


Manual

Installasjonsmanual for Benarx Epoxy Cable Tray


Installation Manual for Benarx Epoxy Cable Tray

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1 Introduction

1.1 Field of Application

The purpose of this document is to give instructions how to install Benarx Epoxy Cable Tray in accordance with the manufacturers, Beerenberg Services, guidelines. These are the generic procedures and there might be specific requirements/details in relevant Purchase Orders which will require qualification of this manual.

Qualification of the installation manual for operational use shall be executed by Beerenberg Services Technology & Development department.

Special attention shall be directed towards section 3.2 Risk Assessment, especially Hazard description/Failure mode and their mitigating actions. Its important to understand the purpose of these mitigating actions and why they are included in the installation procedure.

1.2 Installation Manual Changes

Only Technology & Development Department by Beerenberg is entitled to make changes to this document. For this manual the following assembly models have been used:


- 2001659

1.3 Installation Responsible

To install a Benarx Epoxy Cable Tray it is expected that worker have the necessary skills and training. Every person performing modification work is responsible for maintaining the box' integrity on his/her own reputation and risk.

1.4 Definitions and Abbreviations

PFP – Passive Fire Protection

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1.5 Start-Up Check

Product check:

Make a visual check before start up and verify that there are no damages or cracks on the product. Verify that all eccentric locks are fully intact and that all the parts of the Benarx Epoxy Cable Tray are present. Make sure there are tag numbers for all the parts of the box and verify that the tag number match the equipment to be insulated. Make sure that correct tools and materials are on site before installation starts.


If any damages are detected, Beerenberg Services is to be contacted for information on how to correctly proceed. All repair work shall be approved by Beerenberg Services before initiation.

Equipment check:

Make a visual check of the Cable ensure that the equipment is prepared for and ready for the installation of the Benarx Epoxy Cable Tray. If there are any kind of equipment damages like loose bolts, unfastened cable or similar, these issues must be solved first.

1.6 Modification Work

If any modification of Benarx Epoxy Cable Tray is required, guidelines for this work is given in Modification Procedure for Benarx Epoxy Box (document number TECH-MA21-00569).

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2 Tools, Materials and Protective Equipment


The following tools, materials and equipment is recommended for installation of Benarx Epoxy Cable Tray.

2.1 Tools

Item no.	Item
1	Hammer (rubber-head)
2	Hammer
3	Vice grip (pliers)
4	Drill
5	Marker pen (type Pilot)
6	Metric measure (3 m)
7	Knife (type Mora)
8	Sheet metal shears (right hand)
9	Jig saw
10	Caulking gun
11	Inch ruler (2 m)
12	Bit set
13	Allen key set
14	Pop tong (manual TT55)
15	Pop plier (machine)
16	Hole saw 22mm (for drain plug)
17	Stanley knife
18	Compass
19	Protractor

2.2 Materials


Item no.	Item
1	Pop rivets, A4/A4 16x4.8mm (stainless steel, quality A4)
2	Pop rivets, A4/A4 8x3.2mm (stainless steel, quality A4)
3	Locking pins for eccentric locks (stainless steel, quality A4)
4	Drill bits, Ø 3.3mm (type Dormer)
5	Drill bits, Ø 4.9mm (type Dormer)
6	Nitoseal SC N (white colour)
7	ROKU Strip 1.5 x 20mm (roll à 25 metres)
8	Fire tested and approved drain plug / Benarx Drain Plug (stainless steel, quality A4)
9	Jig saw blade (Bosch T 123X, 14 TPI)

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2.3 Protective Equipment

Item no.	Item
1	Dust mask (P2 filter) Only required for chip forming processes
2	Gloves (cut secure)
3	Safety overall
4	Safety eye wear
5	Safety shoes
6	Helmet
7	Nitrile gloves, (disposable one-time-use)

Note: Protective equipment shall be used in accordance with applicable health, safety and environmental requirements specified for the work place.

