt. kg	Nominal OD Inch	Nominal OD mm	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)
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																
MSHA Approved  Rip Cord	**7918A**	NEC: CMR, CMX- Outdoor CEC: CMR FT4	4	1000 2000†	304.8 609.6	28.0 52.0	12.7 23.6	.230	5.84	1 4 10 16 31.25 62.5 100 200	2.0 4.1 6.5 8.2 11.7 17.0 22.0 32.4	62.3 53.3 47.3 44.3 39.9 35.4 32.3 27.8	60.3 49.2 40.8 36.1 28.2 18.4 10.3 1.0	60.8 48.7 40.8 36.7 30.9 24.8 20.8 14.7	100±15 100±15 100±15 100±15 100±15 100±15 100±15 100±25	20.0 23.0 25.0 25.0 23.6 21.5 20.1 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, Red or Teal PVC Jacket																
Stranded Flexible 	**7924A**	NEC: CMR, CMX- Outdoor CEC: CMR FT4	4	1000 2000†	304.8 609.6	30.0 58.0	13.6 26.3	.242	6.15	1 4 8 10 16 25 31.25 62.5 100 155 200 250 350	2.4 4.8 6.8 7.7 9.7 12.4 13.9 20.2 26.0 33.2 38.4 43.7 53.2	65.3 56.3 51.8 50.3 47.3 44.3 42.9 38.4 35.3 32.5 30.8 29.3 27.2	62.9 51.5 45.0 42.6 37.5 31.9 29.0 18.3 9.2 — — — —	60.8 48.7 42.7 40.8 36.7 32.8 30.9 24.8 20.8 16.9 14.7 12.8 9.9	100±12 100±12 100±12 100±12 100±12 100±15 100±15 100±15 100±18 100±18 100±20 100±20 100±22	20.0 23.6 25.4 26.0 26.0 25.5 25.0 23.5 22.5 19.0 19.0 18.0 17.0
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 • 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																
Stranded Flexible 	**7930A**	NEC: CMR, CMX- Outdoor CEC: CMR FT4	4	1000 2000	304.8 609.6	29.0 56.0	13.2 25.4	.240	6.09	1 4 10 16 31.25 62.5 100 200	2.5 4.9 7.8 9.9 14.1 20.4 26.4 38.9	62.3 53.3 47.3 44.3 39.9 35.4 32.3 27.8	59.8 48.4 39.5 34.4 25.8 15.0 5.9 —	60.8 48.7 40.8 36.7 30.9 24.8 20.8 14.7	100±15 100±15 100±15 100±15 100±15 100±15 100±15 100±25	20.0 23.0 25.0 25.0 23.6 21.5 20.1 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 PVC Jacket																
PLTC  Rip Cord	**7922A**	NEC: PLTC, CMR, CMX- Outdoor CEC: CMR FT4	4	1000 2000	304.8 609.6	46.3 92.5	21.0 42.0	.301	7.65	1 4 8 10 16 25 31.25 62.5 100 155 200 250 350	2.0 4.0 5.7 6.4 8.1 10.3 11.6 16.8 21.7 27.7 32.0 36.4 44.3	65.3 56.3 51.8 50.3 47.3 44.3 42.9 38.4 35.3 32.5 30.8 29.3 27.2	63.3 52.3 46.1 43.9 39.1 34.1 31.3 21.6 17.1 4.7 3.0 — —	60.8 48.7 42.7 40.8 36.7 32.8 30.9 24.8 20.8 16.9 14.7 12.8 9.9	100±12 100±12 100±12 100±12 100±12 100±15 100±15 100±15 100±15 100±18 100±20 100±20 100±22	20.0 23.0 24.5 25.0 25.0 24.3 23.6 21.5 20.1 19.0 19.0 18.0 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.

