

# Instructions for use: Leak sealing bandage

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## 1.0. IDENTIFICATION

### 1.1. PRODUCT TYPE

SAVA leak sealing bandages of SB type.



Figure 1: Label of a SAVA leak sealing bandage, type SB

### 1.2. MANUFACTURER



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## 2.0. PRODUCT DESCRIPTION

### 2.1. BASIC FUNCTIONS AND AREAS OF APPLICATION

SAVA sealing bandages of SB type can seal cracks on pipelines, gas lines, and smaller containers and barrels of diameters between 50 and 450 mm. SAVA sealing bandages should not be used on surfaces with the carrying capacity lower than 8 kg/cm<sup>2</sup>.

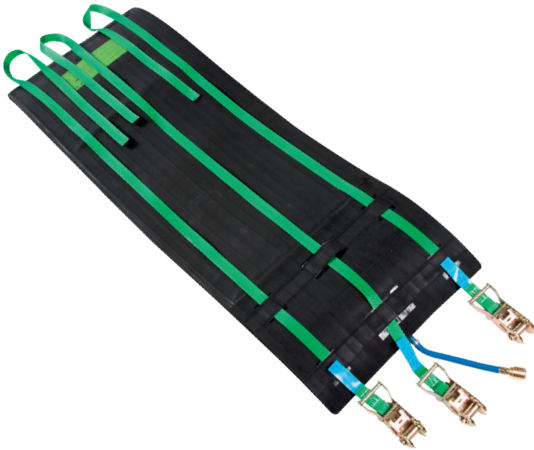


Figure 2: SAVA sealing bandage of SB type

SAVA sealing bandages are of longitudinal shape and manufactured from a combination of soft natural and synthetic rubber, resistant to oil, oil products, acids, lyes and other atmospheric influences. A suitable cord structure provides for proper flexibility and strength of the bandages. All SAVA sealing bandages are equipped with a quick coupling for inflation and deflation and have ratchet straps integrated.

Various compressed air sources are available for inflation of SAVA sealing bandages outdoors, such as compressors, compressed air bottles, foot pumps and others.

### 2.2. BASIC DATA

Table 1: Technical data about SAVA sealing bags, M type

TYPE	PART NUMBER	SIZE USAGE RANGE	DIMENSIONS			WEIGHT	WORKING PRESSURE
			LENGTH	WIDTH	HEIGHT		
			[cm] / [inch]	[cm] / [inch]	[cm] / [inch]		
<b>SB1</b>	515713	<b>5 - 8 / 2 - 3</b>	<b>25 / 10</b>	<b>12.5 / 5</b>	<b>1 / 0.4</b>	<b>2.1 / 5</b>	<b>1.5 / 22</b>
<b>SB2</b>	525813	<b>5 - 20 / 2 - 8</b>	<b>98 / 39</b>	<b>12.5 / 5</b>	<b>1 / 0.4</b>	<b>3.5 / 8</b>	<b>1.5 / 22</b>
<b>SB3</b>	525065	<b>5 - 20 / 2 - 8</b>	<b>98 / 39</b>	<b>21.0 / 8</b>	<b>1 / 0.4</b>	<b>3.9 / 9</b>	<b>1.5 / 22</b>
<b>SB4</b>	525066	<b>20 - 45 / 8 - 18</b>	<b>170 / 67</b>	<b>21.0 / 8</b>	<b>1 / 0.4</b>	<b>6.7 / 15</b>	<b>1.5 / 22</b>
<b>SB5</b>	525277	<b>5 - 18 / 2 - 7</b>	<b>80 / 32</b>	<b>25.0 / 10</b>	<b>1 / 0.4</b>	<b>4.3 / 10</b>	<b>1.5 / 22</b>
<b>SB6</b>	514376	<b>5 - 15 / 2 - 6</b>	<b>65 / 26</b>	<b>45.0 / 18</b>	<b>1 / 0.4</b>	<b>5.5 / 12</b>	<b>1.5 / 22</b>
<b>SB7</b>	516042	<b>10 - 35 / 4 - 14</b>	<b>130 / 51</b>	<b>45.0 / 18</b>	<b>1 / 0.4</b>	<b>9.1 / 20</b>	<b>1.5 / 22</b>
<b>SB8</b>	525814	<b>20 - 45 / 8 - 18</b>	<b>170 / 67</b>	<b>45.0 / 18</b>	<b>1 / 0.4</b>	<b>11.1 / 25</b>	<b>1.5 / 22</b>

## 3.0. DEFINITIONS

**Work area:** A pipe diameter for which SAVA sealing bandage is suitable for use.

**Maximum working pressure:** The maximum permissible pressure for inflation of SAVA sealing bandages.

**Pressure gauge:** A device that indicates the pressure.

**Damaged area:** A damaged area on the object to be sealed.

**Ratchet:** A mechanism by means of which a strap is tightened

**Foot pump:** A device for inflation of sealing bandages, operated by using one's foot.

**Inflation hose:** A hose that conveys compressed air from the controller or foot pump to SAVA sealing bandages.

**Sealing bandage:** An inflatable rubber bag of longitudinal shape, wrapped around a damaged object, that seals leaks (usually on pipelines) utilising the compressed air.

**Test pressure gauge:** A pressure gauge with an integrated coupling for testing of the accessories.

**Safety valve:** A device that protects the system against excessive pressure.

## 4.0. TRANSPORT, STORING, WORK SAFETY AND RESTRICTIONS OF USE

### 4.1. TRANSPORT AND STORING

Products are packed in cardboard boxes with special protection of sensitive parts. When transported, they should be placed horizontally or vertically, make sure they are not bent or folded. They should be stored in a dark and dry space, protected against extreme temperatures (see chapter 4.5).

They are also available as a set in a carrying case, which can be used for storing the products.

### 4.2. SAFETY INSTRUCTIONS BEFORE USE



**Please ensure you read and understand the instructions before using the product.**



Rescue teams should be trained in accordance with the internal regulations applicable to training programmes for professional rescue teams. Other users should participate in training organised by the manufacturer or an authorised training provider.

### 4.3. REMOVAL OF PACKAGING

Do not use any sharp objects, such as knives, screwdrivers and similar, for removal of packaging as the product could get damaged.

### 4.4. DISPOSAL OF PACKAGING



Packaging is made of recyclable cardboard, which is why it should not be disposed but landfilled in waste bins for recycled paper or special containers for cardboard packaging.

#### 4.5. STORING AND PROTECTION OF THE PRODUCT WHEN NOT IN USE

The products should be stored in a dry and dark place.



Storage temperature: +5 °C to +25 °C (+14 °F to +77 °F).

If carrying cases were also purchased, we recommend storing the products, which are not in operation, in these cases.

Make sure the products are not bent, inflation connections loaded or inflation hoses twisted during storing.

#### 4.6. INSTRUCTIONS AND PERIODIC TEST REPORTS



Brief instructions and manufacturer's test report are enclosed with every product. Brief instructions are enclosed with this document too. SAVA recommends that brief instructions are laminated and a copy is kept next to the product.



**The instruction manual should be retained throughout the service life of a product.**

#### 4.7. ENVIRONMENTAL CONDITIONS AND RESTRICTIONS OF USE



The temperature range of application is from -20 to +60 °C. The use of the product at temperatures below -20 °C, but not below -30 °C, is limited to 1 hour at the most, and at temperatures exceeding +60 °C to 30 minutes, yet the temperature may not exceed 70 °C.



The standard version of products is NOT suitable for use in potentially explosive environments.



Open flame and smoking are forbidden when using these product.

#### 4.8. SAFETY AND PERSONAL PROTECTIVE EQUIPMENT

When working with SAVA sealing bandages, always wear personal protective equipment. Fire fighters and rescue team members should wear all of the specified protective equipment.

Other users should wear protective clothing, helmet, goggles gloves and protective footwear.





When working with SAVA sealing bandages in the area near hazardous substances, comply with applicable local guidelines, regulations and the legislation on the use of suitable protective equipment for a specific hazardous substance.

#### 4.9. RECOMMENDATIONS FOR SAFE AND EFFICIENT WORK



Non-compliance with the instructions may lead to a risk to users and third persons, and may cause various injuries, which is why the instructions must be read and understood prior to using the product.



