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## Installation Manual for Benarx Cellular Glass XP

### Installation Manual for Benarx Cellular Glass XP

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**Dokumenthistorikk / History of the document:**

Rev	Dato / Date	Hvem / Who	Beskrivelse / Description
0.1	02.08.2013	CHBA	Update of text, reference list and illustrations.
0.2	22.10.2014	TPH	Added solution with support ring, updated located location of pictures with text.
0.3	20.05.2015	CADS	Sealing compound changed from Fugger Seal to Nitoseal SC N (white). References updated.
0.4	11.12.2017	Christian A. Strømsnes	Document transferred to new template and text update.
0.5	01.05.2018	TU	Update of text, reference list and illustrations
1.0	24.08.2022	ANNBRE	Republished in DMS

## Content

Dokumenthistorikk / History of the document: .....	2
1 Introduction.....	4
1.1 Field of application .....	4
1.2 Installation manual changes.....	4
1.3 Responsible.....	4
1.4 Definitions and abbreviations .....	4
1.5 Informative references .....	4
1.6 Health, environment and safety .....	4
2 Tools, Materials and Protective Equipment .....	5
2.1 Tool list .....	5
2.2 Accessory list .....	5
2.3 Protective equipment list .....	6
3 Scope of work.....	7
3.1 Overview .....	7
4 Component List / Procurement .....	8
5 Implementation.....	10
5.1 Support rings .....	10
5.2 Drainage.....	11
5.3 Mounting of Cellular Glass XP segments .....	12
5.4 Sealing.....	15
5.5 Tightening bands.....	16
5.6 Unequal T-Piece.....	18
5.7 Alternative solution for reducers .....	19
5.8 Trunnions .....	19
5.9 Supporter Box .....	19
5.10 Flattenings.....	21

## 1 Introduction

### 1.1 Field of application

This document shall be used to secure correct installation of Benarx Cellular Glass XP. It serves as a reference document as it takes precedence over all project related Benarx Cellular Glass XP documents - regardless of the project where the product is applied.

All application work must be executed in accordance with the producer's, Beerenberg Services, guidelines.

### 1.2 Installation manual changes

Only Technology & Development Department by Beerenberg is entitled to make changes to this document.

### 1.3 Responsible

Individual operator who installs the Benarx Cellular Glass XP system is installation responsible. Execution shall be according to this document.

### 1.4 Definitions and abbreviations

Cellular Glass XP	- Benarx Cellular Glass XP
Drain plug	- Benarx Drain Plug
Flexiroll XP	- Benarx Flexiroll XP
PFP	- Passive Fire Protection
XP tightening band	- Tightening band with glass fibre tape (on band's innermost side) and clips – for Benarx Cellular Glass XP
XP	- Pitt-Char XP

### 1.5 Informative references

Beerenberg Services document TECH-P21-00558, "Inspection Procedure for Benarx Cellular Glass XP"  
Beerenberg Services document TECH-P21-00573, "Stainless steel tightening band attached glass fibre tape and Benarx Drain Plug"

NORSOK standard R-004, "Piping and equipment insulation"

### 1.6 Health, environment and safety

Protective equipment to be used – see 2.4.

## 2 Tools, Materials and Protective Equipment

Tools, components and accessories that is recommended for product installation.

### 2.1 Tool list

Item no.	Tool
1	Marker pen
2	Numeric metre (length 3 meter)
3	Inch rule
4	Sheet metal shear, left hand
5	Sheet metal shear, right hand
6	Hand drill
7	Tightening tool
8	Locking plier, 3/4"
9	Grip pliers
10	Cellular glass scrape (knife type "Mora")
11	Caulking gun
12	Compass saw
13	Pop tong (TT55)
14	Hole saw (22 mm)
15	Hammer (rubber type)
16	Protractor
17	Compass
18	Handsaw
19	Coarse file

### 2.2 Accessory list

Item no.	Accessory
1	Nitoseal SC N (white colour)
2	RUKO Strip (fire gasket)
3	Glass fibre tape (19 mm)
4	Stainless steel tightening bands, (quality A4), 3/4"
5	Stainless steel clips (quality A4), 3/4"
6	Stainless steel sheet (quality A4), 0,7 mm
7	Stainless pop rivets (type AISI 316L), 3,2 x 6 mm
8	Drill bits Ø 3,3 mm (type Dormer)
9	Benarx Drain Plug

