

FRIAFIT® Sewage system

The safe connection technique for HDPE sewer pipes

Assembly Instructions



FRIAFIT® Sewage system

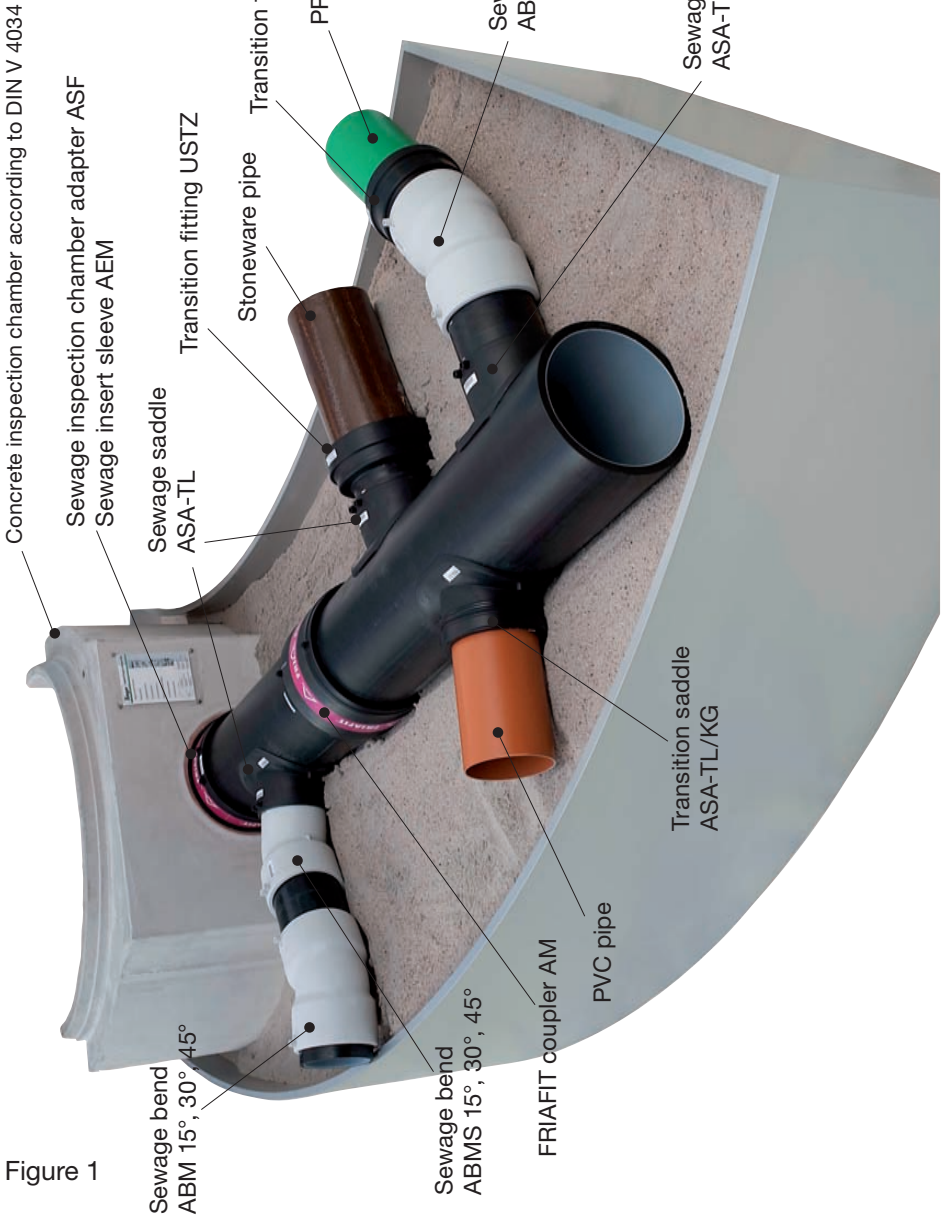


Figure 1

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For a better readability, no identification by ® was used in the continuous texts of this assembly instruction.
The following brands are registered: FRIAFIT, FRIALEN, FRIAMAT and FRIATOOLS.

1. Safety

1.1 Safety advice and tips

The following warning symbols are used in these assembly instructions:



DANGER!

Describes impending danger!

Non-observance of this warning may lead to serious damages to health and objects.



WARNING!

Describes a dangerous situation!

Non-observance of this warning may cause minor injuries or damage to objects.



IMPORTANT!

Describes advice and other useful information!

2. Areas of application

The FRIAFIT Sewage system is used in gravity-flow lines in municipal drainage, industry, and construction of landfill sites. On the basis of electrofusion welding, FRIAFIT joins HDPE sewage pipes longitudinally force-locked, root-proof, and permanently tight.

The FRIAFIT inspection chamber connection ASF/AEM is used in concrete sewers. The design takes into consideration the different material properties of HDPE and concrete.

For domestic water supply, compact elbows facilitate a flexible pipeline routing, transition fittings ensure a seamless material transition in new installations and refurbishment.



IMPORTANT!

The information and processing instructions mentioned on the fitting or enclosed shall apply predominantly.

3. Regulations and processing instructions

3.1 Standard conformity/fusability

The **FRIAFIT** Sewage system complies with DIN 12 666 and thus counts as a regulated building product. As such it does not require a general building supervision approval. A certificate of conformity from DIBt Berlin is available.

The information and processing instructions mentioned on the fitting or enclosed shall apply predominantly.

The **FRIAFIT** Sewage system (except couplers AM) can be fused to pipes of SDR grades 33 to 11, **FRIAFIT** Sewage bends ABM/ABMS can be fused to pipes of SDR 33 to 17, in accordance with DIN 8074/75 and DIN EN 12 666.

FRIAFIT Couplers AM SDR 17 are registered for the use in drinking water mains. They have been registered according to DVGW-VP607 using certification DV-8606B06114 and DV-8611B06115, and are subject to regular external checks.

FRIAFIT Couplers AM SDR 17 can be fused to pipes of SDR grades 33 to 17 in accordance with DIN 8074/75, ISO 4437, EN 12 201 and EN 13 244.

