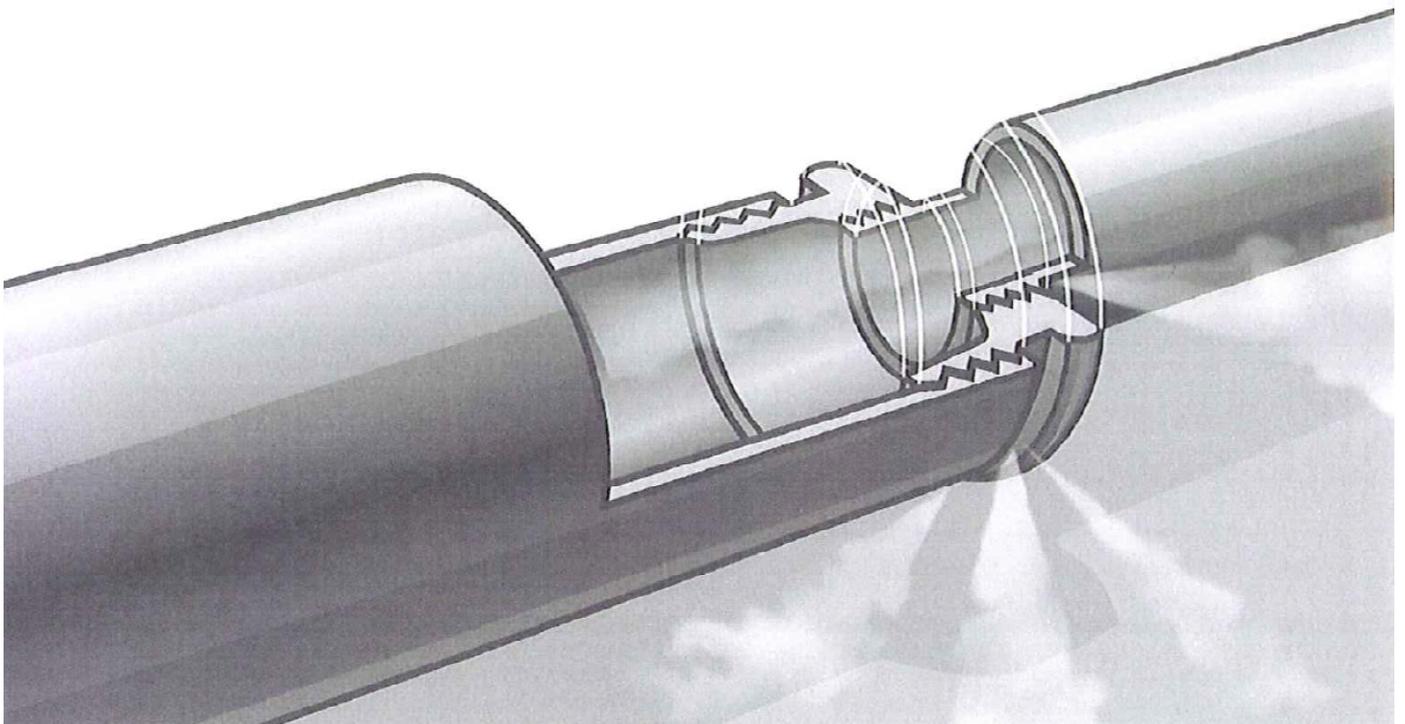




PRODORAL[®] R 6-1



A process for resealing threaded joints of gas pipeworks
in buildings

DIN-DVGW NG-5153 AR 0634



Applications

- Resealing of threaded joints in gas pipes
- Leakage rates up to 5 l/h
- Operating pressure up to 100 mbar

Benefits

- Sealing within few hours without wall breaks
- After sealing pipes can be put back into operation straight away
- One single application is sufficient to comply with the requirements of DIN EN 13090

Description

Solvent-free synthetic dispersion. Sealant penetrates into the leaking threaded joints by means of filling the gas pipe under pressure. The sealing is resistant to vibrations and withstands any media occurring in the pipes.

When handling correctly after filling, the reclaimed material may be reused. If treated in accordance with instructions, the pipes will be leakproof immediately after the sealant has been evacuated and must be put back into operation straight away.

One single filling operation is sufficient to comply with the requirements of DIN EN 13090 „Mittel zum nachträglichen Abdichten von Gewindeverbindungen in Gas-Innenleitungen“ (Means for resealing threaded joints of gas pipework in Buildings).

