



**NOTE**

All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters [and inches]. Unless otherwise specified, dimensions have a tolerance of  $\pm 0.13$  [ $\pm .005$ ] and angles have a tolerance of  $\pm 2^\circ$ . Figures and illustrations are for identification only and are not drawn to scale.

## 1. INTRODUCTION

This specification covers the requirements for application of Induction Heat Terminated Ring Tongue terminals onto copper Litz wire. These requirements are applicable only to semi-automatic machine crimping tools.

When corresponding with TE Connectivity personnel, use the terminology provided on this specification to help facilitate your inquiry for information. Basic terms and features of this product are provided in Figure 1.

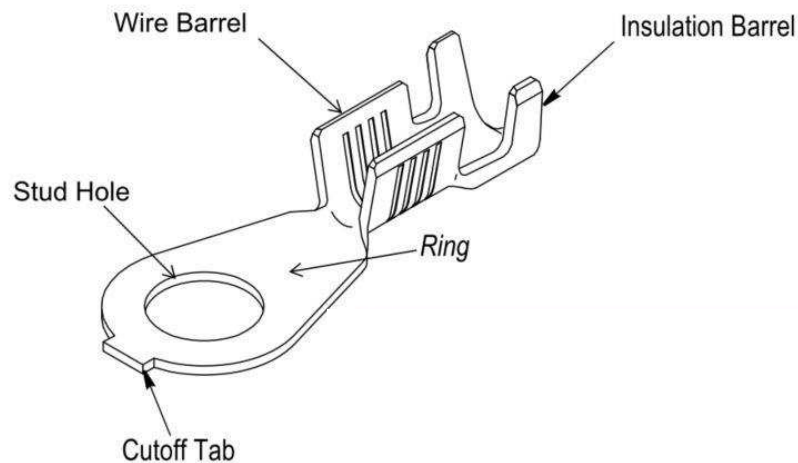


Figure 1

## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

This paragraph is reserved for a revision summary of the most recent additions and changes made to this specification which include the following:

- No revisions have been made to this document yet.

### 2.2. Customer Assistance

Reference product part number 62613-2 and product code 1040 are representative of Induction Heat Terminated Ring Tongue terminals for copper Litz wire. Using these numbers will identify the product line and help you to obtain product and tooling information when visiting [www.te.com](http://www.te.com) or calling the number at bottom of page 1.

### 2.3. Drawings

Customer drawing for product part number 62613-2 is available from [www.te.com](http://www.te.com). Information contained in the customer drawing takes priority.

## 2.4. Instructional Material

Instruction sheets (408-series) provide product assembly instructions or tooling setup and operation procedures and customer manuals (409-series) provide machine setup and operating procedures. Instructional material that pertains to this product are:

- 408-7424 Checking Terminal Crimp Height or Gaging the Die Closure
- 408-8014 Standard-Type End-Feed Applicators
- 408-8024 Miniature Quick-Change Applicator (End-Feed Type)
- 408-8039 Heavy Duty Miniature Quick-Change Applicator (End-Feed Type) with Mechanical or Air-Feed
- 408-8059 Suggested Preventative Maintenance Schedule for Applicators
- 408-9816 Handling Reeled Product

## 3. REQUIREMENTS

### 3.1. Safety

Do not stack product shipping containers so high that the containers buckle or deform. Do not store individual product reels on edge so that reel flanges buckle or deform.

### 3.2. Storage

#### A. Ultraviolet Light

Prolonged exposure to ultraviolet light may deteriorate the chemical composition used in the product material.

#### B. Shelf Life

The product should remain in the shipping containers until ready for use to prevent deformation to components. The product should be used on a first in, first out basis to avoid storage contamination that could adversely affect performance.

#### C. Reeled Splices

Care must be taken to prevent twisting, bending, or other distortion that would prevent smooth feeding of the reeled product through automatic machine feed mechanisms. Store coil wound reels horizontally. Review reel tag data to determine if breaks in the strip are present within the reel.

#### D. Chemical Exposure

Do not store product near any chemical listed below as they may cause stress corrosion cracking in the material.

Alkalines	Ammonia	Citrates	Phosphates	Citrates	Sulfur Compounds
Amines	Carbonates	Nitrites	Sulfur Nitrites		Tartrates



#### NOTE

Where the above environmental conditions exist, phosphor-bronze splices are recommended instead of brass if available.