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: Limited Combustible FHC 25/50 CMP CEC: CMP FT6	4	1000	304.8	24.0	10.9	.187	4.75	1	2.0	65.3	63.3	60.8	100±12	20.0
										4	4.0	56.3	52.3	48.7	100±12	23.0
										8	5.7	51.8	46.1	42.7	100±12	25.0
										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
Installation Temperature: -55°C to +150°C*; Operating Temperature: -70°C to +150°C*										250	36.4	29.3	—	12.8	100±20	18.0
U.S. Patents 5,606,151 and 5,734,126 • Third party verified to TIA/EIA-568-B.2, Category 5e										350	44.3	27.2	—	9.9	100±22	17.0
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	**7935A**	NEC: CM CEC: CM FT1	4	1000 2000	304.8 609.6	24.0 44.0	10.90 19.96	.230	5.84	1	2.0	65.3	63.3	60.8	100±12	20.0
										4	4.0	56.3	52.3	48.7	100±12	23.0
										8	5.7	51.8	46.1	42.7	100±12	25.0
										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
IEC 60332-1										250	36.4	29.3	—	12.8	100±20	18.0
Installation Temperature: +5°C to +75°C; Operating Temperature: -10°C to +75°C*										350	44.3	27.2	—	9.9	100±22	17.0
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

BELDEN

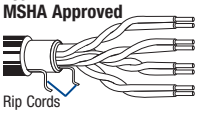
Category 5e DataTuff® Twisted Pair Cables, 4-Pair (continued)

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 Jack

EtherNet/IP Compliant
Upjacketed
MSHA Approved



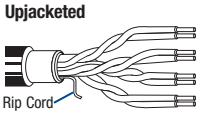
11700A	NEC: CMR, CMX-Outdoor CEC: CMR FT4	4	1000 3000†	304.8 914.4	39.0 117.0	17.7 53.2	.285 Nominal Core OD: .200	7.24 5.08	1	2.0	65.3	63.3	60.8	100±12	20.0
									4	4.0	56.3	52.3	48.7	100±12	23.0
									8	5.7	51.8	46.1	42.7	100±12	25.4
									10	6.4	50.3	43.9	40.8	100±12	26.0
									16	8.1	47.3	39.1	36.7	100±12	26.0
									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



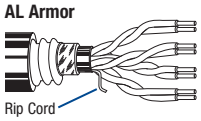
11700A2	NEC: CMR CEC: CMR FT4	4	1000 2000†	304.8 609.6	42.0 86.0	19.1 39.1	.285 Nominal Core OD: .200	7.24 5.08	1	2.0	65.3	63.3	60.8	100±12	20.0
									4	4.0	56.3	52.3	48.7	100±12	23.0
									8	5.7	51.8	46.1	42.7	100±12	24.5
									10	6.4	50.3	43.9	40.8	100±12	25.0
									16	8.1	47.3	39.1	36.7	100±12	25.0
									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 or Gray PVC Outer Jacket

Interlocked AL Armor



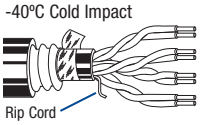
121700A	NEC: CM CEC: HL CMG FT4	4	1000 3000†	304.8 914.4	159.0 459.0	72.0 210.6	.530 Nominal Core OD: .200	13.46 5.08	1	2.0	65.3	63.3	60.8	100±12	20.0
									4	4.0	56.3	52.3	48.7	100±12	23.0
									8	5.7	51.8	46.1	42.7	100±12	24.5
									10	6.4	50.3	43.9	40.8	100±12	25.0
									16	8.1	47.3	39.1	36.7	100±12	25.0
									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
-40ºC Cold Impact



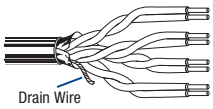
121700R	NEC: CM CEC: HL CMG FT4	4	1000 3000† 5000†	304.8 914.4 1524.0	159.0 459.0 690.0	72.0 210.6 313.0	.530 Nominal Core OD: .200	13.46 5.08	1	2.0	65.3	63.3	60.8	100±12	20.0
									4	4.0	56.3	52.3	48.7	100±12	23.0
									8	5.7	51.8	46.1	42.7	100±12	24.5
									10	6.4	50.3	43.9	40.8	100±12	25.0
									16	8.1	47.3	39.1	36.7	100±12	25.0
									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. 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

