Class I

STANDARD INSTALLATION PROCEDURES FOR RAYATEN COATED MOULDED PARTS – STRAIGHT, 90° AND 45°

ELE-3COP-505

TE Connectivity's Rayaten Coated Straight, 90° and 45° Moulded Parts

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Before starting work please read this document carefully and note the guidance given.

1. PURPOSE AND SCOPE

This Code of Practice describes the procedures to be used when installing straight, 90° and 45° Rayaten Moulded Parts from TE Connectivity (TE) using the standard method. The instructions stated in this document take preference over IPC/WHMA requirements, as do the drawing and any customer documentation.

It is good working practice that where trained operators have not installed this product for over 6 months, a sample installation should be carried out by the operator to refresh installation practice. Performance of the sample can be checked using the inspection standards described within this document.

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2. PERFORMANCE OBJECTIVE

This code of practice is produced to support operators already trained in the installation of heat shrinkable and harnessing products. It identifies the procedures to be used when installing straight, 90° and 45° Rayaten Moulded Parts using Raychem S1125 and S1184 epoxy adhesives.

NOTE:

Best results will be obtained if 10% unresolved recovery (grip) for all outlets of the Rayaten Moulded Parts is available. Please check for compliance with this requirement before assembly. Unresolved recovery is defined as the difference between the installed diameter and the fully shrunk (recovered) diameter as given on the appropriate customer drawings, expressed as a percentage of the fully shrunk diameter. For example, a Rayaten Moulded Part fully shrunk with a diameter of 10 mm and an installed diameter of 11 mm has a 10% unresolved recovery.

3. MATERIALS AND EQUIPMENT

Appropriate Straight, 90° or 45° Rayaten Moulded Part.

Raychem S1125 adhesive.

Raychem S1184 adhesive.

Appropriate DR-25 Packing Piece and RNF-100 tubing.

P100 grit Emery Cloth or equivalent.

Degreasing Agent isopropyl alcohol or isopropanol (IPA) impregnated tissue wipe.

Heavy duty tissues.

Heat Gun CV1981 or equivalent. Other hot air guns may be used but these must be capable of delivering the temperatures required for installation of the Rayaten Moulded Part. This also includes hot air guns with temperature displays.

Reflector PR-26 or equivalent.

Bend Test Fixture 500Z1270 (TE Connectivity).

Heat Resistant Gloves.

Safety Glasses.

4. HEALTH AND SAFETY

Adhere to local Codes and Regulations relating to Safe Working practices. For the UK, adhere to requirements of the Health and Safety at Work Act 1974 and subsequent amendments.

The installation should be carried out in a well-ventilated area.

Always wear heat resistant safety gloves when handling hot plastics and adhesives.

The use of suitable protective gloves and barrier cream is recommended when using solvents. Avoid prolonged repeated skin contact with solvents and always wash hands after using solvents.

Care should be taken to wear safety glasses when using and handling chemical solvents. If eyes do become contaminated, flush with water and obtain medical assistance immediately.

Always ensure all equipment is calibrated before use.

5. PROCEDURE - PREPARATION

5.1. Cut back the cable jacket and shield sufficiently (Dimension L) to terminate the conductors to the connector. See Figure 1. The recommended dimensions depend upon the size of the Rayaten Moulded Part and are given in Table 1. Allow an extra 20 mm for service loops if required.