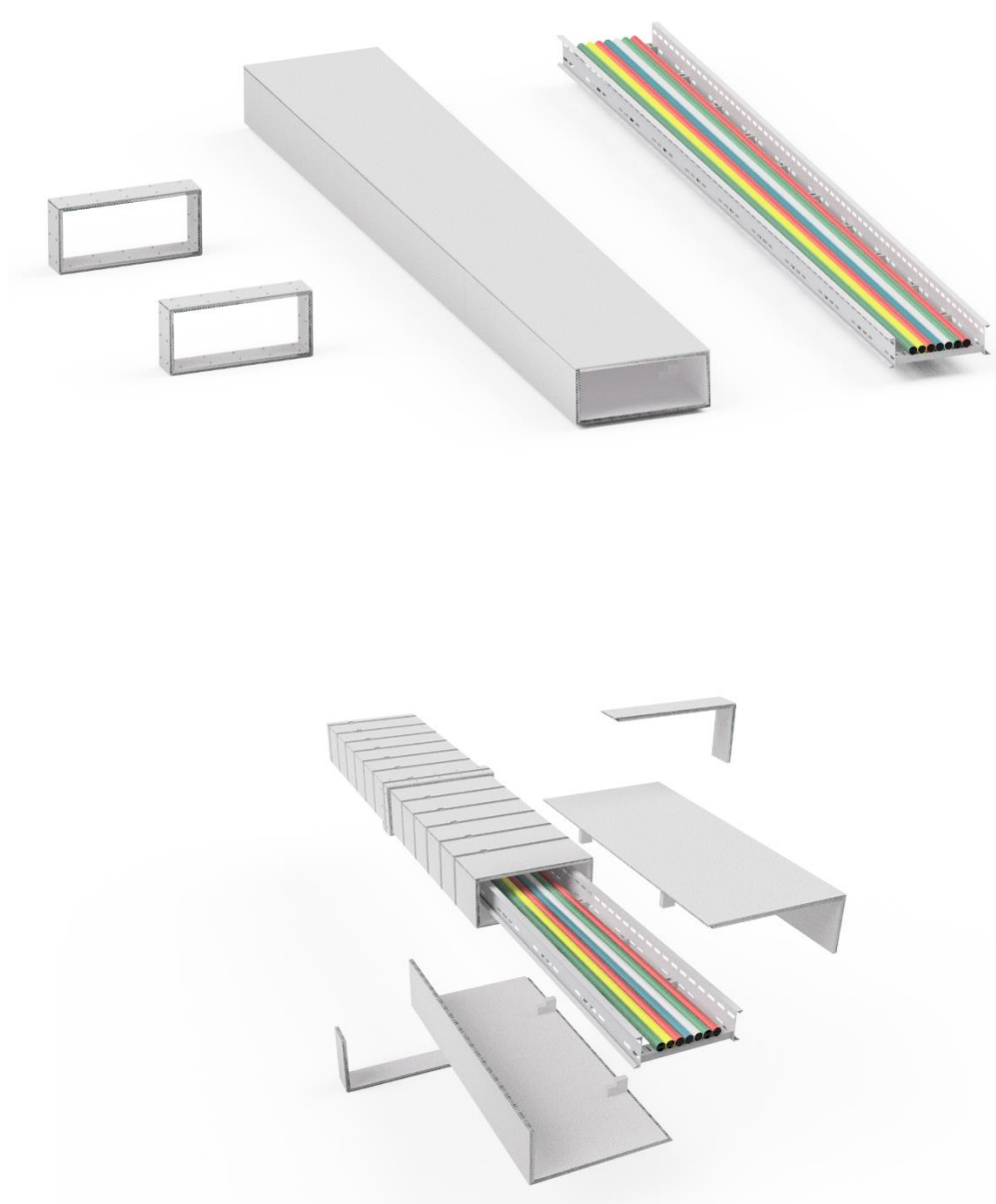
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3 Scope of Work

3.1 Overview

The scope of work included in this installation manual is as illustrated below.


Before installation:



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After successful installation:



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3.2 Risk Assessment

The following risk-evaluation and list of mitigating actions have been carried out as a basis for the installation steps described in this procedure. Its therefore important to pay special attention to these risk-mitigating steps, to understand the purpose of the mitigating-steps described in the manual.


Consequence is defined as 1 (small) to 5 (extreme)

Probability is defined as 1 (not likely) to 5 (very likely)

Risk is defined as the product of Consequence and Probability ranging from 5 to 25.

