Robert Bosch GmbH

1 928 A00 82M-EN

Processing Specification

Matrix 1.2 with SWS

VALID	CHANGE	DWN.	CHK.
15.11.2006	New edition	Seel	Rehbein
15.05.2009	F1928498808	Wittmann	Rehbein
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1 General

This processing specification describes the rules for the crimp processing of the Matrix 1.2 SWS Terminal needed for wire harness manufacturing.

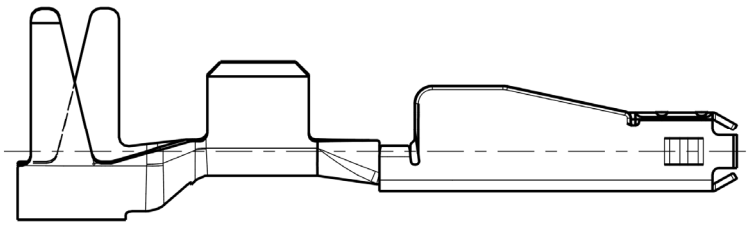
This processing specification is valid for the terminals mentioned in chapter 7.1.
For the crimping only Bosch released tools according to chapter 7.2 have to be used.

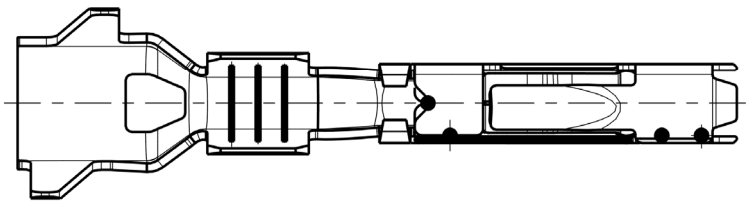
In the offer drawing and the TCI/TKU of the terminal, information about dimensions, materials, SWS and other terminal related aspects can be found.

2 Description

The terminal is designed to hold a single-wire seal (SWS), contains a primary locking and in the connector; a secondary locking can also be used.
The crimp connections are designed for wires of reduced cross section of type FLR-B according to ISO 6722.
The Matrix 1.2 SWS terminals are available for crimp areas of 0.35 to 1.0 mm² according to the different ordering / product numbers.
Other wires require the approval of the Bosch development department.
Double wire application with Matrix 1.2 SWS terminals are not permissible.

The terminal can be inserted into a connector housing only in one orientation (coding).
The terminals are supplied on disposable, one-way reels. The terminals are suitable for transverse left–hand feed.





2.1 Storage

The disposable, one-way terminal reels should be stored well protected against external influences (crushing, impacts, kicks, thrusts, etc.).
Any user is responsible for the usability of the terminals stored at his plant.

To ensure that any problems can be easily traced, the manufacturer must be able to check the production date of the terminals which is mentioned on the packaging.

The terminal can be stored for five years, beginning with the production date.

2.2 Lubrication

The Matrix 1.2 SWS can be processed without additional lubrication. The use of lubricants is not permitted. We cannot accept any responsibility for faulty crimping or changed terminal properties caused by the use of additional lubricants.

3 Crimping

3.1 Crimping Pliers

We offer crimping pliers for a manual crimping (see chapter 7.2).
For industrial crimping e.g. in wire harness manufacturing, an automatic crimping tool has to be applied. Crimping pliers can be employed for prototype production, repairing and similar cases; the crimp quality must be assured by means of measures outlined in this specification.

Functional characteristic of the crimping pliers:

- Positioning of the terminal into the inlet pocket (locator)
- Capability for unlocking in case of false operation

