



Assembly instructions

FRIAFIT sewage system
the closed PE system for sewage,
wastewater, storm and grey water pipe
systems



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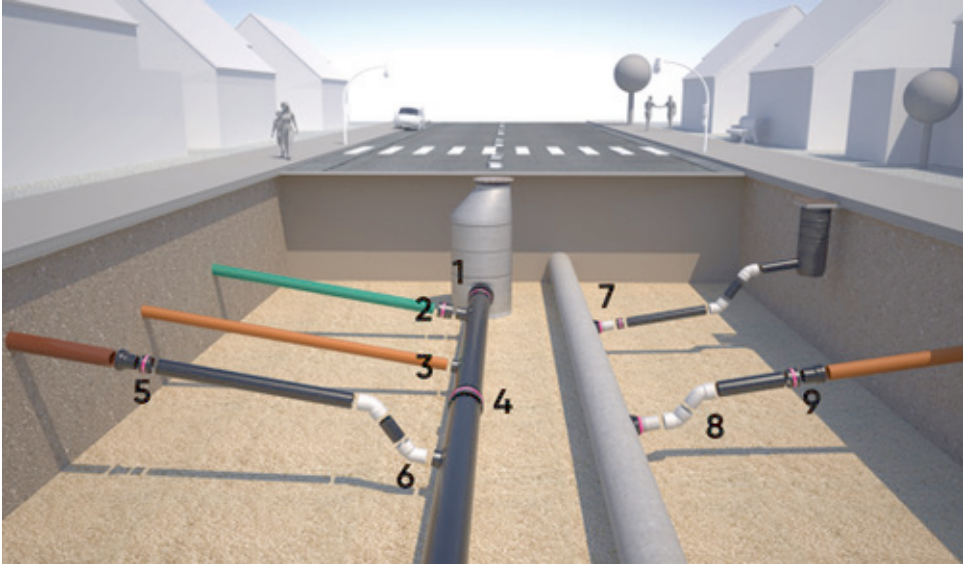
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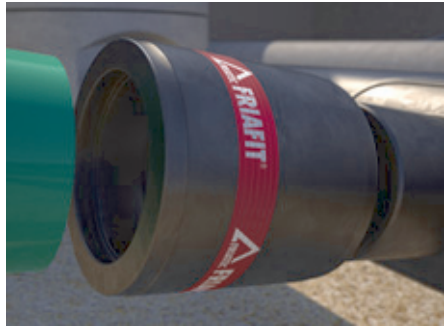
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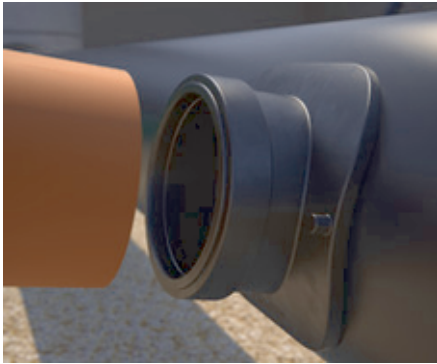
1. Product overview FRIAFIT sewage system



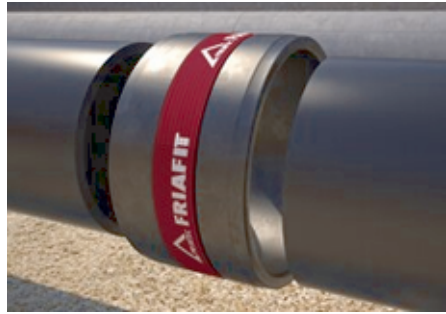
1. Sewage shaft lining adapter **ASF** and plug-in coupler for sewage shaft lining adapter **AEM**



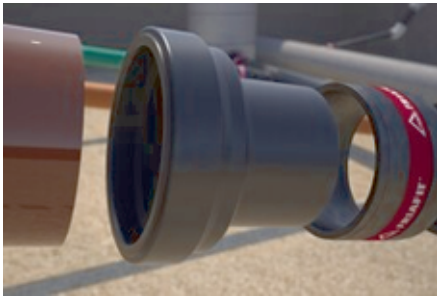
2. Sewage saddle vacuum loading **ASA** VL 225 and transition coupler PE - PVC/PP **AMKG**



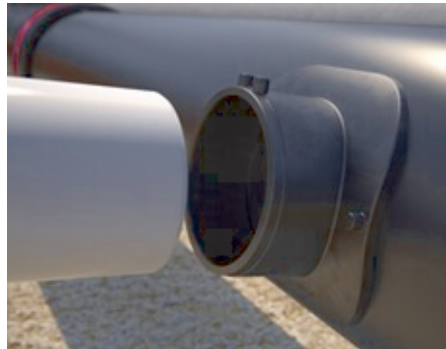
**3. Transition saddle vacuum loading
ASA VL KG 160**



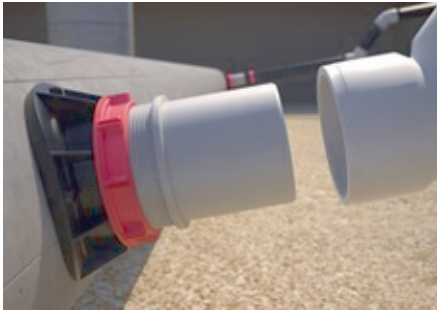
**4. Coupler with removable inner stop,
SDR 17 AM/UB**



5. Transition piece PE-Clay **USTZ**



**6. Sewage saddle vacuum loading **ASA
VL 160****



7. Connecting spigot to clay and concrete pipes **ASA MULTI**



8. Sewage bend (coupler/coupler) **ABM**
and sewage bend (coupler/pipe spigot) **ABMS**



9. Transition piece PE-PVC/PP **UKG**

2. About this document

2.1. Objective and target group of these instructions

These instructions describe all the necessary work steps and precautionary measures which must be implemented to ensure safe and professional handling of the product or assembly.

These instructions are intended for the following target group:

- Trained fitters
- Operators and/or owners

2.2. Handling these instructions

INFO

- Read these instructions carefully before assembly and use.
- Always observe any other applicable documents.
- Users must observe the sequence of work steps at all times.

2.3. Symbols used

The following marks and symbols are utilised in this document:

DANGER

This warning information describes an imminent danger.

- Non-compliance will lead to death or serious injuries.

WARNING

This warning information describes a possible imminent danger.

- Non-compliance can lead to death or serious injuries.

CAUTION

This warning information describes a possible imminent danger.

- Non-compliance can lead to slight or minor injuries.

HINT

This warning describes a danger which can lead to property damage.

- Measures to prevent property damage will be described here.

i INFO

This note provides information about the following subjects:

- Application tips
 - Further information
-

2.4. Applicable relevant documents

The following documents also apply in connection with these assembly instructions:

- FRIATOOLS and FRIAMAT operating instructions from Aliaxis Deutschland GmbH for handling, preparing and processing the components described.
- Technical Data Sheets from Aliaxis Deutschland GmbH,
- Brief instructions and product information enclosed with the product.

When processing components which are not described in these assembly instructions, please always refer to the corresponding product-specific assembly instructions.

2.5. Updates to these assembly instructions

These technical statements are regularly reviewed in order to ensure that they are up to date.

The date of the last revision is indicated on the document.

Updated instructions can be found on the Internet at

<https://www.aliaxis.de/en/downloads>

3. Safety

3.1. Intended use

The FRIAFIT sewage system consists of PE 100 moulded parts and fittings and the tools required for the processing of such for polyethylene pipes used in municipal drainage, industry and landfill construction.

The FRIAFIT sewage system is used for the new construction of gravity pipes or pressure pipes (depending on the component suitability), or to expand or repair such pipes or to renovate existing pipe systems. FRIAFIT couplers AM/UB SDR 17 are also suitable for use in drinking water pipe systems up to an operating pressure of 10 bar.

FRIAFIT fittings use the electrofusion process to join PE-HD sewer pipes in a longitudinally force-locking, root-resistant and permanently leak-proof process.

The FRIAFIT shaft connection elements are used for concrete inspection chambers. The structural design takes into account the different material properties of PE-HD and concrete.

Saddle fittings ensure a reliable joint between the collector and the house connection line. The compact design of the bends enables compact installation with flexible pipe routing and transition pieces ensure a smooth material transition when changing the pipe material.

i INFO

The information and processing instructions stated on or supplied with the moulded part apply, particularly regarding the specified operating pressure.

3.2. Note on pipes that are not underground

These assembly instructions essentially describe the technical requirements for the underground installation of PE pipes. An expanded application window, e.g. in the industrial sector, requires specific knowledge of planning, execution and assembly.

In addition to individual load cases, users must observe the specific project planning and execution principles for industrial pipelines, e.g. DVS 2210-1 et seq.

Deviations may result in the reduced service life of the pipe system with spontaneous failure, rupture or leakage.

3.3. Staff training

All persons involved in the processing and intended use must satisfy the following minimum requirements:

- They must have received training or instructions on how to assemble the products and tools
- They must have read and understood these assembly instructions and all the applicable documents.

4. Processing information

4.1. Pressure-bearing capacity

The FRIAFIT sewage system is designed for pipes that are not under pressure (gravity pipes). The test pressure is maximum 0.5 bar in accordance with DIN EN 1610.

FRIAFIT couplers AM/UB PE 100 SDR 17 are designed in accordance with EN 12201 for a pressure load of 10 bar for drinking water and sewage pressure pipes with a design factor of $C = 1.25$.

i INFO

The design factor C (conversion coefficient for PE components) depends on the area of application and specific specifications (min. 1.25).

FRIAFIT sewage bends ABM/ABMS and the FRIAFIT sewage saddles vacuum loading ASA VL 160 and ASA VL 225 PE 100 SDR 17 are designed for a pressure load of 2.5 bar.

4.2. Statics

The static calculation of the PE sewer pipe pursuant to DWA – A 127 must be carried out by the pipe manufacturer or engineering office in each individual case, depending on the ambient conditions.

The annular rigidity of the pipe joint fused with FRIAFIT couplers is always higher than the annular rigidity of the pipe used.

4.3. Environmental, storage and processing conditions

i INFO

Never process components that have been stored incorrectly, as this could result in a leaking fusion joint.

Storage conditions:

- In closed rooms or containers (e.g. cardboard boxes)
- Protect from UV radiation
- Protect from the effects of the weather, including moisture and frost
- Storage temperatures between 0°C and +50°C

If stored under these conditions, the components may be stored and processed for more than 10 years.

i INFO

Ensure that couplers from d 250 are stored on their front rim to avoid ovality.

i INFO

Before processing, check that the component is supplied free from defects. Do not install damaged components.

Processing conditions:

I INFO

The pipes and moulded parts must always be at an even temperature level during processing.