- Choose a suitable product type of proper size for intervening in a specific situation.
- Always use calibrated foot pumps or controllers, designated for work at the specified pressure.
- Inflate the product until it reaches the specified working pressure.
- Never inflate the product to the pressure that exceeds the maximum working pressure defined for the product.
- Monitor the pressure in the product throughout its use; if required, refill the product to correct the pressure.
- Always use the ratchet straps.
- The length of the inflation hose should enable inflation of the product from a safe distance.
- Always use all the safety equipment as specified.
- If hazardous substances are involved, use the protective equipment in accordance with the local regulations and standards on emergency response plans for accidents involving a specific hazardous substance.
- When the product is used in accidents involving hazardous substances, always act in accordance with the local regulations and standards on emergency response plans for accidents involving a specific hazardous substance.
- The product should not be used in any other way than as described in this instruction manual.

##### 4.9.1. WORKING ENVIRONMENT



###### TEMPERATURE OF THE OBJECT TO BE SEALED

If the temperature of the object to be sealed or the liquid that is leaking exceeds 55 °C, protect the product with rubber plates to prevent damage due to the heat. The lowest temperature at which the product retains its performance and material properties is -20 °C.



###### LIGHTING IN THE PLACE OF WORK

It is dangerous to work in the dark, even though SAVA sealing bandages are simple to handle. Make sure that the place of work is properly illuminated and not in the shade. SAVA recommends the use of additional lights when visibility is significantly poorer due to shade, even during the day. Do not use an open flame for lighting in the dark.



###### RESTRICTED AREA - AUTHORISED PERSONNEL ONLY

Only qualified personnel are allowed to be present in areas where work with SAVA sealing bandages takes place. Other persons should keep out of the area where preparations for sealing and the actual sealing procedure are carried out. If an accident occurs that involves hazardous substances, the personnel using the sealing bandages should be qualified for rescue operations in such accidents in accordance with the local regulations and standards. If additional risks are a threat to people and the environment (e.g. outbreak of fire due to a fuel leakage, moving of a container etc.), professional personnel must carry out all the required precautionary actions to minimise such risks.



## 4.9.2. RESISTANCE TO SUBSTANCES

Standard sealing bandages are made from the Nr/Br material. Special sealing bandages are made from the CR material. The bandages made from CR are marked with an orange dot.

The resistance classification table is in compliance with the standard ISO/TR 7620. The effect of the media on the product is classified as:

1 NEGLIGIBLE	2 LOW	3 MEDIUM	4 SIGNIFICANT
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Table 2: Table of resistance of rubber materials to various substances

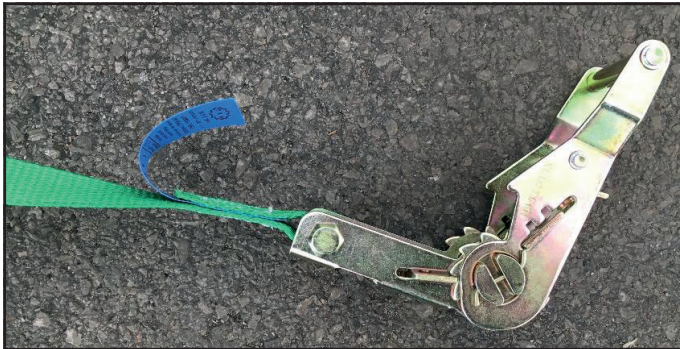
MEDIA	CONCENTRATION (%)	TEMPERATURE [°C] / [°F]	NR/BR	CR	NBR
Acetone		23 / 73.4	1	2	4
Acetylene			1	2	1
Ammonium hydroxide	10	23 / 73.4	1	1	1
	Conc.	23 / 73.4	1	1	2
Aniline		23 / 73.4	2	3	4
		100 / 212	4	4	4
Benzene		23 / 73.4	4	4	4
Boric acid	10	100 / 212	1	1	1
Brake fluid (vegetable)		50 / 122	1	1	4
Butanol		50 / 122	1	1	1
		100 / 212	4	3	1
Butyric acid				2	4
Calcium hydroxide		100 / 212	1	1	2
Calcium hypochlorite	15		4	2	3
Chloric acid	20	23 / 73.4		4	4
Ethanol		50 / 122	1	1	1
Ether		23 / 73.4	4	4	2
		23 / 73.4	1	1	1
Formaldehyde	40	23 / 73.4			4
	40	70 / 158			4
Glycerine		100 / 212	1	1	1
Hexanol		23 / 73.4	1	2	2
Hydrogen peroxide	30	23 / 73.4	1	1	1
	90		4	4	4
Kerosene		70 / 158	4	3	1
Methanol		50 / 122	1	1	1
Methyl chloride			4	4	4
Milk		23 / 73.4	1	1	1
Oil 1 (ASTM No.1, ISO 1817)		100 / 212	4	1	1
Oil 2 (IRM 902, ISO 1817)		100 / 212	4	2	1
Oil 3 (IRM 903, ISO 1817)		100 / 212	4	4	1
Naphtha		23 / 73.4	4	4	1
Natural gas			3	1	1
Nitric acid (diluted)	10	50 / 122	2	3	2
Ozone (conc. 50 ppm)		40 / 104	4	2	4
Phenol		100 / 212	4	4	4
Phosphoric acid		50 / 122	2	2	3
Propanol		50 / 122	1	1	2
Sodium hydroxide	10	100 / 212	1	1	1
	25	100 / 212	1	1	4
Sodium hypochlorite	10	50 / 122	2	3	3
Sulphur hexafluoride				1	1
Sulphuric acid (VI)	10	100 / 212	1	1	3
	20	23 / 73.4	1	1	3
	25	100 / 212	1	1	4
	50	100 / 212	1	1	4
	60	100 / 212	3	4	4
	75	100 / 212	4	4	4
	96	23 / 73.4	4	4	4
Toluene		23 / 73.4	4	4	4

## 5.0. WORK PROCEDURES

**Prior to using SAVA sealing bandages of SB type, carefully read chapter 4, which describes the procedures for safe work and restrictions of use!**

### 5.1. USE OF RATCHET STRAPS

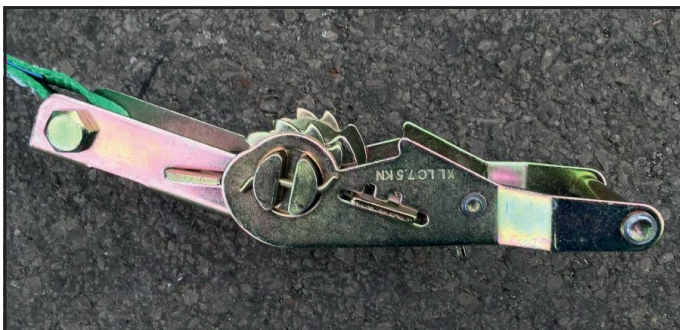
The standard version of SAVA sealing bandages, SB type, is equipped with ratchet straps. Depending on the type, two or three ratchet straps are integrated in the bandage.



*Figure 3: Ratchet strap integrated in SAVA sealing bandages*

#### 5.1.1. TIGHTEN THE RATCHET

When stored, the ratchet is usually in its extended position. Prior to using it, the ratchet should be moved into a working position.



*Figure 4: Ratchet in the extended position*

Use the release catch under the handle to move the ratchet in to working position as shown in the pictures below.

