



**NOTE**

1. 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.
2. Connectors can only be used with approved combination of TE machines and TE approved wires. Contact sales representative for approved combination list or to initiate an approval for a new combination IDC TE Connector – TE Termination machine – wire.
3. According to RAST guidelines and for a proper machine functioning at least one keying rib has to be kept on the finished configuration.

**1. SCOPE**

**1.1. Introduction**

The AMP DUOPLUG 2.5 MK II connectors are used as indirect and direct connectors (card edge connectors, for printed circuit boards (PCBs)).

Contacting with indirect connectors the electrical contacting takes place with a pair of flat springs pressing against the coin of the blade terminal. These blade terminals are soldered on PCBs and assembled by a tab header.

Direct connectors are contacting pressing the pair of flat springs on conductor pads (one or double sided PCB), which are especially provided for this.

**1.2. Content**

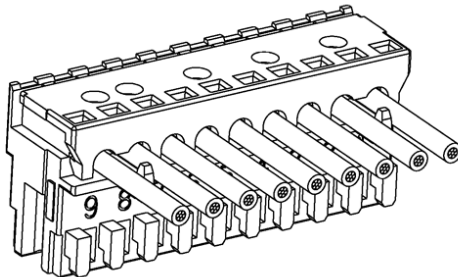
Criteria contained in this specification assure a quality level according product specification no. 108-18785. Provided is an appropriate processing of the AMP DUOPLUG 2.5 MK II female connectors in terms of the TE Connectivity technology.

The instruction is valid for the use of TE processing machines and tools of every possible design.

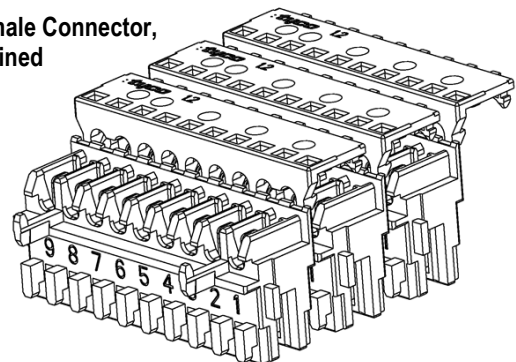
The tools must be released by TE. It is strongly recommended to get the release of the responsible Engineering Department before use new applications or modified application machines.

**Basic terms and features of this product are provided in Figure 1**

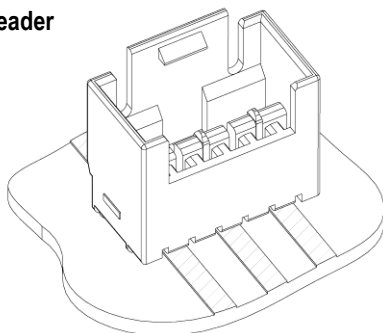
**Female Connector**



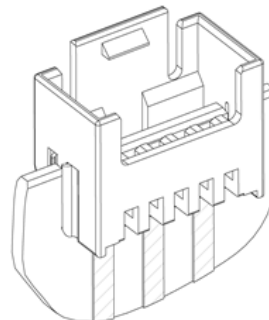
**Female Connector, chained**



**Tab Header**



**PCB Frame**



**Figure 1**

**NOTE**

The parameters and requirements listed in this document are best practices for termination. Due to the variability of the parameters of different wires, deviation to the requirement of this documents can be permitted according to the specific wire approval report evaluated by TE qualified lab.

## 2. REFERENCE MATERI

### 2.1. Revision Summary

- Revised par. 3.4 point D and updated the TE layout with the latest..

### 2.2. Customer Assistance

Reference Product Base Part Number 1534796 and Product Code K358 are representative of AMP DUOPLUG 2.5 MK II connectors. Use of 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 the bottom of page 1.

### 2.3. Drawings

Customer drawings for product part numbers are available from [www.te.com](http://www.te.com). Information contained in the customer drawing takes priority.

### 2.4. Specifications

Product Specification [108-18785](#) provides product performance and test results.

## 3. REQUIREMENTS

### 3.1. Safety

Do not stack product shipping containers so high that the containers 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. Chemical Exposure

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

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

### 3.3. Visual Inspection Requirements of the Connectors before Processing

Dimensions, function and appearance of the AMP DUOPLUG 2.5 MK II connectors have to meet the following requirements prior to processing.

