

## Speciality Cable Solutions



**High Performance  
Solutions for Challenging  
Environments**

As a leader in signal transmission solutions, Belden offers a broad range of high performance wire and cable products for demanding environments.

## Speciality Cable Solutions

Belden® is at the forefront of technology in the use of high-temperature fluoropolymers in wire insulation and cable jackets.

While this technology remains the backbone of the military and aerospace industries, it has also been successfully used in applications within telecommunications, automotive, medical and sensor markets, and in other areas where temperature resistance is critical.

Our reputation as a provider of solutions for high performance wire and cable applications keeps us driven to continuously raise the bar on innovative designs to meet your challenges.

Whether your application is suited for a standard product or requires performance enhancements such as increased mechanical toughness, resistance to extreme temperatures, Belden will deliver the very best solution.

## Service Leadership

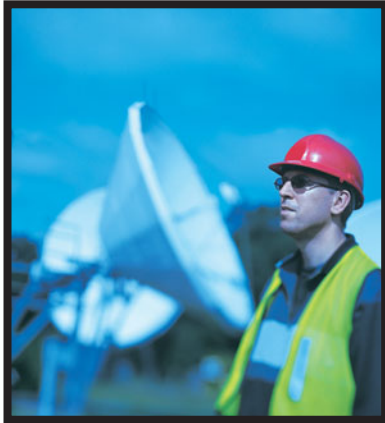
Belden has established a strong reputation for innovation and creativity. For more than 100 years, we have been a leader in the production of high performance communication cables, offering our customers effective and innovative solutions for wire and cable systems requiring specific technical expertise.

As a global leader in signal transmission solutions, we offer customers direct access to a wider range of products and services than ever before. This access to global resources makes us an ideal supplier and development partner, providing you with world-class product, design and quality leadership.

New investments in resources and technology enable us to offer:

- Short enquiry response times
- Fast order acknowledgement
- Stocking arrangements designed to meet your needs
- Shorter lead times
- World class logistics
- Engineering and design expertise from around the globe
- A service package tailored to your needs





## Design and Engineering Leadership

With an established reputation for innovation, we can handle any connectivity need. We meet or surpass all standards, while at the same time creating new ones for the aerospace, electronic and communication industries.

As a leader in cable technology and signal transmission solutions, Belden® has the ability and the experience to deliver the right solution. Our experienced project teams have access to first-class designers from all over the world – and working together with you, we are able to find the right solution for any application.

## Quality Leadership

As you would expect from a global leader, our commitment to quality and reliability is second to none. Our cables are manufactured according to the most rigorous quality processes in the industry and tested to meet all major European and international standards.

## Speciality Cable – Application Overview

| Segment                        | Application                                  | Product Type |         |                          |                     |         |              |                          |
|--------------------------------|--|--------------|---------|--------------------------|---------------------|---------|--------------|--------------------------|
|                                |  | Zyrad        | Trakrad | Equipment / Hook-up Wire | Cathodic Protection | Coaxial | Thermocouple | Tie Cords / Lacing Tapes |
| Aerospace                      | Airframe and aircraft wiring                 |              |         | Y                        |                     |         |              |                          |
|                                | Airfield lighting                            |              |         | Y                        |                     |         |              |                          |
|                                | Avionics                                     |              |         | Y                        |                     |         |              |                          |
|                                | Harness wiring / harness ties                |              |         |                          |                     |         | Y            | Y                        |
|                                | Missile systems wiring                       |              |         | Y                        |                     |         |              |                          |
| Defence / Marine               | Antennas                                     |              |         | Y                        |                     | Y       |              |                          |
|                                | Base stations                                | Y            |         | Y                        |                     | Y       |              |                          |
|                                | General military communications              |              |         | Y                        |                     | Y       |              |                          |
|                                | High intensity lighting                      |              |         | Y                        |                     |         |              |                          |
|                                | Radar systems                                |              |         | Y                        |                     | Y       |              |                          |
| Nuclear                        | Nuclear power wiring                         | Y            |         | Y                        |                     |         | Y            |                          |
|                                | Radiation tolerant applications              |              |         | Y                        |                     |         |              |                          |
|                                | Waste disposal                               |              |         | Y                        |                     |         | Y            |                          |
| Automotive                     | Brake sensors                                | Y            |         | Y                        |                     |         |              |                          |
|                                | Car seat heating systems                     |              |         | Y                        |                     |         |              |                          |
|                                | Catalytic converters                         | Y            |         | Y                        |                     |         |              |                          |
|                                | Gearbox cables                               | Y            |         | Y                        |                     |         |              |                          |
|                                | Harness wiring / harness ties                |              |         |                          |                     |         | Y            | Y                        |
| Industrial                     | Class F motors and transformers              | Y            |         |                          |                     |         |              |                          |
|                                | Domestic appliances                          | Y            |         | Y                        |                     |         |              |                          |
|                                | Ink jet printer manufacture                  |              |         | Y                        |                     |         |              |                          |
|                                | Specialised lighting                         | Y            |         | Y                        |                     |         |              |                          |
|                                | Power generation                             | Y            |         | Y                        |                     |         |              |                          |
|                                | Pressure transducers                         | Y            |         |                          |                     |         |              |                          |
|                                | Industrial sensor systems                    | Y            |         |                          |                     | Y       |              |                          |
|                                | Inductive loop systems                       | Y            |         |                          |                     |         |              |                          |
|                                | Suspending objects in hazardous applications |              |         |                          |                     |         |              | Y                        |
|                                | Under floor heating                          |              |         | Y                        |                     |         |              |                          |
| White goods / small appliances | Y  |              | Y       |                          |                     |         |              |                          |
| Cathodic Protection            | Gas pipelines / Oil platforms                |              |         |                          | Y                   |         |              |                          |
|                                | Underground structures                       |              |         |                          | Y                   |         |              |                          |
|                                | Water storage tanks                          |              |         |                          | Y                   |         |              |                          |
| Rapid Transit                  | Rewiring rail locomotives / carriages        |              | Y       |                          |                     |         |              |                          |
|                                | Underground railway wiring                   |              | Y       |                          |                     |         |              |                          |
| Thermocouple                   | Connecting sensors to devices                |              |         |                          |                     |         | Y            |                          |
|                                | Accurate instrumentation and control         |              |         |                          |                     |         | Y            |                          |
|                                | Accurate temperature measurement             |              |         |                          |                     |         | Y            |                          |

