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Installation Procedure For
Raychem Data Bus Cable Splice Kits

1.0   **Scope**
             This standard contains the procedures for making environment resistant 1 to 1 in-line splice in the Raychem Data Bus cables listed on sheet 2 using Raychem D-150 Series shielded cable splice kits.

2.0   **References**
             Raychem Specification Control Drawing (SCD) Series D-150. See sheet 2 for applicable Raychem parts.

3.0   **Application Equipment**
3.1   Wire Handling Tools
             a) Wire stripper for primaries.
             b) Wire stripper for cable jacket.
             c) Small sharp scissors or diagonal cutters for braid.
             d) Ruler readable to 0.50 (0.025).
             e) Raychem AD-1377 Crimp Tool (calibrated).
             f) Raychem AD-1319 Holding fixture.

3.2   Heating Tools
             Use one of the following or Raychem approved alternative.
             a) CV-5000 Thermogun Model 500B with TG-136 reflector.
             b) CV-5300 Mini-gun 1 with MG-1 reflector.

4.0   **General Information**
4.1   Terminator Description
             The Raychem D-150 Series Data Bus cable splice kits consists of:
             a) Two soldersleeve splices or two mini-seal crimp splices for splicing and encapsulating the primary conductors.
             b) One soldershield braid splice for splicing and encapsulating the cable shields. Two layers of braid in splices for double shielded cables.
             c) One adhesive-lined sleeve for providing strain-relief and added environment protection to the finished splice.

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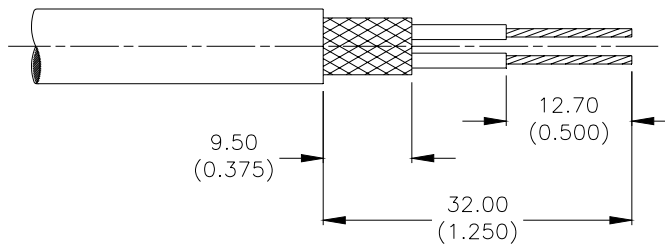
5.0   Installation Procedures

Use procedure applicable to the cable being spliced.

Raychem Cable No.	Inner Splice Type	Splice Kit Number	Applicable Paragraph
10599	Soldersleeve Crimp	D-150-0124 D-150-0167	5.1 5.3
10602	Soldersleeve Crimp	D-150-0124 D-150-0167	5.1 5.3
10605	Soldersleeve Crimp	D-150-0124 D-150-0167	5.1 5.3
10612	Soldersleeve Crimp	D-150-0124 D-150-0167	5.1 5.3
10613	Soldersleeve Crimp	D-150-0134 D-150-0133	5.2 5.4
10614	Soldersleeve Crimp	D-150-0134 D-150-0133	5.2 5.4
EPD 6329	Soldersleeve Crimp	D-150-0124 D-150-0167	5.1 5.3

5.1   Single Shield Cable with Soldersleeve Primary Splice
           Applicable cable numbers: 10599, 10602, 10605, 10612, EPD 6329
           Splice kit number: D-150-0124

5.1.1   Cable Preparation
           a) Remove cable jacket: 32.00 (1.250)
           b) Trim shield to: 9.50 (0.375)
           c) Strip primaries: 12.70 (0.500) and pre-tin with Sn60 or Sn63 solder
           d) Trim filler: flush with shield

Tolerances: all lengths ± 0.50 (0.025)

