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**Terminating Size 16, Series"999", SolderTact Contacts,  
for Coaxial Cable: D-602-0140, -0141, -0171****1. Purpose and Scope**

This standard contains the termination procedures, inspection requirements, and rework procedures for the following Raychem SolderTact contacts for coaxial cable:

- D-602-0140 size 16 pin contacts for MIL-C-38999 Series I, II, III, and IV connectors.
- D-602-0141 size 16 socket contacts for MIL-C-38999 Series I, III, and IV connectors.
- D-602-0171 size 16 socket contacts for MIL-C-38999 Series II connectors.

**2. References**

The following Raychem documents are referenced in this engineering standard:

- AA-400 Superheater Instructions.
- AD-1319 Holding Fixture Instructions.
- HL1920E/HL2020E Heat-Gun Heating Tool Instructions.
- Visual Inspection Standards: Verification Photos.

**3. Application Equipment and Tools****3.1 Holding Fixtures and Adapters**

- AD-1319 holding fixture.
- AD-1567 holding fixture.
- AD-1565 repair holding fixture.
- AD-1572 repair holding fixture.
- AT-1319-27 adapter for D-602-0140 pin contacts and D-602-0171 socket contacts.
- AT-1319-78 adapter for D-602-0140 pin contacts and D-602-0141 socket contacts.



### 3.2 Heating Tools

- AA-400 SuperHeater with No. 979663 Mini-SolderSleeve reflector.
- HL1920E / HL2020E Steinel Hot Air Gun with EH0600-000 HL-Soldersleeve Reflector

**Note**

Steinel HL1920E / HL2020E Replaces CV5300 MiniGun®. But they still can be used

### 3.3 Miscellaneous Tools

- Raychem AD-1575 conductor folding tool.
- Raychem AA-400-140 magnifier bracket assembly for use with AA-400 heating tool.

## 4. **Materials**

- Solder: Sn63 or Sn60 per QQ-S-571
- Flux: Type RMA per MIL-F-14256 (Alpha #611 or equivalent)

## 5. **Termination Procedures**

### 5.1 Coaxial Cable Accommodation

D-602-0140, D-602-0141, and D-602-0171 SolderTact contacts can be terminated to coaxial cable of the dimensions shown in Figures 5-1 and 5-2.

- Figure 5-1 applies to cables prepared using conventional stripping.
- Figure 5-2 applies to cables too small for conventional stripping.