- FRIAFIT saddle components (vacuum and top loading) can be processed with PE pipes of SDR range 33 to 11
- FRIAFIT couplers AM/UB SDR 17 and sewage bends can be processed with PE pipes of SDR range 33 to 17
- Permitted processing range: -10°C to +45°C
- Processing range for couplers SDR 17 ≥ d 710: 0°C to +45°C
- Fusion possible with pipes of raw material type PE 63, PE 80, PE 100 and PE 100 RC
- For PE pipes, a melt mass flow rate of MFR 190/5 in the range 0.2 to 1.7 g/10 min. applies.

5. Standards and certifications

The FRIAFIT sewage system made of PE 100 complies with EN 12666 and is therefore considered a regulated construction product. A general building supervision approval is therefore not required. A certificate of conformity issued by the DIBt[®], Berlin, is available.

FRIAFIT couplers AM/UB SDR 17 are approved for use in drinking water systems MDP 10 bar (PN10) and industrial water systems. They are certified in accordance with DVGW GW335-B2 with the certificate DV-8606B06114 and subject to regular external inspections. They can be fused in accordance with DIN 8074, ISO 4437, EN 12201 and EN 12666.

Please observe the guidelines of the DVGW regulations, the DVS, EN 12201, UVV and/or any other respective country-specific provisions and regulations at all times.

6. Product description and overview

6.1. Product description

These assembly instructions describe the processing of fittings in the FRIAFIT sewage system product range based on electrofusion with PE pipes.

FRIAFIT fittings can be processed with universal fusion units, e.g. the FRIAMAT range. The fusion parameters are automatically transmitted by the fitting barcode.

6.2. Product overview

These assembly instructions describe the processing of FRIAFIT components from Aliaxis Deutschland GmbH, including:

- Coupler SDR 17 **AM/ UB**
- Sewage bend **ABM/ ABMS**

- Transition coupler **AMKG** and transition pieces **UKG** and **USTZ**
- Plug-in coupler for sewage shaft lining adapter **AEM** and sewage shaft lining adapter **ASF/ASFL**
- Sewage saddle vacuum loading **ASA VL 160**
- Transition saddle vacuum loading **ASA VL KG 160**
- Sewage saddle vacuum loading **ASA VL 225**
- Spigot saddle **ASA UNI**
- Connecting spigot **ASA MULTI**
- Fixation **FIXBLOC**

7. Marking on the component

7.1. Batch identification

The component is provided with a batch identification.

This should be read from left to right.

Example:



- Production week (CW) (Stamp 1+2).
 - Year of manufacture (Stamp 2)
 - Material code letter (Stamp 3)
- ⇒ CW 14/2019/E

Some components are marked directly in reading mode.

Image 1:

7.2. Barcode sticker: fusion and traceability

All FRIAFIT fittings have a barcode sticker.



Image 2:

Top barcode (fusion barcode pursuant to ISO 13950):

The fusion parameters are included in the main barcode. The parameters are entered into the fusion unit using a reading wand or a mini scanner. The 24-digit number sequence can be entered manually into the fusion unit via the emergency entry mode. The fusion units always automatically monitor the fusion process and thereby regulate the power input within set parameters.

The barcode stickers will gradually be issued with a 2D barcode on all FRIAFIT fittings pursuant to ISO 12176-5. This new 2D barcode has various advantages for the user: a large volume of important data can be read quickly and securely in just one reading process using a scanner or smartphone, for example, in addition to fusion data, more information about the product, the manufacturer or traceability.

Lower barcode (traceability barcode pursuant to ISO 12176-4):

Data relating to the fitting, e.g. manufacturer, dimension, material, batch are contained in this barcode and therefore enable traceability (component traceability). This data can be archived electronically with the fusion parameters. Suitable fusion units are always required. The 26-digit number sequence can be entered manually into the fusion unit via the emergency entry mode.

7.2.1. Barcode for fixed voltage fusion units (39.5V)



Image 3:

Some FRIAFIT fittings can be processed by fusion units with a fixed output voltage of 39.5V if the fusion time is entered manually. For manual entry of the fusion parameters, the fusion time is indicated on the barcode.

8. Processing of FRIAFIT fittings

I INFO

The sequence of work steps described in these assembly instructions must be strictly observed!

8.1. Preparatory work

Prepare the fusion joint in accordance with the following work steps (e.g. remove oxide layer, clean the fusion zone, etc.).

8.2. Cut the pipe to length

⚠ WARNING

Fusion coils which are not completely covered by the pipe will lead to overheating, uncontrolled melting or spontaneous combustion.

Danger created by burns

- Cut the pipe at right angles to the pipe axis.

The pipe must be cut at right angles to the pipe axis when processing FRIAFIT couplers, sewage bends, plug-in couplers for sewage shaft lining adapters and transition couplers. A PE pipe cutter or a saw with teeth designed specifically for plastic is suitable.

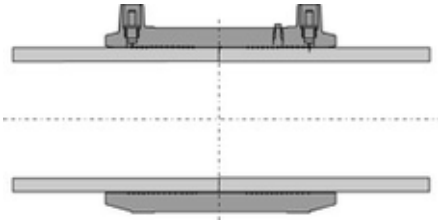


Image 4:

- Cutting the pipe at right angles

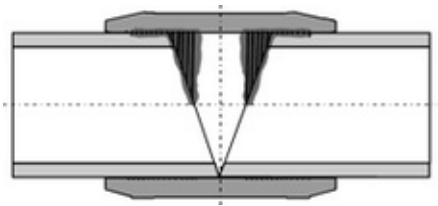


Image 5:

- Not cutting the pipe at right angles



ℹ INFO

Ends of pipes with a pronounced conical inclination of the cut ends may need to be shortened.

8.3. Cleaning the pipe



Image 6:

- Remove dirt and dust from the pipe in the area of the fusion zone.
- Cleaning material: absorbent, non-linting and not dyed paper.

8.4. Measure and mark the fusion zone

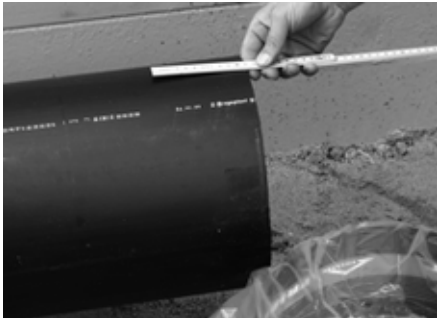


Image 7:

Fusion zone:

- The insertion depth for FRIAFIT couplers, sewage bends, plug-in couplers for sewage shaft lining adapters and transition couplers is generally the half coupler length, or the insertion depth for fittings.

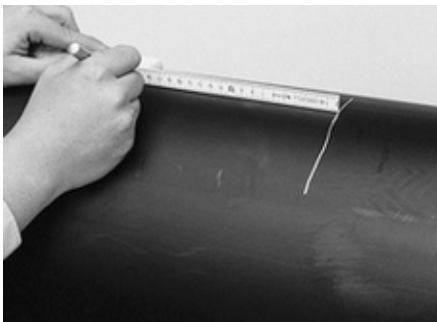


Image 8:

- For FRIAFIT saddle moulded parts, this is the pipe surface covered by the saddle.

i INFO

We recommend adding an additional processing area of approx. +5 mm to the fusion zone. After the fusion process, this is evidence that the oxide layer has been properly removed.

8.5. Applying marking lines



Image 9:

Mark the fusion zone with a marker.

We recommend applying marking (control) lines to ensure that the entire surface has been removed with no gaps.

Any non-scraped areas on the pipe surface that appear during the removal of the oxide layer must be reprocessed.

8.6. Removing the oxide layer

⚠ CAUTION

Danger of injury from rotating scraper tools.

Injuries to hands or on the arm area.

Always observe the relevant operating instructions and the manufacturer's instructions.

Never reach into the working area of the tool.

⚠ CAUTION

Danger of injury from the scraper blade!



Use a (rotary) scraper tool, e.g. a FRIATOOLS scraper tool FWSG, FWSG SE or, for large pipes, the scraper chain FWSK d 250 to d 1200 or the FWSG XL d 800 to d 1200, to completely remove the oxide layer immediately before assembly that has formed on the surface of PE pipes or PE spigots during storage.

Image 10:

INFO

Leaks in the fusion joint could occur if the oxide layer is not completely removed.

INFO

Do not file or sand the pipe, as impurities may be ground into the pipe.

The scraping result must be checked. A single, total removal is sufficient (minimum 0.15 mm). Damage to the pipe surface, such as axial grooves or scratches, must not be present in the fusion zone.

Excessive swarf removal can result in a large annular gap that cannot be closed or not completely closed during fusion. Please therefore use a calliper to regularly check the condition of the scraper blade on the scraper tool and the swarf thickness s and compare the value with the data in the table below.

Worn blades must be replaced!

The following table shows the permitted target swarf thickness s [mm] and the wear limit $s_{\max.}$ [mm] for FRIAFIT fittings from Aliaxis Deutschland GmbH.

Please follow the relevant manufacturer's instructions when using other brands of fittings.

Pipe diameter d [mm]	Scraper tool FRIATOOLS	Target swarf thickness s [mm]	Wear limit $s_{\max.}$ [mm]	
d 32 - d 63	FWSG, -SE	0.15 - 0.25	0.3	
d 75 - d 225	FWSG, -SE	0.15 - 0.35	0.4	
d 75 - d 400	FWSG	0.25 - 0.35	0.5	

Pipe diameter d [mm]	Scraper tool FRIATOOLS	Target swarf thickness s [mm]	Wear limit s _{max.} [mm]	
d 250 – d 710	FWSG, –SE	0.30 – 0.45	0.5	
d 250 – d 1000	FWSK	0.25 – 0.35	0.5	
d 800 – d 1200	FWSG XL	0.40 – 0.60	0.8	

i INFO

The area being processed must be free of dirt, soap, grease, running water and unfavourable weather effects (e.g. moisture, frost formation).

i INFO

The swarf generated by the removal of the oxide layer and all the cleaning and packaging materials must be disposed of in accordance with the stipulations for the material.

Please also observe all the country-specific regulations, standards and guidelines.

8.7. Deburr the cutting edge



Image 11:

After cutting the pipe and removing the oxide layer, deburr the cut edge on the outside and inside.

A hand scraper can be used for this task. A slight chamfering of the pipe front edge on the outer diameter facilitates the installation of the FRIAFIT fitting and prevents damage to the fusion fitting from sharp edges during insertion.

i INFO

Remove any swarf from the pipe generated by the deburring process.

8.8. Re-rounding non-round, oval pipes

WARNING

Danger of injury from crushing.

If the rounding clamp is handled incorrectly, then the hands or fingers can be trapped when assembling, fitting and actuating the rounding clamp.

- ▶ Always observe the operating instructions for the unit and the manufacturer's specifications when assembling, installing and operating the rounding clamp.
- ▶ Always wear protective gloves for protection during assembly work.
- ▶ Never place your hand or fingers between the pipe and the rounding clamp.
- ▶ Never place your hand or fingers between the unit components.

Pipes may lose their perfect roundness or become oval, particularly if stored in coils, drums and pipes of larger diameters. In this case, the round cross section of the pipe must be reinstated if the ovality in the area of the fusion zone exceeds 1.5% of the outside diameter or ≥ 3.0 mm.

