

Belden IndustrialTuff® Cables

Introduction

Tough Cables for Tough Environments

Today, more than ever, manufacturing productivity depends upon seamless data communication and automation systems. And both depend upon high-performance cabling solutions.

Depend on Belden

Belden has developed the world's most comprehensive line of industrial cabling solutions for applications like yours: whether you are networking your factory floor or your process equipment and devices to their controllers...and on to the control room, or relaying data between the control room, the engineering department, and remote manufacturing sites—or, all of the above. From your petrochemical, automotive manufacturing, pharmaceutical, power generation, pulp and paper, metals, food and beverage, or general manufacturing plant to your corporate headquarters—and everywhere in between—Belden has your cabling solution.

Most importantly you can have the peace-of-mind that is inherent with the use of Belden products since all Belden cables are manufactured in ISO 9001:2000 certified facilities to the industry's highest standards of quality, using the most advanced equipment, systems, controls and processes available.

Belden cables give you the performance you need day after dependable day.

Innovative Technology

Bonded-Pair™ Cable

Many DataTuff® Industrial Ethernet cables feature Belden's patented bonded-pair technology. Bonded-pairs provide *Installable Performance*®—superior electrical performance even after the stresses of installation. Bonded-pairs exhibit the most robust and reliable electrical performance in the industry.

Shielding

Effective cable shielding for protection from noise interference remains critical with evolving industrial technology. Belden's shielding designs and testing methods ensure signal integrity and a dependable cable in the presence of electrical noise.

Belden's exclusive patented Beldfoil® design, with its aluminum/polyester foil, was the first shield to offer 100 percent cable protection against radiated emission and ingress at audio and radio frequencies.

Armoring

Belden's innovative armoring technology delivers maximum physical protection in harsh environments. Additional benefits include reduced cost of conduit, easier installation and re-routing, plus additional shielding.

Belden has the capability to protect data, electronic, instrumentation and control cables with interlocking steel or aluminum armor as well as continuous corrugated aluminum armor. Smooth or corrugated protective metal tapes are also available.

Insulation and Jacket

Belden formulates many of its own insulation and jacket compounds. As a result, they provide superior performance under a variety of hostile environmental conditions. See "Technical Information" on pages 125–126 for further details.

Intrinsically Safe Wiring

In accordance with NEC Article 504, intrinsically safe cables are colored blue for easy identification. Belden offers several industrial cables in intrinsically safe blue to meet your requirements for intrinsically safe wiring. Contact the NEC and/or your local inspector for specific guidelines.

Custom Capabilities

Most of our industrial cables are available from stock. Many of these are available off the shelf from distributors. If you have a new or unusual application or you cannot find an Industrial cable in this catalog section that meets your technical requirements, contact Technical Support at 1-800-BELDEN-1.

Overall Jacket

Prefix	Material
1	PVC
3	CPE
4	TPE
5	HDPE
6	Oil Res. II
7	Haloarrest® (LSZH)

Armor

Prefix	Material
2	Aluminum Interlock
3	Steel Interlock
4	Aluminum Belclad®
5	Steel Belclad
6	Copper Belclad
8	Continuous Armor

Example: 343016 is cable part no. 3016 with CPE outer jacket and aluminum Belclad armoring.

Audio, Control and Instrumentation

300V, 60°C • Unshielded



- UL AWM Style

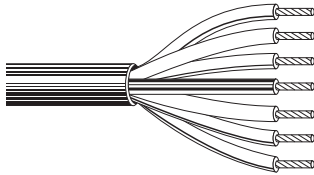
- NEC: CM
- CEC: CM
- NEC: MP (9794 Only)

Part No.	Conductors	Color Code	OD (Nom)		Insulation Thickness		Jacket Thickness	
			Inch	mm	Inch	mm	Inch	mm

22 AWG • Polyolefin/PVC

Solid BC Conductors • Polyolefin Insulation • Cabled • Rose or Gray PVC Jacket								
8795	2	Green, Red	.168	4.27	.018	.46	.022	.56
8794	3	Green, Red, Yellow	.178	4.52				
9794	4	Green, Red, Yellow, Black	.200	5.08	.018	.46	.025	.64
1242A	4	Green, Red, Yellow, Black	.154	3.91				

300V, 60°C • Unshielded



- PVC/PVC
- AWM Style

- NEC: CMG
- CEC: CMG FT4

Part No.	Conductors	Color Code	OD (Nom)		Insulation Thickness		Jacket Thickness	
			Inch	mm	Inch	mm	Inch	mm

Stranded TC Conductors • PVC Insulation • Cabled • Chrome PVC Jacket

20 AWG • 7 x 28 • PVC/PVC

9444	4	Chart 1	.217	5.51	.015	.38	.032	.81
9445	5	Chart 1	.239	6.07				
9439	7	Chart 1	.260	6.60				
9455	9	Chart 1	.317	8.05	.015	.38	.035	.89
9457	15	Chart 2R	.389	9.88				

18 AWG • 19 x 30 • PVC/PVC

8489	4	Chart 1	.257	6.53	.017	.43	.032	.81
8465	5	Chart 1	.282	7.16				
8467	7	Chart 1	.309	7.85				
8469	9	Chart 1	.364	9.25	.017	.43	.037	.94
8466	12	Chart 2R	.412	10.46				
8468	15	Chart 2R	.500	12.70				
8619	19	Chart 2R	.490	12.45	.017	.43	.045	.500
9626	25	Chart 2R	.612	15.54				

