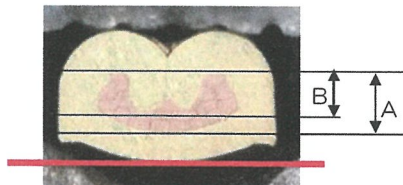




| | | | |
|--|-----------------------|---------------------------------------|----------------------------|
| Process Name/Title: Cut and Crimp Cut Surface Monitoring | | Document No: WI-ENG-PDE-003 | |
| WORK INSTRUCTION | | Effective Date: SEP 28 2017 | |
| Product Code/Name: Common | Customer Code: n/a | Rev.No.: 0 | Page No.: 1 of 2 |

| No. | Work Procedure/Illustration | | Records/Remarks/ Quality Pointers | | | | | | | | | | |
|---|-----------------------------|--|--|---------------------|----------------|-------------------------------------|-------|---|-------|---|-------|--|-------|
| Procedure Part1 | | | | | | | | | | | | | |
| 1. | Objective | To provide information and instruction with regards to the use of True Soltec Cut Monitor Machine in Terminal Cut Surface monitoring. | Refer to Appendix 1 Refer to Appendix 2 Refer to Appendix 2 Refer to Appendix 1 | | | | | | | | | | |
| 2. | Frequency | The frequency and condition for cut surface monitoring and responsible section as follows: <table><tr><th>Frequency/Condition</th><th>Responsibility</th></tr><tr><td>2-1 If Tvssf wire crimp : Every Lot</td><td>C & C</td></tr><tr><td>2-2 If there is change in the compression specification (height, width) of crimping</td><td>C & C</td></tr><tr><td>2-3 When we start to utilize new applicator or new terminal</td><td>C & C</td></tr><tr><td>2-4 When there is a change on the wire crimper of applicator</td><td>C & C</td></tr></table> | | Frequency/Condition | Responsibility | 2-1 If Tvssf wire crimp : Every Lot | C & C | 2-2 If there is change in the compression specification (height, width) of crimping | C & C | 2-3 When we start to utilize new applicator or new terminal | C & C | 2-4 When there is a change on the wire crimper of applicator | C & C |
| Frequency/Condition | Responsibility | | | | | | | | | | | | |
| 2-1 If Tvssf wire crimp : Every Lot | C & C | | | | | | | | | | | | |
| 2-2 If there is change in the compression specification (height, width) of crimping | C & C | | | | | | | | | | | | |
| 2-3 When we start to utilize new applicator or new terminal | C & C | | | | | | | | | | | | |
| 2-4 When there is a change on the wire crimper of applicator | C & C | | | | | | | | | | | | |
| 3. | Monitoring samples | The quantity of monitoring samples as follows: 3-1 Case of 2-1, One (1) sample which should be monitored at the middle of the standard value 3-2 Case of 2-2, Three (3) samples, each monitored at the middle, max. and min. of standard value 3-3 Case of 2-3, Three (3) samples, each monitored at the middle, max. and min. of standard value 3-4 Case of 2-4, One (1) sample which should be monitored at middle of the standard value | | | | | | | | | | | |
| 4. | Cutting | It should be cut at center of crimped wire. | | | | | | | | | | | |
| 5. | Etching | Refer to WI-ENG-PDE-005 | | | | | | | | | | | |
| 6. | Inspection | 6-1 Check Area : Refer to WI-PRO-CNC-046 6-2 Judgment 6-2-1: Compression Ratio : Less than 80% as recommended by the Terminal Manufacturer * Compression Ratio = Wire area/whole surface of crimping*100 6-2-2: Crimping Ratio : Greater(>) than 30% which is recommended by Terminal Manufacturer * Crimping Ratio = (B/A)*100  | | | | | | | | | | | |

| | | | | | | | | | |
|----------------|--------------|------------------------|-------------------|--------|-------|---------|-------------------------|----------------------|------------------------|
| | | | | | | | Prepare | Check | Approve |
| | | | | | | | 9/26/17 R. Alcantara | 9/28/17 A. Aranes | 9/28/17 T. Sugiyama |
| Eff./Rev. Date | Doc/DRCN No. | Rev. No(if applicable) | Details of Change | Revise | Check | Approve | Est. date: | SEP 28 2017 | |

