
Terminating Round Wires to MTC50 Connector Inserts Using Preassembled SolderSleeve Terminators and a Sealing Boot

1.0 Purpose and Scope

This standard contains the procedures for terminating round wire to MTC50 connector inserts with preassembled SolderSleeve terminators, and for application of a sealing boot. These procedures are applicable to the following components:

MTC50 connector inserts:

MTC50-YA2-015:	2-inch "A" pin insert
MTC50-YB2-015:	2-inch "B" pin insert
MTC50-YA2-016:	2-inch "A" socket insert
MTC50-YB2-016:	2-inch "B" socket insert
MTC50-YA1-015:	1-inch "A" pin insert
MTC50-YB1-015:	1-inch "B" pin insert
MTC50-YA1-016:	1-inch "A" socket insert
MTC50-YB1-016:	1-inch "B" socket insert

Round wires:

MIL-W-22759/32-24, -26	(Raychem 55A0111-24 & -26)
MIL-W-22759/33-24, -26	(Raychem 55A0114-24 & -26)
MIL-W-22759/34-24, -26	(Raychem 55A0811-24 & -26)
MIL-W-22759/35-24, -26	(Raychem 55A0814-24 & -26)
MIL-W-22759/43-24, -26	(Raychem 55A0812-24 & -26)
MIL-W-22759/44-24, -26	(Raychem 55A0112-24 & -26)

FilterLine cable:

MIL-C-85485/10	(Raychem 55FA0514-24-7L)
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2.0 References

H50324	AA-400 Superheater Operating and Maintenance Instructions
ES-61402	CE-1404200/ CE-1404300 Waffle Iron Operating and Maintenance Instructions
ES-61257	MTC-50 Connector Assembly and Installation Instructions

3.0 Tools

Raychem AA-400 SuperHeater Hot Air Heating Tool with Needle Point Tip

Raychem CE-1404200 Waffle Iron II Heating Tool

Platen sets for Waffle Iron II Heating Tool

CE-1516300: For pin inserts
CE-1516400: For socket inserts

Solder Pot

Round Wire Stripping Tool, Ideal or equivalent

CE-1605500: MTC50 Insert Termination Fixture

4.0 Materials

Solder: Sn96 per QQ-S-571

Flux: Type RMA per MIL-F-14256 (Alpha #611)

