

 *Aliaxis*



## TECHNICAL PLASTICS PRODUCT RANGE 2019

The specialists  
for safe pipe jointings

Valid from 1st November 2018

# FRIATEC TECHNICAL PLASTICS

## THE SPECIALISTS FOR SAFE PIPE JOINTINGS

FRIATEC offers solutions for the connection or repair of pipelines in water supply, sewage and waste water, gas supply and industry.

### **FRIALEN Safety fittings**

The first choice for distribution lines and long-lasting house connections. The safe connection technology for gas, water and industrial pipelines made of HD-PE and PE-Xa.

### **FRIALEN XL Large pipe technique**

Combines all products for connecting large pipelines from d 250 to d 1200.

### **FRIAFIT Sewage system**

Our answer to leaking sewer networks: permanently tight, longitudinally strong and root-resistant.

### **FRIATOOLS Technical equipment**

The matching tools and accessories.

For your questions and further information please contact our sales team. You will find your contact person on our English website under "contact".

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# DIGITAL PRODUCT CATALOG 2019

The flip catalog with new buttons for simple and faster inquiries as well as additional information.



The **index** facilitates your navigation.



Just click - and find more details and hints of the product in the **datasheet**.



Just click - and find the technical drawings in different formats in our **digital product catalog**.



Just click - and find the matching **operating- or assembly instruction**.



To make it easier for you:

From now on you have the possibility to inquire directly from the online product range. No uncomfortable transcription, just choose the article number of the product you want, select the quantity, add this to your total choice, check the overview and send!



# THE NEW FRIAMAT TOROIDAL TRANSFORMER TECHNOLOGY WITH ACTIVE COOLING



- 1 With new, handy Mini-scanner or a proven reader wand
- 2 Extra-long fusion cable (4m) and power cable (5m) for maximum freedom of movement on the construction site
- 3 Intuitive user guidance through clear menu structure. With error messages and acoustic signaling for status check of the user
- 4 High-resolution, extremely bright 4.3 "TFT color display: The high-contrast graphic display remains legible even in the most unfavorable lighting conditions and from almost any position
- 5 Innovative toroidal transformer technology with flow-optimized, active cooling
- 6 Documentation of fusion and traceability data. Memory space for up to 20,000 fusion logs. CSV or PDF file or FRIATRACE format output to standard USB stick
- 7 The new housing geometry also allows a tilted position for easy operation



**TO THE DATA SHEETS**

# SCRAPER TOOL FWSG 63

## NO DIMENSION ADJUSTMENT REQUIRED

For safe removal of the oxide layer on HD-PE and PE-Xa pipes d 20 - d 63.

Change blade made of carbide with 2 cutting edges.

No additional nominal width adjustment for dimension change required.

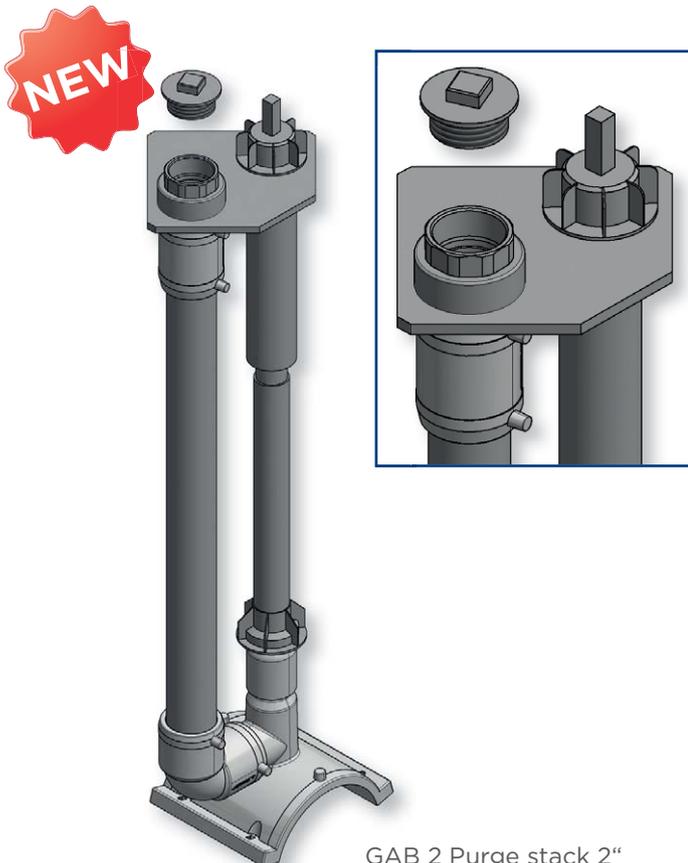


# PURGE STACK GAB 1" OR GAB 2"

## FOR THE VENTILATION OF HD-PE GAS PIPELINES

The FRIALEN purge stack is used for the ventilation of pressurized gas lines. It is used during filling or operation as a measuring point fitting to verify the odorization content.