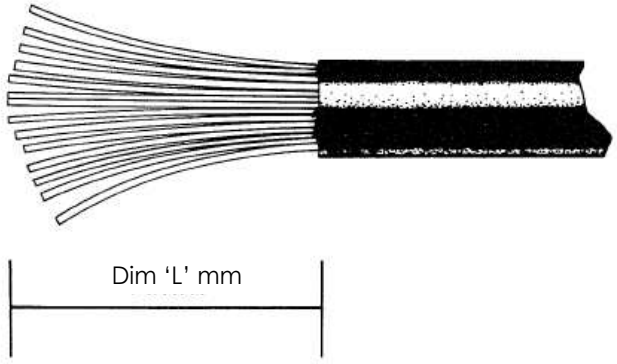


Figure 1 Cable jacket cutback

Moulded Part	Dim 'L' mm	Moulded Part	Dim 'L' mm	Dim 'L' mm
			90°	**45°/G28**
202S121-XXC-0	35	222S121-XXC-0	35	35
202S132-XXC-0	45	222S132-XXC-0	40	40
202S142-XXC-0	55	222S142-XXC-0	45	45
202S152-XXC-0	55	222S152-XXC-0	50	50
202S152-XXC-01-0	39	222S163-XXC-0	65	65
202S163-XXC-0	65	222S174-XXC-0	80	80
202S163-XXC-02-0	55	222S185-XXC-0	76	N/A
202S174-XXC-0	80			
202S174-XXC-02-0	55			
202S185-XXC-02-0	70			

Table 1 Rayaten moulded part sizes

5.2. Before placing the Rayaten Moulded Part onto the cable, degrease the uncoated and coated areas of the inside of the Rayaten Moulded Part using isopropyl alcohol (approximately 30 mm).

5.3. Abrade the uncoated areas of the inside of the Rayaten Moulded Part with P100 grit emery cloth taking care to avoid the coated area. Remove loose particles from the abraded area using a dry tissue. **DO NOT** use solvent.

5.4. Slide onto the cable any marker/protection sleeves, Rayaten Moulded Part, adaptor, DR-25 packing piece and RNF-100 tubing. See Figure 2.

NOTE:

It is essential to build up the cable shield to the same diameter as the cable jacket using a DR-25 Packing Piece. Terminate the conductors to the connector in the appropriate way.

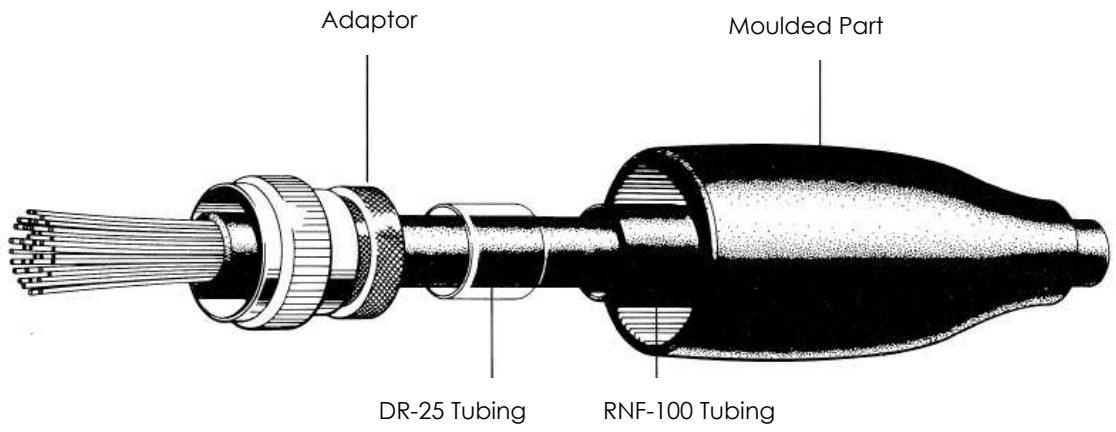


Figure 2 Cable assembly example

5.5. With the major keyway in the correct position, secure the adaptor to the connector using the appropriate mating half and tighten to the specified torque value. Refer to ELE-3COP-452. Remove the cable jacket only, according to dimensions in Figure 3 and Table 2.