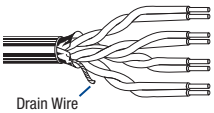
Category 5e DataTuff® Twisted Pair Cables, 4-Pair (continued)

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

†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

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

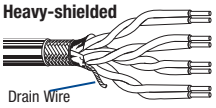
Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black or Blue PVC Jacket

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

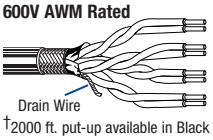
Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black, Red & Teal or Blue PVC Jacket

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

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

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

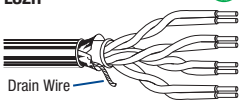
4-Pair Color Codes

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

BELDEN

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 PVC Jacket																
Shielded **LSZH**	**7936A**	CEC: CMG FT4	4	1000	304.8	35.0	17.69	.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*

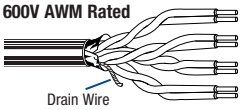
RJ-45 Compatible • U.S. Patents 5,606,151 and 5,734,126

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, Blue or Teal PVC Jacket

EtherNet/IP Compliant **Shielded** **MSHA Approved** **600V AWM Rated**	**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
										200	32.4	27.8	1.0	14.7	100±15	15.0



†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**

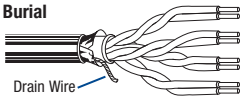
RJ-45 Compatible†† • Cable passes -40°C Cold Bend per UL1581 • U.S. Patents 5,606,151 and 5,734,126

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** **Waterlocked** **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



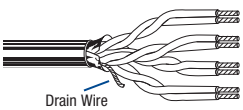
Installation Temperature: -25°C to +75°C • Operating Temperature: -40°C to +75°C*

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 • See Color Code Chart

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

Shielded, Stranded	**7939A** new	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
										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



†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 • TC = Tinned Copper • TPE = Thermoplastic Elastomer

* Subject to length de-rating.

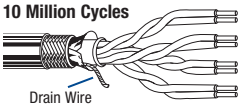
** Pennsylvania Department of Environmental Resources and United States Mine Safety and Health Administration Certification

†† Special RJ-45 plugs required, see www.belden.com-tools-connecter cross referenc

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							
Cat 5e • 24 AWG Bonded-Pairs Stranded Cu Alloy Conductor (7x32) • Overall Beldfoil Shield + 85% TC Braid • See Color Code Chart: Page 8																
Non-Plenum • Polyolefin Insulation • TPE Inner Jacket • Sunlight-, Oil-, Weldsplatter-resistant Matte Black TPE Outer Jacket																
Upjacket **Shielded, Stranded** **Continuous Flex Rated:** **10 Million Cycles**  Drain Wire	**7938A** new	FT1 AWM 20626	4	500†	152.4	28	12.7	0.34	8.60	1	2.5	62.3	59.8	60.8	100±15	20.0
										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

†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

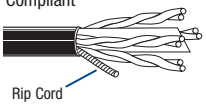
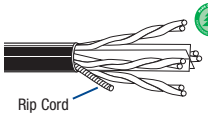
* Subject to length de-rating.

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

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

Industrial Data Solutions® — Industrial Ethernet

Category 6 DataTuff® Twisted Pair Cables, 4-Pair
Heavy-Duty Sunlight and Oil-Resistant Jackets