Product data

The following data were determined at 20°C unless otherwise stated:

Type	synthetic dispersion material
Base	copolymer
Consistency	liquid
Specific weight	approx. 1,0 g/cm ³
Application temperature	≥ 10°C
Application method	by filling under pressure
Flash point	not applicable

Hazard classification acc. to VbF non

Color

Green

Consumption

Approx. 1kg per apartment (length of pipe approx. ca. 25m, 1-1½")

Packaging

20kg one-way plastic container

Storage

For application reasons store frost-free.

Without losing its original properties, PRODORAL® R 6-1 may be exposed to temperatures of max. -20°C for several days, e.g. during transport. In this case stir well before use.

Storage life is 24 months, can be identified by expiry date on labels.

Never use expired material!

Application

Works on gas installations may be carried out only by appropriately qualified specialist personnel. These specialists are trained by us and receive a certificate.

The PRODORAL® R 6-1 method is suitable for sealing gas pipes from the main valve to the gas meter or to the gas outlets, respectively. Both vertical and horizontal steel pipes (zinc or black) may be sealed. On plaster laid parts of the pipe have to be examined regarding corrosion defects.

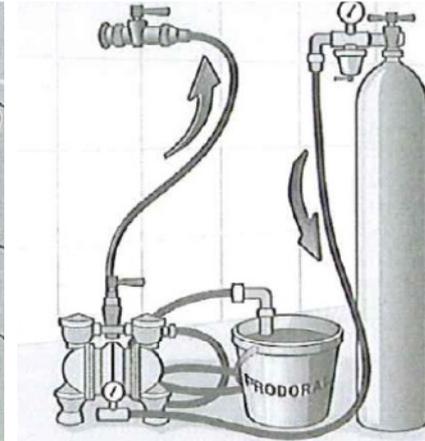
Furthermore „Technischen Regeln für das nachträgliche Abdichten von bestehenden Gas-Innenleitungen“ (DVGW-Arbeitsblatt G 624), respectively DVGW-TRGI 2008 have to be considered.

1. Preparation



Blowing the dust or remaining sealing material out of the pipe

2. Filling



Put the pressure and filling the pipe

3. Refilling



Refilling with sealing material

Sealing process in several steps

Checking the pipe and preparing

- a.) Dismantle the gas meter
- b.) Test leakage rate in accordance with DVGW worksheet G 624. If a reduced level of serviceability is detected, sealing can be carried out with PRODORAL® R 6-1.
Reduced serviceability is evident if the leakage rate is in the Order of 1-5 litres per hour at operating pressure.
- c.) Screw bleed valves to every gas outlet and the connecting valve to the lowest part of the main pipe. Potentially existing shut-off valves have to be removed and parts of the pipe can be bridged with a flexible pressure hose.
- d.) Keep the pipe under pressure of 3 bars for about 3 to 5 minutes. This measure serves a load to detect corrosion damage of the concealed pipe.
- e.) Afterward test leakage rate once again according description under b.).

Cleaning

Clean the pipe with nitrogen respectively compressed air with a pressure of 3 bars. For this the dust is blown out via all bleed valves from top to bottom. (Pic 1)
Thus the connection valve (Pos. 1.5) has to be closed at first until pressure has built up. Then it has to be opened carefully – afterward it can be opened suddenly to make sure a good deflation. Repeat this procedure until no more dust can be blown out. Any dust has to be expelled through the cleaning hose (Pos. 3.3) into the open air. You have to take care that nobody is in the environment of the outlet.

Filling the pipe

- a.) The pipe is filled with a diaphragm pump. The pump may be operated by nitrogen as well as by compressed air from a compressor. The safety valve of the pump is adjusted to 7 bars. The pressure regulator of the pump should therefore be adjusted to the same pressure during its first use. Higher pressure is not permissible as this may damage the pump. Put the immersion pipe of the pump into the open material container and connect pump and gas pipe with the material hose. Put the pressure (Picture 2).
- b.) If the volume of the pipe is larger than the content of the container, refill as necessary (Picture 3).
- c.) **An overpressure of at least 3 bars is necessary to press the sealant into the leaking threaded joints. Thus, at the permissible pump pressure, risers up to 40 m high can be kept under pressure.**
Risers at greater heights are filled as described above. Item e) describes how to keep up pressure.
- d.) After filling the pipe bleed all outlets at the valves (Picture 4). It is important to fill the entire pipe system including strings out of Service. **Then allow the filled piping system to stand for 30 minutes under pressure.**

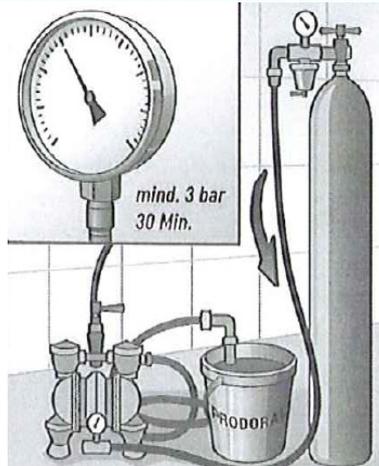
Keep valves between nitrogen cylinder and gas pipe open so that, in the case of any drop of pressure in the pipe, nitrogen or sealant continues flowing.