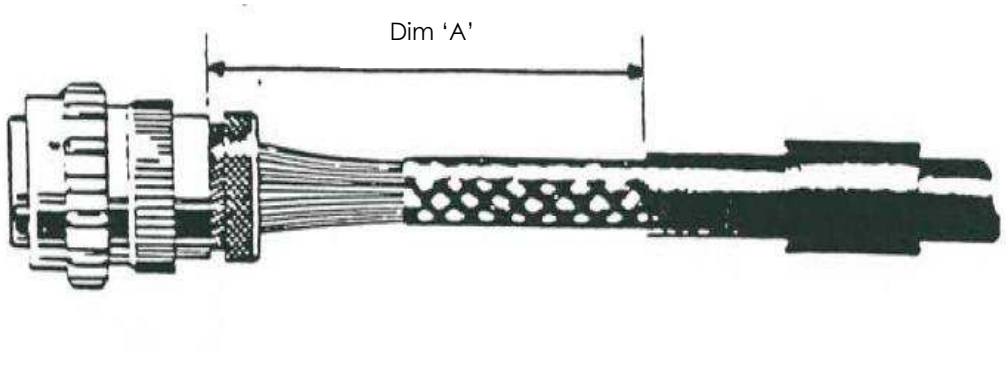


Figure 3 Cable jacket removal

Moulded Part	Dim 'A' mm	Moulded Part	Dim 'A' mm	Dim 'A' mm
			90°	**45°/G28**
202S121-XXC-0	37	222S121-XXC-0	36	34
202S132-XXC-0	52	222S132-XXC-0	45	44
202S142-XXC-0	64	222S142-XXC-0	50	47
202S152-XXC-0	72	222S152-XXC-0	60	59
202S152-XXC-01-0	54	222S163-XXC-0	70	68
202S163-XXC-0	92	222S174-XXC-0	86	82
202S163-XXC-02-0	60	222S185-XXC-0	120	N/A
202S174-XXC-0	117			
202S174-XXC-02-0	70			
202S185-XXC-02-0	82			

Table 2 Cable removal dimensions

5.6. Position and recover the DR-25 packing piece under the shield. Trim the shield 2mm from the front edge of the DR-25 packing piece. Secure using RNF-100 tubing. Alternatively secure the ends of the shield with the tinned copper wire, ensuring that the twisted ends are folded flat against the shield. The shield and cable are now of similar diameter. See Figure 4.

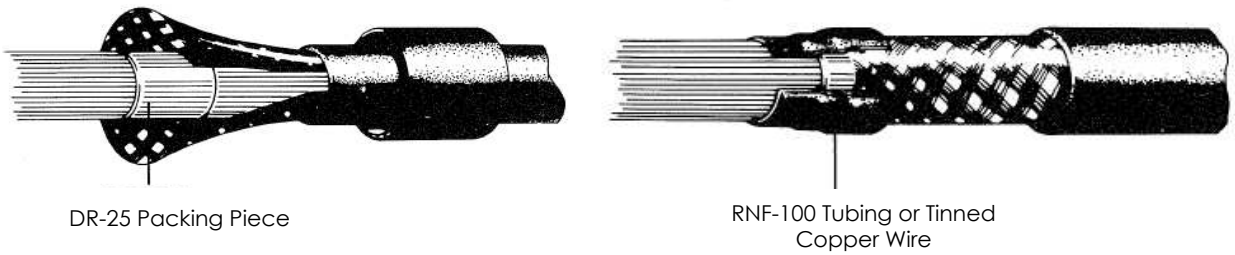


Figure 4 Cable and shield configurations

5.7. To ensure the best possible bond between the Rayaten Moulded Part and the cable jacket, degrease the cable shield and the cable jacket in the area where the Rayaten Moulded Part will recover onto the cable using Isopropyl alcohol. Abrade the cable jacket only thoroughly in the same area with P100 grit emery cloth. The whole surface of the cable jacket should be abraded removing any print on the cable jacket. Remove loose particles from the abraded area on both the Rayaten Moulded Part and the cable jacket using a dry tissue. **DO NOT** use solvent. Ensure sufficient cable jacket has been abraded to incorporate the strip length requirement. See Figure 5. Take care to avoid abrading the plating of the shield.

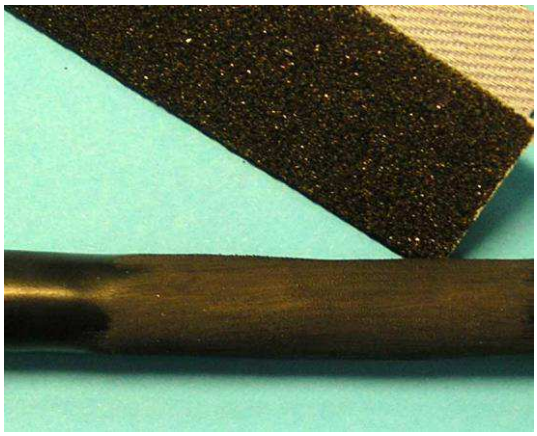


Figure 5 Degreasing cable jacket

This part of the cable preparation is very important in ensuring a strong bond to the moulded part.

