

### 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 Tel-Splice Connectors used to splice insulated communication wire in telephone, security, temperature control, and audio systems. These connectors are available in domestic, international, and flame retardant with 2-wire or 3-wire connection in sealed (with sealant) for moisture resistant applications or unsealed (without sealant). Two-wire connectors are available in butt-and-through, half-tap, and clearing (clear and cap). These connectors are designed to terminate wires by using the insulation displacement technique. Function of each connector is described in Figure 1.

The connectors are marked with the applicable wire size range and are color-coded for identification. Each connector consists of two pre-assembled housings: the upper (also referred to as contact retainer or blade) housing and the lower (also referred to as wire entry) housing. Attached to the upper housing is a U-shaped contact or two blades. The lower housing contains 2 or 3 wire holes or a wire hole and a wire slot. Each hole or slot accepts only one wire. The contact has 4 or 6 wire contact slots—2 for each wire. The lower housing contains a wire stuffer which forces the wires into the contact slots when the housings are pressed together for termination. The lower housing provides strain relief for the wire after termination. The connectors are available in loose-piece, cartridge, and ultrasonically welded stick form for terminating with manual hand-held tools.

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

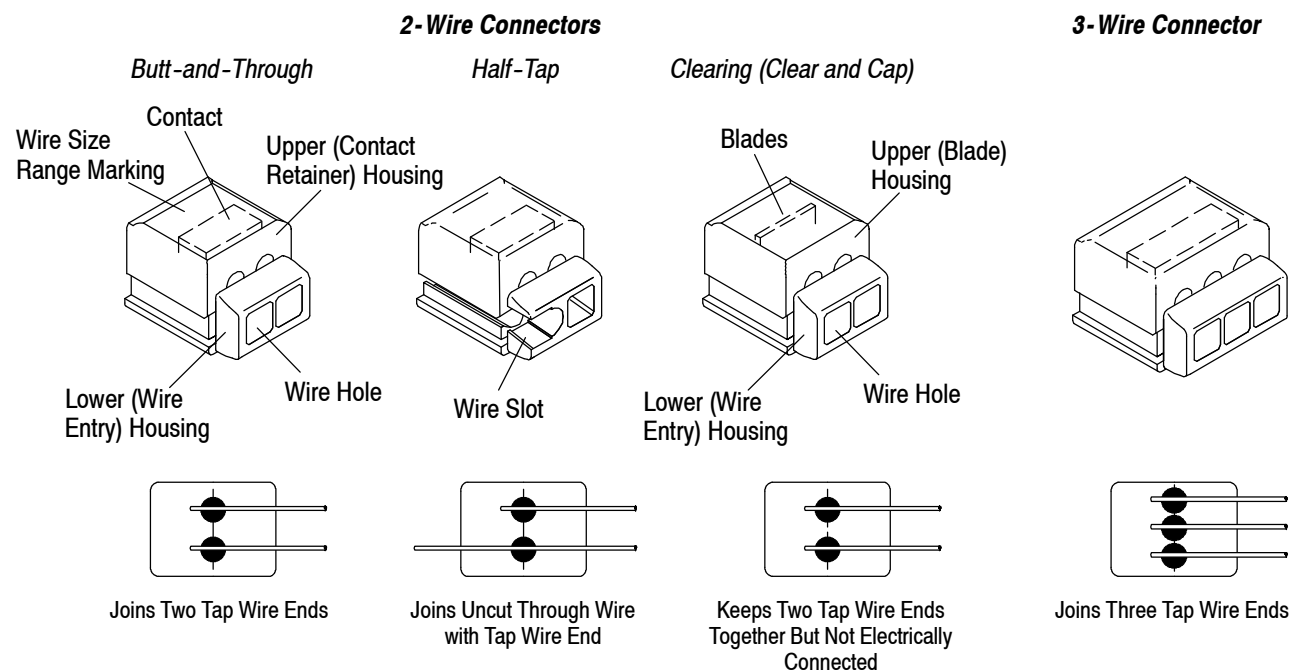


Figure 1

## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

- Updated document to corporate requirements
- Changed information in Paragraphs 2.5 and 2.6

## 2.2. Customer Assistance

Reference Product Part Number 552678 and Product Code 1216 are representative of Tel-Splice Connectors. Use of these numbers will identify the product line and expedite your inquiries through a service network established to help you obtain product and tooling information. Such information can be obtained through a local Tyco Electronics Representative or, after purchase, by calling Product Information at the number at the bottom of page 1.