4. bleeding



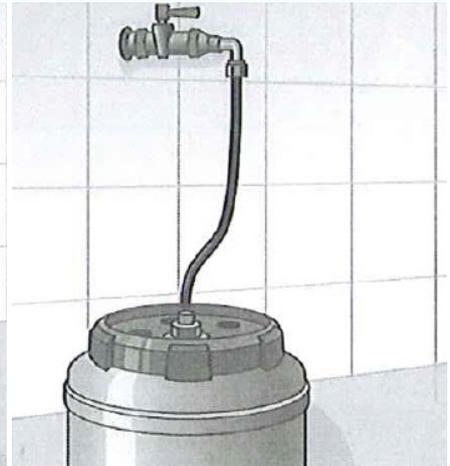
Bleeding the pipe

5. keeping pressure



Keeping pressure

6. evacuating



Evacuating the pipe into collection receptacle

- e.) If several pipes shall be sealed subsequently, it is recommended to use the pressure vessel to keep up pressure.

Maintain the pressure in the pipe by means of the pump for about 15 minutes, then close the connecting valve. Connect the pressure vessel to the highest outlet of the pipe and open the bleed valve.

Before use, put the pressure vessel under a pressure of 5 bars using nitrogen. Thus the required overpressure is ensured for the remaining period during which the pipe is filled. This also provides the necessary pressure for risers higher than 40 m.

After this step the pump is available for filling the next pipe.

receptacle (Picture 6). In Order to do this, close the connecting valve until pressure has built up (Pos. 1.5.) By jerky opening of the valve, the superfluous sealant will be forced out. Initially the connecting valve should be opened carefully to avoid the material spraying out. For the same reason it is advisable to cover the collection receptacle with a cloth.

Evacuating the pipe

- a) Release Pressure after the sealant has been kept in the pipe for 30 minutes. Close nitrogen valve and release Pressure from the pipe by opening the valve on the one side of the pump and also relieve Pressure vessel, if used, by opening the bleed valve (Picture 4). Dismantle hose from the pump and allow sealant to flow back into empty Containers until no major quantity comes out.

- b) Adjust Pressure regulator of the nitrogen cylinder to 3 bars and maintain this pressure until sealing work is finished. Connect the nitrogen hose to all bleed valves in turn (Picture 1) and blow out the residual surplus sealant from top to bottom into the collection

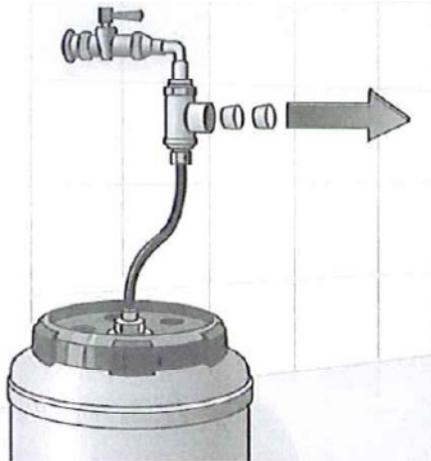
Cleaning with pigs

The surplus sealant is removed from the pipe by means of pigs. Especially stronger stretches of piping running horizontally and pockets of water retain larger quantities of sealant after the blowing process. The pigs are inserted into the pipe at the gas outlets (Picture 1) and pressed through with nitrogen (Picture 7). The size of the pig should exceed the diameter of the largest pipe. As the pigs adapt to fit pipes of all dimensions they push the surplus sealant ahead of themselves into the collection receptacle (Picture 7). They should be pressed through the pipe slowly so that sufficient sealant is removed from the pipe walls.

The speed can be controlled by regulating the nitrogen quantity with the valve of the cylinder. The cleaning process requires the collection device for the pigs which is installed between gas pipe and collection receptacle (Picture 7).