### 2.3 Protective equipment list

Item no.	Protective equipment
1	Dust mask (P2 filter)
2	Gloves (cut secure / Kevlar fibre)
3	Safety overall
4	Safety eye wear
5	Safety shoes

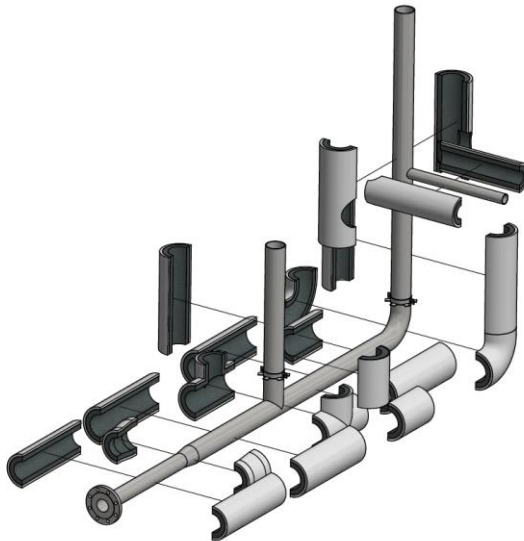
Notes:

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

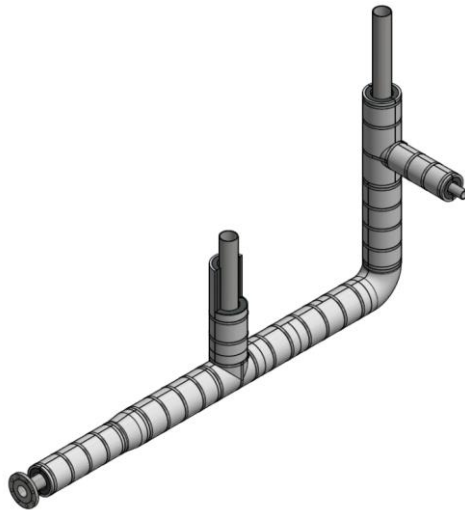
### 3 Scope of work

#### 3.1 Overview





Before installation:



After succesfull installation:


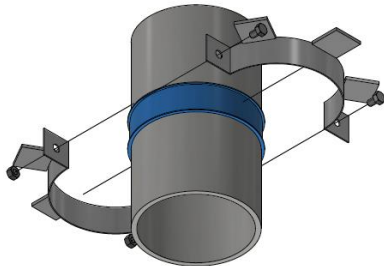
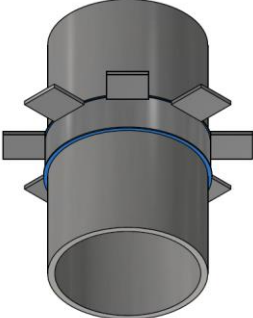


**4 Component List / Procurement**

Component number	Description	Order	Illustration
1.	<i>Benarx Cellular Glass XP</i>	<ul style="list-style-type: none"> <li>Full ISO-drawings ensuring the necessary geometric details are captured.</li> </ul> <p>The area to be insulated must be clearly outlined.</p> <ul style="list-style-type: none"> <li>Attach own measurement sketch if standard components cannot be utilized, or if accurate ISO drawings are not available.</li> </ul>	
2.	<p><i>Tightening band:</i></p> <p>XP TIGHTENING BAND</p> <p>Supplied with 200 mm overlap.</p>	<ul style="list-style-type: none"> <li>Outer diameter where the band shall be mounted.</li> <li>Quantity of pieces.</li> </ul>	
3	<p><i>Tightening band for T-Piece and angle bends</i></p>	<ul style="list-style-type: none"> <li>Produced on site.</li> <li>Pop rivets shall be riveted flat.</li> </ul>	
4.	<p>XP TIGHTENING BAND WITH DRAIN PLUG</p> <p>Benarx Drain Plug installed on tightening band with glass fibre tape and ROKU Strip.</p> <p>Supplied with 200 mm overlap.</p>	<ul style="list-style-type: none"> <li>Outer diameter where the band shall be mounted.</li> <li>Quantity of pieces.</li> </ul>	