For all following requirements, a visual inspection is sufficient. In case of uncertainty a dimensional check is required.

#### A. Allocation of Wire and Contact

TE assures the adherence of the width of the termination slot. Permitted for processing are only wires according to Paragraph 3.5.

### B. Contact

None of the contacts may show damages, which call the correct function into question. Small scratches not reaching the base material are functionally nonsignificant and therefore permitted.

### C. Center Position of the Termination Slot

The central position of the termination slot has to meet the stated symmetry tolerances. See Figure 2.

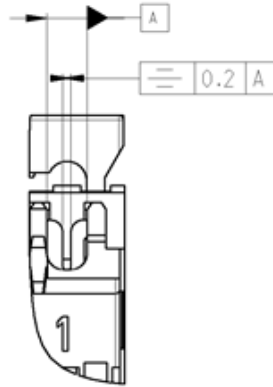


Figure 2

### D. Housing

Prior to processing the housings are not allowed to show damages attributed by incorrect machine setting, broken tools, etc. And the short shot on the side of the housing is acceptable and no impact to the function of the product; see Figure 3. (The short shot may be inconsistent from batch to batch.)

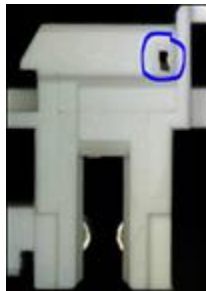


Figure 3

### E. Cut-off Points of the Stick Mould Tie Up

The cut-off point of the housing has to be in tolerance (see Figure 4). A slight break-out of the housing during the cutting process is permitted.

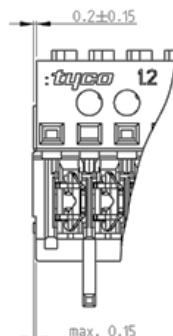


Figure 4

## F. Wire

The wire may not show damages.

### 3.4. Visual Inspection Requirements of the Terminated Connectors

Dimensions, function and appearance of the AMP DUOPLUG 2.5 MK II connectors have to meet the following requirements after processing.

For all following requirements, a visual inspection is sufficient. In case of uncertainty a dimensional check is required.

#### A. Contact

None of the contacts may show damages, which call the correct function into question. In particular damages of the contacts as a result of using the wire insertion tool or the inappropriate handling of the connector have to be avoided. Small scratches not reaching the base material are functionally nonsignificant and therefore permitted.

#### B. Examination of the Wire Insertion Depth

In the insulation displacement technology a significant characteristic of the correct function is the wire insertion depth. Using the AMP DUOPLUG 2.5 MK II female connectors the check of the wire insertion depth has to be done before mounting the cover. The wire insertion depth has to be performed according to Figure 5. The measuring point on the isolation is centered between the sides of the contact slot (see Figure 7). Measuring device: Dial indicator with feeler pin of  $\varnothing 1$  mm, measuring force 1.5-2 N. The measurement has to be done directly after the application of wire. The calibration of the application tooling is made with reference wire TE P/N 726941.

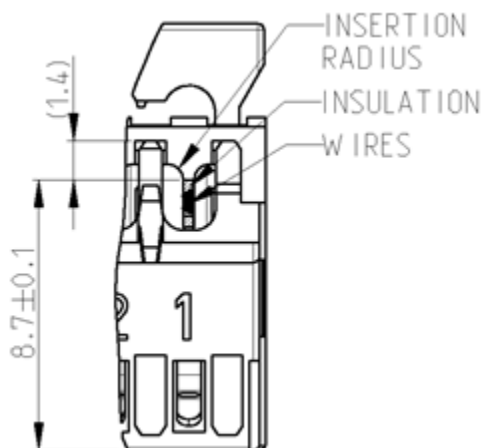


Figure 5

#### C. Position of the Contact within the Housing

Completing the whole processing the contact has to be still in the correct position in the housing (see Figure 6). The centre of the contacting area of the contact may not exceed the tolerance of 0.3 mm. The edges of the contacting area may not be seen in the infeed opening (see Figure 6).

