

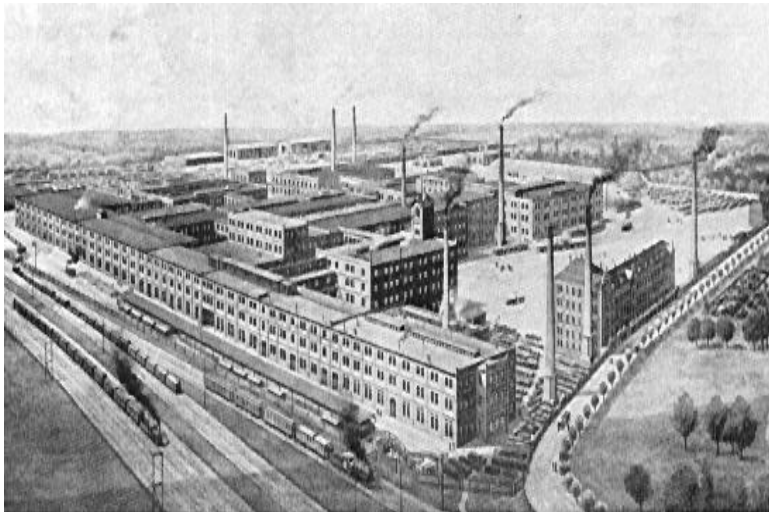


Gas Stop Balloon repair technology For PE 1 & 4 bar pipelines

Petr Sudoma – FRIATEC AG Germany

FRIATEC AG: INNOVATION MEETS TRADITION

INNOVATIVE PRODUCTS SINCE 1863



FRIATEC AG GERMANYTODAY



- Founded in 1863
- Covering an area of approx. 350 000m²
- Approx. 850 employees
- Specialist for corrosion- and wear -resistant materials
- Manufacturer of electrofusion fittings since 1979

FRIATEC AG GERMANY – INNOVATIVE & PROACTIVE PARTNER

FRIATEC to operate Europe's first commercial fuel cell power plant in the megawatt class !



FRIATEC to operate Europe's first commercial fuel cell power plant in the megawatt class !



- Capacity 1.4 MW
- Reduce CO2 emission by approx. 3000 t per year
- Equivalent of 250.000 family cars / 100km each
- Bybuild as joint project by E.ON & Fuel Cell Energy Solution

FRIATEC AG: INNOVATION MEETS TRADITION

A PIONEER IN ELECTROFUSION SYSTEMS



1979: Polyethylene becomes the pipe material of choice for gas distribution companies in Europe.
FRIATEC began early to develop a dedicated range of EF fittings.

GAS IS OUR BUSINESS / GERMANY



FRIALEN SERVICE PACKAGE

CERTIFICATES ALL OVER THE WORLD

-Top quality management



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e.g. QM Certificate ISO9001, Energy Management ISO50001, or Enviromental Certificate ISO14001

FRIALEN SERVICE PACKAGE

CERTIFICATES ALL OVER THE WORLD

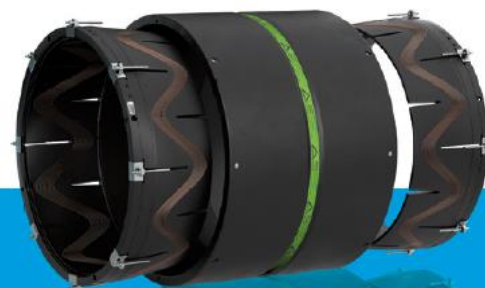
-Top quality management



Worldwide approvals

FRIATEC AG – TECHNICAL PLASTICS DIVISION

150
Years  FRIATEC



FRIALEN® XL

Large Pipe Technique



FRIALEN®

Safety Fittings



FRIAfit®

Sewage System



FRIATOOLS®

Technical Equipment



FRIALEN® + H&B Balloon technology for Gas repair 1 & 4 bar pipelines

BALLOON TECHNOLOGY 1 & 4 BAR

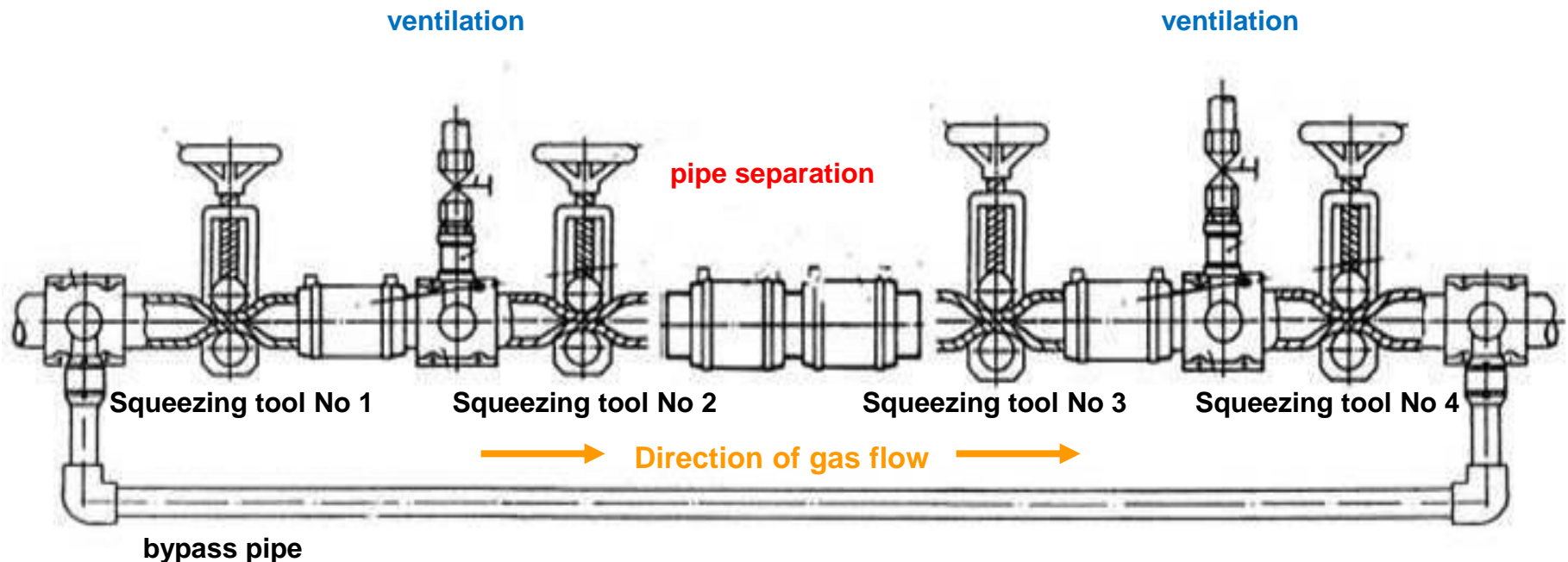
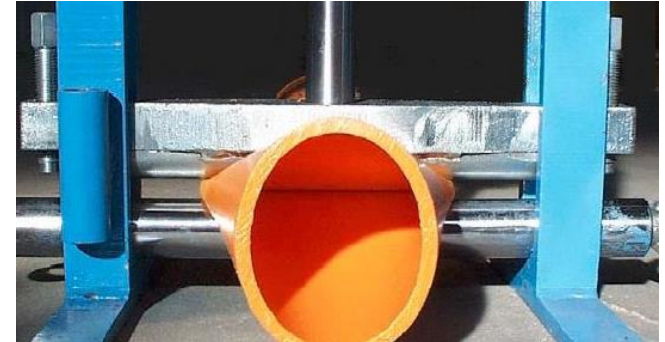
WHY WAS IT DEVELOPED ?

