

Instructions for use: Leak sealing wedges and cones

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1.0. IDENTIFICATION

1.1. PRODUCT TYPE

Sealing bags, either cone-shaped or wedge-shaped:

- Sealing wedge of type 1;
- Sealing wedge of type 2;
- Sealing wedge of type 3;
- Sealing cones.

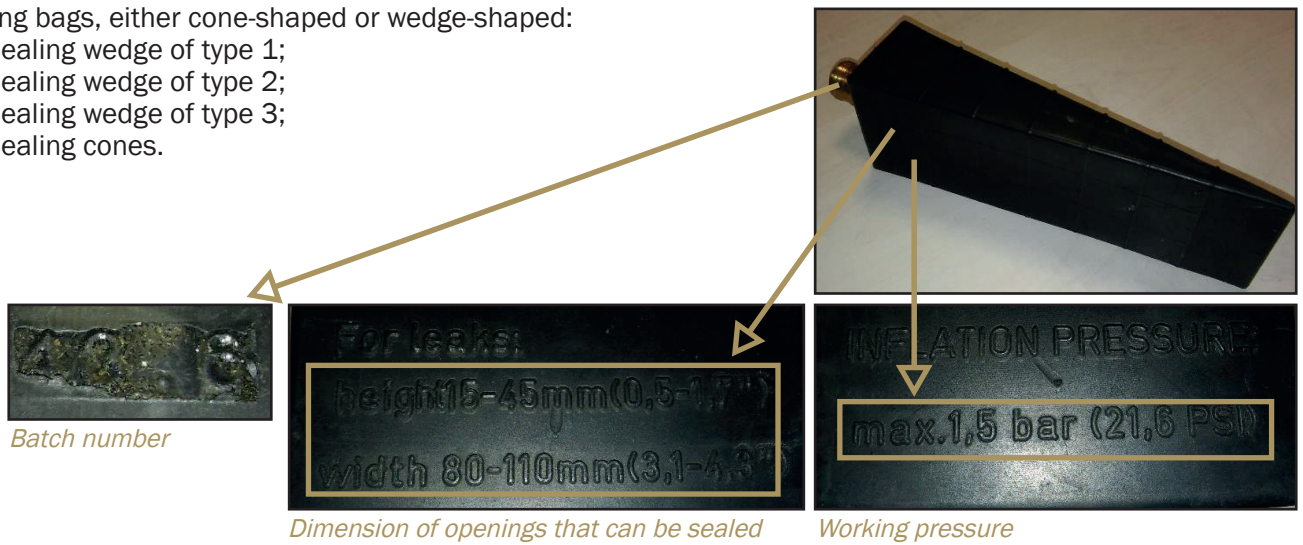


Figure 1: Identification of SAVA sealing wedges

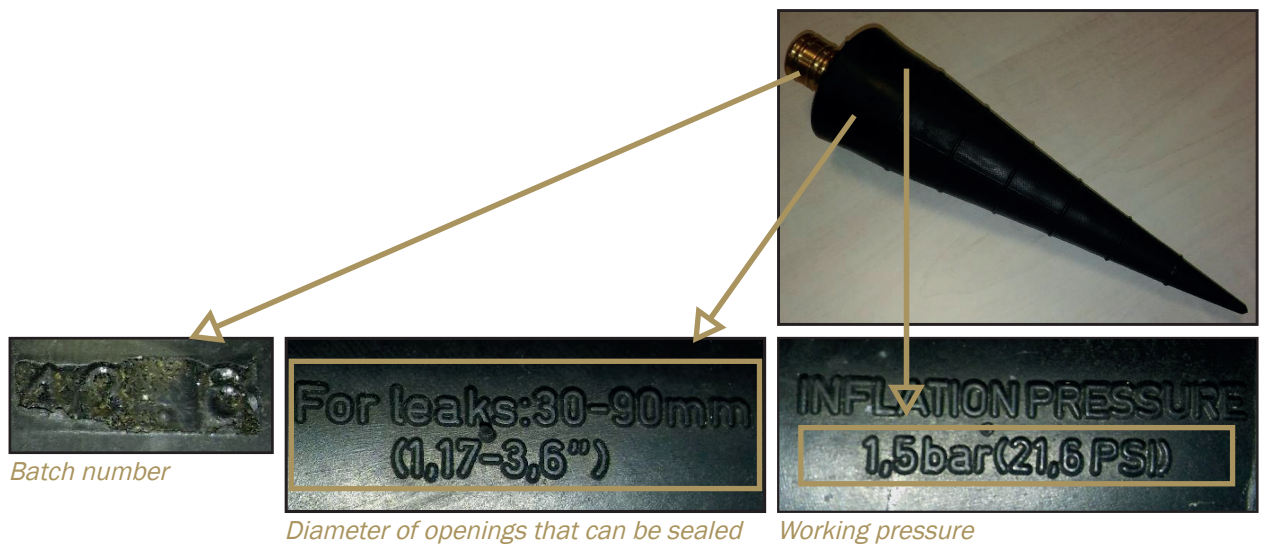


Figure 2: Identification of SAVA sealing cones

1.2. MANUFACTURER



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2.0. PRODUCT DESCRIPTION

2.1. BASIC FUNCTIONS AND AREAS OF APPLICATION

Sealing wedges and cones can seal openings of round, rectangular or irregular shape. By means of the accessories sealing wedges and cones can be positioned from a distance, thereby minimising user's exposure to any leaking liquids.