## 2.3. Drawings

Customer Drawings for product part numbers are available from the service network. If there is a conflict between the information contained in the Customer Drawings and this specification or with any other technical documentation supplied, call Product Information at the number at the bottom of page 1.

## 2.4. Specifications

Product Specifications (108-series) provide product performance and test information. Documents available which pertain to this product are:

- 108-6021 Domestic and International Connectors
- 108-6042 Flame Retardant Connector
- 108-6075 Clearing Splice Connector

## 2.5. Instructional Material

Instruction Sheets (408-series) provide assembly instructions and tooling information. Documents available which pertain to this product are:

### A. Product

- 408-3109 2- and 3-Wire Tel-Splice Connectors (Loose-Piece)
- 408-3175 2-Wire Clearing Splice Connectors (Loose-Piece and Cartridge)
- 408-7955 Tel-Splice Connectors (Loose-Piece and Cartridge)

### B. Tooling

- 408-3183 Economy Hand Tool 231839-1
- 408-6506 Cartridge Terminating Tool 230722-1
- 408-8588 Tel-Splice Connector Applicators 1490017-1 and 1490018-1

## 2.6. Data Sheet

Material Safety Data Sheets provides characteristics and safety data on the sealant (inside housing of sealed connectors). Contact Polymeric Systems, Inc. for MSDS part number 985722-1 on this sealant.

## 3. REQUIREMENTS

### 3.1. Safety

Do not stack product shipping containers so high that the containers buckle or deform.

### 3.2. Limitations

The connectors are designed to operate in a temperature range of  $-40^{\circ}$  to  $90^{\circ}\text{C}$  [ $-40^{\circ}$  to  $194^{\circ}\text{F}$ ] for domestic and international connectors and  $-40^{\circ}$  to  $100^{\circ}\text{C}$  [ $-40^{\circ}$  to  $212^{\circ}\text{F}$ ] for flame retardant connectors.

Sealed connectors must not be terminated in temperatures below  $-12^{\circ}\text{C}$  [ $10^{\circ}\text{F}$ ].

### 3.3. Material

The housing is made of polypropylene, UL 94 HB for domestic and international connectors, polyester molding compound for clearing connectors, and polycarbonate, UL 94 V-O for flame retardant connectors. The contact and blade are made of phosphor bronze plated with tin or brass plated with tin.

### 3.4. Storage

#### A. Ultraviolet Light

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

### B. Shelf Life

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

### C. Chemical Exposure

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

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

### 3.5. Color Code

The housing of the connectors is a certain color to indicate the available designations. The color code is stated in Figure 2.

DESIGNATION	CONNECTOR HOUSING COLOR		
	WITH SEALANT	WITHOUT SEALANT	FLAME RETARDANT WITHOUT SEALANT
2-Wire Butt-and-Through	Translucent (White)	Yellow	Clear
2-Wire Half-Tap	Translucent Blue	Translucent Blue with Yellow Dot	Clear
2-Wire Clearing (Clear and Cap)	Green	Green with Yellow Dot	N/A
3-Wire	Translucent (White)	Yellow	Clear

Figure 2

### 3.6. Wire Selection and Preparation

These connectors will accept any combination of solid copper wire sizes 26 through 19 AWG with an insulation diameter range of 0.51 through 2.0 mm [.020 through .080 in.]. Wire insulation must be filled, foam skin, or air core plastic for domestic and international connectors and paper pulp or air core plastic for flame retardant connectors.