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5.1.2   Assembly Procedure
a) Place the outer strain relief sleeve and the shield splice sleeve (small end first) onto one of the cables.
b) Primary Conductor Splice.
1) Insert primary conductors in the splice assembly.
a) Be sure matching primaries from each cable are in same sleeve. The thermal indicator will lose its color when sufficient heat has been applied to make the joint.
b) Overlap conductors under the solder preforms.
c) Use a Raychem AD-1319 holding fixture to hold wires in alignment.
2) Heat Assembly
a) Heat solder preforms until they melt and form a fillet along the conductors.
b) Heat ends of sleeves until the inserts melt and flow along wires.
3) Inspect per Paragraph 6.1.
c) Shield Splice
1) Center the shield splice sleeve over the splice and the exposed cable shields.
2) Heat sleeve
a) Heat center of sleeve until the solder melts and the shield and tube recover.
b) Move the sleeve through the heat to one end of the shield slowly enough to keep the sleeve recovering.
c) Apply heat for an additional 5 to 10 seconds to the final 12.5 mm (half-inch) of the sleeve shield to ensure sufficient heat transfer to the cable shield to make a good joint.
d) Apply heat to end of sleeve until rings melt and flow along cable jacket.
e) Repeat for other end of sleeve.
3) Inspect per paragraph 6.3.
d) Strain Relief Sleeve
1) Center the strain relief sleeve over the completed splice.
This may be done by marking the cable jacket 25.5 mm (1 inch) from one end of the shield splice sleeve and aligning the end of the sleeve with the mark.
2) Heat Sleeve.
a) Start heating in center of sleeve and then as sleeve recovers, move it through the heat until it has all recovered onto the assembly.
3) Inspect per Paragraph 6.4.

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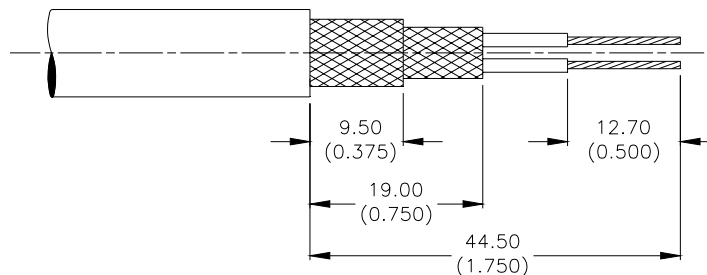
5.2   Double Shield Cable with Soldersleeve Primary Splice
                Applicable cable numbers: 10613, 10614
                Splice kit number: D-150-0134

5.2.1   Cable Preparation
                a) Remove cable jacket: 44.5 (1.750)
                b) Trim shield to: 19.00 (0.750) then trim outer shield to 9.50 (0.375)
                c) Strip primaries: 12.70 (0.500) and pre-tin with Sn60 or Sn63 solder.
                d) Trim fillers: flush with shield

Tolerances: all lengths ±0.50. (0.025)

5.2.2   Assembly Procedure
                a) Place the outer strain relief sleeve and the shield splice sleeve (small end first)
                    onto one of the cables.
                b) Primary Conductor Splice.
                    1) Insert primary conductors in the splice assembly.
                            a) Be sure matching primaries from each cable are in same sleeve.
                            b) Overlap conductors under the solder preforms.
                            c) Use a Raychem AD-1319 holding fixture to hold wires in
                                alignment.
                    2) Heat Assembly.
                            a) Heat solder preforms until they melt and form a fillet along the
                                conductors.
                                The thermal indicator will lose its color when sufficient heat has
                                been applied to make the joint.
                            b) Heat ends of sleeves until the inserts melt and flow along wires.
                            c) Inspect per Paragraph 6.1
                c) Shield Splice
                    1) Center the shield splice sleeve over the splice and the exposed cable
                        shields.

                    2) Heat sleeve.
                            a) Heat center of sleeve until the solder melts and the shield and tube
                                recover.

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        b) Move the sleeve through the heat to one end of the shield slowly enough to keep the sleeve recovering.

        c) Apply heat for an additional 5 to 10 seconds to the final 12.5 mm (half-inch) of the sleeve shield to ensure sufficient heat transfer to the cable shield to make a good joint.

        d) Apply heat to end of sleeve until rings melt and flow along cable jacket.

        e) Repeat for other end of sleeve.