5.8. To ensure the best possible bond between the Rayaten Moulded Part and the adaptor, degrease the adaptor end where the Rayaten Moulded Part will recover onto the adaptor with isopropyl alcohol.

As adaptors are normally plated, NEVER abrade the adaptor.

In order to verify correct installation it is important that certain checks are carried out to ensure that there are no high resistance terminations. This can be done by recording the DC resistance of the shield prior to installation of the Rayaten Moulded Part. Upon completion of installation of the Rayaten Moulded Part, the DC resistance value should not increase by greater than 2.5 milliohms.

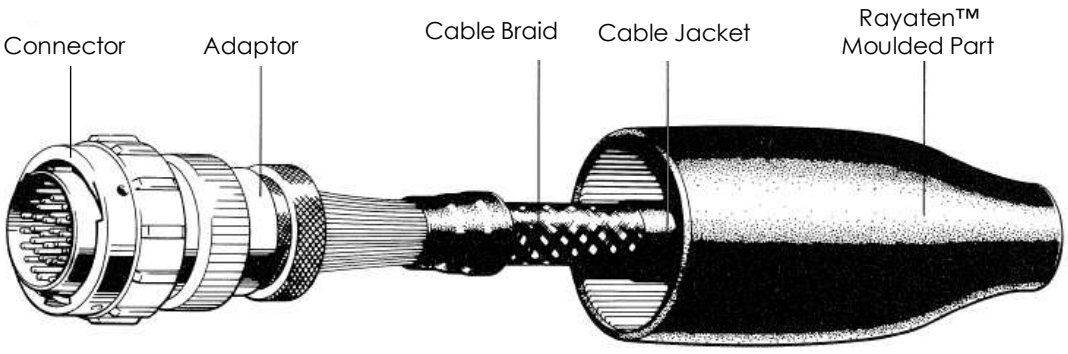
The measurement of DC resistance gives no statement about the screening performance of the harness, it only tells the quality of the termination.

5.9. It is essential that both the cable and connector/adaptor assembly are secured during the installation of the Rayaten Moulded Part. When installing 90° and 45°(/G28) Rayaten Moulded Parts it is recommended to pre-form the cable as shown in Figure 6.

NOTE:

Check keyway orientation prior to installation.

Straight Termination



Pre-form for 90° and 45°(/G28) Terminations

Figure 6 Terminations

5.10. Mix the S1125 and S1184 adhesives in separate containers, taking note of the approximate pot life of 60 minutes at normal room temperature not exceeding 23°.

5.11. Apply the adhesive in the following sequence as shown in Figure 7.

- S1125 to the lip groove of the adaptor (I)
- S1184 to the large knurled section of the adaptor (II), working the adhesive into the knurl to a thickness of approximately 2 mm.
- S1184 to the cable shield (III), working the adhesive into the shield for a length of 10-20mm dependant on the size of the Rayaten Moulded Part to a thickness of approximately 2 mm. There should be no cross contamination of the S1125 and S1184 adhesives.