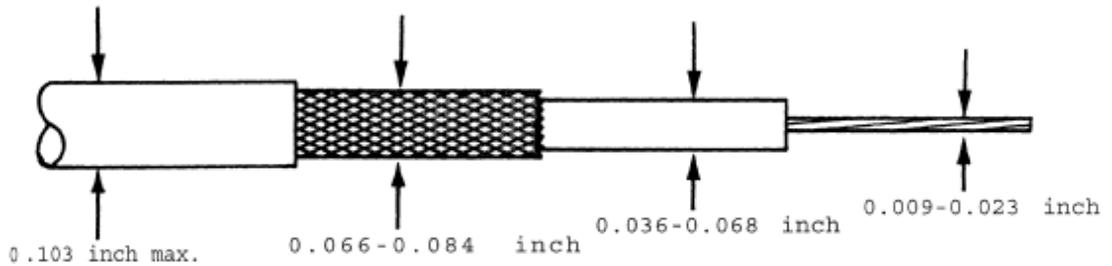


Figure 5-1. Coaxial Cable Size Accommodation: Conventional Stripping

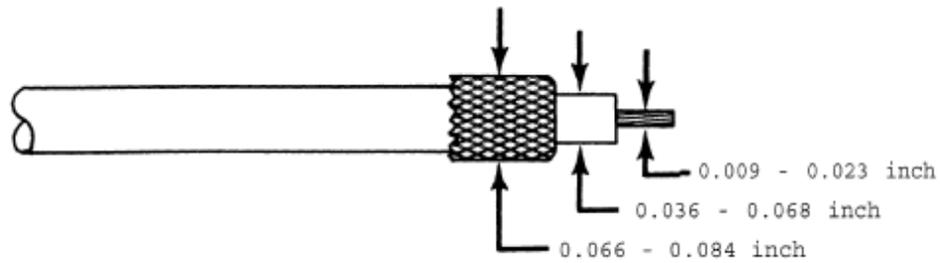


Figure 5-2. Coaxial Cable Size Accommodation: Fold-Back Stripping

5.2 Coaxial Cable Preparation (Except RG-178B/U)

1. Determine the proper cable stripping method (conventional or braid fold-back), based on the diameter of the cable over the braid (See 5.1).
2. Prepare the coaxial cable to the dimensions shown in the applicable example in Figure 5-3, based on the following criteria:
  1. Cable stripping method (from step 1 above)
  2. Cable center conductor size (from Table 5-1)
  - NOTE: If the braid fold-back method is used, fold braid back over cable jacket and trim to the dimensions shown in Figure 5-3.

**Table 5-1. Coaxial Cable Stripping Dimensions**

Coaxial Cable Stripping Method	Coaxial Cable Center Conductor Size	Stripping Example in Figure 5-3
Standard	AWG 30 and larger	A
	AWG 32 and smaller	B
Braid fold-back	AWG 30 and larger	C
	AWG 32 and smaller	D

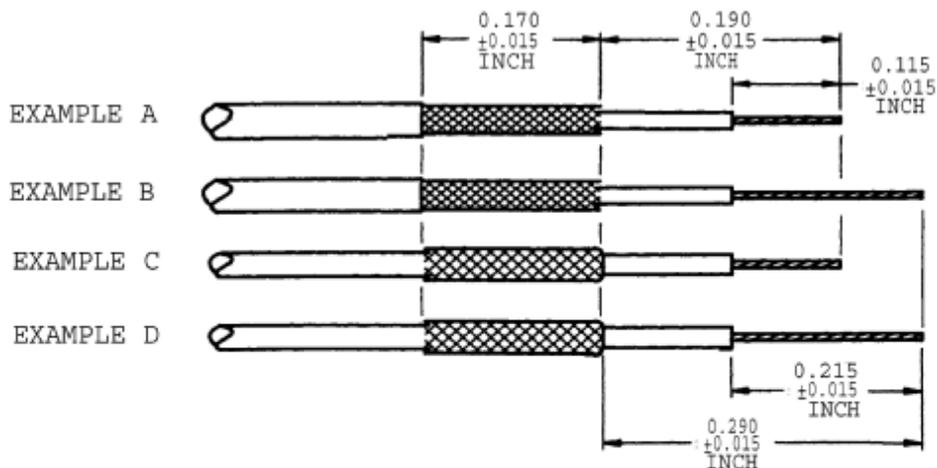


Figure 5-3. Coaxial Cable Stripping Dimensions (Refer to Table 5-1)

3. Straighten the center conductor and make sure that stranded center conductor is twisted into its original lay.
4. Pre-tin stranded center conductor and unplated solid center conductor with Sn63 solder per QQ-S-571.
  - Use RMA flux per MIL-F-14256 (Alpha #611 or equivalent).
5. Make sure that the shield braid is trimmed evenly and that no loose strands are extending out across the exposed dielectric or cable jacket.
6. Smooth the braid ends flat against the dielectric or cable jacket.
7. If the center conductor strip length is 0.215 inch as shown in examples B and D of Figure 5-3, fold the center conductor back on itself as shown in Figure 5-4.
  - The AD-1575 folding tool can be used to help start the fold; however, the fold must be tighter than can be obtained with the AD-1575 tool alone.

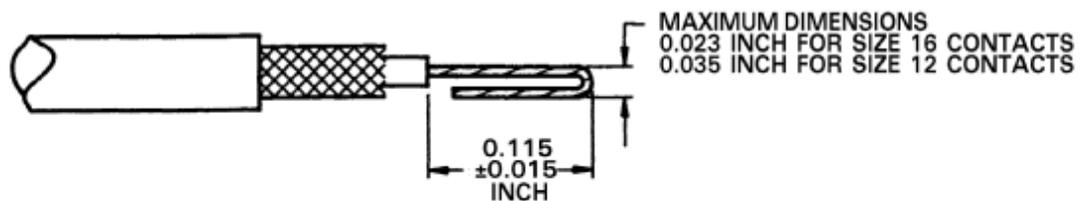


Figure 5-4. Small-Diameter Center Conductor Folded Back

### 5.3 Coaxial Cable Preparation: RG-178B/U Coaxial Cable

1. Strip the RG-178B/U coaxial cable as shown in example A of Figure 5-3
2. Straighten the center conductor and make sure that the center conductor strands are twisted into their original lay.
3. Slip the D-600-0018 dielectric barrier between the shield braid and the cable dielectric (Figure 5-5).
4. Pre-tin the center conductor with Sn63 solder per QQ-S-571.
  - Use RMA flux per MIL-F-14256 (Alpha #611 or equivalent).