- **Worldwide, there are lots of “old” and early developed PE gas pipes**
- **The squeeze of technique is still “a destructive” impact into the PE pipe structure and if not done correctly it can have a long term consequences on the PE pipe quality and integrity (potential slow crack growth propagation)**
- **The existing blocking devices :**
 - Can seep or leak gas during the installation
 - Are quite heavy, not easy to operate and handle
 - The weight of the equipment can crash or damage PE gas pipes

BALLOON TECHNOLOGY 1 & 4 BAR

DISRUPTION OF THE MEDIUM FLOW

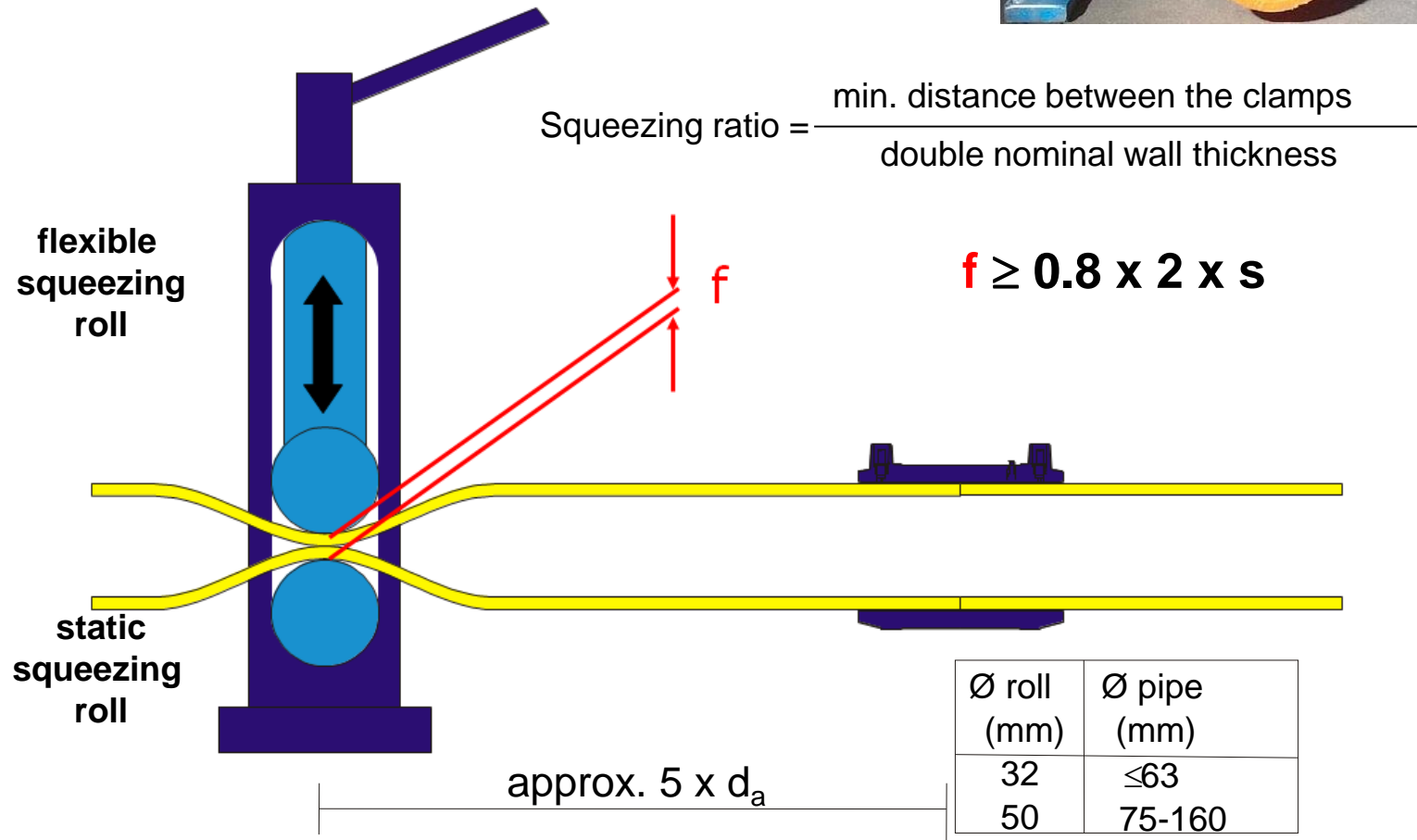
- ... for repair or integration work
using the example of a gas pipeline:
- Squeezing off
Example: double squeezing with ventilation

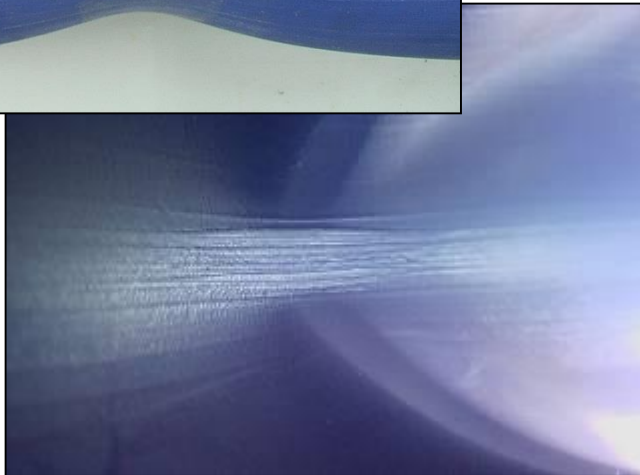


BALLOON TECHNOLOGY 1 & 4 BAR

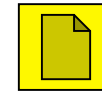
SQUEEZING OF PE-HD PIPES

■ DVGW-GW332: Squeezing of PE-HD pipes





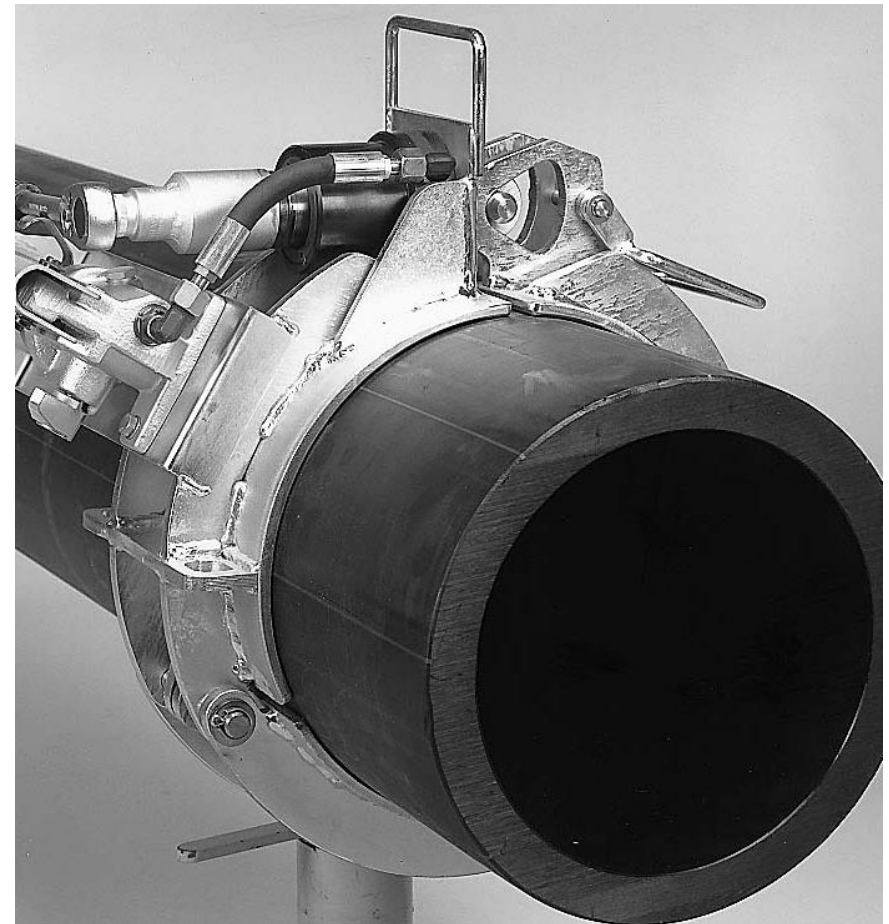
RE-ROUNDING CLAMPS



Operations
instructions



■ Mechanical ...