### 3.3. Wire Size and Preparation

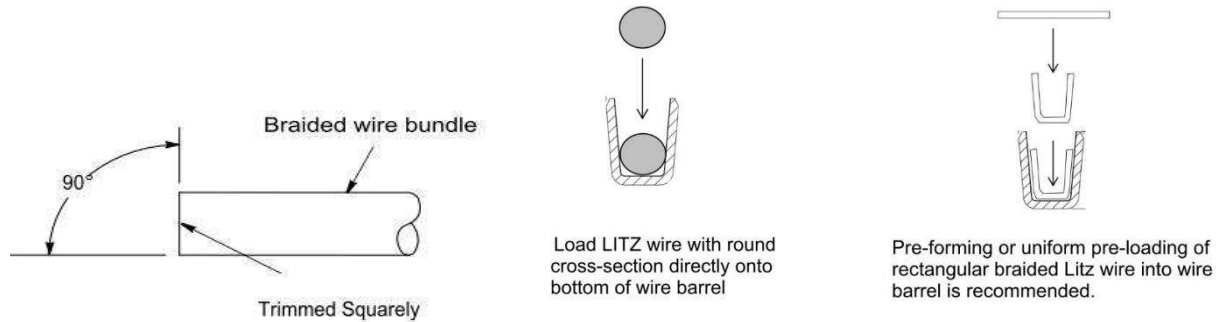
The Induction Heat Terminated Ring Tongue terminal for copper Litz wire will accept a wide range of copper Litz wire sizes and styles from 12–10 AWG. Wires shall be trimmed cleanly and squarely prior to termination. Litz wires with a round cross-section should be placed directly in the bottom of the wire barrel while those with a rectangular cross-section should be pre-formed or uniformly nested into the wire barrel to assure a uniform crimp profile and maximum connection to the individual wire strands. See Figure 2 .



#### CAUTION

Reasonable care must be taken not to nick, scrape, or cut any strands during wire prep. Litz wire must lay evenly in the bottom of the terminal. Other wire, splice, and crimp parameters must be considered as specified in the General Application Guidelines listed in TE product catalog 82221, magnet wire terminals and termination systems.

**i** **NOTE.** Due to the large variety of circular and rectangular geometries available with Litz wire, it may be necessary to pre-form the Litz wire bundle into the terminal wire barrel prior to crimping. This will help to assure a uniform crimp cross-section and maximize electrical contact between the individual wire strands in the Litz wire bundle and the insulation piercing serrations on the inside surface of the wire barrel. See examples in Figure 2.



**Figure 2**

### 3.4. Crimped Terminal Requirements

Figure 3 illustrates the crimp features required for Induction Heat Terminated Ring Tongue terminals intended for use with copper Litz wire after termination.

#### A. Crimp Width and Crimp Height

Optimum electrical and mechanical performance is achieved by reducing the cross-sectional area of the wires and wire barrel by a predetermined percentage. Crimp width is fixed in the application tooling. Crimp height must be set and maintained as determined from the crimp height formula provided on the terminal Customer Drawing. See Figure 3.

#### B. Crimp Length

For optimum crimp length effectiveness, the crimp must be within the area shown and must meet the crimp dimensions provided in Figure 3. Effective crimp length shall be defined as that portion of the crimp barrel, excluding tapers, fully formed by the crimping tool. Instructions for adjusting, repairing, and inspecting tools are packaged with the tools. See Paragraph 2.4, Instructional Material and Paragraph 6, TOOLING.

#### C. Crimp Tapers

Top and bottom crimp tapers shall conform to the dimensions given in Figure 3. Crimp tapers contribute to crimp effectiveness and reduce the risk of nicked and/or broken conductor strands due to sharp material edges at the ends of the splice.

#### D. Cutoff Tabs

Cutoff tabs shall not exceed the dimension shown in View A, Figure 3.

#### E. Cutoff Burrs

Cutoff burrs shall not exceed the dimension shown in View A, Figure 3.

#### F. Wire Barrel Flash

Wire barrel flash, which can be caused by incorrect set up and/or worn and broken crimp tooling, shall not exceed the dimension shown in Section X-X, Figure 3.

### G. Conductor Extension

Conductors must extend completely through the crimp wire barrel. Excess magnet wire and lead wire strands will be trimmed off by the application equipment as shown in Figure 3.

### H. Crimp Seam

The crimp seam must be closed with no evidence of loose wire strands visible in the seam as shown in Figure 3. Single wire strand exposure may occur in seam beyond effective crimp length. See Figure 3.

### I. Tensile Strength

Crimp quality shall be judged solely on proper crimp width, crimp height, and conformance to the requirements shown in Figure 3.