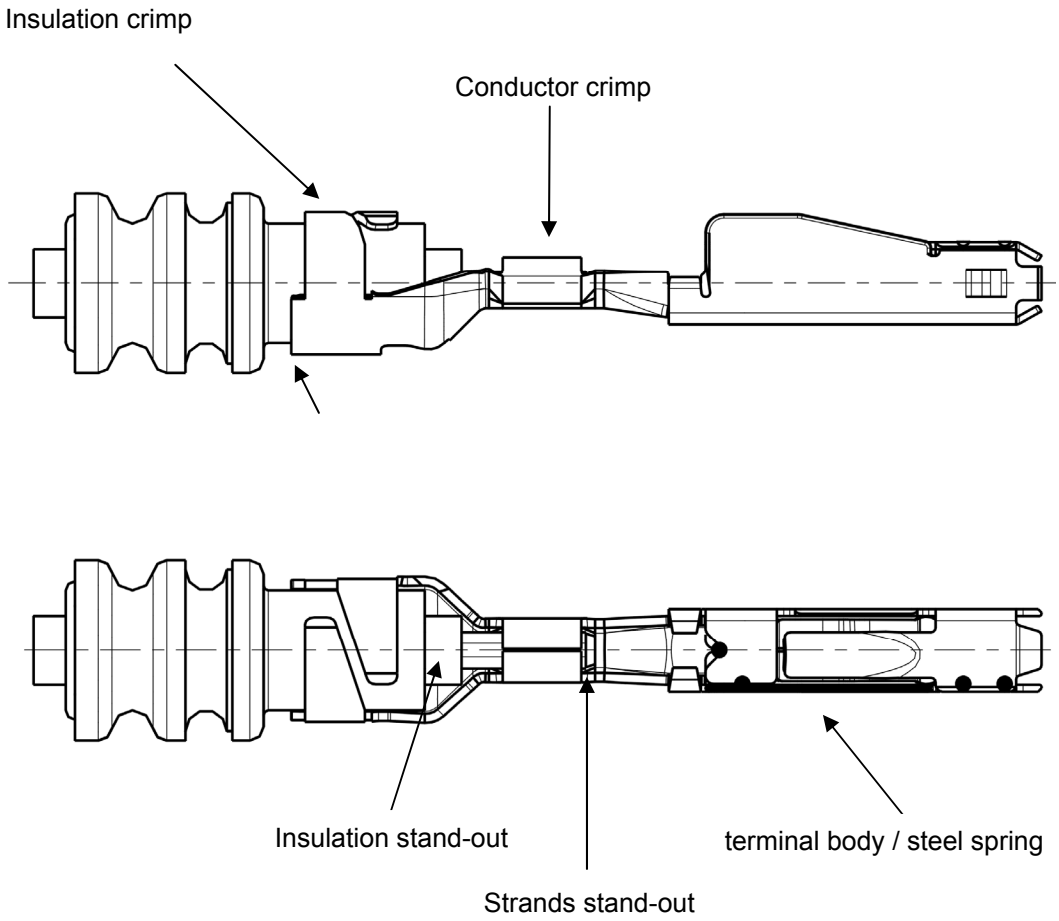
3.2 Crimping tool

For industrial crimping of the Matrix 1.2 SWS terminals crimping tools are available. These crimping tools (for ordering no. see chapter 7.2) are for processing the released Matrix 1.2 SWS terminals.
An automatic monitoring of the crimp force during industrial crimping is required.

Functional characteristic of the crimping tools:

- Adjustment of the crimp height by a locking device with fine grid steps of 0.02 mm.
- Terminal support plate is adjustable in height
- Wear parts exchangeable
- Adjustable for different spacing grids of the transport strip
- AMP-standard mount of the tool for conventional presses possible

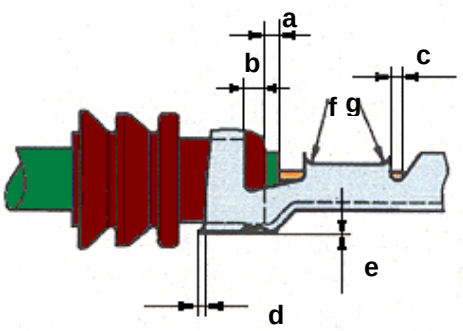
3.3 Crimp specifications



3.3.1 Stripping

The adjustment of the stripping length with fitted single wire seal must be 3.5 ± 0.3 mm. The exact value has to be adjusted according the used wire type.

3.3.2 Wire and SWS positioning

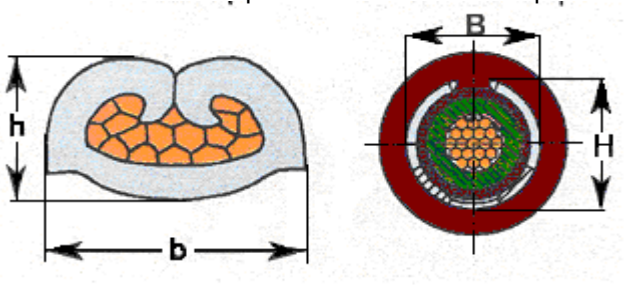


a = Insulation stand-out:	0 - 0.5 mm
b = SWS stand-out:	0.4 - 1.0 mm
c = strands stand-out:	0.1 - 0.3 mm
d = separation ligament:	max. 0.3 mm
e = flash of separation ligament:	max. 0.03 mm
f = intake radius:	visible, max. height 0.15mm
g = run-out radius:	not necessary, max. height 0.05 mm