Acceptance criterion is Risk less than or equal to 5.

Risk assessment							
Product		Benarx Epoxy Box					
Main function		Fire protection of process equipment and similar, mainly valves and flanges by creating a thermal barrier during fire					
Item	Hazard description/Failure mode	Consequence	Probability	Risk	Mitigating action	Section ref	Updated risk
1.0	Technical hazards						
1.1a	Loss of thermal barrier	4 - very high	2	8	Ensuring a tight fit	4.1	4
1.1b		4 - very high	2	8	Apply fire gasket at cut-outs	4.4	4
1.2	CUI	3 - high	3	9	Install drainage	4.5	3
1.3	Water ingress (proper drain provided)	1 - low	5	5	Sealing of joints for water ingress	4.7	2
1.4	Unwanted dismantling during explosion or general operation	4 - very high	2	8	Proper adjusting of eccentric locks and Installation of safety pins	4.8 & 4.9	4
2.0	HSE hazards						
2.1a	Dust inhalation during cutting			Unacceptable	Dust mask to be used during cutting	4.1	Acceptable
2.1b	Inhalation of hazardous fumes during cutting			Unacceptable	Always use fresh jig saw blades to prevent unwanted temperature rise and smoke release		Acceptable
2.2a	Falling objects			Unacceptable	Objects shall always be secured to prevent them from falling	All	Acceptable
2.2b				Unacceptable	Hard hats shall be used at all times	All	Acceptable
2.3	Cuts			Unacceptable	Gloves shall be used during all installation work	All	Acceptable
Comments:		The result from item 1.3 states that the hazard from water ingress is acceptable provided that proper drain is installed. Thus, sealing of joints is optional as an additional barrier.					

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4 Installation Description Illustrated

In this chapter the installation process is described step by step.

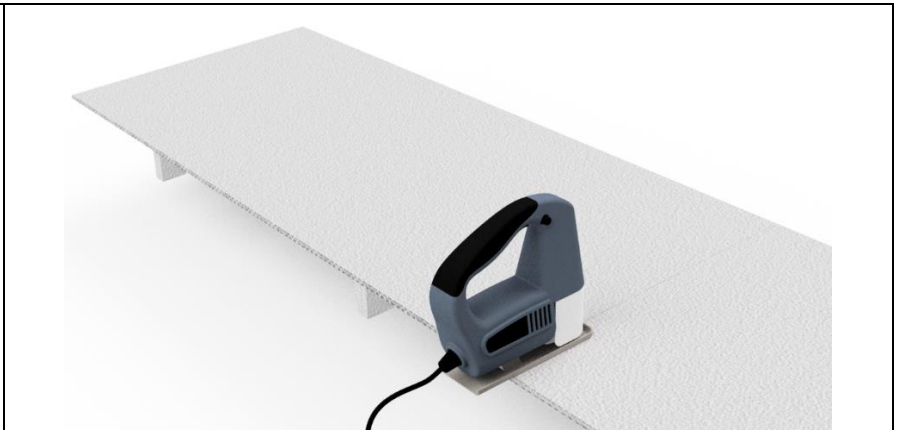
4.1 Making Cut-Outs in Benarx Epoxy Cable Tray

1.

Make cut-outs by using a jig saw.

Note:

- Add appropriate allowance for fire gasket.
- Always use fresh jig saw blades. Worn blades will generate unwanted temperature rise and smoke release due to friction.



4.2 Pre-Installation of Epoxy Cable Tray


1.

Pre-install the fire box to ensure that it fits.


Note:


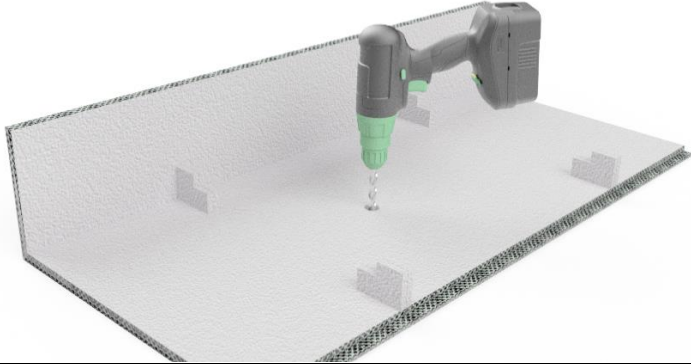
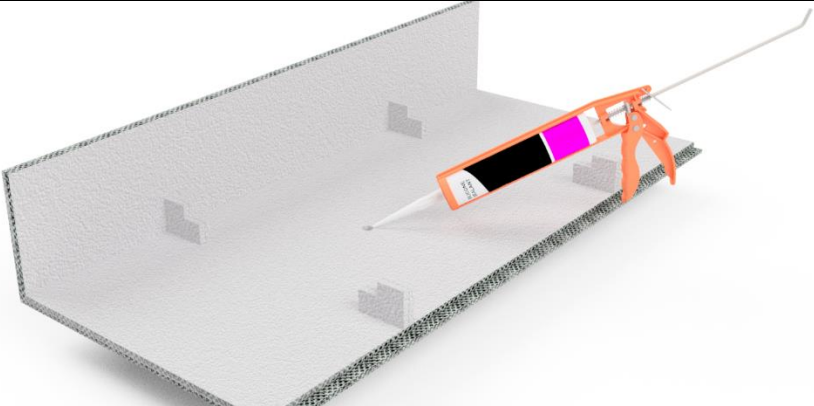
- Make sure no sharp edges is present in cut-outs, to prevent damage to any underlying painted surface.




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4.3 Install Drainage

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<p>1.</p> <p>To prevent water from accumulating inside the box drainage should be provided. Location of drain shall account for Epoxy Cable Tray geometry and installation position such that the most efficient drainage is provided.</p> <p>Only fire tested drain plugs are approved for use (Benarx Drain Plug or similar).</p>	
<p>2.</p> <p>Drill a hole in the bottom of Epoxy Cable Tray by using a 22 mm hole saw.</p>	
<p>3.</p> <p>Apply Nitoseal SC N (white colour) between drain plug and Epoxy Cable Tray drain hole.</p>	

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4.

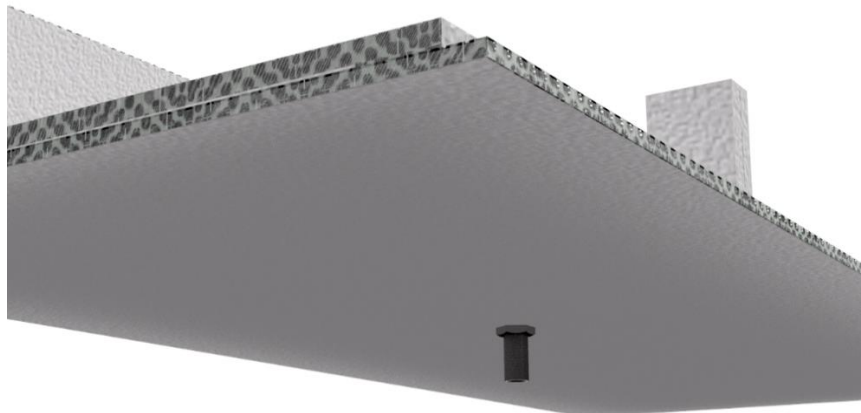
Install drain plug and tighten nut by hand as shown on picture.

The sealant shall then be pushed out through openings.

This will ensure proper locking of washers and prevent water ingress between drain hole and drain plug.

Notes:

Threaded cylinder shall protrude as little as possible (maximum 5mm) into the Epoxy Cable Tray to allow for effective water drainage.



5.

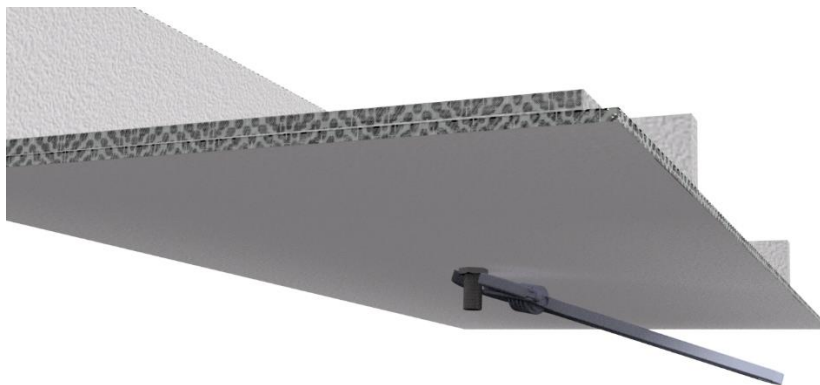
Tighten the outside nut by using a wrench until a firm grip is obtained.