■ ... and hydraulic

BALLOON TECHNOLOGY 1 & 4 BAR

REPAIR OF A LOCALLY PIPE DAMAGE REINFORCING A SQUEEZED AREA

- By means of the FRIALEN® VVS repair and reinforcement clamp
- Two-sided fusion saddle
- Cold zone
 - For centering a squeezed fold after rerounding in the thermally unaffected area



RS d63



Data sheet



VVS

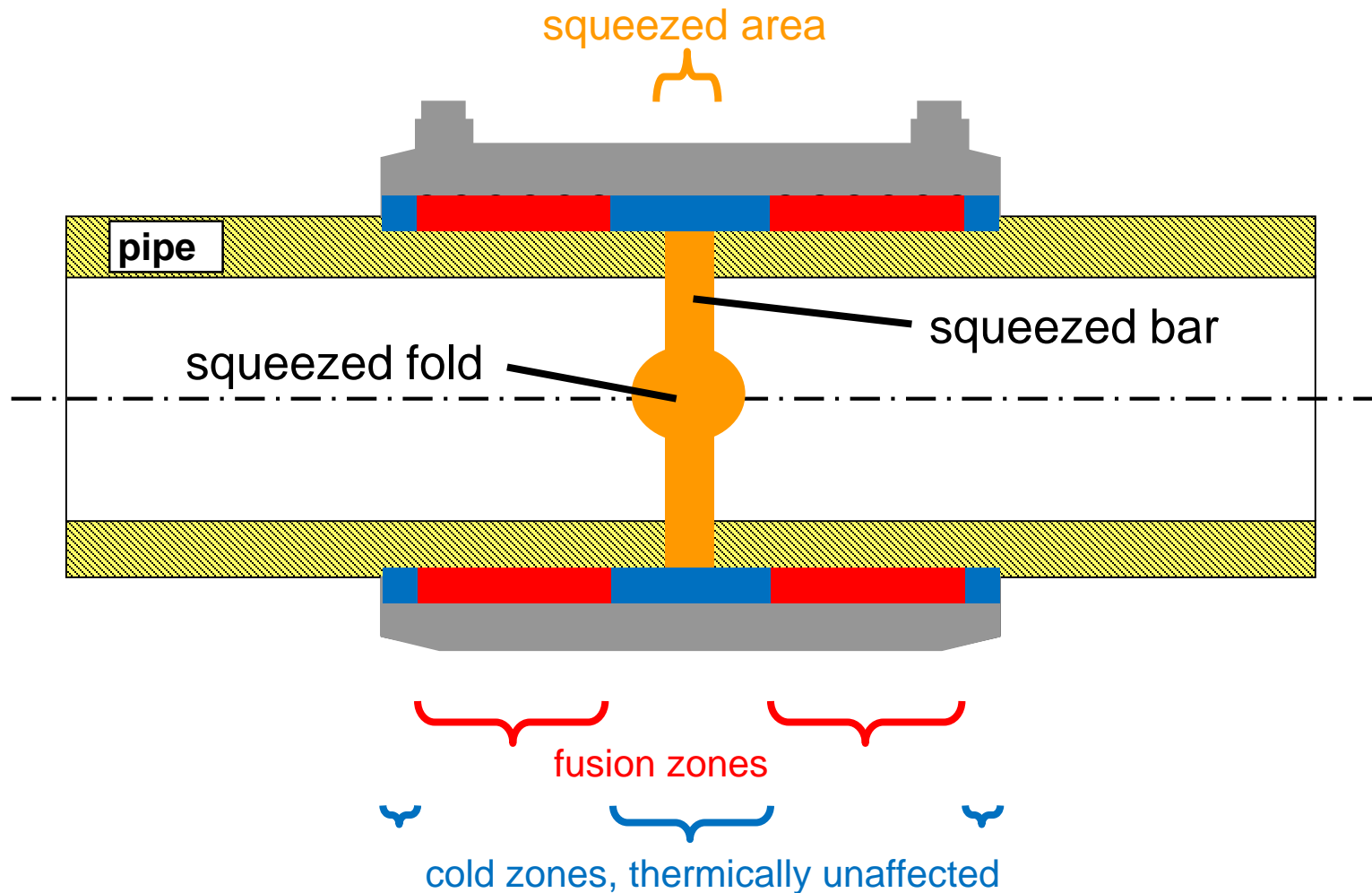


Data sheet



REPAIR AND INTEGRATION TECHNIQUE

REINFORCING A SQUEEZED AREA BY MEANS OF ELECTROFUSION FITTINGS



BALLOON TECHNOLOGY 1 & 4 BAR

FUNDAMENTALS & REASONS

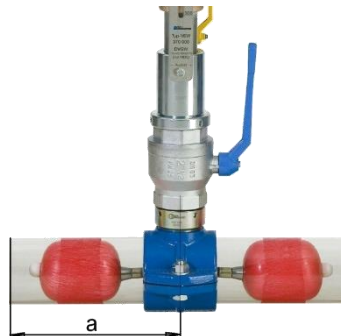
- Health & Safety ...with gas leak free balloon and double stopping and double balloon = double safety !
- NO disturbance or damage to the PE pipe structure & wall, fully fused system !
- Light weight = easy to handle and operate 20-25 kg !
- Overall cost effective solution with minimum disruption to public & traffic environment
- The unit provides TWO in One solution (Under Pressure drilling unit + blocking unit)

BALLOON TECHNOLOGY 1 & 4 BAR

1 BAR UNIT



- Units can be used on PE and Steel pipes
- Units can be used on Gas or LGP lines
- Pipe size DN 90-225 mm
- Four step & components:
 - FRIA-Shut Off saddle
 - Under pressure Drilling
 - Balloon blower
 - Balloons



4 BAR UNIT



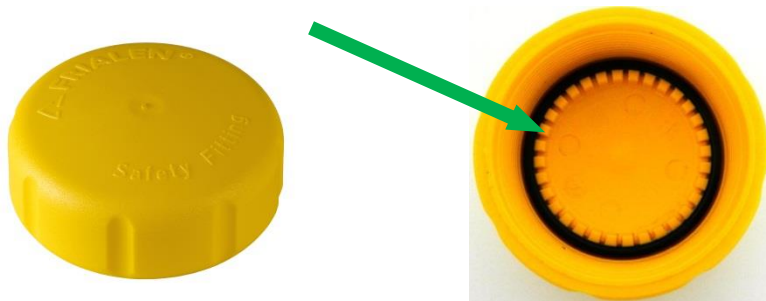
TAPPING TECHNIQUE WITH EXTERNAL DRILLING UNIT