#### NOTE

When crimped as specified, crimp tensile strength will be approximately 70% of the tensile strength of the wire.

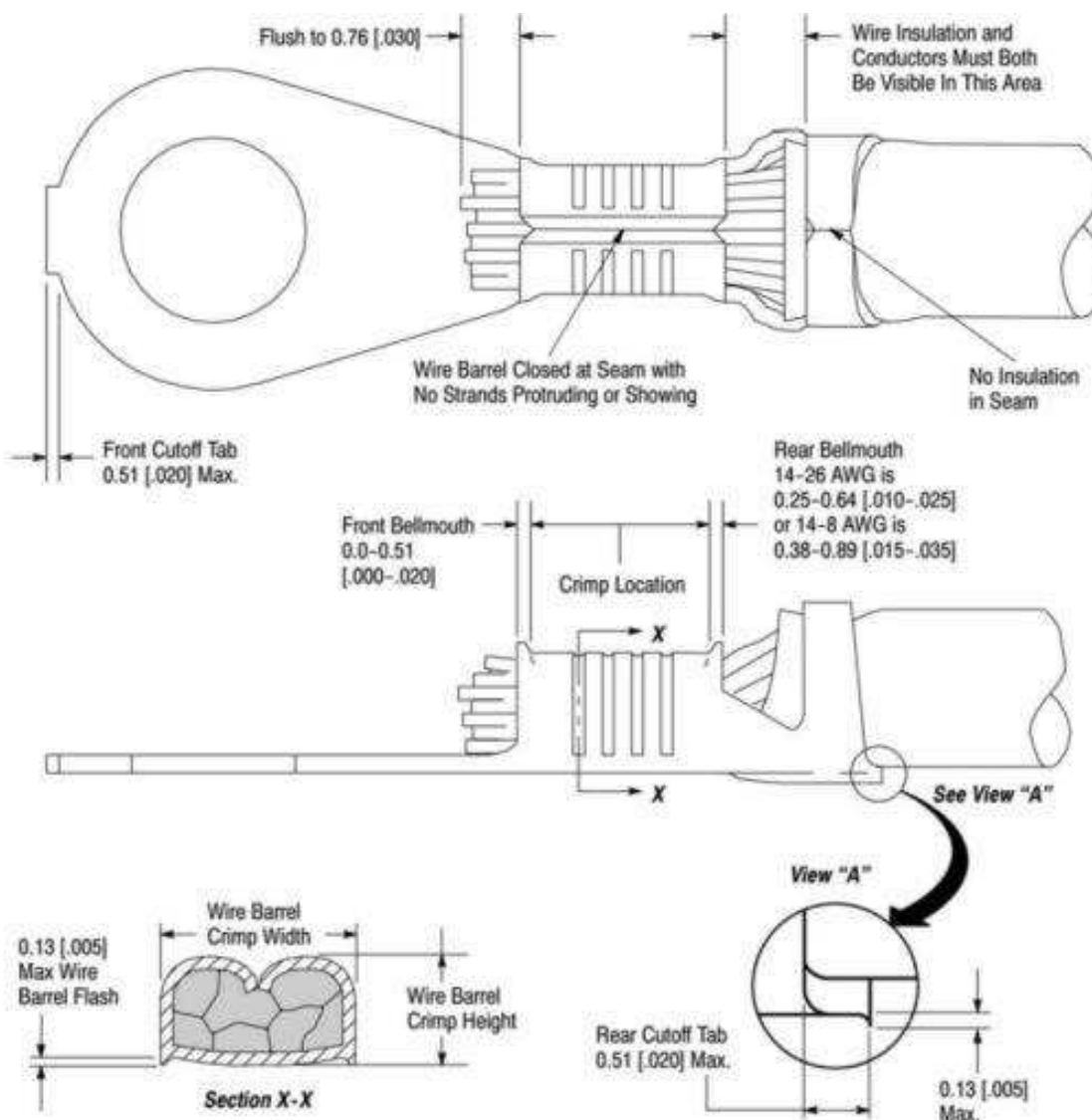


Figure 3

## J. Straightness

The force applied during crimping may cause some bending between the crimped wire barrel and the mating portion of the terminal. Such deformation is acceptable within the limits provided in Figure 4.

- 1 The up and down bend of the crimped terminal, including cutoff tab and burr, shall not be bent above or below the datum line more than the amount shown.
- 2 The side-to-side bend of the terminal may not exceed the limits provided.

