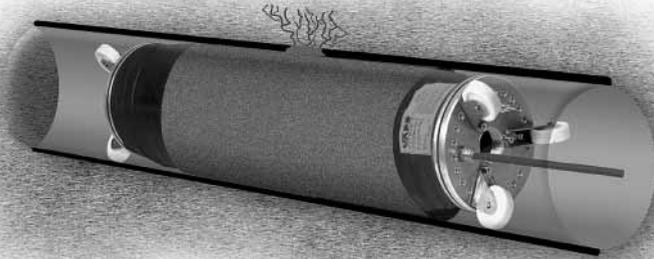


REHABILITATION PACKERS

safety instruction manual



Rehabilitation packers are used for repairing locally – damaged sewerages or other pipelines or for their successive maintenance. The packers can be applied to fissures, leaky joints, misalignments, rootdowngrowth and corroded sections. Sewerages made of all kinds of materials in the diameter ranging from 50 mm to 800 mm can be maintained or repaired in this way. All packers are made of a special rubber guaranteeing the necessary flexibility, strength and resistance. All their metal parts are made of corrosion-resistant materials.



WARNING !!!

Read these instructions carefully before using rehabilitation packers. Nonobservance of instructions and warnings for safe operation of packers can damage product, or can cause serious bodily injury or death.

The instructions apply to all types and sizes of VAPO packers:

Short packers – P

Flexible packers – FP

Long packers – DP

Lateral packers – HP

Bend packers – OP

Rules for safe operation of pneumatic packers

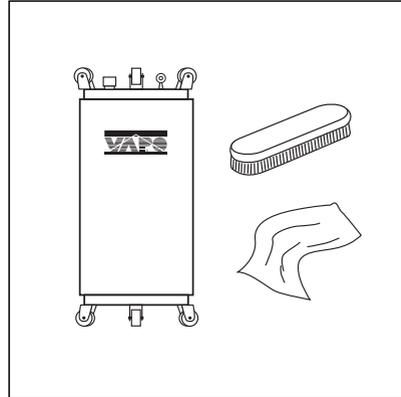
1. Before and after each use clean and inspect the packer and all accessories
2. Always choose the correct size of packer regarding to pipeline
3. Always use accurate safety and control gauge and inflation hoses
4. Always use protective clothing and equipment
5. Install the correct position of the wheels on the packer
6. Protect the packer from exposure to chemicals
7. Clean the pipe before inserting the packer
8. Always make sure that the packer is correctly inserted in the pipe
9. Never exceed the maximum operating pressure of the packer
10. Always keep out of the danger zone while the packer is inflated in the pipe
11. Deflate the packer before removing it from the pipeline

 Before using any of the VAPO packer you must read these instructions carefully. If you have any questions or there are any circumstances not described in this manual, contact your supervisor or producer.

Procedures before using a packer

1. Before and after each use clean and inspect the packer and all accessories

- Check the packer for possible damages such as cuts, punctures, blisters between rubber layers, worn out parts , etc. Connections and wheels must be in function.
- Safety and control gauge, inflation hoses including quick couplings and nipples must be in function.
- After each use, clean the packer with a solution of water and detergent. Never use solvents, hydrocarbons and other aggressive cleaning agents.



2. Always choose the correct size of packer regarding to pipeline

- Each packer is designed for a specific diameter range. This diameter range is clearly marked on the packer itself.
- Before using the packer always measure the inside diameter of the pipe and check if the pipe diameter is within range that is marked on the packer.
- Never use the packer which is smaller or larger in diameter than the one specified on the packer.

3. Always use accurate safety and control gauge and inflation hoses

- Always carefully check safety and control gauge, inflation hoses including quick couplings and nipples. These must be clean, because assure correct function of packer.
- Never adjust the safety valve of control gauge.
- If you suspect that the packer or accessories are damaged consult this with producer or return the product to producer for inspection or replacement for new one.