Please observe the guidelines of the DVGW regulations, of DVS, BGR 500 (VBG 50), EN 1555, EN 12 201, EN 13 244, accident prevention regulations and the relevant country-specific regulations.

Pipes of material types **PE 63**, **PE 80** and **PE 100**. For PE-Pipes the Melt Flow Ratio MFR 190/5 shall be between 0.2 and 1.7 g/10min.

We recommend the use of pipes with restricted diameter tolerance range, tolerance grade B.



WARNING!

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

It is possible to work with the **FRIAFIT** Sewage system using **FRIAMAT** Fusion units except **FRIAMAT L/LE** at ambient temperatures between -10° and $+45^{\circ}$.



WARNING!

During processing, pipes and fittings should have a balanced temperature level in the permissible range of application between -10 °C and +45 °C.

The FRIAFIT fittings can be stored and processed for a long time, provided the general storage specifications are adhered to.

Proper storage:

- in closed rooms or containers (boxes) and/or not exposed to UV radiation,
- not exposed to effects of weather such as humidity,
- storage temperatures between -20°C and +50°C.

If these requirements are met, a storage and processing period of more than four years can be assumed.



WARNING!

Improperly stored component parts may not be processed because this may result in leaking fusion joints.

3.2 Pressure load-bearing capability

The **FRIAFIT** Sewage system has been designed for **unpressurised pipes (open channel flow)**. The test pressure for this type of system in accordance with DIN EN 1610 is a maximum of 0.5 bar.

In addition to this, **FRIAFIT** Coupler **AM** made from PE 100 SDR 17 can be pressurised accordingly to EN 12 201 and EN 13 244 up to a maximum of 10 bar for drinking water and sewage pressure pipes if the pipe is of suitable design ($C = 1.25$).

The **FRIAFIT** Sewage Bends **ABM/ABMS** and **FRIAFIT** Sewage Saddle Top-Loading **ASA-TL/KG** made of PE 100 SDR 17 are designed for a pressure load of 2.5 bar.

3.3 Static

The static calculation of the PE sewage pipe according to ATV-A 127 must be carried out by the appropriate pipe manufacturer or engineering company in each individual case in accordance with ambient conditions.

In any event, the ring stiffness of the pipe connection fused using **FRIAFIT** Fittings is higher than the ring stiffness of the inserted pipe.



WARNING!

The described sequence of the processes is absolutely to be adhered to.

4. Fusing the FRIAFIT® Coupler AM and Sewage bends ABM/ABMS

4.1 Cutting to length of pipes

Cut off the pipe in a right angle to the pipe axis (see Figure 2).

A suitable tool is a saw with toothing suitable for plastics.

Pipe ends with distinctive conical cut ends have to be shortened, if necessary.

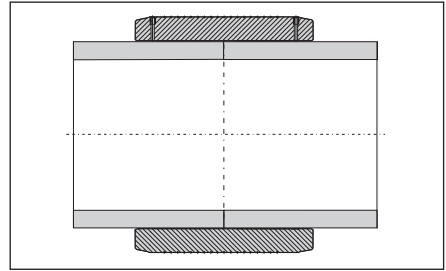


Fig. 2



DANGER!

A non-rectangular pipe cutting may cause the heating coil partially not being covered by the pipe which may result in overheating, uncontrolled melt formation or self-ignition (see Figure 3).

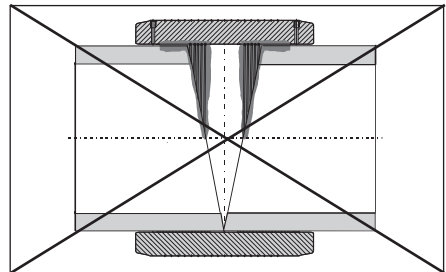


Fig. 3

4.2 Measure fusion zone, mark with a FRIALEN marker and remove oxide layer (see Figure 4 and 6)



WARNING!

Fusion with escaping media is not permissible.

FUSION ZONE:

For **fittings** in general the insertion depth, i.e. the distance between the coupler edge and the internal stop.

For **slide over couplers**, the distance between the coupler edge and the centre of the coupler (see Figure 4).



Fig. 4

At first, remove contaminations from the pipe. A processing allowance of approx. +5 mm in addition of the insertion depth provides proof after fusion that the oxide layer has been removed properly. Using a manual scraper or FRIATOOLS Scraper tool (see Figure 5), the oxide layer, which formed during on the surface of HDPE pipes and spigot fittings during storage, has to be removed completely directly before the assembly.



Fig. 5



INFORMATION:

By using Scraper tools FWSG 225 (area of application d 75-d 225) and 710 (area of application d 250-d 710) a regular and complete dismantling of the oxide layer of the HDPE pipe is ensured. Besides the increase of the working safety a faster processing is possible compared to the use of hand scrapers. We recommend therefore on principle the use of scraper tools.

The scraping result is to be verified.



WARNING!

If the oxide layer is not removed completely, inhomogeneous, leaking fusion joints may result.

A one-time, complete removal is sufficient (min. 0.15 mm). Damages to the pipe surface as e.g. axial grooves or scratches may not be located within the fusion zone.



WARNING!

An excessive swarf removal may result in an excessively large annular gap which either cannot or only insufficiently closed by fusion.

Please thus regularly check the condition of the blade at the manual scraper and the wear of the scraper blade at the scraper tool. Worn blades must be replaced!

Scraper tool	Desired swarf thickness (mm)	Wear limit (mm)
FWSG 225	0.25 - 0.35	> 0.4
FWSG 710	0.30 - 0.40	> 0.5

We recommend checking the external pipe diameter using a diameter tape after scraping.

The stated wear limit applies to FRIAFIT Fittings. Observe any manufacturer's instructions, if any!

Filing or sanding are not permitted because contaminations are introduced.

For a control of the complete surface removal over the entire surface, we recommend to apply marking (control) lines (see **Figure 6**). If during scraping of the surface non-scraped areas occur at some points (e.g. in case of oval pipes), these areas are to be reworked.

