





# HARNESS REPAIR PRODUCTS EVERYTHING YOU NEED TO HELP KEEP HARNESSES MISSION READY

### **QUICK REFERENCE GUIDE**

### Flexible

- Convenient permanent or temporary repairs to restore the harness
- Rugged solutions matched to your application hazards

### Fast and Easy

- Complete line for quick, effective field repairs
- Repair conductors, jackets, bundles, shields, and backshells

#### Wire and Conductor Repair

|             | Product Family   | Description   | Standards   | Features   | Max.<br>Temperature |
|-------------|--|---|---|--|---------------------|
|             | MiniSeal Splices<br>D-436-XX<br>D-200-XX                         | Sealed wire-to-wire crimp splice  | SAE AS81824/1<br>SAE AS81824/11 Pending   | High temperature<br>Sealed<br>Immersion resistant<br>26 thru 12 AWG        | 150°C<br>200°C      |
|             | In-Line Sealed Crimp Splices<br>W-096-XX                         | Sealed wire-to-wire crimp/solder splice                                     | EN3373-001 & 013  | High temperature<br>Immersion resistant<br>26 thru 12 AWG                  | 260°C               |
| and lo      | SolderSleeve<br>Shield Terminators<br>S-200-XX                   | Silver/nickel braid termination   | SAE AS83519/5 Pending   | High temperature<br>Seals to PTFE  | 200°C               |
| Con B       | SolderSleeve Splices<br>D-1744-XX                                | Sealed wire-to-wire solder splice   | NAS 1744  | Sealed<br>Immersion resistant<br>26 thru 12 AWG                            | 150°C               |
|             | RF One-Step Connectors<br>RBD-XX-X-XX<br>RTD-XX-X-XX             | Solder termination  | Meets performance requirements of<br>MIL-C-39012 up to 2.8 GHz                                | Excellent strain relief<br>Sealed  | 150°C               |
|             | Data Bus Splice Kit<br>D-150-0708-5                              |   | MIL-STD-1553b<br>Data Bus USAF 8340708  | Sealed<br>EMI resistant  | 150°C               |
| 200         | SolderShield Splices<br>D-150-0XXX                               | Shielded splice for coax and twisted pairs                                  |   | Sealed<br>EMI resistant  | 150°C               |
|             | SolderShield Splices<br>D-155-XXXX                               | Shield-only splice  |   | Sealed<br>EMI resistant  | 150°C               |
| 215         | Cold Applied Splices<br>D-436-3X-COLD                            | Gel sealed in-line butt crimp   | SAE AS81824/12  | Sealed<br>Altitude immersion<br>No heat gun required<br>26 thru 12 AWG     | 150°C               |
| 11/2        | <b>C-Wrap Repair Sleeves</b><br>D-150-C-1X                       | Jacket repair wrap  | SAE AS6224/1 pending  | Sealed 26 thru 12 AWG  | 150°C               |
| 2010        | Rayseal Repair Sleeves<br>D-260-C-X                              | Jacket repair wrap  | SAE AS6224/2 in process   | Sealed 10 AWG thru 4/0 AWG   | 260°C               |
|             | SolderTacts Coax Contacts<br>D-602-0140 Pin<br>D-602-0141 Socket | One-piece solder contact  | MIL-DTL-38999 Series I thru IV<br>M39029/76 and 77  | Unsealed   | 150°C               |
|             | DEUTSCH Crimp Contacts<br>38943-2238941-22                       | Crimp Contact (Size 22)   | M39029/56-348 Socket<br>M39029/58-360 Pin<br>MIL-DTL-38999 Series I thru IV<br>M39029/56 & 59 | Unsealed   | 125°C               |
| ALS STATE   | SOLISTRAND Splices   | Butt or inline crimp splice   | MIL-T-7928 T Type 1, Class 1 & 2  | Unsealed<br>26 thru 2 AWG<br>1/0 AWG thru 600 MCM                          | 170°C               |
| Charles and | STRATO-THERM Splices   | High-temp splice  |   | Unsealed<br>22 thru 10 AWG   | 649°C               |
|             | COPALUM Splices  | Butt or inline crimp splice for copper or aluminum                          |   | Unsealed<br>Dry crimp<br>8 thru 3/0 AWG aluminum<br>10 thru 2/0 AWG copper | 150°C               |
|             | LightCrimp Fiber Optic Splices                                   | Fiber-optic field splice<br>250/ 900 um buffered fiber<br>1.8/2.0 mm jacket |   | Sealed   | 70°C                |