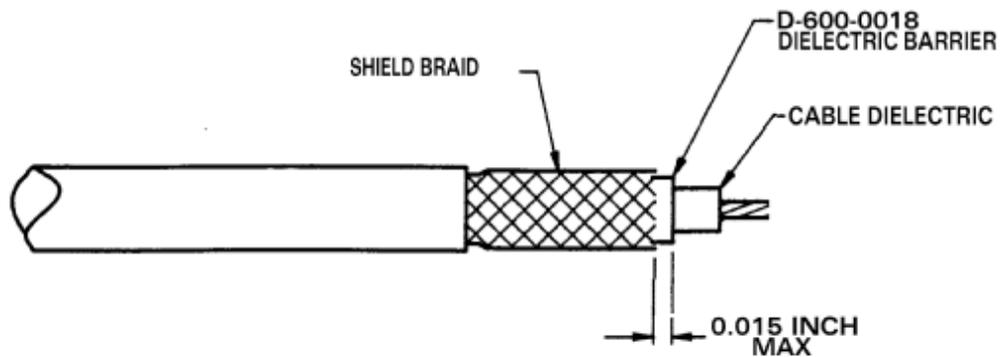


Figure 5-5. D-600-0018 Dielectric Barrier Installation

5. Make sure that the shield braid is trimmed evenly and there are no loose strands extending out across the exposed dielectric.
6. Smooth the braid ends flat against the dielectric barrier.

#### 5.4 Inserting Prepared Cable Into Contact

1. If required to improve wetting of tin plated shield, add a drop of RMA flux per MIL-F-14256 to the cable shield.
  - Poor wetting of shield is indicated by lack of proper solder fillets between cable shield and body of contact, or by lack of solder coverage on shield visible through inspection windows of contact.
2. Slip the contact over the end of the prepared cable, and carefully push the contact onto the cable until it stops.
  - Rotating the contact slightly during cable insertion will help prevent the braid from catching.
  - If the cable cannot be inserted as required, remove the contact from the cable and check for improper strip dimensions, splayed shield braid, or bent center conductor.
3. Inspect for proper insertion (Figure 5-6).
  - The center conductor must be visible through one of the forward inspection windows.
  - The distance from the rear of the contact body to the cable jacket insulation should not exceed 0.1 inch (2.5 mm).
  - If the cable cannot be inserted as required, remove the contact from the cable and check for improper strip dimensions, splayed shield braid, or bent center conductor.

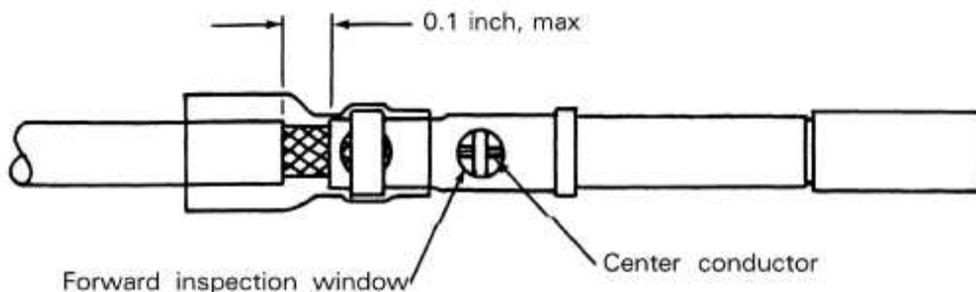


Figure 5-6. Inspection for proper cable insertion



**6. Heating Procedures**

**6.1 Holding Fixture and Adapter Selection**

Select the appropriate holding fixture and adapter for the contact to be terminated (Table 6-1).