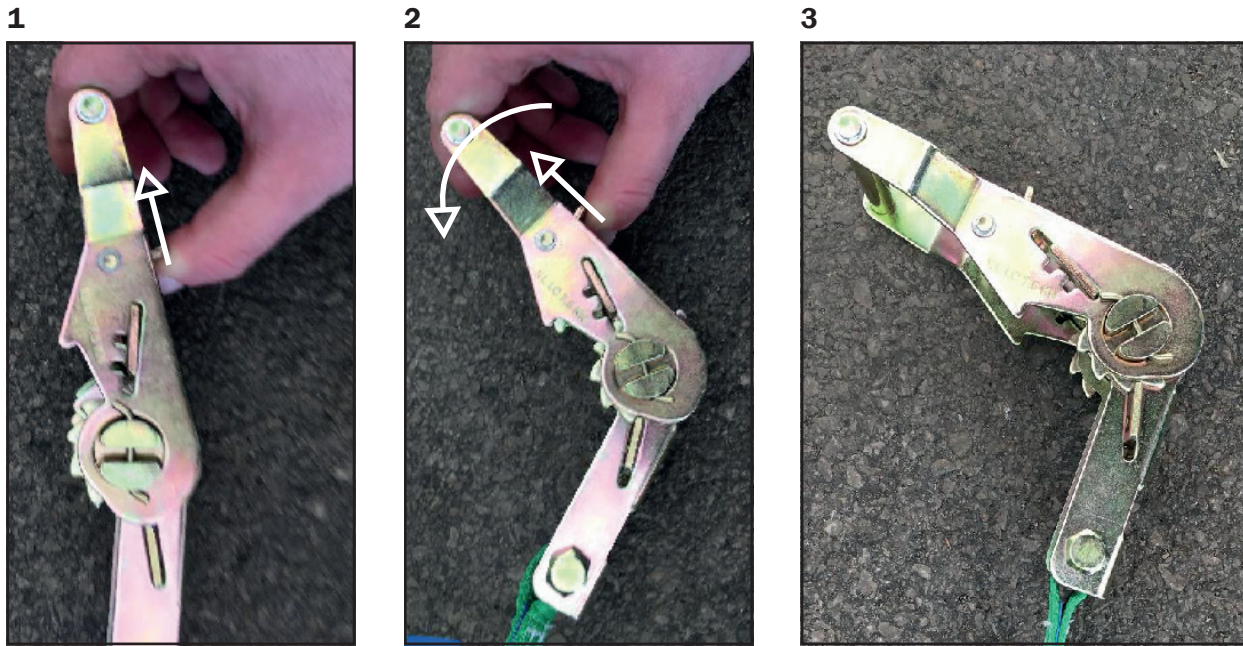
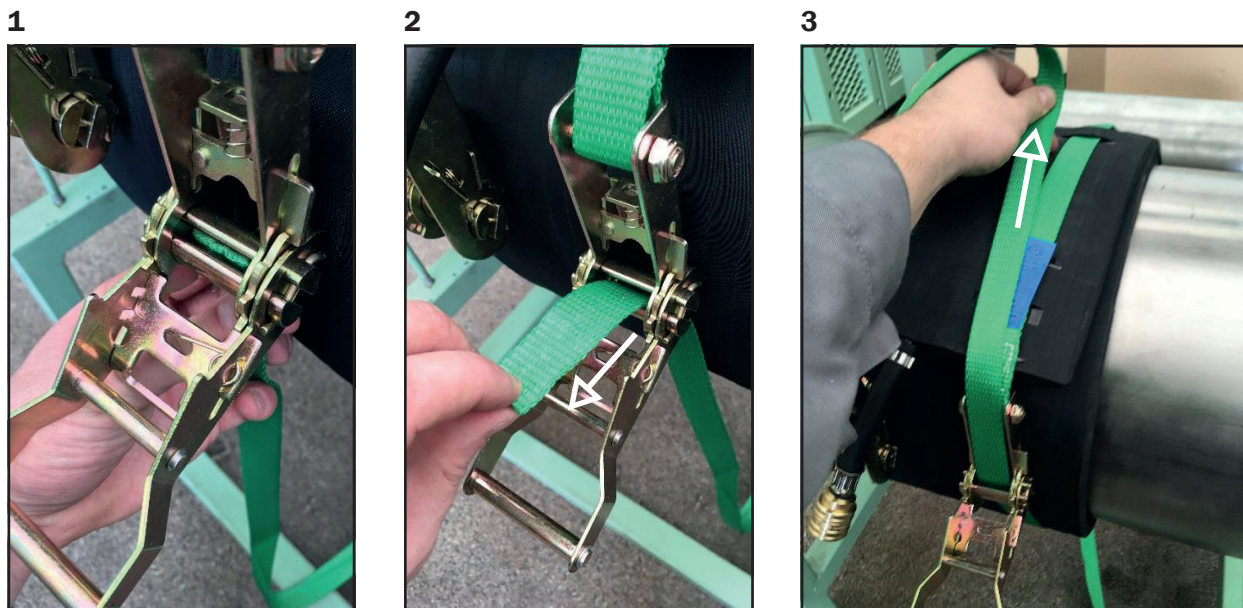


Figure 5: Procedure for moving the ratchet in working position

Insert the strap into a slot from the back side of the ratchet and feed it through the ratchet. Ensure the strap is not twisted.



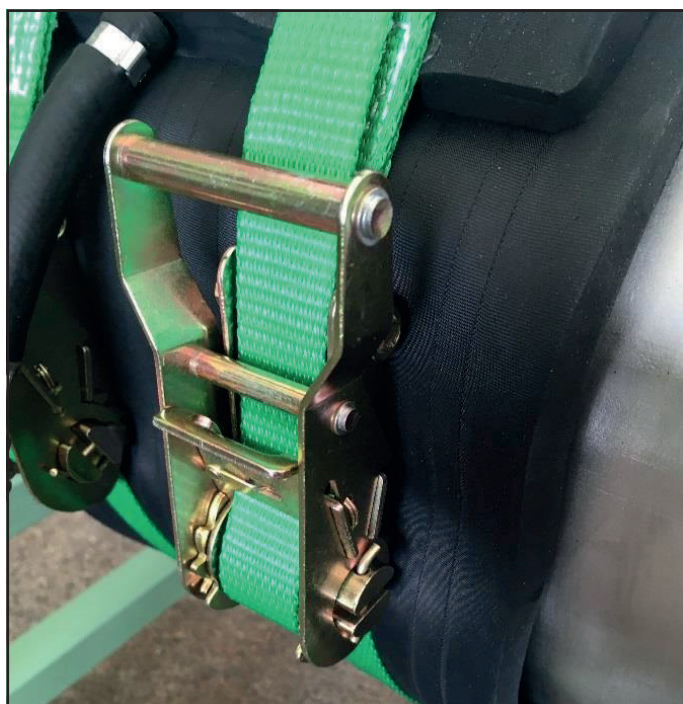


Pull the strap tight by hand and begin to tighten it using the ratchet. Crank the ratchet handle from its one to its other extreme position. The strap should be at least double-wound in the ratchet to ensure it is properly tight and safely locked to prevent it from slipping. Only then release the strap.



*Figure 7: Tightening with the ratchet*

When the strap is fully tightened, move the ratchet into its extreme lock position as shown in the picture below.



*Figure 8: Ratchet in the extreme lock position*

### 5.1.2. RELEASE THE RATCHET

To release the ratchet, it should be fully opened. First open it, then press the release catch under the handle and move it to a fully open position.

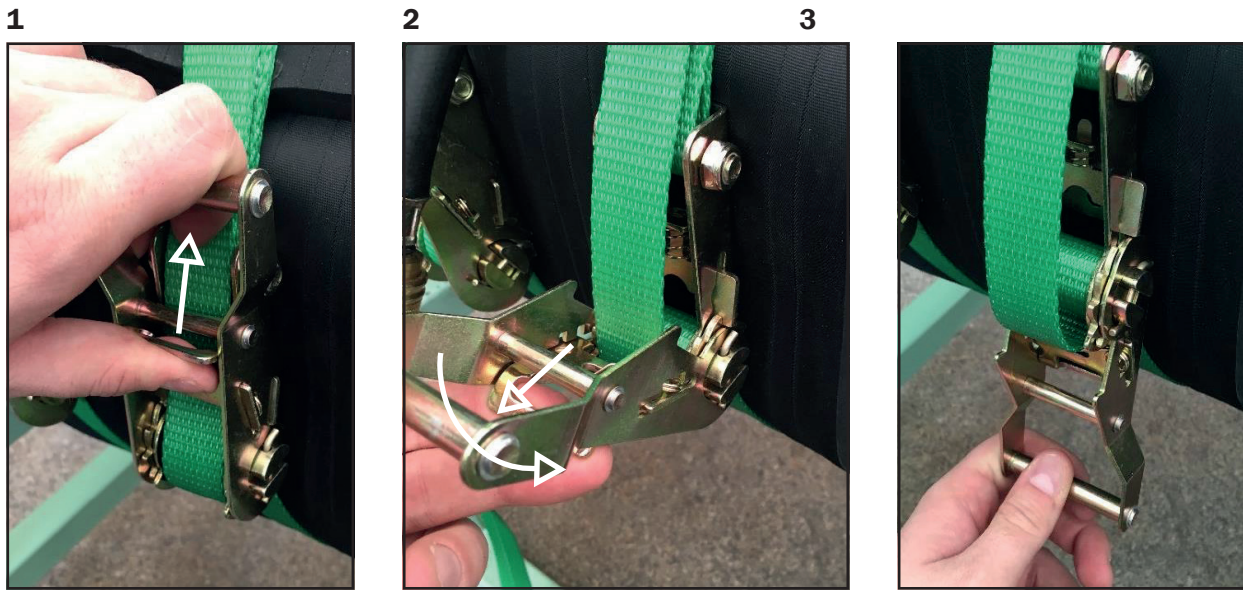


Figure 9: Moving the ratchet in fully open position

When the ratchet is fully opened, pull the loose end of the strap to release it. Remove the entire strap from the ratchet.