Sealing wedges are suitable for openings within the application range from 15 x 60 mm to 60 x 170 mm, whereas sealing cones can cover the application range from Ø30 mm to φ Ø90 mm.

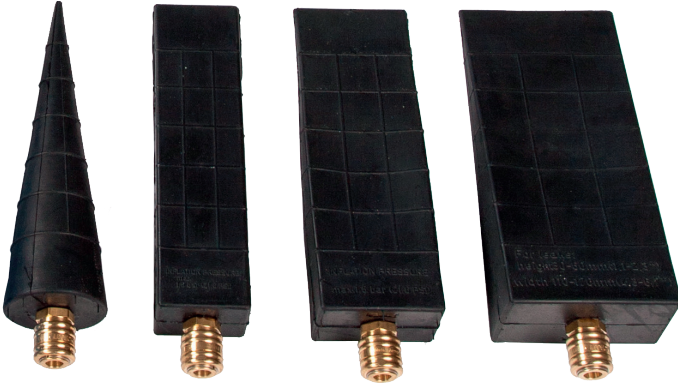


Figure 2: Identification of SAVA sealing cones

Sealing wedges are shaped like a wedge and sealing cones like a cone. They are made from a combination of soft natural and synthetic rubber, resistant to oils, oil products, acids, lyes and other atmospheric influences. A suitable cord structure provides for proper flexibility and strength of the wedges or cones. All sealing wedges and cones are equipped with a quick coupling for inflation and deflation.

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

2.2. BASIC DATA

Table 1: Technical data about SAVA sealing wedges and cones

TYPE	PART NUMBER	SIZE USAGE RANGE		WEIGHT	WORKING PRESSURE	DEFLATED PLUG DIMENSIONS			INFLATION VALVE
		HEIGHT	WIDTH			LENGTH	WIDTH	HEIGHT	
		[mm] / [inch]	[mm] / [inch]			[mm] / [inch]	[mm] / [inch]	[mm] / [inch]	Thread size
WEDGE-SHAPED SEALING BAG TYPE 1	528386	15-45 / 0.6"-1.8"	60-80 / 2.4"-3"	0.3 / 0.7	1.5 / 22	230 / 9"	60 / 2.4"	50 / 2"	R 1/4"
WEDGE-SHAPED SEALING BAG TYPE 2	528387	15-45 / 0.6"-2.8"	80-110 / 3"-4"	0.4 / 0.9	1.5 / 22	230 / 9"	80 / 3"	55 / 2.2"	R 1/4"
WEDGE-SHAPED SEALING BAG TYPE 3	528388	30-60 / 1.2"-2.4"	110-170 / 4"-7"	0.5 / 1.1	1.5 / 22	230 / 9"	110 / 4"	70 / 3"	R 1/4"
CONE-SHAPED SEALING BAG	528389	Ø 30-90 / Ø 1.2"-3.5"		0.3 / 0.7	1.5 / 22	230 / 9"	Ø 65 / Ø 2.6"	Ø 7 / Ø 0.3"	R 1/4"

3.0. DEFINITIONS

Controller: A device for inflation of SAVA sealing wedges or cones.

Maximum working pressure: The maximum permissible pressure for inflation of SAVA sealing cone or wedge.

Pressure gauge: A device that indicates the pressure.

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

Foot pump: A device for inflation of SAVA sealing cones and wedges, operated by using one's foot.

Inflation rod: A rod for both insertion and inflation of wedges and cones.

Sealing wedge: An inflatable wedge-shaped product for sealing of various openings (damages).

Sealing cone: An inflatable cone-shaped product for sealing of various openings (damages).

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

Application area: The size of an opening that can be sealed with a particular SAVA sealing wedge or cone.

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

Splash disc: A rubber protection, shaped like a disc, that protects the user against splashes of substance from the opening to be sealed.

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 twisted or folded. They should be stored in a dark and dry space, protected against extreme temperatures (see chapter 4.5).

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, when they 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 for all types of product are enclosed with this document. SAVA recommends that they 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 USAGE RESTRICTIONS



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 cones and wedges, always wear personal protective equipment. Fire fighters and rescue team members should wear all the protective equipment as specified.