Use rounding clamps or rounding bars, e.g. FRIATools rounding clamps or similar to re-round the pipe, which must be positioned at the end of the fusion zone.

INFO

Pipes with a local deformation, e.g. flattening, are not suitable for electrofusion. Ensure that the requirements for pipe roundness are satisfied.

8.9. Clean the joining surfaces

CAUTION

Skin contact with cleaning agent

Degreasing the skin, dehydration

- ▶ Always wear protective gloves.
- ▶ Utilise in metered quantities.
- ▶ Follow the manufacturer's safety instructions.



Image 12:

The surfaces of the pipe

- to be fused and
- the (inner) surfaces of the FRIAFIT fitting you wish to process

must always be completely clean, dry and free of grease.

Clean these surfaces with a suitable cleaning agent and only with absorbent, lint-free and non-dyed paper immediately before assembly and after removing the oxide layer.

i INFO

When using cleaning agents containing alcohol, the alcohol content must be a minimum of 99.8%, e.g. in accordance with DVGW-VP 603.

We recommend PE cleaning agents that are certified pursuant to the DVGW-VP 603 test standard, e.g. AHK cleaner.

When cleaning, avoid rubbing soiling from the unscraped pipe surface from entering the fusion zone. The cleaning agent must have totally evaporated before starting the fusion process. Avoid touching the cleaned fusion zone with your hand. Moisture, e.g. from dew or frost, in the area of the fusion zone must be removed using the appropriate means.

i INFO

Only remove the FRIAFIT fitting to be processed from the packaging immediately before processing. It protects the fitting against external influences during transport and storage.

8.10. Mark the fusion zone again

Then redraw the fusion zone, i.e. the marking lines for the insertion depth for couplers and moulded parts or the saddle surface for saddle moulded parts, on the pipe with a marker, as these were removed during the oxide layer removal and cleaning process. These marking lines are designed as a check to avoid tilting during assembly, particularly for pipes from d 250.

9. Assembly and fusion: FRIAFIT couplers and moulded parts

9.1. Tension-free assembly

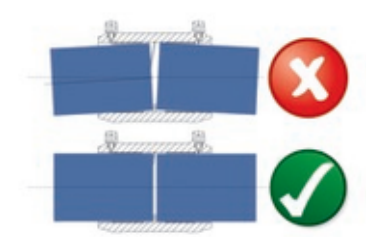


Image 13:

Do not tilt the FRIAFIT fitting when connecting it to the pipe.
All the connection points prepared for fusion must be free of tension or stress.
Pipes must not be inserted into the fitting under bending stress or dead load. Users must be able to push the fitting on or insert it without force.

i INFO

An unacceptable melt flow and defective connection point may arise if the joint is under tension or displaced during the fusion process.



Image 14:

If necessary, assembly can be carried out by striking evenly around the front edge with a rubber mallet.

i INFO

Observe the fusion contacts on the coupler!

The processed insertion end must be inserted evenly up to the marking.

i INFO

Maintain the tension-free fixation of the joint until the cooling time specified on the barcode has expired.



Image 15:

If necessary, the pipe connection or fusion fitting must be supported or suitable clamping units must be used.

For example, use FRIATOOLS pipe alignment clamps or similar tools.

Before starting the fusion process, use the marking lines on the pipe to again check if the position of the pipe insertion end in the fusion fitting has not shifted (correct the position if necessary).

Repeat the scraping process if, despite the previous procedure, you are unable to push on the fusion fitting without using force. Repeated scraping must not be carried out to remedy assembly issues arising from ovality! In this case, you can quickly position the fusion fitting to check the high points and evaluate the annular gap. Subsequent scraping of the high points is permitted.

9.2. Fusion process

i INFO

Use only fusion units for processing FRIAFIT fittings from Aliaxis Deutschland GmbH that are approved by the manufacturer for such processing, e.g. FRIAMAT fusion unit or similar. See DVS 2207-1 and ISO 12176-2.

i INFO

Never leave FRIAMAT fusion units unattended when in operation!

The operator of the fusion unit must maintain the device and the fusion fitting to be processed in their sight at all times during the fusion process.

i INFO

Follow the operating instructions and the specifications of the manufacturer of the fusion unit.

9.2.1. Switch on the fusion unit, read the barcode and start the fusion process

⚠ CAUTION

Plastic melt escaping during the fusing process

Burns on the skin

Always maintain a distance of one metre from the fusing site during the fusion process for general safety reasons.



Image 16:

When positioning the fitting, ensure that the fusion contacts on the fitting are easily accessible and ensure that the fusion cable is causing no tension or load on the fusion joint.

Use the contact plugs on the fitting to plug the fusion cable into the fusion plugs. The fusion plugs must be fully plugged into the contact plugs of the fitting, i.e. over the entire internal contact length.

The fusion parameters are contained in the (upper) barcode, which is attached to the barcode sticker on the FRIAFIT fitting.

When using fully automatic fusion units, such as the FRIAMAT fusion unit or similar, the fusion parameters are read into the fusion unit with a reading wand or a mini scanner. The lower barcode on the barcode sticker contains the data for component traceability. Read only if the component traceability will be used.

ℹ INFO

When applying an electrical contact with the FRIAFIT fitting, please note whether the fusion fitting to be processed has a continuous fusion wire winding (monofilar winding) or separate fusion wire winding for each side of the fusion fitting (bifilar winding).

- **Monofilar winding:** both sides of the fusion fitting are fused simultaneously.
- **Bifilar winding:** each side of the fusion fitting is fused separately.

ℹ INFO

Only fusion units FRIAMAT XL should be used for couplers $UB \geq d 1000$. Please note the requirements for the power range of the generator!

i INFO

Check and, if necessary, adjust the correct alignment of the fusion joint before starting the fusion process.



Image 17:

After reading the fusion barcode, which is confirmed with an acoustic signal (on FRIAMAT fusion units), compare the data on the fusion unit with the data from the fusion fitting.

Start the fusion process if both sets of data match.

The fusion unit automatically monitors the fusion process and thereby regulates the power input within set parameters.

The end of the fusion process is indicated with two acoustic signals (on FRIAMAT fusion units).

i INFO

If necessary, the data can be entered into the FRIAMAT fusion unit manually using the emergency input mode.



Image 18:

Alternatively, the fusion process for the fusion unit types FRIAMAT 7 and FRIAMAT 6 prime eco can be easily started and controlled using the WorkFlow app.

Use the integrated barcode scanner to quickly and clearly read the fusion and traceability barcodes and display all the relevant data.

Fusion protocols are automatically transferred to the WorkFlow app along with additional data including geodata, photos and comments can be added quickly and easily.

i INFO

The fusion indicator provides data on the fusion process that has been carried out. However, the correct fusion process is only displayed by the fusion unit.

9.2.2. Pre-heating

The maximum distance that can be bridged between the fusion coupler and the pipe must not exceed 3 mm along the entire circumference. This means: $\Delta d \leq 6 \text{ mm}$ for the fusion coupler centred and mounted on the pipe. Pre-heating can compensate for the annular gap between the coupler and pipe within specific parameters. The thermal reduction of tensions in the joint area also has a positive effect on the fusion result.



Image 19:

In addition to the barcode sticker (white barcode sticker) with the fusion and traceability barcode, the components mentioned below also have a barcode sticker for the pre-heating data (yellow barcode sticker) on the component.

i INFO

The use of pre-heating technology is required for FRIAFIT couplers AM/UB SDR 17 $\geq d$ 560 and for plug-in couplers for sewage shaft lining adapters AEM $\geq d$ 560.

Procedure for using the pre-heating technology:

1. Preparation of the joint area in accordance with these assembly instructions.
2. Centre the coupler on the pipe, so that the annular gap is as consistent as possible over the circumference. Support the coupler if necessary.
3. Close the annular gap with adhesive tape to avoid heat loss.
4. Close open pipe ends to avoid a chimney effect.
5. Standard processing:
 - a. Pre-heat **first** coupler side, reading of yellow barcode by the fusion unit and start the process, then
 - b. pre-heat **second** coupler side, reading of yellow barcode by the fusion unit and start the process, then
 - c. first coupler side: check the annular gap and, if it is still too large, repeat the pre-heating procedure no more than twice. If OK: start the fusion of the **first** coupler side (read white barcode), then

- d. second coupler side: check the annular gap and, if it is still too large, repeat the pre-heating procedure no more than twice. If OK: start the fusion of the **second** coupler side (read white barcode).

i INFO

Maintain a pause between the pre-heating and the actual fusion process to allow the components (coupler and pipe) to heat up evenly. This pause corresponds approximately to the pre-heating or fusion time, depending on the dimension, i.e. approx. 15–30 minutes. The pause between pre-heating and fusion must be observed when processing one side of the coupler only. If the pause time is exceeded by more than double, then repeat the process described above.

i INFO

Open pipe ends must be closed (chimney effect). The annular gap should be closed with adhesive tape to prevent heat loss during bad weather conditions (cold, wind, etc.).

9.3. Designation marking of the fusion joint and switching off the fusion unit



Image 20:

Once the fusion process is completed, the actual fusion time achieved must be compared with the target fusion time on the fusion unit and noted on the pipe or fitting with a marker. This marking procedure ensures that no fusion site is overlooked.

After the fusion time has expired, the fusion unit can be switched off and the fusion cable removed from the fitting.

9.4. Repeat the fusion process

If the fusion process is interrupted, e.g. due to generator failure, the fusion process can be repeated when both the FRIAFIT fitting and the pipe have cooled down to ambient temperature.

INFO

In the event of a repeated fusion process, please contact your specialist technical sales engineer or the Aliaxis Deutschland GmbH hotline, telephone number: +49 621 486-1486.

9.5. Cooling time

HINT

Premature movement of the fusion joint, i.e. before the cooling time CT has elapsed.

This will lead to leaking joints.

Always observe the cooling time CT which has been specified on the barcode!

Cooling time is defined as follows:

1. **Cooling time CT:** the time required for the fusion joint to cool to the temperature that allows the joint to move. This time is also on the barcodes and is marked CT.
2. **Cooling time pressurisation:** the time required by the fusion joint to cool down to a temperature that allows the full test pressure to be applied.

INFO

When pulling in pipes, the cooling time until pressure is applied is decisive.

Diameter in mm	Cooling time in min. for FRIAFIT couplers AM/UB SDR 17	
	CT until the joint can be moved, or until pressure is applied to max. 0.5 bar (test pressure)	For the max. test pressure of a pressure pipe system MDP 10 bar (PN10)
110	10	40
125	15	45
160 - 225	20	75
250 - 355	30	100
400 - 800	40	120
900 - 1200	90	240

The respective cooling times for FRIAFIT saddle moulded parts, e.g. ASA VL or ASA VL KG, are listed in the corresponding product-related chapter in these assembly instructions.