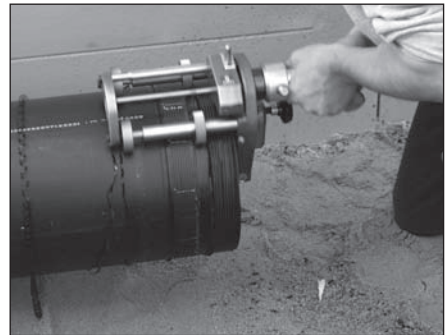


Fig. 6

The processed zone is to be protected against dirt, soap, grease, subsequently flowing water and unfavourable effects of weather (e.g. moisture, frost formation). Do not touch the fusion zone again after scraping.



WARNING!

FRIAFIT Fittings with integrated heating coils guarantee optimal heat transfer through their exposed heating coils and may thus not be scraped at the inside of the fitting.

4.3 External and internal chamfering of the cutting edge (see Figure 7)

For this purpose, the manual scraper is a suitable tool. Strong chamfering of the pipe face edge of the external diameter will make the coupler installation easier. **Remove swarves from within the pipe.**



Fig. 7

4.4 Restoration of irregular / oval pipes

Pipes, especially those with larger diameters, can lose their roundness during storage. If the pipe out-of-roundness in the fusion zone area exceeds 1.5% of d (outer diameter) or is > 3.0 mm, these pipes must be rounded in the fusion zone area. Please use rounding clamps for this purpose which are installed at the end of the fusion zone (see Figure 8).

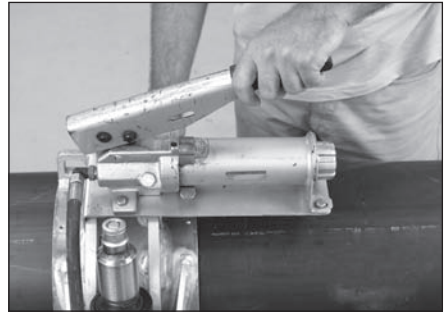


Fig. 8

4.5. Cleaning

The surfaces of the pipes to be fused and the interior surfaces of the **FRIAFIT** Fittings must be absolutely clean, dry and free from any grease. These areas are to be cleaned with a suitable cleaning agent and exclusively with absorbent, lint-free and non-dyed paper directly before the assembly and after scraping (see Figure 9).



Fig. 9



WARNING!

We recommend PE cleaning agents which meet the requirements of the test basis DVGW-VP 603, e.g. AHK cleaning agents.

When cleaning, ensure that no contaminations from the unscraped pipe surface are introduced into the fusion zone.



WARNING!

When using alcoholic cleaning agents, the alcohol percentage must be at least 99.8% according to DVGW-VP 603.

The amount of the cleaning agent is to be chosen such that the paper is slightly wetted. Skin contact is therefore to be avoided. Please observe the safety notes of the manufacturer!

The cleaning agent **must** be **completely evaporated** before starting the fusion process.

Subsequently, re-apply marking line for the insertion depth on the pipe distributed across the circumference (approx. 120°) with the **FRIAFIT** marker because this line was removed during scraping and cleaning. Take care to ensure that the fusion zones remain clean whilst doing this. It is essential not to touch the cleaned fusion zones with your hands (if necessary, clean zones again).

Moisture in the area of the joint area, e.g. because of dew or frost, is to be removed using suitable aids.

The fitting is to be removed from the packaging only directly before the planned processing. The packaging protects the fittings against external influences during transport and storage.

4.6 Positioning of insertion or pipe ends into the fitting

When the **FRIAFIT** Fitting and pipe are being assembled take care to ensure that the contact sockets are accessible to allow connection of the fusion plug.

Do not jam when connecting. The HDPE pipe must be able to be pushed into the FRIAFIT Fitting without force. Mounting can take place by applying blows at regular intervals around the frontal edge using a plastic hammer. The processed insert end must be inserted up to the marks distributed across the circumference. If necessary use rounding clamps (see Figure 8).

Because of the large tolerance ranges, a repeated scraping of the pipe diameter may be required. Repeated scraping may not be performed to remedy installation problems due to out-of-roundness.

If the coupler cannot be slipped on despite the above described procedure, a repeated scraping of the high points is permitted (see Item 4.4).

A simple control of the high points is possible by installing the fitting and evaluating the annular gap.

After assembly the annular gap between coupler and pipe should be checked. It is possible that **distortion** can occur due to storage, which may lead locally to large gaps between the pipe and the fitting. In this case it may be necessary to carry out additional work in order to re-round the pipes.

4.7 Ensuring a tension-free assembly of the components

All joints prepared for fusion must be tension-free. Pipes may not be positioned in the **FRIAFIT** Fitting under bending stress or self-load. (see Figure 10).

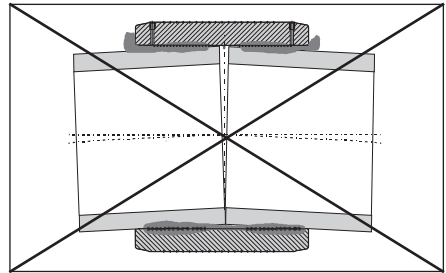


Fig. 10

If necessary the pipe or the fitting has to be supported. The **annular gap** between coupler and pipe should be **clearly perceived to be uniform**.

Stress free support of the joint must be maintained until cooling time indicated by C.T. on the barcode is reached (see also point 4.9)

Before fusing check once again the line marks and make sure that the pipe has not displaced in the **FRIAFIT** Fitting (correct, if necessary).



WARNING!

A non-tension-free or shifted joint may result in an impermissible melt flow and a defective joint during fusion (see Figure 10).

4.8 Carrying out fusion

(AM d 560/AM d 630/AEM d 560/AEM d 630 = see 4.8.1)



WARNING!

Only use fusion units which have been approved by the manufacturer with regard to their function for the processing of FRIAFIT Fittings. See DVS 2207-1.

The fusion parameters are contained in a barcode which is affixed to each **FRIAFIT** Fitting. When using fully automatic fusion units (e.g. **FRIAMAT** fusion unit) the parameters are entered into the unit by using the wand.

