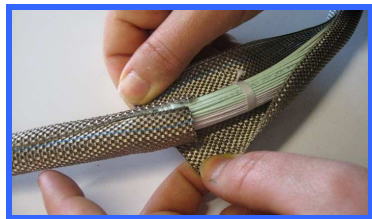
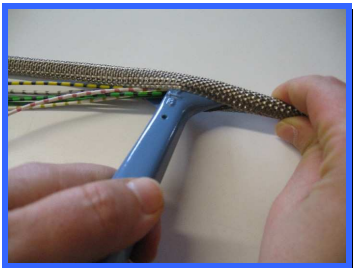
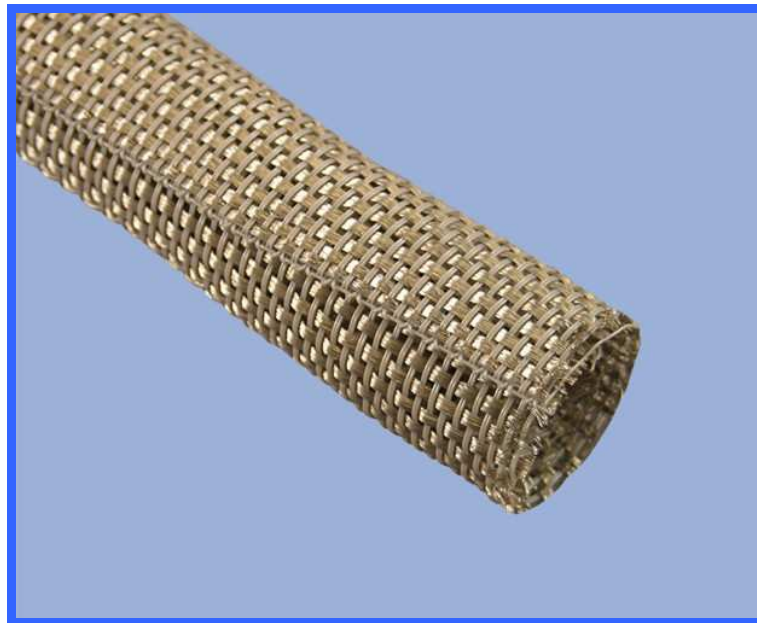


# Assembly Guide

## Roundit V0 EMI



**While using this guide, all customers must comply with their own harness manufacturing rules.**

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## 1 – Description

UL 94 V0 rated PPS monofilaments & oxygen free nickel plated copper wires Class 4 acc. to ASTM B-355



## 2 - Application

The sleeve **Roundit V0 EMI** can be used for a:

- **EMI protection** and **bundling** of electrical harnesses in all railcar zones
- **Open solution for modification of the original harness**
- **Repair of EMI shielding**

Use of **Roundit V0 EMI** has to be seen as part of a global accessible system, including access to the cable ties and fixation to give the possibility of making repairs and modifications.

## 3 - Sleeve Installation on a Harness

### 3.1 - Preparation of the Wire Harness

#### 3.1.1 - Bundles

The wire bundles have to be prepared before installing **Roundit V0 EMI**.

To help with installation, some breakout bundles can be tied to hold the wires in place.

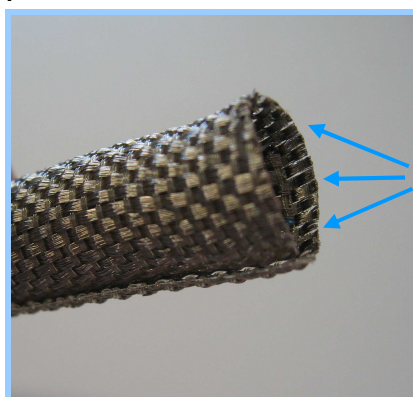
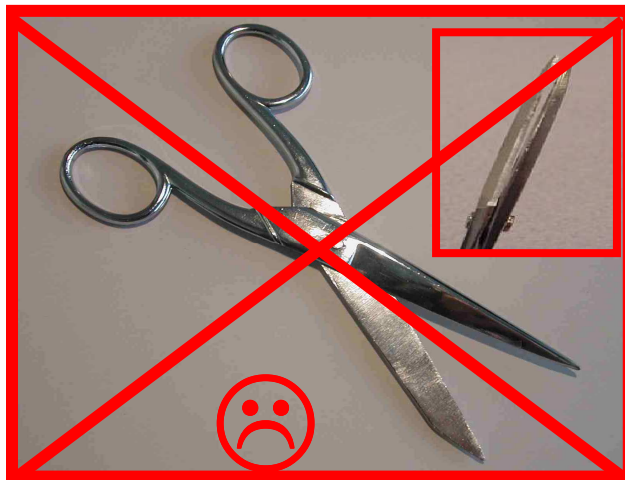
This operation should be done minimally, using as little lacing tape or tape as possible since the complete harness with the sleeve will be tied after the installation of **Roundit V0 EMI**.

### 3.1.2 - Cutting

- **Cutting the sleeve**

**Roundit V0 EMI** is cold cut with scissors. The textile fabric of the sleeve has an anti-fray system with a knot at the edge.

Good quality paper scissors are required in order not to damage to **Roundit V0 EMI** during cutting.



The ends of the sleeve do not fray and do not injure fingers.

### 3.1.3 - Tools

2 tool designs can be used to facilitate the installation of **Roundit V0 EMI** on bundles for sizes below 25 while removal of the sleeve can be performed manually without tools.



Use of the tools is explained in section 6

### 3.1.4 - Installation

**Roundit V0 EMI** on the bundle must be **tight** in order to avoid folds.

To make it easier for multi-branch harnesses, it is better to start covering the smallest bundle and finish with the biggest. This makes it possible to cover the small size by a bigger size on the break-out.

In order to use the maximum diameter indicator correctly, **respect the position of the ivory line** on the overlap direction (Please refer to the diagram in section 3.2).

### 3.1.5 - Twisting

**Roundit V0 EMI** can be **twisted on all bundles**.

The **twist** can be on average around **1 to 2 turns per linear meter** (2 turns/yard) of the bundle.

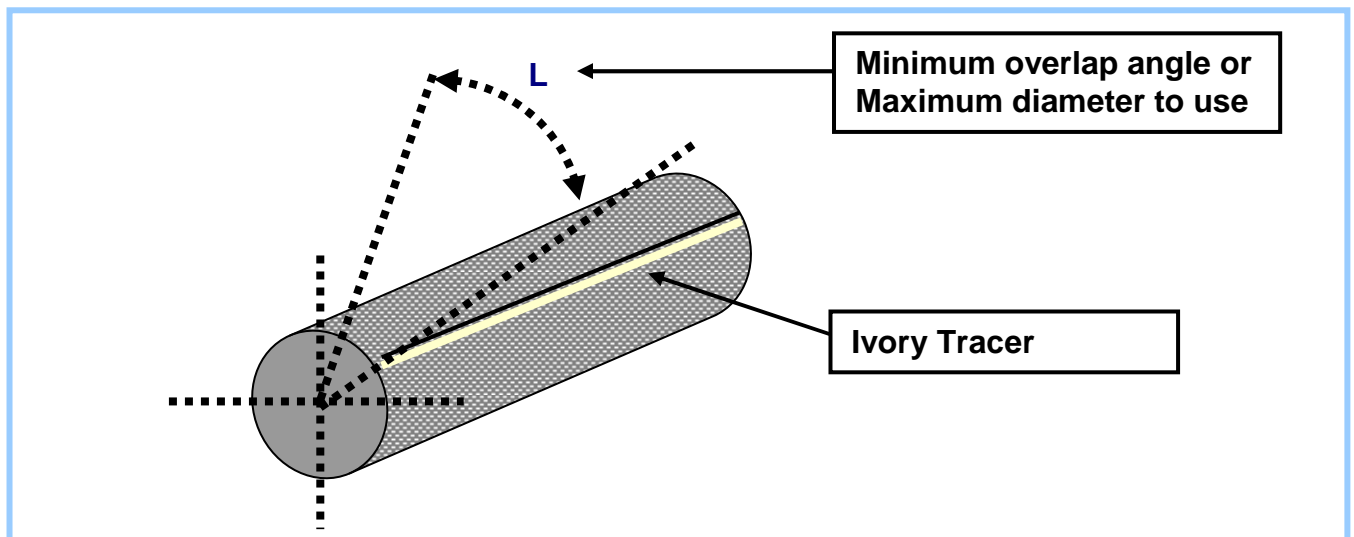
In order to ensure good performance in transfer impedance, it is **important not to twist Roundit V0 EMI** too much. **Do not exceed 2 twists per meter**.