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





When working with SAVA sealing cones and wedges 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. INSTRUCTIONS AND PERIODIC TEST REPORTS



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 controllers or foot pumps, designated for work at the specified pressure.
- Inflate the product until it reaches the specified working pressure.
- Never inflate the product to a pressure that exceeds the maximum working pressure defined for the product.
- Monitor the pressure in the product throughout the use; if required, refill the product to correct the pressure.
- The length of the inflation rods should enable inflating 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 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 damages 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 wedges and cones 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 wedges and cones 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 wedges and cone 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. an 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 types of SAVA sealing wedges and cones are made from the NR/BR material. Special types of these products can be made also from CR; the CR products 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
		50 / 122	1	1	1
Butanol		100 / 212	4	3	1
				2	4
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
Formaldehyde	40	23 / 73.4	1	1	1
	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	60	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 wedges and cones, carefully read chapter 4, which describes the procedures for safe work and restrictions of use!

5.1. USE OF INFLATION RODS AND A SPLASH DISC

Inflation rods, and a splash disc are part of the accessories and thus already included in the set of SAVA sealing cones and wedges.



Figure 4: Inflation rods (left) and splash disc (right)

Inflation rods are of equal size. Three rods are identical, whereas the fourth one has a chain with a deflation nipple attached next to the coupling. Inflation rods can be combined in different ways; however, it should be made sure that the rod with a plug is positioned furthest from the wedge or the cone. Different number of rods can be used.



Figure 5: Four inflation rods connected together

The splash disc protects the user against splashes of the leaking liquid. The inflation rod should be inserted through the hole in the middle of the disc. The splash disc should be positioned at the bottom end of the first inflation rod connected to the wedge or the cone.



Figure 6: Correctly mounted splash disc

5.2. USE OF THE FOOT PUMP

SAVA sealing cones and wedges are commonly inflated with a foot pump.

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.