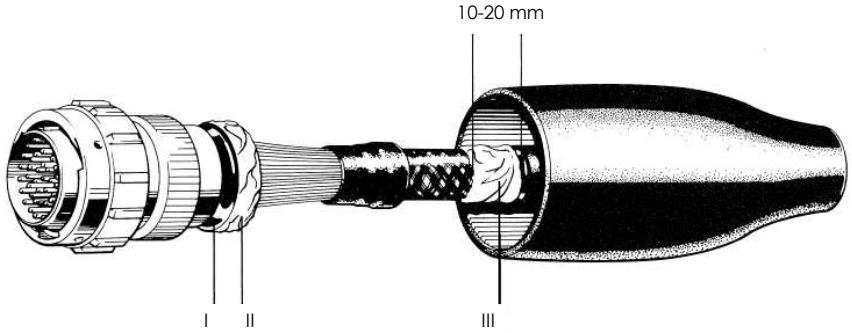


Figure 7 Adhesive application

5.12. Using a CV1981 Heat Gun set to 230°C to 250°C and with a PR-26 reflector, start heating at the connector end directing the heat towards the connector. Heat must be applied evenly around the Rayaten Moulded Part to recover evenly and prevent scorching. When the lip of the Rayaten Moulded Part is fully recovered into the adaptor groove and the body is parallel for the first 10-15 mm of its length, look for evidence that S1125 adhesive is present, cease heating and remove any excess adhesive from the adaptor/ Rayaten Moulded Part. See Figure 8.

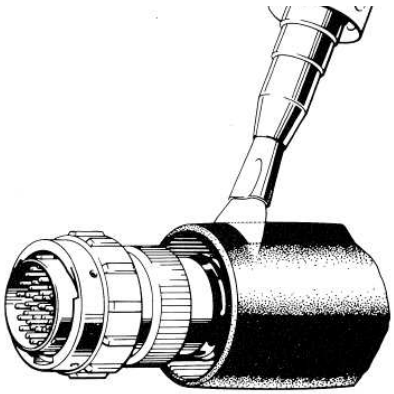


Figure 8 Heat application

5.13. Apply S1125 adhesive to the cable jacket where the ‘J’ end of the Rayaten Moulded Part is to be recovered and also to the uncoated area only of the Rayaten Moulded Part. See Figure 9. There should be no cross contamination of the S1125 and S1184 adhesives.

Figure 9 Adhesive application during recovery

5.14. Continue to recover the Rayaten Moulded Part starting at the connector end applying heat evenly around the Rayaten Moulded Part working towards the cable end until it is fully recovered. Remove any excess adhesive. See Figure 10.

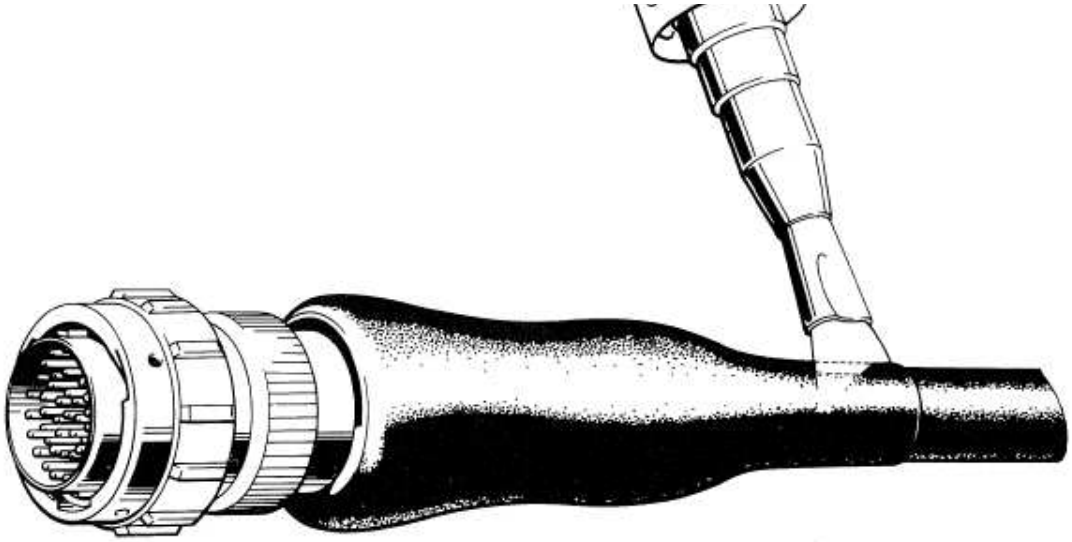


Figure 10 Rayaten moulded part recovery

5.15. Post heat both ends of the Rayaten Moulded Part as follows:

202/222S121 to 142 Connector End 30 seconds, Cable End 60 seconds.

202/222S152 to 185 Connector End 30 seconds, Cable End 90 seconds.