SPA d90 – d225

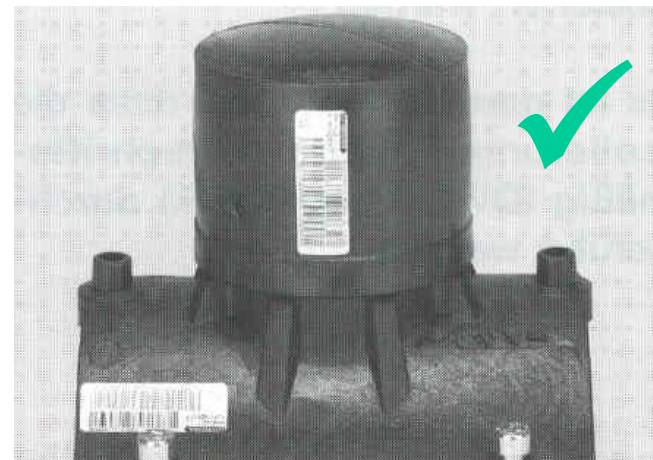
■ New:

SPA d90 new with screw cap in massive design:

- protection of the thread in the installed status
- 2nd sealing through axial crimped O-Ring



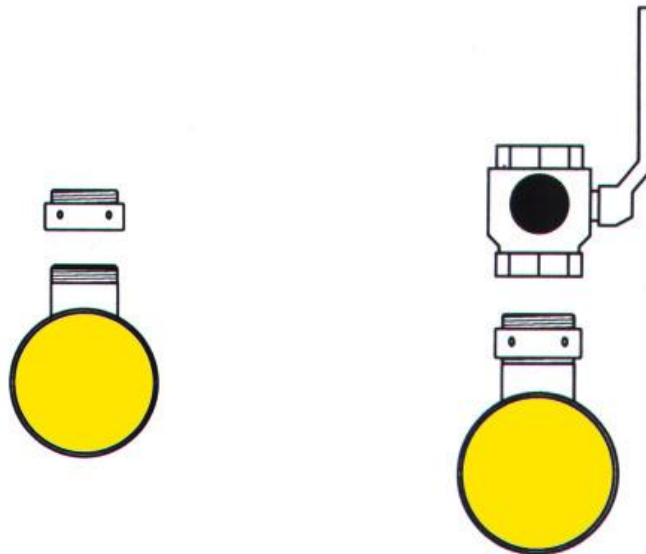
- or protection against access to the dome by fusing on a **FRIALEN®** SPAK or K.



Installation steps for using a FRIATEC shut off balloon saddle SPA

Welding of the SPA according the FRIATEC assembling instructions.

After the cooling time the adapter ring 360 024 must be screwed over the thread as far as possible. The ball valve must be assembled against the adapter ring



Drilling

Guide the rod onto the pipe surface and tighten the screw for the drilling support.

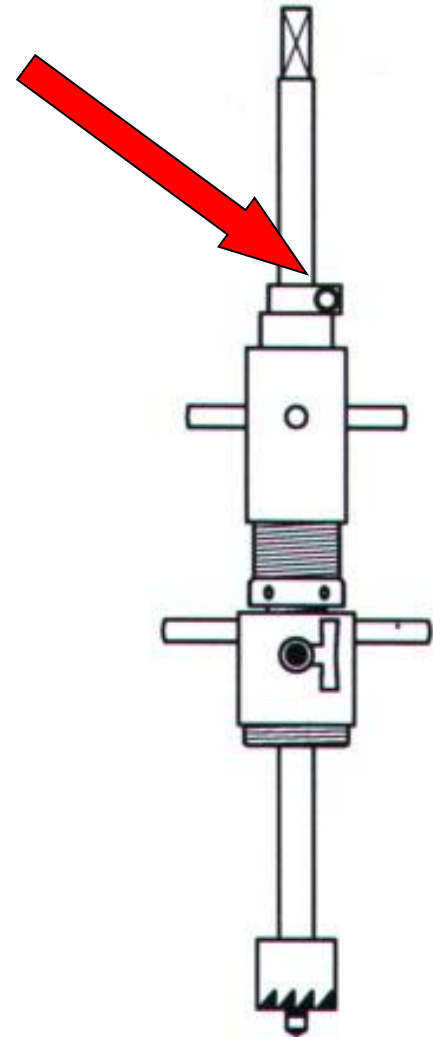
Carry out the drilling by using the ratchet on the square of the rod and give the corresponding feed.

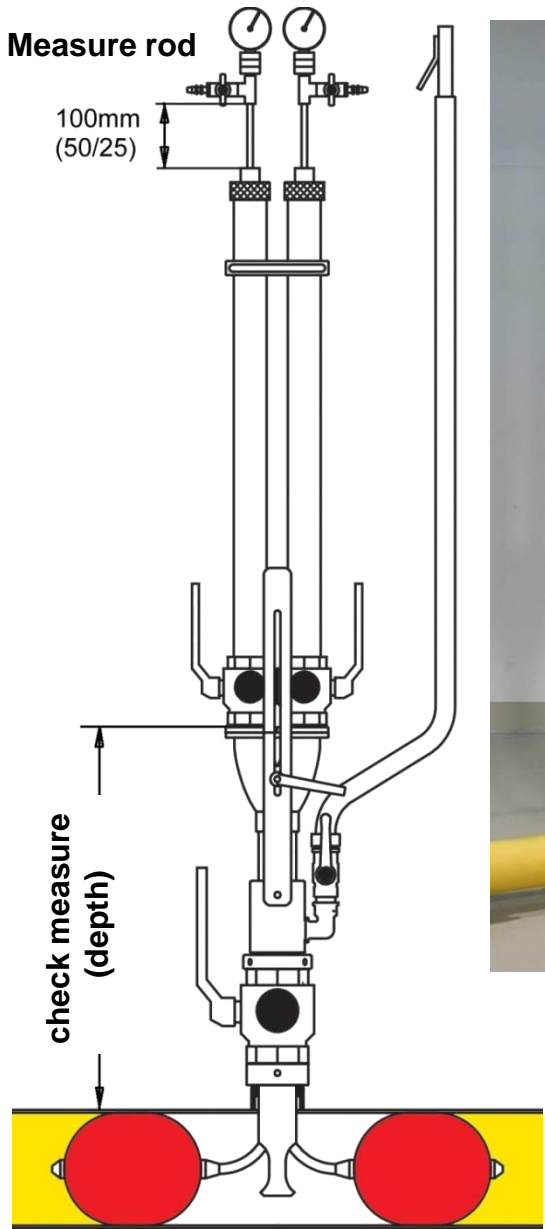
After successfully drilling turn the feed unit back and open the screw at the rod carefully.



Regarding the inside pressure the rod can be rebound.

Close the ball valve ventilate and replace the drill unit.