- **IMPORTANT:** A suitable holding fixture must be used, to prevent damage to the contacts.
- The AD-1565 and AD-1572 repair holding fixtures are designed for use during the replacement of contacts where limited access prevents the use of the AD-1319 or AD-1567 fixtures. The repair holding fixtures do not provide cable clamping; therefore the cable must be secured during heating to prevent faulty solder terminations.

**Table 6-1. Holding Fixture and Adapter Selection**

CONTACT	STANDARD HOLDING FIXTURE		REPAIR HOLDING
	BASIC FIXTURE	ADAPTER	FIXTURE
D-602-0140 D-602-0141	AD-1319 or AD-1567	AT-1319-78	AD-1565
D-602-0140 D-602-0171	AD-1319 or AD-1567	AT-1319-27	AD-1572

## 6.2 Holding Fixture Setup

### 6.2.1 Setup Procedures for AD-1319 Holding Fixture

1. Install the appropriate adapter (from Section 6.1) onto the AD-1319 holding fixture (See Figure 6-1).
2. Insert a contact in the adapter and set up the dimensions as shown in Figure 6-1.
  - Make sure that the contact is inserted in the appropriate end of the adapter:
    - a. D-602-0140 outer pin contacts in the “P” end.
    - b. D-602-0141 and D-602-0171 outer socket contacts in the “S” end.
  - If using a hot-air heating tool, the spacer collar is not needed, but may be left in place.

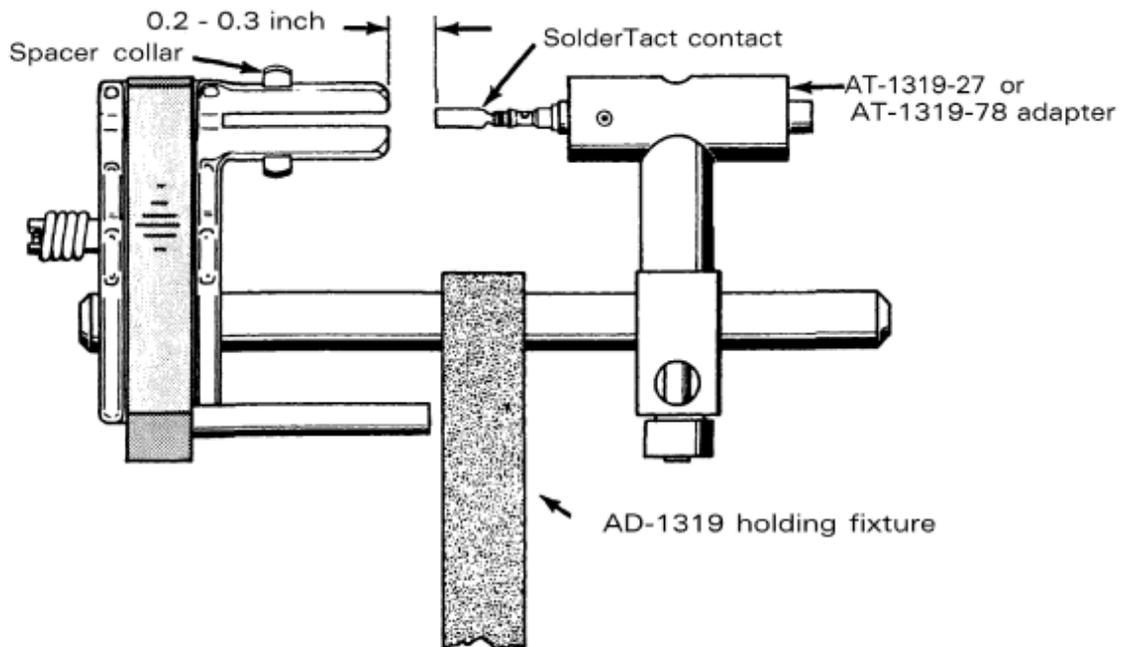


Figure 6-1. Setup Dimensions for AD-1319 Holding Fixture

### 6.2.2 Setup Procedures for AD-1567 Holding Fixture

1. Install the appropriate adapter (from Section 6.1) onto the AD-1567 holding fixture (See Figure 6-2).
  - If installing an adapter for the first time, it is necessary to separate the cylindrical parts of the adapter from the rectangular mounting base. The rectangular base is not used with the AD-1567 holding fixture.
  - Be sure to install two collars, one above the AD-1567 body and one below it.