Flux Thinner: Isopropyl Alcohol or as appropriate

Flux Remover: Isopropyl Alcohol

5.0 Termination Procedures

5.1 Round Wire Preparation

1. Cut wires to the length required (Figure 5-1).

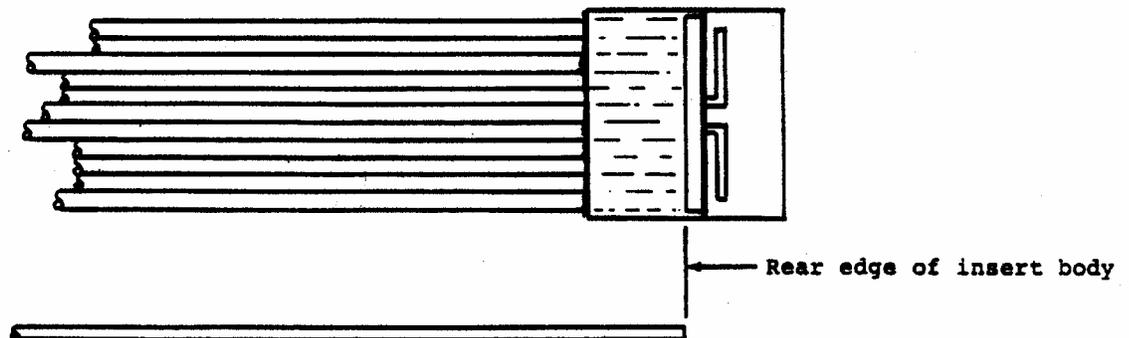


Figure 5-1. Length Determination for Round Wires

2. Strip wire for a length of 0.15 ± 0.01 inches.
 - Use an Ideal round wire stripper or equivalent.
3. Make sure that the strands of the conductor are twisted into their proper lay, and that the wires are straight.
4. Flux coat the exposed conductors.
 - Dip the conductors for one half of their exposed length in a 1:1 mixture of Alpha #611 flux and isopropyl alcohol.
5. Allow fluxed conductors to dry for at least 30 seconds.
6. Pre-tin the conductors by dipping them in molten Sn96 solder.
 - Solder temperature: 515 ± 10 degrees F
 - Skim dross from solder pot
 - Immerse conductors for 4 to 6 seconds and withdraw slowly to prevent icicle formation.
 - Depth of immersion to be approximately $3/4$ of the exposed length.
7. Remove flux residue using isopropyl alcohol.
 - Do not immerse wire ends. Use tissues moistened with alcohol to wipe off flux.

WARNING

Isopropyl Alcohol is a volatile, flammable liquid and should not be used near open flames or electrical sparks.

8. Allow cleaned conductors to dry for at least one minute.

5.2 Inserting Wires into Inserts

1. Position the MTC50 insert (with SolderSleeve terminators preinstalled) in the CE-1605500 termination fixture (Figure 5-2).

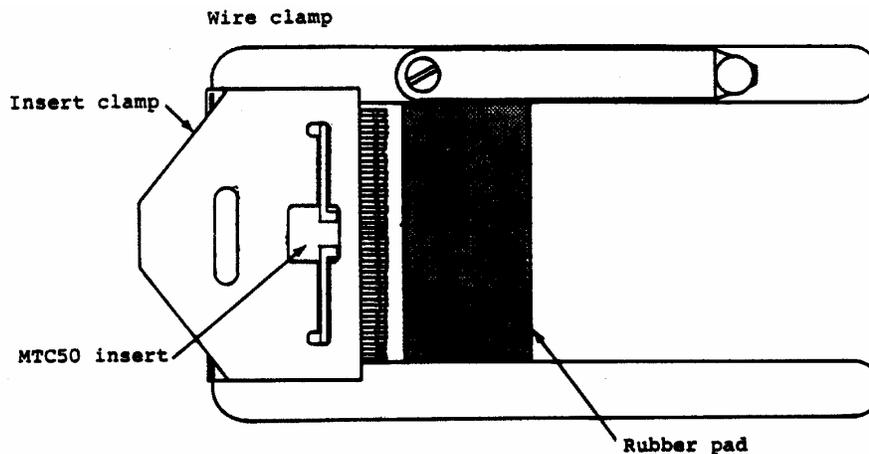


Figure 5-2. Positioning MTC50 Insert in CE-1605500 Termination Fixture

2. Install the sealing boot over the wires. Push it back out of the way.
 - The end of the boot with a double layer of adhesive is positioned toward the wires. see Fig. 7-1
3. Load the prepared wires into the SolderSleeve terminators that are preinstalled on the insert.
 - Consult the applicable drawing or wiring list for wire positions.
 - Insert each conductor into the SolderSleeve terminator until it bottoms out.
 - Every SolderSleeve terminator must have a prepared wire inserted. For wire positions that are not active circuits, insert stripped wires cut to a length of 0.37 to 0.40 inch. These filler wires will be encapsulated in the sealing boot.
4. Close and latch the clamp.
5. Verify that each wire is in the correct position and each conductor is bottomed out in its SolderSleeve terminator.
 - If any wire needs repositioning, leave the clamp closed and move the wire under it.

5.3 Heating

1. Heat the SolderSleeve terminators using the AA-400 SuperHeater with a needle-point tip.
 - Start at one side of the insert and tilt the heat gun slightly, aiming the hot air stream toward the SolderSleeve terminators.
 - Aim the hot air at the solder ring inside the SolderSleeve terminator; hold the tip about 1/8 to 1/4 inch from the sleeve.
 - Heat each SolderSleeve terminator until the solder ring melts and flows, and a solder fillet is formed between the wire and the terminal of the MTC50 insert.
 - Work across the row of SolderSleeve terminators, terminating each one completely before continuing on to the next. As each SolderSleeve terminator is being heated, the hot air from the tilted heat gun will preheat the next one.