MDS-blower-bellows Ø80 – Ø215 mm (N1 – N4)

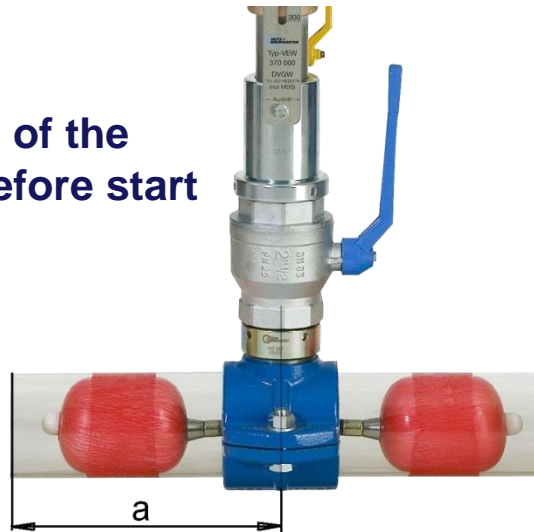
Pipe	Scale on unit	Check measure (depth)	Measure rod
PE/PVC Da 90	Scale 80 (pipe on inside stop)	565	100
PE/PVC Da 110-Da 225	Scale 100	555	100

MDS-Blase Ø190 – Ø270 mm (N5)

Pipe	Scale on unit	Check measure (depth)	Measure rod
PE/PVC Da 200-Da 225	Scale 100	555	50
PE/PVC Da 250-Da 280	Scale 100	555	25

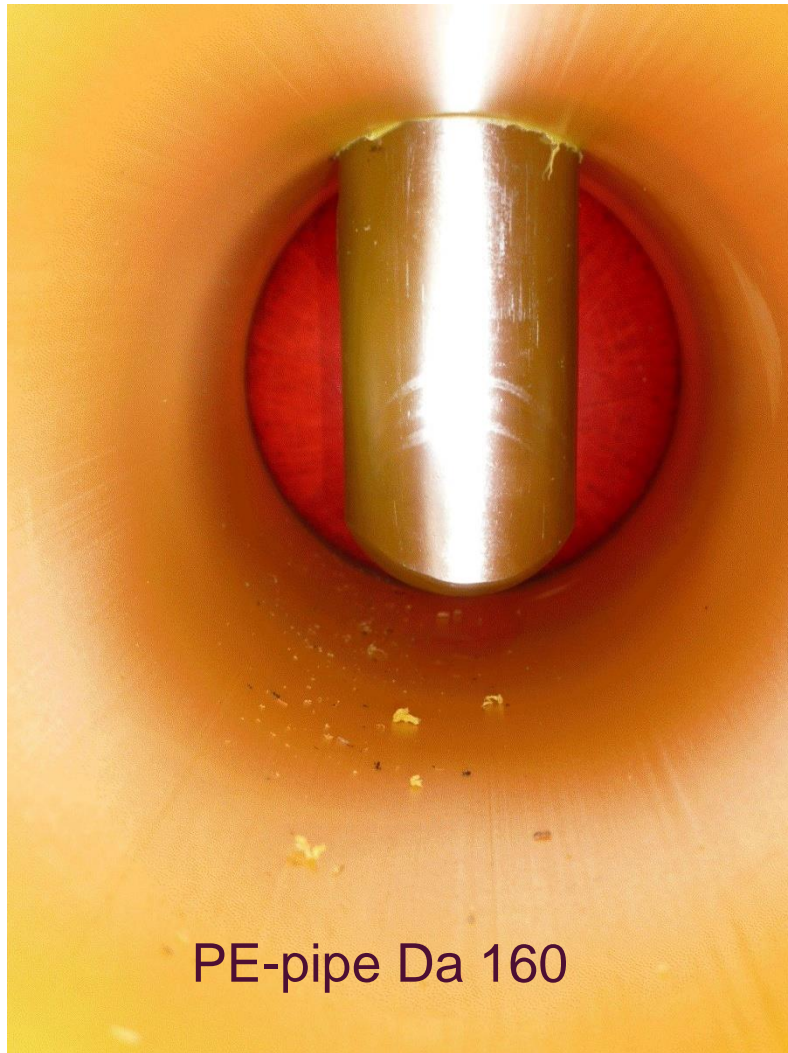
For the setting of the blower-bellows on a ring system it could be necessary to build a bypass if the gas flow is too high.

Note the measure of the blower-bellows before start working



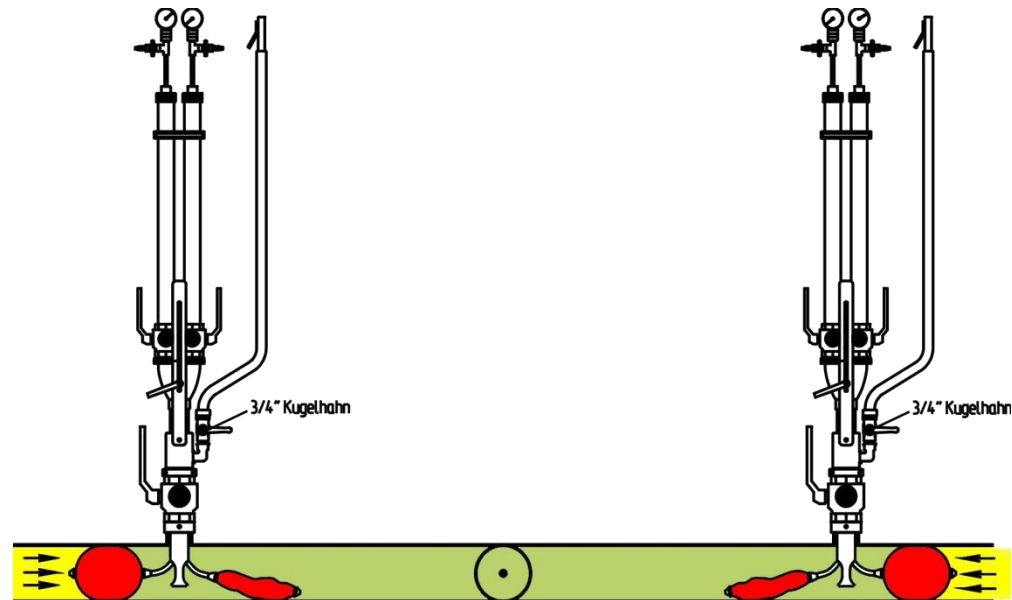
pipe	Used MDS-BB	Measure for the MDS-BB
DN 80	Ø80-120	340 mm
DN 100	Ø80-120	330 mm
DN 125	Ø120-170	450 mm
DN 150	Ø120-170	420 mm
DN 150	Ø140-215	510 mm
DN 200	Ø140-215	470 mm
DN 200	Ø190-270	530 mm
DN 250	Ø190-270	500 mm

MDS-Balloon placed in the pipe



TIP: The working area could be ventilated in the same way before setting the second blower-bellows.