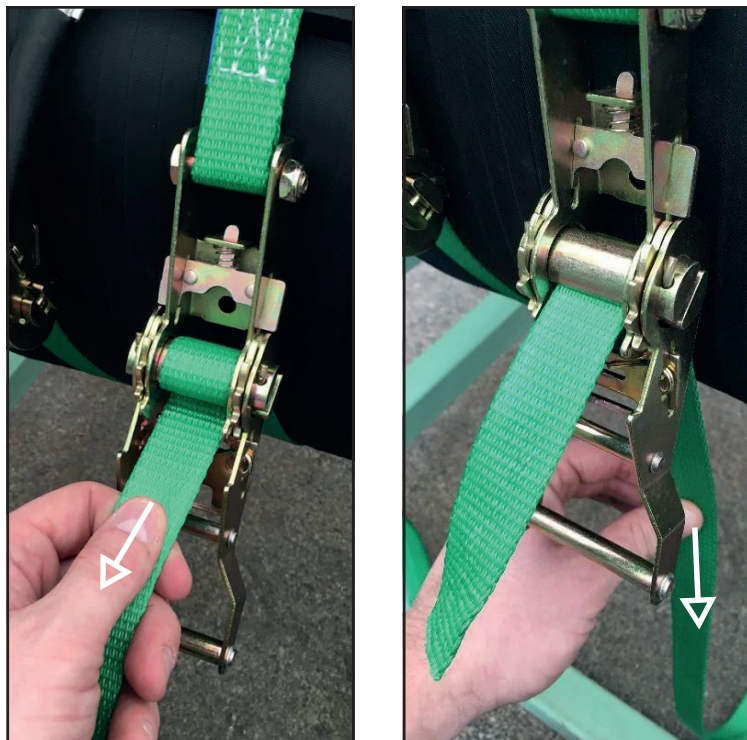


Figure 10: Removing the strap from the ratchet



## 5.2. USE OF THE FOOT PUMP

SAVA sealing bandages, SB type, are commonly inflated with a foot pump. Foot pumps form part of standard sets of SAVA sealing bandages.

### 5.2.1. PREPARATION FOR USE

First release the special pin that locks the pedal of the foot pump. Press the foot pedal towards the ground and unpin the metal pin, after which the foot pedal is released.

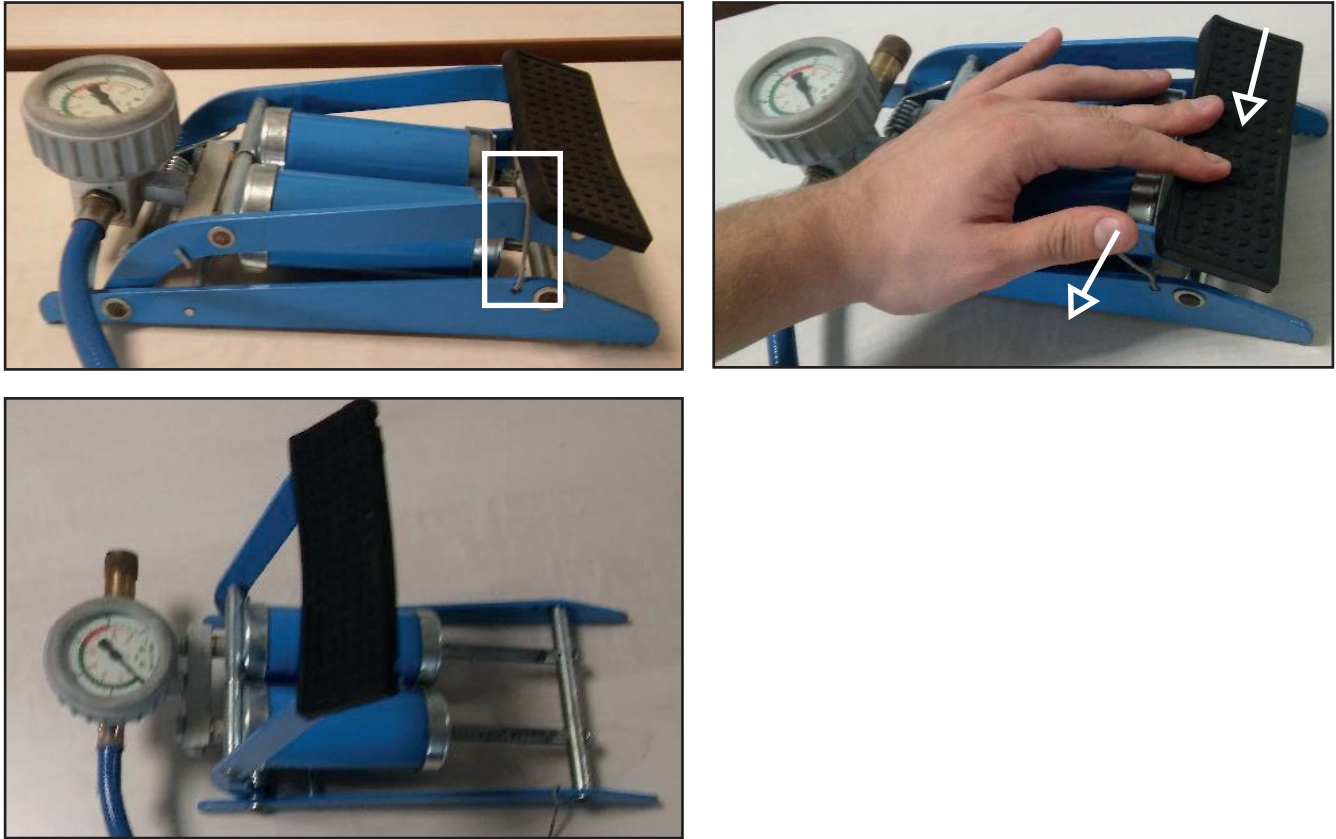


Figure 11: The marked pin of the foot pedal (top left), releasing the pin (top right), the released pedal of the foot pump (bottom)

Before using the foot pump, make sure that the lock screw on the safety valve end is closed. To close the screw, turn it clockwise.

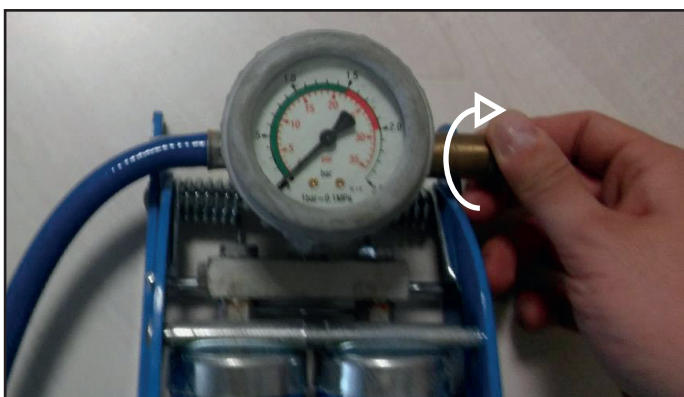


Figure 12: Check if lock screw is closed

## 5.2.2. CONNECTION AND INFLATION

First connect the foot pump and SAVA sealing bandage. The foot pump can be connected directly to the SAVA sealing bandage or, if required, an additional inflation hose can be inserted between both elements.

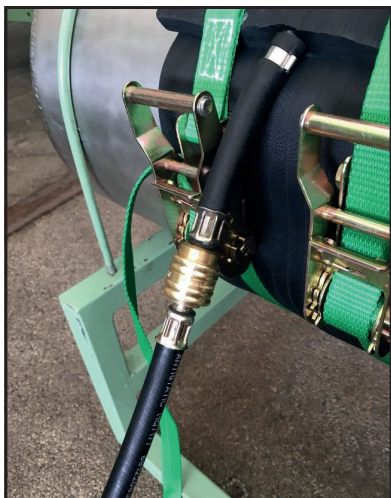


Figure 13: Inflation hose connected to the SAVA sealing bandage

Inflate the SAVA sealing bandage by pushing – either by foot or hand – the pedal of the foot pump towards the ground and releasing it to its upper position. When released, the pedal automatically returns to its upper position.