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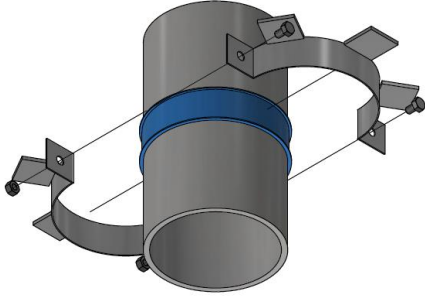
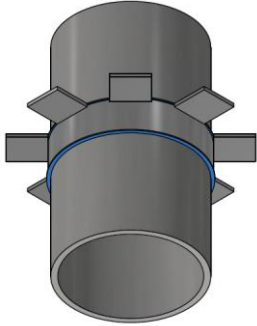


Component number	Description	Order	Illustration
5.	<p><i>Drain Plug on tightening band for T-Piece:</i></p> <p>XP TIGHTENING BAND WITH T-DRAIN PLUG</p>	<ul style="list-style-type: none"> <li>Produced on site.</li> <li>Pop rivets shall be riveted flat.</li> </ul>	
6a	<p><i>Retaining ring for vertical pipe – fastened with bolts and nuts</i></p> <p><i>Alternative 1</i></p>	<ul style="list-style-type: none"> <li>Outer diameter on pipe.</li> <li>Quantity of pieces.</li> </ul>	
6b	<p><i>Retaining ring for vertical pipe – fastened with tightening band</i></p> <p><i>Alternative 2</i></p>	<ul style="list-style-type: none"> <li>Outer diameter on pipe.</li> <li>Quantity of pieces.</li> </ul>	

## 5 Implementation

Execution shall be implemented according to the illustrations.

### 5.1 Support rings

<p>Installation of retaining ring on vertical pipe sections.</p> <p>Alternative 1: Fastening with bolts and nuts.</p> <p>Note: Gasket shall be installed on pipe in advance.</p>	
<p>Installation of retaining ring on vertical pipe sections.</p> <p>Alternative 2: Fastening with tightening bands.</p> <p>Note: Gasket shall be installed on pipe in advance.</p>	

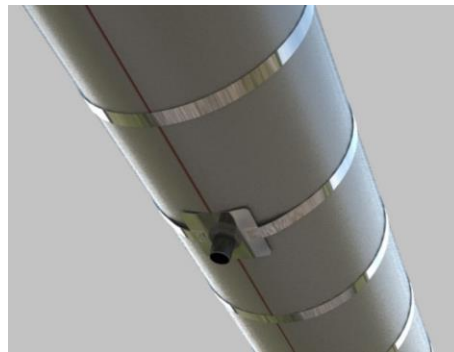
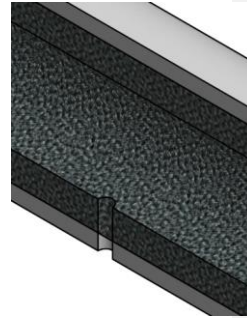
## 5.2 Drainage

Installation of Benarx Drain Plug  
Drain hole (Ø 22 mm)

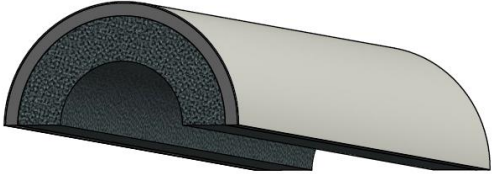

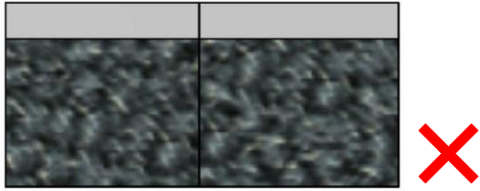
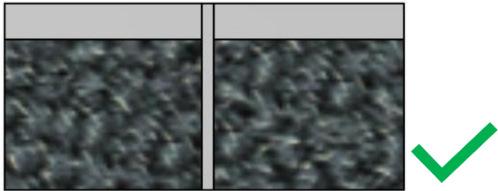
A drain hole shall be made in the component prior to installation to avoid any damage to the pain system.