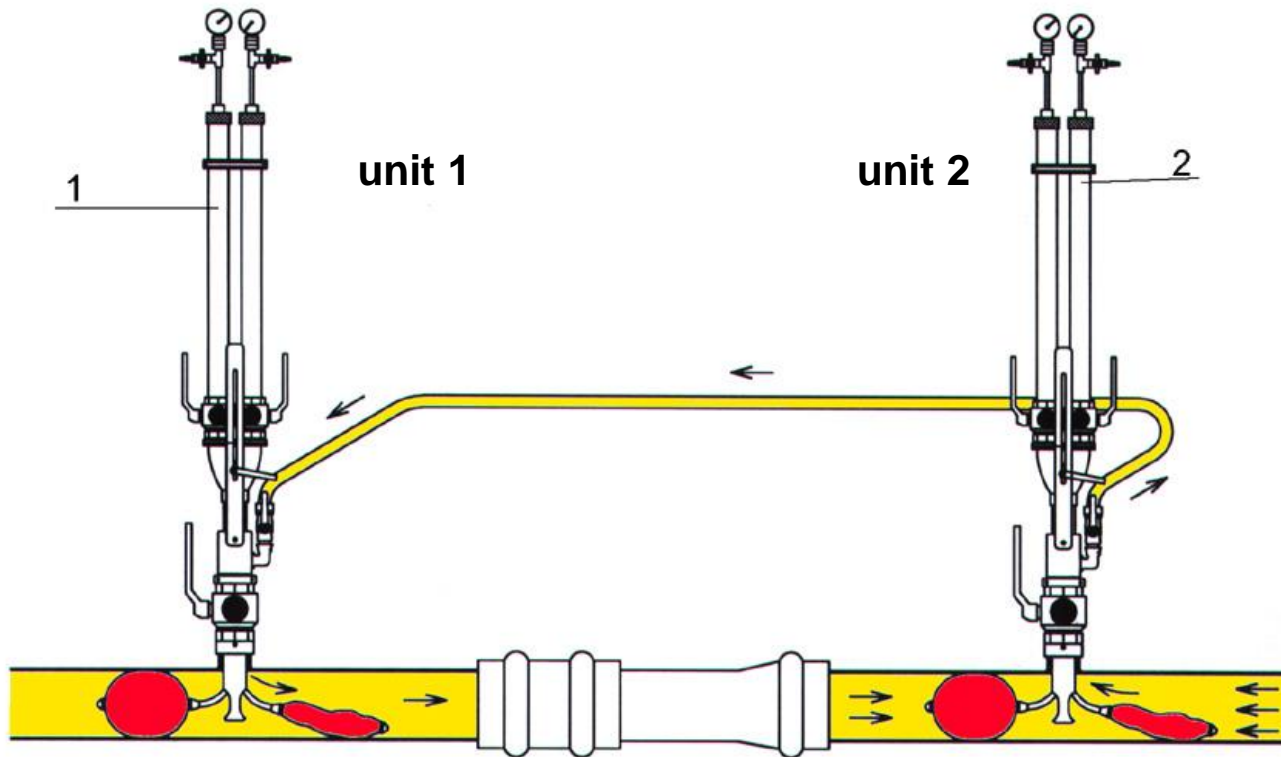
The working area can be inerted with nitrogen.



Check the pressure for approx. 15min. before starting the repair work. The manometer for the blower-bellows must be observed at any time of the work.

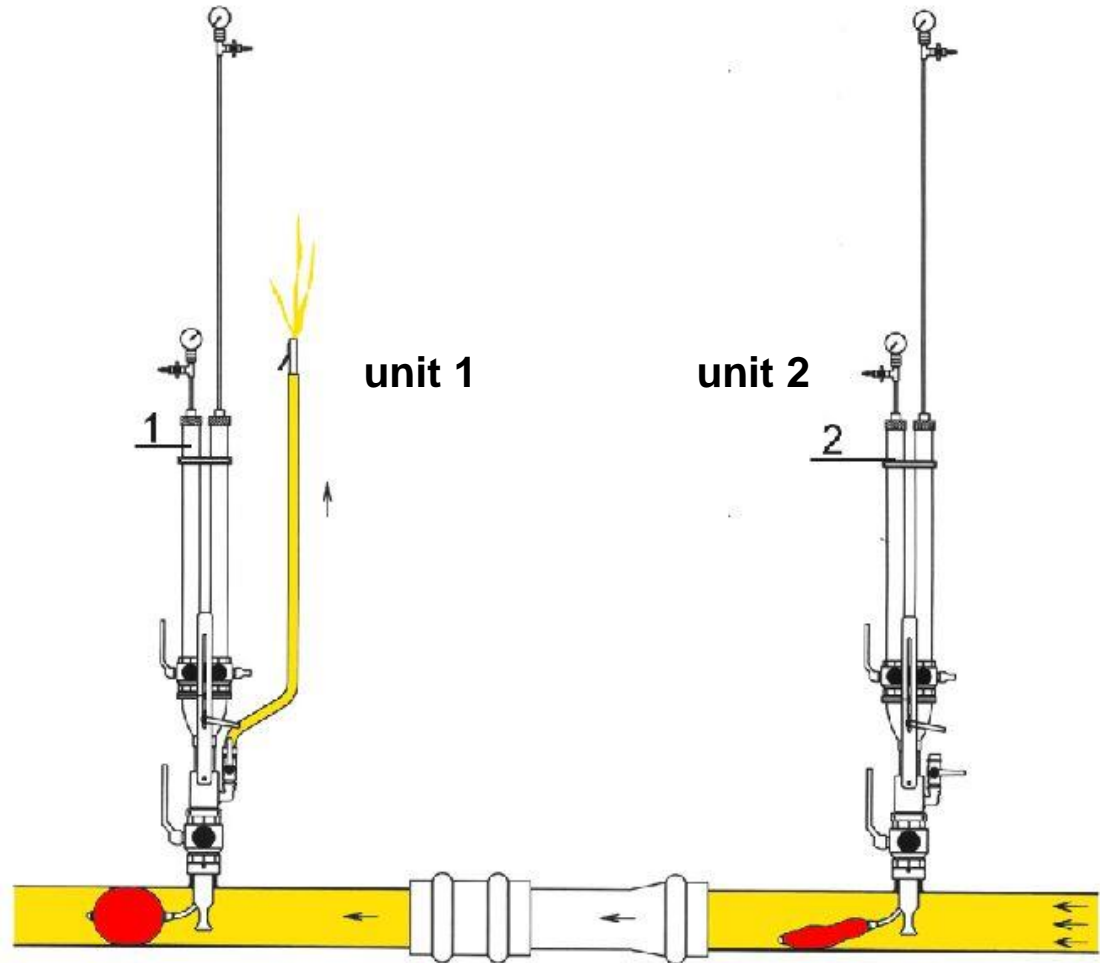


2. Sample – Embedding or repairwork with 2 setting units (ring network)



Pic.3: Connect both flush cocks with the $\frac{3}{4}$ " bridging hose to carry out the pressure compensation for the working zone.

2. Sample – Embedding or repairwork with 2 setting units (ring network)



Pic. 4:
Ventilate and remove the
vapour b-b (unit 2) and
ventilate the working area
via flush cock (unit 1)
Remove pressure b-b
(unit 1)

Setting the plugs

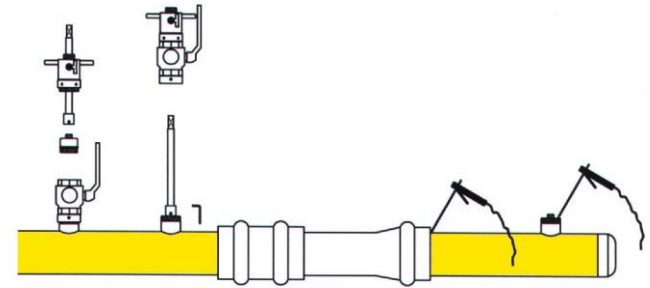
Remove the setting unit in reversed order

