

FRIALEN®-Large Pipe Technique for laying large pipes and relining pipe networks

Traceability

Fitting Instructions

FRIALEN®
Large Pipe Technique



Contents

Page

FRIALEN®-Safety Fittings:

1.	Areas of Application	3
2.	Standard publications and specifications for use	3
3.	Couplers from Ø 250 mm	7
4.	Moulded saddle components Top-Loading	21
5.	Pipeline relining	34

**For further information regarding
the processing of FRIALEN®
safety fittings please contact:**

FRIATEC AG

Technical Plastics Division

PO Box 710261 68222 Mannheim

Telephone +49 621 486-0

Telefax +49 621 479196

www.friatec.de

Email: info-frialen@friatec.de

Helpline +49 621 486-1486

1. Areas of Application

FRIALEN® safety fittings are used for weld connections of polyethylene pressure pipes SDR 17 (17.6) to SDR 11 for water and gas supply, pressure discharge, industry and in the construction of waste dumps.

For pipes SDR > 17.6 please check.

2. Standard publications and specifications for use

Detailed information to FRIALEN Safety Fittings can be found on the technical data sheets, which are available on our web site www.friatec.de.

Always comply with the guidelines of the DVGW standard publications, and of the DVS, VBG 50, prEN 1555, prEN 12201, UVV etc. and the respective national regulations.



WARNING !

The sequence of working operations described must always be strictly adhered to.

FRIALEN® Safety Fittings are made of **PE 100**. They can be fused to **pressure pipes between SDR 17 and SDR 7.25** made of **PE 50, PE 63, PE 80** and **PE 100** to DIN 8074 / 75, prEN 1555-2, prEN 12201-2, prEN 13244-2, ISO 4437 in melt index groups 003 to 020.

We recommend the use of pipes with restricted diametral tolerance, Range B.

FRIALEN® Safety Fittings comply with the requirements of DIN 16963 Part 5 and Part 7, prEN 1555-3, prEN 12201-3, and also ISO/CD 8085-3. It is possible to work with the FRIALEN® Safety Fittings using FRIALEN Fusion Units at ambient temperatures of between - 10 °C and + 45 °C.



N.B.

Fusing to other pipe materials e.g. PP, PVC etc. is not possible.



N.B.

Pipes and moulded components should have settled to a balanced temperature level when being processed.



INFORMATION:

FRIALEN® Safety Fittings are marked with a batch identification symbol.

Reading from left to right this gives:

- Week of manufacture (calendar week)
- Year of manufacture
- Material identification letter

Example:



KW 14/01/E

Traceability

A specialised barcode containing specific fitting data e.g. manufacturer, dimensions, material, batch, enables automatic component tracing when using e.g. FRIAMAT® equipment (see figure 8). The component tracing data may be archived electronically in conjunction with fusion process data.



INFORMATION:

Manual fusion units (without barcode feature), e.g. FWS 225, are no longer in line with current technology. It is therefore no longer possible to process FRIALEN® safety fittings using this equipment.

2.1 Pressure loading capacity

The pressure loading capacity of FRIALEN® Safety Fittings is expressed in SDR stages.

$SDR = \frac{\text{Standard Dimension Ratio}}{\text{(SDR) is the ratio of pipe outside diameter to pipe wall thickness. } SDR = d/s$

Taking account of the design factor C (calculation coefficient for components made of PE) we get the following pressure stages depending on the PE material used and the area of application:

Moulding material: PE 100 (FRIALEN® Standard)	Water	Gas
SDR Stage	maximum working pressure in bar for: C = 1.25	maximum working pressure in bar according to DVGW, C ≥ 2
17	10	5
11	16	10

The parts are marked and can be used with reference to their loading pressure capacity as shown in the table above.



DANGER !

Fusion whilst the medium is leaking out is not permissible.

3. Couplers from d 250 mm

3.1 Cut off the pipe to length

Cut the pipe square to its axis (see Figure 1). A saw with teeth suitable for plastic is ideal for the job.

Distinctive conical oblique pipeends must be cut off, if necessary.



Danger!

A pipe which is not cut off square could mean that the heating coil will not be fully covered by the pipe and this can cause overheating, uncontrolled melting or spontaneous ignition (See Figure 2).

3.2 Measure off the fusion zone, mark it with a FRIALEN® marker and remove the oxide skin (See Figure 3)

Fusion zone:

The length of the fusion zone corresponds to half the length of the coupler.