### 3.2 - Diameters of Bundles/Sizes

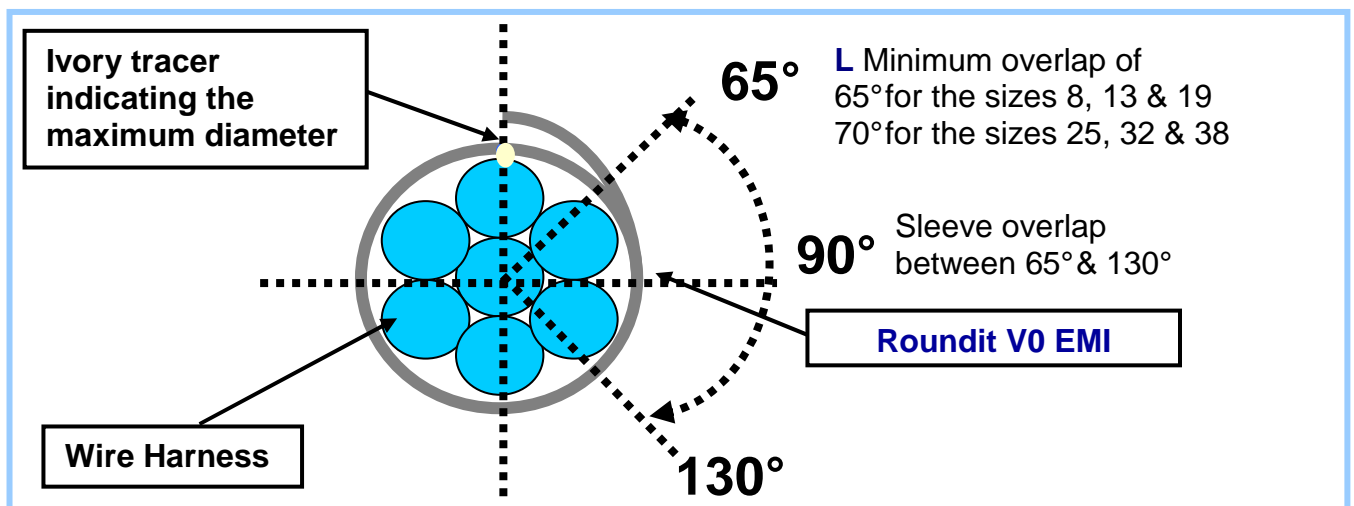
**Roundit V0 EMI** sizes must be adapted to suit the diameters of the bundles so that, in all cases, lip overlap is 130° maximum and 65° minimum. Overlap is 90° on nominal size.

Sizes mm (inches)	Bundle Diameter		Cross section mm <sup>2</sup>
	Min mm (inches)	Max mm (inches)	
8 (5/16")	5 (3/16")	8 (5/16")	3,5
13 (1/2")	8 (5/16")	13 (1/2")	4,8
19 (3/4")	13 (1/2")	19 (3/4")	5,5
25 (1")	19 (3/4")	25 (1")	6,9
32 (1 1/4")	25 (1")	32 (1 1/4")	8,9
38 (1 1/2")	32 (1 1/4")	38 (1 1/2")	10,6
45 (1 3/4")	38 (1 1/2")	45 (1 3/4")	11,9

**Roundit V0 EMI** from the side:



**Roundit V0 EMI** installed on a wire harness:





### 3.3 – Connection and Fixation of the sleeve

#### 3.3.1 Fixation of the sleeve

**Roundit V0 EMI** junction on connector back shell and break out accessories are made with **Band-It**. The sleeve on the bundle must be tied with cable ties or lacing tapes.

The cable tie or lacing tape **interval is 10 cm**.

The **fixation** of the harness on railway car **will increase the quantity of cable ties**.

A silicone Tape **67N** (ABS 5334) can be added to finish the ends. It adds local waterproof protection (salt spray resistance) and prevents injuries.

**67N** (ABS 5334)

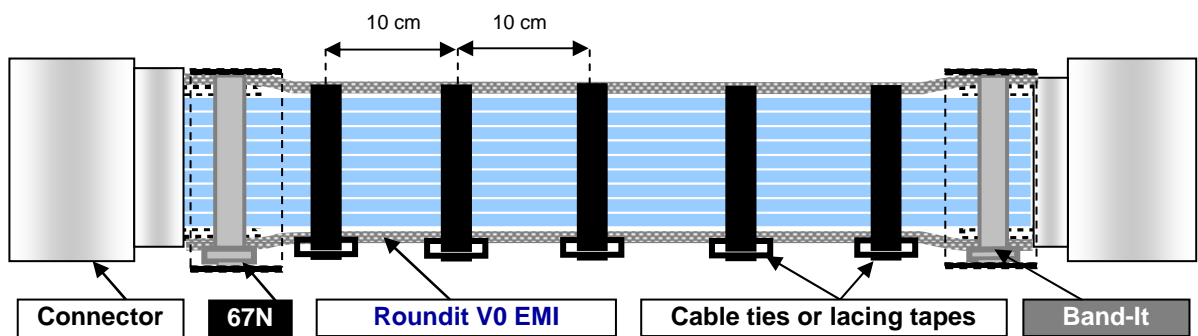


#### 3.3.2 Back-shell Junction

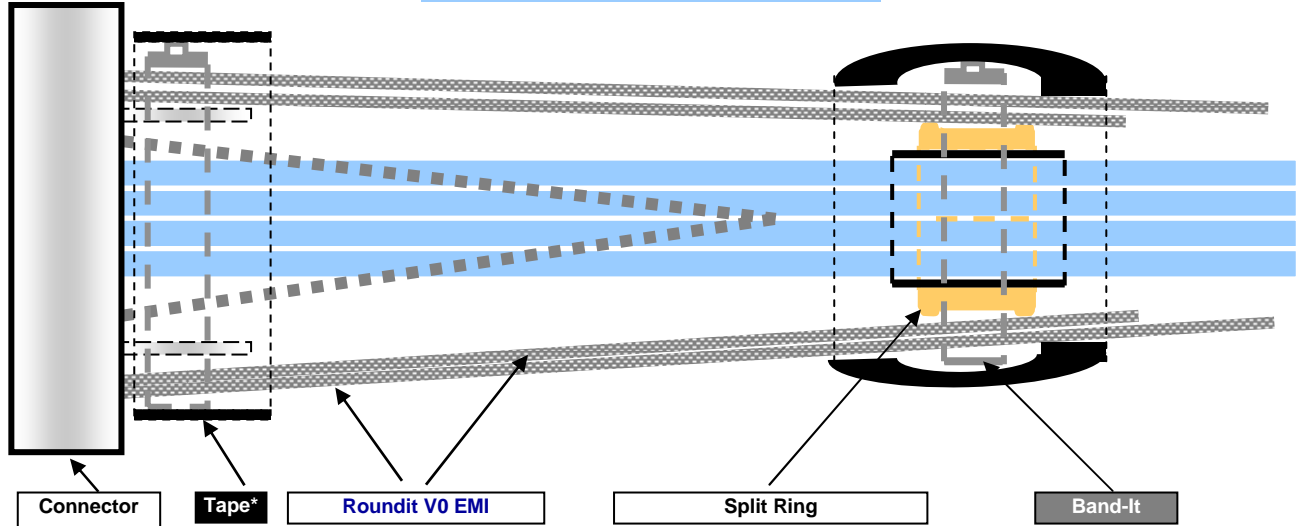
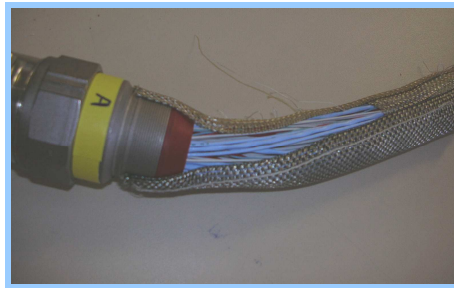
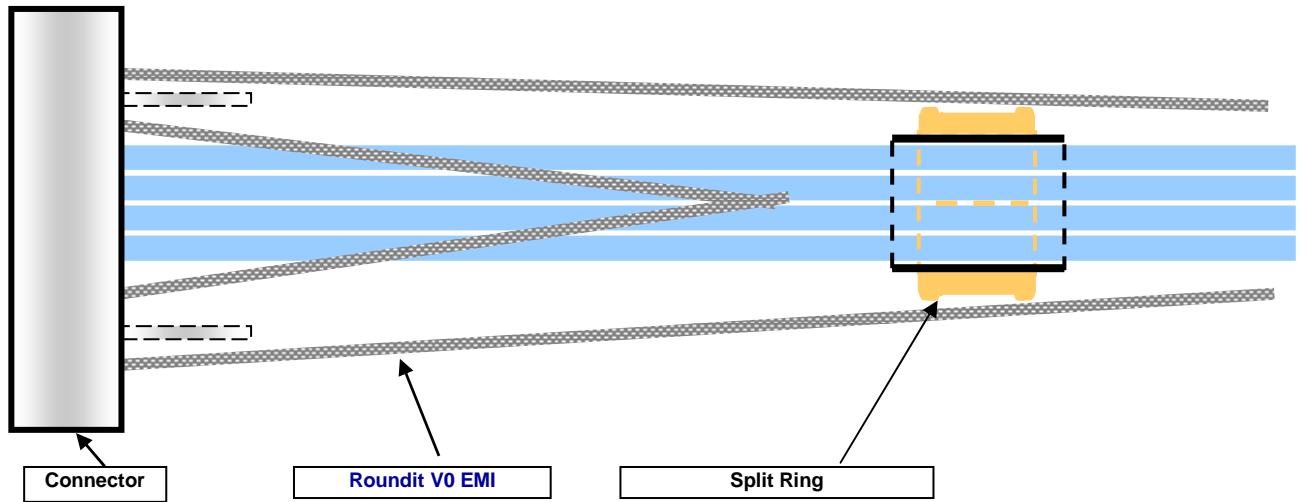
- 1) Size of **Roundit V0 EMI** suitable to the backshell diameter