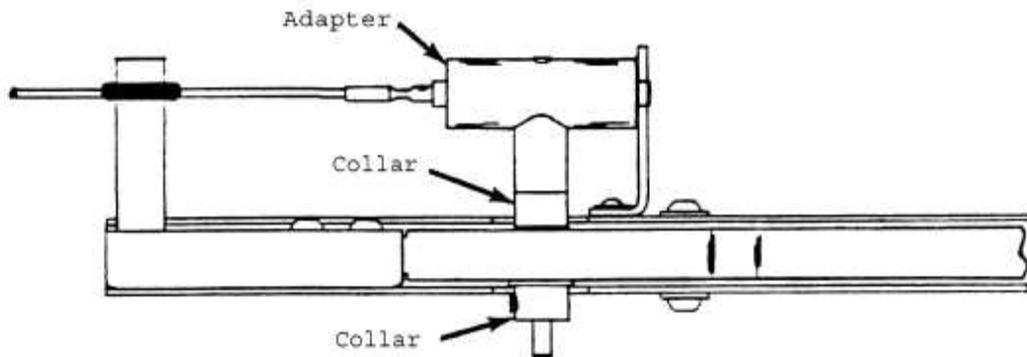


Figure 6-2. Adapter Installation on AD-1567 Holding Fixture

### 6.3 Heating Procedure

1. Insert the contact/cable assembly into the appropriate end of the adapter (Figure 6-3) or repair holding fixture (Figure 6-4).
  - a. D-602-0140 outer pin contacts in the “P” end.
  - b. D-602-0141 or D-602-0171 outer socket contacts in the “S” end.

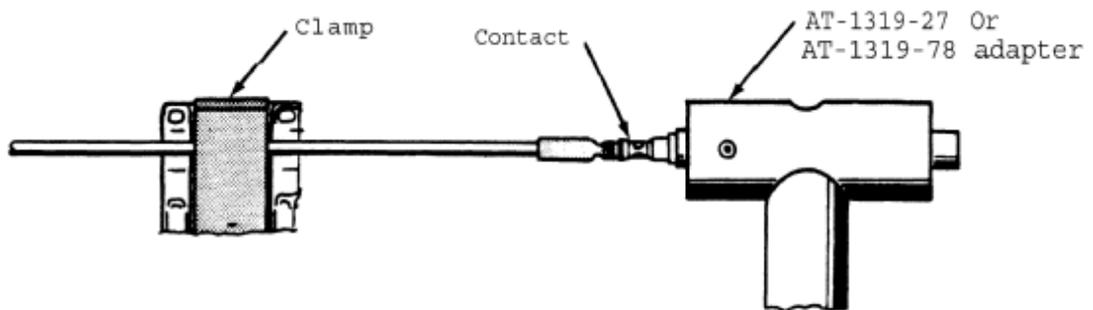


Figure 6-3. Contact Inserted into AT-1319-27 or -78 Adapter

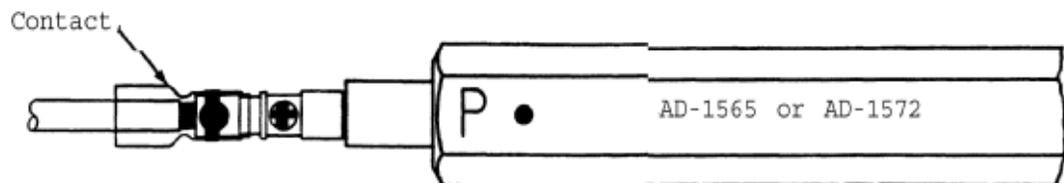


Figure 6-4. Contact Inserted into AD-1565 or AD-1572 Repair Holding Fixture



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- 2 Clamp the cable in the AD-1319 or AD-1567 holding fixture (if used).
    - The cable must remain fully inserted in the contact,
    - The contact must be fully inserted in the adapter
    - The cable must be straight between the contact and the cable clamp.
  - 3 Attach the appropriate reflector and other applicable accessories to the heating tool.
    - For the AA-400 SuperHeater: No. 979663 Mini-SolderSleeve reflector (required) and AA-400-140 magnifier bracket assembly (optional).
    - For the HL1920E/HL2020E HeatGun: EH0600-000 HL-Soldersleeve Reflector
  - 4 Turn the heating tool on and allow to warm up.  
Steinel settings: 700°F ± 50°F, setting Air Flow Stage II, Duration-20 to 30 Secs
    - See instructions for tool used.

