



**PLEASE READ AND UNDERSTAND THIS MANUAL BEFORE
USING SAVA PNEUMATIC REHABILITATION PACKERS**

PNEUMATIC REHABILITATION PACKERS

SAFETY INSTRUCTION MANUAL



**NONOBSERVANCE OF INSTRUCTIONS AND WARNINGS FOR SAFE OPERATION OF PNEUMATIC
PACKERS CAN DAMAGE PRODUCTS, CAUSE SERIOUS BODILY INJURIES OR EVEN DEATH.**

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ELEVEN RULES FOR SAFE OPERATION OF PNEUMATIC PACKERS

1. Stay clear of the danger zone while packer is inflated in the pipe (10)
2. Always wear protective clothing and equipment (4)
3. Always use accurate air pressure gauges (3)
4. Never exceed the maximum packer inflation pressure (9)
5. Before and after each use, clean the packer and inspect for surface tears, cuts or any other damage (1)
6. Always deflate (release pressure completely) the packer before removing from the pipe (11)
7. Always choose the correct size of packers for the job (2)
8. Always clean the pipe before inserting the packer (7)
9. Always make sure that the packer is correctly inserted in the pipe (8)
10. Always protect the packer from exposure to chemicals (6)
11. Always follow the correct procedure for installing the wheels on the packer (5)

SAFETY INSTRUCTIONS

Instructions for safe and proper operation of Sava packers

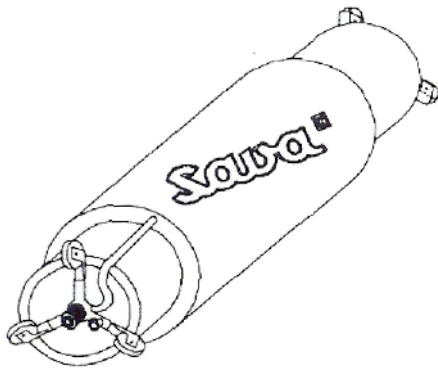
WARNING

READ THESE INSTRUCTIONS CAREFULLY BEFORE USING ANY SAVA PACKERS



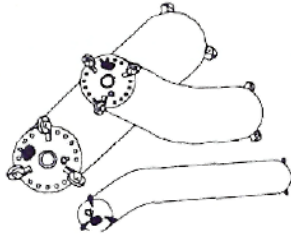
These instructions apply to all types and sizes of Sava packers: Short packers, Flexible packers, Long packers

All products are made of highly resilient, cord-reinforced elastomers, which provide additional stability and safety by preventing stretching in longitudinal direction. They can be filled with air or water. They can be used at temperatures from 14°F to 194°F (-10 to +90°C) (263°K - 363°K).



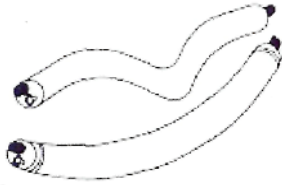
Short packers have a replaceable double-layer rubber sleeve mounted on PPH tube. On each side there are three wheels attached at an angle of 120 degrees to ensure stability and prevent tipping over while moved along the pipe. All products are designed in such a way that allows the greatest flow possible.

Due to their stiff construction they do not have to be inflated before use.



Flexible packers have a single-layer rubber sleeve. On each side of the packer wheels are attached to ensure stability and prevent tipping over during transport along the pipeline. Design of all products assures a maximum flow.

The special construction assures flexibility and ease of insertion into the pipe from the manhole. Before use they should be inflated slightly to get the proper shape.



Long packers - on both ends of the rubber hose, there is an aluminum or rubber flange. These packers are not equipped with wheels. Custom sizes (length and type), including flow-through models, are available. Before insertion into the pipe from a manhole, these packers should be inflated slightly to get the proper shape.

These safety instructions shall be available to users of Sava packers at all times. All recommendations, requirements and instruction for use, apply to all sizes and types of Sava packers.

Before using any of the SAVA packers, be sure to read these instructions carefully. Should you have any questions or if faced with any unusual circumstances not described in this manual, consult your supervisor or safety engineer.

Additional copies of the manual are always available from Sava Trade Inc - If you require additional copies or if you have any questions, do not hesitate to contact us in Florida USA (phone 386 760-0706) or your Sava Trade Inc authorized representative/distributor.

PROCEDURE BEFORE USE

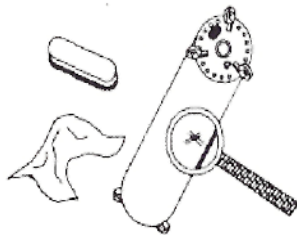
1. Before and after each use, clean the packer and inspect for surface tears, cuts or any other damage

Sava packers can be cleaned with a solution of water and detergent. Be sure to wipe the packer dry using a soft cloth.



WARNING!

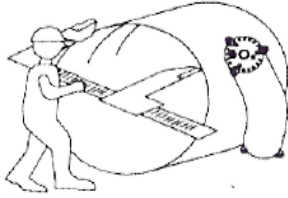
NEVER USE SOLVENTS, HYDROCARBONS AND OTHER AGGRESSIVE CLEANING AGENTS. USE OF SUCH AGENTS CAN RESULT IN DAMAGE OR EVEN DESTRUCTION OF THE PACKER.