Open the sleeve and insert your cables ended with a connector.



2) Backshell adaptation installation



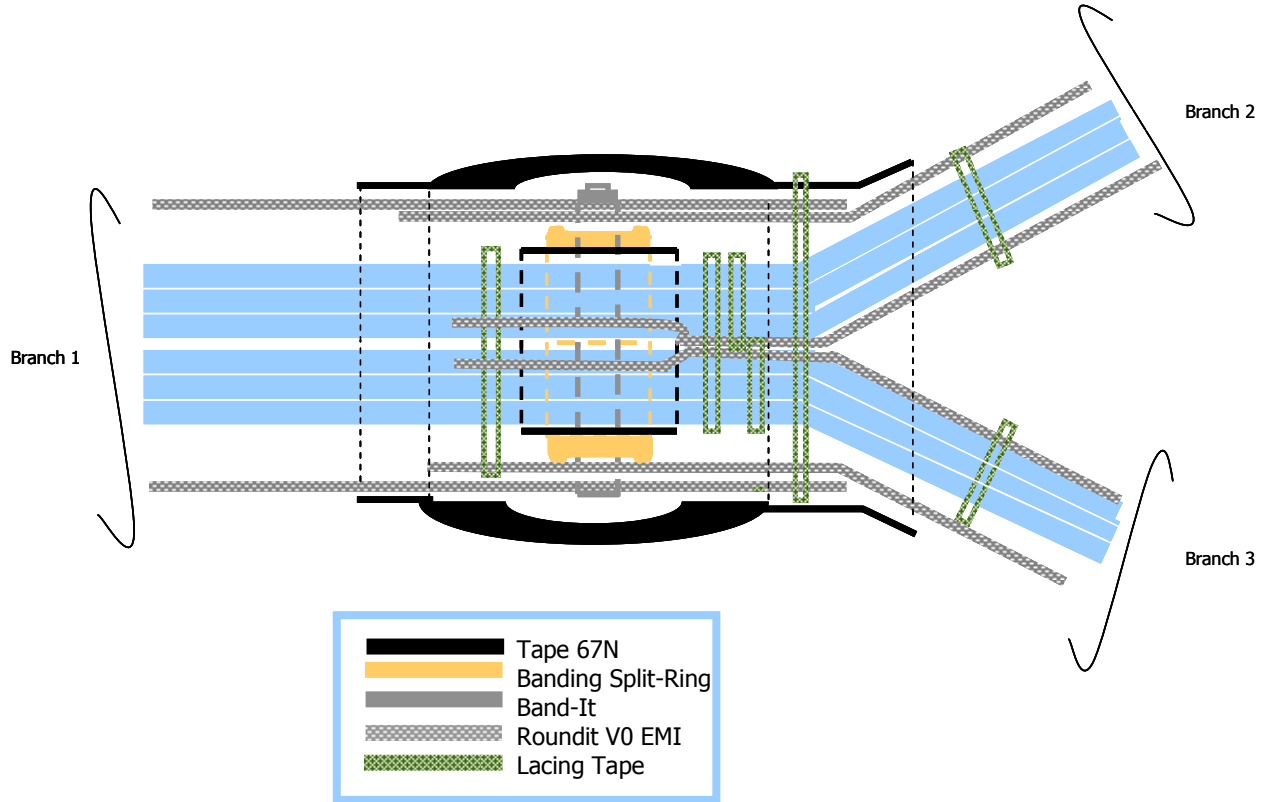
\* Silicone Tape for Railway application