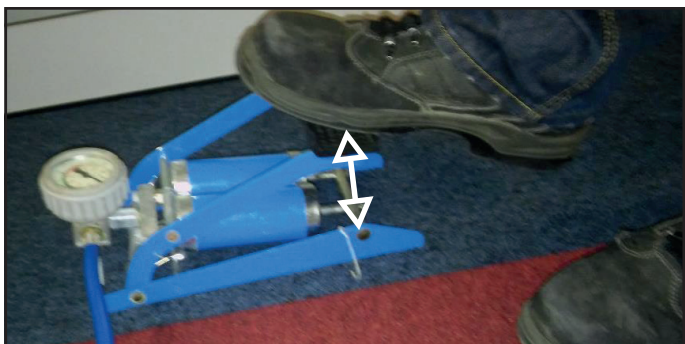


Figure 14: Inflate the sealing bandage by pushing and releasing the foot pedal

Repeat the procedure until the required working pressure is reached. The working pressure is indicated on the pressure gauge.

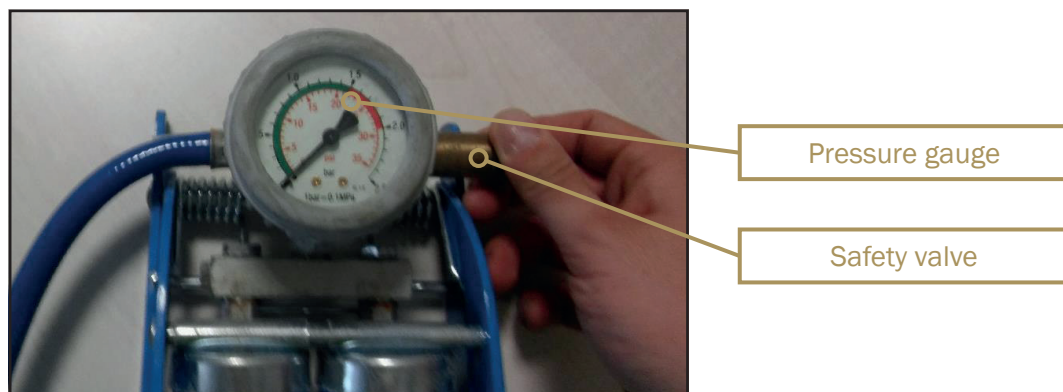


Figure 15: Pressure gauge and safety valve on the foot pump

If the pressure in SAVA sealing bandage is exceeded, the safety valve, integrated in the foot pump, automatically opens to relieve excessive pressure.

### 5.2.3. EMPTYING, DISCONNECTION AND TIDYING UP

To deflate SAVA sealing bandage, connected to the foot pump, unscrew the lock screw on the safety valve end. To unscrew the lock screw, turn it anti-clockwise.

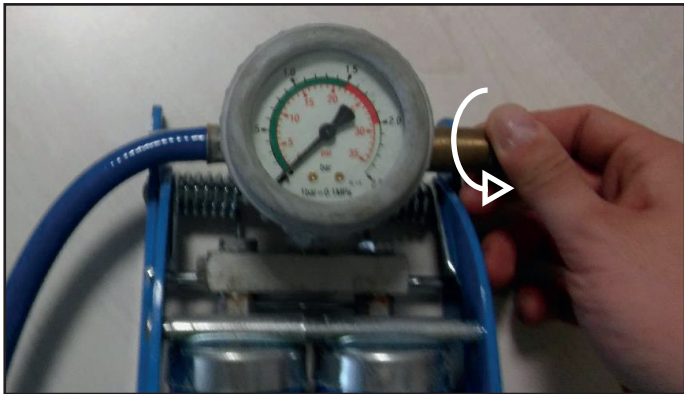


Figure 16: Open lock screw on the foot pump

When the sealing bandage is emptied, close the lock screw on the foot pump by turning it clockwise.

Afterwards disconnect the inflation hose from the coupling on SAVA sealing bandage and lock the foot pedal in the lower position by pushing it towards the ground and inserting the pin of the pedal in the pedal side.

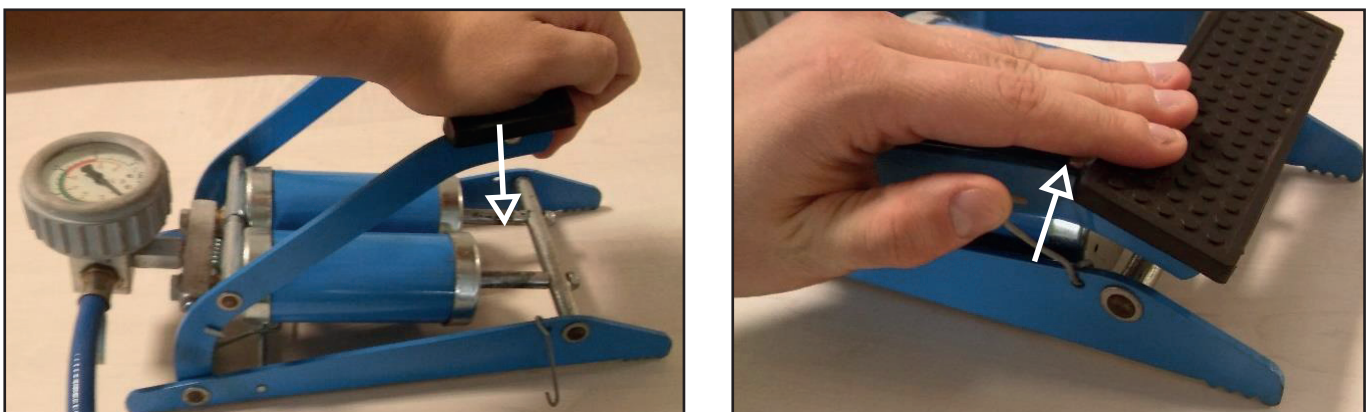


Figure 17: Lock the pedal in the lower position

## 5.3. USE OF SEALING BANDAGES OF SB TYPE

Before using the products, the user should read and understand:



**Safety instructions before use , see chapter 4.2;**  
**Environmental conditions and restrictions of use, see chapter 4.7;**  
**Safety and personal protective equipment, see chapter 4.8;**  
**Recommendations for safe and efficient work, see chapter 4.9.**

### 5.3.1. PLACE AND FASTEN THE SEALING BANDAGES

Place the bottom (the part without ratchet straps) inner (the side with no label) part of SAVA sealing bandage onto the damaged area.



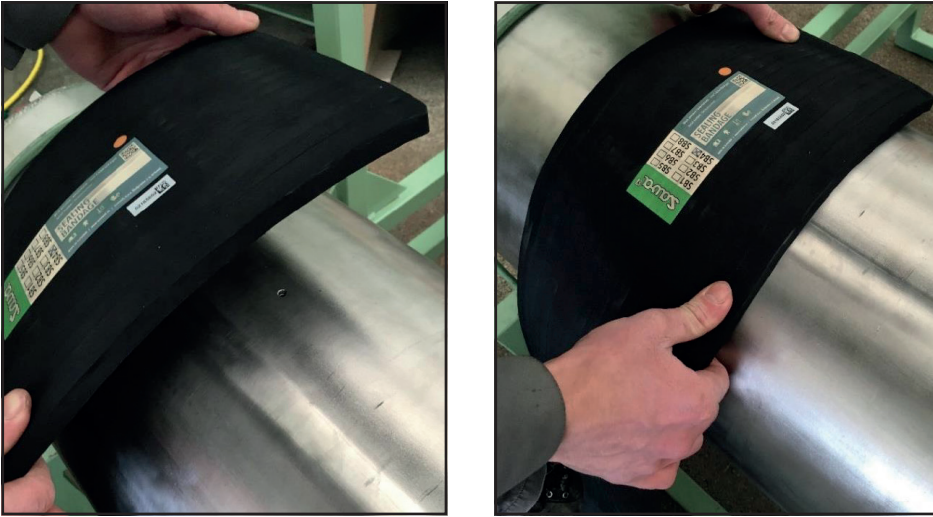


Figure 18: Position the SAVA leak sealing bandage on to the damaged area

Wrap SAVA sealing bandage as tightly as possible around the pipe.