Be careful not to overtightening the nut, resulting in cracks in surface protection and PFP.

Smooth out excess sealant, ensuring no sealant is covering the drain hole.

Notes:

Number of drainage holes will depend on the box size: 1 to 5 holes is sufficient.



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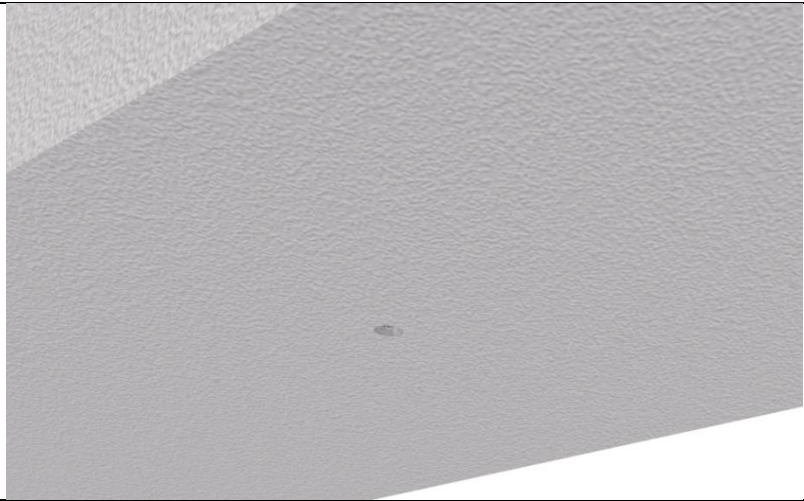
6.


Alternative drainage solution:

Drill a hole in the bottom of Epoxy Cable Tray by using a 3,3 mm drill bit.

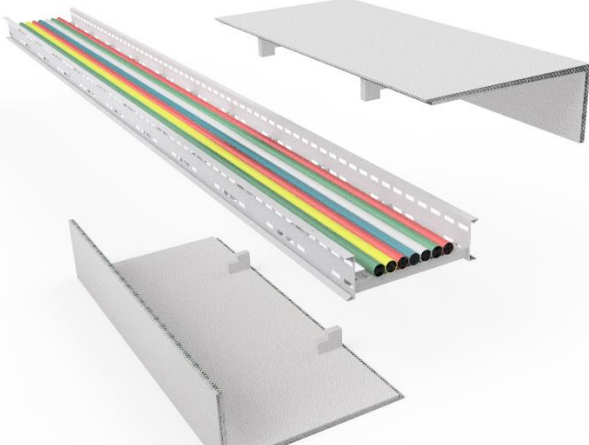
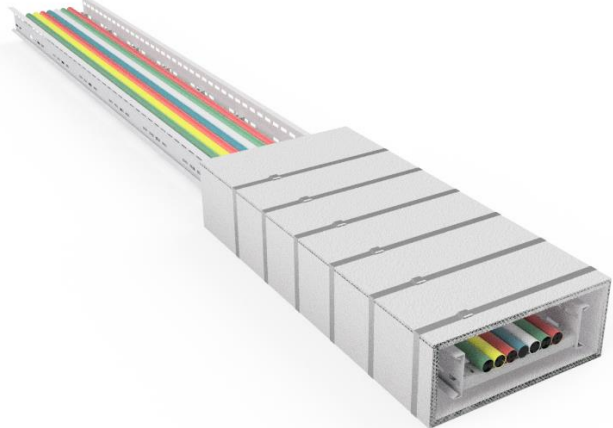
Notes:


Number of drainage holes will depend on the Epoxy Cable Tray size: 1 to 5 holes is sufficient.