## Product Leadership

Belden® manufactures a wide range of extremely efficient communication cables. Belden has become recognised as a world leader in the supply of speciality cables for the aerospace, electrical, OEM and distribution industries.

Our product range includes:

- High temperature cables
- Cross-linked cables
- Halogen-free cables
- Coaxial cables
- Silicone cables
- Fire resistant aero engine cables
- MaxFlite® Ethernet cables (in-flight entertainment cables)
- Celltec™ (high temperature, foamed fluoropolymer)
- Seamless Wrap PTFE cables



## Speciality Cable Product Overview – Crosslinked Cable

|                            | Product Code   |   |   |   |  |
|----------------------------|--|---|---|---|--|
|                            | Zyrad 400  | Zyrad 500   | Zyrad 555   | Zyrad 700   | Trakrad                                    |
| <b>Key Characteristics</b> | High abrasion resistance<br>Flame retardant<br><br>Thin wall insulation  | Excellent abrasion resistance<br>Class "F" UL 3288/9<br>temperature resistance<br>Flame retardant | Excellent abrasion resistance<br>Class "F"<br>temperature resistance<br>Flame retardant | High abrasion resistance<br>Halogen-free / low-smoke<br><br>Flame retardant | Enhanced oil resistance<br>Flame retardant |
| <b>Conductor (AWG)*</b>    | <b>min</b> 24<br><b>max</b> 4/0  | 24<br>4/0   | 24<br>4/0   | 22<br>4/0   | 20<br>3/0                                  |
| <b>Conductor Type</b>      |  |   |   |   |  |
| Copper                     | Y  |   |   |   |  |
| Tin Plated Copper          |  | Y   | Y   | Y   | Y  |
| <b>Service Temp °C</b>     | <b>min</b> -65<br><b>max</b> 125   | -65<br>150 **   | -65<br>155 **   | -20<br>150  | -65<br>125                                 |
| <b>Voltage Rating (V)</b>  |  |   |   |   |  |
| 150                        | Y  |   |   |   |  |
| 300                        | Y  |   |   |   |  |
| 600                        | Y  | Y   | Y   | Y   |  |
| 1000                       | Y  |   | Y   | Y   |  |
| 1900 / 3300                |  |   |   |   | Y  |
| <b>Colour Range</b>        | Available in 11 standard colours and striped colour options  |   |   |   | Grey                                       |
| <b>Approvals</b>           | Belden holds a variety of international approvals, including:<br>British standards, European norms, Nato standards, UL/CSA approvals and Military standards. |   |   |   |  |

\* AWG numbers are approximate and relate to the nearest metric cross sectional area

\*\* Will withstand varnish bake temperatures of 190°C and short term exposure at 250°C



