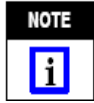**NECTOR X and NECTOR T**
Pin and Socket Contacts crimp

<table>
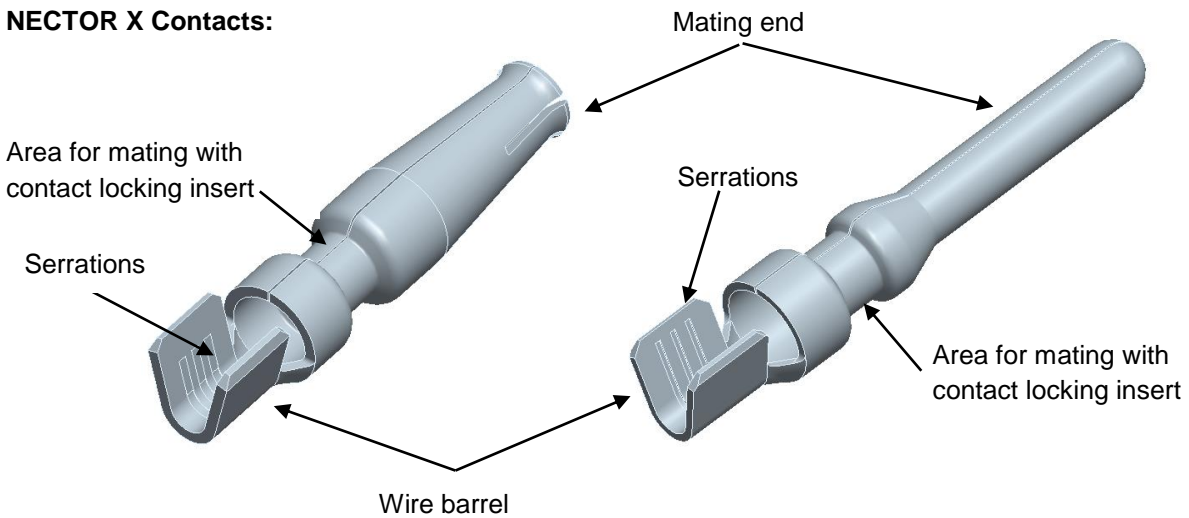<tr><td>NOTE
[i]</td><td>*All dimensions are millimeters.*
Figures and illustrations are for identification only and are not drawn to scale.</td></tr>
</table>

1   Introduction

This specification contains the regulations to crimp contacts used on NECTOR X and NECTOR T Socket and Pin connectors.
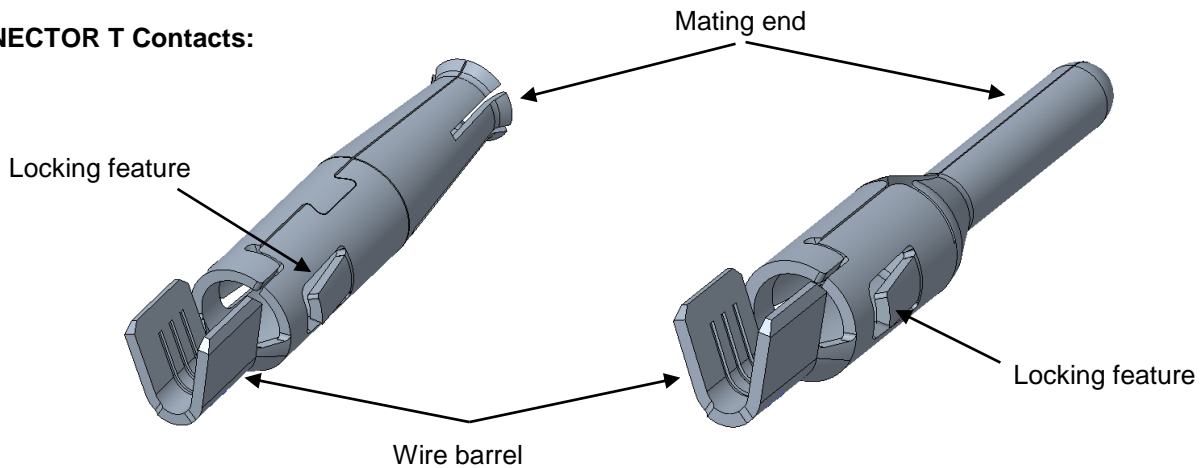
NECTOR X Contacts:

NECTOR T Contacts:

Fig. 1

This specification is a controlled document.