6.0 Inspection of Soldersleeve Terminations

6.1 Inspection for Proper Conductor Positioning and Spacing

1. Each wire conductor must be positioned on its terminal as shown in Figure 6-1.

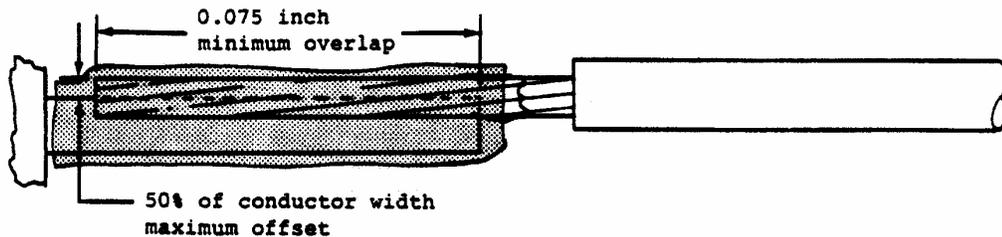


Figure 6-1. Inspection for Conductor Positioning

2. The distance between electrically conductive surfaces must not be less than 0.015 inch as shown in Figure 6-2.

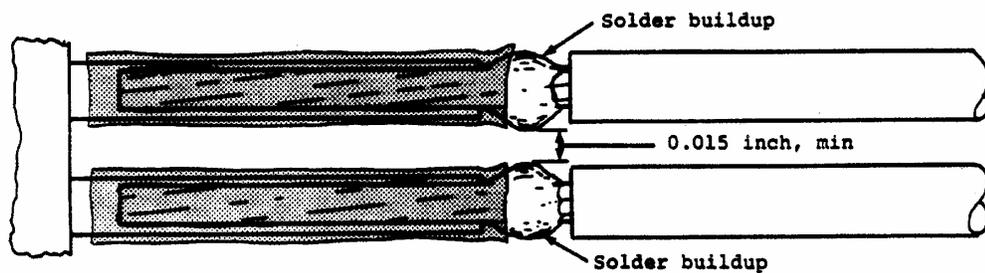


Figure 6-2. Inspection for Conductor Minimum Spacing

6.2 Inspection for Correct Heating

1. The solder preform must be melted and flowed so that:
 - A solder fillet is visible between the wire conductor and the terminal of the MTC50 insert (Figure 6-3).
 - There is no remnant of the original solder preform shape. (There may be a dark band showing the original location of the solder preform.)

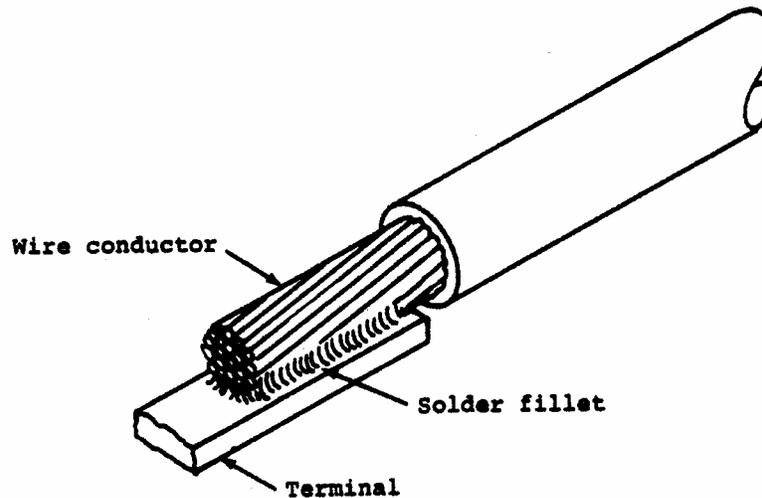


Figure 6-3. Heating Inspection

2. The sleeve must be fully shrunk onto the wire and terminal.
3. The sleeve must not be darkened so as to prevent visual inspection of the termination.