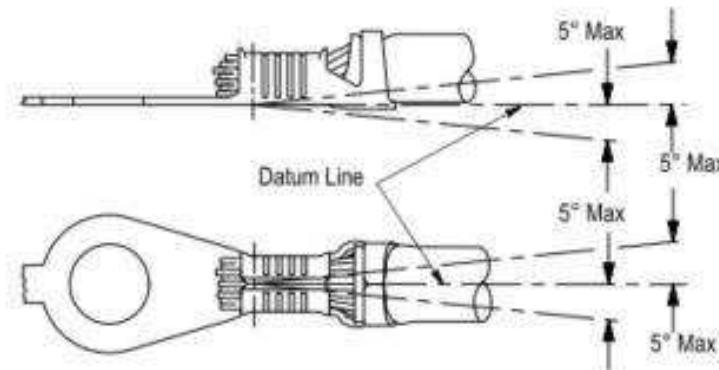


Figure 4

## 3.5. Induction Heating Requirements

### A. Positioning of Crimped Terminal

Position the terminal such that the crimped wire barrel is in the center of the copper induction coil before initiating the induction heating process. It is advisable to use a fixture to consistently locate terminals within this target area for consistent heat treatment.



Do not use an iron-based fixture as this will distort the electromagnetic field intended solely for heating the terminal. Additionally, the iron will heat rapidly, creating a potential burn hazard. Instead use a copper or copper-based fixture. Locate the fixture outside of the induction coil target area.

### B. Induction Heating Exposure

The exact specifications for time and power levels required to make satisfactory Litz wire connections are dependent on wire size, type and other factors that are best assessed by the experts at TE Connectivity. Please submit your wire samples to TE for a complete assessment and recommended settings.

## 3.6. Terminal Repair

If a terminal is not crimped correctly or it has been damaged, it cannot be repaired or re-terminated. It must be cut from the wire and replaced with a new terminal.

## 4. GENERAL APPLICATION GUIDELINES

To assist you in obtaining the optimum product termination, the following guidelines are recommended

- The braided Litz wire must be placed uniformly into the bottom of the wire barrel before crimping. Offset positioning may prevent full electrical connection to the braided Litz wire.
- Wire barrels are designed to accept a single braided Litz wire only. Combinations of multiple Litz wires and/or stranded lead wires is prohibited and will prevent full connection to the Litz wire.
- The total circular mil area (CMA) of the braided Litz wire (including insulation) should not exceed the capacity of the terminal.

## 5. QUALIFICATION

Due to numerous wire types and styles, Underwriters Laboratories Inc. (UL) and CSA International will not grant blanket approval for this part number. Customers must submit their end product to these agencies for application evaluation.

## 6. TOOLING

This section provides a selection of tools for various application requirements. They include semi-automatic machines for power-assisted application of strip form contacts. Modified designs and additional tooling concepts may be available to meet other application requirements. See Figure 5.



### NOTE

TE Connectivity's (TE) tool engineers have designed machines for a variety of application requirements. For assistance in setting up prototype and production line equipment or questions about tooling, contact TE tool engineering through your local TE representative or call the product information number at the bottom of page 1.

### 6.1. Applicator

Applicators are designed for the full wire size range of strip-fed, precision formed contacts, and provide for high volume, heavy duty, production requirements. The applicators can be used in bench or floor model power units.

### 6.2. Power Units

A power unit is an automatic or semi-automatic device used to assist in the application of a product. Power unit includes the power source used to supply the force or power to an applicator.

### 6.3. Bench Machines

A bench machine is a dedicated unit that applies a specific, strip-fed, formed contact. Bench machines incorporate the aspects of the applicator and power unit in a single machine and often provide advantages such as reduced footprint, excess wire trim, and ease of use when compared to applicator/power unit combinations. While it is possible to convert a bench machine to run various terminals, it is not practical in a high-volume production environment because the tooling is incorporated into the machine and requires a skilled technician to perform the conversion and subsequent set-up.



Typical OCEAN  
Applicator



AMP 5K Terminating Machine  
2161700-[ ] CE Machine (409-10204)  
2161300-[ ] CE Thru Splice Machine  
1725900-[ ] Non-CE Machine (409-32034)

Figure 5

### 6.4. Induction Heating Units

An induction heating unit is an automatic or semi-automatic device used to induce a rapid pulse of high frequency current into the wire crimp barrel creating resistance heating that melts the insulation away from the individual strands of the Litz wire and interconnects all the strands across the crimp junction. Power unit includes the power source used to supply the power to the focusing coil fixture.