After reading of the barcode, the fitting data are to be compared with the data shown on the unit's display.

The fusable pipe series are listed in the SDR labelling on the label.

The fusion units automatically monitor the fusion process and control the supplied energy in determined limits.



INFORMATION!

The fusion parameters are coded as a 24 digit number on the barcode sticker and can be manually entered into the FRIAMAT fusion unit via the emergency entry mode.



Fig. 11

Start fusion. Compare the instructions on the display with the data on the fittings. Avoid stress on the connecting spot.



WARNING!

Keep a distance of one meter to the fusion site during the fusion process for general safety reasons.

The obtained **ACTUAL fusion time** is to be compared with the **TARGET fusion time** on the unit and to be noted on the pipe or the **FRIAFIT Fitting (see Figure 12)**.

With this identification it is ensured that no fusion point is overlooked.

When the fusion process is interrupted e.g. through generator failure, a fusion process may be repeated when both fitting and pipe have cooled down to the ambient temperature.



Fig. 12

Please contact for this purpose your local **FRIAFIT** sales engineer by phone or the **FRIAFIT** Hotline: +49 621 486-1486.



WARNING!

If fitting and pipe are not cooled down sufficiently there is the danger of overheating and spontaneous combustion.



WARNING!

WARNING!

FRIAFIT Fittings from d 110 to d 450 and FRIAFIT Sewage Bends ABM have monofilar windings.

With through winding, both sides of the fitting will be fused simultaneously (see Figure 13).

FRIAFIT Fittings from d 500 to d 630 and FRIAFIT Sewage Bends ABMS have bifilar windings

If winding is separate, each side of the fitting needs to be fused **separately** (see Figure 14).

Immediately on completion of the fusion process, the next pre-mounted joint can be fused.



INFORMATION:

Open pipe ends must be closed (chimney effect). If the weather is unfavourable (cold, wind), the annular gap can be closed using adhesive tape to avoid heat loss.

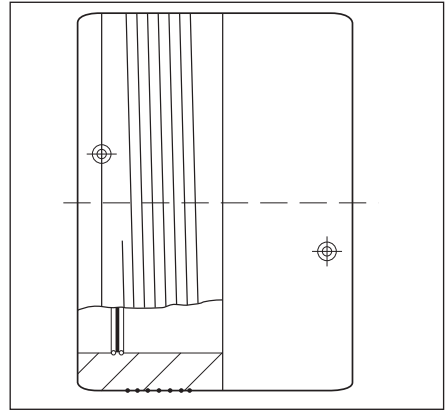


Fig. 13

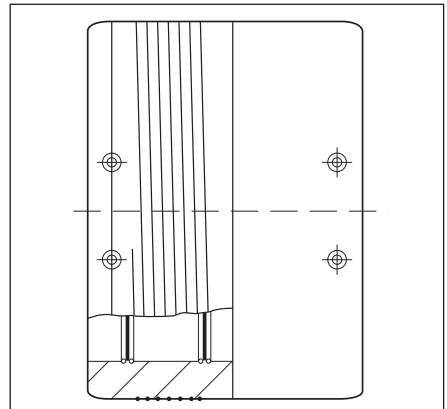


Fig. 14

4.8.1 Indications for AM d 560 / AM d 630 and AEM d 560, AEM 630

For the safe bridging of the annular gap tolerances between pipe and coupler the pre-heating process **must be** carried out.

Procedure:

- Preparation of the area to be connected according to point 4.1 - 4.8.
- Place coupler in the centre of the pipe allowing for the annular gap to be spread as evenly as possible across the circumference. After centering the gap may not exceed 3 mm.
- Close annular gap using adhesive tape in order to avoid loss of heat.

- Close open pipe ends (chimney effect).
- Read yellow pre-heating barcode using the FRIAMAT fusion unit and start process.
- Once pre-heating is complete, leave to warm through for approx. 15 min. If necessary, pre-heat second coupler half during the warning process.
- Check gap and reheat if necessary.
- Once the gap has closed sufficiently, start fusion process according to point 4.8.
- Regard cooling times in line with point 4.9.



WARNING!

Between preheating and fusion, a waiting time is always required to ensure heating through of the component parts. This waiting time corresponds approximately to the preheating or fusion time, depending on the dimension approx. 15 minutes. If only one coupler side is to be processed or AEM d 560, AEM d 630 is to be fused, the waiting time between preheating and fusion is to be observed. If the waiting time is exceeded by more than the double time, the described process is to be repeated.

4.9 Cooling times

The cooling time is

- a) the time which is required to cool down the component to the temperature which facilitates the movement of the joint. This time is also listed on the barcode and is identified by CT.
- b) the time which is required to cool down the component to the temperature which facilitates the application of the full test or operating pressure.



WARNING!

For the insertion of pipings (e.g. relining), the cooling time up to the application of pressure is decisive.

diameter in mm	cooling times in minutes for FRIAFIT® AM Couplers	
	CT Until the joint may be moved, i.e. until operating pressure has been applied up to max. 0.5 bar (test pressure)	CT Until pressure has been applied > 0.5 bar
110	20	30
125 – 225	20	60
250 – 355	30	75
400 – 630	40	95



INFORMATION!

The outer reinforcing wire detaching during the cooling phase is caused by heat induced expansion of the fused joint and is no negative aspect.

5. Installing the FRIAFIT® Sewage inspection chamber adapter ASF into the concrete inspection chamber according to DIN V 4034

Connections to structural items e.g. inspection chambers are to be implemented flexible according to DIN V 4034 (or ATV-DVWK-A 157). For this the **ASF** should be used in conjunction with the **AEM** (see Figure 1, page 2), as pipes made of HDPE will not form a joint with mortar or concrete.

The **FRIAFIT** Inspection chamber adapter **ASF** acts as a connecting element between the prefabricated inspection chamber and the **FRIAFIT** Sewage insert sleeve **AEM**. The **ASF** is usually fitted into the concrete when manufacturing the prefabricated concrete inspection chamber. Please make sure that the fixing bridges (T profile) are completely filled in the entire width.