Apply Nitoseal SC N (white) on the sheet, and between the drain plug and insulation to secure a sealed connection.

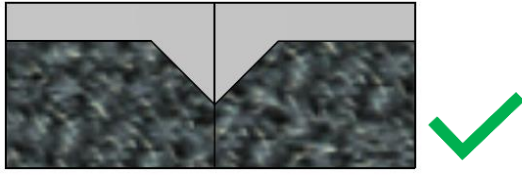
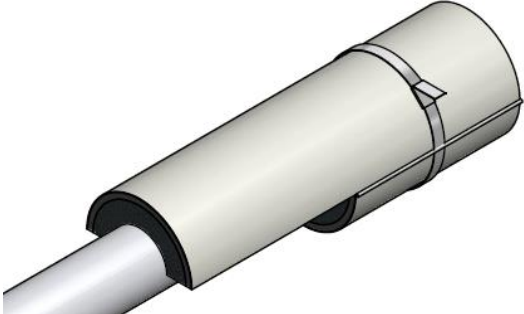
**NB!**  
Drains shall be installed with the distance of maximum 3 metres between each point. In addition, a drain plug shall be installed on the shallow section.



**5.3 Mounting of Cellular Glass XP segments**

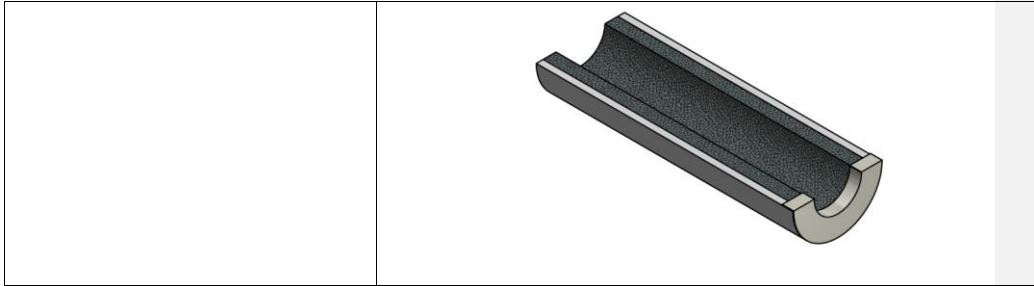
<p>Customizing contact surface/Joints</p> <p>Check the straightness of the longitudinal joints on the Benarx F Cellular Glass XP segment. Adjusting can be made with a Stanley Surf-Former to create a correct contact surface.</p>	
<p>Verification of size and modification of product</p> <p>Before sealant is applied, it shall be verified that the Benarx XP shell used is of the right shape and size.</p> <p>In the case of small misfits, a coarse scrape or file shall be used to provide adequate space for adjustments.</p> <p>If the product is significantly larger than the intended space, the space shall be measured and the Benarx XP cut to the correct length.</p>	
<p>Incorrect installation – two cut edges</p>	
<p>Correct installation (1 of 3): - Cut edges with applied Pitt-Char XP or Flexiroll XP</p>	

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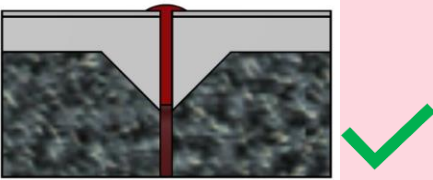
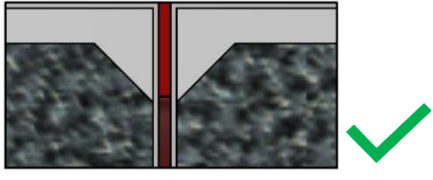
<p>Correct installation (2 of 3): - Cut edge + single chamfer edge with Pitt-Char XP.</p>	
<p>Correct installation (3 of 3): - Double chamfer edge with Pitt-Char XP.</p>	
<p>Apply sealant</p> <p>The intention is primarily to glue the segments together over the entire joint surface for all joints. Ensure that sufficient amount of sealant is applied.</p> <p>Secondarily the sealant will provide a continuous barrier against water ingress.</p> <p>Reference is made to chapter 6.4 Sealing.</p>	
<p>Temporary tightening band</p> <p>Assemble the segments and secure that sealant is forced out between the segments for all joints.</p> <p>Install the temporary tightening band (not to be locked)</p>	
<p>Terminations</p> <p>Termination of segments are to be sealed over the entire end surface.</p> <p>Sealant may be dry or wet before the segments are installed on the pipe.</p>	

**Kommentert [ACH1]:** Fuge må vises rundt alle skjøter, ikke bare langsgående. Ellers vil noen tro at de kun skal fuge langsgående skjøter....