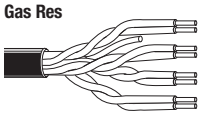
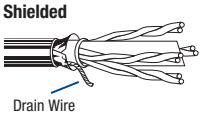
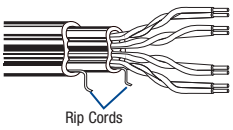
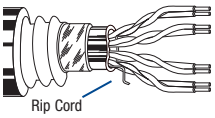
Description	Part No.	UL NEC/ C(UL) CEC Type	No. of Pairs	Standard Lengths		Standard Unit Wt.		Nominal OD		Freq. (MHz)	Max. Atten. (dB/ 100m)	Min. PSUM NEXT (dB)	Min. PSUM ACR (dB/ 100m)	Min. PSUM ELFEXT (dB/100m)	Input Imped. (Ω)	Min. RL (dB)
				Ft.	m	Lbs.	kg	Inch	mm							
Cat 6 • 23 AWG Bonded-Pairs Solid BC • Internal Tape Separator • Rip Cord • See Color Code Chart: Page 8																
Non-Plenum • Polyolefin Insulation • .030" Industrial Grade Sunlight- and Oil-resistant Black PVC Jacket																
EtherNet/IP Compliant  Rip Cord	**7940A**	NEC: CMR CEC: CMR FT4	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	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
Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C*										155	25.2	39.5	14.3	20.9	100±25	18.8
RJ-45 Compatible†† • Cable passes -40°C Cold Bend per UL1581 • U.S. Patents 5,606,151, 5,734,126 and 5,821,467										200	29.0	37.8	8.8	18.7	100±26	18.0
Jacket sequentially marked at 2 ft. intervals • Verified to TIA/EIA-568-B.2-1, Category 6										250	32.8	36.3	3.5	16.8	100±27	17.3
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																
 Rip Cord	**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
**PSUM ACR >0 is guaranteed to 460 MHz.										400	40.6	39.3	0.6	18.8	100±22	19.5
Installation Temperature: -25°C to +75°C; Operating Temperature: -40°C to +75°C* • RJ-45 Compatible††										500	46.2	37.8	>0.0**	16.8	100±22	18.4
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										550	48.8	37.2	—	16.0	100±22	18.0
Jacket sequentially marked at 2 ft. intervals • Third party verified to TIA/EIA-568-B.2-1, Category 6										600	51.4	36.6	—	15.2	100±22	17.6