The **ASF** is made to suit DIN V 4034, (Concrete inspection chambers and prefabricated concrete components) i.e. it enables a flush connection (internal and external) in the bottom section of the concrete inspection chamber.

When vibrating in by machine the inspection chamber adapter must be supported by a core. The outside diameter of the core should be the same as the inside diameter of the ASF.



WARNING!

If the inspection chamber adapter is not supported during vibrating, this may lead to an ovalisation of the ASF which can in turn cause installation problems in connection with the AEM Sewage insert sleeve.

One of the two faces is marked with a sticker “FRONT” whereby “FRONT” refers to the outside.



Fig. 15



WARNING!

When applying the ASF it is to be made certain that the correct positioning is ensured.

The gutter in the prefabricated concrete inspection chamber should be designed to be on the same level as the HDPE pipe (see Figure 16). See table 1, page 20 for the appropriate gutter heights (h) in accordance with the pipe wall thickness (s) of the PE pipe applied in each case. The gutter should connect flush to the ASF in the interior of the inspection chamber.

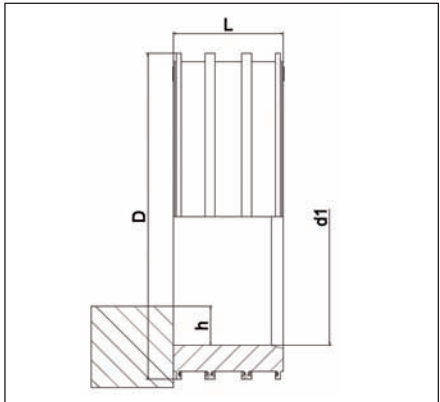


Fig. 16



WARNING!

Depending on static conditions, the wall thickness of the applied PE pipe may vary. The wall thickness of the PE pipe applied must be requested from the client or engineering company, in order to avoid uneven gutter connections (step).

Alternatively an AEM with a piece of pipe pushed into it can serve as a template.

Example for HDPE pipe d280x15.90 mm:

Wall thickness of the HDPE pipe (s) + wall thickness **AEM** = gutter height (h), starting from the **ASF**.

→ 15.90mm + 16.50mm = 32.40mm

If you require further information on the installation of the ASF, please contact our FRIAFIT customer service, Tel No +49 621 486-1486.

Table 1:

d mm	SDR 33		SDR 26		SDR 17.6		SDR 17		Gutter height (h) ASF in mm			
	s (mm)	ID (mm)	s (mm)	ID (mm)	s (mm)	ID (mm)	s (mm)	ID (mm)	SDR 33	SDR 26	SDR 17,6	SDR 17
110	3.5	103.0	4.3	101.4	6.3	97.4	6.6	96.8	14.0	14.8	16.8	17.1
160	5.0	150.0	6.2	147.6	9.1	141.8	9.5	141.0	18.5	19.7	22.6	23.0
180	5.6	168.8	7.0	166.0	10.2	159.6	10.7	158.6	23.1	24.5	27.7	28.2
200	6.2	187.6	7.7	184.6	11.4	177.2	11.9	176.2	29.7	31.2	34.9	35.4
225	7.0	211.0	8.7	207.6	12.8	199.4	13.4	198.2	33.0	34.7	38.8	39.4
250	7.8	234.4	9.7	230.6	14.2	221.6	14.8	220.4	21.3	23.2	27.7	28.3
280	8.7	262.6	10.8	258.4	15.9	248.2	16.6	246.8	25.2	27.3	32.4	33.1
315	9.8	295.4	12.2	290.6	17.9	279.2	18.7	277.6	29.3	31.7	37.4	38.2
355	11.1	332.8	13.7	327.6	20.1	314.8	21.1	312.8	33.1	35.7	42.1	43.1
400	12.4	375.2	15.4	369.2	22.7	354.6	23.7	352.6	36.9	39.9	47.2	48.2
450	14.0	422.0	17.4	415.2	25.5	399.0	26.7	396.6	38.5	41.9	50.0	51.2
560	17.2	525.6	21.4	517.2	31.7	496.6	33.2	493.6	50.2	54.4	64.7	66.2
630	19.3	591.4	24.1	581.8	35.7	558.6	37.4	555.2	57.3	62.1	73.7	75.4

d - external pipe diameter

s - wall thickness of the HDPE pipe

ID - internal diameter of the HDPE pipe

h - gutter height, starting from the ASF.

6. Fitting the FRIAFIT® Sewage insert sleeve AEM into the Inspection chamber adapter ASF of the concrete inspection chamber

The AEM (see **Figure 1, page 2**) is used for the flexible connection of HDPE pipes into the ASF inspection chamber adapter. Before connecting the AEM into the ASF, the following points should be observed:

6.1 Preparation

Clean the inner surface of the ASF, and then thinly apply **soft soap based lubricant**.



WARNING!

Oils and grease are not suitable as lubricants. Keep the areas to be fused free from contamination caused by lubricant!

Remove AEM from plastic bag. Check correct position of sealing rings (**2 pieces**). If required, a **water swelling sealing ring Q** (blue) can be applied as an option. It would need to be positioned into the appropriate AEM nut before insertion into the ASF.



WARNING!

The water swelling sealing ring Q is protected from wet and moisture inside a foil bag. Take out and position on the AEM only immediately prior to mounting.



Fig. 17

6.2 Assembling the AEM

The AEM is then pushed with its sealing rings first into the ASF. This process is either carried out by hand or using a crow bar with a piece of wood laid across the front of it (see **Figure 18**).

The AEM must be pushed in until it connects flush with the ASF / ASFL (see **Figures 19a / 19b**).



WARNING!

Heating coils must be protected against damage and dirt while the AEM is being inserted.



Fig. 18

7. Fusing the FRIAFIT® Sewage insert sleeve AEM d 110 – d 630 to the HDPE pipe

7.1 Cutting to length of pipes (see 4.1)

7.2 Measure the fusion zone, mark it with a FRIAFIT marker and remove the oxide layer.

a) ASF fusion zone use

As a rule the pipe is pushed into the AEM until it stops flush against the face of the AEM and is connected directly to the gutter (see **Figure 19a**).