ECOC ETDO
LOC: I

NECTOR X and NECTOR T
Pin and Socket connectors, stamped contacts crimp

TE Contact P/N	Product Family	Description
293644-1	NECTOR X	Pin contact for 1.5 - 2.5 mm² wire
293644-2		Pin contact for 4.0 mm² wire
293645-1		Socket contact for 1.5 – 2.5 mm² wire
293645-2		Socket contact for 4.0 mm² wire
2359528-1	NECTOR T	Pin contact for 1.5 - 2.5 mm² wire
2359528-2		Pin contact for 4.0 mm² wire
2359527-1		Socket contact for 1.5 – 2.5 mm² wire
2359527-2		Socket contact for 4.0 mm² wire

2   Drawings

Customer Drawings for product part numbers available in TE website. For more details and dimensions see Customer Drawings. If there is a conflict between the information contained in the Customer Drawings and this specification or with any other technical documentation supplied, call the Product Information Center.

3   Specifications

Design Objectives 108-20284 (Nector X) and 108-133123 (Nector T) provides expected product performance and test information. Standard Norm for reference is IEC 61535: Installation couplers intended for permanent connection in fixed installations

4   Requirements

4.1 Storage

A. Ultraviolet Light
Prolonged exposure to ultraviolet light may deteriorate the chemical composition used in the contacts.

B. Shelf Life
The contacts should remain in the shipping containers until ready for use to prevent deformation to the contacts and/or damage to the housings. The contacts should be used on a first in, first out basis to avoid storage contamination that could adversely affect signal transmissions.

C. Chemical Exposure
Do not store contacts near any chemicals 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.

4.2   Materials
The pin and socket contacts are made of copper alloy with tin plating.

4.3 Wire Size and Preparation (see item 6 - connector assembly procedure - for more details)

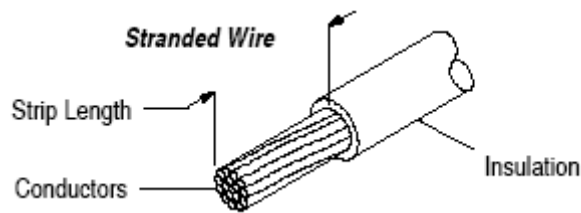The contacts will accept a wire size range from 1.5mm² to 4.0 mm² and are to be terminated to stranded wire See Figure 2.

Fig. 2

The conductor section area and outer diameter of the wire must be in according to the terminal drawing.
The insulation must be cut uniform and torn off the conductor.
No remainders of the insulation are allowed on the stripped conductor; single strands of the conductor may neither be cut nor damaged nor pulled during stripping operation.
After pull off the insulation sleeve the single strands of the conductor may not split open. Separated single strands are not allowed.
The strands of the conductor are not allowed to be twisted.
If the stripped wire isn't crimped immediately, the stripped conductor end is to be protected against dirt splitting off of the single strands, for example by partial pull off the insulation sleeve.
Any protruding wire strands must not impede the mating and basic function of the contact.

4.4 Wire Crimp

The crimp height is the overriding quality characteristic of a crimp connection. The measurement allows a non-destructive verification and a continuous production control. The crimp height including its relevant tolerance ensures a sufficient compression of the conductor and an acceptable pull out force, irrespective of the tolerance of the crimp barrel and the cross-sectional area tolerance of the conductor.
The measurement of the crimp width as production control is not possible; the measurement of the crimp width at the crimp bottom allows a control if right crimp profile width is used.