ACR = Attenuation Crosstalk Ratio • AL = Aluminum • BC = Bare Copper • ELFEXT = Equal Level Far-end Crosstalk • FRPO = Flame-Retardant Polyofelin • 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-connecter 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 Ft.	Standard Lengths m	Standard Unit Wt. Lbs.	Standard Unit Wt. kg	Nominal OD Inch	Nominal OD mm	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)
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: Limited Combustible FHC 25/50 CMP CEC: CMP FT6	4	1000	304.8	35.0	15.9	.214	5.44	1 10 20 31.25 62.5 100 200 250	2.0 6.0 8.5 10.7 15.4 19.8 29.0 32.8	72.3 57.3 52.8 49.9 45.4 42.3 37.8 36.3	70.3 51.3 44.3 39.2 30.0 22.5 8.8 3.5	64.8 44.8 38.7 34.9 28.8 24.8 18.7 16.8	100±15 100±15 100±15 100±15 100±15 100±15 100±22 100±32	20.0 25.0 25.0 23.6 21.5 20.1 18.0 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 Solid BC • Internal Tape Separator • Overall Beldfoil Shield • Rip Cord • See Color Code Chart: Page 8																
Non-Plenum • Polyolefin Insulation • FRPO Inner Jacket • .030" Industrial Grade Sunlight- and Oil-resistant Black PVC Outer Jacket																
EtherNet/IP Compliant **Shielded**  Drain Wire	**7953A** new	NEC: CMR CEC: CMR FT4	4	1000 2000	304.8 609.6	32.0 64.0	14.5 29.0	.340	8.64	1 4 8 10 16 20 25 31.5 62.5 100 155 200 250	2.0 3.8 5.3 6.0 7.6 8.5 9.5 10.7 15.4 19.8 25.2 29.0 32.8	72.3 63.3 58.8 57.3 54.3 52.8 51.3 49.9 45.4 42.3 39.5 37.8 36.3	70.3 59.5 53.4 51.3 46.7 44.3 41.8 39.2 30.0 22.5 14.3 8.8 3.5	64.8 52.7 46.7 44.8 40.7 38.7 36.8 34.9 28.8 24.8 20.9 18.7 16.8	100±15 100±16 100±17 100±18 100±19 100±20 100±21 100±22 100±23 100±24 100±25 100±26 100±27	20.0 23.0 24.5 25.0 25.0 25.0 24.3 23.6 21.5 20.1 18.8 18.0 17.3
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  Rip Cords	**11872A**	NEC: CM CEC: CM FT1	4	1000	304.8	66.0	30.0	.475 x .265 Nominal Core OD: .365 x .165	12.07 x 6.73 9.27 x 4.19	1 4 10 16 31.25 62.5 100 155 200 310 350 400*** 500***	1.9 3.7 5.9 7.5 10.63 15.4 19.8 25.1 29.0 37.1 39.8 43.0 49.0	72.3 63.3 57.3 54.3 49.9 45.4 42.3 39.5 37.9 34.9 34.2 33.3 31.8	70 59 51 46 39 30 25 14 10 — — — —	64.8 52.7 44.8 40.7 34.9 28.8 24.8 20.9 18.7 14.9 13.9 12.7 10.8	100±12 100±12 100±12 100±12 100±15 100±15 100±15 100±15 100±15 100±20 100±22 100±32 100±32	20.0 25.0 25.0 25.0 23.6 21.5 21.0 21.0 21.0 18.0 17.0 14.0 14.0
***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 • Verified to TIA/EIA-568-B.2-1, Category 6																
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**  Rip Cord	**121872A**	NEC: CM CEC: HL CMG FT4	4	1000	304.8	222.0	100.6	.684 Nominal Core OD: .365 x .165	17.37 9.27 x 4.19	1 4 10 16 31.25 62.5 100 155 200 310 350 400*** 500***	1.9 3.7 5.9 7.5 10.6 15.4 19.8 25.1 29.0 37.1 39.8 43.0 49.0	72.3 63.3 57.3 54.3 49.9 45.4 42.3 39.5 37.9 34.9 34.2 33.3 31.8	70 59 51 46 39 30 25 14 10 — — — —	64.8 52.7 44.8 40.7 34.9 28.8 24.8 20.9 18.7 14.9 13.9 12.7 10.8	100±12 100±12 100±12 100±12 100±15 100±15 100±15 100±15 100±15 100±20 100±22 100±32 100±32	20.0 23.0 25.0 25.0 23.6 21.5 21.0 21.0 21.0 18.0 17.0 14.0 14.0
***Value provided for information 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																

ACR = Attenuation Crosstalk Ratio • AL = Aluminum • BC = Bare Copper • ELFEXT = Equal Level Far-end Crosstalk • FRPO = Flame-Retardant Polyofelin • 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-connecter cross reference

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	600V UL AWM	Hi/Lo Temp	Heavy	Upjacket	Armored
Category 5e Cable																				
7932A EtherNet/IP	2	●		●		●	20	●	●									●		
7933A EtherNet/IP	2		●	●		●	20	●	●									●		
7923A EtherNet/IP	4	●		●		●	40	●	●		●				●			●		
7918A	4	●		●			35	●	●		●				●			●		
7924A	4	●			●	●	40	●	●		●							●		
7930A	4	●			●		25	●	●		●							●		
7922A PLTC	4	●		●		●	40	●	●		●							●		
7934A EtherNet/IP	4	●		●		●	40	●	●			●						●		
7937A	4		●	●		●	40	●	●			●							●	
7939A	4		●		●	●	40	●	●		●							●		
7928A EtherNet/IP	4	●		●		●	40	●	●				●				●	●		
11700A EtherNet/IP	4	●		●		●	40	●	●		●				●				●	
11700A2 Oil Res I&II	4	●		●		●	40	●	●										●	
121700A	4	●		●		●	40	●	●											●
121700R	4	●		●		●	40	●	●											●
7929A	4		●	●		●	35	●	●		●				●			●		
7919A	4		●	●			25	●	●		●				●			●		
7921A EtherNet/IP	4		●	●		●	75	●	●		●							●		
7957A EtherNet/IP	4		●	●		●	75	●	●							●		●		
7935A EtherNet/IP	4	●		●		●	40		●					●				●		
7936A	4		●	●		●	40		●					●				●		
7958A EtherNet/IP	4		●	●		●	75	●	●						●	●		●		
7938A High Flex	4		●		●	●	50	●	●	●									●	
Category 6 Cable																				
7927A	4	●		●		●	45	●	●									●		
7931A	4	●		●		●	40	●	●				●				●	●		
7940A EtherNet/IP	4	●		●		●	45	●	●		●							●		
11872A	4	●		●		●	45												●	
7953A EtherNet/IP	4		●	●			45	●	●		●								●	
121872A	4	●		●		●	45	●	●											●