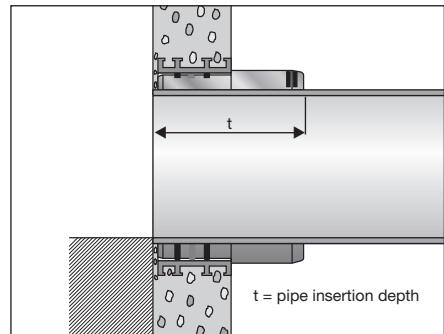


Fig. 19a

b) ASFL fusion zone use

The pipe is pushed into the AEM until it is connected directly to the gutter (see Figure 19b).

Further proceeding as described under 4.2.

7.3. External and internal chamfering of the cutting edge

as described under 4.3

7.4. Restoration of irregular / oval pipes

as described under 4.4

7.5. Cleaning

as described under 4.5

7.6. Inserting pipe ends into the sleeve

It has to be ensured that the pipe can be pushed into the **FRIAFIT** Sewage insert sleeve AEM without force. **The processed insert end must be inserted up to the mark or up to the channel (see Figures 19a+b). Do not tilt when joining together!**

Additional points as described under 4.6.

7.7. Ensuring a tension-free assembly of the components

as described under 4.7

WARNING!

A non-tension-free or shifted joint may result in an impermissible melt flow and a defective joint during fusion (see Figure 20).

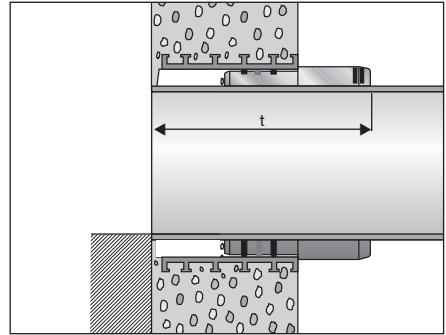


Fig. 19b

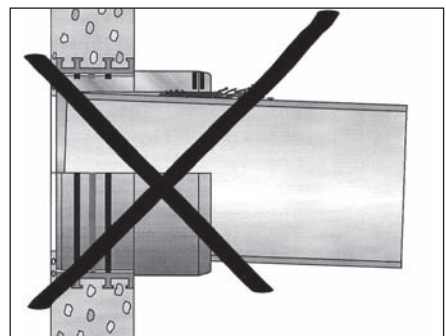


Fig. 20

7.8 Carrying out fusion

as described under 4.8

for AEM d 560/AEM d 630 as described in 4.8.1

7.9 Cooling times

see point 4.9

Diameter in mm	Cooling times in minutes for FRIAFIT® AEM Sewage insert sleeves
	CT Until the joint may be moved, and until pressure of max. 0.5 bar (test pressure) is applied respectively.
110	10
160 – 225	20
250 – 355	30
400 – 630	40

8. Fusing and tapping of a FRIAFIT® Sewage saddle Top-Loading ASA-TL and ASA-TL/KG

With the **FRIAFIT** Sewage saddle sewage house connections can be connected to the main pipe made of HDPE with the dimensions SDR 33 to SDR 11.

Areas of application: new installations or retrospective integrations of domestic connections.

The FRIAFIT Sewage saddle is installed by using the FWFIT clamping and drilling unit.



NOTE: FRIAFIT ASA-TL sewage saddle

Processing advice: please ensure that you are using the correct assembly tool in line with the table below:

Table 2:

ASA-TL	HDPE pipe	
	SDR 26-33	SDR 11-17,6
d 200/160	In addition: Clamping belt required Do not clamp ASA-TL over star handle.	
d 225/160		
d 250/160		
d 280/160		
d 315/160		
d 355/160	FWFIT clamping and drilling unit	
d 400/160		
d 450/160		
d 500/160		
d 560/160	In addition: FRIATOP clamping unit required	
d 630/160	Please contact our applications engineering service	
Please contact our factory with any questions: Tel.: +49 621 486-1486.		

**NOTE:**

If a pipe d 560 is used, the FRIAFIT Sewage saddle d 500/560 is clamped with the FRIATOP Clamping unit (see item 8.6.3).

**WARNING!**

The described sequence of the processes is absolutely to be adhered to.

8.1 Measuring the fusion zone on the pipe and mark with a FRIAFIT® marker

Fusion zone is the area of pipe covered by the saddle.

Place ASA-TL on the intended spot of the service line on the main pipe (see Figure 21).

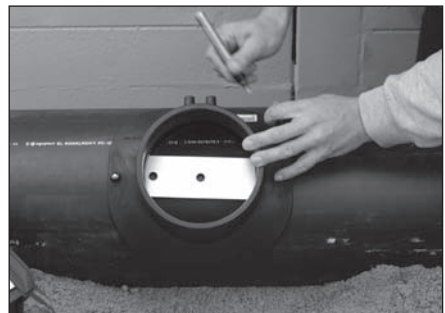


Fig. 21

8.2 Marking the insertion bores using the drilling template

The drilling template (FWFIT accessories) serves for the marking of the insertion bores for the clamping core (centre) and the FWFIT cutter. Insert drilling template axially to the longitudinal axis of the main pipe into the outlet of the ASA-TL and mark insertion bores using the **FRIAFIT** marker (see **Figure 22**).

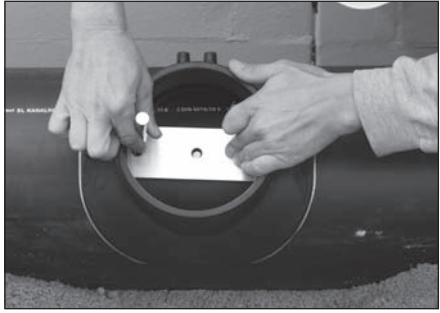


Fig. 22

8.3 Preboring

Remove ASA-TL and drilling template. Drill centre bore and cutter insertion bore using a **d 12.5 mm** drill (FWFIT accessories). Use a portable drilling machine (see **Figure 23**).