## Speciality Cable Product Overview – Equipment/Hook-up Wire

|  | Insulation / Jacket Type  |  |  |   |   |   |
|--|---|--|--|---|---|---|
|  | PTFE  | EFGLAS   | FEP  | PEEK  | Polyimide (Kapton™)   | ETFE  |
| <b>Chemical Resistance Rating</b>                        | 5   | 5  | 5  | 4   | 4   | 4   |
| <b>Temperature Rating</b><br>(5 = Outstanding, 1 = Good) | 5   | 5  | 4  | 4   | 4   | 3   |
| <b>Key Characteristics</b>                               | Outstanding chemical resistance<br>Highly flexible at low temperature<br>Non flammable / non toxic  | Outstanding chemical resistance<br>Improved abrasion resistance<br>Excellent mechanical strength | Outstanding chemical resistance<br>Highly flexible at low temperature<br>Non flammable / non toxic | Outstanding chemical resistance<br>Excellent radiation resistance<br>Zero halogen content | Lightweight<br>Mechanically tough<br>Low-smoke / low toxicity | Good chemical resistance<br>Excellent impact strength<br>High flex life |
| <b>Conductor (AWG)</b>                                   |   |  |  |   |   |   |
| <b>min</b>   | 30  | 22   | 30   | 26  | 30  | 30  |
| <b>max</b>   | 2/0   | 2/0  | 10 *   | 12  | 2/0   | 10 *  |
| <b>Conductor Type</b>                                    |   |  |  |   |   |   |
| <b>Silver Plated Copper</b>                              | Y   |  | Y  | Y   | Y   | Y   |
| <b>Nickel Plated Copper</b>                              | Y   | Y  |  | Y   | Y   |   |
| <b>Tin Plated Copper</b>                                 |   |  | Y  |   |   | Y   |
| <b>Service Temp °C</b>                                   |   |  |  |   |   |   |
| <b>min</b>   | -75   | -75  | -75  | -75   | -75   | -75   |
| <b>max</b>   | 260   | 260  | 200  | 200   | 200   | 150   |
| <b>Voltage Rating (V)</b>                                |   |  |  |   |   |   |
| <b>min</b>   | 250   | 600  | 250  | 600   | 250   | 600   |
| <b>max</b>   | 10000   | 600  | 10000  | 600   | 5000  | 5000  |
| <b>Colour Range</b>                                      | Available in 11 standard colours and striped colour options   |  |  |   |   |   |
| <b>Approvals</b>   | Belden holds a variety of international approvals, including: British standards, European norms, Nato standards, UL/CSA approvals and Military standards. |  |  |   |   |   |

\* Larger conductor sizes available on request

## Speciality Cable Product Overview – Specialist Cables

|                            | Product Type  |  |  |  |   |
|----------------------------|---|--|--|--|---|
|                            | Coaxial   | Thermocouple   | Multicore  | Cathodic Protection  | Tie Cords / Lacing Tape   |
| <b>Key Characteristics</b> | Excellent chemical resistance<br>Highly flexible at low temperature<br>Non flammable / non toxic  | Dissimilar conductors in one cable<br>Insulation provides performance and economic benefits in hazardous environmental conditions.                   | Customised design solution of up to 61 twisted pairs available for individual applications. Cable components include conductor, insulation, screen, jacket and armour if required. | Inert to groundbed acids<br>Resistant to salt water<br>Excellent abrasion resistance | Braided PTFE coated glass yarn<br>Superior strength<br>Outstanding chemical resistance<br>Excellent flex life |
| <b>Insulation Type</b>     | PTFE (FEP Jacket)   | FEP / PFA / PTFE Polyimide   | ETFE / FEP / PFA / PEEK / PTFE Polyimide, Zyrad  | PVDF / ECTFE (PE Jacket)   | PTFE  |
| <b>Conductor (AWG)</b>     |   |  |  |  |   |
| <b>min</b>                 | 30  | 32   | Various  | 12 (4 mm <sup>2</sup> )  | Not applicable  |
| <b>max</b>                 | 18  | 10   |  | 2/0  |   |
| <b>Conductor Type</b>      | Silver plated copper<br>Silver plated copper covered steel  | Twisted pair<br>Multi conductor<br>Flat twin, Single shot<br>Types E / J / K / N / T / Vx / U<br>Tolerances to BS EN 60584-2 (previously BS 4937-20) | Twisted pair<br>Multi conductor  | Tin annealed stranded copper   | Not applicable  |
| <b>Service Temp °C</b>     |   |  |  |  |   |
| <b>min</b>                 | -75   | As per insulation type – see equipment wire overview   | As per insulation type – see equipment wire overview   | -40  | -75   |
| <b>max</b>                 | 260   |  |  | 80   | 260   |
| <b>Colour Range</b>        | Brown (other colours on request)  | Colour codes in accordance with BS4937-30 (IEC584-3)   | Available in 11 standard colours and striped colour options  | Black  | White   |
| <b>Approvals</b>           | Belden holds a variety of international approvals, including: British standards, European norms, Nato standards, UL/CSA approvals and Military standards. |  |  |  |   |

## GLOBAL LOCATIONS

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