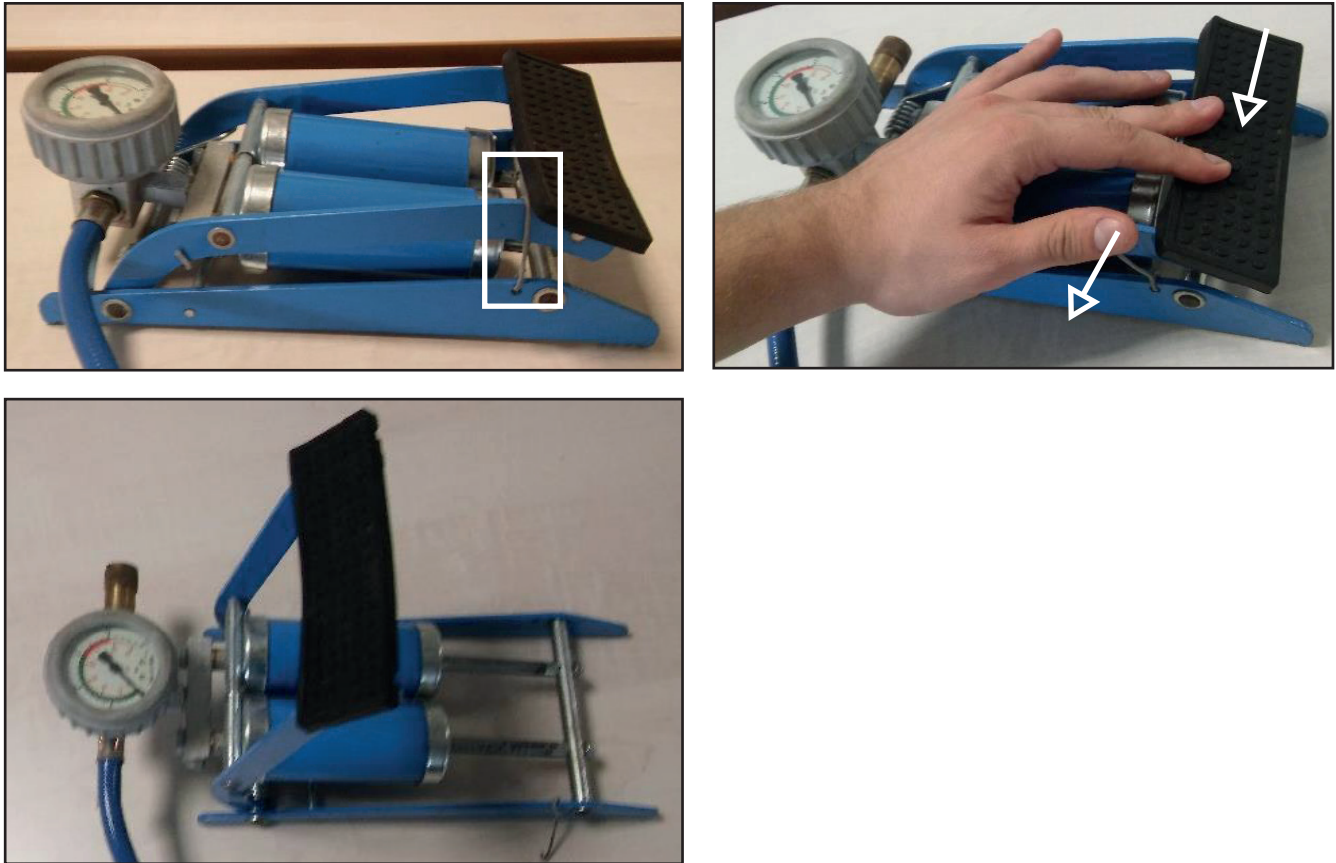


Figure 7: The marked pin of the foot pedal (top left), releasing the pin (top right), the released pedal of the foot pump (bottom)

Prior to using the foot pump, make sure that the lock screw on the safety valve end is in its closed position. To close the screw, turn it clockwise.

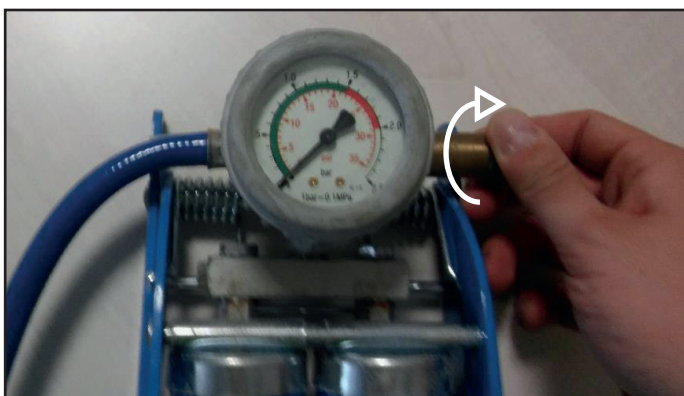


Figure 8: Check if lock screw is closed

5.2.2. CONNECTION AND INFLATION

The foot pump is normally connected to the controller which is connected to the SAVA sealing wedge or cone via the inflation rods.



Figure 9: Inflation hose connected to the controller

Inflate the sealing wedge or cone 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.

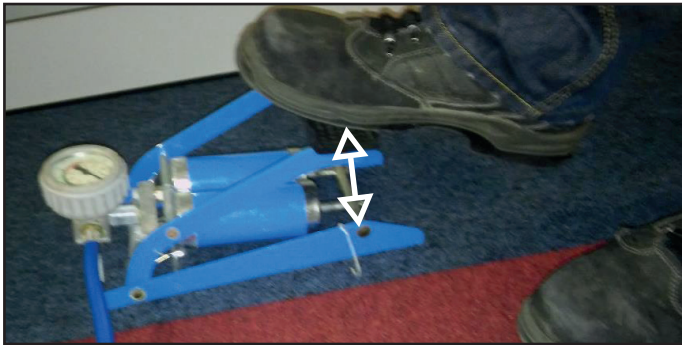


Figure 10: Inflate the sealing wedge or cone by pushing and releasing the foot pedal

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

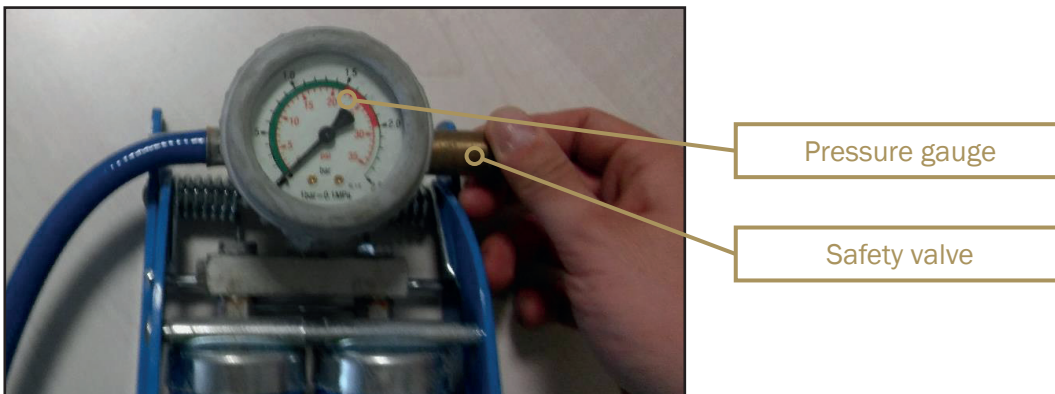


Figure 11: Pressure gauge and safety valve on the foot pump

If the pressure in SAVA sealing wedge or cone 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 wedge or cone, unscrew the lock screw on the safety valve end. To unscrew the lock screw, turn it anti-clockwise.