### 6.5 Induction Focusing Coil

An induction focusing coil is a coiled tube of copper used to create a focused electro-magnetic field around the terminal wire barrel.

## 7. VISUAL AID

Figure 6 shows a typical application of an Induction Heat Terminated Ring Tongue terminal for use on copper Litz wire. This illustration should be used by production personnel to ensure a correctly applied product. Applications which DO NOT appear correct should be inspected using the information in the preceding pages of this specification and in the instructional material shipped with the product or tooling.

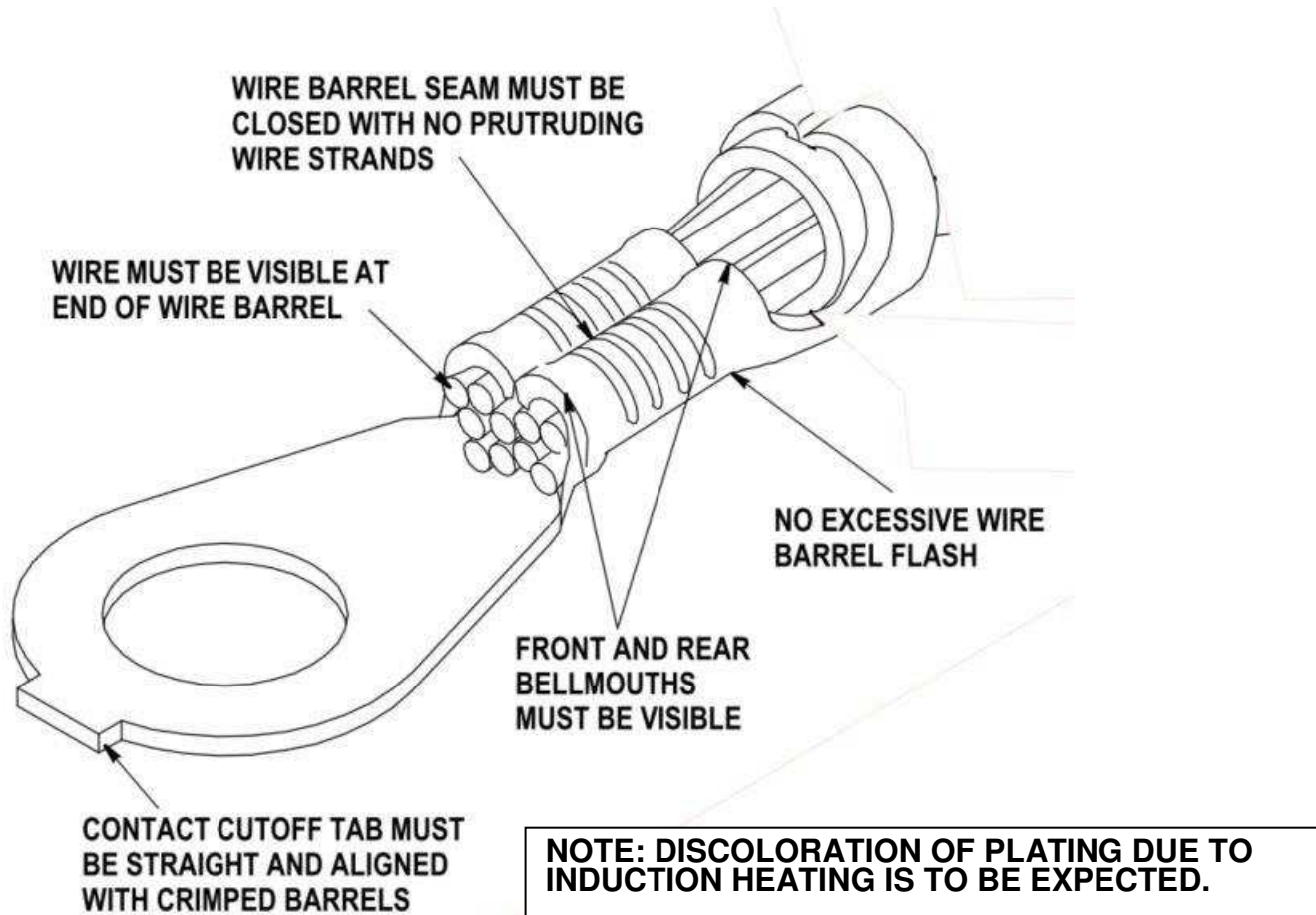


Figure 6: Visual Aid