| Temporary /<br>Permanent | Re-Enterable /<br>Re-Workable | Side Entry | Installation<br>Practices &<br>Instructions | Tooling                              |
|--------------------------|-------------------------------|------------|---|--------------------------------------|
| Perm                     | _                             | _          | RCPS-200-20                                 | AD-1377<br>Heat gun                  |
| Perm                     | _                             | _          | RPIP-685-00                                 | AS-1377-S<br>Heat gun                |
| Perm                     | _                             | _          | RCPS-100-71                                 | Heat gun                             |
| Perm                     | _                             | _          | RPIP-850-00                                 | Heat gun                             |
| Perm                     | <i>√</i>                      | _          | RPIP-683-00                                 | Heat gun                             |
| Perm                     | _                             | _          | RPIP-600-12                                 | AD-1377<br>Heat gun                  |
| Perm                     | _                             | _          | RCPS-150-02                                 | AD-1377<br>Heat gun                  |
| Perm                     | _                             | _          | c/w drawing                                 | Heat gun                             |
| Perm                     | -                             | _          | RPIP-1102                                   | AD-1381-1                            |
| Perm                     | _                             | 1          | RPIP-1101                                   | Heat gun<br>M81969/8<br>removal tool |
| Perm                     | _                             | 1          | RPIP-1106                                   | CV2014 Heat gun<br>PR-38 Reflector   |
| Perm                     | _                             | 1          | ES61226                                     | Heat gun<br>AD-1565 fixture          |
| Perm                     | _                             | _          | Crimp tool specific                         | Crimp tool                           |
| Perm                     | _                             | _          | Crimp tool specific                         | Various crimp                        |
| Perm                     | _                             | _          | Crimp tool specific                         | Various crimp                        |
| Perm                     | -                             | _          | Crimp tool specific                         | Various crimp                        |
| Perm                     | _                             | _          | 408-10193                                   | Kit                                  |

#### **Bundle and Shield Repair**

|          | Product Family  | Description   | Standards   | Features   | Max.<br>Temperature | Temporary /<br>Permanent | Re-Enterable /<br>Re-Workable | Side Entry | Installation<br>Practices &<br>Instructions | Tooling   |
|----------|---|---|---|--|---------------------|--------------------------|-------------------------------|------------|---|-----------|
|          | High-Shrink-Ratio Tubing<br>RP-4800-XX  | 4:1 shrink ratio  | VDE 0341 PT 9005 Part A<br>SAE AMS-DTL-23053/5        | High temperature<br>Sealed & Unsealed  | 135°C               | Perm                     | 1                             | _          | COP551                                      | Heat gun  |
|          | High-Shrink-Ratio Flexible Tubing<br>HRHF-XX  | 5.5:1 shrink ratio  |   | High temperature<br>Sealed & Unsealed  | 135°C               | Perm                     | V                             | _          | COP551                                      | Heat gun  |
|          | High-Shrink-Ratio Tubing<br>HRHT-XX   | 5.5:1 shrink ratio  | SAE AMS-DTL-23053/15<br>(except some sizes)           | High temperature<br>Sealed & Unsealed  | 135°C               | Perm                     | V                             | _          | COP551                                      | Heat gun  |
|          | <b>Ultra-High-Shrink-Ratio Tubing</b><br>URHT-XX  | Up to 8:1 shrink ratio  | UL E85381   | High temperature<br>Sealed & Unsealed  | 135°C               | Perm                     | V                             | -          | COP551                                      | Heat gun  |
| X        | RayOLOn Roll-On Sealing Sleeves<br>LNCL-XX-XXX  | Roll-on sleeve  |   | Reusable<br>Nonshrink<br>Gel strips for sealing<br>NSN listed  | 70°C                | Perm & Temp              | V                             | -          | TUS-41-3007                                 | _         |
|          | RayRim Edging Material  | Protective, self-adhering edging profile                          |   | Edge protection  | 80°C                | Perm                     | 1                             | 1          | PIP-067                                     | Heat gun  |
| Sec. St. | Side-Entry Bushing<br>SEB-XX  | Coiled bushing  | SAE AMS-DTL-23052/10<br>MIL-PRF-46846 Type II Class 1 | Side entry   | 180°C               | Perm                     | 1                             | 1          | N/A   | _         |
|          | RayBraid Tubular Copper Braid<br>Ray101-XX ( tin plated)<br>Ray103-XX (nickel plated)<br>LWB-10X-XX (lightweight) | Copper braid over plastic former                                  |   | Pull on<br>Add heat shrink tubing for sealing<br>Alternative to braiding machine                     | 150°C<br>200°C      | Perm                     | 1                             | _          | COP361                                      | _         |
|          | Electrical Shielding Tape<br>000W280  | Shielded gauze tape   |   | Tinned copper<br>Wrapping transitions  | 150°C<br>200°C      | Perm                     | 1                             | 1          | -   | _         |
|          | INSTALITE Cable Bundle<br>Management Sleeves<br>CBMS-XX-P   | Low friction, light weight system for open wire bundle management | RW3042  | Very lightweight<br>Easy to install<br>Uses standard termination<br>equipment/method<br>Low friction | 150°C               | Perm                     | -                             | -          | ELE-3COP-365                                | Available |