4. Always use protective clothing and equipment

- When working with VAPO packers, always wear protective clothing, a helmet and safety glasses.
- It is extremely important, that all regulations concerning to confined space entry are strictly observed when working in sewer manholes.

5. Install the correct position of the wheels on the packer

- Incorrect adjustment of the wheels can make difficulties during insertion into the pipe and cause a delay in positioning the packer to the damaged section. Quickness of this operation is very important according to resin – impregnated fabric. Delay in positioning the packer can result in poor quality repair or even damage of the packer.

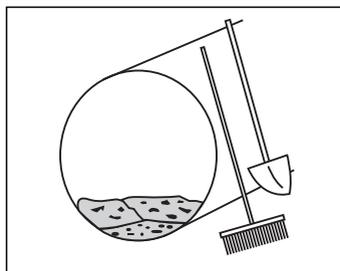


6. Protect the packer from exposure to chemicals

- Before to wrapping impregnated fabric around the packer, protect it with PE-foil or suitable coating to prevent chemical reaction between rubber body of packer and chemicals from resin. If you apply a protective coating it is recommended to fill the packer to 0,2 bar before applying the coating. This will allow the coating to penetrate to all pores in the rubber body of the packer.
- Inproper protection of the packer can result in chemical reaction and damage or destroy the packer. Never use solvents, hydrocarbons and other aggressive coating agents as a protective coating.

7. Clean the pipe before inserting the packer

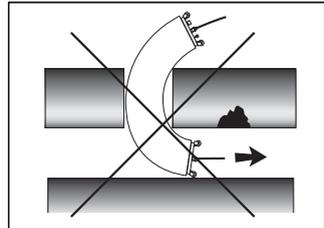
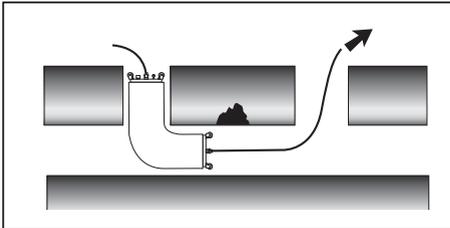
- Before insertion of the packer into the pipe always clean the pipe from sand, dirt, stones and any other sharp objects, which can make damage the packer. In most case it will be necessary to flush the pipeline using a high-pressure water jet. It is recommended inspecting the pipeline with camera after cleaning.



Procedures during use a packer

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

- Never inflate the packer to more than 0,2 bar, when it is outside the pipe.
- When the packer is inserted into the pipe, make sure that the rubber body of the packer is not dragging on the bottom of the inlet where the sharp objects can damage the packer. When the packer is inside the pipe it is pushed to the repair section by filling and pushing rods. These rods also serve to measure the exact distance between the inlet and the repair section as well as for inflate the packer.
- Never inflate the packer in the pipe which has not been properly cleaned.



9. Never exceed the maximum operating pressure of the packer

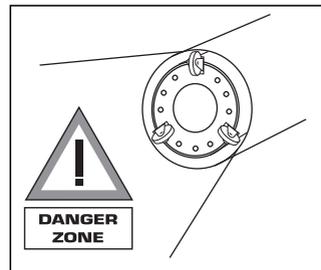
- Always inflate the packer to the maximum operating pressure indicated on the label of the each packer. During extended use, we recommend to check the pressure at least once every hour.
- Right function of the safety and control gauge must be checked regularly before each use.
- Exceeding the maximum operating pressure can result in a damage of the packer, while low operating pressure can result in poor quality repairs.

10. Always keep out of the danger zone while the packer is inflated in the pipe

- Danger zone is the area before the pipe, manhole or any other opening, into which the packer is inserted.

DANGER !!!

Always keep out of the danger zone while the packer is in us. Failure can cause serious bodily injury or even death.



Procedures for removing a packer

11. Deflate the packer before removing it from the pipeline

- Never remove the packer before it is not completely deflated.
- Never remove it by inflation hose, always use a rope attached to an eyebolt.

