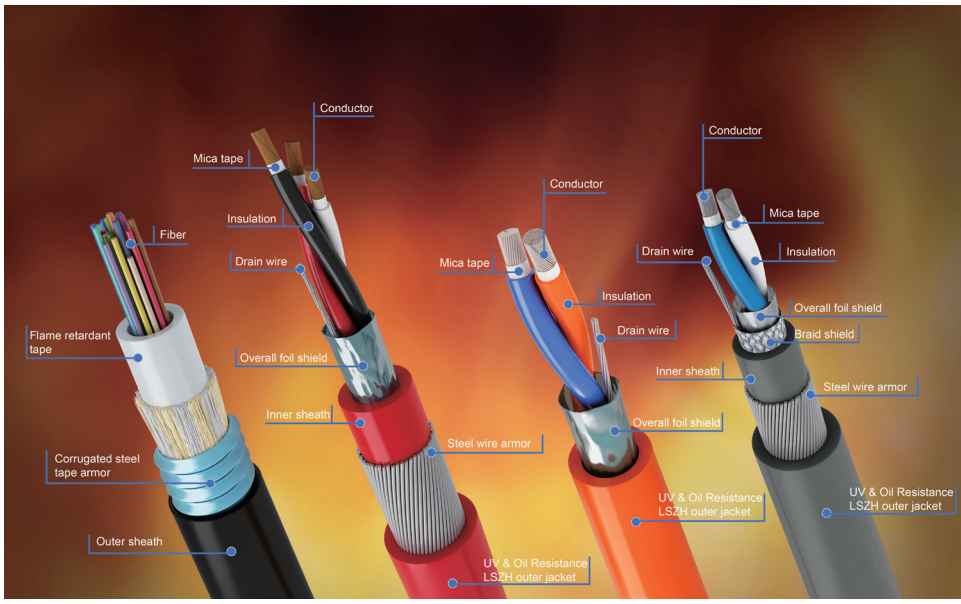
BELDEN

Product Bulletin

PB00106

Fire Survival And Circuit Integrity Cables

Belden's new range of fire survival cable for continous operation of emergency circuits, zero emission of harmful smoke and fire containment in critical and hazardous applications.



Belden introduces a new series of fire survival and circuit integrity cables which can operate continously in the presence of fire up to three hours. These cables meet the following fire resistant standards:
IEC 60331-23
IEC 60331-25
BS6387 CWZ

Survival System Choice

Belden now offers a new line of high quality, high reliability and 3 hours of fire survival circuit integrity cables for mission critical and hazardous applications. As these cables are manufactured with a hybrid mica glass type, highly engineered insulation materials and LSZH sheath they can continously operated and maintain circuit integrity even in the presence of a fire. These cables are flame retardant low smoke zero halogen which also ensures they do not emit harmful toxic gases and prevent any fire from spreading while continously transmitting signals.

These cables can be used in a variety of verticals such as airports, intelligent transportation, high speed trains, theme parks, building automation, offshore rigs, oil and gas, marine, PT and D etc. Safety, installion environment, ease of termination longevity are the main parameters based on which Belden developed the following ranges of fire survival circuit integrity cables.
a) IEC 60331-23--90 min fire survival cable @750°C
b) IEC 60331-25--90 min fire survival cable @750°C
c) BS6387 CWZ-180 min fire survival cable 950°C

Easier to Terminate and Install

To meet the needs of installers, Belden fire resistance cables are manufactured with a user friendly, aluminium polyester shielding tape, instead of the copper tapes used by other manfacturers. This makes Belden's fire resistant cables the most easily terminated cable of its kind.