300V, 80°C • Unshielded



- Unjacketed
- AWM Style
- VW-1

Part No.	Conductors	Color Code	OD (Nom)		Insulation Thickness		Jacket Thickness	
			Inch	mm	Inch	mm	Inch	mm

16 AWG • PVC

Stranded (19 x 29) TC Conductors • PVC Insulation • Cabled								
9498	3	Orange, Black, Orange with Black Stripe	.243	6.17	.027	.69	—	—

BC = Bare Copper • TC = Tinned Copper • PVC = Polyvinyl Chloride

Belden Conductor Color Code Charts

Color Code Chart 1

Cond. No.	Color
1	Black
2	White
3	Red
4	Green
5	Brown
6	Blue
7	Orange
8	Yellow
9	Purple
10	Gray
11	Pink
12	Tan

Color Code Chart 2 and 2R: 2 = Spiral Stripe, 2R = Ring Band Stripe

Cond. No.	Color
1	Black
2	White
3	Red
4	Green
5	Orange
6	Blue
7	White/Black Stripe
8	Red/Black Stripe
9	Green/Black Stripe
10	Orange/Black Stripe
11	Blue/Black Stripe
12	Black/White Stripe
13	Red/White Stripe

Cond. No.	Color
14	Green/White Stripe
15	Blue/White Stripe
16	Black/Red Stripe
17	White/Red Stripe
18	Orange/Red Stripe
19	Blue/Red Stripe
20	Red/Green Stripe
21	Orange/Green Stripe
22	Black/White/Red
23	White/Black/Red
24	Red/Black/White
25	Green/Black/White
26	Orange/Black/White

Cond. No.	Color
27	Blue/Black/White
28	Black/Red/Green
29	White/Red/Green
30	Red/Black/Green
31	Green/Black/Orange
32	Orange/Black/Green
33	Blue/White/Orange
34	Black/White/Orange
35	White/Red/Orange
36	Orange/White/Blue
37	White/Red/Blue
38	Black/White/Green
39	White/Black/Green

Cond. No.	Color
40	Red/White/Green
41	Green/White/Blue
42	Orange/Red/Green
43	Blue/Red/Green
44	Black/White/Blue
45	White/Black/Blue
46	Red/White/Blue
47	Green/Orange/Red
48	Orange/Red/Blue
49	Blue/Orange/Red
50	Black/Orange/Red

Color Code Chart 3: Belden Standard for Paired Cable

Pair	Color
1	Black & Red
2	Black & White
3	Black & Green
4	Black & Blue
5	Black & Yellow
6	Black & Brown
7	Black & Orange
8	Red & White
9	Red & Green
10	Red & Blue

Pair	Color
11	Red & Yellow
12	Red & Brown
13	Red & Orange
14	Green & White
15	Green & Blue
16	Green & Yellow
17	Green & Brown
18	Green & Orange
19	White & Blue
20	White & Yellow

Pair	Color
21	White & Brown
22	White & Orange
23	Blue & Yellow
24	Blue & Brown
25	Blue & Orange
26	Brown & Yellow
27	Brown & Orange
28	Orange & Yellow
29	Purple & Orange
30	Purple & Red

Pair	Color
31	Purple & White
32	Purple & Green
33	Purple & Blue
34	Purple & Yellow
35	Purple & Brown
36	Purple & Black
37	Gray & White

Color Code Chart 4: Belden Standard for Paired Cable

Pair	Color
1	White & Blue
2	White & Orange
3	White & Green
4	White & Brown
5	White & Gray
6	Red & Blue
7	Red & Orange

Pair	Color
8	Red & Green
9	Red & Brown
10	Red & Gray
11	Black & Blue
12	Black & Orange
13	Black & Green
14	Black & Brown

Pair	Color
15	Black & Gray
16	Yellow & Blue
17	Yellow & Orange
18	Yellow & Green
19	Yellow & Brown
20	Yellow & Gray
21	Purple & Blue

Pair	Color
22	Purple & Orange
23	Purple & Green
24	Purple & Brown
25	Purple & Gray

Color Code Chart 5: Western Electric Standard for Paired Cable

Pair	Color
1	White/Blue Stripe & Blue/White Stripe
2	White/Orange Stripe & Orange/White Stripe
3	White/Green Stripe & Green/White Stripe
4	White/Brown Stripe & Brown/White Stripe
5	White/Gray Stripe & Gray/White Stripe
6	Red/Blue Stripe & Blue/Red Stripe
7	Red/Orange Stripe & Orange/Red Stripe

Pair	Color
8	Red/Green Stripe & Green/Red Stripe
9	Red/Brown Stripe & Brown/Red Stripe
10	Red/Gray Stripe & Gray/Red Stripe
11	Black/Blue Stripe & Blue/Black Stripe
12	Black/Orange Stripe & Orange/Black Stripe
13	Black/Green Stripe & Green/Black Stripe
14	Black/Brown Stripe & Brown/Black Stripe

Pair	Color
15	Black/Gray Stripe & Gray/Black Stripe
16	Yellow/Blue Stripe & Blue/Yellow Stripe
17	Yellow/Orange Stripe & Orange/Yellow Stripe
18	Yellow/Green Stripe & Green/Yellow Stripe
19	Yellow/Brown Stripe & Brown/Yellow Stripe
20	Yellow/Gray Stripe & Gray/Yellow Stripe
21	Purple/Blue Stripe & Blue/Purple Stripe

Pair	Color
22	Purple/Orange Stripe & Orange/Purple Stripe
23	Purple/Green Stripe & Green/Purple Stripe
24	Purple/Brown Stripe & Brown/Purple Stripe
25	Purple/Gray Stripe & Gray/Purple Stripe