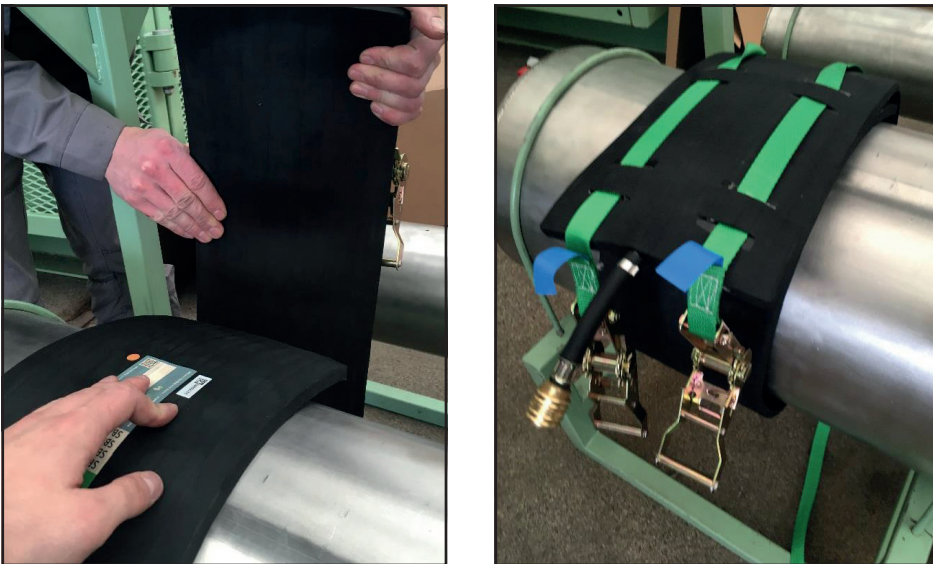


Figure 19: Wrap the SAVA seling bandage around the damaged pipe

Wrap the ratchet straps around SAVA sealing bandage, feed them through the ratchet and tighten as described in chapter 5.1. When feeding the straps, make sure they are not twisted or bent. Tighten gradually and evenly all straps around the SAVA sealing bandage.

### 5.3.2. INFLATION OF SEALING BANDAGES

When SAVA sealing bandage has been fastened with ratchet straps, it should be filled with air. A foot pump, which forms part of the accessories, is usually used for filling the sealing bandages. A controller with a pressure reducer and air cylinder or a controller with an alternate air source may also be used.



Figure 20: Foot pump (left) and inflation hose (right)

First connect the supply hose of the foot pump to the bandage; if required, add another inflation hose.

Then fill SAVA sealing bandage up to the working pressure. Monitor the pressure in the bandage throughout the inflation procedure. Refer to chapter 5.2.1 for preparation of the foot pump and chapter 5.2.2 for use of the foot pump.



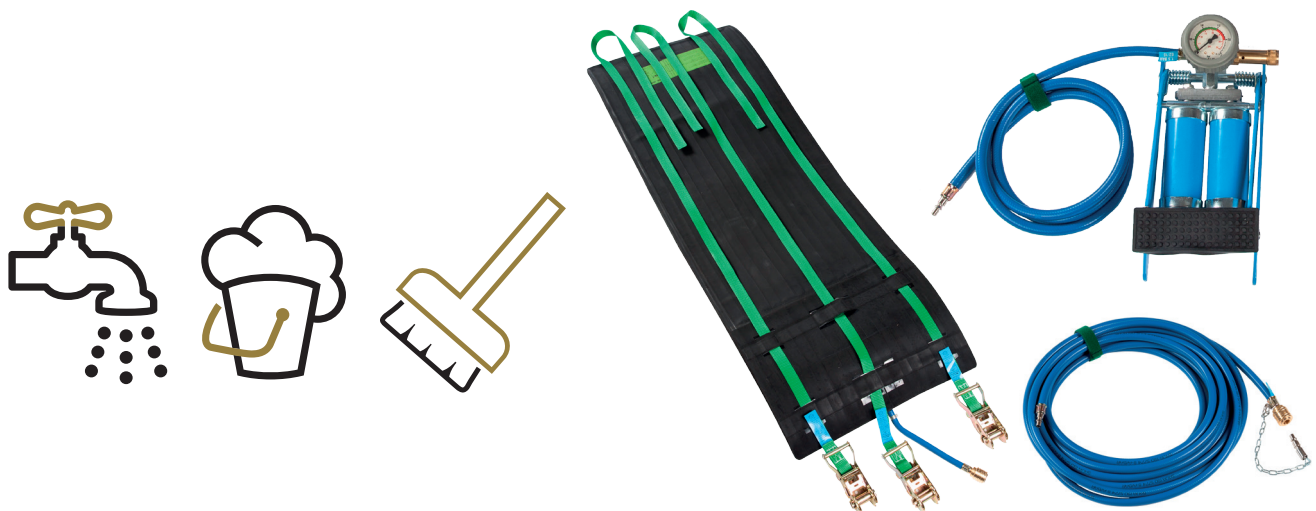
Figure 21: Mounted and inflated SAVA sealing bandage

### 5.3.3. REMOVAL OF SEALING BANDAGES

After the application is finished, SAVA sealing bandage should be emptied. Open the lock screw on the safety valve of the foot pump as described in chapter 5.2.3.

When the sealing bandage is entirely emptied, remove the inflation hose, then loosen and remove the ratchet straps as described in chapter 5.1.2.

When the sealing bandage and the accessories are removed, they should be cleaned and inspected as described in chapter 6.



## 5.4. LIST OF THE ACCESSORIES

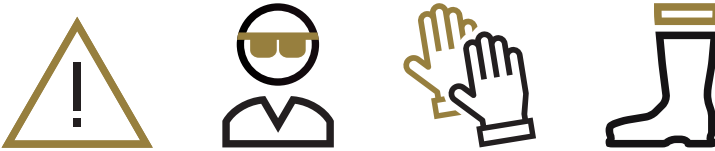
In the table below the accessories are listed to be used with SAVA sealing bandages. All listed items are compatible with the available variants of SAVA sealing bandages, SB type.

Table 3: Accessories for sealing bandages, SB type

CODE	NAME
528873	Foot pump 1.5 bar
529094	Inflation hose 10 m - blue
529663	Single fitting controller 1.5 bar

## 6.0. MAINTENANCE AND CLEANING

### 6.1. SAFETY WARNINGS



Always wear protective goggles, gloves and footwear when cleaning SAVA sealing bandages.



**If the product is contaminated by hazardous substances, protective equipment should be used in accordance with the relevant regulations for a specific hazardous substance. Comply with applicable local regulations and guidelines.**

### 6.2. CLEANING AFTER USE

Clean and inspect SAVA sealing bandage after every use. Long-term exposure to stains caused by certain hazardous substances, can damage the sealing bandages. Dirt in the inflation coupling prevents proper connection with the inflation hose and obstructs the air flow.

Check the opening in the coupling; if it's filled with dirt, remove it with a thin wire. Always pull the dirt out of the coupling, do not push it inside a SAVA sealing bandage.

Use a hard-bristle brush to remove any agglutinated dirt from the surface of SAVA sealing bandages. Move the brush in various directions. Use of sharp objects for dirt removal is forbidden.

After removing all the agglutinate dirt, soak any marks or stains on SAVA sealing bandage with a light solution of washing-up detergent and warm water, and remove the remaining dirt from the surface with a hard-bristle brush. Do not use petrol, diluters, alcohol or aggressive cleaning agents.

Rinse SAVA sealing bandage with clean, cold water. The jet of water will remove any remaining dirt and detergent from the surface of SAVA sealing bandages.



**High-pressure cleaners should NOT be used.**



Hold SAVA sealing bandage upright, wipe its coupling with a clean cloth then allow to air dry.



**Dryers or heat devices should NOT be used.**

Carefully check the cleaned and dry SAVA sealing bandages:

- Check for air bubbles, cuts, worn-out parts that can be hidden by dirt. Mark the damage or defect with a chalk. Consult the manufacturer or an authorised agent about the seriousness of the damage or possibility for further use of SAVA sealing bandage.
- Check the coupling; in the cases of damages that prevent connection to the plug on the hose, replace it.

### 6.3. REPLACEMENT OF INFLATION COUPLING

Clip the hose clamp next to the SAVA sealing bandage.



Figure 22: Clip the hose clamp

Remove the hose from the connection on the SAVA sealing bandage.

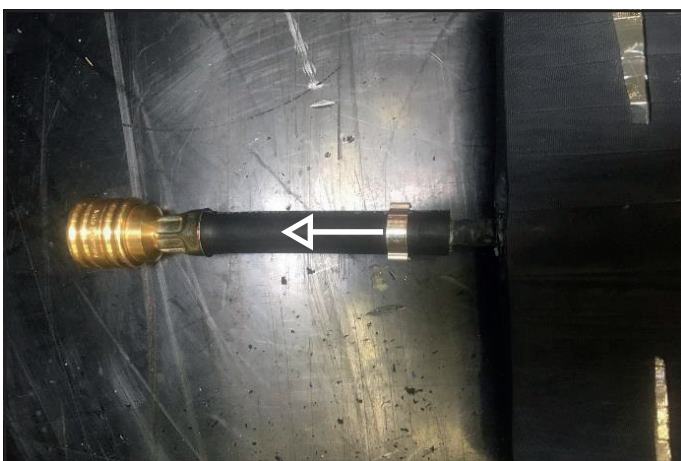


Figure 23: Remove the hose

Pull a clamp over the new hose with an integrated inflation coupling. Insert the hose in the connection on the sealing bandage. The hose clamp should be positioned between 8 and 12 mm from the edge of the SAVA sealing bandage. Clamp the hose in position.