I INFO

FRIAFIT couplers AM $\geq d$ 250 and UB SDR 17 $\geq d$ 315 have an outer reinforcement (wire winding) to ensure optimal joining pressure during the fusion process. The separation of the external reinforcement from the coupler body that occurs during the cooling phase arises from the thermal expansion behaviour of the fusion joint and is not a negative aspect.

10. FRIAFIT transition pieces and transition couplers

10.1. Product description and application

FRIAFIT transition pieces and transition couplers create a continuous material transition from PE-HD pipes to PVC, PP or clay pipes.



Transition coupler PE - PVC/PP AMKG

The FRIAFIT transition coupler **AMKG** in the house connection area serves as a continuous material transition from PE-HD pipes (wall thickness ratio SDR 33 to SDR 17) to PVC/PP pipes with dimensions d/DN 160/150 and 225/200.

Image 21:



Image 22:

Transition piece PE – PVC/PP UKG

The FRIAFIT transition piece **UKG** in the house connection area serves as a continuous material transition from PE-HD pipes (wall thickness ratio SDR 33 to SDR 17) to PVC/PP pipes with dimensions d/DN 160/150.



Image 23:

PE transition piece – PE – Clay USTZ

The FRIAFIT transition piece **USTZ** in the house connection area serves as a continuous material transition from PE-HD pipes (wall thickness ratio SDR 33 to SDR 17) to clay pipes with dimensions d/DN 160/150.

10.2. Processing

- **AMKG:** The FRIAFIT transition coupler AMKG is processed on the PE-HD side with an integrated coupler using a heated coil (electrofusion) process. The preparatory work, e.g. cutting the pipe to length, measuring the fusion zone and marking it with a marker, removing the oxide layer, cleaning the fusion zones and assembly and fusion is detailed in the chapters [8. Processing of FRIAFIT fittings, P.15](#) and [9. Assembly and fusion: FRIAFIT couplers and moulded parts, P.23](#). The PVC or PP pipe is inserted on the plug-in coupler side. The plug-in coupler has an SBR sealing lip (pursuant to EN 681-1) and a large insertion depth for secure and easy pipe guidance.

i INFO

The fusion zone must be free of contamination, particularly if lubricants are used to assemble plug-in coupler joints, which may enter the fusion zone.

- **UKG:** The transition piece UKG is processed on the PE side at the pointed end with a FRIAFIT coupler AM d 160 or a FRIAFIT sewage saddle vacuum loading ASA VL 160. The preparatory work, e.g. cutting the pipe to length, measuring the fusion zone and marking it with a marker, removing the oxide layer, cleaning the fusion zones and assembly and fusion is detailed in the chapters [8. Processing of FRIAFIT fittings, P.15](#) and [9. Assembly and fusion: FRIAFIT couplers and moulded parts, P.23](#). The PVC or PP pipe is inserted on the plug-in coupler side. The plug-in coupler has an SBR sealing lip (pursuant to EN 681-1) and a large insertion depth for secure and easy pipe guidance.
- **USTZ:** The transition piece UKG is processed on the PE side at the pointed end with a FRIAFIT coupler AM d 160 or a FRIAFIT sewage saddle vacuum loading ASA VL 160. The preparatory work, e.g. cutting the pipe to length, measuring the fusion zone and marking it with a marker, removing the oxide layer, cleaning the fusion zones and assembly and fusion is detailed in the chapters [8. Processing of FRIAFIT fittings, P.15](#) and [9. Assembly and fusion: FRIAFIT couplers and moulded parts, P.23](#). The clay pipe is inserted on the plug-in coupler side. The plug-in coupler has an SBR sealing lip (pursuant to EN 681-1) and a large insertion depth for secure and easy pipe guidance.

11. FRIAFIT sewage shaft lining adapter ASF/ASFL

11.1. Installation of sewage shaft lining adapter ASF/ASFL in the concrete shaft



Image 24:

Connections to structures, e.g. shafts, must be articulated in accordance with DIN 4034 (or DWA - A 157). For this purpose, the FRIAFIT sewage shaft lining adapter ASF/ASFL must be used with the FRIAFIT plug-in coupler for sewage shaft lining adapter AEM, as PE-HD pipes do not form a chemical bond with mortar or concrete.



Image 25:

The FRIAFIT sewage shaft lining adapter ASF/ASFL serves as a connecting element between the prefabricated shaft and the FRIAFIT plug-in coupler for sewage shaft lining adapter AEM. The ASF is generally inserted into the concrete work during the manufacture of prefabricated concrete sewage inspection chambers. It can, however, also be used for in-situ concrete construction. It is important to ensure that the circumference of the anchoring bars (T-profile) is completely filled.

The ASF/ASFL is based on DIN V 4034 (shafts made of prefabricated concrete and reinforced concrete parts), i.e. to enable a flush finish (internal and external) in the lower section of the concrete shaft.

i INFO

A core must be used to support the shaft lining to counteract vibration from machining. The outer diameter of the core should be equal to the inner diameter of the ASF/ASFL.

Failure to support the sewage shaft lining adapter to counteract vibration may cause the ASF/ASFL to adopt an oval shape, resulting in issues with the plug-in coupler for sewage shaft lining adapter AEM during assembly.

The ASF/ASFL must be installed so that the front face marked "FRONT" is directed outwards in the shaft.

i INFO

When processing the ASF/ASFL, it is important to ensure the correct position.

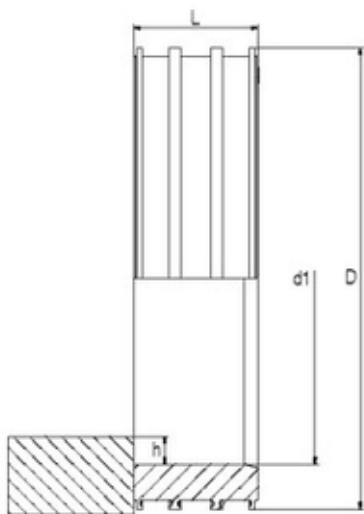


Image 26:

The channel in the prefabricated concrete shaft should be installed to be flush with the PE-HD pipeline. The table below shows the respective channel heights (h) based on the pipe wall thickness (s) of the PE pipe used. The channel should connect directly to the ASF/ASFL inside the shaft.

The wall thickness of the PE pipe used may vary depending on the static conditions. The wall thickness of the PE pipe must be requested from the client or engineering office to avoid unequal transitions (levels) between channels.

Alternatively, a plug-in coupler for sewage shaft lining adapter AEM with an inserted pipe section may serve as a template.

INFO

Example for PE-HD pipe d 280 X 15.9 mm:

Wall thickness of the PE-HD pipe (s) + wall thickness AEM = channel height (h), based on the ASF/ASFL.

- 15.9 mm + 16.5 mm = 32.4 mm

d = External diameter of the pipe

s = Wall thickness of the PE-HD pipe

ID = Internal diameter of the PE-HD pipe

h = Channel height from the ASF/ASFL

(All dimensions refer to nominal dimensions, tolerances are not taken into account)

d [mm]	Channel height (h) ASF/ASFL [mm]				
	SDR 33	SDR 26	SDR 17.6	SDR 17	SDR 11
110	14.0	14.8	16.8	17.1	20.5
160	18.5	19.7	22.6	23.0	28.1
180	23.1	24.5	27.7	28.2	33.9
200	29.7	31.2	34.9	35.4	41.7
225	33.0	34.7	38.8	39.4	46.5
250	21.3	23.2	27.7	28.3	36.2

d [mm]	Channel height (h) ASF/ASFL [mm]				
280	25.2	27.3	32.4	33.1	41.9
315	29.3	31.7	37.4	38.2	48.1
355	33.1	35.7	42.1	43.1	54.2
400	36.9	39.9	47.2	48.2	60.8
450	38.5	41.9	50.0	51.2	65.4
500	43.8	48.6	57.9	59.2	75.4
560	50.2	53.4	63.7	65.2	82.8
630	57.3	63.6	75.2	76.9	96.7

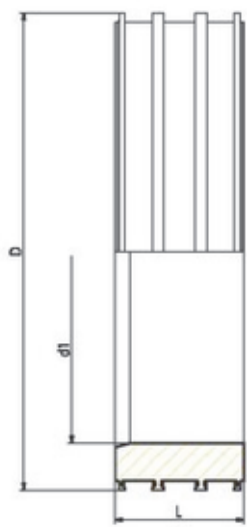


Image 27:

Installation of ASF/ASFL in concrete shafts using core drilling

We recommend an addition of > 60 mm to the outer dimension D for the diameter of the drill bit.

Example: pipe d 160: 250 mm + 60 mm = 310 mm

Please refer to the table below for the pipe dimensions.

We recommend filling the resulting annular space with a commercially available grout. Please ensure compliance with the manufacturer's specifications for processing.

d pipe [mm]	D [mm]
110	200
160	250
180	280
200	315
225/250	355

d _{pipe} [mm]	D [mm]
280	400
315	450
355	500
400	560
450	630
500	670
560	710
630	800

12. FRIAFIT plug-in coupler for sewage shaft lining adapter AEM



The plug-in coupler for sewage shaft lining adapter AEM serves as an articulated joint of PE-HD pipes in the sewage shaft lining adapter ASF/ASFL. It is inserted into the sewage shaft lining adapter ASF/ASFL of the concrete shaft.

Please note the following points before inserting the AEM into the ASF/ASFL.

Image 28:

12.1. Preparatory work

Clean the inner surface of the ASF/ASFL, then apply a thin layer of soft soap-based lubricant.

i INFO

Grease and oils are unsuitable as lubricants. Keep the fusion surfaces free of contamination from lubricants!



Image 29:

Only remove the plug-in coupler for sewage shaft lining adapter AEM from the foil pouch shortly before processing. Check the correct position of the two sealing rings. A sealing ring mounted on the AEM and additional water-swelling sealing ring Q (blue) is supplied in the foil bag. This must be positioned in the intended groove of the AEM before inserting into the ASF/ASFL.

i INFO

The water-swelling sealing ring Q is protected from damp and moisture in a foil bag. The removal and positioning on the AEM must take place immediately before assembly.

12.2. Assembly of the AEM



Image 30:

The plug-in coupler for sewage shaft lining adapter AEM with its sealing rings is then first inserted into the ASF/ASFL. This process is carried out either manually or using a crowbar with a chisel placed crosswise.

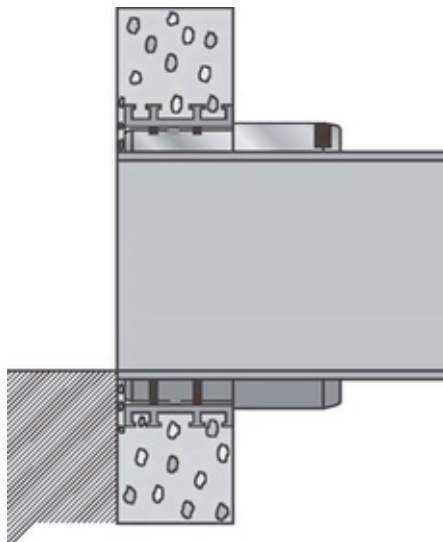


Image 31:

The plug-in coupler for sewage shaft lining adapter AEM must be inserted into the ASF/ASFL up to the channel or as far as it will go.

i INFO

When inserting the AEM, the heating coils must be protected from damage and the ingress of dirt or soiling.