Always ensure that the air vent on the rear of the hot air gun is open and that it is dust free.

Always allow the hot air gun to stabilise at the required temperature and setting for two minutes before commencing calibration and installation.

5.16. Hot air gun validation shall be carried out on a regular basis, frequency will depend on usage. Please refer to the Manufacturers guide for hot air gun calibration and maintenance and ELE-3COP-711 for hot air gun validation.

6. INSPECTION REQUIREMENTS

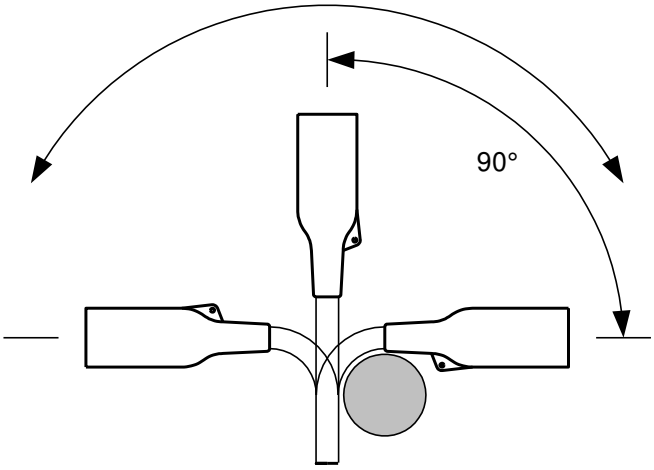
One of the following cure cycles must be completed before the termination is flexed.

2 hours at 80ºC followed by 24 hours at 23°C (Room Temperature)

48 hours at 23°C (Room Temperature)

For normal handling purposes, the adhesive will be sufficiently cured after 24 hours at room temperature. If left to cure at room temperature avoid aggressive handling for 7 days.

The termination should be rotated so it is subjected to a flex test of 90º in each of four planes around a mandrel with a diameter equal to 6 times the cable diameter.



There should be no separation between the Rayaten Moulded Part and the cable jacket at the adhesive bond line.

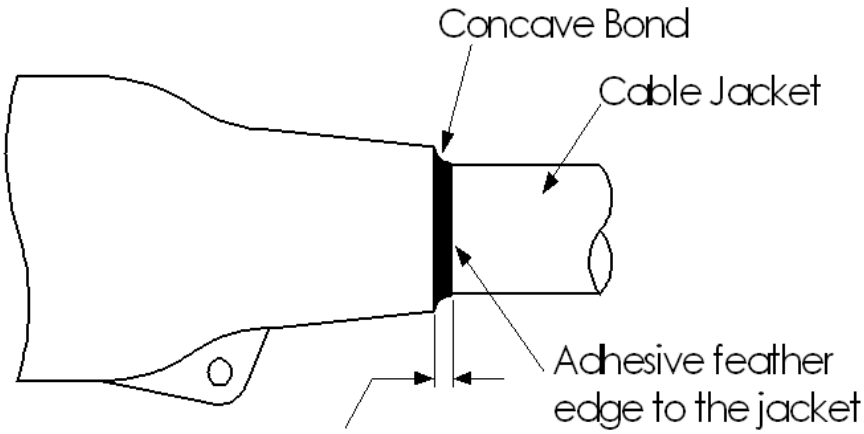
There should be no separation between the Rayaten Moulded Part and the adaptor.

The Rayaten Moulded Part must be free from fingerprints, excess adhesive and scorch marks.

There should be no cross contamination of the S1125 and S1184 adhesives.

Record DC resistance measurements.

7. VISUAL STANDARDS



Acceptable

Insufficient adhesive

Excess adhesive

Adaptor body shall be free of excess adhesive

8. REVISION HISTORY

Author	Approved	Date	Rev	Comments
K. Carter	P. White	08APR1991	7	080491
P. Newman	N. Dorricott	06APR2010	8	CR09-DM-018
P. Newman	N. Dorricott	07JUN2011	9	Visual Identity
P. VU	H. Smith	19FEB2018	10	Plated Rayaten replaced by Coated Rayaten moulded parts RTS-1364475.1

Table 3 Revision history