Applications

These cables are suitable for the following applications:

- Emergency voice alarm communication (EVAC)
- Control shut down of industrial devices
- Fire and gas detection alarm
- Public address voice alarm (PAVA)
- Public address general alarm (PA/GA)
- Fire fighting phone and smoke detection
- Analog 4-20mA current loop signaling
- Resistance temprature detectors (RTD)
- SCADA communication
- Heating, Ventilation Air Conditioning (HVAC)
- Emergency shutdown (ESD) systems
- Railway signaling communication
- Underground tunnel applications

Cable Specifications

Belden cables have been designed and tested to meet the highest standards:

- BS EN 50288-7, 300 or 500V
- Flame Retardant IEC 60332-3C or IEC 60332-3A
- Smoke Density IEC 61034-2 or BS 7622
- Oxygen Index ASTM D2863 or ISO 4589-2
- Halogen content IEC 60754-1 or BS 6425
- Acid gas IEC 60754-2 or BS 6425
- Oil Resistant IEC 60811-2-1
- UV Resistant UL1581

These cables are also available with the following armoring options:

- Steel wire braid armor (SWB)
- Tinned copper braid armor (TCB)
- Steel wire armor (SWA)

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Belden Industrial 3 Hours Fire Resistant Circuit Integrity (CI) Cables

Belden's Multi-Conductor Fire Resistant Cables ensure continued operation in industrial environments, to be employed in controlled shutdown or emergency situations in circuitry that pertains to mission-critical industrial processes. These cables are also used for fire alarm and PAVA system installation in verticals like airports, theme parks, high rise buildings, hotels, mass transit systems, railway stations etc. Belden Fire Resistant cables have gone through rigorous fire tests like BS6387 CWZ (950°C for 180 minutes), IEC 60331-23 (750°C for 90 minutes), EN 50200 (842°C for 120 minutes).

3 Hours Fire Resistant Circuit Integrity (CI) Industrial Data Solutions ® SensorNet / Manchester

Description	Part No.	Conductor Size	Armor	No. of Pairs	Standard Unit Weight (kg)	Nominal Jacket Thickness (mm)	Nominal Diameter (mm)	Nominal DC Resistance (Ω/km)
Multi Pair Cable 300V - Overall foil shielded • Mica Glass Tape (MGT) • TC Conductors • XLP Insulation • LSZH Jacket								
IEC60332-3-22 BS6387CWZ	8760CWZ	18 AWG	Unarmored	1	73.4	0.9	8.0	23.2
	8719CWZ	16 AWG	Unarmored	1	98.5	0.9	9.1	14.6
	8720CWZ	14 AWG	Unarmored	1	131.8	1.0	10.0	9.1

3 Hours Fire Resistant Circuit Integrity (CI) Public Address & General Alarm (PAGA) Cables

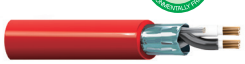
Description	Part No.	Conductor Size	Armor	No. of Cores	Standard Unit Weight (kg)	Nominal Jacket Thickness (mm)	Nominal Diameter (mm)	Nominal DC Resistance (Ω/km)
Multi Core Cable 300V - Unshielded • Mica Glass Tape (MGT) • BC Conductors • XLP Insulation • LSZH Jacket								
EN 50288-7 BS6387CWZ	ZC8ACFU02	18 AWG	Unarmored	2	68.3	0.9	8.1	21.4
	ZC8ACFU03	18 AWG	Unarmored	3	88.7	0.9	8.6	21.4
	ZC8ACFU04	18 AWG	Unarmored	4	111.0	0.9	9.4	21.4
	ZC8ACFU06	18 AWG	Unarmored	6	157.5	0.9	11.4	21.4
	ZC8ACFU08	18 AWG	Unarmored	8	202.0	1.0	12.4	21.4
	ZC6ACFU02	16 AWG	Unarmored	2	84.9	0.9	8.8	13.5
	ZC6ACFU03	16 AWG	Unarmored	3	112.0	0.9	9.3	13.5
	ZC6ACFU04	16 AWG	Unarmored	4	141.3	0.9	10.3	13.5
	ZC6ACFU06	16 AWG	Unarmored	6	202.2	1.0	12.4	13.5
	ZC6ACFU08	16 AWG	Unarmored	8	260.9	1.0	14.0	13.5
	ZL6ACFU02	16 AWG	GSWA	2	321.5	1.3	13.0	13.5
	ZL6ACFU03	16 AWG	GSWA	3	349.2	1.3	13.4	13.5
	ZL6ACFU04	16 AWG	GSWA	4	398.0	1.4	14.4	13.5
	ZL6ACFU05	16 AWG	GSWA	5	454.0	1.4	15.4	13.5