12.3. Pipe assembly and fusion of the AEM with PE pipe

The preparatory work, i.e. cutting the pipe to length, measuring the fusion zone and marking it with a marker, removing the oxide layer and cleaning the fusion zones is detailed in chapter [8. Processing of FRIAFIT fittings, P.15](#)

Then deburr the inside and outside of the cut edge of the pipe, e.g. with a hand scraper, and align any non-round or oval pipes if necessary.

When measuring the fusion zone, note the pipe insertion depth based on the use of the sewage shaft lining adapter ASF or ASFL.

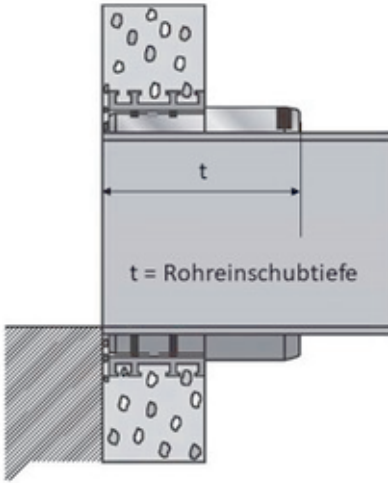


Image 32:

Fusion zone for pipe assembly – ASF use

Insert the pipe into the AEM until it is flush with the front surface of the AEM and connects directly to the channel.

t = pipe insertion depth

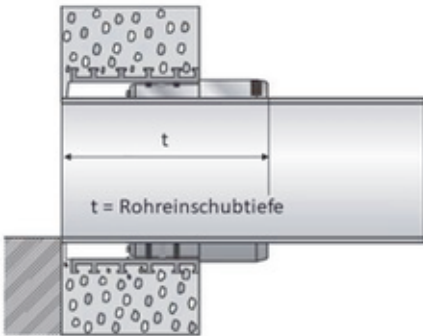


Image 33:

Fusion zone for pipe assembly – ASFL use

The pipe is pushed into the AEM until it is directly connected to the channel.

t = pipe insertion depth

Clean the pipe surface to be fused and the inner surface of the AEM with a suitable cleaning agent before assembling the PE pipe. See chapter [8.9. Clean the joining surfaces, P.21](#)

Insert the pipe end into the plug-in coupler for sewage shaft lining adapter AEM.

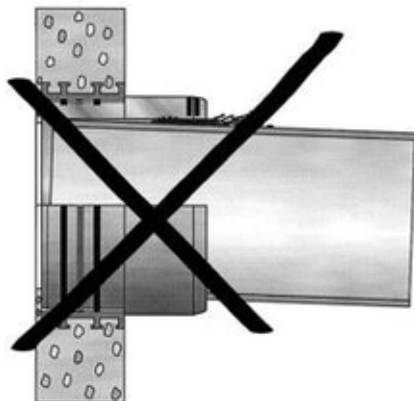


Image 34:

When connecting the FRIAFIT plug-in coupler for sewage shaft lining adapter AEM and the PE pipe, ensure that no force is used to push the pipe into the AEM. The processed insertion end must be inserted up to the marking or to the channel. Do not tilt the pipe during the joining process!

Ensure that the components are not under tension during assembly!

An unacceptable melt flow and a defective joint may occur if the joint is under tension or displaced during the fusion process.

Then carry out the fusion process. See chapter [9.2. Fusion process, P.24](#)

12.3.1. Cooling time

The following cooling times must be observed:

Diameter [mm]	Cooling time in min. for FRIAFIT plug-in coupler for sewage shaft lining adapters AEM
	CT until the connection can be moved, or until pressure is applied to max. 0.5 bar (test pressure)
110	10
160 - 225	20
250 - 355	30
400 - 630	40

13. Processing of saddle components with vacuum loading

13.1. Intended use

The FRIAFIT saddle components sewage saddle **ASA VL 225**, **ASA VL 160** and transition saddle **ASA VL KG 160** are processed using vacuum clamping technology.



Image 35:

Branches or vents can be quickly and easily created using FRIAFIT sewage saddles ASA VL. The KG variant also enables a material transition from PE-HD to PP or PVC.

The FRIAFIT sewage and transition saddles vacuum loading ASA VL are clamped using the FRIATOOLS FRIALOAD clamping unit. The required clamping force is applied by vacuum.

13.2. Scope of delivery of the clamping unit



Image 36:

- Vacuum lifter (PUMP) order no. 613810



Image 37:

- PLATE (2 pcs) Order no. 617372 with plug-in cap
 - PLATE large (d 400 mm)
 - PLATE small (d 325 mm)

i INFO

The small PLATE is required to process the FRIAFIT sewage and transition saddles vacuum loading ASA VL 160, ASA VL 225 and ASA VL KG 160.

13.3. Product description



Image 38:

- **Sewage saddle vacuum loading
ASA VL 225 with outlet spigot**

Processing ranges (max. permitted operating pressure): sewage 2.5 bar

Can be processed on PE pipes SDR 17 with the FRIALOAD clamping unit to connect large-volume branch pipes to PE-HD collectors in the dimension range d 355 to d 630 or through dimensions up to d 710.

i INFO

The ASA VL assembly tool (order no. 613371) is required in addition to the FRIALOAD clamping unit for the standard processing of the cross-dimensional processing of the FRIAFIT sewage saddle vacuum loading ASA VL 225 in dimensions d 315, d 400, d 500 and d 710.

Please also note the assembly instructions for "cross-dimensional processing" of the FRIAFIT sewage saddle vacuum loading ASA VL 225 are available on the homepage of Aliaxis Deutschland GmbH in the download area at https://www.aliaxis.de/pim/friatec-new/documents/asa_vl_dimensionsuebergreifende_verarbeitung_ma_friatec.pdf



Image 39:

- **Sewage saddle vacuum loading
ASA VL 160 with integrated fusion
coupler in the outlet**

Processing ranges (max. permitted operating pressure): sewage 2.5 bar

Can be processed on PE pipes SDR 17 with the FRIALOAD clamping unit to join connecting pipes to the existing PE main channel in the dimension range d 225 to d 630.



Image 40:

- **Transition saddle vacuum loading
ASA VL KG 160 with integrated
plug-in coupler in the outlet**

Processing ranges (max. permitted test pressure): sewage 0.5 bar pursuant to DIN EN 1610

Can be processed on PE pipes SDR 17 with the FRIALOAD clamping unit to join PP or PVC (DN 150) connecting pipes in the dimension range d 225 to d 630.

13.4. Assembly of the saddle component and the clamping unit

13.4.1. Preparatory work

The FRIAFIT sewage or transition saddle ASA VL or ASA VL KG is mounted using the FRIALOAD clamping unit. The FRIALOAD clamping unit generates the required joining pressure through a vacuum. FRIALOAD is a universally applicable tool for all dimensions. The assembly area on the PE pipe must be prepared for electrofusion in accordance with the general assembly requirements (mark and clean the fusion zone, remove the oxide layer, etc.). See chapter 8. [Processing of FRIAFIT fittings, P.15](#)

i INFO

Users must observe the sequence of work steps at all times.

13.4.2. Mount the saddle component on the pipe



Image 41:

Place the saddle component vacuum loading ASA VL or ASA VL KG on the prepared pipe surface.

Place the small PLATE on the outlet of the saddle component. Always ensure that the holding clamps for the vacuum lifter (PUMP) are freely accessible.

i INFO

Inspect the rubber mat located on the back of the PLATE to ensure that it is in perfect condition before assembling the PLATE. If the rubber mat is defective, then it may not be possible to generate a vacuum. In this case, do not use the FRIALOAD clamping unit and contact the hotline of Aliaxis Deutschland GmbH, Tel. +49 621 486-1486.



Image 42:

▪ With ASA VL 225 only

Establish a connection with the pneumatic hose between the ASA VL 225 and the PLATE. To do this, use the pneumatic connections on the saddle component and on the PLATE.

The vacuum is only generated via the outlet with the vacuum lifter (PUMP) with the saddle components ASA VL 160 and ASA VL KG 160.



Image 43:

- **With ASA VL 160 and ASA VL KG 160 only**

The pneumatic connection on the PLATE must be closed with a push-in cap when processing the ASA VL 160 and ASA VL KG 160. Otherwise a vacuum cannot be created.

13.4.2.1. Additional assembly ASA VL 160 and ASA VL KG 160

A rubber mat must be placed around the saddle to support the vacuum generation when assembling the FRIAFIT sewage and transition saddles ASA VL 160 and ASA VL KG 160. The rubber mat is supplied with the saddle components.

i INFO

An additional barcode sticker is applied to the rubber mat, as the barcode sticker on the saddle surface is no longer accessible once the rubber mat is installed.



Image 44:

Peel off the protective film from the self-adhesive backing of the rubber mat.



Image 45:

Place the self-adhesive side of the rubber mat on the saddle surface of the ASA VL 160 or the ASA VL KG 160.

Ensure that the contact eyes of the sewage and transition saddles ASA VL 160 and ASA VL KG 160 are in the openings provided in the rubber mat.



Image 46:

Press the rubber mat evenly around the outlet of the ASA VL 160 or ASA VL KG 160 on the saddle surface and the pipe surface.

i INFO

First, stick the rubber mat to the saddle surface, then adhere the rubber mat by brushing it towards the pipe surface. Ensure that the rubber mat is a tight fit all round.

13.4.3. PUMP assembly



Image 47:

Push the vacuum lifter (PUMP) in the guides onto the PLATE until it reaches the end stop.



Image 48:

Before generating the vacuum, make sure that the FRIALOAD clamping unit and its components PLATE and PUMP are correctly assembled.

13.5. Clamping the saddle component

The clamping of the FRIAFIT sewage and transition saddles ASA VL 225, ASA VL 160 and ASA VL KG 160 is made possible by the vacuum generation with the FRIALOAD clamping unit.



Image 49:

- Slide the switch to the "On" position on the On/Off main switch of the vacuum lifter (PUMP) to turn it on.
- Check the LED display to see if the accumulator is sufficiently charged to install the saddle component.
- If the accumulator charge level is low, then charge it first. See operating instructions for the FRIALOAD clamping unit <https://www.aliaxis.de/de/downloads>
- Press the green button to start the vacuum lifter (PUMP).

i INFO

It may take several seconds before the full suction power is reached after switching on the vacuum lifter (PUMP).



Image 50:

- Press the vacuum lifter (PUMP) on the PLATE to boost the vacuum generation process.
- The vacuum will be generated when the vacuum lifter (PUMP) makes suction noises and the numbers on the digital display begin to increase.
- A vacuum of a minimum of **-0.6 bar** must be achieved, and the vacuum lifter (PUMP) will then automatically switch off.
- The vacuum lifter (PUMP) will continue to automatically readjust the vacuum whenever necessary.

i INFO

The vacuum **must** always be maintained throughout the entire processing time until the end of the cooling time.