**CAUTION**

The heating tools have hot nozzle surfaces and produce hot air that can cause burns. To prevent burns, do not touch the nozzle, and keep hands and fingers away from the hot air stream.

5. Heat the contact as follows:
  - a. Using the holding fixture, position the contact in the heating tool reflector as shown in Figure 6-5, with the forward inspection window centered in the reflector
  - b. Continue heating until the small solder preform in the forward inspection window has melted and flowed, The large solder preform in the rear inspection window should have melted and flowed by this time; if it has not, direct hot air at the rear inspection window until it does.
    - If contact is UNDERHEATED, there will be visible remnants of the original shapes of the solder preforms. An underheated contact must be reheated as directed in 8.1,
    - If contact is OVERHEATED, solder will wick away from the joint areas, leaving no solder fillets. An overheated contact must be removed and a new contact installed as directed in 8.2,



MINI SOLDER SLEEVE REFLECTOR FOR AA-400 SUPERHEATER

**Solder Sleeve Reflector**

6. After the contact has cooled for at least 10 seconds, remove the contact and cable from the holding fixture.
7. Inspect the completed termination according to Section 7.0,



## 7. Inspection

If contacts are underheated, overheated, or improperly assembled, they must be reworked as directed in Section 8.0,

### 7.1 Inspection for Proper Assembly

Inspect the completed termination for correct assembly according to the following criteria:

1. The cable shield must extend into the contact at least as far as the front edge of the rear inspection windows.
2. The center conductor must be visible through one of the forward inspection windows.

### 7.2 Inspection for Proper Heating

Inspect the completed termination for proper heating according to the following criteria:

1. The solder preform in the forward inspection windows must be melted and flowed so that:
  - a. None of the original preform shape remains.
    - Any remaining preform shape indicates underheating.
  - b. Solder fillet is visible between the center conductor and the inner contact soldering surface,
    - Insufficient visible solder indicates overheating.
2. The solder preform in the rear inspection window must be melted and flowed so that:
  - a. None of the original preform shape remains.
    - Any remaining preform shape indicates underheating.
    - The original position of the solder preform may be visible in the form of a contrasting band.
  - b. Solder fillet is visible between cable braid and contact body.
    - Insufficient visible solder indicates overheating.
3. The insulating sleeve must be fully shrunk onto the cable braid and jacket at the rear of the contact,

Continued next page,



4. The insulating sleeve must not be darkened so as to obscure the solder joints or hinder inspection.
  - If the solder joints cannot be seen due to darkening of the sleeve material, the termination is overheated,
5. The coaxial cable insulation must not show signs of damage or overheating outside of the insulating sleeve.

## **8. Repair and Rework**

### **8.1 Underheated Terminations**

Reheat underheated areas as directed in Section 6.0 and reinspect per Section 7.0. Avoid reheating areas that have been properly heated.

### **8.2 Overheated or Improperly Assembled Terminations**

1. Remove the contact from the cable as directed in Paragraph 8.3.
2. Check the cable for damage and incorrect stripping.
  - If the cable is damaged, cut off the damaged portion and restrip as described in Section 5.0.
3. If stripping is incorrect, restrip as required (Section 5.0).
4. Install new contact (Sections 5.0, 6.0, 7.0).

### **8.3 Removing Contact From Coaxial Cable**

1. Use a sharp knife or razor blade to score the outer insulating sleeve full length on two opposite sides of the contact.
  - Avoid cutting into cable jacket.
2. Peel off the outer insulating sleeve.

#### **CAUTION**

Safety glasses must be worn during the following operation. Hot solder can fly off the wires and cause burns to unprotected eyes,

3. Holding the contact with pliers, heat the contact until the solder melts, and quickly pull the heated contact off the cable.