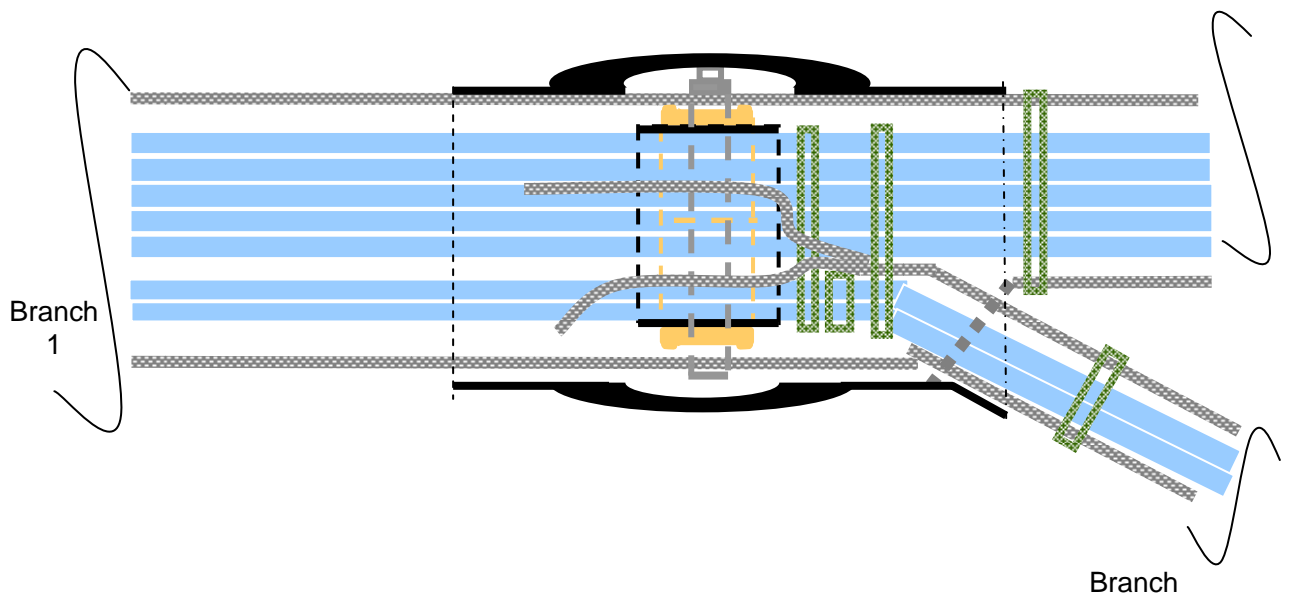


### 3.4 - Branches

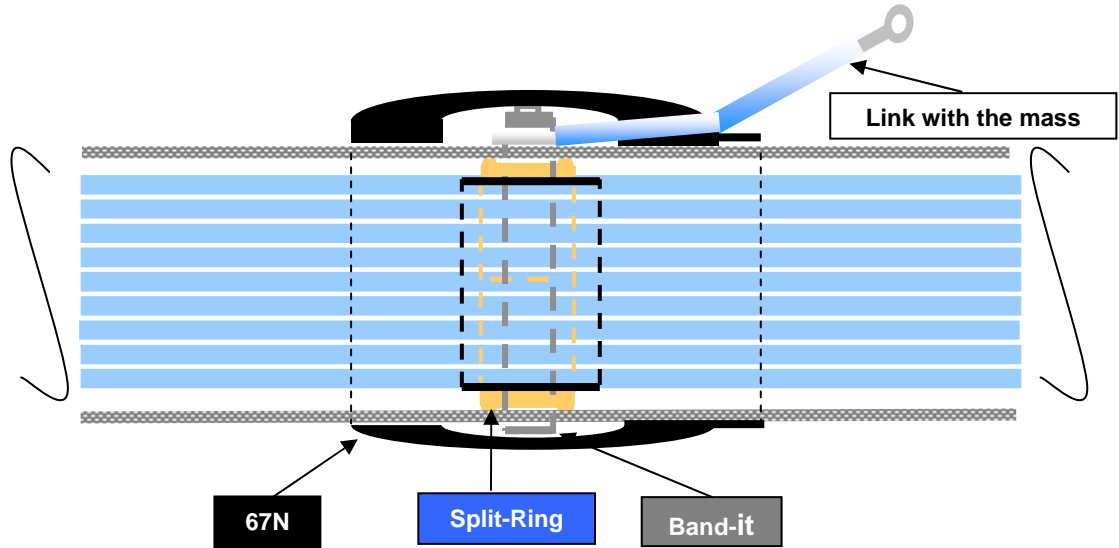
#### 3.4.1 - Symmetrical branches: 3 sleeves of **Roundit V0 EMI**



#### 3.4.2 - Asymmetrical branches: 2 sleeves of **Roundit V0 EMI**



### 3.4.3 - Bonding strap connection



Installing **Split Ring**  
over Tape **67N**.



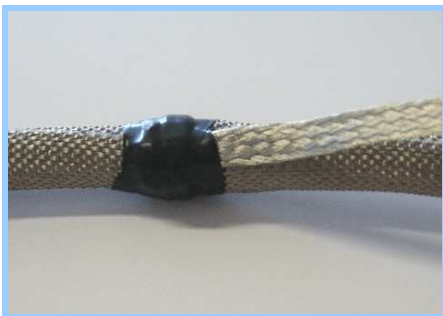
Placing **Bonding**  
Strap with **Band-It**.



Crimping of **Band-It** on the Bonding Strap with the Band-It Tooling.



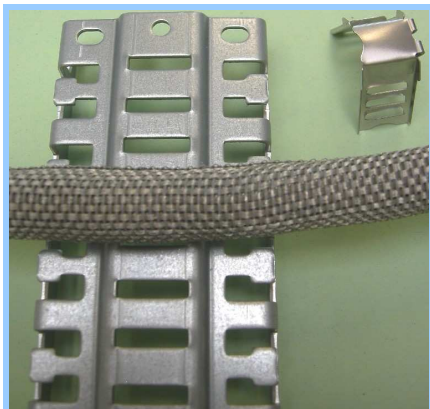
The electrical contact is now guaranteed.



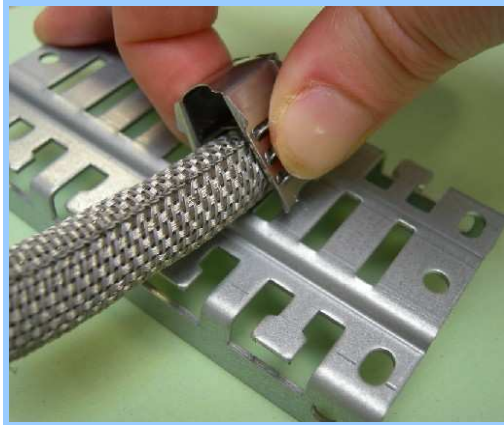
Final Assembly once Tape **67N** has been stuck.

### 3.4.4 - Ground connection

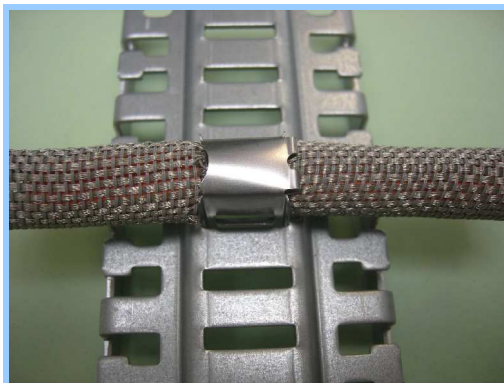
- **1st Alternative : Staples**



You can have a ground connection by installing a staple.



Insert the staple into the rail.



The Ground connection is now secured.

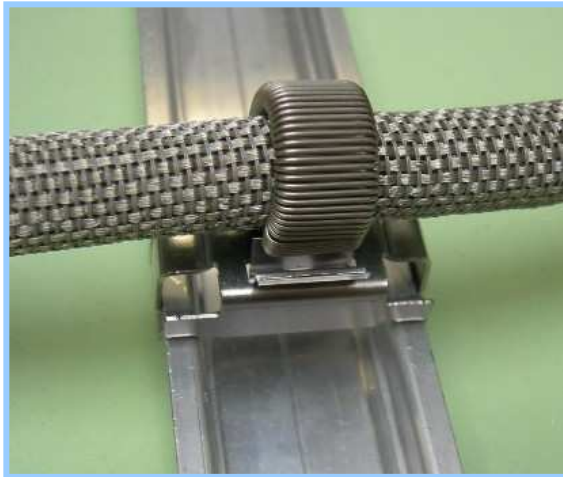
- **2nd Alternative : Spring**



You can insure a ground connection by using a metal spring.



Set the spring and insert it into the hole.

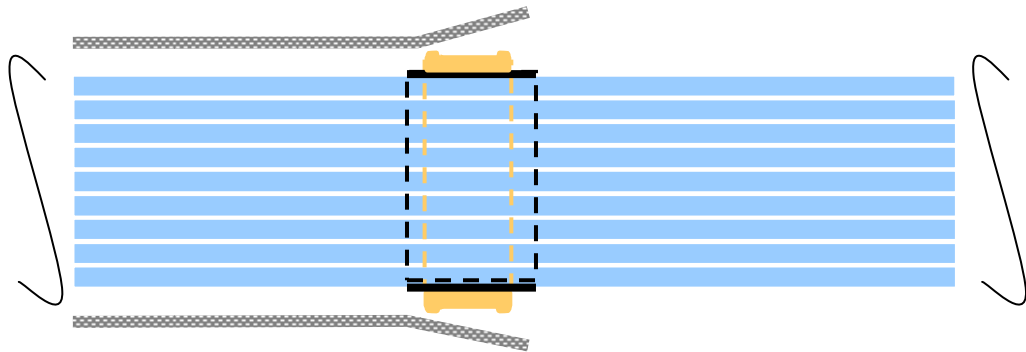


Your ground connection is now secured.

