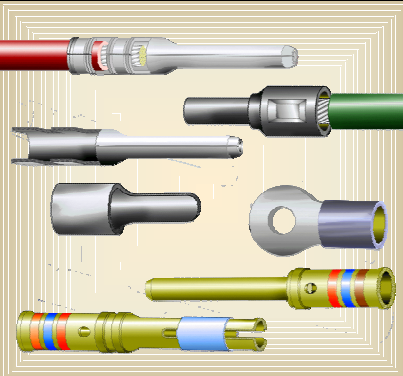


**CRIMPED TERMINATIONS
GENERAL REQUIREMENTS**

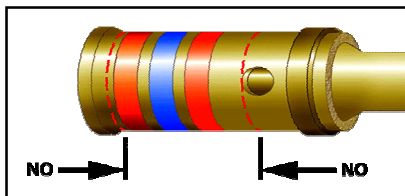


CRIMPED TERMINATIONS

Crimping is an efficient and highly reliable method to assemble and terminate conductors, and typically provides a stronger, more reliable termination method than that achieved by soldering.

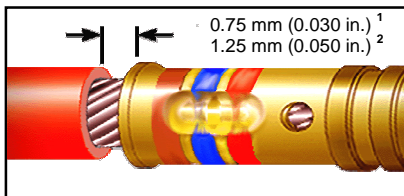
Crimp terminations are available in different styles, depending upon the design application and connectivity requirements.

This section details the generic accept / reject criteria of commonly used crimp termination styles. See 2.02 – 2.10 for specific accept / reject criteria applicable to individual crimp styles.



**CRIMP LOCATIONS
(ALL CRIMP TYPES)**

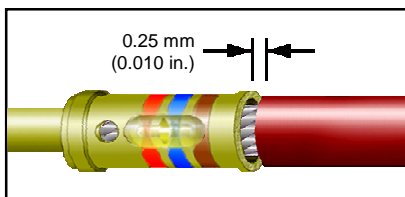
Crimp indents should be centered between the wire entry shoulder of the crimp barrel and the inspection hole / wire exit shoulder. Crimp indents shall not encroach on the wire entry shoulder or the inspection hole / wire exit shoulder.



**MAXIMUM INSULATION CLEARANCE
(ALL CRIMP TYPES)**

- For conductors 20 AWG and smaller, the maximum clearance is 0.75 mm (0.030 in.).
- For 18AWG and larger conductors, the maximum clearance is 1.25 mm (0.05 in.).

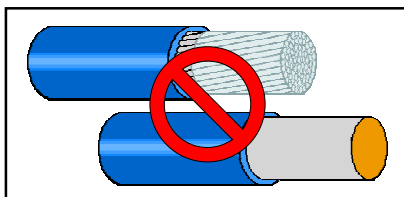
[NASA-STD-8739.4 \[10.1.7.b.2 \], \[19.6.2.c.9 \]](#)



**MINIMUM INSULATION CLEARANCE
(ALL CRIMP TYPES)**

The minimum insulation clearance for all crimped connections is 0.25 mm (0.010 in.).

[NASA-STD-8739.4 \[10.1.7.b.1 \], \[19.6.2.c.9 \]](#)




**SOLDER-TINNED STRANDED WIRE
SOLID WIRE**

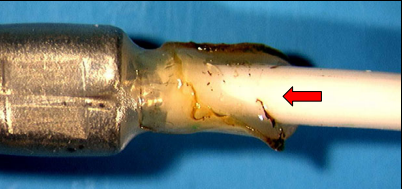
Crimping of solid wire, component leads, or stranded wire that has been solder-tinned, is prohibited.

[NASA-STD-8739.4 \[4.3.4 \]](#)

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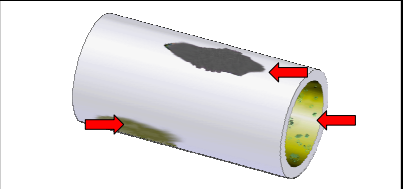
**CRIMPED TERMINATIONS
GENERAL REQUIREMENTS (cont.)**



**UNACCEPTABLE
CHARRED / SPLIT HEAT SHRINK**

The heat shrink tubing has been exposed to excessive heat, resulting in charring and splitting of the sleeve and possible damage to the conductor. Slight discoloration is acceptable.