3.3.3 Crimp dimensions

Conformity with the specified crimp dimensions and tolerances is urgently recommended in order to guarantee uniformly high standards of quality. Suitable measuring instruments, such as specially shaped micrometers and caliper gauges, must be used for checking. All geometric measurements can be taken non-destructively. All specified values refer to FLR wires (ISO 6722), preferred FLR-B type. By applying other tools than the Bosch released these values can differ. In any cases the quality of the crimp must fulfill this specification. For any open questions please contact us (addresses given in chapter 8).

conductor crimp insulation crimp



	conductor crimp [mm]		insulation crimp [mm]		Wire according	
Wire [mm²]	**h** conductor crimp height ± 0.03	**b** conductor crimp width ± 0.03	**H** insulation crimp height ± 0.05	**B** insulation crimp width ± 0.05	**wire according to** ISO 6722 (type FLR-B)	
					single wire	
					No. of strands	**diameter of single strand**
0.35	0.83	1.44	3.03	3.20	12	0.21
0.50	0.88	1.45	3.03	3.25	16	0.21
0.75	1.03	1.85	3.05	3.10	24	0.21
1.00	1.13	1.75	3.20	3.25	32	0.21
					wire according to AWG	
AWG20	1.00	1.66	3.10	3.15	7	0.315
AWG20	1.00	1.66	3.10	3.15	19	0.20

Dimensions of the insulation crimp have to lie inside a circumscribed circle with diameter 3.30 mm.

Parallelism:

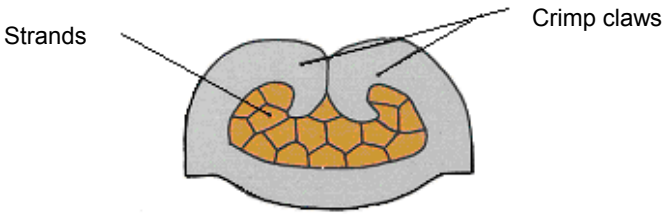
- Conductor crimp to terminal body: 0.2 mm
- SWS-Crimp to terminal body: 0.2 mm

Symmetry:

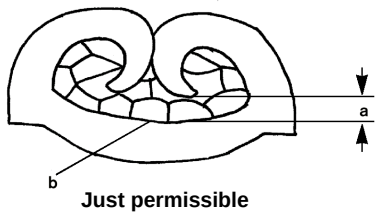
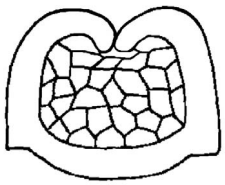
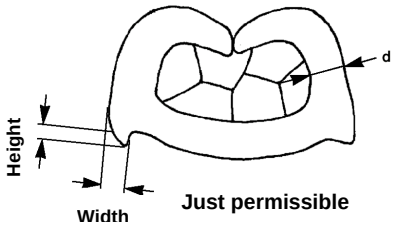
- SWS-Crimp to terminal body: 0.2 mm

3.3.4 Micrographs conductor crimp

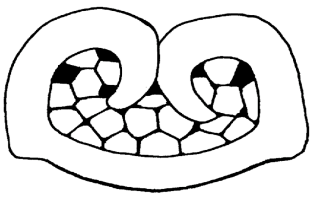
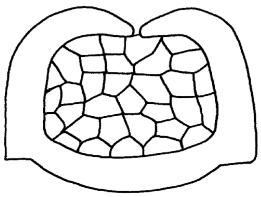
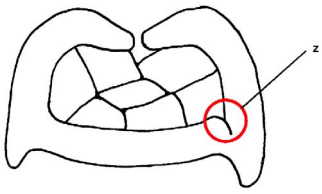
Ideal:



Special cases:

 **Just permissible**	 **Just permissible**	 **Just permissible**
a ≥ b (b = ½ strand diameter)		width < ½ d (thickness of the wall)

Not permissible:

 **not permissible**	 **not permissible**	 **not**
cavities	open crimp claws	open crimp claws and crack

3.3.5 Pull off forces (extraction forces)

The pull off forces have to meet the targets of TCI/TKU 1 928 A00 46T.
The measurements have to be executed according to DIN IEC 512-8 with an opened SWS-crimp.
Speed for the force measurements: 25 mm/min.