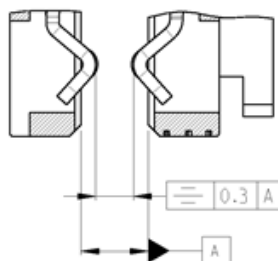


Figure 6

### D. Wire Positioning Inside the Housing

The inserted wire must have dimensions as shown in Figure 7. Ensure that wires are not compressed or deformed, creating a bulge or deforming plastic. See Figure 7, Figure 8, and Figure 9 for acceptable and unacceptable conditions.

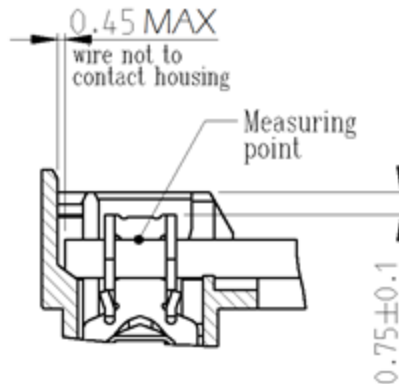


Figure 7

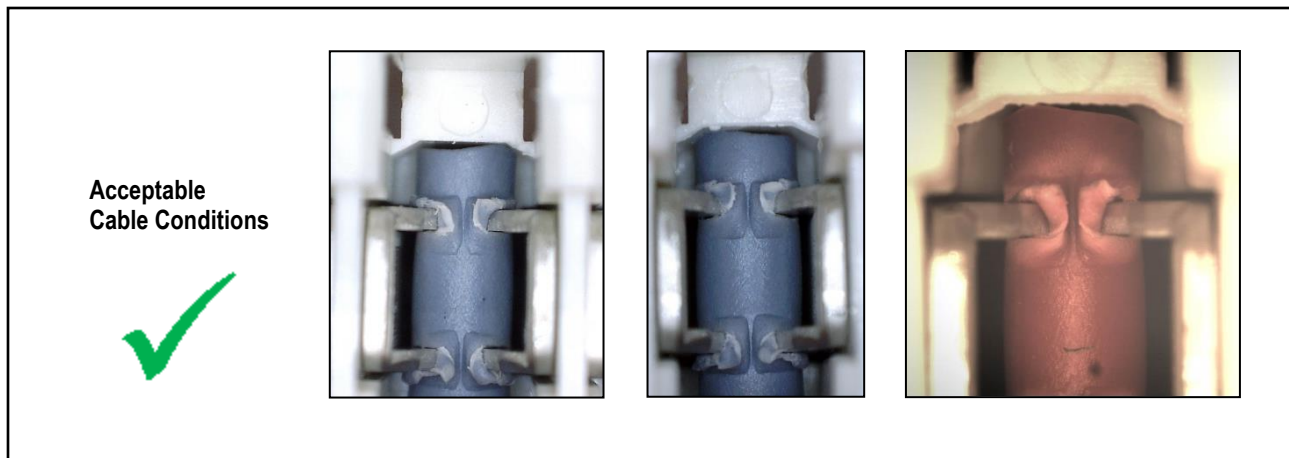


Figure 8

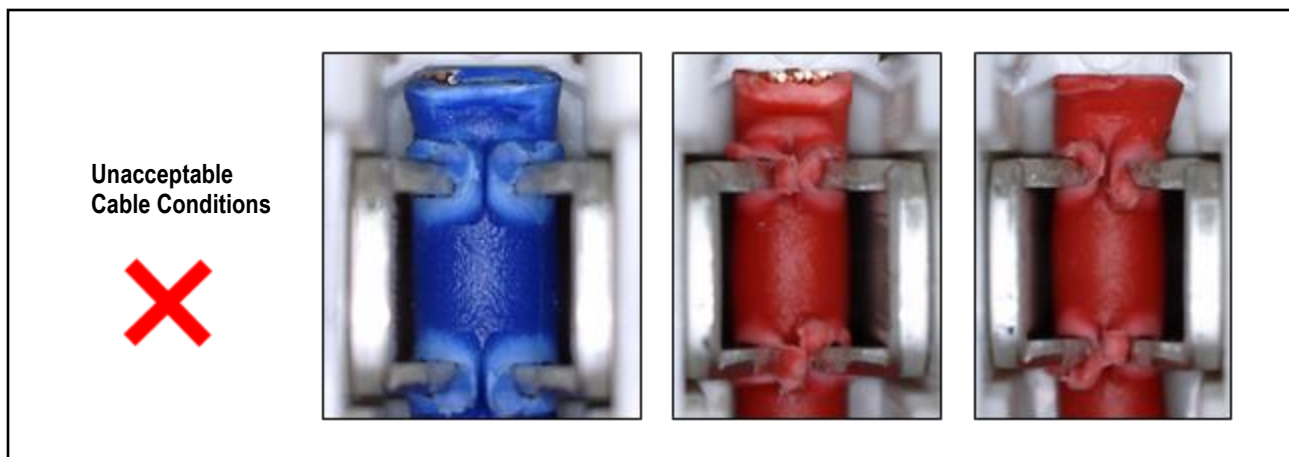


Figure 9

### E. Housing

After processing the housings are not allowed to show damages caused by incorrect machine setting, broken tools, etc.

### F. Section Point of the Keying Ribs

The housings have to be burr-free after cutting the keying ribs off. The tolerances are shown in Figure 10. A slight break-out of the housing wall caused by the cutting process does not affect the function and is therefore permitted. Due to the processing concept it is not allowed to cut off all keying ribs! It is necessary that at least one of the keying ribs is existing (any position is suitable).

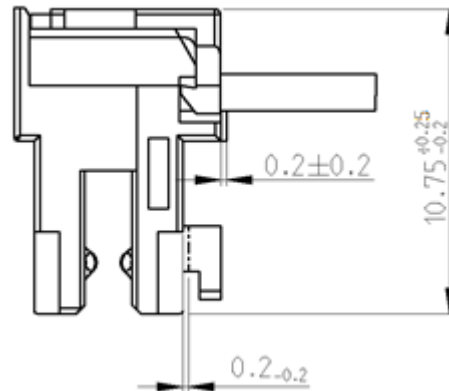


Figure 10

### G. Section Point of the Linked Cover

The section point between housing and cover has to meet the tolerances shown in Figure 11. A slight break-out of the housing wall or the cover caused by the cutting process does not affect the function and is therefore permitted. A burr resulting from the cutting process at a maximum of 0.3mm may exist on the front side of the cover. A burr on the back side of the housing is not permitted.

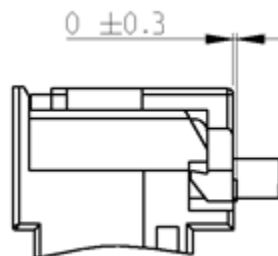


Figure 11