Before and after use, carefully check the packer and accessories for possible damages such as cuts, blisters between rubber layers, worn out parts, damaged connections, etc.

2. Always choose the correct size of packers

Each Sava packer is designed for a specific diameter range. The nominal packer size or the diameter range within which the packer may be used is clearly marked on the packer itself.



Before using the packer always:

- Measure the inside diameter of the pipe into which the packer will be inserted
- Check if the pipe diameter is within the range that is marked on the packer

WARNING!

NEVER USE A PACKER IN PIPE THAT IS SMALLER OR LARGER IN DIAMETER THAN THE ONE SPECIFIED ON THE PACKER.

3. Always use accurate air pressure gauges

Always carefully check inflation hoses, regulating and safety devices and replace if required. Be sure that safety valves, pressure valves and clamps are free of dirt, which will assure undisturbed and correct application of the packer.

WARNING!

IF YOU SUSPECT THAT THE PACKER OR ACCESSORIES ARE DAMAGED, CONSULT A SAVA REPRESENTATIVE AND ARRANGE FOR RETURNING OF THE PRODUCT TO SAVA FOR INSPECTION, OR SCRAP THE PRODUCT AND REPLACE IT WITH A NEW ONE. IN CASE YOU NOTICE ANY UNEXPLAINABLE PECULIARITIES ON THE PRODUCT, DO NOT USE IT AND INFORM THE SUPERVISOR OR YOUR SAFETY ENGINEER.

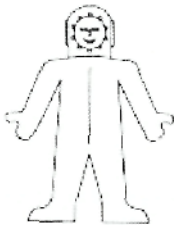


4. Always wear protective clothing and equipment

When working with Sava packers, always wear a helmet, safety glasses and protective clothing,

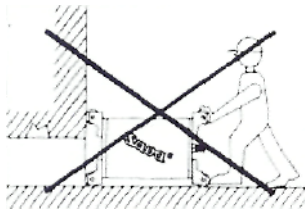
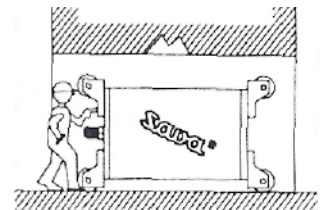
WARNING

IT IS EXTREMELY IMPORTANT THAT ALL REGULATIONS AND GUIDELINES PERTAINING TO CONFINED SPACE ENTRY ARE STRICTLY OBSERVED WHEN



5. Always follow the correct procedure for installing the wheels on the packer

Detailed instructions and drawings showing how to properly adjust the wheels are attached to this manual. Always make sure that the wheels are properly adjusted based on the pipe diameter into which the packer is to be inserted.



WARNING!

INCORRECT ADJUSTMENT OF THE WHEELS CAN MAKE THE INSERTION INTO THE PIPE DIFFICULT AND CAUSE A DELAY IN POSITIONING THE PACKER IN THE SECTION TO BE REPAIRED. THIS OPERATION IS IN MOST CASES TIME CRITICAL DUE TO RESIN-IMPREGNATED FABRIC WRAPPED AROUND THE PACKER. A DELAY IN POSITIONING THE PACKER CAN RESULT IN POOR QUALITY REPAIR OR EVEN DAMAGE TO THE PACKER.

6. Always protect the packer from exposure to chemicals

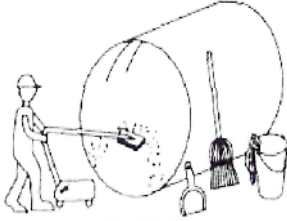


Prior to wrapping impregnated fabric around the packer, protect it with PE-foil or suitable coating to prevent a chemical reaction between the rubber part and chemicals. If you apply protective coating it is recommended to fill the packer with air - not exceeding 0,2 bar (3 PSI) - before applying the coating. This will allow the coating to penetrate all pores in the rubber part of the packer.

WARNING

IMPROPER PROTECTION OF THE PACKER CAN RESULT IN REACTION OF CHEMICALS AND THE RUBBER PART THUS CAUSING RUBBER HARDNESS AND REDUCTION OF ITS RESILIENCE, WHICH CAN EVEN DESTROY THE PACKER. NEVER USE SOLVENTS, HYDROCARBONS AND OTHER AGGRESSIVE COATING AGENTS. USE OF SUCH AGENTS CAN DAMAGE OR DESTROY THE PACKER.

7. Always clean the pipe before inserting the packer



Before insertion of the packer into the pipe, always remove dirt, sand and sharp objects which may cause damage to the packer. In most cases it will be necessary to flush the pipeline using a high-pressure water jet. We recommend inspecting the pipeline with a camera after cleaning.