Target values:

Wire [mm²]	Pull off forces F [N]
0.35	≥ 60
0.50	≥ 70
0.75	≥ 80
1.00	≥ 90
AWG20	≥ 90

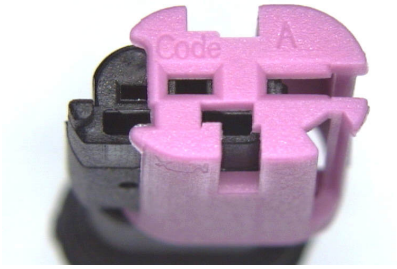
3.3.6 Visual inspections

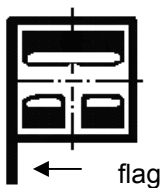
- All strands must be surrounded by the crimp claw for a good compression.
- Damage of the strands is not permissible.
- Crimp claws have to be closed for a good compression.
- Avoid large flashs at the bottom of the crimp barrel.
- The terminals have to show no damages: check of bended or squeezed terminals (bodies, crimp, tang spring).
- Observe and keep limits for the position of the wires and stripping dimensions.
- Keep symmetry conditions of the terminal.
- Keep the SWS without any damages or deformations.

4 Assembly

4.1 Manual

The terminal can be inserted into a connector housing only in one orientation (Coding).
The alignment and the orientation is according to the flag of the terminal. During assembling the terminal, the orientation should no more be changed.





example: 2-pole trapez plug-and-socket connection

After assembling test the full locking of the terminals by a light pulling (max. 15 N) off the wire (pull -test) *before* the secondary locking (in the figure purple-colored) will be closed.
A so called push-test / push-back-test by using a pin or tool with a certain force is ***forbidden***.

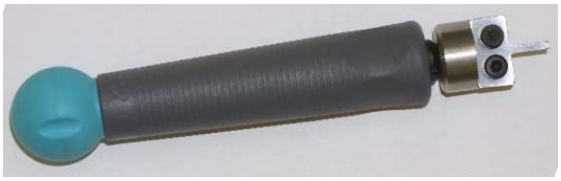
5 Final inspection

The electrical function test has to be executed with spring mounted test pins according to AZ 1 928 A00 180. These test pins must enable to meet the opening for all tolerances without damaging the terminal or connector and without penetrating into the contact area of the terminal. For any open questions, please contact us (chapter 8.2).

The electrical test has to be done after closing of the secondary locking.

6 Disassembly

In case of false assembly or in order to repair failures first open the secondary locking. Then extract the terminal with a special disassembly tool (chapter 7.2).



The disassembly process has to be done with the Bosch disassembly tool. After disassembly, the terminal has to be checked carefully for any damages.

Damaged terminals (chapter 3.3.6) have to be replaced by new parts.

7 Ordering information

7.1 Terminal

Matrix 1.2 (SWS)

crimp range [mm²]	Plating	Part-No.	single-wire seal
0.35 – 0.5	Au	1 928 498 140	1 928 300 934
0.75 – 1.0	Au	1 928 498 141	1 928 300 936
0.35 – 0.5	Ag	1 928 498 143	1 928 300 934
0.75 – 1.0	Ag	1 928 498 144	1 928 300 936
0.35 – 0.5	Sn	1 928 498 146	1 928 300 934
0.75 – 1.0	Sn	1 928 498 147	1 928 300 936

Matrix 1.2 – high-vibration

crimp range [mm²]	Plating	Part-No.	single-wire seal
0,35 - 0,5	Au	1 928 498 808	1 928 300 934
0,75 - 1,0	Au	1 928 498 809	1 928 300 936
0,35 - 0,5	Ag	1 928 498 810	1 928 300 934
0,75 - 1,0	Ag	1 928 498 811	1 928 300 936

7.2 Crimping tools and pliers

Article	Part - No.
Crimping pliers for 0.35 und 0.50 mm²	1 928 498 215
Crimping pliers for 0.75 und 1.00 mm²	1 928 498 216

Article	crimp range	Part - No.
Crimping tool Wear Part Set for the Crimping tool	0.35 – 0.50 mm²	1 928 498 203 1 928 498 209
Crimping tool Wear Part Set for the Crimping tool	0.75 mm²	1 928 498 205 1 928 498 211
Crimping tool Wear Part Set for the Crimping tool	1.00 mm²	1 928 498 204 1 928 498 210
Crimping tool Wear Part Set for the Crimping tool	AWG20	1 928 498 114 1 928 498 115

Article	Part - No.
Disassembly tool	1 928 498 298
Spare part for disassembly tool	1 928 498 299

8 Information and addresses

8.1 Ordering

Robert Bosch GmbH
Gasoline Systems
Technical sales department
Department GS-AM/SCO
PO box 1131

71301 Waiblingen

Telephone: 0711 811-42694
0711 811-43671

8.2 Technical information

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Department GS-AM/ENC1
PO box 300240

70442 Stuttgart

Telephone: 0711 811-34629
0711 811-34063