13.5.1. Assembly for cross-dimensional processing with assembly aid

Supplement for assembling the FRIAFIT sewage saddles ASA VL for cross-dimensional processing, the ASA VL assembly aid (order no. 613371) is required in addition to the FRIALOAD clamping unit.

The ASA VL can be used on the following pipe dimensions (see Table):

d _{pipe}	ASA VL d ₁ /d ₂	SDR _{pipe}
315	355/225	33 – 11
400	355/225	33 – 11
500	450/225	33 – 11
710	630/225	33 – 11

8

INFO

ASA VL d 355/225 on pipe d 315 is only designed for ambient temperature ranging from +5 °C to +45 °C.



Image 51:

- To install the ASA VL on the pipe, use the ASA VL assembly aid (order no. 613371) in addition to the FRIALOAD clamping unit.
- First fit the ASA VL assembly aid. Make sure the assembly aid sits correctly on the saddle.
- The installation situation should be as shown in the image.

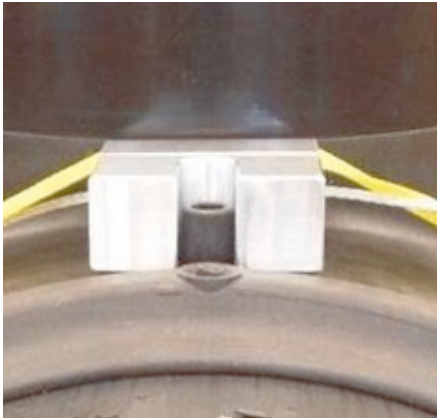


Image 52:

- Position the securing block on the ASA VL in such a way that the contact pins are freely accessible.



Image 53:

- Next, place the tensioning belt with the clamping bar around the saddle. Because of the defined position of the clamping bar on the tensioning belt, the clamping bar is automatically positioned on the edge of the saddle. If necessary, manually correct the position of the clamping bar.
- Loop the tensioning belt around the pipe and pass the end of the tensioning belt into the belt ratchet.
- Tighten the ASA VL firmly onto the pipe by operating the belt ratchet.
- Carry out the steps described in section 13.5 Clamping the saddle component.
- Note the vacuum information.



Image 54:

- Connect the fusion contacts to the contact plugs on the FRIAFIT saddle component.



Image 55:

- Read the preheating barcode (printed on the instruction leaflet) into the fusion unit and then start the preheating process.
- Start fusion process immediately once the preheating process ends.
- Proceed as described in chapter 13.6 Carrying out the fusion process.
- At the end of the cooling time, release the belt from the belt ratchet and remove the ASA VL assembly aid.

13.6. Carrying out the fusion process

⚠ CAUTION

Plastic melt escaping during the fusing process

Burns on the skin

Always maintain a distance of one metre from the fusing site during the fusion process for general safety reasons.

i INFO

Always observe the operating instructions of the fusion unit manufacturer, e.g. FRIAMAT fusion unit from Aliaxis Deutschland GmbH or similar.



Image 56:

Plug the fusion cable of the fusion unit into the contact plug on the FRIAFIT saddle component. The fusion socket must be fully plugged into the contact plugs of the saddle component, i.e. over the entire internal contact length.



Image 57:

The fusion parameters are contained in the (upper) barcode, which is attached to the barcode sticker on the saddle component. The lower barcode on the barcode sticker contains the data for the component traceability. Read only if component traceability will be used. The fusion parameters are read into the fusion unit with a reading wand or a mini scanner.

i INFO

Before starting fusing, make sure that the vacuum on the digital display of the vacuum lifter (PUMP) is constant at a minimum of -0.6 bar.



Image 58:

After reading the fusion barcode, the data on the fusion unit display must be compared with the data from the saddle component. Start the fusion process if both sets of data match. The fusion unit automatically monitors the fusion process and regulates the power supplied within set parameters.

i INFO

The indicator provides data on the fusion sequence which is being executed. However, the correct fusion sequence is only indicated by the fusion unit.

13.7. Designation marking of the fusion joint



Image 59:

Once the fusion process is completed, the actual fusion time achieved must be compared with the target fusion time on the fusion unit and noted on the pipe or fitting with a marker.

i INFO

This marking procedure ensures that no fusion site is overlooked.

i INFO

After the fusion time has expired, the fusion unit can be switched off and the fusion cable removed from the saddle component.

13.8. Cooling time

i INFO

Never dismantle the FRIALOAD clamping unit until the cooling time CT has expired. Failure to comply with the stated cooling and clamping times could result in a leaking fusion joint!

i INFO

The cooling time CT is indicated on the barcode sticker of the FRIAFIT sewage and transition saddles or on the self-adhesive rubber mat for ASA VL 160 and ASA VL KG 160.

13.9. Dismantling the FRIALOAD clamping unit

⚠ CAUTION

Danger of injury caused by dismantling the clamping unit

The FRIALOAD clamping unit can suddenly fall from the outlet of the spigot saddle and therefore cause injuries when releasing the vacuum clamping unit. Always secure the FRIALOAD clamping unit against falling down when releasing the vacuum clamping unit.



Image 60:

- The vacuum can be removed from the spigot outlet of the saddle component after the cooling time has expired.
- Press the red button to switch the vacuum off and to detach the vacuum lifter (PUMP) from the PLATE.
- Then slide the On/Off main switch of the vacuum lifter (PUMP) to Off. The vacuum lifter (PUMP) is now therefore switched off.



Image 61:

- Slide the vacuum lifter (PUMP) out of the PLATE guides.
- Replace the vacuum lifter (PUMP) in the transport box to protect it.
- Then remove the PLATE from the saddle component outlet.
- Also stow the PLATE in the transport box again to protect it.

13.10. Tapping the pipeline

⚠ DANGER

Explosive and/or health-threatening gas mixtures

Injuries caused by explosion and/or inhalation of hazardous gas mixtures (e.g. residual gas, decomposing digester gas).

Always ensure that the pipe is depressurised and completely empty before any tapping.

⚠ DANGER

Escaping medium (e.g. residual water) in the drilling machine.

Electric shock.

Always ensure that the pipe is completely empty and that there is no medium located in the area of the pipe bottom before tapping.

⚠ CAUTION

Carbide cutting edges on the hole saw

A danger of injury to the hands exists when removing the drill core and the chips. Always wear protective gloves.



Image 62:

Tapping is carried out using the FRIATOOLS FWAB drilling equipment under no operating pressure and with the pipe completely drained. Observe the operating instructions for the FRIATOOLS FWAB drilling equipment. Current instructions are available on our homepage in the download area <http://www.aliaxis.de/de/downloads>

i INFO



Image 63:

Please note that the drilling equipment used for tapping is suitable for use with a hole saw holder for **SDS max. (1)** or **SDS plus (2)** – depending on the pipe wall thickness. Please note the recommended minimum requirements for the drilling equipment, e.g. power consumption and speed range, in the operating instructions for the FWAB drilling equipment!



Image 64:

To drill, insert the hole saw centrally and vertically into the outlet of the sewage and transition saddles vacuum loading, and drill through the pipe wall. Always remove any swarf from the hole saw after the tapping is completed. If necessary, also remove any swarf from the pipe. Always deburr the cut edge after tapping.



Image 65:

When tapping the ASA VL 160 and ASA VL KG 160, a section of plastic pipe DN 150 must be inserted into the outlet spigot to protect the heating coil and the stop or central guide in the outlet. The FRIATOOLS drilling equipment FWAB ASA d 160 contains all the components described in these operating instructions.

8 INFO



Image 66:

Please note that with the transition saddle vacuum loading ASA VL KG 160, the rubber seal in the outlet must be removed before tapping. It must be reinserted when the tapping is completed.

13.11. Commissioning

Install the connection pipe. Please note the general assembly requirements for electrofusion (remove/clean the oxide layer). See chapter 8. [Processing of FRIAFIT fittings, P.15](#)

14. Processing of saddle components with UNITOP

14.1. Intended use

The FRIAFIT spigot saddle SDR 17 **ASA UNI** is processed with the UNITOP clamping unit.



Image 67:

The spigot saddle ASA UNI for integrating a branch pipe into PE pipes, unpressurised or under operating pressure.

The UNITOP clamping unit is used to mount the spigot saddle ASA UNI. The UNITOP clamping unit is a cross-dimensional, universally applicable clamping tool.

14.2. Scope of delivery of the clamping unit

The UNITOP clamping unit comprises the following components:

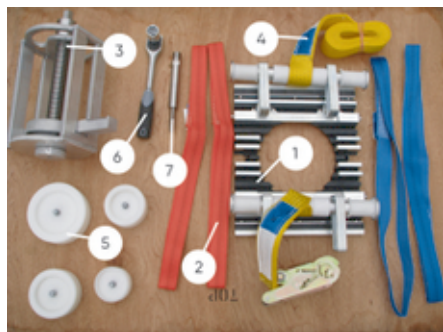


Image 68:

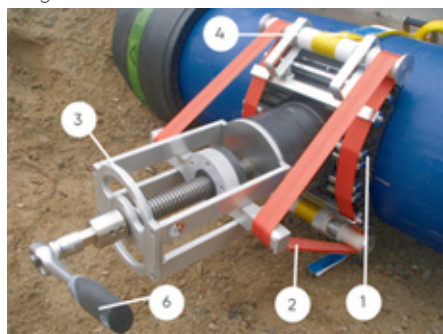


Image 69:

14.3. Product description



Image 70:

1. Clamping plate
2. Tensioning belts (when processing, use the red ASA UNI tensioning belt)
3. Clamping unit
4. Lower belt
5. Adapter for outlet spigots (when processing, use the ASA UNI adapter d 160)
6. Ratchet
7. Pressure test adapter FWDPA SA (not when processing ASA UNI!)

▪ ASA UNI

Processing ranges: maximum permitted operating pressure 2.5 bar sewage

Can be processed on PE pipes of SDR range 17/17.6 for a sole-equal passage with the UNITOP clamping unit across dimensions in the dimensional range d_1 630 to 900.

Outlet spigots are available in the dimension d_2 160.

14.4. Assembly of the saddle component and the clamping unit

14.4.1. Preparatory work

The UNITOP clamping unit is used to mount the FRIAFIT spigot saddle SDR 17 ASA UNI. The UNITOP clamping unit is assembled using the top-loading method and ensures an even distribution of force on the saddle surface. The UNITOP clamping unit is a universally applicable, cross-dimensional tool.

The assembly area on the PE pipe must be prepared for electrofusion in accordance with the general assembly requirements (mark and clean the fusion zone, remove the oxide layer, etc.). See chapter 8. [Processing of FRIAFIT fittings, P.15](#)

i INFO

Users must observe the sequence of work steps at all times.