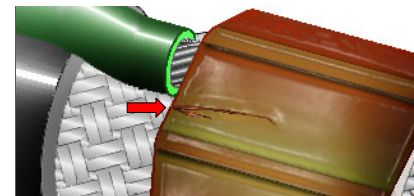
[NASA-STD-8739.4 \[9.8.1 \]](#)



**UNACCEPTABLE
CONTAMINATION**

Tarnish, corrosion, and/or contamination reduces the reliability of the crimp contact.

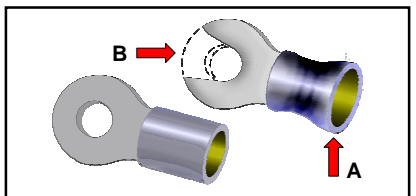
[NASA-STD-8739.4 \[12.2.2 \], \[19.6.2.c.8 \]](#)



**UNACCEPTABLE
CRIMP BARREL CRACKS**

Cracks in the crimp barrel reduce the mechanical reliability of the conductor-crimp termination.

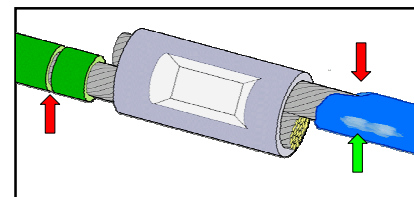
[NASA-STD-8739.4 \[19.6.2.c.2 \]](#)



**UNACCEPTABLE
CRIMP MODIFIED TO FIT**

Modifying the crimp, to accommodate an undersized / oversized conductor (A) or termination (B), reduces the mechanical strength and reliability of the conductor-crimp termination.

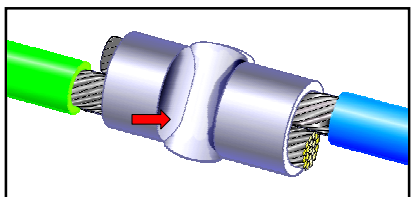
[NASA-STD-8739.4 \[4.3.5.a \], \[12.3.3 \], \[19.6.2.c.6 \]](#)



**UNACCEPTABLE
DAMAGED INSULATION**

Cut, crushed, gouged, damaged, or nicked insulation may result in reduced electrical isolation and/or short circuits. Slight scuffing or discoloration is acceptable.

[NASA-STD-8739.4 \[19.6.2.a.1 \]](#)




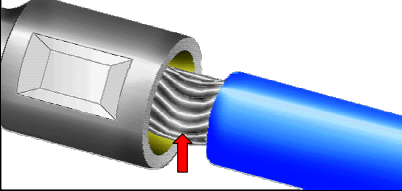
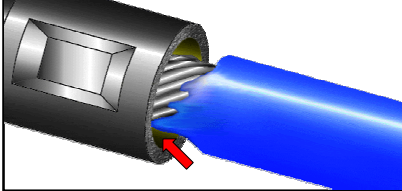
**UNACCEPTABLE
DEFORMED CRIMP**

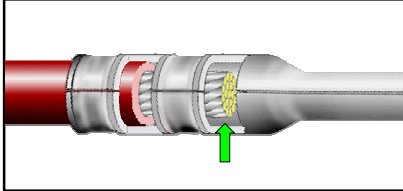
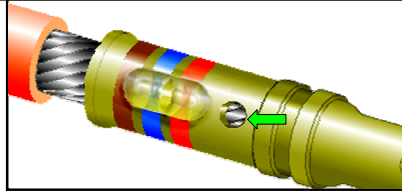
A damaged or deformed crimp indicates the use of an incorrect crimp positioner, and/or improper insertion into the crimp tool.

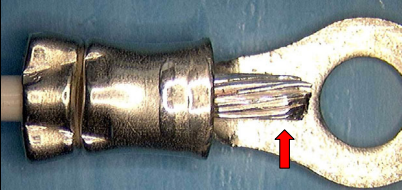
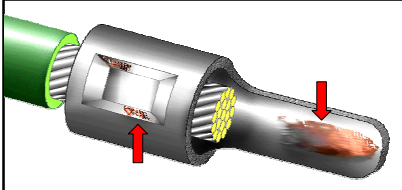
[NASA-STD-8739.4 \[19.6.2.c.6 \]](#)