Fig. 3
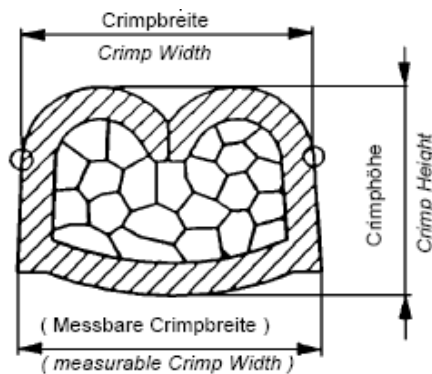
CRIMPING DATA FOR PIN AND SOCKET STAMPED CONTACT								
Contact	Order No.		Wire size [mm²]	Strip Length ±0,1 [mm]	Crimp Width ±0.03* [mm]	Crimp Height ±0.03* [mm]	Crimp Shape	Crimp Tool	Hand Crimp Tool
	Strip	Loose piece							
Pin	293644-1	1-293644-1	1.5	5.0	2.54	1.67	F	2151675-1	Not Applicable
			2.5	5.0	2.54	1.97			
	293644-2	1-293644-2	4.0	5.0	3.30	2.14		2151676-1	
	2359528-1	N/A	1.5	5.0	3.10	1.80		2151675-1	To be defined In-progress
			2.5	5.0	3.13	2.06			
	2359528-2		4.0	5.0	3.85	1.90		2151676-1	

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Socket	293645-1	1-293645-1	1.5	5.0	3.05	2.18	F	2151675-1	Not Applicable
			2.5	5,0	3.05	1.92			
	293645-2	1-293645-2	4.0	5.0	3.80	1.90		2151676-1	
	2359527-1	N/A	1.5	5.0	3.10	1.80		2151675-1	To be defined In-progress
			2.5	5.0	3.13	2.06			
	2359527-2		4.0	5.0	3.85	1.90		2151676-1	

Note *Tolerances for crimp height and width for hand crimped contacts are ±0.05* mm

Crimp height measurements are to be carried out in the middle of the conductor crimp, using for example a crimp height micrometer.
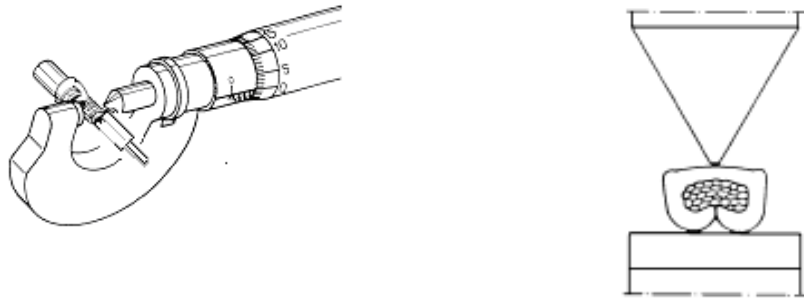
Fig. 4

Crimp height and width can also be measured in a microsection, but mechanical measurement takes precedence. The crimp height must be checked continual in the production. For each batch and after each change of terminal reel or wire bundle or crimp tool or its settings, the crimp height must be controlled.