Initially the pipe must be carefully cleaned. An allowance of approx. + 5 mm in addition to the insertion depth will prove after welding that the oxidic layer was removed correctly. Immediately before assembly, the oxidic layer which has formed on the surface of pipes and HD-PE nozzle fittings during storage must be carefully removed (see figure 4).

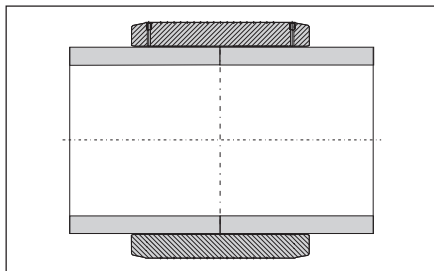


Figure 1

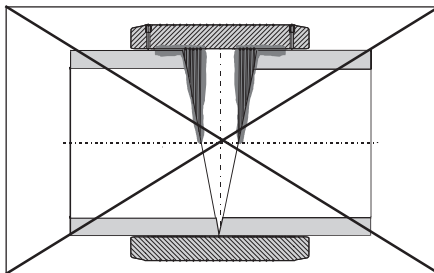


Figure 2



Figure 3



Information:

The FRIALEN® scraper tool FWSG 710 (diameter range d 250 – d 710) removes completely and even the oxide layer of the PE pipe. Besides the improved safety the handling of the scraper is more effective compared to a hand scraper. Therefore, we advice to use the FRIALEN® scraper tool FWSG 710 for larger diameter installations.



N.B.!

If the oxide skin is not completely removed this can lead to a fused joint which is not homogeneous and which may leak.



NB!

The FWSG 710 scraper tool must in all circumstances be used for the UB d710 coupler.

A one-off careful scraping process of the surface is sufficient (minimum 0.15 mm).

There may not be any pipe surface damage such as grooves or scratches within the fusion zone.



Figure 4a



Figure 4b



N.B.!

The removal of an excessively large amount of material can leave a large annular gap which cannot be closed, or completely closed, during fusion. (for the remedy see Point 3.8).

Please check regularly the condition of manual scraper blade and scraper tool blade. Worn blades must be replaced! (see also FRIALEN® Info No 1).

Scraper Tool	Estimated swarf thickness (mm)	Abrasion limit (mm)
FWSG 225	0.25 - 0.35	0.4
FWSG 710	0.30 - 0.40	0.5

We recommend the outside diameter of the pipe be checked with a diameter measuring tape after scraping.

Please note that the indicated wearing margin applies to FRIALEN® safety fittings. Where appropriate please observe manufacturers' indications

Filling or using emery cloth etc. is not acceptable as this can lead to impurities being embedded in the surface.

As a check that the removal of material from the surface is unbroken and covers the full area we recommend the marking of (checking) lines (See Figure 3). If during the scraping process localised areas of the surface are not scraped (e.g. if the pipe is oval) these must be reworked.

Protect the cleaned up zone from dirt, soap, grease, water running back and unfavourable weather (e.g. from effects of moisture, the formation of frost). After scraping do not touch the fusion zone again.



N.B.!

FRIALEN® Safety Fittings with integral heating coils ensure optimal heat transfer due to their exposed coils and because of this the inside of the fitting must not be scraped.

3.3 Deburr the outer and inner cut edges. (See Figure 5)

A hand scraper is best for this. A good chamfer on the outside diameter of the face of the pipe will make it easier to fit the coupler. **Remove the swarf from inside the pipe.**



Figure 5

3.4 Correcting pipes which are oval / not round.

Pipes can lose their roundness during storage. If the pipe ovality in the area of the fusion zone is more than 2 % of d (outside diameter) you must round up the affected pipe in the area of the fusion zone. For this use rounding clamps which have to be fitted at the end of the fusion zone (See Figure 6).

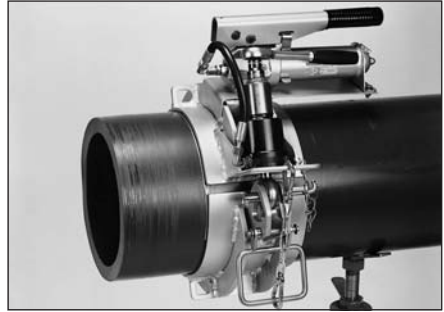


Figure 6



N.B.!

For the installation of d 710 couplers rounding clamps for the pipes need to be applied in all circumstances.

With UB couplers d 280 to d 450 the pipe may be adjusted to the coupler following evaluation of the annular gap (> 1 mm) by using the pre-heating barcode (yellow). (See also point 3.8).



N.B.!

The pre-heating barcode must be applied when using UB d 500 – d 710 couplers.