### 3.5 – Straight Splice

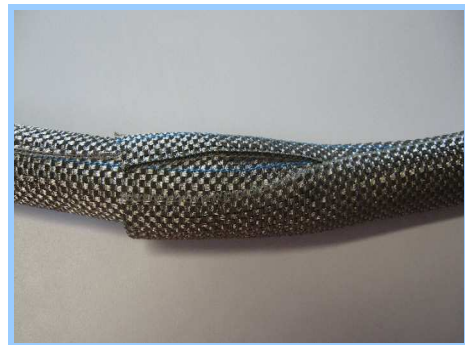
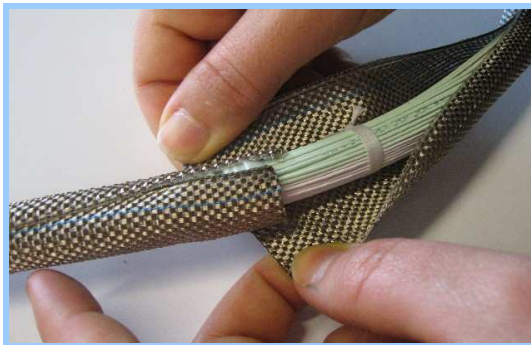
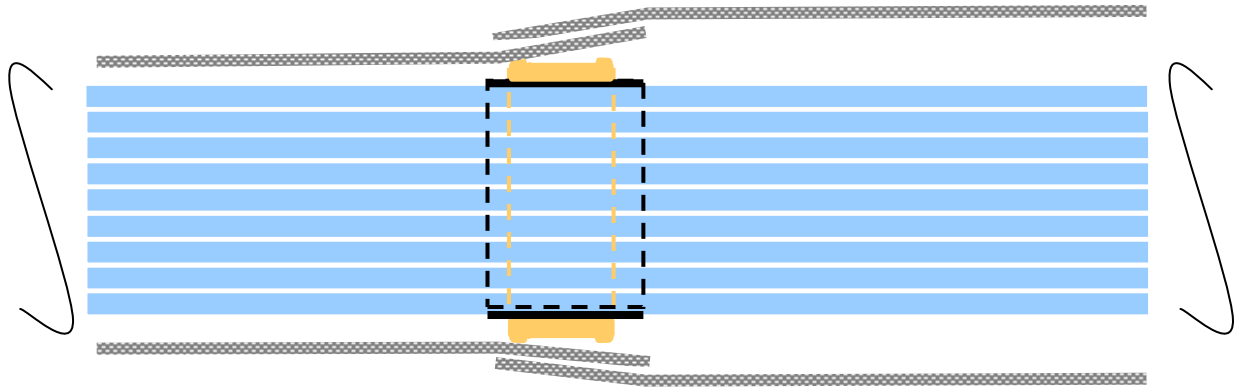


Install Split Ring with Tape **67N** to adjust the diameter.

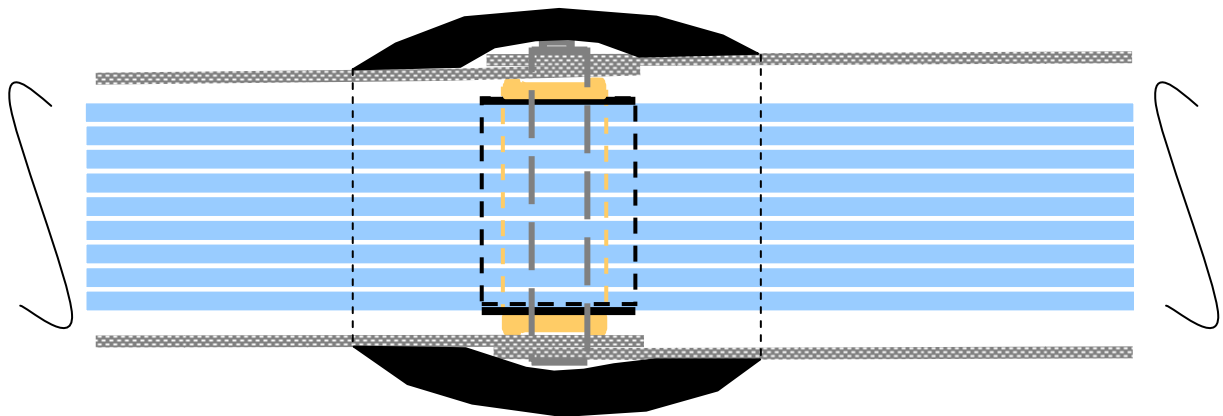




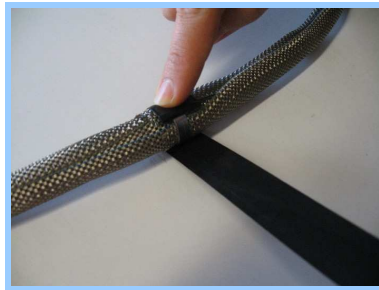
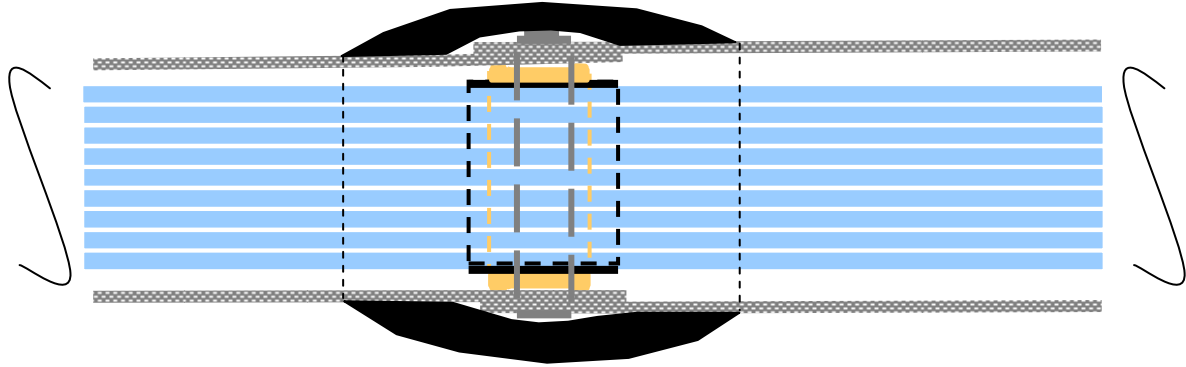
Install the second sleeve.



Crimp the **Band-It**.



Apply Tape **67N** to protect the splice zone.



## 4 - Harness Installation on Aircraft

When you use **Roundit V0 EMI**, the radii of curvature of the harnesses must respect the following recommendations: As a general rule, it is “10 times the diameter” of the bundle. It may be reduced to “5 times the diameter” of the bundle if it could make the installation easier on the railway car. In any case, it cannot be reduced further otherwise damages to the sleeve could occur.

Drain holes are not required on the low points of bundles protected with **Roundit V0 EMI**.

Fixing the harness on the railway car will add more cable ties on **Roundit V0 EMI**. This should be considered when installing cable ties or lacing tapes to secure **Roundit V0 EMI** on the bundles.

## 5 - Maintenance, Modifications & Repairs

### 5.1 - Maintenance/Modifications

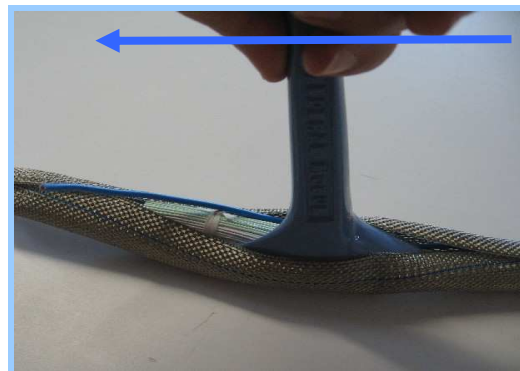
Adding or removing wires made easier by cutting some cable ties and opening the **Roundit V0 EMI**. Adding a wire may require the use of tools.

It is possible to replace **Roundit V0 EMI** without removing the harness.

Installation / removal of **Roundit V0 EMI** can be performed manually or with a Roundit<sup>®</sup> Tool.

