OSP Broadband Installation Guidelines

OSP Broadband Cable

Superior Essex manufactures Outside Plant (OSP) Broadband cables for outdoor use in Category 5, 5e, 6 and 6A cables designs. These OSP cables have no fire resistance ratings, and as such are subject to common restrictions on indoor use per codes and standards such as the United States National Electrical Code (NEC). Installers and end users must be familiar with the applicable codes for their locale.

Cable Installation Practices

Communications cables are designed with installation in mind. That being said, there are certain limitations to cable handling that must be considered during installation. In general, the four most critical characteristics to remain mindful of are tensile strength, bend radius, crush resistance, and temperature rating. These characteristics vary among cables types, sizes, and even manufacturers. It is important for the designer and installer to be familiar with these criteria before the installation process begins.

Minimum Bend Radius

Cable Shield Type	Minimum Bend Radius
No Shield	Cable Diameter x 10
Single Shields	Cable Diameter x 12
Dual Shields	Cable Diameter x 15

Tensile Strength

Design Type	Maximum Pulling Tension
4-Pair (all)	25 lbs (110 N)
25-Pair MEGAPIC™	158 lbs (695 N)
100-Pair MEGAPIC	633 lbs (2785 N)

Crush resistance

Crush resistance is an important attribute, which is easily quantifiable in a test laboratory, yet difficult to predict in an installation environment. Crushing a cable can cause many issues from temporary, intermittent anomalies to permanent failure. The best rule of thumb is to avoid actions, routes, guides, mounting devices, etc that deform the shape of the jacket.

Temperature Ratings

-40°C to 80°C (-40°F to 176°F)

Cable Preparation and Termination

Superior Essex Broadband cables are intended for outdoor applications and as such are filled cables. To prevent the ingress of water, all void spaces in a cable are filled with either filling or flooding compounds. The interstices between the pairs are filled with PFM™ gel (a non-sticky gel used by Superior Essex that reduces installation time and labor cost) in the BBD Series or extended thermoplastic rubber (ETPR) compound in the MEGAPIC Series. The spaces between the core and shield, the shield overlap, and in some designs, the space between the shield and jacket are filled with water-blocking super absorbent powder (SAP), yarns, PFM gel or a polyolefin flooding compound. These compounds are non-toxic and dermatologically safe to exposed skin. Material Safety Data Sheets are available upon request.

These cables do not contain sheath slitting cords (ripcords). They are intended for applications generally requiring minimal conductor exposure. In addition, the filling and flooding compounds serve as lubrication to ease the removal of the sheath after it is ring cut at the desired location. Some designs include water-blocking yarns beneath the sheath(s), but these yarns are wrapped around the core and will not serve as ripcords.

Utility and Splicer knives may be used to ring-cut the sheath, but a ring-cut tool such as those designed for standard UTP and/or coax is preferred for ease of use and consistent results. The type of cable prep will vary greatly depending on the hardware being used. All shielded designs should be bonded and grounded. The method of bonding to the shield will determine the cable end prep. To prevent electrical shock hazards to employees or damage to equipment, temporary ground connections should be established while the cable is being terminated. These temporary grounds should remain in place until permanent grounds are established.

When the cable end is opened to prepare the cable for termination, the filling and flooding compounds should be removed. The recommended methods for removing these compounds are dry wiping with a soft cloth or paper towel or using a cleaning compound designed for use in telecom products. Use of solvents or cleaning compounds not designed for telecom use may remove cable filling / flooding compounds but may also degrade the physical and thermal stability characteristics of the insulation.

Termination – BBDN and BBDG Designs

The cable termination must accommodate bonding of the shield. The inner jacket must extend beyond the end of the shield tape in order to provide dielectric protection between the shield and cable pairs. The exact length the inner jacket extends beyond the shield depends on the desired spacing between shield connection and protector for the particular installation. The cable pairs must extend beyond the end of the inner jacket to the length required to allow the individual pairs to reach the insulation displacement connectors (IDC). The pair twist of each individual pair must be maintained to within ½ inch of the IDC.

Removal of Shield and Jackets – BBDN Designs

In BBDN designs, the outer jacket is bonded to the shield tape, preventing the jacket from slipping from the shield. To remove the jacket/shield, ring-cut the outer jacket at the intended end of the shield, scoring the shield at the same time. Flex the cable about the cut, breaking the shield tape and slide the jacket and excess shield off the cable end.

The preferred method of bonding is to use a bullet bond that slides over the inner jacket, underneath the shield. To accommodate the bullet bond, make a longitudinal cut in the outer jacket/shield sufficient (about 1 inch depending on the bullet bond design) to allow the outer jacket/shield to flare over the bullet bond.

