



ASSEMBLY AND USE

Types and purpose

This instruction is a brief description of Hammpack® steel packers. We describe how and where to use steel packers. The injection packer is installed in a sealed element and is designed to introduce a given injection under pressure. All injection packers are equipped with check valves to be able to stop the pressure of the injected substance in the structure.

You can find a description of the correct execution of injection drilling in our instruction: "ResinBau - Proper Drilling".

Thank you to Hammpack® for providing marketing materials and assisting in the creation of this description.

Characteristics of a good steel packer:

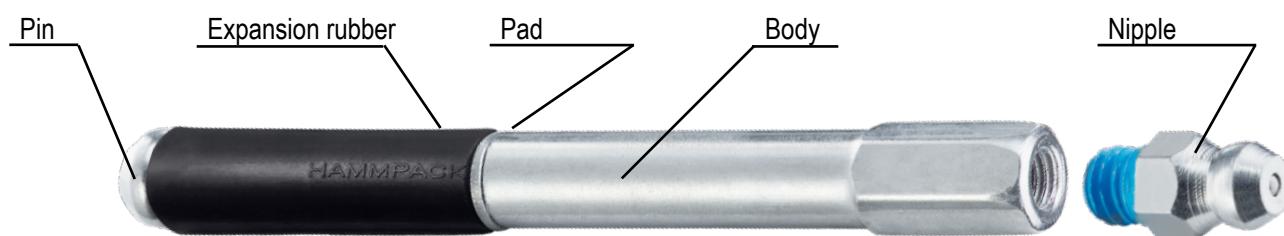
- ❖ Sealing of packer: Hammpack® packers are specially designed injection packers that ensure the highest seal when injecting. The packer holds back pressure and there are no resin leaks during or after the injection.
- ❖ Sealing of packer and body: Regardless of whether you use packers with a pre-coating application (PRE/FPRE) or machine-tightened threaded connections, the joint between the packer and the body must be tight.
- ❖ Low opening pressure of packer: The lowest possible opening pressure of the packer (below 2 bar) provides the best results for the dispersion of the injected substance in the structure.
- ❖ The appropriate mixture and size of the expansion rubber, as well as the proper tolerance of threaded connections, ensure the seal when injecting the substance through the injection packer.
- ❖ Steel injection packers can maintain pressures above 400 bar in laboratory conditions.

Meaning of symbols

PI-SPH 10/110pre

Packer **I**njection - **S**teel **P**single rubber **H**ammpack®

10 (ø10mm - injection hole diameter) **/110** (110mm - overall length of the packer) **pre** (nipple type - pre - coating pre-application)



Types of grease nipples



SWG

- Straight packers with thread sealing using anaerobic adhesive, **tightened by machine**.

Straight nipple grease - easy and fast work. Easy removal even at very high pressures. The packer, together with the four-jaw fitting for the purpose of a tight injection, should be in one line. It should be remembered that during injection with manual pumps, there should be two people: one person holds the four-jaw end of the pump in a straight line with the injection packer, eliminating hose jerking, and the other is responsible for operating the pump.



FWG

- Flat grease nipples with thread sealing using anaerobic adhesive, **tightened by machine**.

Flat grease nipple - easy and clean work. The advantage of this type of packer is the cleanliness of work - the closure of the packer causes a full seal, ensuring clean work even in the case of injection of ceilings with manual pumps. However, there may be difficulties with removing the packer at high pressures above 100 bar.



PRE / FPRE

Straight / flat grease nipples with Pre-coated Threads.

The grease fitting thread has been subjected to a machine pre-coating, which acts like a perfectly applied Teflon tape. It is an ideal solution for professional injection and venting of cracks. When the packer is screwed into the body, it is immediately sealed.

Injection using packers with pre-applied coating is recommended by us as the only method that allows for full observation of the injection process.