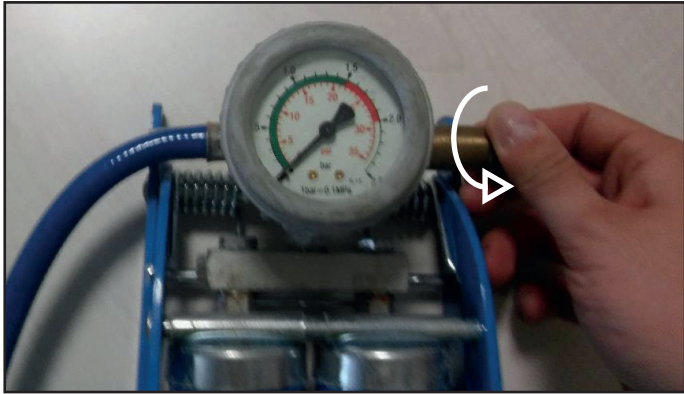


Figure 12: Open lock screw on the foot pump

When the emptying is finished, screw the stop valve on the foot pump by turning clockwise.

Afterwards disconnect the inflation hose of the foot pump 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.

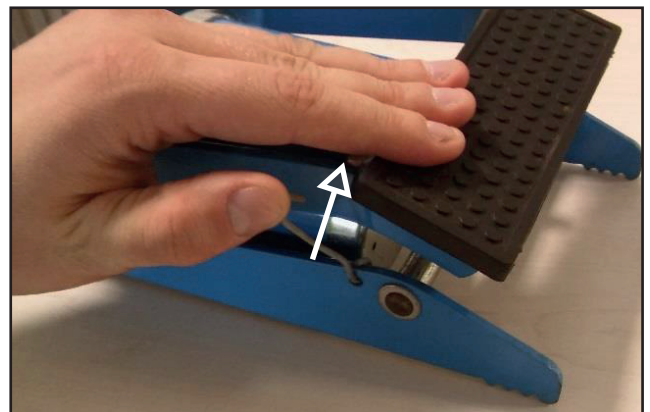
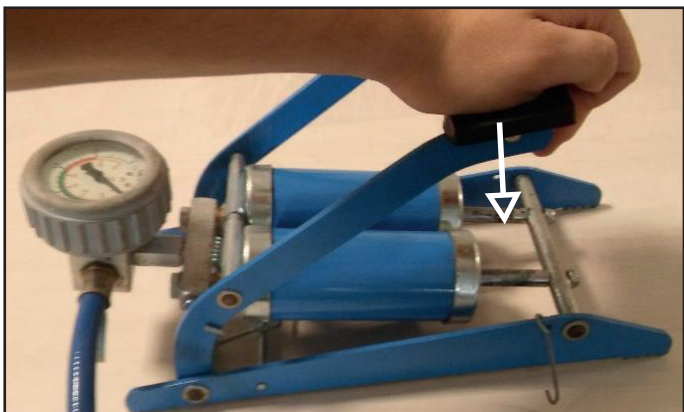


Figure 13: Lock the pedal in the lower position

5.3. USE OF THE CONTROLLER

For additional control of the inflation pressure in SAVA sealing wedges and cones a controller is used. The controller enables the user, who inserts SAVA sealing wedges and cones in the damaged area, to control the pressure inside the product. The controller has a safety valve integrated to protect the product against high inflation pressure.



Figure 14: Controller

5.3.1. OPERATING THE CONTROLLER

First check if the safety valve is shut-off. Connect the controller to the last inflation rod of the sealing wedge or cone and connect it to the foot pump. Insert the inflation rod connector in the coupling so that it snaps in.

The valve is used to supply air to the SAVA sealing wedge or cone. The valve is opened, when its lever runs parallel to the inlet coupling – SAVA sealing wedge or cone is being inflated. The safety valve should be closed at that time. The valve is closed, when its lever runs across the inlet coupling – the sealing wedge or cone is not being inflated.



Figure 15: Valve on the controller in closed position

The pressure in SAVA sealing wedges or cones can be monitored on the pressure gauge of the controller. The green colour on the pressure gauge scale indicates the permitted pressure range for SAVA sealing wedges and cones. The value of working pressure on the pressure gauge is indicated at the end of the green field.



SAVA sealing cones and wedges should not be used in the red or above the red range of the pressure gauge.



Figure 16: Pressure gauge on the controller

To provide for additional safety, the controller is equipped with a safety valve set at 1.1-times working pressure. If the set value is exceeded, the safety valve opens to relieve the pressure from the SAVA sealing wedge or cone.