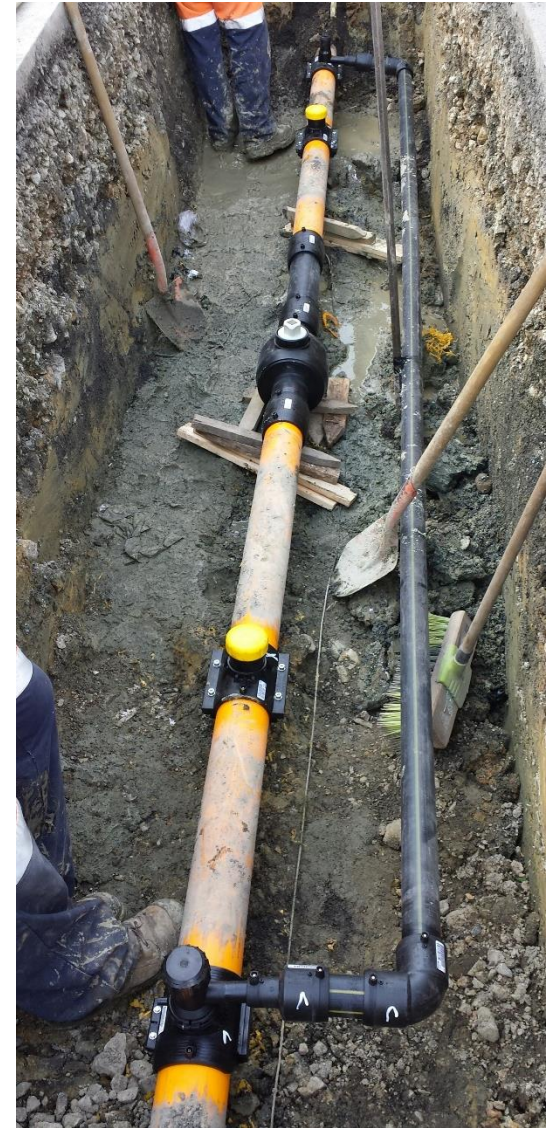
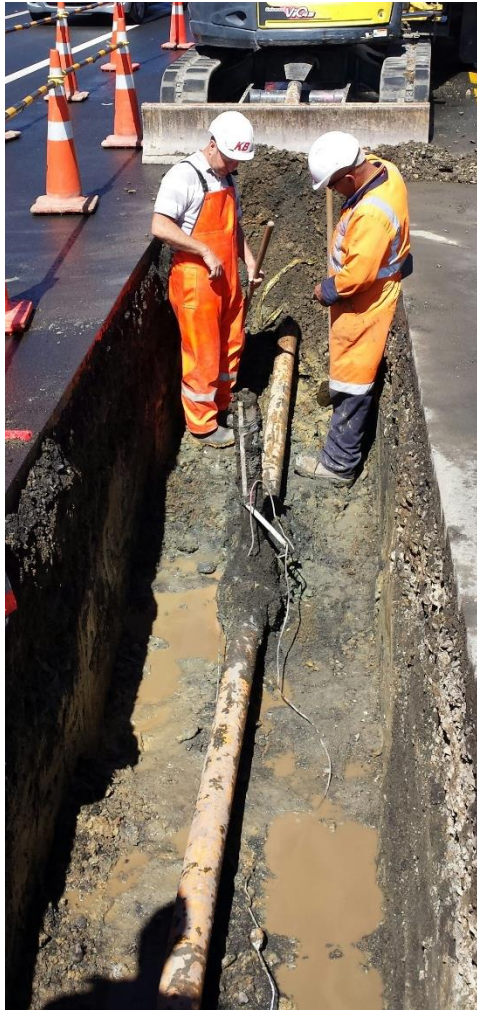
Fix the plug onto the stopper rod and assemble the rod together with the plug setting unit to the ball valve.

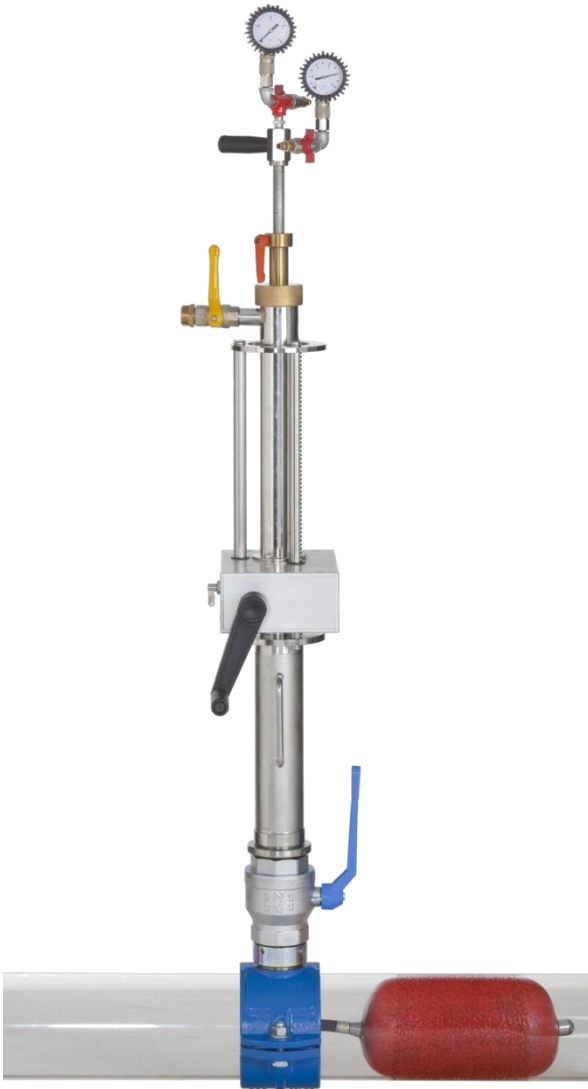
Open the ball valve and push the plug against the pressure onto the thread of the SPA saddle and tighten it until a stop is recognizable.

Check with the 1/4" valve at the plug setting unit that the plug is tight assembled.

Remove the plug setting unit incl. ball valve and save the thread of the SPA by the yellow plastic cap (maybe for another use) or fuse a SPAK onto the dome





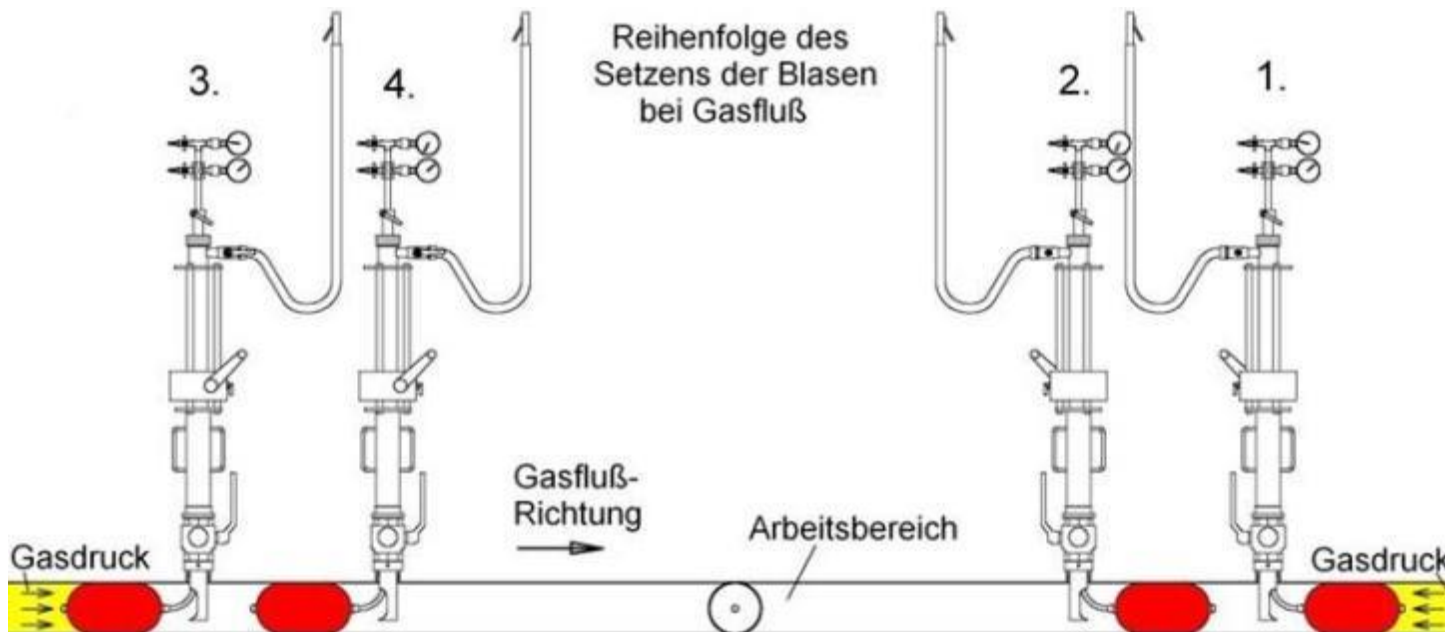


1.4 Specifications :

use dimension :	steel pipe: DN 80 – DN 200 PE-pipe: Da 90 – Da 225
maximum line pressure	: 4 bar
ballooning pressure	: <u>always</u> 8 bar
balloon dimensions	: Ø70-90 mm, Ø90-120 mm, Ø120-160 mm, Ø160-215 mm
weight (unit only)	: 24,8 kg
height	: 1475 mm
required boring-Ø	: 56,5 mm
connection thread on the device:	external thread G 2 ½"