Figure 24: Mount the hose to the connection of the sealing bandage (left), position of the clamp (right)



Figure 25: Clamping the clamp in place

## 6.4. PREVENTIVE MAINTENANCE

Visual and performance tests are obligatory and should be conducted by a person qualified for work with SAVA sealing bandages. We recommend that periodic tests are performed. They can be performed either by the manufacturer or a person authorised by the manufacturer.

## 6.5. INSPECTION INTERVALS

### 6.5.1. SAVA SEALING BANDAGE

Table 4: Inspection intervals for SAVA sealing bandages

TEST	INSPECTION INTERVAL	TEST OPERATOR	PROCEDURE
Visual test	<ul style="list-style-type: none"> <li>After every use</li> <li>Annually</li> </ul>	A person qualified for work with SAVA sealing bandages	Chapter 6.6.1.1.
Performance test	<ul style="list-style-type: none"> <li>After every use</li> <li>Annually</li> </ul>	A person qualified for work with SAVA sealing bandages	Chapter 6.6.1.2.
Periodic test	Recommended in the 5 <sup>th</sup> , 8 <sup>th</sup> , 10 <sup>th</sup> , 11 <sup>th</sup> , 12 <sup>th</sup> , 13 <sup>th</sup> and 14 <sup>th</sup> year after the manufacture.	Manufacturer or a person authorised by the manufacturer	

## 6.5.2. FOOT PUMP

Table 5: Inspection intervals for foot pumps and controllers

TEST	INSPECTION INTERVAL	TEST OPERATOR	PROCEDURE
Visual test	<ul style="list-style-type: none"> <li>• After every use</li> <li>• Annually</li> </ul>	A person qualified for work with SAVA sealing bandages	Chapter 6.6.2.1.
Performance test	<ul style="list-style-type: none"> <li>• After every use</li> <li>• Annually</li> </ul>	A person qualified for work with SAVA sealing bandages	Chapter 6.6.2.2.
Periodic test	Recommended in the 5 <sup>th</sup> , 8 <sup>th</sup> , 10 <sup>th</sup> , 11 <sup>th</sup> , 12 <sup>th</sup> , 13 <sup>th</sup> and 14 <sup>th</sup> year after the manufacture.	Manufacturer or a person authorised by the manufacturer	

## 6.5.3. INFLATION HOSE

Table 6: Inspection intervals for inflation hoses

TEST	INSPECTION INTERVAL	TEST OPERATOR	PROCEDURE
Visual test	<ul style="list-style-type: none"> <li>• After every use</li> <li>• Annually</li> </ul>	A person qualified for work with SAVA sealing bandages	Chapter 6.6.3.1.
Performance test	<ul style="list-style-type: none"> <li>• After every use</li> <li>• Annually</li> </ul>	A person qualified for work with SAVA sealing bandages	Chapter 6.6.3.2.
Periodic test	Recommended in the 5 <sup>th</sup> , 8 <sup>th</sup> , 10 <sup>th</sup> , 11 <sup>th</sup> , 12 <sup>th</sup> , 13 <sup>th</sup> and 14 <sup>th</sup> year after the manufacture.	Manufacturer or a person authorised by the manufacturer	

## 6.6. TEST PROCEDURES

### 6.6.1. SEALING BANDAGE

#### 6.6.1.1. Visual test



**The following tests should be carried out outdoors.**



**If SAVA sealing bandage fails to pass the visual test, it should be removed from further use. If in doubt about the seriousness of the damage, the product should be inspected by the manufacturer.**

Connect SAVA sealing bandage as instructed in chapter 5.3. and inflate it to 0.2-times working pressure. Visually check for unusual bulges, punctures, cuts or similar mechanical damages. Using a brush, apply soap water on the entire surface of SAVA sealing bandage, in the connection area too. Visually check if SAVA sealing bandage and the connection are airtight.

### 6.6.1.2. Performance test



**The following test should be carried out outdoors. Provide for a proper safety distance between people and the test object, as well as buildings and the test object.**



**If SAVA sealing bandage fails to pass the performance test, it should be removed from further use. If in doubt about the seriousness of the damage, the product should be inspected by the manufacturer.**



**To qualify for testing the performance, SAVA sealing bandage should first pass the visual test.**



**If SAVA sealing bandage is suspected unsafe to work with or be tested, consult the manufacturer.**

Connect SAVA sealing bandage as instructed in chapter 0. and inflate it to 0.5-times working pressure. If the pressure in SAVA sealing bandage does not drop by more than 10 %, within an hour, the bandage has passed the performance test.

## 6.6.2. FOOT PUMP

### 6.6.2.1. Visual test

Visually check the foot pump for defects. Check the pressure gauge for damages. Check if the protective valve on the safety valve can be unscrewed and screwed smoothly.

### 6.6.2.2. Performance test

A performance test for the foot pump includes checking for correct functioning.

Connect the outlet coupling of foot pump's hose on test pressure gauge. Check if the connector of foot pump's hose and the coupling of test pressure gauge lock correctly.

Repeatedly step on the pump's pedal to build up the working pressure in the system. Check if the pointer of the pressure gauge moves across the entire indication range. If the pedal is released, the pressure in the system should not drop. Check the pressure on the pressure gauge and test pressure gauge. A permissible deviation is  $\pm 10\%$  of the maximum working pressure. Apply soap water on the inflation hose, the connection between the inflation hose and the foot pump, and the connection between the connector of the inflation hose and the coupling of test pressure gauge. Check visually for any leaks on the coated areas.

Check the function of the safety valve by pressing the foot pump lever and monitor, at which pressure the safety valve opens; it should open in the range between the maximum working pressure and 1.1-times maximum working pressure.

When testing is finished, relieve the pressure by opening the protective valve on the safety valve. Check if the pointer of the pressure gauge is smoothly dropping across the entire working area during pressure release.

### 6.6.3. INFLATION HOSE

#### 6.6.3.1. Visual test

Visually check the inflation hose. Check its coupling and connection for damages and any other defects. Check if the coupling and the connector lock tightly. Check the hose for ruptures, punctures and other damages such as stiff areas due to exposure to acids etc.

#### 6.6.3.2. Performance test

A performance test for the hose includes checking for correct functioning.

Connect the inflation hose to the controller (the controller should be connected to the air source) or the foot pump. When connecting the coupling of the inflation hose to the connector of the controller or the foot pump, check if both parts lock and unlock properly. Connect test pressure gauge to the connector of the inflation hose. Check if the connector of the inflation hose and the coupling of test pressure gauge lock and unlock properly. Fill the inflation hose to the maximum working pressure. Apply soap water on the entire surface, the connection of the hose coupling and the connector of the controller or the foot pump, and the connection between the hose coupling and test pressure gauge coupling. Visually check for any leaks on the coated areas.

### 6.7. SERVICE LIFE

The age of SAVA sealing bandage is clear from the serial number; the first two digits refer to the month and the second two to the year of manufacture.

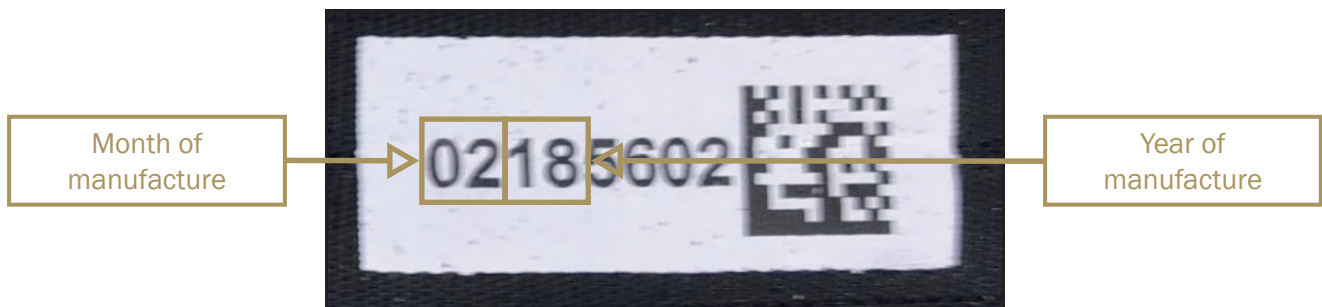



Figure 26: Serial number on SAVA sealing bandage

The picture shows a SAVA sealing bandage that was manufactured in February (02) in 2018 (18).