3.5 Cleaning

The surfaces of the pipe being fused and the internal surfaces of the **FRIALEN® Safety Fittings** must be absolutely clean, dry and free from grease. Immediately before assembly, and after scraping clean these surfaces with a suitable cleaning fluid, **using only an absorbent non-fibrous, non-coloured paper** (See Figure 7). We recommend the use of special PE cleaning fluid, e.g. AHK Cleaner.



Figure 7

When cleaning, take special care to avoid dirt from the unscraped pipe surface being introduced into the fusion zone.



N.B.

For cleaning purposes we recommend PE cleaning agents certified according to DVGW-VP 603, e.g. AHK cleaning fluid.

The cleaner **must** have **evaporated completely** before fusing.

Now, using the **FRIALEN® marker**, re-mark the line to show the width of the fusion zone on the pipe since this will have been removed by scraping and cleaning. Take care to ensure that the fusion zones remain clean whilst doing this. It is important not to touch the cleaned fusion zones with the hands (re-clean if necessary).

Do not take fitting to be fused from its packaging until just before processing. The packaging protects the component from external damage during transport and storage.

3.6 Inserting push fit ends or pipe ends into the fitting.

When the **FRIALEN® Safety Fittings** and pipes are being assembled care should be taken to ensure that the contact sockets are accessible to allow connection of the fusion plug. Assembly can be assisted by tapping around the face with a plastic hammer at the same time. **When assembling do not tilt.** The machined insertion end must be pushed into the fitting up to the mark. If necessary hydraulic rounding clamps should be used (See Figure 6).

Use hydraulic rerounding clamp (refer picture 6), if required.

Repeated scraping of the outer diameter might be necessary if the tolerance is big. Repeated scraping is not permitted in order to eliminate the ovality caused due to the installation mistake.

If in spite of the earlier work it is not possible to push on the fitting then localised rescraping is permissible (See Point 3.4).

To control the high tolerance points of the pipe it is recommended to assemble the coupler and evaluate the gap.

3.7 Ensuring unstressed assembly of the components.

All joints prepared for fusion must be free of stress. Pipes must not be inserted into the **FRIALEN® coupler** under a bending stress or under a load from their own weight.

If necessary the pipe run or the fitting should be supported from beneath or suitable holding devices used. The stress-free support of the joints must be maintained until the cooling period, given on the bar code and in the table, is reached (see Point 3.9).

Before fusing check once again by means of the line marks that the seating of the pipeinsertion end in the **FRIALEN® Safety Fitting** has not moved (if necessary correct this).



N.B. !:

A joint which is not free of stress or which is displaced can lead to an unacceptable flow of molten material during the fusion process and this can lead to a defective joint (See Figure 8).

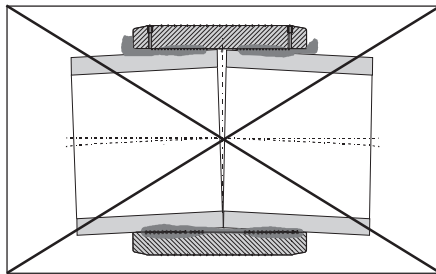


Figure 8

3.8 Carrying out the fusion.



N.B.!

Only use fusion units which are authorised by their manufacturer to process FRIALEN® Safety Fittings as part of their function. See DVS 2207, Part 1, 5.2.

Use FRIAMAT® fusion units only for FRIALEN® UB d 710!

Pre-heating code (see also component leaflet)

By the use of a specially matched preheating code (Figure 9) it is possible, within certain limits, to reduce the annular gap between coupler and pipe. The maximum bridging of the gap between the pipe and coupler shall not exceed 3mm at the complete circumference. This means for the assembled centred pipe on the coupler $\Delta d \leq 6$ mm. For the relining coupler REM d110/DN100 and d160/DN150 a maximal gap of 2mm is effective. The thermal reduction of stresses in the region of the joint will also have a beneficial effect on the fusion result.



Figure 9

Procedure:

- Prepare the area of the joint in accordance with Point 3.1 -3.8
- Centralise the coupler on the pipe so that the annular gap is as uniform as possible around the circumference. After centring the maximum gap may not exceed 3 mm.
- Seal the annular gap with adhesive tape to prevent heat losses.
- Seal off the open ends of the pipe (chimney effect)
- Read the yellow preheating barcode with the FRIAMAT® control box and start the fusion process.
- After the preheating process has finished allow to warm through for about 12 minutes. Whilst soaking preheat the second half of the coupler if necessary.
- Check the gap and if necessary preheat again.
- When the gap has closed sufficiently start the fusion in accordance with Point 3.9
- Observe cooling times in line with Point 3.10.