#### **Backshell Terminations**

|         | Product Family                             | Description  | Standards | Features   | Max.<br>Temperature | Temporary /<br>Permanent | Re-Enterable /<br>Re-Workable | Side Entry | Installation<br>Practices &<br>Instructions | Tooling         |
|---------|--|--|-----------|--|---------------------|--------------------------|-------------------------------|------------|---|-----------------|
| 6       | Wrap-Around Heat-Shrink Boot<br>209W2XX-XX | Zipper termination spine<br>Allows repair when there is no access<br>to end of harness |           |  | 200°C               | Perm                     | _                             | ~          |   | Heat gun        |
|         | Tinel-Lock Splice<br>TXS51-XX              | Split metal ferrule, for bandstrap shield splice                                       |           | Two piece<br>Midpoint shield butt splice           | 150°C to 200°C      | Perm                     | 1                             | 1          |   | Banding tool    |
|         | Tinel-Lock Splice<br>TSR-XX                | Metal ferrule for Tinel shield splice  |           | Midpoint shield butt splice                        | 150°C to 200°C      | Perm                     | 1                             | _          |   | Tinel heat tool |
| and and | HexaShield Adapters<br>Hex-XX              | Metal ferrule individual shield terminations   |           | Overall shield termination                         | 150°C to 200°C      | Perm                     | 1                             | _          |   | Torque tool     |
|         | <b>Bandstrap</b><br>BND-1225S              | Steel straps, nickel or cadmium plated   |           | Easy replacement of shield termination             | 150°C to 200°C      | Perm                     | 1                             | J          |   | Banding tool    |
| 220     | Side-Entry Tinel Ring<br>SETR-XX           | Split Tinel Ring shield termination  |           | Notch engagement<br>Easy replacement of Tinel Ring | 150°C to 200°C      | Perm                     | J                             | J          |   | Tinel heat tool |