*NOTE: GSW - Galvanized Steel Wire Armor

Multi Core Cable 500V - Unshielded • Mica Glass Tape (MGT) • BC Conductors • XLP Insulation • LSZH Jacket								
	ZO4ACFU02	14 AWG	Unarmored	2	116.8	1.0	10.7	8.4
	ZO4ACFU03	14 AWG	Unarmored	3	155.3	1.0	11.4	8.4
	ZO4ACFU04	14 AWG	Unarmored	4	197.0	1.0	12.6	8.4
	ZO4ACFU06	14 AWG	Unarmored	6	283.6	1.1	15.3	8.4
	ZO4ACFU08	14 AWG	Unarmored	8	367.4	1.1	17.3	8.4

3 Hours Fire Resistant Circuit Integrity (CI) Public Address & General Alarm (PAGA) Cables

Description	Part No.	Conductor Size	Armor	No. of Pairs	Standard Unit Weight (kg)	Nominal Jacket Thickness (mm)	Nominal Diameter (mm)	Nominal DC Resistance (Ω/km)
Multi Pair Cable 300V - Overall foil shielded Multi - Pairs • Mica Glass Tape (MGT) • BC Conductors • XLP Insulation • LSZH Jacket								
EN 50288-7 BS6387CWZ	ZA8ACFF01	18 AWG	Unarmored	1	75.2	0.9	8.2	21.8
	ZA8ACFF02	18 AWG	Unarmored	2	138.7	1.0	12.6	21.8
	ZA8ACFF04	18 AWG	Unarmored	4	225.4	1.0	14.7	21.8
	ZA8ACFF06	18 AWG	Unarmored	6	321.1	1.1	17.8	21.8



Description	Part No.	Conductor Size	Armor	No. of Pairs	Standard Unit Weight (kg)	Nominal Jacket Thickness (mm)	Nominal Diameter (mm)	Nominal DC Resistance (Ω/km)
Multi Pair Cable 300V - Overall foil shielded • Mica Glass Tape (MGT) • BC Conductors • XLP Insulation • LSZH Jacket								
EN 50288-7 BS6387CWZ	ZA6ACFF01	16 AWG	Unarmored	1	92.1	0.9	8.9	13.8
	ZA6ACFF02	16 AWG	Unarmored	2	173.3	1.0	13.7	13.8
	ZA6ACFF04	16 AWG	Unarmored	4	288.2	1.1	16.0	13.8
	ZA6ACFF06	16 AWG	Unarmored	6	421.6	1.2	19.6	13.8
	ZJ6ACFF01	16 AWG	SWA	1	326.0	1.3	13.3	13.8
	ZJ6ACFF02	16 AWG	SWA	2	425.4	1.4	18.3	13.8
	ZJ6ACFF04	16 AWG	SWA	4	486.4	1.5	20.8	13.8
*NOTE: SWA - Steel Wire Armor								
Multi Pair Cable 500V - Overall foil shielded • Mica Glass Tape (MGT) • BC Conductors • XLP Insulation • LSZH Jacket								
	ZM4ACFF01	14 AWG	Unarmored	1	123.5	0.9	10.7	8.6
	ZM4ACFF02	14 AWG	Unarmored	2	239.7	1.1	16.8	8.6
	ZM4ACFF04	14 AWG	Unarmored	4	411.3	1.2	20.0	8.6
	ZM4ACFF06	14 AWG	Unarmored	6	593.1	1.3	24.3	8.6