An alternative method of bonding is to expose shield, which is required by some bonding hardware such as compression clamps and combination strain relief/ bond clamps. To expose shield for this type hardware, make a second circumferential cut in the outer jacket ½ inch from the jacket/shield end. Locate the shield overlap and make a third longitudinal cut located over the shield overlap in the outer jacket. When making the second and third cuts, take care not to cut into the shield. Remove the ½ inch length of outer jacket from the outer surface of the shield. If this length of jacket is not easily removed, some careful paring of the jacket material may be required. The shield coating must also be scraped from the shield material to ensure a good ground if the hardware does not employ an effective method to penetrate the coating.

To expose the pairs, cut the inner jacket circumferentially at the intended end of the inner jacket and slide the jacket off the cable end, taking care not to damage the cable pairs.

Removal of Shield and Jackets – BBDG Designs

In BBDG designs, the outer jacket is not bonded to the shield tape, allowing the jacket to be easily removed from the shield. To remove the jacket, ring-cut the outer jacket (taking care not to cut into the shield) at the intended end of the outer jacket and slide the jacket off the cable end.

The preferred method of bonding is to use a bullet bond that slides over the inner jacket, underneath the shield. To accommodate the bullet bond, make a longitudinal cut in the outer jacket/shield sufficient (about 1 inch depending on the bullet bond design) to allow the outer jacket/shield to flare over the bullet bond.

An alternative method of bonding is to expose shield, which is required by some bonding hardware such as compression clamps and combination strain relief/ bond clamps.
To expose the desired amount of inner jacket, score (ring-cut) the shield at the intended end of the shield. Using long-nosed pliers open the shield tape at the overlap and peel the shield tape along the scored line to remove. Take care to preserve the exposed length of shield tape in a cylindrical shape when removing the excess shield. The shield coating must also be scraped from the shield material to ensure a good ground if the hardware does not employ an effective method to penetrate the coating.

To expose the pairs, cut the inner jacket circumferentially at the intended end of the inner jacket and slide the jacket off the cable end, taking care not to damage the cable pairs.

Termination – MEGAPIC™

The cable termination must accommodate bonding of the shield. The core wrap must extend beyond the end of the shield tape to provide dielectric protection between the shield and cable pairs. The exact length the core wrap extends beyond the shield depends on the desired spacing between shield connection and protector for the particular installation. The cable pairs must extend beyond the end of the core wrap sufficient to allow the individual pairs to reach the insulation displacement connectors (IDC). The pair twist of each individual pair must be maintained to within ½ inch of the IDC.

Removal of Shield and Jackets – MEGAPIC

In MEGAPIC designs, the outer jacket is not bonded to the shield tape, allowing the jacket to be easily removed from the shield. To remove the jacket, ring-cut the outer jacket (taking care not to cut into the shield) at the intended end of the outer jacket and slide the jacket off the cable end.

To expose the desired amount of cable core, score (ring-cut) the shield at the intended end of the shield (depending on bonding hardware, this may coincide with the end of the jacket). Using long-nosed pliers open the shield tape at the overlap and peel the shield tape along the scored line to remove. Take care to preserve the exposed length of shield tape in a cylindrical shape when removing the excess shield.

MEGAPIC-GF types have dual shielding, removal of the outer steel tape may require the use of diagonal cutters. Take care not to damage the core wrap when removing the excess shield tape.

The excess core wrap may be removed with scissors.

The above guidelines are intended to provide a basic understanding of how to dress the jacket and shield ends. Additional information may be obtained from the shield bond connector manufacturer.

Should the connector installation require a different configuration for the jacket and shield end, the above guidelines should be modified to reflect the manufacturer's recommendations. Some building entrance protectors have built in hardware to effect the ground wire connection to the cable shield.

Termination Suggestions

Superior Essex OSP Broadband cables feature solid conductors which are generally intended for IDC terminations such as wiring blocks and jacks. However, there are many suitable ways to terminate these cables. Based on common requests for compatible plugs and bond connectors, following are a few suggestions. This list is not exhaustive nor intended to be an endorsement of any specific hardware component or termination method.

8P8C Plugs (often erroneously referred to as RJ45)	
BBDE	Sentinel Connector Systems Inc. 111-08080028L34 TYCO 5-569278
BBDNE and BBDGE	Sentinel Connector Systems Inc. 111S08080028C34 Sentinel Connector Systems Inc. 111S08080028L34* TYCO 5-569550*
BBD6	Sentinel Connector Systems Inc. 111-08080090L34
BBDN6 and BBDG6	Sentinel Connector Systems Inc. 111S08080090C34 Sentinel Connector Systems Inc. 111S08080090L34*
BBDN6A and BBDG6A	No known CAT 6A plug available

**These are shielded connectors but are not designed to bond with the shields used in Superior Essex OSP Broadband Cables. A separate shield bond connector must be used.*

Shield Bond Connectors	
All 4-pair designs	Electric Motion Company EM R88-B
25-Pair MEGAPIC	Electric Motion Company EM 20B1
100-Pair MEGAPIC	Electric Motion Company EM 20B2