3.9 Carrying out the fusion



N.B.!

Only use fusion units which are authorised by their manufacturer to process FRIALEN® Safety Fittings as part of their function. See DVS 2207, Part 1, 5.2.

Use FRIAMAT® fusion units only for FRIALEN® UB d 710!



Figure 9a

Fusion parameters are contained in the main barcode on the **FRIALEN® safety fitting**. With fully automatic fusion units (e.g. **FRIAMAT®** or **FWA 315**) the parameters are entered into the fusion unit via the reader wand. After entering the barcode, the fitting data should be compared with the equipment display.

The secondary barcode contains the data for component traceability (see point 2). This barcode must be entered only if component traceability is to be used. Appropriate fusion units are a requirement.

Pipe series to be fused are listed on the sticker using SDR marking.

The fusion units automatically monitor the progress of the fusion process and regulate the electrical energy supplied to within specified limits.



Information:

Welding parameters are coded using a number consisting of 24 digits (above), traceability data is coded using a series of numbers consisting of 26 digits (below) on the barcode sticker and may be entered manually into the FRIAMAT® fusion unit via the emergency programming mode. Couplers from d 280 are additionally marked with a yellow pre-heating code.



Information:

Fusion units FRIAMAT® L and FRIAMAT® LE are not suitable for the fusion of large couplers.

For fittings with separate windings (see Figure 10) each end of the fitting has to be fused separately.

For fittings with a continuous winding the two ends of the fitting are fused simultaneously (see Figure 11).

When **FRIALEN® Safety Fittings** are equipped with a fusion indicator, this only gives an indication that fusion has taken place. The proper progress of the fusion process, however, is only shown by the fusion unit!

Start the fusion process. Compare the details in the display with the data for the fitting. Avoid loads on the joints.



N.B.!

For the sake of general safety always maintain a distance of one metre from the fusion point during the fusion process.

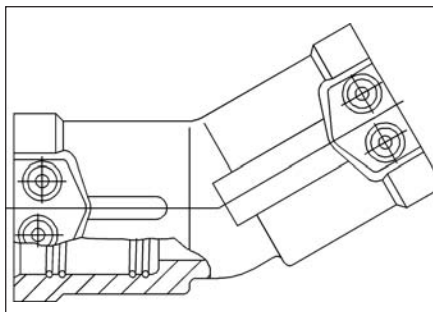


Figure 10

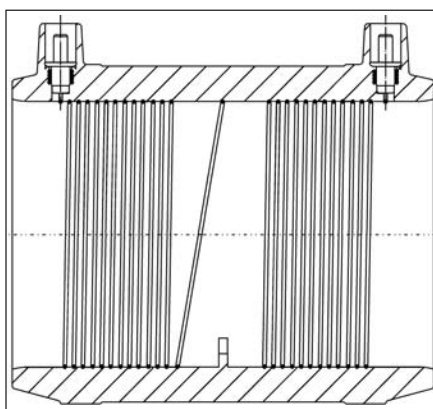


Figure 11

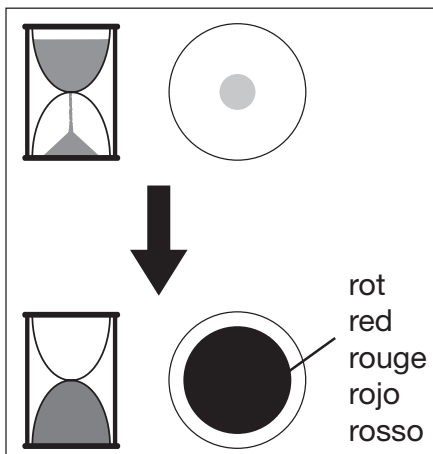


Figure 12

The **ACTUAL fusion time** taken should be compared with the **TARGET fusion time** on the unit and noted on the pipe or on the **FRIALEN® Safety Fitting** (See Figure 13).

This marking also ensures that no fusion point is overlooked.

If there is an interruption, e.g. the generator breaks down a fusion can be repeated when both the fitting and also the pipe have cooled down to ambient temperature. Please contact your areal product manager or FRIALEN®-Hotline.



Figure 13

3.10 Cooling down times.

The cooling down time is

- a) the time which is needed to allow the component to cool down to a temperature which permits movement of the joint. This time is also on the bar code and is identified as CT.
- b) the time which is needed to allow the component to cool down to a temperature which permits pressurisation to the full test or working pressure. Here a distinction is made between pressure magnitudes up to 6 bar and > 6 bar.