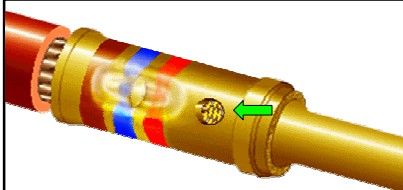

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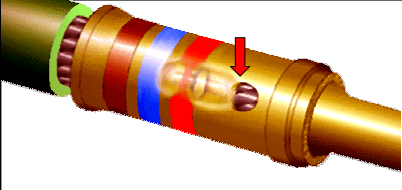
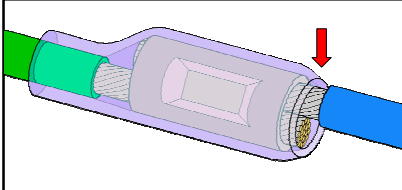
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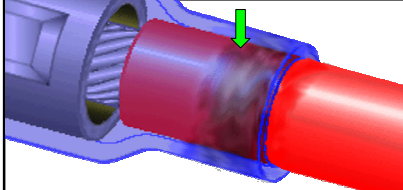
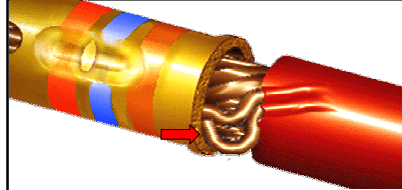
CRIMPED TERMINATIONS GENERAL REQUIREMENTS (cont.)	
 <p>UNACCEPTABLE DISTURBED LAY</p> <p>Disturbing the lay of wire strands during crimping may reduce the reliability of the crimp termination. Best Workmanship Practice</p>	 <p>UNACCEPTABLE EDGE FLASH / INSULATION WHISKERS</p> <p>Excessive edge flash or insulation whiskers that extend into the conductor crimp section may interfere with the proper mechanical and electrical termination of the crimp. NASA-STD-8739.4 [19.6.2.c.10]</p>

CRIMPED TERMINATIONS GENERAL REQUIREMENTS (cont.)	
 <p>WIRE ENDS VISIBLE (LUG / OPEN BARREL CRIMPS)</p> <p>The wire ends shall be visible. The conductor should extend a minimum of even with, and a maximum of one wire diameter beyond, the conductor crimp edge. Best Workmanship Practice</p>	 <p>WIRE STRANDS VISIBLE (PIN / CLOSED BARREL CRIMPS)</p> <p>The wire strands shall be visible in the inspection hole, indicating that the conductor is properly inserted. Preferably, the wire end should be bottomed in the crimp barrel. NASA-STD-8739.4 [19.6.1.c.3]</p>

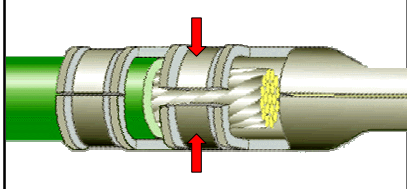
 <p>UNACCEPTABLE EXCESSIVE CONDUCTOR LENGTH</p> <p>The conductor should extend a minimum of flush with, and a maximum of one (1) wire diameter beyond the conductor crimp edge. Best Workmanship Practice</p>	 <p>UNACCEPTABLE EXPOSED BASE METAL</p> <p>Exposed base metal reduces the reliability of the crimp. NASA-STD-8739.4 [12.2.5], [19.6.2.c.6]</p>
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 <p>ACCEPTABLE (MINIMUM) WIRE ENDS VISIBLE (PIN / CLOSED BARREL CRIMPS)</p> <p>At a minimum, the ends of the wire strands shall be visible in the inspection hole, indicating that the conductor has been properly inserted in the crimp barrel. NASA-STD-8739.4 [19.6.1.c.3]</p>	 <p>ACCEPTABLE HEAT SHRINK INSTALLATION</p> <p>Tubing is tight, symmetrical, undamaged (slight discoloration is acceptable). Overlaps meet minimum electrical spacing and provide strain relief. Termination is visible and inspectable. NASA-STD-8739.4 [9.8.1], [9.9]</p>
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 <p>UNACCEPTABLE IMPROPER CRIMP LOCATION (INSPECTION HOLE)</p> <p>The indents shall not encroach on or distort the inspection hole. NASA-STD-8739.4 [19.6.2.c.7]</p>	 <p>UNACCEPTABLE IMPROPER HEAT SHRINK LENGTH</p> <p>Heat shrink tubing conforms to the crimp outline, but does not extend over the wire to provide any sealing or strain relief to the conductor. NASA-STD-8739.4 [9.9]</p>
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 <p>ACCEPTABLE DISCOLORATION</p> <p>Slight discoloration of the shrink tubing is acceptable. Evidence of burning or charring is not acceptable. Best Workmanship Practice</p>	 <p>UNACCEPTABLE BIRDCAGED STRANDS</p> <p>Birdcaged strands reduce the conductor's overall strength and increase the possibility of shorting. NASA-STD-8739.4 [19.6.2.c.3]</p>
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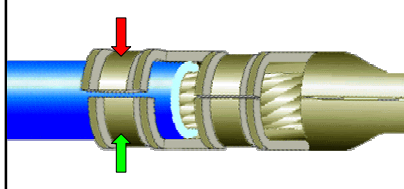
**CRIMPED TERMINATIONS
GENERAL REQUIREMENTS (cont.)**