### H. Section Point of the Connective (Chaining) Hooks

The housings have to be burr-free after cutting off the connective hooks. The tolerances are shown in Figure 11. A slight break-out of the housing wall or the cover caused by the cutting process does not affect the function and is therefore permitted.

## I. Cover Locking

After inserting the wire, the contact and the wire are protected through the mounting of the cover. A proper function is guaranteed if all locking hooks, on the front and the back, fit in their locking position (see Figure 12). A slight deformation of the locking hooks due to the locking concept does not affect the function and is therefore permitted. The overall height of the terminated connectors is shown in Figure 10. A slight elastic out of spec on the overall height does not affect the function and the engagement on the counterpart and it is therefore admitted. This elastic deformation is due to the wire insulation spring effect.

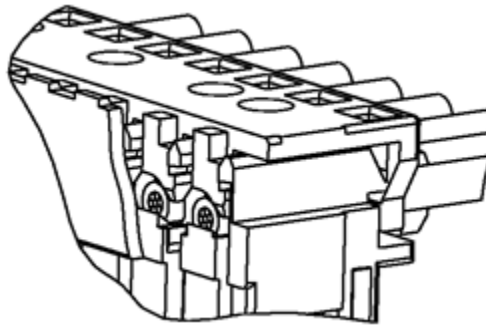


Figure 12

## 3.5. Application Tooling

Generally we differ between single wire termination and mass termination. By using single wire termination, all wires are terminated one after one. During single wire termination, the connector-sidewalls are always supported by clamps. Special set-up is not required.

By using mass termination, all wires are terminated in one stroke. For selectively applied AMP DUOPLUG 2.5 Mark II connectors (fully or selectively loaded with contacts) terminated with wires having insulation diameters  $>1.4$  mm, there are special Stuffer clamps to support the connector side-wall. It is not allowed to terminate the prementioned connectors without clamps. It is necessary to set-up the stuffer unit for each PN (see Paragraph 3.5.B).