▲ 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

BELDEN

TrayOptic® Heavy-Duty, All Dielectric Optical Fiber Cable
Loose Tube — Indoor/Outdoor Riser & Tray

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 383-2003 flame test. Waterblocking agent for moisture protection. CPE outer jacket option provides extra chemical or abrasion resistance.

Fiber Type	62.5/125µ
Jacket Material	PVC or CPE
Strength Member	Aramid Yarn
Jacket Color	Orange

Ratings

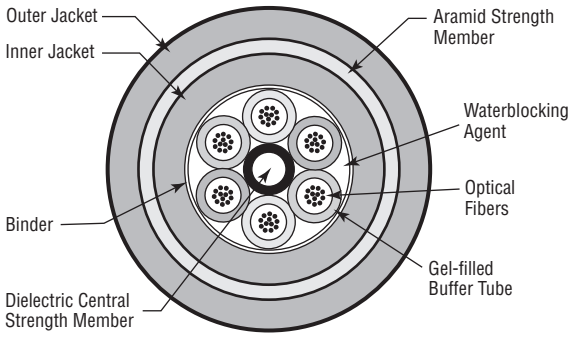
Riser	
UL Type	OFNR
cUL Type	OFN FT4
Flame Resistance	IEEE1202/383-2003

Specifications

Temperature Range	
Storage	-40 to +70°C
Operating	-40 to +70°C
Crush Resistance (EIA-455-41)	2000 N/cm
Impact Resistance (EIA-455-25) @ 1.6N-m	2000 impacts
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)
Optical Specifications	See page 10.2*

*2006 Edition of the Master Catalog at www.belden.com

Fiber Bundle Detail



No. of Fibers	Fibers Per Tube	Outside Diameter		PVC Jacket			CPE Jacket		
		Inches	mm	Belden Part No.	Weight Lbs./1000'	Weight kg/km	Belden Part No.	Weight Lbs./1000'	Weight kg/km
TrayOptic® Series									
Riser (NEC/CEC OFNR/OFN FT4)									
2	2	0.440	11.18	**I100255**	88	131	**I100266**	83	124
4	4	0.440	11.18	**I100455**	88	131	**I100466**	83	124
6	6	0.440	11.18	**I100655**	88	131	**I100666**	83	124
8	4	0.440	11.18	**I400855**	88	131	**I400866**	83	124
12	6	0.440	11.18	**I601255**	88	131	**I601266**	83	124
18	6	0.440	11.18	**I601855**	88	131	**I601866**	83	124
24	6	0.440	11.18	**I602455**	88	131	**I602466**	83	124
36	6	0.440	11.18	**I603655**	88	131	**I603666**	83	124
48	12	0.540	13.72	**I604855**	136	202	**I604866**	129	192
60	12	0.540	13.72	**I606055**	136	202	**I606066**	129	192
72	12	0.540	13.72	**I607255**	136	202	**I607266**	129	192

All optical fiber products can be supplied in compliance with RoHS regulations. Please contact Customer Service for more details.
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