Connections and Repairs

Shut Off Saddle Technique



1.6 device technology for setting balloon



Photo	Description	No. used
1	Single ballooning setting device, complete	4
2	Blocking balloon MDS 4 – D1 Ø70-90 mm	4
	Blocking balloon MDS 4 – D2 Ø90-120 mm	4
	Blocking balloon MDS 4 – D1 Ø120-160 mm	4
	Blocking balloon MDS 4 – D2 Ø160-215 mm	4
3	Balloon test close-off	4
4	ball valve 2 ½"	4
5	Adapter I- 2 ½" x A- 2 ½" for steel	4
	Adapter I- 2 ½" x A- 2 ½" for PE-Friatec	
	Adapter I- 2 ½" x A- 2 ½" for PE-Plasson	
6	Ballooning pump with quick coupling	1
7	Hose for ballooning pump	1
8	Adapter with pressure gauge 0-4 bar	1
9	Bridging hose ¾", 2 m	1
10	Sickle spanner with peg and allen key 4 mm	1
11	Separation compound (silicone-spray) for MDS-balloons	1

3. Transportation

To protect the equipment and to ensure completeness, we recommend storing and transport the equipment in transport boxes. Primarily for the protection of the balloons, a transport box specially designed for this purpose.



MDS-balloon 4 bar – Balloon dimensions



Screw the balloons with the test close-off and fill to max. 0.3 bar with the ballooning pump (the telescope must not go onto the block). During the pressure test, examine the balloons for damage and then screw off the test close-off.



WARNING

The visual examination of the balloon to infirmity and tightness before each use required! (German rule „BGR 500 Kapitel 2.31“) Also note the age limit of "4 bar MDS balloons" of 6 years. Decisive is the test date marked on each balloon!

BALLOON TECHNOLOGY 1 & 4 BAR

TRAINING & CERTIFICATION

- Under the German regulation and law all operators **SHALL** be trained by H&B/ Friatec engineers
- The unit **SHALL** be handled & operated at least time by one certified operator
- All components and modifications are N OLT allowed unless approved by H&B/ Friatec
- Each operator shall be re-certified by H&B/Friatec by approx. every two years







Construction site in Schmiedefeld on 10.08.2010
PE Da 160 SDR 11, line pressure 3,1 bar

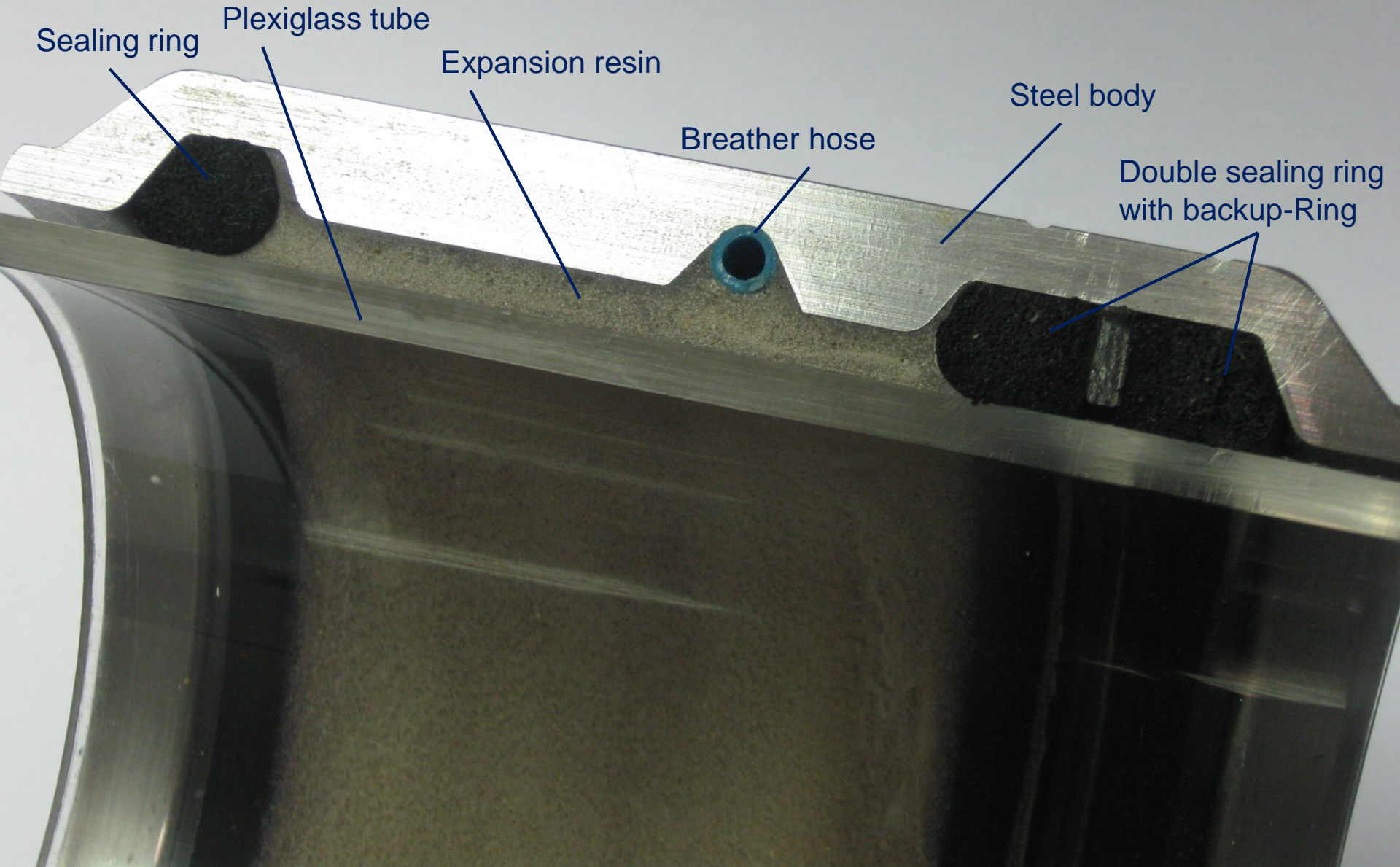
Construction site in Ellwangen on 13.07.2010
steel DN 200 , line pressure 3,2 bar





Construction site in Bretten on 19.05.2010
steel DN 150, line pressure 3,2 bar

Sectional view of the sealing area



4 bar-overslide-fitting (company Franz Schuck)



THANK YOU !

PETR SUDOMA – FRIATEC