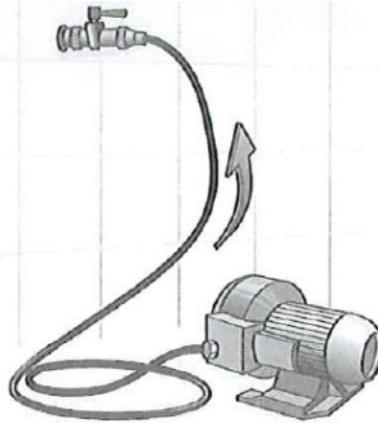
When installing the collection device to the gas pipe take care not to build in a bottleneck so that the pigs can pass through without difficulties. The sealant collection receptacle is designed such that cleaning without collection device for the pigs is impossible. Empty it regularly both before and during cleaning with pigs to avoid the

7. Cleaning with pigs



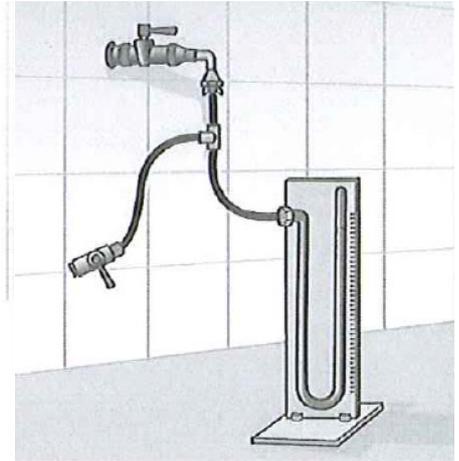
Molchen mit der Auffangvorrichtung

8. Drying



Trocknen der Gasleitung

9. Test



Test Leakage rates

sealant splashing out. The pigs can be reused after cleaning with water. Passing the pigs through each outlet twice will be sufficient in most Gases. The reclaimed material is reusable several times. If contaminated, strain through a sieve with a maximum gauge of 1 mm.

Drying

Dry the pipe with PRODORAL® R 6-1 blower by blowing ambient air from bottom to top for about one hour (Picture 11). Take care that sealant likely to spray out at the pipe ends will not lead to contamination. This can be avoided by screwing bends or elbows to the ends and collecting the spray residues in containers. By no means keep pipe openings closed (dismantle valves), as this may cause damage to the blower.

The indicated drying time refers to average pipes of approx. 25 m length and a diameter of 1" to 1 1/2". Larger pipes require a correspondingly stronger drying period. Careful drying is absolutely necessary to avoid that residual sealant drips into the gas meter or obstructs pipe strings. The blower is fit for continuous use. Install it in a way that the cool air of the motor can ventilate unhampered. Never cover the blower by any means. Take care that the sieve of the induction opening is always free. Clean it regularly. Otherwise the blower needs no maintenance.

Do not dry pipes with a diameter less than 1/2", this will overload the motor of the blower. Claims for damages resulting from not complying with our or partly dried material must be removed by mechanical means.

application advice may not be accepted within the framework of our general conditions of warranty.

The subsequent test for soundness is carried out. for 10 minutes at 150 mbars, the temperature having first been equalized in accordance with DVGW TRGI. 2008 Item 5.6.4.2. restore the gas pipe to use.

The pipework can be put into operation.

Consideration

The sealant is supplied ready-to-use, by no means dilute it with water. Expired sealant shall be disposed of according to the local or national regulations. For use in Germany ask for special instructions. Keep material away from drains or the soil. The diaphragm pump should always remain filled up to the top, therefore close inlet and outlet valve after completion of sealing work. Cleaning the inside of the pump is thus not necessary. The required pressures are most conveniently built up with nitrogen. A 50 l nitrogen cylinder and a pressure regulator with a scale of 0 -10 bars should be available on site. Alternatively, a compressor capable of exerting the required pressures may be used. The induction air volume should be at least 400l/min. It is advisable to use a compressor equipped with a maintenance unit (at least water separator) to prevent water from penetrating into the pump.

Maintenance of equipment

When still wet remove PRODORAL® R 6-1 with water. Dried or partly dried material must be removed by mechanical means. Equipment should be checked regularly and thoroughly cleaned as necessary.

Health and Safety

The liquid material is not flammable and does not exhale toxic vapours. Short-term contacts with the skin will be harmless. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

The complete PRODORAL® R 6-1 equipment.



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|--------------------------------------|---|---|
| 1.1 Diaphragm pump | 3.1 Collection receptacle | 5.2 Collection device for pigs up to 3" |
| 1.2 Materialhose, 2 m | 3.2 Nitrogen hose, 25 m | 6.1 Set of pigs 1/2" - 2" |
| 1.3 Suction hose with immersion pipe | 3.3 Cleaning hose, 10 m | 6.2 Set of pigs 1 1/2"-3" |
| 1.4 Connecting hose for pump, 5 m | 4.1 Bleaching receptacle | 7.1 Pressure vessel |
| 1.5 Connecting valve | 4.2 Bleaching valves (4 pcs per pack) | 7.2 Pressur hose |
| 2.1 Blower for drying | 4.3 Bleaching hose, 1 m | 7.3 Filling plug |
| 2.2 Connecting hose, 3 m | 5.1 Collection device for pigs up to 2" | |

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