The output connector of the controller is intended for connection to the inflation rods, which are connected to a SAVA sealing wedge or cone.



When pressurized, the SAVA sealing wedge or cone must always be connected to the controller.

To deflate the sealing wedges or cones, unscrew the protective screw on the safety valve of the controller.



Figure 17: Opening the safety valve screw

5.4. USE OF SAVA SEALING CONES AND WEDGES

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.

5.4.1. PREPARATION OF SEALING WEDGES AND CONES

Choose a suitable SAVA sealing cone or wedge that fits the opening to be sealed. Mount the splash disc on the first inflation rod that will be attached to SAVA sealing wedge or cone. Connect the required number of inflation rods. Make sure the inflation rod with a plug is positioned last. Mount the controller on the last inflation rod and the foot pump on the controller.



Figure 18: SAVA sealing cone prepared for use

5.4.2. INSERTION OF SEALING WEDGES AND CONES

Insert the prepared SAVA sealing wedge or cone as perpendicularly to the opening or damaged surface as possible. Using the inflation rods, inflation SAVA sealing wedge or cone until it softly lands, avoid inflationing in and pulling out.



Figure 19: SAVA sealing cone inserted in the damaged surface

5.4.3. INFLATION OF SEALING WEDGES AND CONES

Prior to filling check if the caps of the safety valves on the controller and the foot pump are closed. Open the valve on the controller and start stepping on the pedal of the foot pump as described in chapter Connection and inflation. Fill SAVA sealing wedge or cone until the leak is sealed or the maximum working pressure of 1.5 bar is reached.



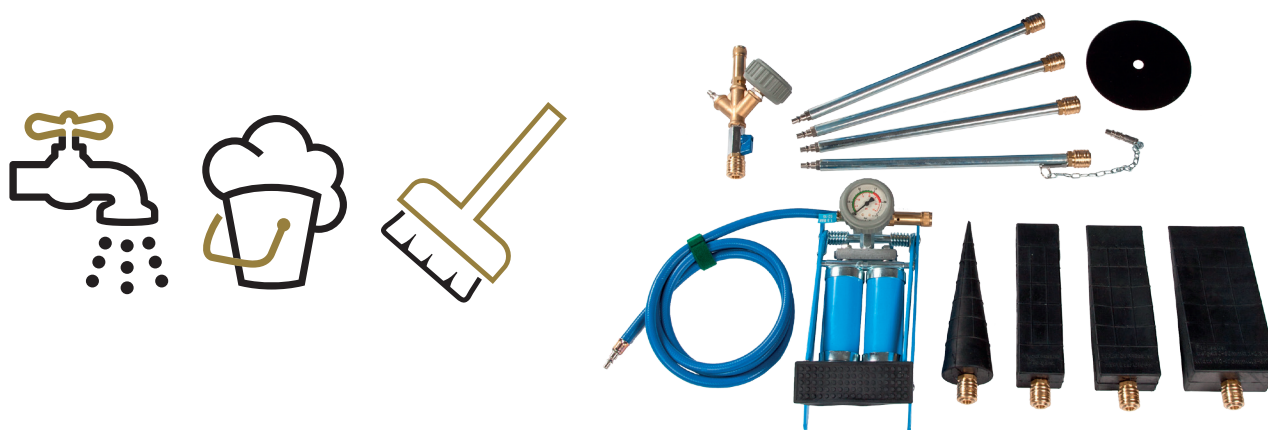
Figure 20: Inflated SAVA sealing cone

5.4.4. REMOVAL OF SEALING WEDGES AND CONES

When the work is finished, SAVA sealing wedge or cone should be emptied. Open the lock screw on the safety valve of the foot pump or the controller as described in chapters Emptying, disconnection and tidying up and Operating the controller.

When SAVA sealing wedge or cone is entirely empty, disconnect the foot pump, controller and inflation rods in reverse order.

When SAVA sealing wedge or cone and the accessories are removed, they should be cleaned and inspected as described in chapter Maintenance and cleaning.



5.5. LIST OF THE ACCESSORIES

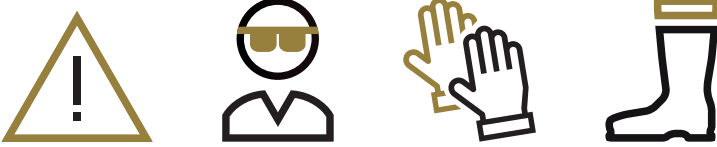
In the table below the accessories are listed to be used with SAVA sealing wedges and cones. All listed items are compatible with the available types of SAVA sealing wedges and cones.