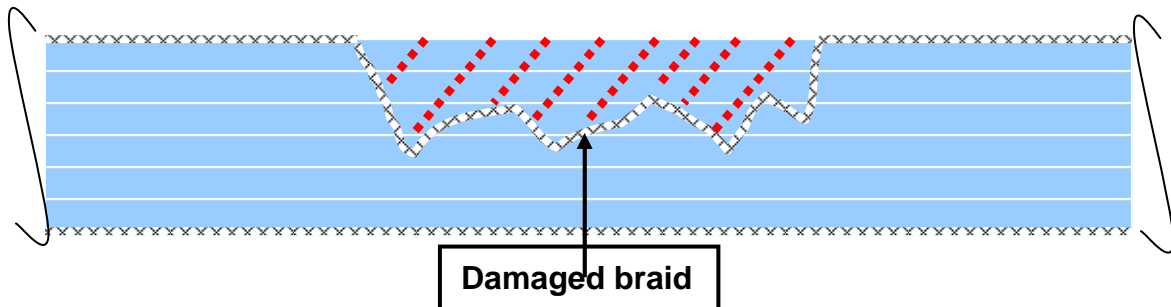
Insert the whole wire harness + the additional wire in the tool through the lateral aperture

Pull the tool along the wire harness to insert the whole length

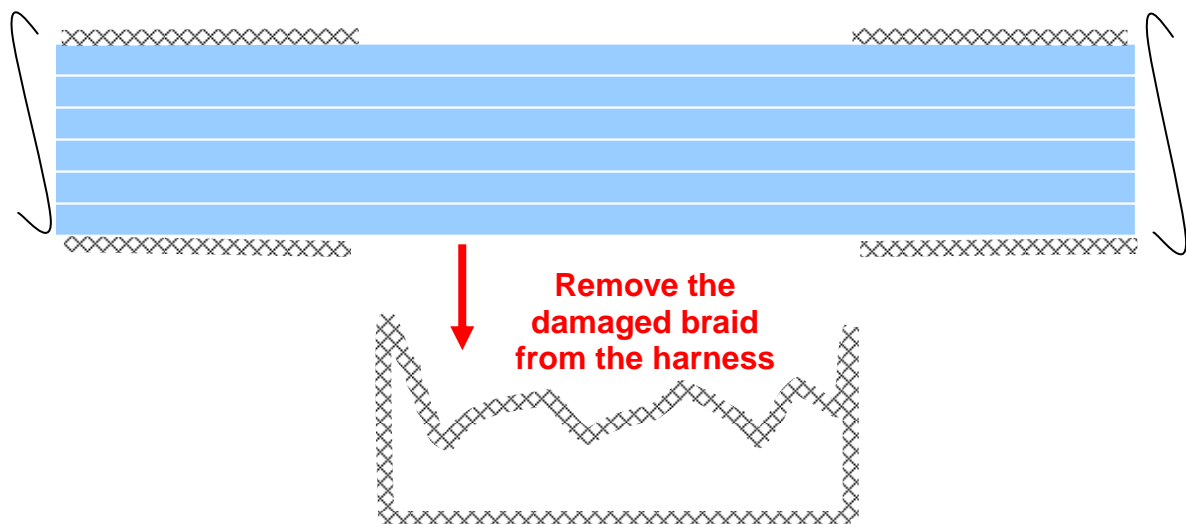
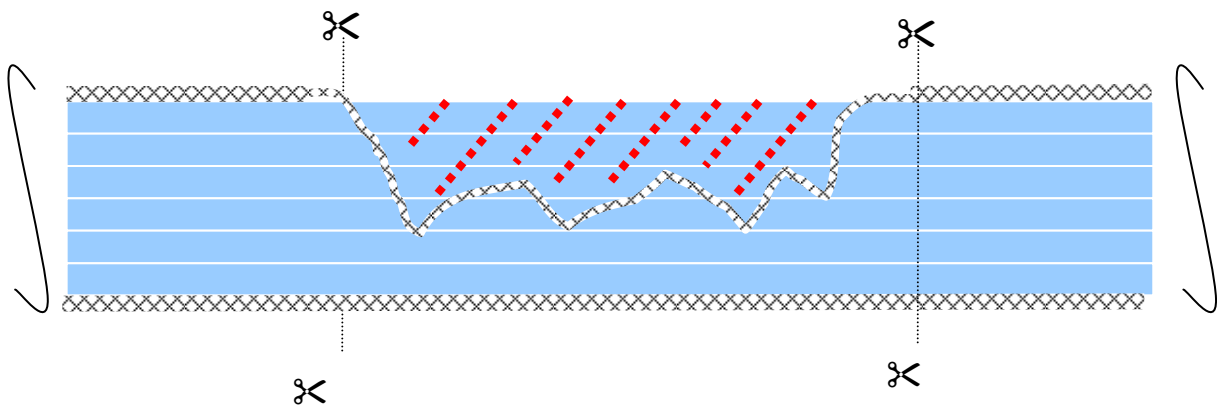


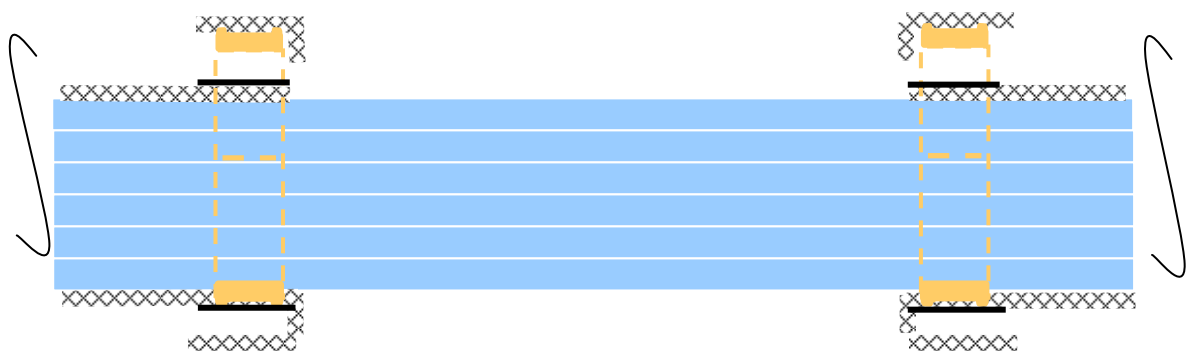
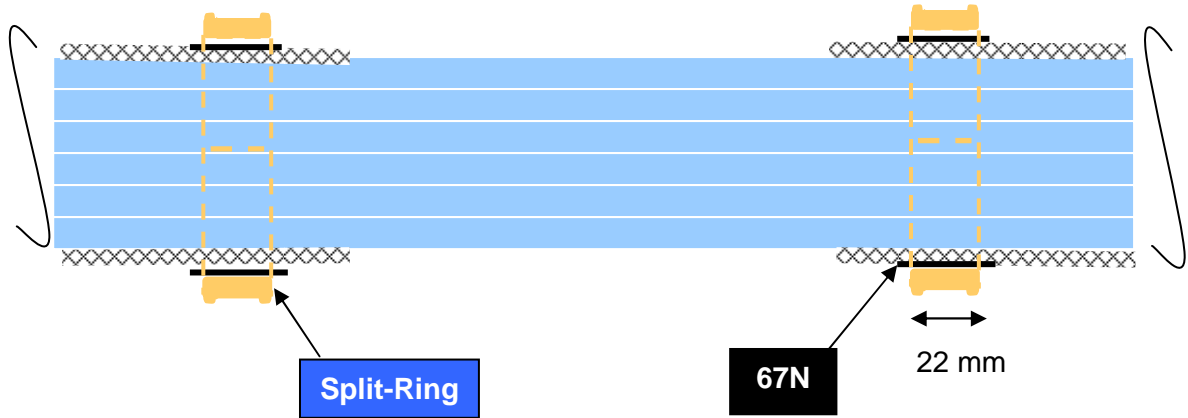
Operations on end items: It is possible to partially open **Roundit V0 EMI** on only the required sections.