SAVA sealing bandages are made from rubber and thus exposed to the process of natural ageing. Even though no defects were detected during a visual inspection, products should be taken out of service after 15 years because the material structure could hide invisible signs of ageing.



## 6.8. FAULT IDENTIFICATION AND REMEDY

FAULT	CAUSE	REMEDY
The inflation hose and the hose connector of the foot pump fails to be properly connected	<ul style="list-style-type: none"> <li>• Dirt in the connector or coupling.</li> <li>• The connector or coupling is damaged.</li> </ul>	<ul style="list-style-type: none"> <li>• Clean the connector and the coupling.</li> <li>• Replace the hose or the foot pump.</li> </ul>
Even though the foot pedal has been activated, SAVA sealing bandage fails to be filled.	<ul style="list-style-type: none"> <li>• Safety valve failure.</li> <li>• Protective screw on the safety valve is loosened.</li> <li>• The connector or the coupling is blocked.</li> <li>• Connecting hoses are not connected correctly.</li> <li>• The hose of the foot pump or connecting hoses are damaged or not airtight.</li> </ul>	<ul style="list-style-type: none"> <li>• Replace the foot pump.</li> <li>• Tighten the protective screw on the safety valve.</li> <li>• Clean the connector or the coupling</li> <li>• Check and reconnect the connecting hoses.</li> <li>• Replace the foot pump or connecting hoses.</li> </ul>
Even though the lock screw on the safety valve of the foot pump is open, SAVA sealing bandage fails to be emptied.	<ul style="list-style-type: none"> <li>• Connectors or couplings are blocked.</li> </ul>	<p> <b>WARNING!</b></p> <ul style="list-style-type: none"> <li>• <b>Extreme care is required during the following procedure.</b></li> <li>• <b>If the SAVA sealing bandage is to seal hazardous substances use all the protective equipment required in handling with a specific substance. Comply with applicable local regulations and guidelines.</b></li> </ul> <ol style="list-style-type: none"> <li>1. Depressurise the foot pump and inflation hoses by opening the lock screw on the safety valve.</li> <li>2. Be extremely careful when disconnecting the connecting hose from SAVA sealing bandage that fails to be deflated.</li> <li>3. Push a suitably big needle in the hole of the filling coupling on SAVA sealing bandage to relieve the pressure. Be careful as during this procedure the sealed hazardous substance could begin to leak again or SAVA sealing bandage could move.</li> </ol>

## 7.0 WARRANTY CONDITIONS

### 7.1. GENERAL CONDITIONS

- 7.1.1. These warranty conditions apply as for Environmental protection and rescue products, manufactured by Trelleborg Slovenija, d.o.o. (hereinafter referred to as TBSLO), Product Area Environmental protection and rescue products (Products). If any provision of this warranty conditions would be contrary to any mandatory legal provisions in any particular jurisdiction, such provision shall apply to a maximum extent as provided for by such mandatory legal provisions.
- 7.1.2. Products which may be sold by TBSLO Product Area Environmental protection and rescue products but are not manufactured by it are not covered by this warranty and are sold exclusively with warranties, if any, by their original manufacturer.

### 7.2. MANAGEMENT OF THE PRODUCTS

- 7.2.1. In order to claim a remedy pursuant to this warranty, purchaser must conform to instructions for management of the Products, available at [www.savatech.eu/environmental-protection-and-rescue/manuals](http://www.savatech.eu/environmental-protection-and-rescue/manuals)

### 7.3. WARRANTY

- 7.3.1. TBSLO warrants to the purchaser that for the period of twelve (12) months as of delivery of the Products, such Products shall be free from defects in material and workmanship, subject to normal and management of the Products, including, among others, proper storage. For high pressure lifting bags, the warranty period amounts to thirty-six (36) months as of delivery.
- 7.3.2. This warranty shall be in lieu of any other warranties, express or implied, including, but not limited to, any warranty of merchantability or fitness for a particular purpose.

### 7.4. EXCLUSION OF WARRANTY

- 7.4.1. Warranty shall be excluded in cases where the Products have not been used for the ordinary purpose or have been subject to abnormal conditions such as, but not limited to misuse, mishandling (such as, but not limited to, cuts, tears, vandalism, fire, wilful destruction, improper installation and/or improper maintenance, misapplication), use of unauthorized components or attachments or if adjustments or repairs have been performed by anyone other than TBSLO or its authorized agents.
- 7.4.2. Warranty shall also be excluded and TBSLO shall not be held liable in case of force majeure circumstances, such as, but not limited to:
- war or threat of war, sabotage, insurrection, riots or requisition;
  - all laws, restrictions, regulations, by-laws, prohibitions or any other measures by the governmental, parliamentary or local bodies;
  - import and export regulations or embargo;
  - strikes, lock-outs or other industrial measures or trade disputes (if including Manufacturer's employees or third party);
  - difficulties with supply of raw materials, work force, fuel, parts or machinery;
  - power blackout, break of machinery.

- 7.4.3. TBSLO shall not be held liable for any deficiencies in Products manufactured according to drawings, designs, project drafts and/or specifications provided by the purchaser.
- 7.4.4. Ordinary wear and tear are not covered by this warranty.

## **7.5. MAKING A WARRANTY CLAIM**

- 7.5.1. Purchaser is obliged to take delivery of the Products and perform an ordinary inspection of the Product upon delivery.
- 7.5.2. Any claim by the purchaser with reference to the Products shall be deemed waived unless submitted in writing to TBSLO within the earlier of (I) eight days as of the discovery of the defect, or (II) twelve months as of the date of delivery of the Products or thirty-six (36) months as of delivery of high pressure lifting bags. Discovery of the defect is deemed to have occurred when a defect could have reasonably been detected by the purchaser.
- 7.5.3. Claim must at least contain the following data:
- part number,
  - serial number,
  - description of defect,
- and must be substantiated by adequate evidence, such as pictures... Upon request, TBSLO must be allowed to inspect the Product.
- 7.5.4. To obtain performance under this warranty, any products suspected of having a manufacturing defect in materials or workmanship shall be returned freight prepaid for inspection to TBSLO, Product Area Environmental protection and rescue products, Škofjeloška c. 6, 4000 Kranj, Slovenia..

## **7.6. REMEDIES**

- 7.6.1. TBSLO shall decide on a claim within forty -five days after receiving a complete documentation and Product pursuant to art 5.
- 7.6.2. Providing TBSLO acknowledges the claim as justified, it shall, at its discretion, either:
- repair the Product,
  - replace those components of the Product which are defective,
  - replace the Product, if repair is not possible or reasonable,
  - reimburse the consideration for the Product or its components which are defective.
- 7.6.3. Whenever TBSLO repairs or replaces the Product at its expense or reimburses the purchase price, it shall reimburse the purchaser, with a credit note, the same surface freight amount the purchaser had when returning the Product to TBSLO.
- 7.6.4. Remedies pursuant to this article 6 shall constitute the sole and exclusive remedy in the event of a breach of warranty. For the avoidance of doubt, TBSLO shall not be liable for any incidental, consequential and/or non-pecuniary damages or damages having a comparable effect. TBSLO's aggregate liability in respect of any and all losses arising under or in connection to the contract/ purchase order/any similar document that is the basis for sale of Products, shall be limited to an amount equal to the invoiced price for the Products supplied. Any exclusions or limitations of liability are agreed to be extended for the benefit of all entities within TBSLO's group.

## **7.7. CLOSING PROVISIONS**

- 7.7.1. No statement or action by Trelleborg Slovenija, whether express or implied, other than set forth herein, shall constitute a warranty.
- 7.7.2. Any applicability of general terms and conditions used by the purchaser, wherever stated, is hereby explicitly excluded, notwithstanding any provisions of such general terms and conditions to the contrary.
- 7.7.3. This warranty statement is subject to the laws of the Republic of Slovenia, with the exclusion of its conflict of law principles.

Kranj, January 2019





Trelleborg Slovenija, d.o.o.  
PA Environmental protection products (PA EKO)

We are a division of Trelleborg Slovenija d.o.o..  
We manufacture and sell rubber products for environmental protection and rescue operations and industrial use. Our growing division was established more than thirty years ago and is constantly striving to meet our customer's current and future needs and expectations.

[WWW.SAVATECH.EU](http://WWW.SAVATECH.EU)  
[WWW.SAVATECH.COM](http://WWW.SAVATECH.COM)

Instructions for Use: Leak sealing bandages

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