N.B. !

When inserting piping (e.g. relining) it is the cooling time before pressurising which is important.

Diameter in mm	Cooling down time for FRIALEN® Couplers and moulded components		
	before the joint can be moved (CT)	before pressurising at up to 6 bar	before pressurising at > 6 bar
250 – 355	30	75	100
400 – 710	40	95	120



Information:

A pipeline must not be put into operation until it has passed a pressure test (See DIN 4279, Part 7/8 or DVGW G 469).

The guidelines of the DVGW Work Sheets for pressure trials and the European standards or corresponding national regulations must be complied with.



Information:

The detachment of the outer armouring wire during the cooling down stage is caused by the thermal expansion characteristics of the fused joint and does not present a problem.

4. Moulded saddle components - Top Loading

FRIALEN® Moulded Saddle Components are used with pipes from SDR 17 to SDR 11 from Ø 250 mm. They are held in place whilst working by the FRIATOP clamping device.

4.1 DAA-TL Pressure Tapping Fittings - Top Loading, Ø 250 - Ø 400 mm

FRIALEN® DAA-TL Pressure Tapping Fittings are suitable for fitting as branch connectors onto unpressurised or pressurised pipelines.



N.B. !

FRIALEN® pressure tapping valves $\geq d$ 355 mm may be processed using only SDR 17 pipes due to tapping technique.

4.1.1 Measure off the fusion zone on the pipe, (and the side outlet spigot) mark it and remove the oxide skin.

The fusion zone: is the area of pipe covered by the saddle; for a side outlet it is the insertion depth on the smooth pipe spigot. The oxide skin in the area of the fusion zone, which has formed on the surface of the HD-PE pipes during storage, must be **totally** removed with a hand scraper immediately **before** assembly (See Figure 15).

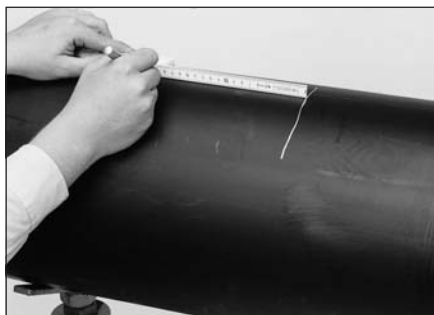


Figure 14



N.B.!

If the oxide skin is not completely removed this can lead to a fused joint which may leak.

Worn blades on the hand scraper must be replaced.



Figure 15

A single unbroken removal of the surface is adequate (min. 0.15 mm). This should leave an even surface with no flat spots or ridges of material on the diameter of the pipe.



N.B.!

Filing or using emery cloth etc. is not acceptable as this can lead to impurities being embedded in the surface.

As a check that the removal of material from the surface is unbroken and covers the full area we recommend the marking of (checking) lines (See Figure 13). If during the scraping process areas of the surface are not scraped (e.g. if the pipe is oval) these must be reworked. Protect the cleaned up zone from dirt, soap, grease, water running back and unfavourable weather (e.g. from effects of moisture, the formation of frost).

4.1.2 Cleaning

The surfaces of the pipe being fused and the internal surfaces of the **FRIALEN® DAA-TL Pressure Tapping Fittings** must be absolutely clean, dry and free from grease. Immediately before assembly, and

after scraping, clean these surfaces with a suitable cleaning fluid, using **only an absorbent non-fibrous, non-coloured paper.**

When cleaning, take special care to avoid dirt from the unscraped pipe surface being introduced into the fusion zone.



N.B.!

For cleaning purposes we recommend PE cleaning agents certified according to DVGW-VP 603, e.g. AHK cleaning fluid.

The cleaner **must** have **evaporated completely** before fusing.

Now, using the **FRIALEN®** marker, re-mark the line to show the width of the fusion zone on the pipe since this will have been removed by scraping and cleaning. Take care to ensure that the fusion zones remain clean whilst doing this.

Do not take fitting to be fused from its packaging until just before processing. The packaging protects the component from external damage during transport and storage.



Figure 16a



Figure 16b

4.1.3 Fitting

- Place the saddle onto the prepared surface of the pipe.
- Fit the adapter of the FRIATOP clamping device (Figure 16a).
- Fit the clamping device as directed in the Operating Instructions (Figure 16b).



N.B.!

On FRIALEN® Pressure Tapping Fittings the drill setting made at the factory must not be altered before fusing.

After the fusion process has finished always maintain the jointing pressure for a 10 minute cooling period!