The wires must not be stripped. For 2-wire half-tap connectors, the tap wire must be cut to length and the through wire uncut. For 2-wire, 2-wire clearing, and 3-wire connectors, the wires must be evenly cut to length.

### 3.7. Wire Placement (Before Termination)

For 2-wire half-tap connectors, tap wires must be bottomed in the housing wire holes. Through wires must be fully contained in the housing side slot and extend past the housing.

For 2-wire, 2-wire clearing, and 3-wire connectors, wires must be bottomed in the housing wire holes.

### 3.8. Termination Requirements

#### A. Wire Location

For 2-wire half-tap connectors, the tap wire must be bottomed in the housing wire hole. The through wire must be fully contained in the housing side slot and extend past the housing. For 2-wire, 2-wire clearing, and 3-wire connectors, wires must be bottomed in the housing wire holes. See Figure 3.

#### B. Crimp Height

The crimp height must be within the dimensions provided in Figure 3.

#### NOTE



*The developed crimp configurations result from using the specific tooling described in Section 5, TOOLING.*

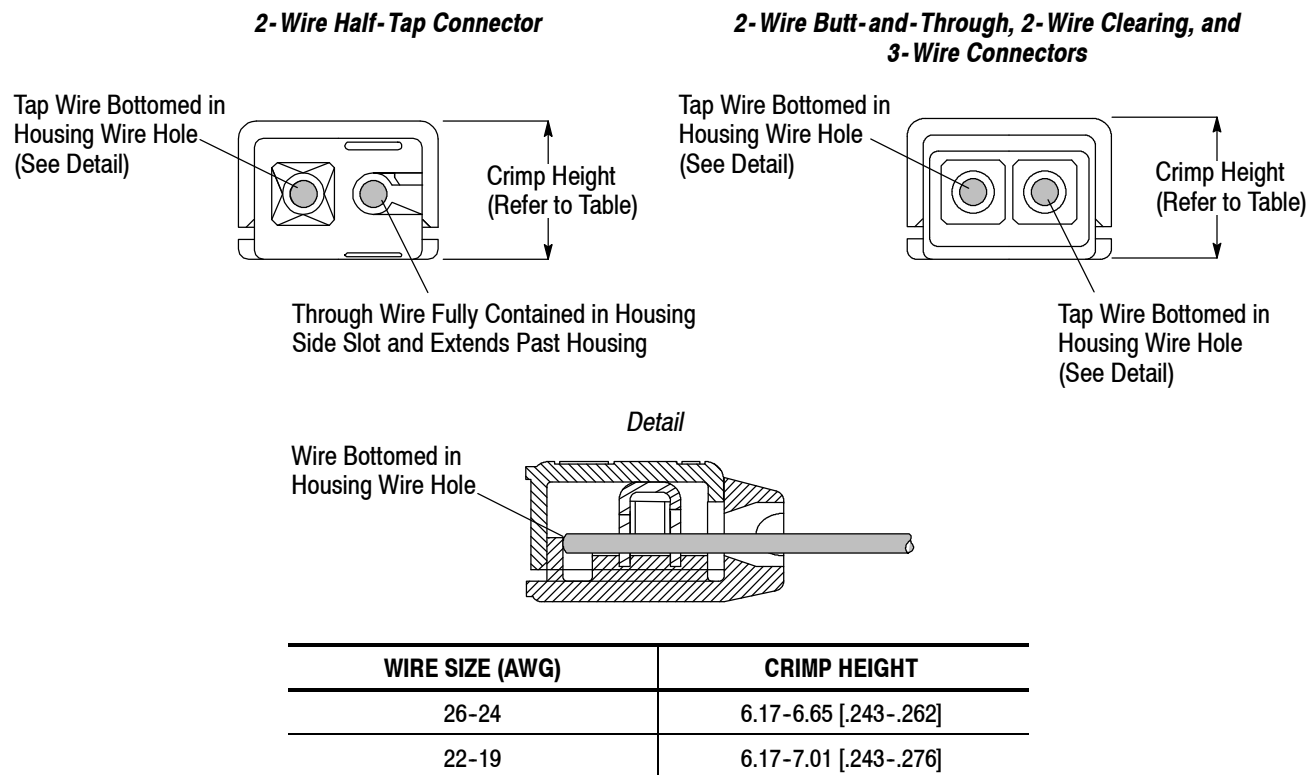


Figure 3

### C. Cutoff Tab or Flash (Connectors Removed from Ultrasonically Welded Stick)

The cutoff tab or flash is the remaining portion of the stick that may appear on both sides of the connector after the connector is removed from the stick. This cutoff tab or flash will not interfere with performance of the connector.

### 3.9. Repair

Terminated connectors must NOT be re-used by removing the wires. Defective connectors must be discarded and replaced.

## 4. QUALIFICATION

Unsealed flame retardant Tel-Splice Connectors are Listed by Underwriters Laboratories Inc. (UL) in File E81956. No qualifying support for sealed flame retardant or sealed and unsealed domestic and international connectors was defined at the time of publication of this document.