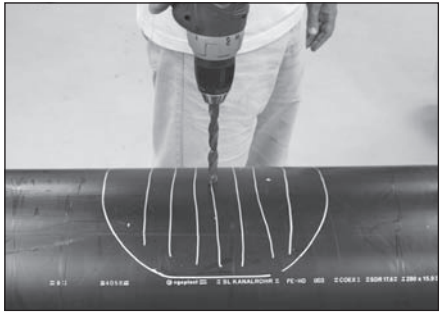


Fig. 23



WARNING!

For drilling the centre bore and the cutter insertion bore drills of **d 12.5 mm** must always be used.



WARNING!

Please take care that the borings are carried out each time right-angled to the indicated surface of the pipe (see **Figure 23**).



WARNING!

According to valid safety guidelines only electrical appliances with a low safety voltage <50 volt may be used in the pipe trench.



WARNING!

The number of revolutions of the drilling machine should be at least 900 revolutions/minute.

8.4 Removing oxide layer

Immediately before installation the oxide layer which has formed during storage on the surface of the pipe must be removed completely from the entire fusion zone by using a hand scraper.



WARNING!

If the oxide layer is not removed completely, leaking fusion joints may result.

Worn blades of the manual scraper must be replaced.

A one-time, complete removal is sufficient (min. 0.15mm). A uniform surface without flattening and material grates at the pipe diameter should be the result.



WARNING!

Filing or sanding of the pipe is not permitted because contaminations are introduced.

For a control of the complete surface removal over the entire surface, we recommend to apply marking (control) lines (see **Figure 24**). If during scraping of the surface non-scraped areas occur at some points, these areas are to be reworked. The processed zone is to be protected against dirt, soap, grease, subsequently flowing water and unfavourable effects of weather (e.g. moisture, frost formation).

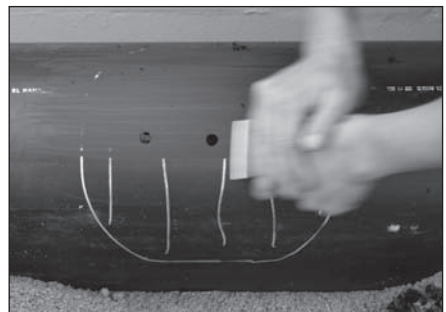


Fig. 24

8.5 Cleaning

See point 4.5 (see **Figure 25**) on cleaning the scraped pipe surface and the inside of the saddle.

8.6 Assembling the ASA-TL

8.6.1 Processing using FWFIT

Attach the three handles (FWFIT accessories) to the cross beam of the FWFIT clamping and drilling unit.

Place saddle onto the prepared pipe surface and align along the **central bore** (see **Figure 26**).



WARNING!

When installing side-on it is necessary to ensure that the bar-codes for fusing the ASA-TL or the contact sockets at the outlet are visible from above.

Place FWFIT **without** cutter unit on the outlet of the saddle and insert clamping core into centre bore (see **Figure 27**).



WARNING!

Make sure that the heating coils in the outlet are not damaged. The supporting faces of the cross beam must fit flush to the upper edge of the saddle outlet.

Do not tilt when inserting the clamping core into the central bore!



Fig. 25



Fig. 26

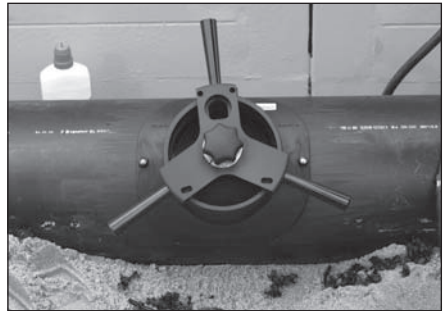


Fig. 27

Clamp clamping core right **to the end** by turning the star handle clockwise. **The directions are marked on the cross beam as “AUF” (open) and “ZU” (close).**

Check visually the supporting face of the saddle on the pipe. The saddle must fit tight in its flanks and onto the pipe's apex.

8.6.2 Processing using FWFIT and clamping belt



WARNING!

ASA-TL d 225, d 250, d 280 and d 315 must be mounted to pipes SDR 26 to SDR 33 with clamping belt. ASA-TL d 200 is always, i.e. for pipes from SDR 11 to SDR 33, to be mounted with clamping belt.

Procedure:

- Mount FWFIT but do not tighten star handle!
- Wind clamping belt around pipe.
- Align girder in such a way that the hooks of the clamping belt may be hooked into the blind hole boreholes of the girder.
- Clamp belt manually and tighten by turning the belt ratchet until the ASA-TL saddle sits flush on the pipe (see Figure 28).

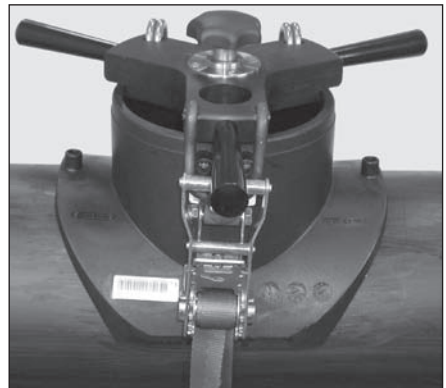


Fig. 28

Fusion of the saddle takes place in line with Point 6.1.7.

8.6.3 Processing using FRIATOP

With d 560 pipes the ASA-TL is mounted using the **FRIATOP** (see **Figure 29**) clamping unit. Please observe **FRIATOP** assembly instructions. The clamping pressure on the pressure gauge of the air pump should not exceed 2 bar.

Fusion of saddle takes place according to point 8.7.

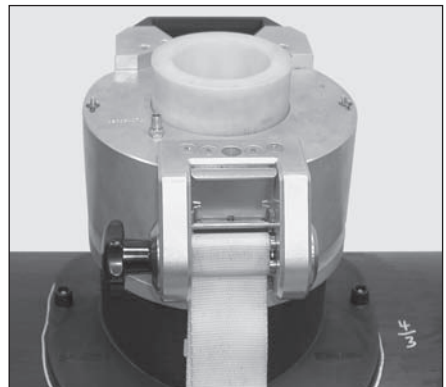


Fig. 29

8.7 Fusing of the saddle



WARNING!