Assembly of packers

- ❖ The injection hole should be cleaned with pressurized water (preferably using a long tube inserted to the end of the hole, through which pressurized water will flow and flush out any debris).
- ❖ The packer should be placed in the injection hole so that the entire expansion rubber is submerged in the hole and approximately 1cm of the body.
- ❖ If the hole is excessively widened, compress the packer with your fingers and insert it into the hole as described before.
- ❖ In case of long boreholes in soft materials where the holes expand excessively, packers with wings like PI-SPHW 10/110 can be helpful, or a short hole (5 cm) can be drilled for a larger diameter packer.
- ❖ The packers should be installed with a drill set to the screw tightening mode (with a clutch). This is the fastest way to install them.
- ❖ The tightening force must be checked for each new object. Usually, it is the maximum power of the screwdriver when tightening. Sometimes, it may be necessary to add one and a half turns with a flat wrench, and sometimes to reduce the force of the screwdriver. The appropriate tightening force ensures optimal working conditions. Too much tightening force can break the rubber and make the hole unsuitable for injection. Remember the tightening force and do it consistently. The packer can always be tightened more if it loosens, and an overtightened packer no longer holds high pressures.

Packers disassembly

- ❖ The injection packer should be removed after the resin has fully cured (24-48 hours after injection).

Types of injection packers

- ❖ **Steel injection packers** - this instruction is dedicated to steel injection packers.



- ❖ **Injection packer extensions** - Thanks to the innovative "Packer Connector" system, you don't have to buy a packer with a specific length anymore. Now you can extend a standard 110mm packer with 15cm sections. With the use of the PI-SCREW nipple with a special pre-applied coating, we guarantee sealing even at high pressure.



- ❖ **Steel injection packers - dual-valve / one-day-packers** - They allow you to finish work right after injection, thanks to the use of a check valve in the expansion part and a clamping ring, you can remove the body immediately after injection, and the remaining expanding rubber with the valve will hold the injected material in the structure.



- ❖ **Plastic injection packers** - driven-in packers, ideal for work that does not require high pressure (for pressures below 60 BAR). Low opening pressure valve (gravity valves). The packers are suitable for saturating structures as well as for curtain injection. Ideal for injecting water-based solutions, silicates, injection resins, and gels. Remember to use a special striker when installing plastic packers, hitting the head without a striker can deform the valve and cause valve leakage.

* More about these packers in our "**ResinBau - Plastic Packers**" instruction.



- ❖ **Injection packers for cement** - Application: Sealing injections, filling injections. Materials: Cement suspensions, water dispersions, etc. Thanks to their large flow diameter, the injectors enable the injection of materials with higher density or larger grain size. These are packers made of steel (screwed) or plastic (driven).



- ❖ **Injectors for injection hoses** - these injectors are used to fill injection hoses, and this group also includes connectors for injection hoses.



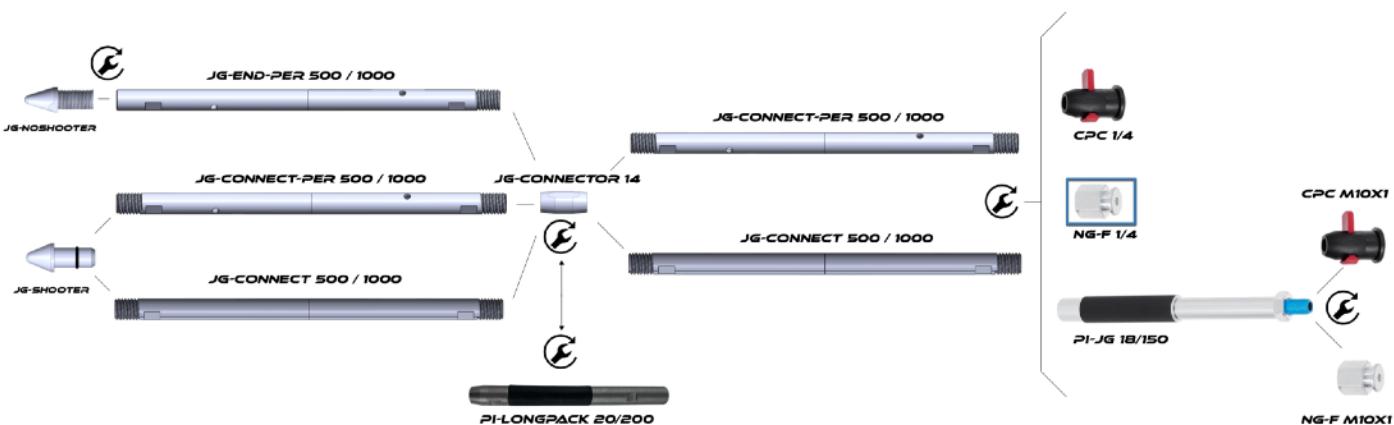
- ❖ **Injection packers with adhesive backing** - these are packers that are applied to a crack using adhesive. They are used very rarely. They can be used when the crack surface is dry and adherent, where we cannot drill into the structure (thin-walled element or drilling is prohibited), or when the crack opening is large enough that injection with lower pressure is sufficient.