Description	Part No.	Conductor Size	Armor	No. of Triads	Standard Unit Weight (kg)	Nominal Jacket Thickness (mm)	Nominal Diameter (mm)	Nominal DC Resistance (Ω/km)
Multi Triad Cable 300V - Overall foil shielded • Mica Glass Tape (MGT) • BC Conductors • XLP Insulation • LSZH Jacket								
EN 50288-7 BS6387CWZ	ZB8ACFF01	18 AWG	Unarmored	1	95.9	9.0	8.7	21.8
	ZB8ACFF04	18 AWG	Unarmored	4	311.1	1.1	16.6	21.8
	ZB8ACFF06	18 AWG	Unarmored	6	455.7	1.2	20.4	21.8
	ZB6ACFF01	16 AWG	Unarmored	1	119.4	0.9	9.4	13.8
	ZB6ACFF04	16 AWG	Unarmored	4	401.9	1.1	18.1	13.8
	ZB6ACFF06	16 AWG	Unarmored	6	591.2	1.3	22.3	13.8
	ZK6ACFF01	16 AWG	SWA	1	359.9	1.4	14.0	13.8
	ZK6ACFF02	16 AWG	SWA	2	483.0	1.5	20.2	13.8
	ZK6ACFF04	16 AWG	SWA	4	580.6	1.5	23.2	13.8
*NOTE: SWA - Steel Wire Armor								
Multi Triad Cable 500V - Overall foil shielded • Mica Glass Tape (MGT) • BC Conductors • XLP Insulation • LSZH Jacket								
	ZN4ACFF01	14 AWG	Unarmored	1	163.4	1.0	11.5	8.6
	ZN4ACFF04	14 AWG	Unarmored	4	574.7	1.3	22.6	8.6
	ZN4ACFF06	14 AWG	Unarmored	6	835.8	1.4	27.6	8.6

Circuit Integrity (CI) Industrial Data Solutions EIA / TIA RS - 485 Data Communication Cable

Designed for applications that are used for RS 232/422/485, CANBUS, and MODBUS communication protocols. Cable applications include motion oriented machine, machine control networks, temperature controllers, control panels, machine cutting tools, auxiliary equipment, SCADA communications etc. These cables can also be used in emergency evacuation/shutdown systems in offshore, petrochemicals and railway applications and are fire resistant up to 90 minutes @ 750°C as per IEC 60331-23 and flame retardant as per IEC 60332-3-22 Category A.

ABS (The American Bureau of Shipping) is the leading international classification society devoted to promoting the security of marine-related life and property. With ABS-type approval, no additional special approvals or insurance company exceptions are required for Belden cable system installations.

Description	Part No.	Conductor Size	Armor	No.of Pairs	Standard Unit Weight (kg)	Nominal Jacket Thickness (mm)	Nominal Diameter (mm)	Nominal Impedance (Ω)	Nominal Capicitance (pF/m)	Nominal DC Resistance (Ω/km)
RS-485 Multi Pair Cable 300V - Overall foil shielded • Mica Glass Tape (MGT) • TC Conductors • XLP Insulation • LSZH Jacket										
IEC 60092-376 IEC 60331-23	50021L	20AWG	Unarmored	1	152	1.0	10.4	120	46	41.6
	50022L	20AWG	Unarmored	2	252	1.2	15.4	120	46	41.6
	50024L	20AWG	Unarmored	4	312	1.3	18.0	120	46	41.6

ABS Certificate No.15-HS1434726-PDA

Description	Part No.	Conductor Size	Armor	No.of Pairs	Standard Unit Weight (kg)	Nominal Jacket Thickness (mm)	Nominal Diameter (mm)	Nominal Impedance (Ω)	Nominal Capicitance (pF/m)	Nominal DC Resistance (Ω/km)
RS-485 Multi Pair Cable 300V - Overall foil shielded • Mica Glass Tape (MGT) • TC Conductors • XLP Insulation • LSZH Jacket										
IEC 60092-376 IEC 60331-23 	50021LS	20 AWG	SWA	1	355	0.9	13.7	120	46	41.6
	50022LS	20 AWG	SWA	2	598	1.2	19.1	120	46	41.6
	50024LS	20 AWG	SWA	4	679	1.2	21.5	120	46	41.6
	50031L	16 AWG	Unarmored	1	224	1.2	13.4	120	46	14.6
	50032L	16 AWG	Unarmored	2	456	1.5	20.4	120	46	14.6
	50034L	16 AWG	Unarmored	4	602	1.9	24.3	120	46	14.6
	50031LS	16 AWG	SWA	1	512	1.3	17.1	120	46	14.6
	50032LS	16 AWG	SWA	2	846	1.3	23.6	120	46	14.6
	50034LS	16 AWG	SWA	4	1011	1.4	26.9	120	46	14.6