14.4.2. Mount the saddle component on the pipe

14.4.2.1. Pre-assembly

⚠ CAUTION

Danger of injury when the belt ratchet is open

The clamping lever of the belt ratchet must be locked in the closed position again after the assembly has been completed.

i INFO

The following images show the saddle with outlet spigot universal SA UNI!



Position the clamping plate on the spigot saddle SDR 17 ASA UNI.

i INFO

Make sure that the ASA UNI is placed on a clean and dry surface.



Image 72:

Place the ASA UNI and the pre-mounted clamping plate on the prepared pipe surface.

i INFO

Make sure you handle the ratchet correctly and thread the lower belt correctly.

The lower belt is attached to the clamping bars of the clamping plate. Loop the lower belt around the pipe and insert the loose end of the lower belt into the belt ratchet. Operate the belt ratchet to (pre-)position the clamping plate with the spigot saddle ASA UNI on the pipe.

i INFO

Only use the ratchet to tighten the lower belt hand-tight!

The spigot saddle ASA UNI is first pre-assembled and clamping takes place in the next step.

i INFO

Ensure that the lower belt is in the correct position!

Make sure that the lower belt does not twist and is positioned centrally within the guides of the clamping bars.

14.4.2.2. Assembly of the clamping unit

i INFO

Ensure that the crossbar of the clamping unit is in the end position before installing the clamping unit.



Image 73:

Select the adapter d 160 (order no. 613839) suitable for the outlet spigot of the ASA UNI and then screw the adapter d 160 onto the clamping unit.

The adapter d 160 is **not** supplied with the UNITOP clamping unit and must be ordered separately.



Image 74:

Select the upper red tensioning belts in accordance with the dimension range for the outlet spigot d 160 of the ASA UNI.

Thread both tensioning belts into the mounting points of the clamping bars on the clamping plate.

i INFO

When processing the spigot saddle ASA UNI only use the **red** tensioning belt!

Mount the clamping unit on the ASA UNI outlet spigot.



Image 75:

To do this, insert the adapter d 160, which is screwed onto the clamping unit, into the outlet spigot.

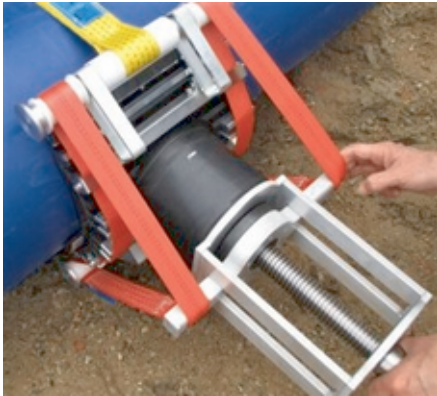


Image 76:

Hold the clamping unit in this position and loop the two tensioning belts around the crossbar so that the clamping unit, clamping plate and ASA UNI are firmly positioned on the pipe.



Image 77:

Make sure that the UNITOP clamping unit, the spigot saddle ASA UNI and the tensioning belts are aligned vertically and straight. Correct the position of the ASA UNI on the pipe where necessary.

i INFO

Secure the position to prevent unintentional slipping of the spigot saddle ASA UNI.

i INFO

Make sure that the tensioning belts are positioned centrally within the guides of the clamping bar on the clamping plate and the crossbar on the clamping unit!

Do not twist the tensioning belts!

Check the correct position of the ASA UNI again after mounting the UNITOP clamping unit on the pipe before activating the clamping unit!

14.4.2.3. Operating the clamping unit

⚠ CAUTION

Danger of crushing!

Injuries to hands or on the arm area.

Never reach under the clamping plate or the saddle component when actuating the clamping unit.

⚠ CAUTION

The belts are always tensioned!

Failure of the tensioning belt can result in injuries.

Always inspect the fault-free condition of the belts before commissioning and utilising the UNITOP clamping unit. Worn or old belts must always be exchanged.

Only utilise original spare parts from Aliaxis Deutschland GmbH.

HINT

Never attach an extension to the ratchet.

The larger, increased leverage can damage the clamping unit.



Image 78:

Use the ASA UNI outlet spigot to clamp the saddle onto the pipe.
To do this, place the ratchet with the nut on the spanner flat of the threaded spindle and turn it clockwise until the ASA UNI rests on the pipe surface **with no gaps**.



Image 79:

When installing, make sure that the contact eye of the ASA UNI is in the designated recess in the clamping plate.

After activating the clamping unit, remove the ratchet and place it back in the transport box.

14.5. Carrying out the fusion process

Follow the work steps for the fusion process (switch on the fusion unit, read the barcode and start the fusion process, mark the fusion parameters, etc.). See chapter [9.2. Fusion process, P.24](#)

i INFO

Check and, if necessary, adjust the correct alignment of the clamping unit and the gap-free contact of the saddle on the pipe! If necessary, re-tighten the saddle.

i INFO

If your fusion unit has straight fusion sockets, you will also need the ADWL angle adapter (order no. 613241). FRIAMAT fusion units are already equipped with angle plugs as standard.



Image 80:

Carry out the fusion process.

After the fusion time has expired, the fusion unit can be switched off and the fusion cable removed. Do not dismantle the UNITOP clamping unit until the cooling time (CT) has expired at the earliest.

14.5.1. Designation marking of the fusion joint

Once the fusion process is completed, the actual fusion time achieved must be compared with the target fusion time on the fusion unit and noted on the pipe or fitting with a marker.

i INFO

Marking ensures that no fusion joint is overlooked.

i INFO

After the fusion time has expired, the fusion unit can be switched off and the fusion cable removed from the saddle component.

14.5.2. Cooling time

i INFO

The cooling time CT is indicated on the barcode of the spigot saddle SDR 17 ASA UNI.

i INFO

Failure to comply with the stated cooling and clamping times could result in a leaking fusion joint.

d ₁	ASA UNI: Cooling time in minutes after the end of the fusion time until....
	... dismantling the UNITOP clamping unit. ... for tapping non-pressurised pipelines.
630 - 900	20

14.6. Dismantling the UNITOP clamping unit

⚠ CAUTION

Danger of injury if the ratchet lock is released.

If it is utilised incorrectly, then kickback on the operator's hand is possible.
Always take care when releasing the locking part.

Turn the ratchet counterclockwise to loosen the spindle nut. Rotate until the crossbar is in the down position.



Image 81:

Hold the clamping unit firmly to secure it and loosen the tensioning belts from the crossbar.
Then dismantle the clamping unit from the ASA UNI outlet and place the clamping unit back in the transport box.



Image 82:

Open the belt ratchet to loosen the lower belt on the pipe and then pull the clamping plate over the outlet of the spigot saddle ASA UNI.
Store the unit in a dry and clean condition in the transport box.

14.7. Tapping the pipeline

▲ DANGER

Explosive and/or health-threatening gas mixtures

Injuries caused by explosion and/or inhalation of hazardous gas mixtures (e.g. residual gas, decomposing digester gas).

Always ensure that the pipe is depressurised and completely empty before any tapping.

▲ DANGER

Escaping medium (e.g. residual water) in the drilling machine.

Electric shock.

Always ensure that the pipe is completely empty and that there is no medium located in the area of the pipe bottom before tapping.

▲ CAUTION

Carbide cutting edges on the hole saw

A danger of injury to the hands exists when removing the drill core and the chips.
Always wear protective gloves.



Image 83:

The tapping is carried out using the FRIATOOLS FWAB drilling equipment under **no** operating pressure and with the pipe completely drained.

Observe the operating instructions for the FRIATOOLS FWAB drilling equipment.

Current instructions are available on our homepage in the download area <https://www.aliaxis.de/de/downloads>



Image 84:

The hole saw from the FWAB drilling equipment is used to drill through the pipe wall.

After tapping, remove the drill core and any swarf from the hole saw and deburr the cut edge.

If necessary, also remove any swarf from the pipe.

14.8. Commissioning

Install the connection pipe. Please note the general assembly requirements for electrofusion (remove/clean the oxide layer). See chapter 8. [Processing of FRIA FIT fittings, P.15](#)

15. Installation of the FRIAFIT connecting spigot ASA MULTI

15.1. Intended use



Image 85:

The FRIAFIT connecting spigot **ASA MULTI** to join PE-HD connecting pipes to clay and concrete pipes

- To connect fused, root-resistant PE-HD connecting pipes to clay or concrete pipes
- For re-installation and renovation without a separation from or full exposure of the main sewer.

The outlet spigot d 160 provides a passage with the same sole when using SDR 17/17.6 pipes.

The light inner surface of the spigot ensures optimal visibility when viewing with a camera and can be fused with a FRIAFIT coupler AM or FRIAFIT bends ABM/ABMS.

15.2. Product description



Image 86:

▪ **ASA MULTI**

Processing ranges: max. permitted test pressure 0.5 bar pursuant to DIN EN 1610

The FRIAFIT connecting spigot ASA MULTI is used to connect fused PE-HD house connections or side branches to clay or concrete pipes (see table below).

The FRIAFIT connecting spigot ASA MULTI is installed using mechanical clamping with an elastomeric seal. The PE outlet spigot d 160/DN 150 SDR 17 is fused to the connection pipe using a FRIAFIT coupler AM or a FRIAFIT bend ABM/ABMS.

Sewage pipe Clay: standard (N) and high-load series (H) pursuant to EN 295 / concrete pursuant to EN 1916	Connecting spigot PE 100 / SDR 17 pursuant to EN 12666 d 160 / DN 150
Clay DN 250 N	ASA MULTI DN 250
Clay DN 250 H	
Clay DN 300 N	ASA MULTI DN 300/350 DN 250/300
Clay DN 300 H	
Clay DN 350 N	
Clay DN 350 H	
Concrete DN 250	
Concrete DN 300	




▪ **ASA MULTI MS assembly key**

The ASA MULTI MS assembly key (order no. 682660) is required to assemble the FRIAFIT connecting spigot. The assembly key is **not** supplied with the ASA MULTI.

Image 87:

15.3. Assembly ASA MULTI

15.3.1. Tapping of the main pipe


CAUTION

Risk of injury on the core bit.
Risk of injury from splinters and sharp edges.
Wear appropriate safety goggles and protective gloves.

HINT

Leaking joint.

Clean the cut edge of the hole after tapping. Check the hole for damage, e.g. flaking or edges.



Image 88:

The clay or concrete pipe is tapped using standard core drilling equipment and a suitable drill bit for a standardised tapping diameter of $d_{AB} = 172^{+2}$ mm.

Use a suitable core bit to cut out a circular hole at the intended connection point on the main pipe to accommodate the FRIAFIT connecting spigot ASA MULTI.

To ensure a tight joint, please note:

- The drilling must be perpendicular to the pipe axis to create a circular drill hole.
- The drill must be firmly positioned on the pipe.
- The drill hole must be created with a diameter of $d_{AB} = 172^{+2}$ mm.

i INFO

The surface treatment of the cut edge may be carried out as specified by the pipe manufacturer.