- ❖ **Injection packers for cracks** - designed for direct insertion into cracks. They are used for injection into cracks in all popular building materials such as concrete, granite, blocks, bricks, and sandstone. They are suitable for injecting epoxy resin, polyurethane resin, microcement suspensions (depending on the packer flow rate). They are also well suited for direct insertion into wood for pressure impregnation, impregnation with wood preservatives or epoxy resin for wood consolidation. Wedge packers can be easily removed from building materials without leaving traces. With strong fixing, they can be used at a maximum injection pressure of 50 bar.



- ❖ **Packers for lances / injection lances** - **JG-SYSTEM** injection lance system, with lengths of solid and perforated sections of 500 mm and 1000 mm. Balanced injection surface structure for both cement suspensions, geopolymers, acrylic gels and polyurethane resins.



- ❖ **Injectors for wood** - these are small injectors with a small diameter (for injection hole diameter of $\varnothing 6\text{mm}$), with a four-jaw chuck (conical collet) or a push-in attachment (injector inserted flush with the surface of the construction). Injectors of this type are also suitable for low-pressure injection or where a small injection hole is required and high injection pressure is not needed (maximum pressure up to 20 BAR).



- ❖ **Special injection packers** - in this group you will find packers used for very specific sealing purposes. For example, corner packers (inserted at the junction of a wall with another wall or in a corner). Stainless steel injection needles used for piercing rubber elements, or other non-standard packers.



Types of injection couplers

- ❖ **Coupler CPX / CPX-T** - We press it onto a conical grip and remove it by twisting with a half turn of the wrist. The life of such a fitting is between 50-300 cycles. We recommend replacing it after every longer break in injection.

Easy installation and removal even at high pressure. The nozzle with the four-jaw chuck should be in a straight line until the pressure is "caught". It should be remembered that two people are required for injection with manual pumps: one person holds the four-jaw chuck of the pump in a straight line with the injection packer, eliminating hose jerking, and the other person pumps.



- ❖ **CPF / CPF-UP Coupler** - We slide the adapter onto the flat cones until we feel resistance. This type of connection ensures a very tight injection. There are problems with the adapter slipping off at pressures above 100 BAR. In order to extend the lifespan of the adapter, apply technical grease to it before each use.

The CPF nozzle's sealing rubber and spring wear out over time, and the repair kit is a quick and inexpensive way to fix it.





- ❖ **CPC Cap + Injection Pliers** - The CPC cap enables easy observation and control of injections through a sliding multi-use valve. It has a very large flow diameter of $\varnothing 7.5\text{mm}$. The injection pliers are easy to use and very tight. An ideal solution for injecting cement suspensions, even those with large grain sizes.

- ❖ **CPW injection nozzle** - designed for injecting wood and dedicated to the PI-P 6.5/15 injection packer. The nozzle works by compression and is virtually indestructible under normal use. It is made of CW617N brass and has an M10x1 GW thread at the end. The advantage of this solution is that the packer is flush with the surface of the structure (no element protrudes from the structure), and the nozzle is pressed to achieve tightness. The maximum possible pressure is 10-15 BAR.



Useful accessories

- ❖ **PI-CAPS** - grease nipple clip. Poor quality grease nipple leaking under back pressure? Certainly not in a Hammpack®! But if you come across poor quality grease nipples or just want to protect the grease nipple head, use PI-CAPS (can be used multiple times)



- ❖ **Mallets** - Packer knockers - an essential tool when using driven packers (striking the magnet head directly causes deformation and reduces the tightness of the injection). Available for SDS+ rotary hammers and manual mallets (rubber mallets work best).



Thank you to the Hammpack® brand for providing marketing materials and assistance in creating this description. The products presented in the description are available on the platform: www.pakery.pl