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**5.4 Sealing**

<p>Sealing compound</p> <p>Nitoseal SC N (white) with a caulking gun shall be used as sealing compound between insulation pipe sections.</p> <p>White colour shall be used unless otherwise is specified.</p> <p>The sealing compound shall be ironed and smoothed to an even and nice finish.</p> <p>NB! Exposed Pitt-Char, which is damaged or is missing surface protection, shall be flick painted or covered with Nitoseal SC N (white).</p>	
<p>Application of sealant – without edge painting.</p>	
<p>Application of sealant – with edge painting.</p>	

**Kommentert [ACH2]:** Hvorfor viser vi grå fugepatron når det står at vi skal bruke hvit type?  
Bilde må forandres til hvit type, evt. tegning av hvit type

**Kommentert [ACH3]:** Skal ikke XP alltid males rundt kanten i produksjon?  
Det vill vært mer relevant å vise fugging på kuttet flate (der en eller to av skålene mangler chamfer)  
Case'et som vises her er vel strengt tatt ikke et scenario i virkeligheten?

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**5.5 Tightening bands**

Permanent XP tightening bands.

Measure and mark the correct placement of the tightening bands.

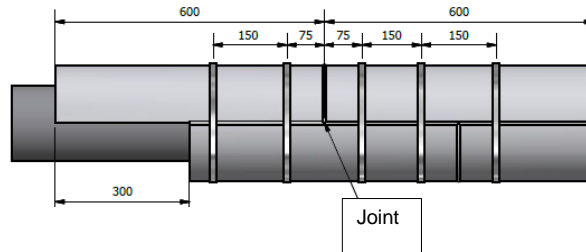
The preferred method is to install the XP tightening bands 75mm beside the circumferential joints. The centre-to-centre distance of the XP tightening bands is always minimum 150mm.

*Alternatively the tightening bands can be installed on the circumferential joints, but this method requires extra care and inspection in order to ensure proper use of sealant.*

After the XP tightening bands has been installed, the temporary bands shall be removed. Fill gaps from under the temporary tightening bands with sealant.,

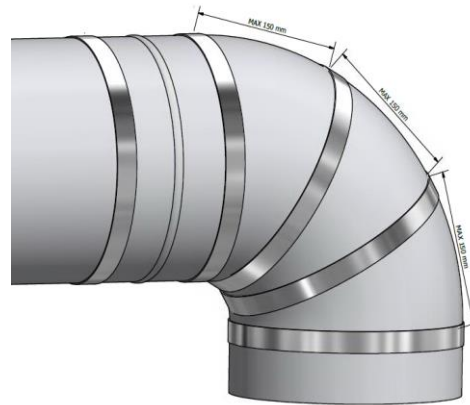
**IMPORTANT**

Do not overtighten XP tightening bands. Overtightening will cause top coat damages.



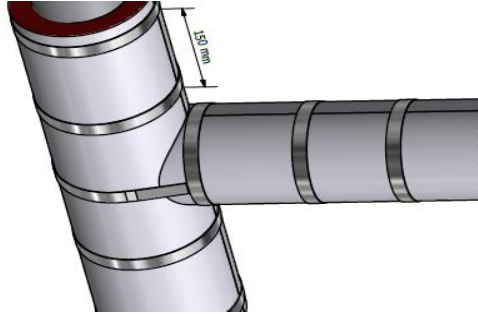
Centre distance XP tightening bands for bends.

XP tightening bands of type ¾" is installed with 150 mm distance (centre to centre).





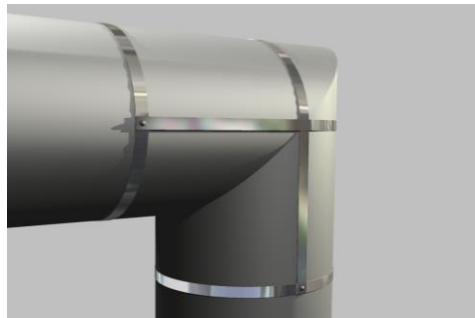
Installation of XP tightening band on T-piece.