## 5.2 – Repairs

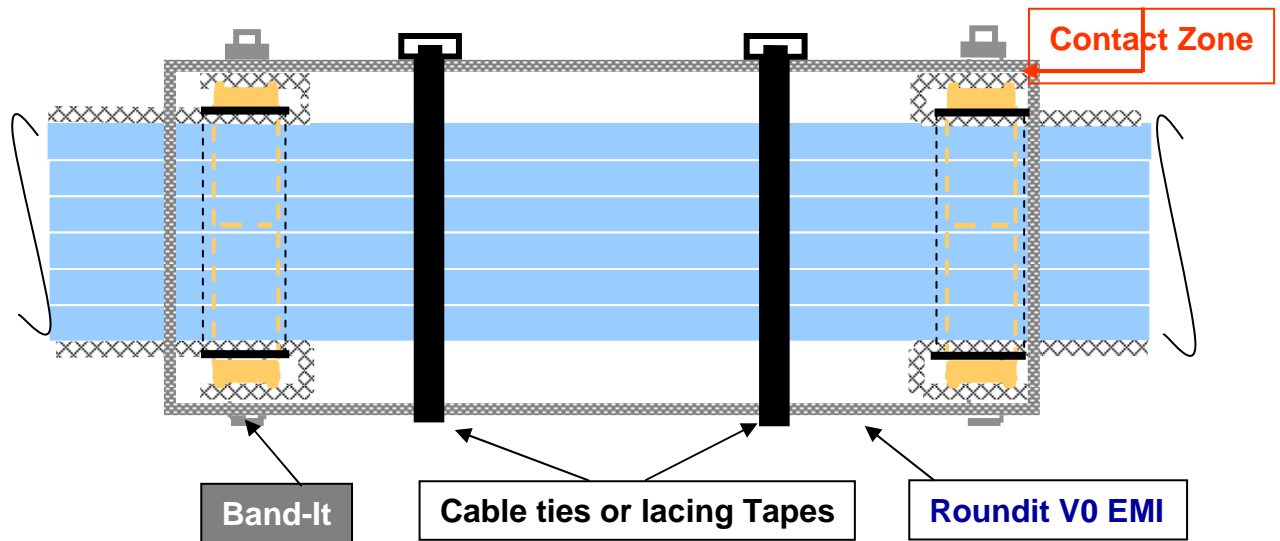


- By removing the sleeve and replacing by **Roundit V0 EMI**



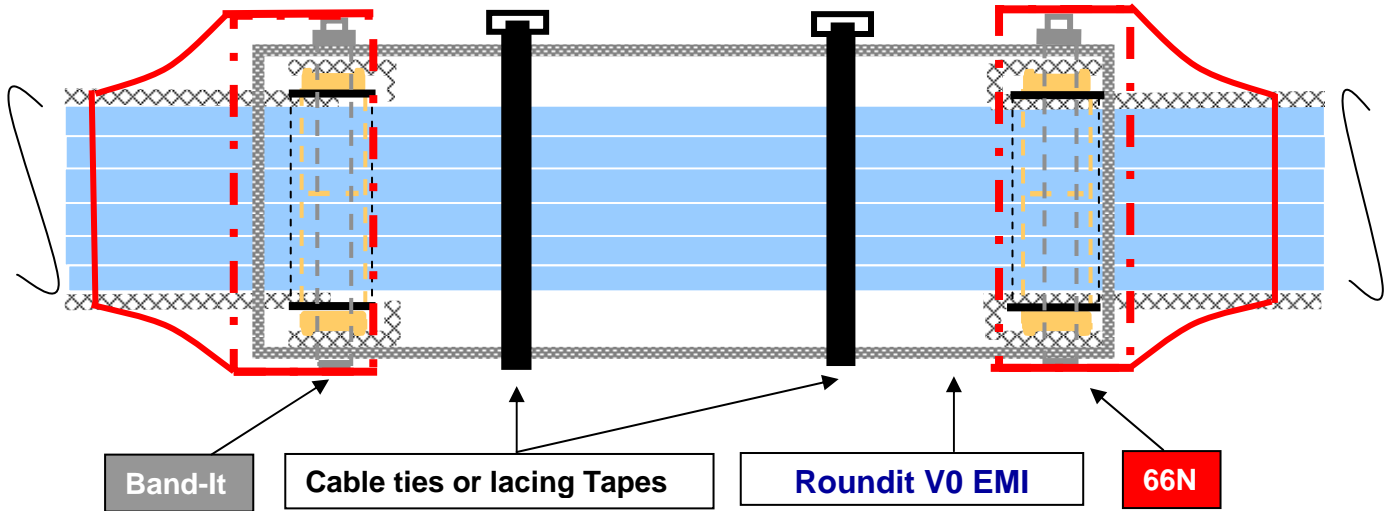


- By over-sleeving **Roundit V0 EMI** on the damaged area





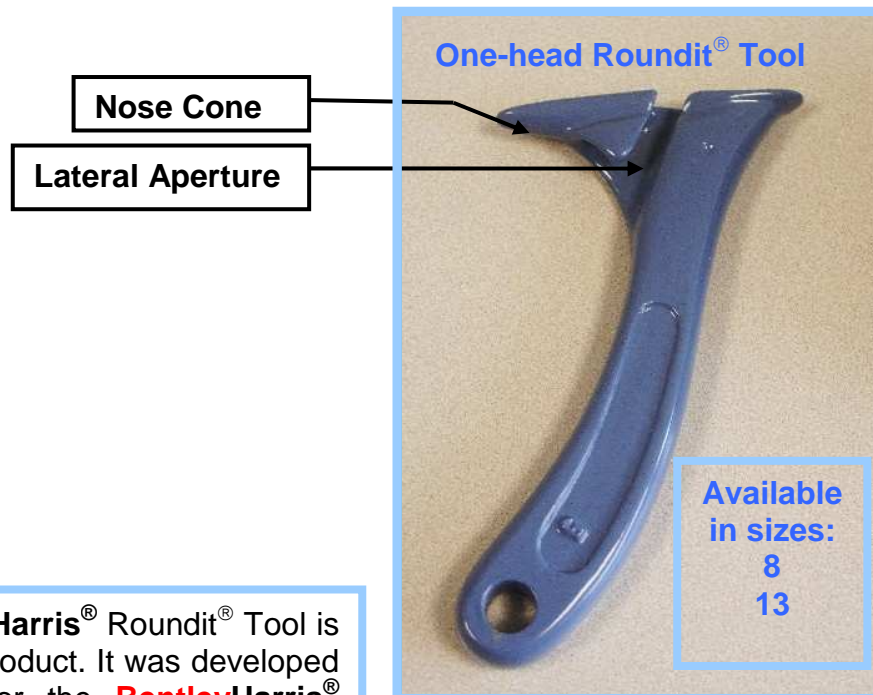
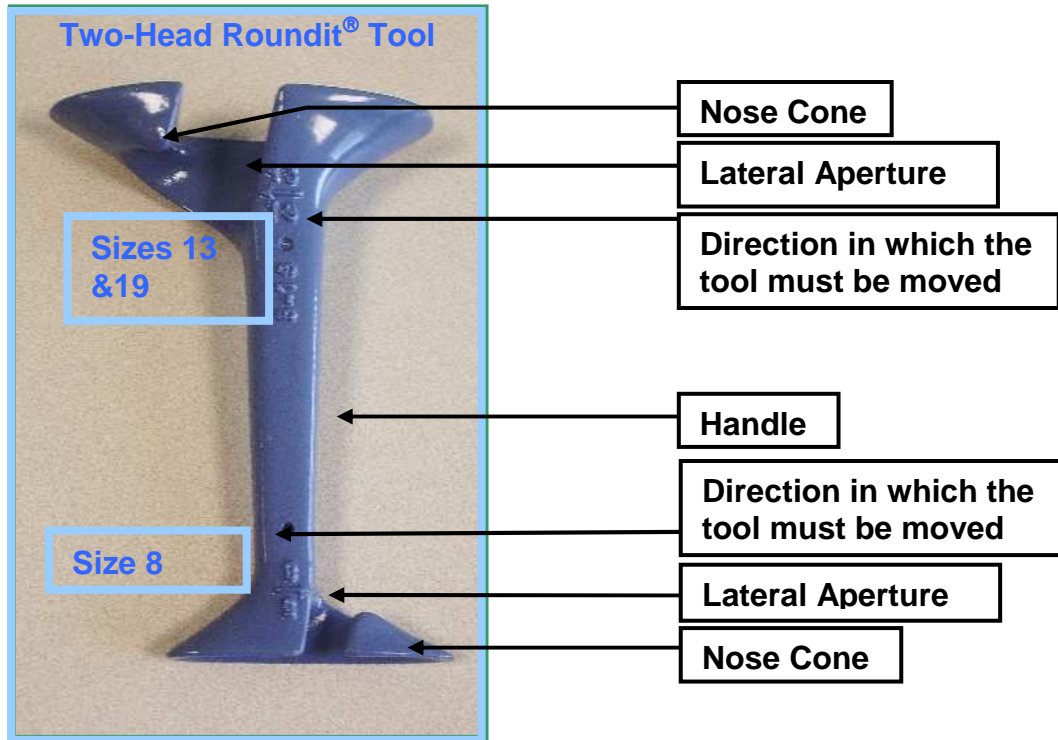
- By waterproofing the assembly