Only use fusion units which are authorised by their manufacturer to process FRIAFIT Sewage saddles (FRIAMAT Fusion units except FRIAMAT L/LE). See DVS 2207, part 1, 5.2.

The fusion parameters are contained in a barcode which is attached to the FRIAFIT Sewage saddle (see Figure 30).



Fig. 30

The parameters are entered into the fusion unit via the wand.

The fusion unit automatically controls the fusion procedure and adjusts the energy supply within given limits.

Start the fusion process. Information in the display of the fusion unit must be compared with the fitting data.



WARNING!

Always keep one meter distance to the fusion site during fusion for general safety reasons.

The **ACTUAL fusion** time must be compared with the **TARGET fusion** time on the unit and marked on the pipe.

8.8 Cooling times

Cooling time is the time required to cool the component down to the temperature needed to enable tapping into the main pipe. This period of time is contained in the barcode and is marked as C.T.

**Cooling times ASA-TL – saddle up until tapping:
d 200 – d 630: CT = 10 minutes**



WARNING!

If the cooling time is not observed the saddle may become separated from the pipe in the fusion zone. A permanently secure joint cannot be guaranteed. The clamping and drilling unit may not be dismantled or loosened during the cooling time!

8.9 Tapping

Tapping of the main pipe is carried out with the FWFIT clamping and drilling unit as well.

Loosen the star handle of the FWFIT until the cross beam may be easily turned. Position the cutter insertion in the cross beam above the boring, then insert cutter unit into the cross beam up to the stop. The cutter must fit into the boring (**see Figure 31**).



Fig. 31



WARNING!

Do not touch the outlet during operation (rotating tool). When inserting the cutter, take care that the heating coil or elastomer sealing of the ASA-TL/KG in the outlet is not damaged.

Place drilling machine onto cutter unit and clamp boring socket.



WARNING!

The number of revolutions of the drilling machine must amount to a minimum of 900 revolutions/minute.

The outlet of the main pipe created by cutting **clockwise**. Hold the drilling machine with one hand, and at the same time guide the cross beam by the handles provided using the other hand (**see Figure 32**). If necessary, remove swarf in the outlet.



Fig. 32



WARNING!

Too much expenditure of force during the cutting process may lead to premature wear of the cutter, to deviations from the desired cutting path and to breakage of the cutter respectively.

After completing the cutting process, run **several times** across the starting point (short twist of cross beam to the right and to the left).

Once the drill has stopped, release the drill chuck and remove the drilling machine. Then dismantle the FWFIT.



WARNING!

When removing the FWFIT, take care that the heating coil or elastomer sealing of the ASA-TL/KG in the outlet is not damaged by the cut-out circular disk.

Take out the cutter unit from the FWFIT, loosen star handle (**direction is marked on the cross beam as “AUF” (open)** and pull off circular cutted piece from the clamping core. Store the FWFIT in its transporting case.

8.10 Clean cut-out drill-hole

Remove the swarf in the ASA-TL outlet.

8.11 Fusing the ASA-TL outlet

- **Cut off service line to length** as described in **4.1**.

- **Measure off fusion zone, mark it and remove oxide layer**

The fusion zone corresponds to **insertion depth = 76 mm**.

Then as described in **4.2**

- External and internal chamfering of the cutting edge

as described in 4.3

- Restoration of irregular / oval pipes

as described in 4.4

- Cleaning

as described in 4.5

- Insert pipe end into ASA-TL outlet

On inserting the service line pipe into the outlet it is important to ensure that the pipe can be pushed in up to the stop without force.

Further points as described in 4.6

- Ensure unstressed assembly of the service line

as described in 4.7

- Carrying out fusion

as described in 4.8

- Cooling time for connection fusion

The cooling time of the ASA-TL is **20 minutes** at each d 160 outlet. Further points as described in 4.9

8.12 Slip-on couplers of the ASA-TL/KG

The slip-on coupler is suitable for transition connections of PVC and PP pipes DN 150.

For the material transition, the specific standards, e.g. with regard to the permissible diameter tolerances and insertion depths, as well as the mounting instructions are to be observed.

After tapping of the main pipe, the swarves in the plug-in outlet of the ASA-TL/KG are to be removed and **anti-seize agent on soft soap basis** is to be applied thinly.

Cut the PVC or PP pipe clean and straight. Chamfer the cut pipe edge on the outside.

Remove swarves and dirt from the pipe with a dry and clean paper.

Mark the insertion depth of the slip-on coupler with a line on the pipe.



WARNING!

Check the elastomer sealing for damages. Damaged elastomer sealings may result in leaking connections.

Insert the pipe into the slip-on coupler up to the stop.

9. FRIAFIT® Transition fittings UKG, USTZ and Unequal branch, Sewage bends (spigot fittings)

are HDPE plastic parts which are joined to **FRIAFIT** Fittings in the same way as HDPE pipes (see Point 4).

The fusion zones must be free from contaminations, in particular if lubricants, which might get into the fusion zone, are used for the installation of slip-on couplers.

If lubricants are used for the mounting of push-fit fitting connections the fusion zones must be kept free from contamination caused by the lubricant.

Specific standards, e.g. with regards to authorised diameter tolerances and insertion depths, as well as installation instructions, must be observed for the connection of materials.

Further operating and assembly instructions are available:

- FRIALEN®-Safety Fittings for house connections and distribution pipes up to d 225
- FRIALEN®-Large Pipe Technique for laying large pipes and relining pipe networks
- FRIAMAT® Fusion Units
- FRIATOOLS® Scraper Tools
- FRIATOP Clamping Unit
- FWFIT Clamping and Drilling Unit

10. Updates of assembly instructions

These technical statements are checked regularly in terms of up-to date-ness. The date of the recent revision is specified on the document.

Visit www.friafit.com, in the left navigation menu you will find the submenu "Downloads". Here you will be able to read and even print out up-to-date operating instructions (pdf file). We also would be pleased to send them to you.

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