4.1.4 Carrying out the fusion

When fusing **FRIALEN® Pressure Tapping Fittings** onto pipes carrying a medium the following maximum permissible operating pressures must not be exceeded during the fusion process and until cooling down is complete.

Pipe material	PE 80		PE 100	
SDR	17	11	17	11
Maximum permissible working pressure in bar				
Gas pipe	2	5	5	10
Water pipe	8	12.5	10	16



N.B.!

Only use fusion units which are authorised by their manufacturer to process FRIALEN® Safety Fittings as part of their function. See DVS 2207, Part 1, 5.2.

The fusion parameters are contained in a bar code which is affixed to the **FRIALEN® Safety Fitting**. The parameters are entered into the fusion unit using the reader wand.

The fusion units automatically monitor the progress of the fusion process and regulate the electrical energy input to within specified limits.

The fusion indicator only gives an indication that fusion has taken place. The proper progress of the fusion process, however, is only shown by the fusion unit!



N.B.!

For the sake of general safety always maintain a distance of one metre from the fusion point during the fusion process.

4.1.5 Drilling and applying the test and working pressure.

The waiting times below must be adhered to:

Diameter in mm	Cooling down time in minutes for FRIALEN® moulded saddle components	
	before pressurising through the outlet	before drilling (CT)
≥ 250	50	60

The cooling times CT given on the components are the cooling times before drilling.



N.B.!

If the waiting times are not complied with, there is a risk of a fused joint which may leak. Before drilling the general installation guidelines must be observed.

4.1.6 Drilling the Pressure Tapping Fittings

Remove the sealing plugs. Screw the drill bit down to the lower stop with the correct FRIALEN actuation key (See Figure 17).

Turn back the drill bit to the upper stop.

Fit the sealing plugs and screw them down with a hexagon spanner until the collar of the plug is **lightly touching** the face of the drill spigot.

Now screw the plug **half a turn** back to relieve the O-ring.



N.B.!

If the torque on the collar is too high it can break the plug or twist off the hexagon. In this event the plug must be changed.

It is recommended that a sealing cap be fused onto the drill spigot.

The necessary scraping and cleaning work will have to be carried out (See Section 3.2 - 3.8).



Figure 17

4.1.7 Tapping of DAV-TL pressure tapping valves d 250 - d 400



N.B.!

FRIALEN® pressure tapping valves DAV-TL may be processed using pipes SDR 11 up to d 315 and SDR 17, up to d 400.

Assembly, Fusion and Cooling time is on the line with 4.1.3 ff.

Tap by turning square spanner clockwise up to lower end position (see picture 18). The valve is now closed. In order to open the valve, the tap must be moved anti-clockwise up to the end position. Once upper end position is reached, turn back about $\frac{1}{2}$ a rotation.

The metal end points for the 'open shut' positions of the valve lead to a distinctly noticeable increase in the activating force. As sealing takes place in the closed position using a radially injected O-ring, it is not necessary to apply a great deal of pressure when closing the valve.

Install the FRIALEN Installation Kit EBS on the 14 mm square of the DAV-TL and secure the splint against pull out.



INFORMATION!

Retrospective tapping via FRIALEN® EBS from the road top is possible.

Set the required overlapping height on telescoping frame. Telescoping frame may be adjusted by sliding scale and will stop securely at any point. The **FRIALEN® EBS** is technically perfectly adapted to the **FRIALEN® DAV-TL**.



Figure 18

4.2 VAM-RG-TL Valve Tapping Fittings d 250 - d 315 mm VAM-RG-TL

4.2.1 Assembly

The preparation for assembly and fusion is analogous to that for **FRIALEN® Pressure Tapping Fittings** (See 4.1.1 to 4.1.4).

The cooling times must be complied with (See Point 4.1.5 **Pressure Tapping Fittings**).

The fitting is drilled using a suitable close-off device or fitted with a valve in accordance with the relevant Fitting Instructions from the different valve manufacturers. The preparation and conduct of the pressure test are carried out in accordance with the details given by the valve manufacturer.

The threaded components fitted at the factory must be **secured with a spanner to prevent them from twisting**.

Care should be taken to ensure that the insulation work is carried out in accordance with the regulations (DVGW Standard Publication).



Figure 19

4.3 SPA-TL Shut off Saddles Top-Loading d 250 - d 315 mm SPA-TL

4.3.1 Fitting

FRIALEN® Shut off Saddles Top-Loading (see Figure 20) are prepared for assembly and fused in the same way as **FRIALEN® Pressure Tapping Fittings** (See Sections 4.1.1 to 4.1.4). The drilling (max. Ø 56.5 mm) of the pipe can be carried out after the end of the cooling down period (See Point 4.1.5) and in compliance with the Assembly Instructions for Tapping/Bubble setting units from the relevant manufacturer.