### A. Tooling for Single Wire Termination

Type	Part Number
SIM 250T	528377-4
SIM 25E	x-529812-x
SIM 25F	x-1372011-x

### B. Tooling for Mass Termination

#### 1. Application Tooling for Mass Termination and Standard Application

Type	Part Number
IHM Base Machine Plus	x-539030-x
IDC-workstation	x-1372010-x

#### 2. Application Tooling for Mass Termination and Selective Application (Selective Applied Connector and Wire Diameter $>1.4$ mm)

Type	Part Number
IHM Base Machine Plus	x-539030-x
IDC-workstation Plus	x-1372010-x
Conversion Kit	4-539527-0 & 4-539527-1 (Particularly special stuff block 1-1372290-0)

### C. Tooling for 2-Pole AMP DUOPLUG 2.5 Mark II

2-pole AMP DUOPLUG 2.5 Mark II connectors can be processed without changings on SIM 25 E / SIM 25 C Machine and IDC Station for IHM Mark III under the following restrictions:

- Max. 4 connectors in one sequence
- 2-pos. connector must not be used neither as first nor as last connector of the sequence

### 3.6. Wire Selection

#### A. Wire Cross-Section

The AMP DUOPLUG POWER connectors are designed for the following wire cross sections:

0,22mm<sup>2</sup> – 0,35mm<sup>2</sup> stranded wire (7 or multiple strands)



#### NOTE

The above shown wires as well as those mentioned in the specification Paragraph 3.6.C. Released wires see specification 114-18750-1. Preapprovals of samples made by handtool are possible. For final approval samples made of the planned application machine must be available.

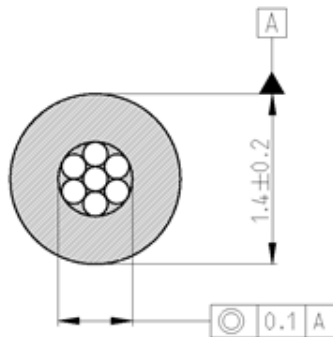
#### B. Insulation

The AMP DUOPLUG 2.5 MK II female connectors are suitable for an insulation diameter of 1.2 – 1.6mm. The wire isolation material has to be PVC or Silicon. The Shore hardness has to meet A 92 ± 3 acc. DIN 53 505. The isolation quality must be semi-rigid, for ex. YJ3 acc. VDE 209.

#### C. Wire Specification

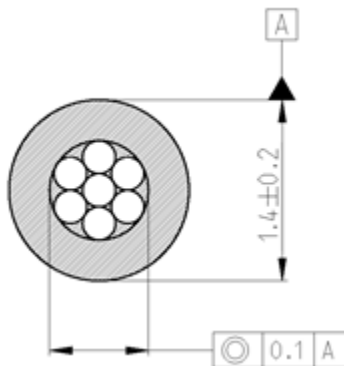
The conductor material is copper. Dimensions are shown in figures below.

1. Conductor 0,22mm<sup>2</sup>

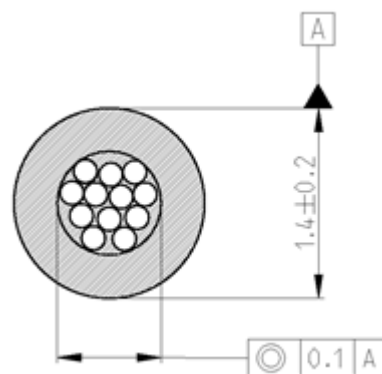


Stranded wire: 7 x ø0,2mm  
Length of twist: 12 – 26mm

2. Conductor 0,35mm<sup>2</sup>



Stranded wire: 7 x ø0,25mm  
Length of twist: 12 – 26mm



Stranded wire: 12 x ø0,2mm  
Length of twist: 12 – 26mm





**NOTE**

The combination wire/application tool has to be approved by the responsible product engineering department of TE Connectivity. In case of differences to the above shown insulation dimensions and wires without PVC or Silicon insulation or copper further investigations and a separate approval are necessary. See Paragraph 3.5.

