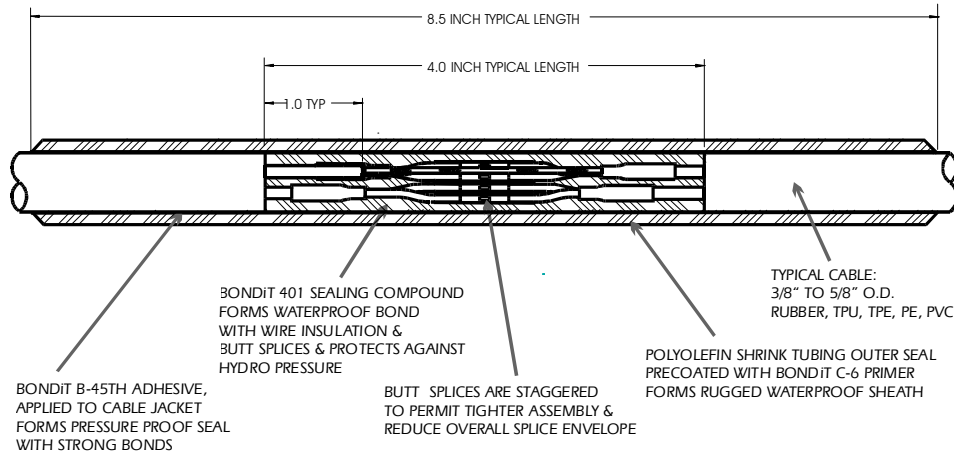




Adhesives and Coatings for Harsh Environments

## Waterproof Electrical Cable Splice Kit for Rubber & Polyurethane Jackets



High Reliability with the Duol-Seal System for Permanent High Pressure Waterproof Electrical Cable Splicing

The **Outer Seal** is highly abrasion resistant providing mechanical stiffness to the splice in order to better match the cable stiffness as well as provide sealing.

The **Splice compound** and **Outer Sealing Tube** is of different materials, providing greater environmental resistance to chemicals, thermal shock, and stress cracking.

The **Sealing Compound** encapsulates the electrical splices, provides a strain relief for the conductors, acts as a water block, eliminates air voids that tend to act as pumps to draw in water during pressure cycles, and prevents damage from hydro-pressure.

Pre-cut and prepped components equal simplicity of assembly. The **Sealing Tube** is pre-shaped and the inner walls are factory treated with **BONDIT™ C-6** primer. The technician need only abrade and wash the cable, then apply **BONDIT™ B-45TH** adhesive. Sealing and bonding is accomplished with the simplicity of a hot air gun.

Fast assembly time is measured in minutes. No long hours of waiting for curing cycles. Ease of transport and storage-- minimum one-year shelf life. Simple skill, low cost, permanent field or production splicing.

The **Outer Sealing Tube** forms chemical bonds to the cable jacket, providing resilience in sealing, and mechanical integrity to the splice. The B-45TH adhesive is flexible and highly chemically resistant.

The **Seal Tube** is chemically bonded by use of the **BONDIT™ C-6** primer, which activates the chemical reaction with the polyolefin shrink tubing and B-45TH adhesive to the cable jacket when heated.

**Dual-Seal** is synonymous with reliability. The **Seal Tube** and the **Sealing Compound** provide redundant sealing for high reliability, each tested independently in Accelerated Life Tests with *100% waterproof and pressure proof sealing for years of service.*

Highly tolerant to assembly error. Under tests, abrading instructions were not followed, and sealing surfaces were not cleaned, but rather, deliberately contaminated. Testing demonstrated acceptable waterproof seals were still obtained. Cleanliness is emphasized as a normal good operating procedure for best results.

Wide range of sizes and applications. Specialty designs available on request, for all underwater and down hole-oil well applications. Both hot splice and cold splice technology available.

[www.reltekllc.com](http://www.reltekllc.com)

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## ***Cable Splice Kit Assembly Instructions***

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**Introduction** The purpose of this document is to aid the user in making a permanent, pressure and waterproof splice in all underwater cable, using the supplied splice kit.

**Safety** Refer to the Material Safety Data Sheet for safety precautions of **BONDiT™ B-45TH**. Rubber gloves and safety glasses are recommended.

**Storage**

<b>BONDiT™ B-45TH:</b>	1 year minimum, when stored at 70 °F, sealed in original container.
<b>Splice Seal Compound:</b>	2 year minimum, when stored at 70 °F, sealed in original container.
All other kit components:	5 years when stored at 70 °F.

**Tooling and Materials List** Following is a list of required tools and materials, not included in the kit:

Electrical butt crimps and insulators/shrink tubing for butt crimps  
Wire insulation strippers  
Long, thin flathead screwdriver or probe, 8+ inches  
Exacto knife or equivalent  
Needle nose pliers, 6 inch  
Isopropyl Alcohol (IPA)  
Box Kimwipes or equivalent  
Disposal container (Kimwipes)  
6" steel scale  
Nylon or rubber gloves  
Safety glasses

Included in the splice kit:

- 2 **Splice Seal Compound**, strips (red)
- 1 **Outer Seal Tube**, 8.5" X 3/4" O.D. (black)
- 1 **BONDiT™ B-45TH** in dual-pack cartridge dispenser & plunger
- 1 **Abrasive Paper**, mixing tin and brush

## ***Cable Splice Kit Assembly Instructions***

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### **Cable Preparation**

The cable must be inspected for damage, stripped and the outer jacket evenly abraded.

Inspect the cable jackets for significant damage in splice area. Small nicks can quickly be removed with the provided Abrasive Pad by abrading the damaged area. If light abrading does not smooth out the damage, an Exacto knife (or razor blade) can be used to scrape the area with the blade, back and forth, along the length of the cable until all nicks, cuts etc. are removed.