Fitting the brass plug

To screw in the brass plug requires the application of a torque load of around 150 Nm. If necessary a lever arm should be used to achieve this torque.

The plug should be screwed in up to the stop; the O-ring must seal in the dome (See Figure 21).

After fitting the brass plug either the 2½" plastic nut must be screwed on or a **FRIALEN® cap for Shut off Saddles** must be fused on, ensuring that the usual scraping and cleaning work is carried out (See Figure 22).



Figure 20



Figure 21



Figure 22

4.4 SA-TL Spigot Saddles Top-Loading Ø 250 - Ø 500 mm SPA-TL

4.4.1 Fitting

The preparation for assembly and the fusing are carried out in the same way as for **FRIALEN® Pressure Tapping Fittings** (See Sections 4.1.1 to 4.1.5).



N.B.!

Drilling is carried out in the un-pressurised state with the **FRIALEN® FWAB drilling unit** or with a normal commercial hand drill.

We recommend the specially designed drill by Hütz + Baumgarten, Remscheid:

Hütz + Baumgarten GmbH & Co. KG
Anbohrgeräte
Solinger Straße 23-25
42857 Remscheid

Please contact our FRIALEN® application technology department.

Please observe manufacturers' installation instructions.



Figure 23

4.5 VSC-TL Repair Saddle Top-Loading Ø 250 - Ø 560 mm

4.5.1 Fitting

For localised damage to the pipe at a single point the damaged spot can be sealed off with a plug and then fused with the repair Saddle Top-Loading.

The preparation for assembly and the fusing of the half clamp are carried out in the same way as for **FRIALEN® Pressure Tapping Fittings** (See Points 4.1.1 to 4.1.5).



Figure 24



N.B.!

Care must be always taken during assembly to ensure that the damaged or deformed point on the pipeline lies in the centre of the heating element.

Fusion whilst the medium is leaking out is not permissible.

4.6 AKHP-TL Tapping Ball Valves Valves Ø 250 - Ø 560 mm

AKHP-TL Tapping Ball Valves allow the drilling of unpressurised or pressurised pipelines.

4.6.1 Fitting

The preparation for assembly and the fusing of the Tapping Ball Valve are carried out in the same way as for FRIALEN® Pressure Tapping Fitting (See Points 4.1.1 to 4.1.5).

We recommend the Hütz + Baumgarten, Remscheid, tapping tool for leakage free tapping.

Using the BS Installation Kit, the FRIALEN® Tapping Ball Valve can be operated from the street cover.



Figure 25

5. Pipeline relining

5.1 Procedures and areas of application

Defective old pipelines made of cast iron, steel or other conventional materials can be renovated by drawing in an HD-PE pipe, as an alternative to laying new pipes.

Standard pipes are used for the relining process and are joined using suitable FRIALEN® Moulded Components.

For the so-called close-fit process (lining with precisely fitting pipes), however, the pipes which are used have a cross section which has been changed in the manufacturing process (e.g. U-liners) or on the building site itself (e.g. Swage lining). The outside diameter of these pipes is matched to the inside diameter of the old pipeline and thus deviates from the standard.

The ends of each renovated section of pipeline can be fused with **FRIALEN® REM Relining Adapter Couplers**.

At points where it is scheduled to fuse on a coupler or a saddle the relining pipe should be sized to the nominal inside diameter during the reshaping by fitting half shells.

5.2 REM Relining Adapter Couplers

One end of the **REM Relining Adapter Coupler** (Figure 23) is matched to the dimensions of the pipes used for this process. The other end corresponds to the standard pipe size. This allows renovated sections of pipeline to be connected using fitted pieces of standard pipe. The fittings are used like slip-on couplers.

5.3 Fitting and fusion

5.3.1 Relining using HD-PE standard pipes

When joining standard pipes the appropriate FRIALEN® Moulded Components are used. The fitting and fusion is carried out in a similar fashion to that in Point 2. For couplers > Ø 250 mm preheating in accordance with Point 3.8 or 5.3.3 is recommended when there are larger annular gaps.

5.3.2 Close-fit relining

After the renovation the HD-PE pipes used will often exhibit deviations both in their diameter and from the ideal round shape in the area of the proposed joint. Depending on the characteristics of the pipe the joint can be made using a preheating code, and also in conjunction with a support sleeve or a pipe expander tool.