ABS Certificate No.15-HS1434726-PDA

*NOTE: SWA - Steel Wire Armor

FOUNDATION Fieldbus is the dominant industrial network in the oil, gas and petrochemical industries as well as most process industries. Fieldbus is an all-digital, serial, two-way communications protocol that standardizes the interconnection of field devices at a communications rate of 31.25 kB/s. The field devices are accessible to communication networks (running at 1 or 2.5 Mb/s), through linking devices. These cables have electron beam (E-Beam) XLPE insulation that offers lower capacitance, longer run lengths and chemical resistance compared to other insulations. These cables are fire resistant as per IEC 60331-23. Type A, H1 Foundation Fieldbus Registered Cable.

Fire Resistant Circuit Integrity (CI) Type A Foundation Fieldbus H1 Cables

Description	Part No.	Conductor Size	Armor	No.of Pairs	Standard Unit Weight (kg)	Nominal Jacket Thickness (mm)	Nominal Diameter (mm)	Nominal Impedance (Ω)	Nominal Capicitance (pF/m)	Nominal DC Resistance (Ω/km)
Multi Pair Cable 300V - Overall foil shielded • Mica Glass Tape (MGT) • TC Conductors • XLP Insulation • LSZH Jacket										
IEC 60092-376 IEC 60331-23 	50076L	18 AWG	Unarmored	1	79	1.0	8.5	100	80	22
	50076LS	18 AWG	SWA	1	280	0.8	12.0	100	80	22
	50076LB	18 AWG	SWB	1	200	0.9	11.5	100	80	22

ABS Certificate No.15-HS1434724

*NOTE: SWA - Steel Wire Armor

*NOTE: SWB - Steel Wire Braid

Fire Resistant Optical Fiber Cables

Description	Part No.	No. of Fibers	Armor	Fiber Mode Type	Fiber Type (mm)	Tube Type	Cable OD nom/max (mm)	Mode-Field /Cladding Diameter (μm)	Wavelength (nm)	Attenuation typical/ max. (dB/KM)
Central Loose Tube Cables Universal - Indoor/Outdoor - Corrugated Steel Tape Armor (CSTA) A/I-DQ(ZN)(SR)H Full Rodent Protection										
IEC 60794-1 IEC 60331-25 	GUCN812	12	CSTA	Single Mode	G.625D	Central Loose Tube	9.0/9.3	9.2±0.4 125±0.7	1310 1550	0.3/0.4 0.2/0.3
	GUCN112	12	CSTA	Multi Mode	OM1	Central Loose Tube	9.0/9.3	62.5±2.5 125±1.0	850 1300	2.7/3.2
	GUCND12	12	CSTA	Multi Mode	OM3	Central Loose Tube	9.0/9.3	50±2.5 125±1.0	850 1300	0.6/1.1
	GUCN806	6	CSTA	Single Mode	G.625D	Central Loose Tube	9.0/9.3	9.2±0.4 125±0.7	1310 1550	0.3/0.4 0.2/0.3
	GUCN106	6	CSTA	Multi Mode	OM1	Central Loose Tube	9.0/9.3	62.5±2.5 125±1.0	850 1300	2.7/3.2
	GUCND06	6	CSTA	Multi Mode	OM3	Central Loose Tube	9.0/9.3	50±2.5 125±1.0	850 1300	0.6/1.1

*NOTE: CSTA - Corrugated Steel Tape Armor