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|------------------------|---|---------------------------------------|------------|-------|-------------------|------------|---------------------------------------|-------------------|------------|---------------------------------------|-----|------------|-----------------------------------|--|
| 7. Record | 6-3 Wire Crimper Replacement Condition If Burr exceeds below the red line, replace the applicator 's wire crimper. | | | | | | | | | | | | | |
| 8. Calibration | Refer to Appendix 1 and 2 | | | | | | | | | | | | | |
| 9. Maintenance | Refer to WI-ENG-PDE-006 and WI-ENG-PDE-007 | | | | | | | | | | | | | |
| 10. Retention | Refer to WI-ENG-PDE-008 | | | | | | | | | | | | | |
| 11. Monitoring File | Inspected sample does not need to retain after upload the monitoring image. | | | | | | | | | | | | | |
| 12. List of Appendices | Electronic File shall be uploaded in the designated folders in the server allocated for that purpose by Cut and Crimp Leader. Folder and information shall be manage by Quality Assurance Supervisor. <table><thead><tr><th>Clause No.</th><th>Appendices</th><th>Title</th></tr></thead><tbody><tr><td>2-1; 2-4; 7</td><td>Appendix 1</td><td>Crimp Cross Section Inspection Result</td></tr><tr><td>2-2; 2-3; 7</td><td>Appendix 2</td><td>Crimp Cross Section Inspection Result</td></tr><tr><td>6-2</td><td>Appendix 3</td><td>Crimping ratio calculation method</td></tr></tbody></table> | Clause No. | Appendices | Title | 2-1; 2-4; 7 | Appendix 1 | Crimp Cross Section Inspection Result | 2-2; 2-3; 7 | Appendix 2 | Crimp Cross Section Inspection Result | 6-2 | Appendix 3 | Crimping ratio calculation method | |
| Clause No. | Appendices | Title | | | | | | | | | | | | |
| 2-1; 2-4; 7 | Appendix 1 | Crimp Cross Section Inspection Result | | | | | | | | | | | | |
| 2-2; 2-3; 7 | Appendix 2 | Crimp Cross Section Inspection Result | | | | | | | | | | | | |
| 6-2 | Appendix 3 | Crimping ratio calculation method | | | | | | | | | | | | |

| | | | | |
|-----------------|--|---------------|-----------------------|--------------------|
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| Document Title: | CUT AND CRIMP CUT SURFACE MONITORING | Rev. 0 | Eff. Date | SEP 28 2017 |

Appendix 1:

Crimp cross section inspection result

| | | |
|---------------------|---------------------|------------------------------------|
| Terminal: 7114-4025 | Line type: TVSSF0.3 | Application model number: CG-98365 |
|---------------------|---------------------|------------------------------------|

| | | | | | |
|---|---|--|--|--|--|
| | C/H 1.000 (Standard value) | | | | |
| C/H Actual measurement value (mm) | 1.000 | | | | |
| C/W Actual measurement value (mm) | 1.83 | | | | |
| Vertical cross section (Serration section) |  | | | | |
| Compression ration | 76% | | | | |
| Inclination rate | 56% | | | | |

※ Refer to WI-PRO-CNC-046 for judgement
of section inspection result

Good: ○ No good: ×

Compression ratio 80% or less

Crimping ratio: over 30%

| | | | | |
|-------------|-----------|-----------|-----------|-----------|
| Judgment: ○ | Judgment: | Judgment: | Judgment: | Judgment: |
|-------------|-----------|-----------|-----------|-----------|

| | | | | |
|--------------------------|---------------|---------------|---------------|---------------|
| LOT: | LOT: | LOT: | LOT: | LOT: |
| Created date: 2016/11/25 | Created date: | Created date: | Created date: | Created date: |
| Author: Kiriya masami | Author: | Author: | Author: | Author: |
| Approval: Sato shouzou | Approval: | Approval: | Approval: | Approval: |

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Appendix 2:

Crimp cross section inspection result

| | | |
|--------------------|--------------------|------------------------------------|
| Terminal: 714-4025 | Line type: Tvsf0.3 | Application model number: CG-98365 |
|--------------------|--------------------|------------------------------------|

| | C/H 1.000 (Standard value) | C/H 1.025 (Upper limit value) | C/H 0.975 (Down limit value) |
|---|--|---|---|
| C/H Actual measurement value (mm) | 1.000 | 1.025 | 0.975 |
| C/W Actual measurement value (mm) | 1.83 | 1.83 | 1.83 |
| Vertical cross section (Serration section) |  |  |  |
| Wire area | 0.3818 | 0.3818 | 0.3818 |
| After compression area | 0.28512 | 0.29214 | 0.29345 |
| Compression ration | 74.7% | 76.5% | 76.9% |
| A dimension | 72.380 | 72.501 | 73.144 |
| B dimension | 26.000 | 22.141 | 29.254 |
| Inclination rate | 36% | 31% | 40% |

※ Refer to WI-PRO-CNC-046 for judgement

of section observation result

Good: ○ No good: ×

Compression ratio 80% or less

Crimping ratio: Over 30%

| | | |
|-------------|-------------|-------------|
| Judgment: ○ | Judgment: ○ | Judgment: ○ |
|-------------|-------------|-------------|

| | | |
|-----------|---------------|---------------|
| | Created date: | Created date: |
| Author: | Author: | Author: |
| Approval: | Approval: | Approval: |

| | | | | |
|-----------------|--|---------------|-----------------------|--------------------|
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Appendix 3:

Crimping ratio calculation method

Radius of one core wire × Radius of one core wire × 3.14 × Number of core wires → wire area

TVSSF 0.3 (made in Japan)

Radius of one core wire → 0.08

Number of core wires → 19

wire area $0.08 \times 0.08 \times 3.14 \times 19 = 0.3818$

IRAKKUSU YORI YORI 0.3 (made in Japan)

Radius of one core wire → 0.05

Number of core wires → 49

wire area $0.05 \times 0.05 \times 3.14 \times 49 = 0.3847$

AVSS 0.3 (made in Philippines)

Radius of one core wire → 0.13

Number of core wires → 7

wire area $0.13 \times 0.13 \times 3.14 \times 7 = 0.3714$

AVSSF 0.3 (made in Philippines)

Radius of one core wire → 0.08

Number of core wires → 19

wire area $0.08 \times 0.08 \times 3.14 \times 19 = 0.3818$