CAUTION: Using excessive pressure with the blade, could result in further damage to the cable. Cable with significant damage should be cut back to good jacket material.

Strip the ends of both cables to be spliced, to expose 2 1/4" of the insulated shield/conductors. When stripping the jacket from the conductors, avoid damaging the conductors and their shields.

Cut the conductor lengths so that the wire butt crimps will be staggered in the completed assembly. This will minimize the finished splice diameter. Strip insulation from conductors using wire strippers to match butt crimps. Be careful not to nick conductors or remaining insulation.

To achieve a best bond between the cable jacket and the Splice Seal Tubing, it is necessary to aggressively abrade the surface of the jacket with the Abrasive Paper provided.

Wrap the paper around the jacket and abrade aggressively with a twisting motion a 3" minimum length, starting from the end of the jacket. The jacket will have a dull, matt finish when properly abraded; deep penetration with abrasion is mandatory to reach non-contaminated raw cable jacket material. If the jacket is glossy and/or smooth in appearance, it is not properly abraded and may produce a poor bond.

Scrub the cable jacket with IPA for two feet on either side of the splice to ensure cleanliness when the Outer Seal Tube is assembled on the cable. Before completing the conductor splices, the Outer Seal Tube must be placed over the cables and moved out of the way.

## ***Cable Splice Kit Assembly Instructions***

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### **Splicing the Conductors**

Electrical splicing requires butt splice crimping of the conductors, and heat shrinking the crimp insulation.

**CAUTION:** *The **Outer Seal Tube** must be placed over either cable and moved out of the way before the splice between any of the conductors or shields is completed.*

Make sure all conductors are properly stripped. Use butt crimps (user supplied) to verify strip length. Adjust if necessary. Ensure the butt crimps will be staggered as much as possible in the final assembly. The maximum length between cable jacket ends of the splice is 4.0" to 4.5" in order to adequately fill the space with the Sealing Compound.

Crimp butt crimps to all conductors on one cable end before completing any electrical splices to the mating cable. Install the butt crimp insulators over the conductors before completing splice to mating cable. When all crimps are complete heat shrink the butt crimp insulators as required. Placing a small amount of the B-45TH adhesive over the crimp prior to shrinking the tube will improve the sealing properties of the butt joint.

### **Splice Seal Compound**

The **Sealing Compound**, (red) is used to encapsulate the entire splice volume. This makes the splice area diameter match the cable and reduces the possibility of a break in the **Seal Tube** at cable edges by acting as a strain relief. It also provides an inner seal for water blocking as a highly moisture resistant adhesive, eliminates air voids, and prevents damage to the splice due to hydro-pressure.

Peel the protective plastic from one side of the **Sealing Compound** strips and press the conductors into one strip. Lay the second strip over the splice and press together.

Remove the remaining protective plastic and shape the **Sealing Compound** to fill around conductors to match cable diameter as closely as possible. All conductors, including shields, must be completely encapsulated. Use care to eliminate trapped air pockets. Remove excess compound, and wipe **Sealing Compound** and cable jacket clean with IPA. Remove any **Sealing Compound** stuck on the cable jacket.

## ***Cable Splice Kit Assembly Instructions***

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### **Coating the Cable**

Before applying BONDiT B-45TH, the cable jacket and splice seal compound should be free of contaminants. Scrub cable and splice area Sealing Compound with IPA. Use fresh Kimwipes for every scrub. Continue to clean abraded area until Kimwipes appear clean after scrubbing. It is important that all abraded areas of the cable jacket are cleaned properly to insure a quality seal.

CAUTION: Do not contaminate cleaned areas with bare hands. Wear protective nylon, or rubber gloves.

BONDiT B-45TH is shipped in a two-part dual cartridge and ready for application. It is necessary to use the plunger with the cartridge to dispense the adhesive properly in a 2:1 ratio of part A to part B. When not in use, keep the dispenser closed.

Using the plunger with the cartridge squeeze adequate adhesive into the mixing tin to coat the cable jacket and Sealing Compound over the electrical splice area. The coated area should extend beyond the Sealing Tube ends (approximately 5 inches from the center of the splice). The surface will turn shiny from the coating process.

Once the jacket is coated, up to four-five minutes ambient exposure is acceptable. Protect the primed area from contaminants.

## ***Cable Splice Kit Assembly Instructions***

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### **Final Assembly**

The Outer Seal will now be positioned over the splice and heat shrunk to form a watertight seal.

Center the Outer Seal Tubing over splice area.

Shrink the Seal Tubing onto splice with hot air gun. Heat must be applied evenly, starting in the center, until the entire length has shrunk down around the cable and splice.

After tubing has shrunk, apply heat evenly starting again at the center, with particular emphasis at the Seal Tubing interface with the cable jacket. Heating time is about 1 ½ - 2 minutes. BONDiT™ C-6, the Sealing Tube, BONDiT™ B-45TH, should reach a high enough temperature (approximately 400°F to melt, react and form a waterproof bond. Some evidence of bubble formation indicating reaction will extrude with adhesive from the ends of the tubing and be cured by the heat. The strength of bond will be somewhat dependent on the type of jacket material: rubber and TPU forming highly cohesive bonds, and TPE, and PE forming strong adhesive bonds.

CAUTION: Excessive heat may damage cable jacket. Use lower power setting of about 750 watts / 570°F.

Allow the splice assembly to cool for ease of handling.

Reinspect cable for any damage. Splice is complete.

### **Technical Support**

For technical support call RELTEK at 707-284-8808, or email [reltek@reltekllc.com](mailto:reltek@reltekllc.com).