4.5 Micro-sectioning

For evaluating the crimp quality achieved with the crimp tool, beginning with the first crimp, microsections cross the wire crimp must be made regularly.
The microsection must be made in the middle of the conductor crimp perpendicular to the longitudinal axis.
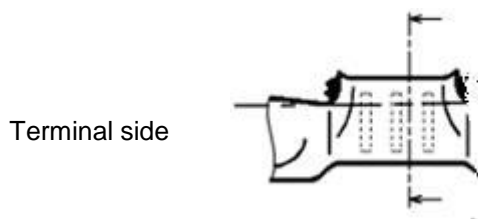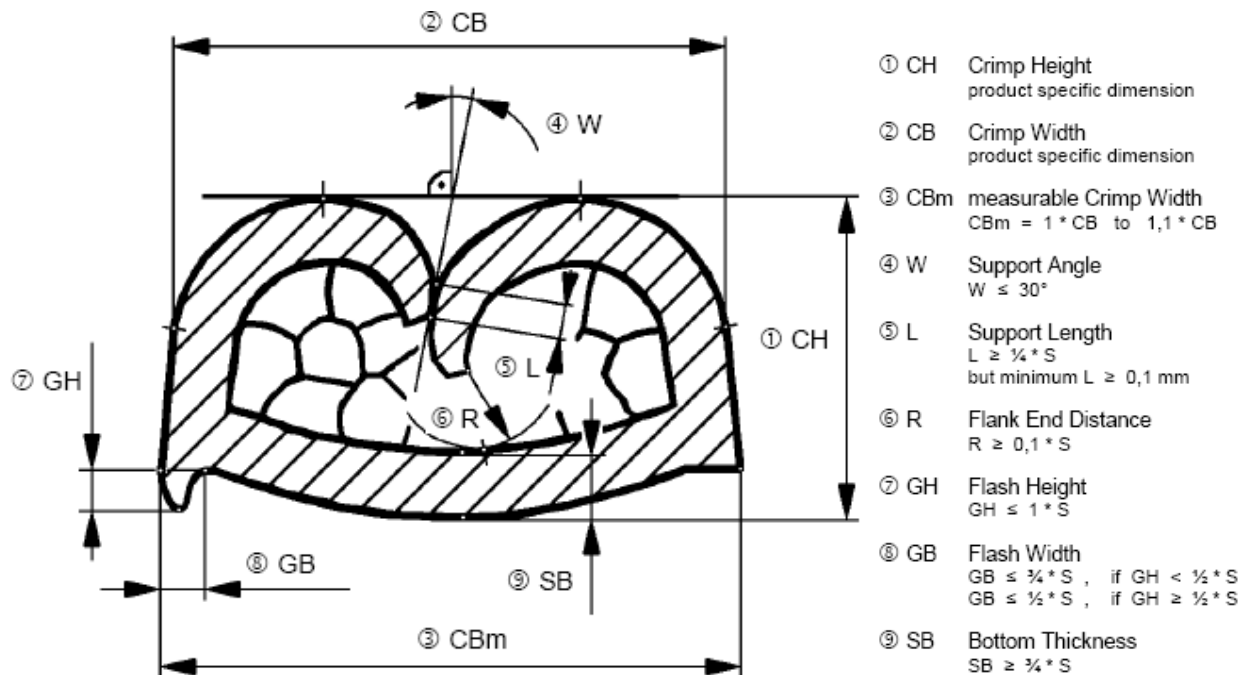
Terminal side

Fig. 5

The sectioning layer must avoid being made through a serration inside of the conductor crimp.
To avoid any changes inside of the crimp the sample preferentially must be infused into synthetic resin.
The cutting and grinding direction need to be against the opening direction of the crimp.
For good judge ability after the cutting of the crimp it is necessary to grind and etch the surface.

The microsection picture in suitable magnification must be evaluated acc. the following criteria:

① CH   Crimp Height
        product specific dimension

② CB   Crimp Width
        product specific dimension

③ CBm measurable Crimp Width
        CBm = 1 * CB to 1,1 * CB

④ W   Support Angle
        W ≤ 30°

⑤ L   Support Length
        L ≥ ¼ * S
        but minimum L ≥ 0,1 mm

⑥ R   Flank End Distance
        R ≥ 0,1 * S

⑦ GH   Flash Height
        GH ≤ 1 * S

⑧ GB   Flash Width
        GB ≤ ¾ * S , if GH < ½ * S
        GB ≤ ½ * S , if GH ≥ ½ * S

⑨ SB   Bottom Thickness
        SB ≥ ¾ * S

S = Terminal Material Thickness
    to be taken from terminal drawing

Fig. 6   Wire barrel closed at seam with no
         strands protruding or showing
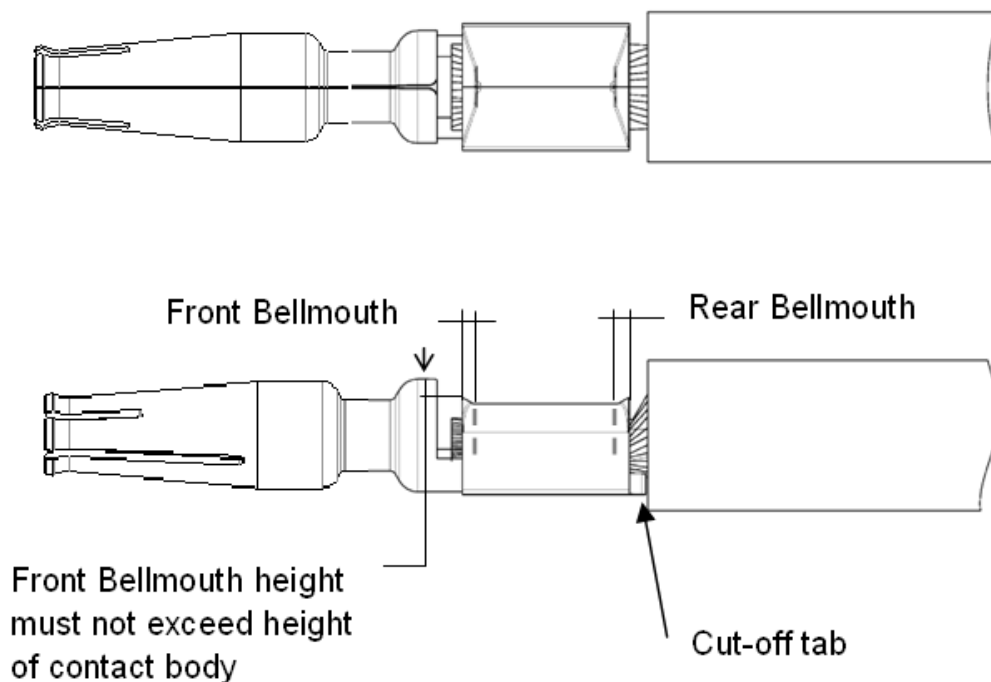
4.6 Other requirements