      3) Inspect per Paragraph 6.3.

    d) Strain Relief Sleeve

      1) Center the strain relief sleeve over the completed splice.
This may be done by marking the cable jacket 25.5 mm (1 inch) from one end of the shield splice sleeve and aligning the end of the sleeve with the mark.

      2) Heat sleeve.

        a) Start heating in center of sleeve and then as sleeve recovers, move it through the heat until it has all recovered onto the assembly.

      3) Inspect per Paragraph 6.4.
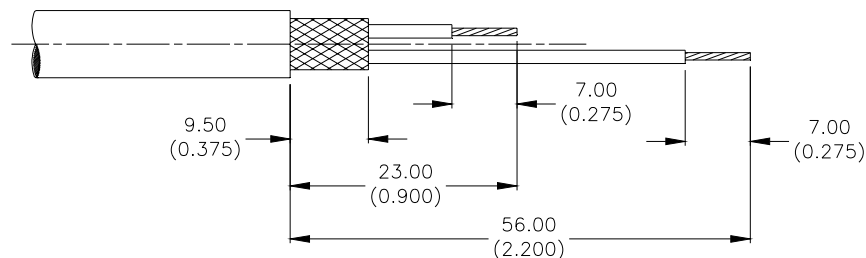
5.3   Single Shield Cable with Mini-seal Crimp Primary Splice
         Applicable cable numbers: 10599, 10602, 10605, 10612, EPD 6329
         Splice kit number: D-150-0167

5.3.1   Cable Preparation

    a) Remove cable jacket: 56.00 (2.200)

    b) Trim shield to: 9.50 (0.375)

    c) Cut primaries: 1each cable to 23.00 (0.900) from cable jacket

    d) Strip primaries: 7.00 (0.275)

    e) Trim fillers: flush with shield.

Tolerances: all lengths ± 0.50 (0.025)

5.3.2   Assembly Procedure

    a) Place the outer strain relief sleeve and the shield splice sleeve (small end first) onto one of the cables.

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 b) Primary Conductor Splice
  1) Place one sealing sleeve onto the longer lead of each cable.
  2) Crimp matching primaries into opposite ends of the crimp splice using a calibrated Raychem AD-1377 crimp tool.
  3) Center the sleeves over the splices.
  4) Heat sleeves. Heat center until it recovers and then heat ends until sealing rings melt and flow along wires.
  5) Inspect per Paragraph 6.2.

 c) Shield Splice
  1) Center the shield splice sleeve over the splice and the exposed cable shields.
  2) Heat sleeve.
   a) Heat center of sleeve until the solder melts and the shield and tube recover.
   b) Move the sleeve through the heat to one end of the shield slowly enough to keep the sleeve recovering.
   c) Apply heat for an additional 5 to 10 seconds to the final 12.5mm (half-inch) of the sleeve shield to ensure sufficient heat transfer to the cable shield to make a good joint.
   d) Apply heat to end of sleeve until rings melt and flow along cable jacket.
   e) Repeat for other end of sleeve.
  3) Inspect per Paragraph 6.3.

 d) Strain Relief Sleeve
  1) Center the strain relief sleeve over the completed splice.
   This may be done by marking the cable jacket 25.5mm (1 inch) from one end of the shield splice sleeve and aligning the end of the sleeve with the mark.
  2) Heat sleeve
   a) Start heating in center of sleeve and then as sleeve recovers, move it through the heat until it has all recovered onto the assembly.
  3) Inspect per paragraph 6.4.