WARNING

DIRT AND SHARP OBJECTS IN THE PIPE CAN CAUSE CUTS IN THE RUBBER OR EVEN DESTRUCTION OF THE PACKER AS WELL AS POOR QUALITY OF THE

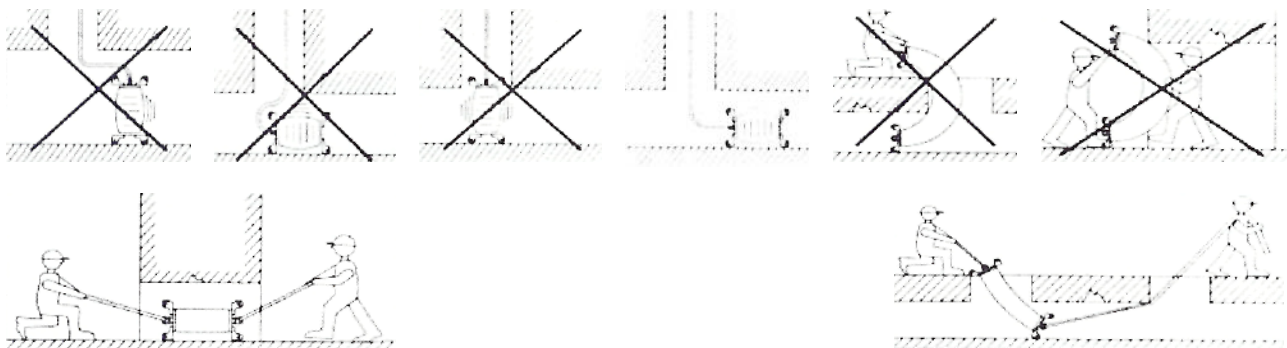
REPAIR.

PROCEDURES DURING USE

8. Always make sure that the packer is correctly inserted in the pipe

All wheeled packers (short and flexible) should be inserted into the pipe making sure that the rubber body of the packer is not dragging on the bottom of the inlet where sharp edges or sharp objects can damage the packer. Once the packer is inside the pipe, it can be easily pushed to the repair section by means of hollow, flexible push rods. The push rods also serve to measure the exact distance between the inlet and the repair section as well as for filling the packer with air or water,

Long packers without wheels should be protected in the front and rear with elastic braiding with good stretching characteristics in order to prevent damage to the impregnated fabric which is wrapped around the packer.



DANGER

Before and during the insertion of the packer, the following basic rules must be followed:

1. WHEN OUTSIDE THE PIPE, NEVER INFLATE THE PACKER TO MORE THAN 0.2 BAR (3PSI)
2. NEVER INFLATE THE PACKER IN A PIPE WHICH HAS NOT BEEN PROPERLY CLEANED
3. NEVER ALLOW THE PACKER TO PROJECT OUT OF THE PIPE WHILE INFLATED
4. NEVER INFLATE THE PACKER THROUGH THE OPENING

9. Never exceed the maximum packer inflation pressure



Always inflate packers up to the prescribed maximum inflation pressure. The correct inflation pressure is clearly marked on each packer and in the tables at the end of this manual. Closely monitor the pressure, especially in the beginning when the pressure within the packer can vary during the stabilization period. During extended use, we recommend to check the pressure at least once every hour.

WARNING!

WHEN WORKING WITH PACKERS OR ANY OTHER INFLATABLE DEVICE, MAKE SURE THAT THE PRESSURE GAUGES ARE PROPERLY CALIBRATED.

EXCEEDING THE MAXIMUM INFLATION PRESSURE CAN RESULT IN DAMAGES OF PACKERS; INFLATION UNDERPRESSURE CAN RESULT IN A DAMAGED PACKER WHILE TOO LOW INFLATION PRESSURE CAN RESULT IN POOR QUALITY REPAIRS.

10. Stay clear of the danger zone while packer is inflated in the pipe

Danger zone is the area of a pipe or manhole or any opening into which the packer is inserted.

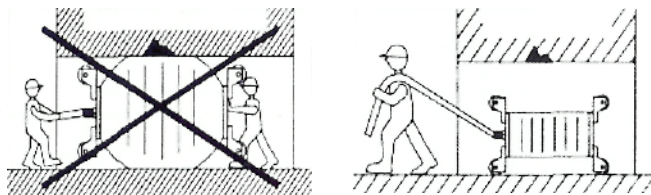


DANGER

STAY CLEAR OF THE DANGER ZONE, FAILURE TO DO SO MAY RESULT IN SERIOUS INJURY OR EVEN DEATH.

PROCEDURE FOR REMOVING THE PACKER FROM THE PIPE

11. Always deflate (release pressure completely) the packer before removing from the pipe



Before removing the packer from the pipe, release all pressure in the packer.

WARNING

NEVER REMOVE THE PACKER BEFORE IT IS COMPLETELY EMPTY. NEVER ATTEMPT TO REMOVE IT BY PULLING ON THE INFLATION HOSE. ALWAYS USE A ROPE ATTACHED TO AN EYEBOLT. USE OF THE INFLATION HOSE CAN DAMAGE THE PACKER OR THE INFLATION HOSE MAKING THE OPERATION OF THE PACKER OR THE ACCESSORIES HAZARDOUS. NONOBSERVANCE OF INSTRUCTIONS AND WARNINGS FOR SAFE OPERATION OF PNEUMATIC PACKERS CAN DAMAGE PRODUCTS, CAUSE SERIOUS BODILY INJURIES OR EVEN DEATH