## 5. TOOLING

Tooling part numbers and instructional material packaged with the tooling are shown in Figure 4.

### 5.1. Terminating Tools

Hand terminating tools for application of loose-piece, cartridge, and ultrasonically welded stick form connectors are available to cover the full wire size range. The tools are designed to press the housings of the connector together. This displaces the wire insulation to provide electrical contact points for each wire and, in sealed connectors, positions the sealant inside the housing.

#### NOTE



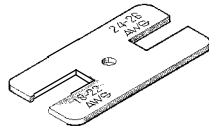
*Industry-standard tools having parallel-action jaws can be used to terminate these connectors; however, as with any tool used, the terminated connector must be gaged periodically to ensure proper wire insertion depth.*

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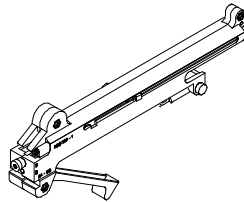
## 5.2. Sealed Splice Connector Crimp Height Gage

This gage is required for measuring the crimp height of the terminated connector. It is designed to ensure proper wire insertion depth. The gage is packaged with the connectors.

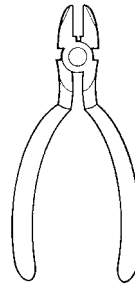
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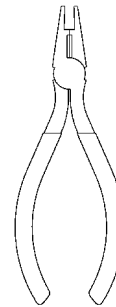
Sealed Splice Connector  
Crimp Height Gage 230495-1  
(No Document Available)



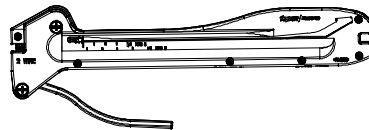
Cartridge Terminating Tool  
230722-1 (408-6506)



Economy Hand Tool  
231839-1 (408-3183)



Economy Hand Tool  
(With Spring-Loaded  
Handles) 790162-1  
(No Document Available)



Tel-Splice Connector Applicator  
1490017-1 (2-Wire Sticks) or  
1490018-1 (3-Wire Sticks)  
(408-8588)