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5.4   Double Shield Cable with Mini-seal Crimp Primary Splice
       Applicable cable numbers; 10613, 10614
       Splice kit number: D-150-0133

5.4.1   Cable Preparation
       a) Remove cable jacket: 71.00 (2.800)
       b) Trim shield to: 19.00 (0.750) then trim outer shield to 9.50 (0.375)
       c) Cut primaries: 1 each cable to 32.38 (1.275) from cable jacket.
       d) Strip primaries: 7.00 (0.275)
       e) Trim fillers: flush with shield.
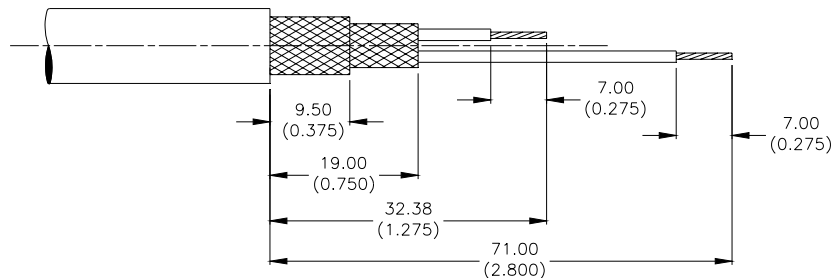
Tolerances: all lengths ± 0.5 (0.025)

5.4.2   Assembly Procedure
       a)   Place the outer strain relief sleeve and the shield splice sleeve (small end first)
            onto one of the cables.
       b)   Primary Conductor Splice
            1)   Place sealing sleeve onto the longer lead of each cable.
            2)   Crimp matching primaries into opposite ends of the crimp splice using a
                 calibrated Raychem AD-1377 crimp tool.
            3)   Center the sleeves over the splices.
            4)   Heat sleeves. Heat center until it recovers and then heat ends until sealing
                 rings melt and flow along wires.
            5) Inspect per Paragraph 6.2.
       c) Shield Splice
            1)   Center the shield splice sleeve over the splice and the exposed cable
                 shields.
            2)   Heat sleeve
                 a)   Heat center of sleeve until the solder melts and the shield and tube
                      recover.

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     b) Move the sleeve through the heat to one end of the shield slowly enough to keep the sleeve recovering.

     c) Apply heat for an additional 5 to 10 seconds to the final 12.5 mm (half-inch) of the sleeve shield to ensure sufficient heat transfer to the cable shield to make a good joint.

     d) Apply heat to end of sleeve until rings melt and flow along cable jacket.

     e) Repeat for other end of sleeve.

   3) Inspect per paragraph 6.3.

 d) Strain Relief Sleeve

   1) Center the strain relief sleeve over the completed splice.
This may be done by marking the cable jacket 25.5 mm (1 inch) from one end of the shield splice sleeve and aligning the end of the sleeve with the mark.

   2) Heat sleeve.

     a) Start heating in center of sleeve and then as sleeve recovers, move it through the heat until it has all recovered onto the assembly.

   3) Inspect per paragraph 6.4.

6.0   Inspection

6.1   Soldersleeve Splices

   a) Conductors must be overlapped at least 9.50 (0.375).

   b) Fillet length must be at least 6.00 (0.250) long.

   c) Sealing rings must have flowed along wire insulation.

   d) Sleeve must not have discolored to the degree that joint can not be inspected.

   e) Sleeve must not cut or split.

   f) Strands of conductor must not be poking through the sleeve.

6.2   Mini-seal Splices

   a) Conductors must be visible at point where they enter crimp barrel.

   b) Both indentations of a crimp must be on the crimp barrel.

   c) Sealing sleeve inserts must have flowed along wire insulation.

   d) Sleeve must not have discolored to the degree that the crimp barrel cannot be inspected.

   e) Sleeve must not be cut or split.

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6.3   Shield Splice

    a) Sleeve/shield must be recovered along its entire length.
    b) Sleeve must be recovered tightly around cable jacket.
    c) Sealing rings must have flowed along cable jacket.
    d) Sleeve must not have discolored to the degree that joint can not be inspected.
    e) Sleeve must not cut or split.
    f) Strands must not be poking through the sleeve.

6.4   Outer Sleeve

    a) Must be recovered tightly onto assembly along its full length.
    b) An adhesive bead should be visible at ends of sleeve.
    c) Sleeve must not be cut or split.