7.0 Installation of Sealing Boots

7.1 Waffle Iron II Setup

Set up the Waffle Iron as described in paragraph 5.1 of the Waffle Iron II instructions and as follows:

- Use platens and control settings as listed in Table 7-1.

Table 7-1. Waffle Iron II Platens and Control Settings

Insert Type	Platen Number	Control Setting Temp/Time
Pin, 2 inch	CE-1516300 Rev. C	04
Pin, 1 inch	CE-1516300 Rev. C	02
Socket, 2 inch	CE-1516400 Rev. C	04
Socket, 1 inch	CE-1516400 Rev. C	02

7.2 Assembly Procedures

Slide the sealing boot (previously installed over the wires) onto the rear of the connector insert.

- The sealing boot goes over the SolderSleeve terminators and over the indented part of the insert as shown in Figure 7-1.
- The sealing boot must contact the shoulder where the indented part of the insert meets the main body of the insert.

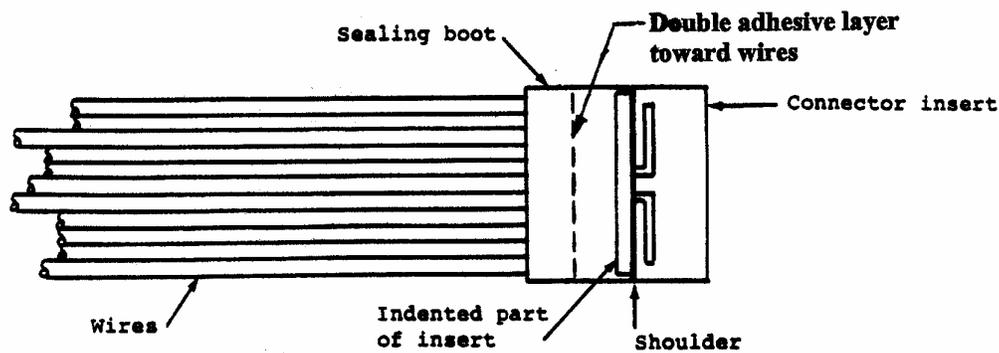


Figure 7-1. Sealing Boot Position on MTC50 Insert

7.3 Heating Procedures

Use of the Waffle Iron II is described in detail in Section 3.3 of the Waffle Iron II operating and maintenance instructions.

WARNING

In keeping with good industrial hygienic practice, adequate ventilation must be maintained whenever plastic materials are heated.

1. Load the assembly so that the MTC50 insert is nested in the bottom platen.
 - Make sure that the mating end of the insert contacts the stop in the platen.
 - Retention ribs of insert face upward.
 - Wires extend to the operator's right.
2. Align the wires so they will exit the boot straight after termination.
3. Close and lock the clamp onto the wires.
4. Inspect for proper position of boot and wires.
5. Close and latch the upper heat sink of the Waffle Iron.
6. Press the start button.
 - The green **READY/ERROR** light must be illuminated before the heating cycle can be started.
7. Allow the heating cycle to continue until the **READY/ERROR** light comes on again.
8. Open the upper heat sink and remove the terminated assembly.
9. Inspect the terminated assembly (Section 8).

8.0 Inspection of Sealing Boot

Visually inspect terminated sealing boot

- Boot sealant must have melted and flowed around the wires.
- Some sealant may have flowed out where the boot meets the insert. Remove any excess adhesive so the insert will properly fit in the housing.
- Boot may not have any splits or tears.
- Some discoloration of boot may have occurred due to heat, but the boot may not be brown or charred.

9.0 Electrical Testing

The following electrical tests are recommended for the completed termination:

1. Electrical continuity.
2. Insulation Resistance.
Requirement is 5000 megohms, minimum, at 500 VDC, between adjacent conductors.
3. Dielectric Withstanding Voltage.
Requirement is 2.0 milliamp maximum leakage at 300 Vrms, between adjacent conductors.

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