#### Jacket Repair

|     | Product Family  | Description   | Standards   | Features   | Max.<br>Temperature | Temporary /<br>Permanent | Re-Enterable /<br>Re-Workable | Side<br>Entry | Installation Practices &<br>Instructions     | Tooling                                 |
|-----|---|---|---|--|---------------------|--------------------------|-------------------------------|---------------|--|---|
| 7/  | High-Temp Heat-Shrink Tape<br>RT-555-TX.X-A260-XX               | High-temperature, side-entry,<br>shrinkable repair tape               | RT-1381   | High temperature<br>Sealed<br>Fluids resistant<br>Altitude immersion<br>Moderate peel strength   | 200°C               | Perm                     | 1                             | 1             | TUS-41-3032                                  | Heat gun<br>PTFE tape                   |
| Q   | Self-Amalgamating Tape<br>S-1081                                | Bonds to itself   | RK-6019   | Supplement with adhesive at ends for sealing   | 130°C               | Perm & Temp              | 1                             | 1             | ELE-3COP-606<br>c/w data sheet<br>HSL#04146  | Heat gun                                |
| 0   | Silicone Fusion Tape<br>608036                                  |   |   | High temperature sealing<br>Low peel<br>Supplement with heat shrink<br>tubing for mechanical protection  | 200°C               | Temp                     | Į                             | J             | 408-9716                                     | N/A                                     |
| -   | Chemical- and Abrasion-Resistant<br>Heat-Shrink Tubing<br>DR-25 | 2:1 shrink ratio  | SAE AMS-DTL-23053/16<br>VG95343 Part 5 Type D<br>DEF STAN 59-97 Issue 3 | Sealing, strain-relief<br>Mechanical protection<br>Supplement with adhesive  | 150°C               | Perm                     | 1                             | _             | ELE-3COP-551<br>PIP-068<br>COP551TUS-41-3024 | Heat gun                                |
|     | High-Temperature<br>Heat-Shrink Tubing<br>RT-555-XX             | 2:1 shrink ratio  | RT-555  | High temp<br>Mechanical protection<br>Supplement with adhesive   | 200°C               | Perm                     | 1                             | _             | ELE-3COP-551                                 | Heat gun                                |
|     | Semiflexible Dual-Wall<br>Heat-Shrink Tubing<br>HTAT-XX         | 4:1 shrink ratio<br>Hotmelt adhesive                                  | SAE AMS-DTL-23053/16  | Sealing, strain-relief   | 125°C               | 1                        | 1                             | _             | COP610                                       | Heat gun                                |
| -   | Heat-Shrink Molded Parts<br>AT-099-XX<br>INSTALITE              | High shrink ratio<br>Elastomer sleeve                                 | MIL-S<br>VG95343<br>VG95343/XX<br>AS85049/XX                            | Sealing, strain-relief<br>Heat-activated epoxy adhesive Refurbish back-<br>shell<br>Anti-rotation  | 150°C               | Perm                     | 1                             | _             | COP554                                       | Heat gun                                |
| (9) | Helical Convolex Conduit Tubing<br>HCTE                         | High temperature, fluid resistant<br>Conduit, nonheat shrink          | VG96936 Part 6<br>RT-1162   | High temp<br>Impact protection<br>Flexing<br>Supplement with shrink boots<br>Supplement with adhesive  | 200°C               | Perm                     | 1                             | _             | COP566                                       | N/A                                     |
|     | COPALUM Splice Cover<br>RT-555-XXX-YYY-A287                     | High-temperature, heat-shrinkable,<br>fluid-resistant sealing sleeves | FAR Part 25<br>FAA Standard   | Sealed, high temp  | 200°C               | 1                        | 1                             | _             | TUS-41-3026                                  | Heat gun                                |
|     | Wrap-Around Marker<br>WM-SCE                                    | Wrap around heat-shrink<br>identification marker                      |   | Adhesive lined<br>Harness marking<br>Any difficult to access area  | 135°C               | 1                        | 1                             | V             | 411-121004                                   | Heat gun<br>PTFE tape<br>Thermal printe |
| 3   | S1260 Adhesive Tape   | Fast, permanent repair to high temperature PTFE jacket                | RT-1050/29  | High temperature sealing<br>Fluid resistance<br>Seals to PTFE<br>Cures with heat gun, no oven required   | 240°C               | Perm                     | _                             | J             | TUS-44-3039                                  | Heat gun rated<br>to 2200 W             |
| A A | Epoxy Adhesive<br>S-1125  | Two-component liquid<br>Sealing and mechanical bonding                | VG95343/15<br>RK-6619   | Flexibility<br>Potting<br>High peel strength<br>Room temp cure, no oven required   | 240°C               | Perm                     | _                             | J             | COP604                                       | N/A                                     |
| 9   | Hotmelt Adhesive Tape<br>S-1048                                 | Sealing and mechanical bonding  | RT-1050/3   | Flexibility<br>High peel strength<br>No curing<br>Heat gun set<br>Re-workable  | 120°C               | Perm                     | 1                             | J             | COP607                                       | Heat gun                                |
|     | Conductive Epoxy<br>S-1184                                      | Two-component liquid<br>Sealing and mechanical bonding                | RK-6627   | Flexibility, Potting, Braid shield termination<br>Low electrical resistance<br>No heat, no solder, no clamping<br>Supplement with structural/ sealing epoxy<br>Caution with shelf life & storage | 150°C               | Perm                     | _                             | J             | COP522<br>COP505                             | N/A                                     |
|     | <b>Shrink Tape</b><br>T-DR-25                                   | No adhesive<br>Sealing and mechanical bonding                         |   | Flexibility<br>Mechanical protection<br>Nonself-amalgamating<br>Supplement with adhesive for sealing and bonding   | 135°C               | Perm                     | _                             | J             | TDR25INSTALL                                 | Heat gun                                |

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