15.3.2. Assembly

i INFO

Use the ASA MULTI MS assembly key to assemble the FRIAFIT connecting spigot ASA MULTI!



Insert the ASA MULTI spigot at right angles through the exact centre of the tapped hole, without tilting, until the saddle lies with no gaps on the main pipe.

Image 89:



Image 90:



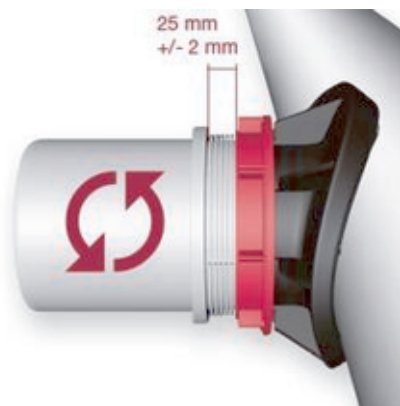
The saddle must rest on the main collector with no gaps.

Image 91:



Tighten the ring nut on the ASA MULTI using the assembly key and a rubber mallet.

Image 92:



Ensure that the saddle is resting on the main pipe with no gaps, and that the distance between the end stop and the ring nut is 25 \pm 2 mm.

Image 93:

15.3.2.1. Adapter for the pipe type

i INFO

The adapter on the FRIAFIT connecting spigot ASA MULTI can be adapted to the respective pipe material where required!

Select the adapter based on the table.

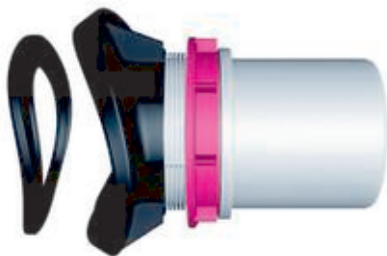


Image 94:

Sewer pipe/pipe type	Connecting spigot d 160	Adapter marking	ASA MULTI adapter
Clay DN 250 N	ASA MULTI DN 250	2 ¹	Ready to install
Clay DN 250 H		3 ¹	Modification 2 to 3 adapter
Clay DN 300 N	ASA MULTI DN 300/350-STZ DN 250/300-B	1 ¹	Ready to install
Clay DN 300 H		1 ¹	Ready to install
Clay DN 350 N		without	dismantle adapter
Clay DN 350 H		without	dismantle adapter
Concrete DN 250		1 ¹	Ready to install
Concrete DN 300		without	dismantle adapter
1 no. marked on the adapter			



Image 95:

Users can replace the adapter on the connecting spigot (see table) to adapt the connecting spigot ASA MULTI to the respective pipe material and the outer diameter of the main collector. Loosen the two screws on the saddle to remove the adapter. Observe the instructions supplied to replace the adapter.

15.3.3. Fitting the connecting line



Image 96:

Connect the PE house connection to the PE spigot of the FRIAFIT ASA MULTI with a FRIAFIT coupler AM or a FRIAFIT sewage bend ABM.

Please note the general assembly requirements for electrofusion (remove/clean the oxide layer). See chapter [8. Processing of FRIAFIT fittings, P.15](#)

16. Fixation for absorbing axial thrust and tensile forces: FRIAFIT FIXBLOC

16.1. Intended use



Image 97:

The FRIAFIT FIXBLOC is used to absorb high axial tensile and thrust forces wherever they occur. This is the case, for example, with pipe renovations, when creating attachment points and fixings.

For universal use on PE-HD pipes in dimensions d 160 to d 1600 as a pull-in or pull-out safety device, a fixing or to create an attachment point. The strength per fixed point is 40 kN.

16.2. Product description

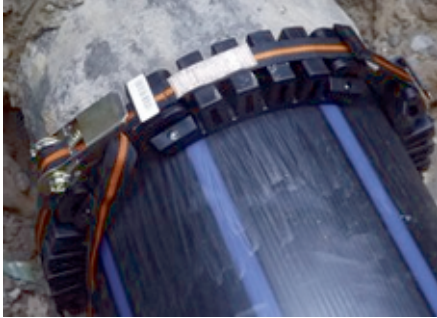


Image 98:

Standard processing:

A standard tensioning belt may be used to mount the FRIAFIT FIXBLOC on a PE pipe. Several FIXBLOCs can also be processed on one pipe if increased anchoring force is required. Please comply with the following requirements for the tensioning belt: belt width 50 mm, belt length approx. 3.5 x pipe diameter, or correspondingly longer for multiple uses.



Image 99:

Processing with a clamping unit FIXBLOC FWFB:

The FRIAFIT FIXBLOC can also be clamped and fused from the pipe cut edge using the FRIATOOLS FIXBLOC FWFB clamping unit. This is particularly useful if the pipe circumference is not accessible, e.g. with a PE liner in the duct that must be anchored against the shaft wall.

16.3. Preparatory work and assembly with tensioning belt

The FRIAFIT FIXBLOC is mounted with a commercially available tensioning belt or with the FIXBLOC FWFB clamping unit.

The assembly area on the PE pipe must be prepared for electrofusion in accordance with the general assembly requirements (mark and clean the fusion zone, remove the oxide layer, etc.). See chapter 8. [Processing of FRIAFIT fittings, P.15](#)

i INFO

Users must observe the sequence of work steps at all times.

16.3.1. Use the tensioning belt to mount the FRIAFIT FIXBLOC on the pipe.

⚠ CAUTION

The tensioning belt is always tensioned

Danger of injury

Failure of the tensioning belt can result in injuries. Always inspect the belt to ensure it is in perfect condition before using it and exchange it if necessary.



Image 100:

Position the FRIAFIT FIXBLOC on the prepared pipe surface, guide the tensioning belt around the pipe and thread the belt into the two tabs of the FRIAFIT FIXBLOC.

The FRIAFIT FIXBLOC can also be used in multiple applications, using several FIXBLOCs around the pipe.



Image 101:

Insert the end of the tensioning belt into the belt ratchet and operate the belt ratchet to fix the FRIAFIT FIXBLOC on the pipe.

i INFO

After assembly, the clamping lever of the ratchet must be locked in the closed position.

i INFO

Select the tensioning belt!

Use tensioning belts with a belt width of 50 mm and a minimum length of approx. 3.5 x pipe diameter. If used multiple times, the belt length must be adjusted accordingly.



Image 102:

The FRIAFIT FIXBLOC must now be positioned on the pipe with no gaps.

Check and, if necessary, ensure the correct position of the FRIAFIT FIXBLOC and the gap-free contact on the pipe!

16.3.2. Fusion



Image 103:

Follow the work steps for the fusion process (switch on the fusion unit, read the barcode and start the fusion process, mark the fusion parameters, etc.).

See chapter [9.2. Fusion process, P.24](#)

I INFO

The barcode required for fusion is attached to a tab on the component.

After the fusion time has expired, the fusion unit can be switched off and the fusion cable removed.

The FRIAFIT FIXBLOC must remain clamped during the cooling time. After the cooling time has expired, the tensioning belt can be dismantled.

I INFO

Observe the cooling time!

Comply with the CT data on the barcode! Failure to observe the cooling time could significantly reduce the anchoring force of the FRIAFIT FIXBLOC.

16.3.3. Dismantling the tensioning belt

After the cooling time CT has expired, open the belt ratchet to loosen the belt. Remove the tensioning belt from the FRIAFIT FIXBLOC.

16.4. Preparatory work and assembly with the clamping unit

The FIXBLOC FWFB clamping unit must be used to clamp the FRIAFIT FIXBLOC if it is not possible to install the FRIAFIT FIXBLOC with the tensioning belt, e.g. if the pipe circumference is not freely accessible.

The assembly area on the PE pipe must be prepared for electrofusion in accordance with the general assembly requirements (mark and clean the fusion zone, remove the oxide layer, etc.). See chapter [8. Processing of FRIAFIT fittings, P.15](#)

i INFO

Users must observe the sequence of work steps at all times.



Image 104:

Scope of delivery of the FIXBLOC FWFB clamping unit:

- Fixing plate
- 1 large clamp (for the middle position)
- 2 small clamps (for the outer positions)

16.4.1. Mount the FRIAFIT FIXBLOC with the clamping unit on the pipe

i INFO

Warning: read the barcode!

Read the fusion barcode before installing the fixing plate, as the plate covers the barcode sticker.



Image 105:

Mount the fixing plate on the FRIAFIT FIXBLOC.

When installing the fixing plate on the FRIAFIT FIXBLOC, make sure that the two guide rails on the fixing plate are positioned on the two outer bars of the FRIAFIT FIXBLOC.



Image 106:

Position the FRIAFIT FIXBLOC with the pre-assembled fixing plate on the pipe surface.

Then mount the first of the three clamps in the middle position of the fixing plate. A guide on the fixing plate facilitates the installation of the clamp.

Turn the handle of the clamp to position the FRIAFIT FIXBLOC securely on the pipe.

i INFO

After installing the first clamp, check the correct position of the FRIAFIT FIXBLOC on the pipe!



Image 107:

Then mount the two remaining clamps on the outer positions of the fixing plate.

Guides are fixed on the fixing plate to mount the screw clamps in the two outer mounting positions.

i INFO

When tightening the two outer clamps, make sure that the middle clamp does not become loose. Tighten these if necessary.



Image 108:

Turn the handles with a ratchet or spanner to position the FRIAFIT FIXBLOC on the pipe surface with no gaps.

The FRIAFIT FIXBLOC is correctly mounted on the pipe when the two outer guides are resting on the pipe.

The FRIAFIT FIXBLOC must now be positioned on the pipe with no gaps.

i INFO



Image 109:

When fitting the outer screw clamps, make sure that you have the highest feed rate for the threaded spindle (max. span of the clamping arms).

This ensures that even larger gaps between FRIAFIT FIXBLOC and the pipe can be bridged.

I INFO

Before starting the fusion process, check the correct position of the FRIAFIT FIXBLOC and the gap-free contact on the pipe; correct if necessary!

16.4.2. Fusion



Image 110:

Follow the work steps for the fusion process (switch on the fusion unit, **Warning: the barcode has been read!** and start the fusion process, mark the fusion parameters, etc.). See chapter [9.2. Fusion process, P.24](#)

After the fusion time has expired, the fusion unit can be switched off and the fusion cable removed.

The FRIAFIT FIXBLOC must remain clamped during the cooling time. After the cooling time has expired, the FIXBLOC FWFB clamping unit can be dismantled.

I INFO

Observe the cooling time!

Comply with the CT data on the barcode! Failure to observe the cooling time could significantly reduce the anchoring force of the FRIAFIT FIXBLOC.

16.4.3. Dismantling the clamping unit

▲ CAUTION

The fixing plate is always tensioned

Danger of injury when opening the screw clamps.
Always open the screw clamps slowly!

Turn the handles of the clamps to reduce the clamping pressure on the FRIAFIT FIXBLOC. Open the clamps to remove them from the guide rails on the fixing plate.

Store the FIXBLOC FWFB clamping unit components in a dry and clean condition in the transport box.

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