**4. QUALITY ASSURANCE MEASURES**

**4.1. General Requirements**

The actions listed below serve as quality assurance of the AMP DUOPLUG 2.5 MK II connector systems in terms of the product specification 108-18785 and have to be executed due to changes of one of the following parameters:

- a. Introduction of a new product
- b. Change of wire
- c. Change of tooling
- d. Introduction of a new tooling equipment

**4.2. Quality Assurance Characteristics**

Item Number	Characteristic	Paragraph Reference
1	Allocation of wire and contact	3.3.A
2	Center position of the termination slot	3.3.C
3	Wire quality	3.5
4	Wire insertion depth	3.4.B
5	Wire positioning inside the housing	3.4.D
6	Positioning of the contact within the housing	3.4.C
7	Section point of the keying ribs	3.4.F
8	Cut-off points of the stick mould tie up	0
9	Section point of the linked cover	3.4.G
10	Section point of the connective (chaining) hooks	3.4.H
11	Cover locking	3.4.I
12	Tooling for single wire termination	3.5.A
13	Tooling for mass termination	3.5.B

## 5. QUALITY PROOF

### 5.1. Tensile Strength of Applied Leads

The terminated wires must withstand a pull out force in axial direction. The values are shown in the chart in Figure 13.

Conductor Variations	Axial Direction (See Figure 14)
Stranded wire 7 and multiple strands 0,22mm <sup>2</sup>	30 N
Stranded wire 7 and multiple strands 0,35mm <sup>2</sup>	30 N

Figure 13

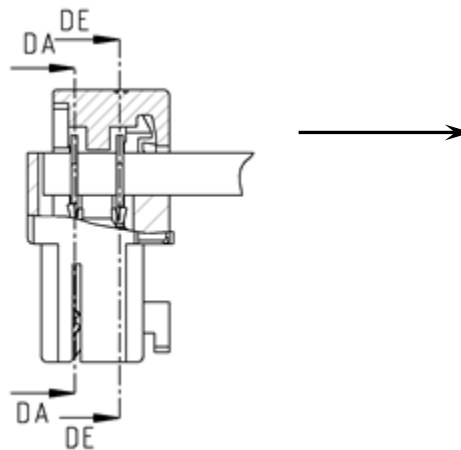


Figure 14

### 5.2. Polished Micrograph Section

The parts to be tested shall be embedded bubble-free in vacuum into water-clear epoxy resin to fill all cavities precisely. The grinding direction must be perpendicular to the contacting slot to avoid movements within the surrounding isolation to the greatest possible extent. The grinding has to be performed to half of material thickness of the contact. Recommended sequence of grinding: DA (wire exit) and after it DE (wire input); see Figure 14.

The judgement of the images shall be carried out in cooperation with TE.

## 6. PRODUCT HANDLING AFTER TERMINATION PROCESS

### 6.1. Recommended Process

1. Connectors are terminated with wires. See Figure 15.



Figure 15

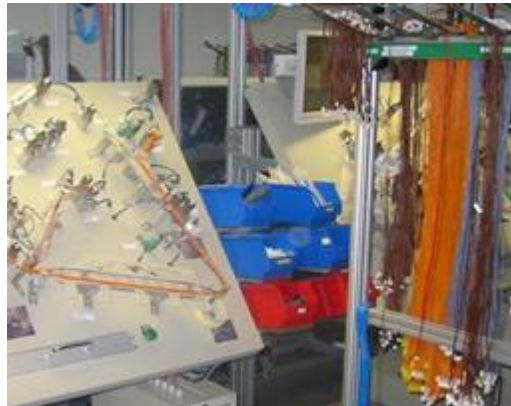
2. Connectors need to be inserted in specific blister and then to be put on racks. See Figure 16.



**Figure 16**

3. Harnesses have to be created as below requests. See Figure 17.

- a. Various and different single harnesses are taken from racks and to be put on electrical table to create the complete harness.
- b. Once electrical join is completed, cables could not be pulled to preserve covers integrated when removing the connectors.



**Figure 17**

4. Harnesses with PCB board must be inserted into boxes. See Figure 18.



**Figure 18**

5. Harnesses without PCB board must be put using plastic fasteners or tapes (see Figure 20) then to be packed into bags (see Figure 19).



Figure 20



Figure 19



**NOTE**

*The connection cables could not be pulled in order to preserve the covers integrated.*