Installation of XP tightening band with drain plug.



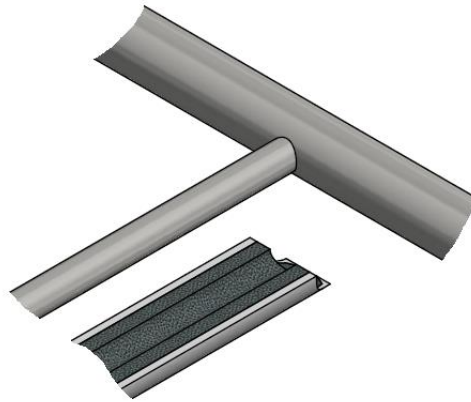
Installation of XP tightening band on knee bends.



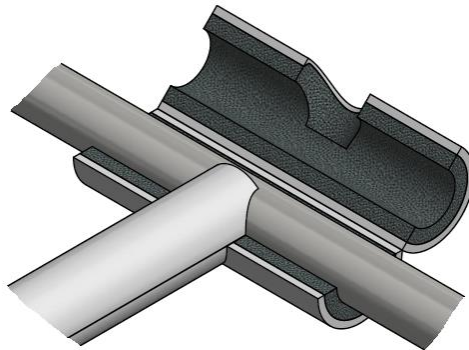
**5.6 Unequal T-Piece**

Installation of T-piece with dissimilar pipe diameter.

Cut and adjust the segment to the pipe as illustrated.



Cut and adjust the horizontal segments to the vertical segments.



**5.7 Alternative solution for reducers**

<p>Alternative solution for reducers.</p> <p>XP for the larger dimension is to be ordered with full end cap. Fitting according to piping is done on site.</p>	
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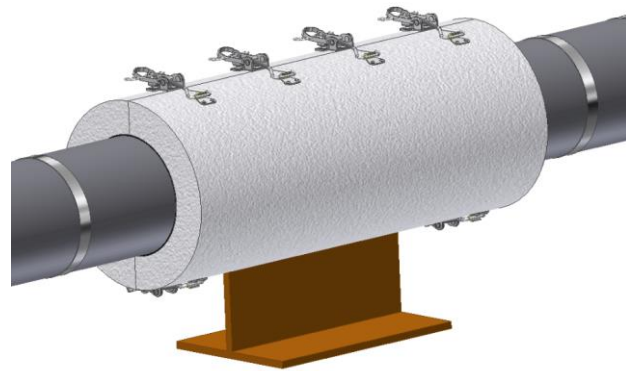
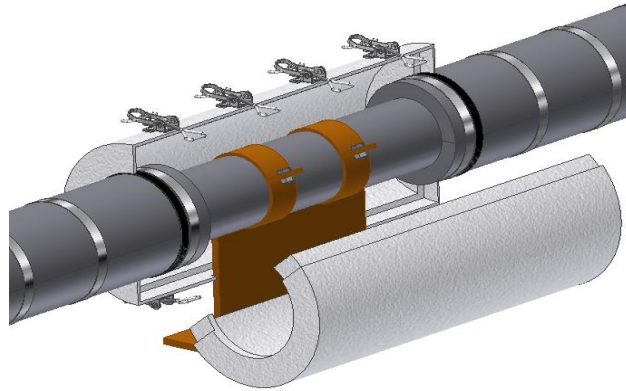
**5.8 Trunnions**

<p>Mounting of trunnion.</p> <p>Cut the XP tangent section, so that it follows the radius of the bend. The bend shall be cut and mounted around the XP tangent section on the trunnion as illustrated.</p> <p><u>Remember to apply a retaining ring on all vertical tangent sections according to current specifications.</u></p>	
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**5.9 Supporter Box**

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To maintain a continuous fire protection barrier at pipe supports, and not being forced to constrain the Cellular Glass XP between fixed points, installation of the Benarx Epoxy Box is recommended.



## 5.10 Flattenings

Example of flattenings over entire segment lengths and over a part of the segments length.