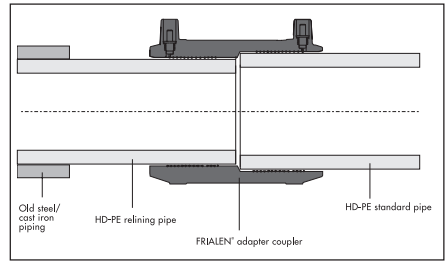


Figure 26

5.3.3 Pre-heating code (see also component leaflet and 3.8)

5.3.4 Support sleeve

Where there are larger deviations in shape or size on the ends of the pipes in the area of the joint the use of support sleeves is recommended (Figure 27). The fitting can then be used as a slip on coupler.

For fitting the support sleeve a suitable pipe expander tool has to be employed (Figure 28). Before using the pipe expander tool deviations in shape must be taken into account. The expander shells should be positioned to give an optimum rounding effect.

The design of the support sleeve is dependent on the medium flowing, the material and the pipe size.

The fitting of coupler and sleeve will be made easier if the pipe tolerances are taken into account when deciding on the size. **The use of preheating in accordance with Point 5.3.3 will then be essential.**

5.3.5 Use of a pipe expander tool as a temporary support sleeve

If a support sleeve is not wanted the coupler can be fused using a suitable pipe expander tool, matched to the size of the pipe. Use of the preheating code (see Point 5.3.3) is particularly important to reduce the stresses in the pipe. The tool must remain in place during the fusion process and until the cooling period has passed.

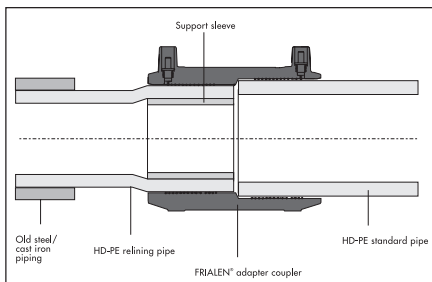


Figure 27

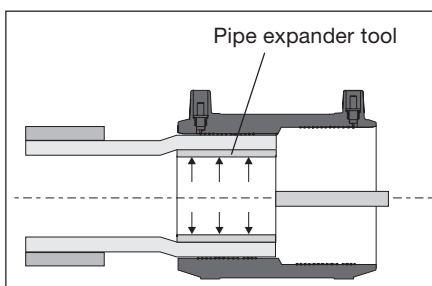


Figure 28

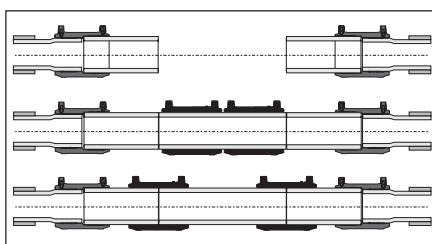


Figure 29

5.4 Cooling times

For cooling times Point 3.9 is applicable.

5.5 Relining fittings and clips (top loading)

When fitting saddle components (Figure 30) care must be taken with any ovality or flattening of the HD-PE pipe. In order to achieve a uniform surface pressure, and thus a proper fusion, the radius of curvature on the inner liner at the site of the proposed joint must correspond to the diameter range d of the moulded component being used. If necessary the saddle must be brought into line either axially or radially. Please take the diameter range for the relevant component from the "Special Technology" price list.

The fitting of the moulded saddle components is carried out in accordance with point 4.1.1 to 4.1.6



Figure 30

Before the renovation the old pipe should be cut away at the point where a moulded saddle component is to be fused to the inner liner pipe. The pipe diameter will be brought to size at the proposed jointing point by fitting half shells.

When fitting a house connection at some later point access to the inner liner is gained by using a window cutter to get through the old pipe.

If required you are welcome to order further Assembly and Operating Instructions from us:

- FRIALEN® Safety Fittings for service and distributor lines up to d 225
- FRIAFIT® Sewage System
- FRIASAFE® Compression Fittings
- FRIAMAT® Fusion Units
- FRIATOP – Top Loading Unit
- FWSG 63, FWSG 225 and FWSG 710, FWSGS, FWSGA scraper tools and further assembling devices.

or download from internet.

www.friatec.de, Technical Plastics Division

- All technical details in this publication are checked annually for their current value. Please check the bottom of the back page for issue date of this publication. We will be happy to send you the latest issue.

FRIATEC Aktiengesellschaft · Technical Plastics Division
P.O.B. 71 02 61 · D-68222 Mannheim
Telephone +49 621 486-0 · Telefax +49 621 479196
www.friatec.de · E-Mail: info-frialen@friatec.de