**UNACCEPTABLE
INCOMPLETE CONDUCTOR CRIMP**

An incomplete or improper conductor crimp will produce a conductor-crimp termination with reduced mechanical strength and reduced reliability.

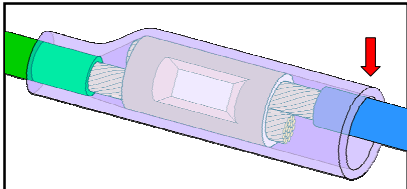
[NASA-STD-8739.4 \[19.6.2.c.6\]](#)



**UNACCEPTABLE
INCOMPLETE INSULATION CRIMP
(MULTIPLE CRIMP PINS / SOCKETS)**

An incomplete or improperly set insulation crimp will produce a termination with reduced mechanical strength and reduced reliability.

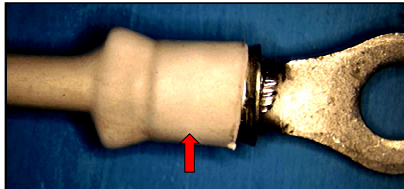
[NASA-STD-8739.4 \[19.6.2.c.6\]](#)



**UNACCEPTABLE
INCOMPLETE SHRINKAGE**

The heat shrink tubing conforms to the crimp outline and extends over the wire the proper length, but does not follow the contour of the wire, or provide any sealing or strain relief.

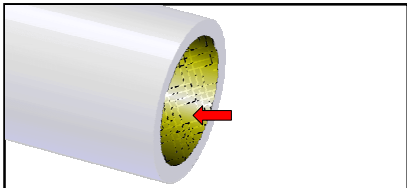
[NASA-STD-8739.4 \[9.8.1\]](#)



**UNACCEPTABLE
OPAQUE HEAT SHRINK**

Heat shrink tubing is opaque, prohibiting visual inspection of the termination. Heat shrink tubing shall be transparent or translucent, allowing visual inspection of termination.

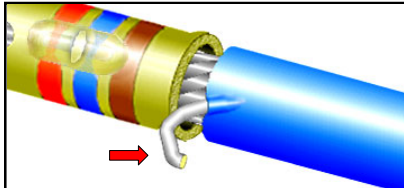
[Best Workmanship Practice](#)



**UNACCEPTABLE
PEELING / FLAKING PLATING**

A contact exhibiting peeling or flaking plating indicates a component of questionable quality and, shall be rejected.

[NASA-STD-8739.4 \[12.2.3\], \[19.6.2.c.5\]](#)



**UNACCEPTABLE
PROTRUDING STRANDS**

Protruding strands reduce the current capacity of the termination, and present a puncture, sharp object damage, or shorting risk.

[Best Workmanship Practice](#)

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CRIMPED TERMINATIONS GENERAL REQUIREMENTS (cont.)	
<p>UNACCEPTABLE WIRE MODIFIED TO FIT</p> <p>Modifying wires to fit the crimp barrel reduces the current carrying capacity and mechanical reliability of the conductor-crimp termination.</p> <p>NASA-STD-8739.4 [4.3.5.a], [12.3.3], [19.6.2.a.2]</p>	<p>UNACCEPTABLE WIRE STRANDS NOT VISIBLE (PIN / CLOSED BARREL CRIMPS)</p> <p>Wire strands not visible in the inspection hole indicate that the conductor may not be properly inserted and shall be cause for rejection.</p> <p>NASA-STD-8739.4 [19.6.2.c.4]</p>

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