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4.4 Epoxy Cable Tray Installation

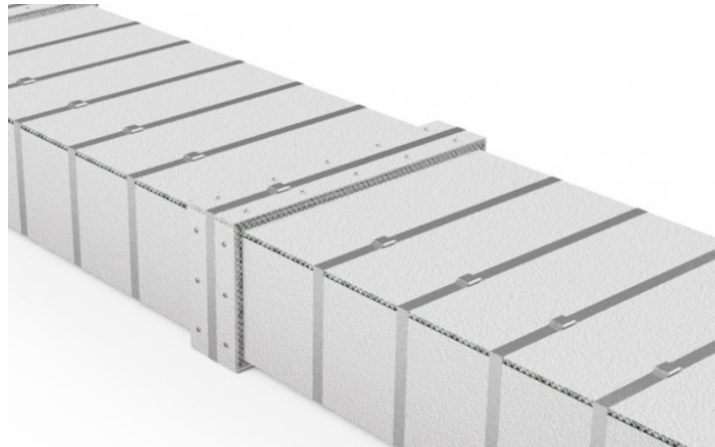
<p>1.</p> <p>Installation should in general start with the part as installed on top.</p> <p>Note: For boxes requiring special installation sequence, this will be described in the boxes' accompanying documentation.</p>	
<p>2.</p> <p>Install Epoxy Cable Tray part with SS316 tightening straps with a C-C 150mm</p>	


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3.

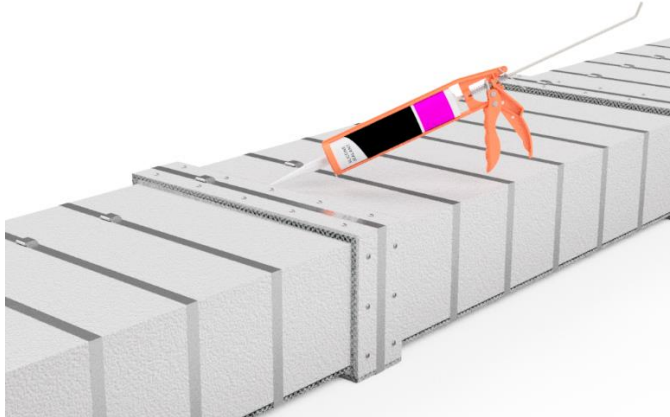

Install splicer securing it with SS Screws, 4x19mm, C-C 100mm and a SS Tensioning Band.


SS Pop Rivets can be used instead of SS Screws




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4.5 Sealing of Joints (if applicable)

<p>1.</p> <p>In order to ensure that the Benarx Epoxy Cable Tray provides a water tight barrier, all joints and cut-outs shall be sealed with sealat</p> <p>Note: Sealant should be applied before completely tightening the SS316 tightening straps to allow the sealant to get in between the outer joints.</p>	
<p>2.</p> <p>Silicone sealant Nitoseal SC N (white colour) can be used to prevent water and moisture intrusion.</p> <p>Silicone sealant shall be applied around all cut outs and overlapping box parts.</p> <p>Notes: This type of silicone sealant is the only accepted by Benarx Epoxy Box for use. Temperature range is -40°C to +150°C (after curing).</p>	


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<p>4.</p> <p>Application of sealant</p>	
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4.6 Installing Tag Plate

<p>1.</p> <p>Tag plate to be installed where it can easily be detected.</p>	
<p>2.</p> <p>Tag plate is glued to Epoxy Cable Tray by use of Nitoseal SC N</p> <p><u>Note:</u></p> <ul style="list-style-type: none"> • Check that tag plate is firmly mounted. • Tag shall be clearly visible from access way. • All tags shall be attached to its specific Epoxy Cable Tray part. 	<div style="background-color: #cccccc; padding: 10px; border-radius: 10px;"> <p style="font-size: 24px; margin: 0;">Benarx Solutions</p> <p>Supplier Benarx Solutions AS</p> <p>Line No. 0150-ZPV-13-0333-KA2-03-A</p> <p>Tag No. WG-13-0229</p> <p>Item No. OSD-WG-13-0229-001</p> <p style="margin-left: 20px;">Part 1 of 2</p> <p>Design Jet 350 KW/m² 60 min</p> <p>Fab No. 67951</p> </div>

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