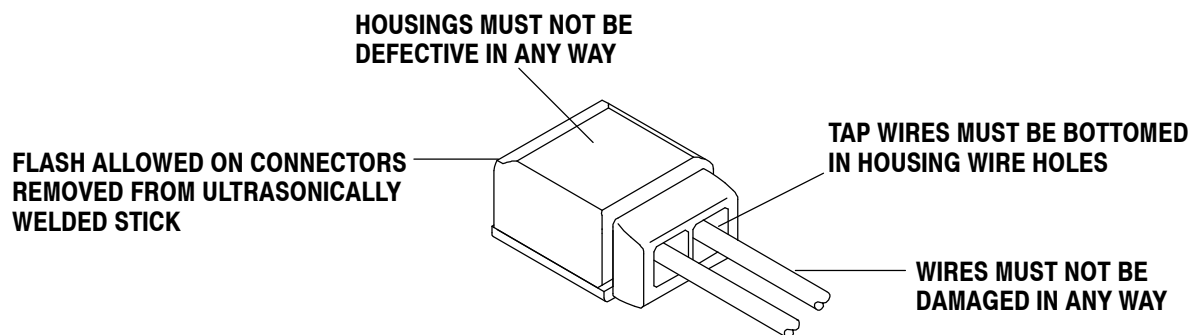
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Figure 4

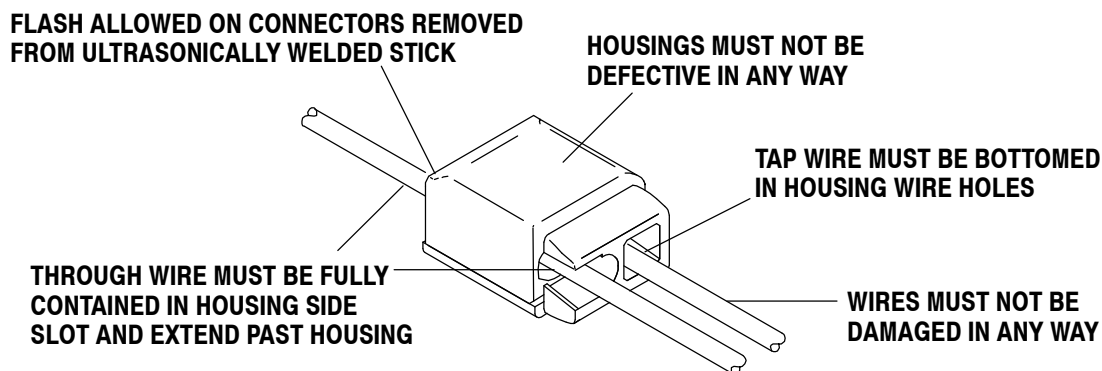
## 6. VISUAL AID

Figure 5 shows a typical application of domestic, international, and flame retardant Tel-Splice Connectors. 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.

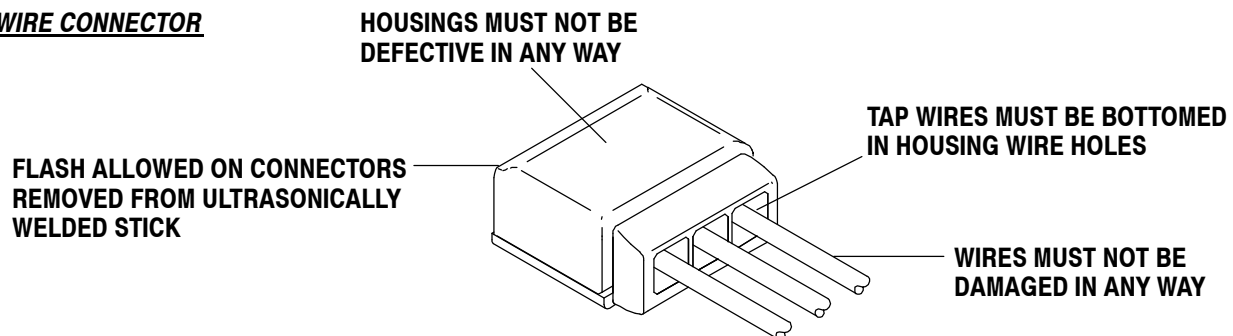
### 2-WIRE BUTT-AND-THROUGH AND CLEARING CONNECTORS



### 2-WIRE HALF-TAP CONNECTOR



### 3-WIRE CONNECTOR



**FIGURE 5. VISUAL AID**