Front Bellmouth

Rear Bellmouth

Front Bellmouth height
must not exceed height
of contact body

Cut-off tab

Fig. 7

(Picture shown for ref only)

NECTOR X and NECTOR T
Pin and Socket connectors, stamped contacts crimp

- Under no circumstances the insulation material may be within the wire crimp barrel;
- The rear of the wire crimp barrel must feature a bell mouth; a bell mouth at the front end of the wire crimp barrel is not mandatory, but it is permissible with maximum size same as the bell mouth at rear end.
  The dimensions of the bell mouth are depending on the wire range:

Wire range [mm²]	Rear / Front Bellmouth dimensions [mm]
1.5 – 2.5	0.4 ± 0.2
4.0	0.6 ± 0.3

- The cut off tab is still visible and may be max 0.4mm long and its burr must not exceed 0.03mm;
- The cut off tab & burr must not impede the ability of mounting into cavity and mating of the contact
- The crimp barrel inside wall is formed to the shape of the strands for an intimate contact.
  All existing wire strands are enclosed within the wire barrel. Any stranding outside the crimp barrel or broken strands outside the wire crimp are not permissible;
- To avoid over compression, which would favor wire barrel flash, the thickness at the bottom of the crimp barrel must be at least ¾ of the material thickness of the contact.
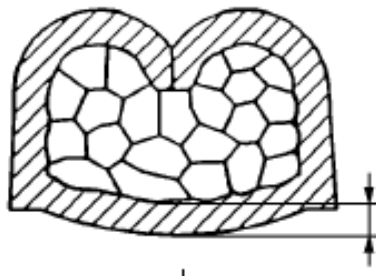

Fig. 8

- The crimp barrel seam must be closed over its entire length between the bell mouths; The rolled in crimp barrel legs must touch each other and show mutually supporting.
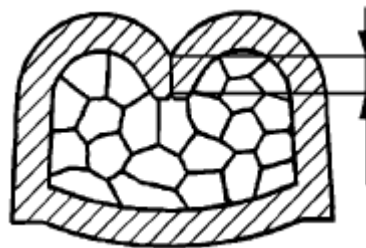

Fig. 9

- An unequal roll in of the crimp barrel legs is permissible, if support length and support angle are kept; neither crimp leg and may hit the inner wall of the crimp barrel

Fig. 10

NECTOR X and NECTOR T
Pin and Socket connectors, stamped contacts crimp

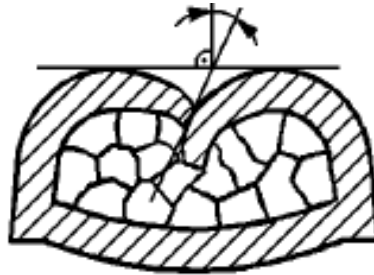- The support angle may deviate from vertical by maximum 30°

Fig. 11

4.7 Wire Pull Out Forces

The measuring of the wire pull-out forces from the wire crimp is carried out as a supporting manufacturing control.

Adjust tensile testing machine for head travel of 25.4 mm/min

Wire size [mm²]	Crimp Tensile, min values
1.5	200 N
2.5	300 N
4.0	350 N