Table 3: Accessories for SAVA sealing wedges and cones

CODE	NAME
528618	Push and inflation rod with a plug for emptying
528619	Push and inflation rod
529510	Controller 1.5 bar
528873	Foot pump 1.5 bar
529087	Splash disc
532632	Portable plastic case 470 × 360 × 120 mm (18,5" × 14" × 5"),

6.0. MAINTENANCE AND CLEANING

6.1. SAFETY WARNINGS



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



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 wedges and cones after every use. Long-term exposure to stains caused by certain hazardous substances, can damage the sealing wedges and cones. 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 wedge or cone.

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

After removing all the agglutinated dirt, soak any marks or stains on SAVA sealing wedges or cones 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 wedges and cones with clean, cold water. The jet of water will remove any remaining dirt and detergent from the surface of SAVA sealing wedges or cones.



High-pressure cleaners should NOT be used.

Wipe SAVA sealing wedges and cones with a clean cloth and allow to air dry.



Dryers or heat devices should NOT be used.

Carefully check the cleaned and dry SAVA sealing wedges and cones:

- 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 severity of the damage or possibility for further use of SAVA sealing wedges or cones.
- Check the coupling; in the cases of damages that prevent connection to the plug on the connecting hose, replace it.

6.3. REPLACEMENT OF INFLATION COUPLING

Unscrew the coupling from SAVA sealing wedge or cone; use a spanner 22. To unscrew the coupling, turn it to the left.



Figure 21: Unscrewing the coupling

Clean the threaded connector and wrap it with Teflon tape or coat it with sealing adhesive.



Figure 22: The thread wrapped with teflon tape

Screw a new coupling on the threaded connection, use a spanner 22. To screw the coupling, turn it to the right.



Figure 23: Screwing the new coupling

6.4. PREVENTIVE MAINTENANCE

Visual and performance tests are obligatory and can be conducted by a person qualified for work with SAVA sealing wedges and cones. 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 WEDGES AND CONES

Table 4: Inspection intervals for SAVA sealing wedges and cones

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

6.5.2. FOOT PUMP AND CONTROLLERS

Table 5: Inspection intervals for foot pump and controller

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

6.5.3. INFLATION ROD

Table 6: Inspection intervals for inflation rods

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

6.6. TEST PROCEDURES

6.6.1. SAVA SEALING WEDGES AND CONES

6.6.1.1. Visual test



The following tests should be carried out outdoors.



If SAVA sealing wedge or cone 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 wedge or cone as instructed in chapter 5.2.2. 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 wedge or cone, also in the connector area. Visually check if SAVA sealing wedge or cone and the connector 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 wedge or cone 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 wedge or cone should first pass the visual test.



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

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

6.6.2. FOOT PUMP AND CONTROLLER

6.6.2.1. Visual test

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

6.6.2.1. Performance test

FOOT PUMP

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

Connect test pressure gauge to the outlet coupling of foot pump hose. Check if the connectors of foot pump hose and that of test pressure gauge lock properly.

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 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 hose connector and the coupling of test pressure gauge. Check visually for any leaks on the coated areas.

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

When testing of the safety valve 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 over the entire working area during pressure release.

CONTROLLER

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

Connect the foot pump on the inlet coupling of the controller.

Connect the inflation rod to the outlet coupling of the controller and test pressure gauge to the end of the inflation rod. Check if the connector of the controller and the coupling of the inflation rod lock properly.

Open the stop valve and step on the pedal of the foot pump to build up the pressure in the system up to the working pressure. Check if the pointer on the pressure gauge moves across the entire range. Check the pressure on the pressure gauge and test pressure gauge. A permitted deviation is $\pm 10\%$ of maximum working pressure. Apply soap water on the connection between the controller's connector and the inflation rod connector, and the connection between the hose of the foot pump and the controller's coupling. Visually check for any leaks on the coated areas.

Check the function of the safety valve by opening the stop valve and stepping on the pedal of the foot pump. Monitor the pressure at which the safety valve opens; it should open in the range between the maximum working pressure and 1.1-times maximum working pressure.

When testing of the safety valve 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 over the entire working area during pressure release.

6.6.3. INFLATION RODS

6.6.3.1. Visual test

Visually check the inflation rod. Check the coupling and the connector for damages or any other irregularities. Check the inflation rod for deformations or damages, and corrosion.

6.6.3.1. Performance test

A performance test for the inflation rod includes checking for correct functioning.

Connect the inflation rod to the foot pump. When connecting the coupling of the inflation rod to the connector of the foot pump, check if both parts lock and unlock properly. Connect test pressure gauge to the connector of the inflation rod. Check if the connectors of inflation rod and test pressure gauge lock and unlock properly. Fill the inflation rod to the maximum working pressure. Apply soap water on the inflation rod, the connection between the rod connector and the connector of the foot pump, and the connection between the rod coupling and test pressure gauge coupling. Visually check for any leaks on the coated areas.