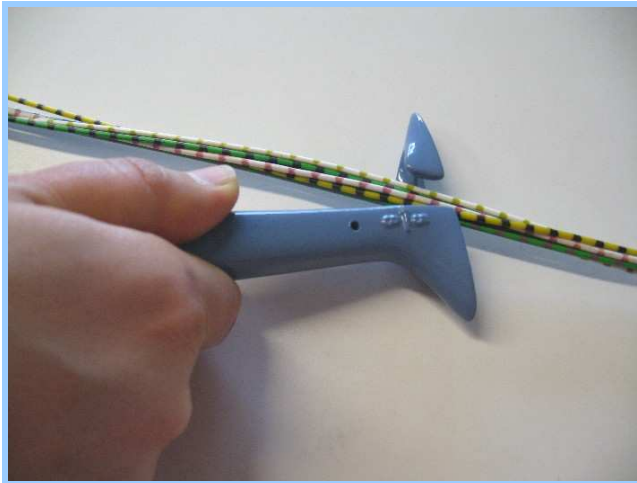
Tape **66N**  
for Repair



## 6 - Use of the Roundit®-Tool



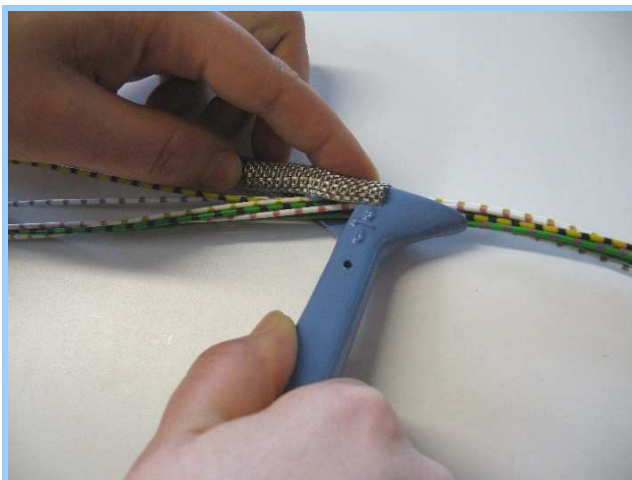
The **BentleyHarris®** Roundit® Tool is a patented product. It was developed specifically for the **BentleyHarris®** sleeves in the Roundit® 2000 family. It is not authorized for use on any other product.



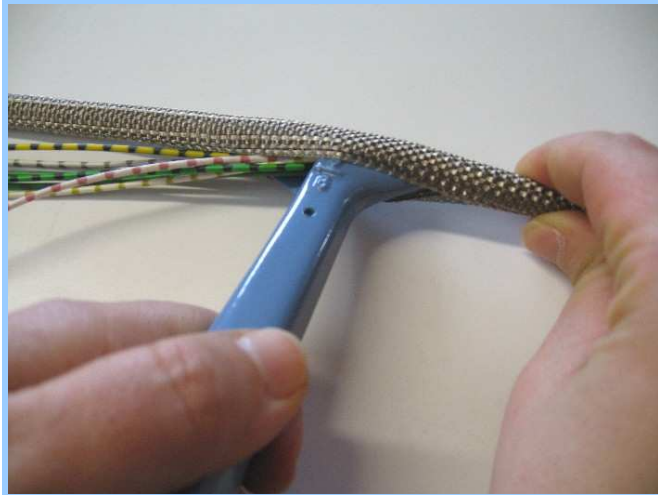
Select the head of the tool that fits the right size of **Roundit V0 EMI**.  
Insert the harness on the Roundit®-Tool by the lateral aperture



Group all the wire harness on the head of the Roundit®-Tool

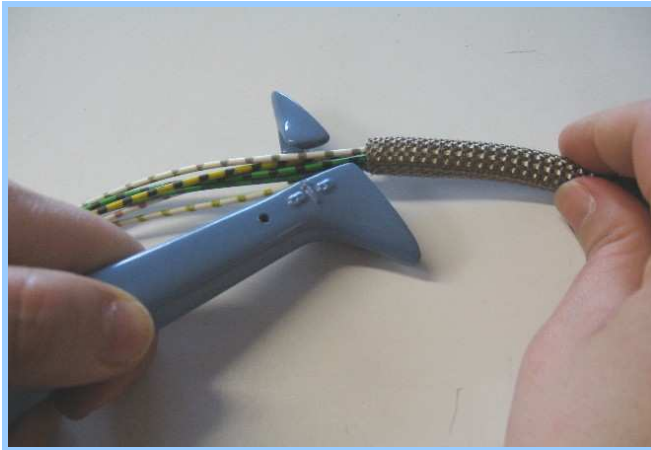


Insert **Roundit V0 EMI** by the nose cone

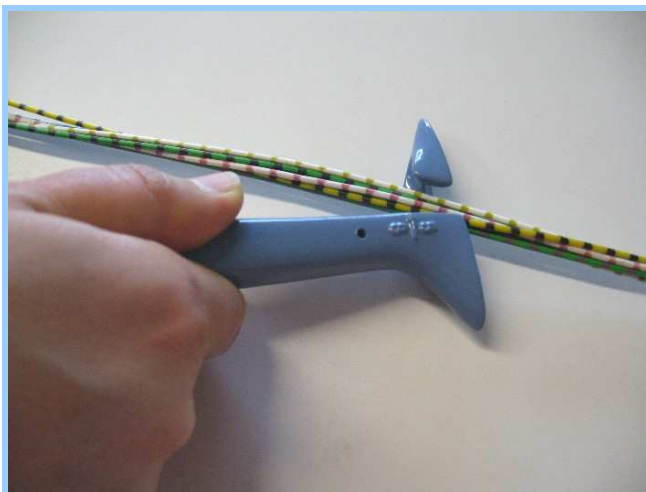


Assembly of the sleeve on the harness can be done by:

1. Moving the Roundit<sup>®</sup>-Tool along the wire and Roundit V0 EMI (Applicable to long wire harness made on a table)
2. Moving Roundit V0 EMI and the harness with the Roundit<sup>®</sup>-Tool fixed (Applicable to simple wire harness for serial manufacturing)
3. Moving Roundit V0 EMI and the Roundit<sup>®</sup>-Tool along the wire harness (Applicable to small harness on table)



Remove the tool from Roundit V0 EMI



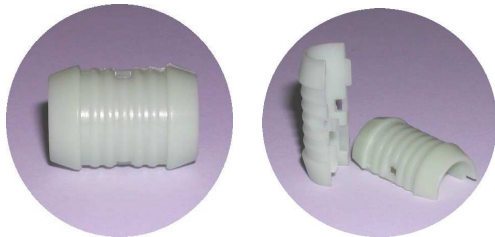
Remove the tool from the harness

## 7- Accessories



### **Band-it**

Used to secure break out and repairs.



### **Banding Split-Ring**

Used to protect cables from being damaged when a Band-It is installed over.

*Ref ABS: MIL-C-85049/93*



### **Silicone Tapes**

**67N** standard manufacturing

**66N** for repair

Used to gather cables, cover Band-It for cut protection, and avoid cables and Banding Split Ring from moving.



### **Cable Tie**

Used to secure the closure of the sleeve.



### **Lacing Tapes**

Used to secure the closure of the sleeve.



### **Band-it Tooling**

Used to fix and tighten a **Band-It**.

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