6.7. SERVICE LIFE

The age of SAVA sealing wedges and cones is clear from the serial number: the first two digits refer to the week and the second two to the year of manufacture.

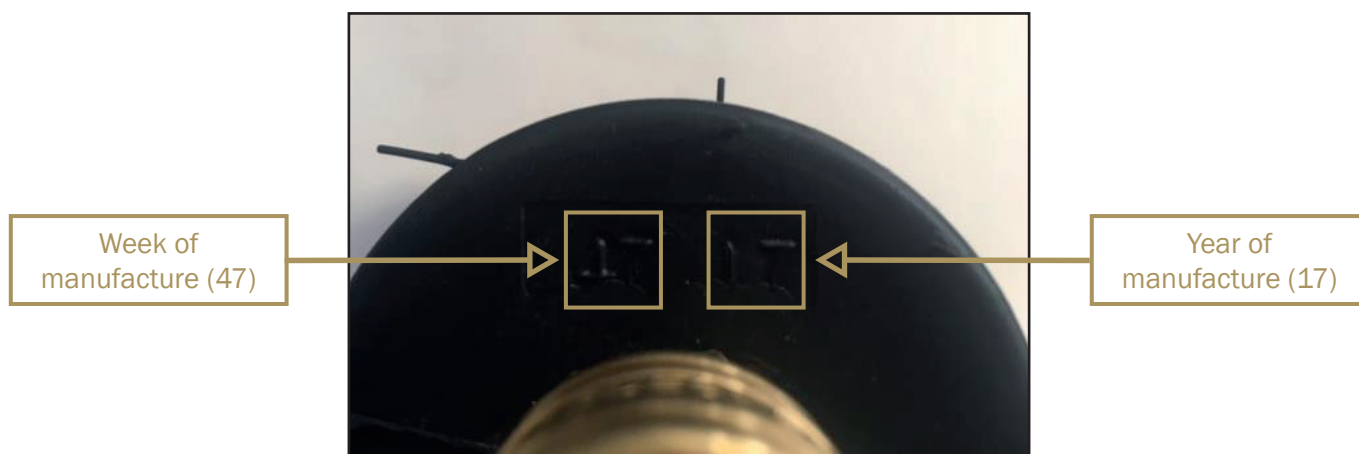



Figure 24: Serial number of SAVA sealing cone

The picture shows SAVA sealing cone that was manufactured in the 47th week of 2017 (17).

SAVA sealing wedges and cones 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 rod cannot be properly connected to hose connector of the foot pump/controller.	<ul style="list-style-type: none"> • Dirt in the connector or coupling. • The connector or coupling is damaged. 	<ul style="list-style-type: none"> • Clean the connector and the coupling. • Replace the inflation rod or the foot pump/controller.
The hose connector of the foot pump cannot be properly inserted in the connecting coupling of the controller.	<ul style="list-style-type: none"> • Dirt in connectors or couplings. • Connectors or couplings are damaged. 	<ul style="list-style-type: none"> • Clean the connector and the coupling. • Replace the foot pump or the controller.
Even though the stop valve on the controller is opened and the foot pump's pedal is pushed, SAVA sealing wedge or cone fails to be inflated.	<ul style="list-style-type: none"> • Safety valve failure. • Protective screw on safety valve is unscrewed. • The connector or coupling is blocked. • The foot pump and controller or inflation rods are not connected correctly. • The foot pump, controller or inflation rods are damaged and not airtight. 	<ul style="list-style-type: none"> • Replace the controller or foot pump. • Tighten the protective screw on the safety valve. • Clean the connector or coupling. • Check and re-connect the foot pump, controller and inflation rods. • Replace the foot pump, controller or inflation rods.
Even though the lock screw on the safety valve of the controller or foot pump is opened, SAVA sealing wedge or cone fails to be emptied.	<ul style="list-style-type: none"> • Connectors or couplings are blocked. 	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;">  </div> <div> <p>WARNING!</p> <ul style="list-style-type: none"> • Extreme care is required during the following procedure. • If SAVA sealing wedge or cone seals hazardous substances, use all the protective equipment required in handling with a specific substance. Comply with applicable local regulations and guidelines. <ol style="list-style-type: none"> 1. Depressurise the controller/foot pump/inflation rods by opening the lock screw on the safety valve. 2. Be extremely careful when disconnecting the inflation rod on SAVA sealing wedge or cone that fails to be deflated. 3. Push a suitably big needle in the hole of the filling coupling on SAVA sealing wedge or cone to relieve the pressure. Be careful as during this procedure the sealed hazardous substance could begin to leak again or SAVA sealing wedge or cone could move. </div> </div>

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

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
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Instructions for Use: Leak sealing wedges and cones

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