The purge stack with the corresponding pressure tapping valve DAV is fused - tightly and longitudinally strong - onto the HD-PE pipeline by FRIALEN electrofusion.



GAB 2 Purge stack 2"

# TRAININGS

## FROM SPECIALISTS FOR SPECIALISTS

Our seminars promote the intensive sharing of knowledge and personal contacts with a competent trainer.

Our trainers do not only share theoretical knowledge. It is important for us to put this knowledge into practice with the participants. Therefore, practical exercises in our training workshop take up a large part of the training. From electrofusion basics up to PE Supervision, our speakers know exactly what they are talking about. They show you what is important in pipeline construction and what the current trends look like. The personal contact to a competent contact person for tricky practical questions remains.

Do you have a specific training requirement? We offer you tailor-made seminars, the contents of which we optimally adapt to your training goals. We would also be happy to train you on site.

## REGISTRATION

If you're interested in our trainings, please contact your area sales manager, or check here:



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## FRIALEN/FRIAGRIP



**This training includes the following:**

- Basics electrofusion
- Basics pipe systems
- Electrofusion in water supply
- PE Supervisor

## FRIALEN XL LARGE PIPE TECHNIQUE



**This training includes the following:**

- Economical and safe construction of branch pipelines
- Assembly for saddle components on pressure lines
- Tapping techniques in unpressurized and pressurized condition

## FRIAFIT SEWAGE SYSTEM



**This training includes the following:**

- Branch and connection pipes as well as on sewers that have been renovated with close-fit liners made of HD-PE
- Connections of PE-HD pipes for gravity lines up to d 1200
- Practical reports/experiences of external speakers from municipal sewerage companies or engineering offices for sewer rehabilitation

## Things worth knowing about safe connection technology with FRIATEC

### Contents

The following pages present lists of keywords that are to help you find your way through our range to the products you are looking for.

### Stocked status

Please note when planning your material requirements:

- Articles with stocked status 1 (MTS) are generally available from stock.
- Articles with stocked status 3 (MTO) are order related products. Delivery time on request. These articles cannot be returned or exchanged.

### Packaging and pallet units

Packaging (BX) and pallet units (PU) are given on the price list. Orders for complete BXs/PUs simplify your incoming goods and warehousing processes. In addition, they promote fast order picking and delivery at our locations. The price list shows that the units we have chosen are fair and practicable.

### Returns

The total value of the return / position must be at least 100,- €.

We must first approve all returns of goods before they are entered as credit items. Please inform us of your wish to return goods. Following approval, we shall send you a return slip bearing a unique number. Your return cannot be processed without this number. Our quality management requires in addition that the goods fulfil certain criteria. If you wish, we shall be pleased to send you details under separate cover. If the goods fulfil the criteria and the return has been approved, a credit entry is made with a 30% deduction for the examination costs.

### Inspection test certificates

We charge a processing fee of €20,00/item for inspection test certificates as set down under DIN EN 10204 – 3.1. The inspection test certificate must be included in the order, and cannot be issued at a later date.

To eliminate unnecessary expenditure, we can also provide you with the certificate for FRIALEN articles if this is needed. This needs only the component's traceability batch found on the barcode or in the shipping documents.

### Electronical Product Range

A product catalogue in the format of an electronic flip catalogue is available for you in the download area. In order to obtain detailed information as quickly and easily as possible, we have provided the products with additional pictograms. Please note the explanation on the first pages.

### Quality

FRIALEN safety fittings, FRIALEN XL large pipe technique, the FRIAFIT sewage system, and our FRIATOOLS technical equipment are subjected to continuous quality control and strict testing regulations that form part of our extensive quality management system certified under DIN EN ISO 9001:2015.

FRIALEN safety fittings, FRIALEN XL large pipe technique, the FRIAFIT sewage system, and our FRIATOOLS technical equipment are all matched to each other. All modifications and supplements arising from our continued developments are treated accordingly. Our continuous quality control extends to FRIALEN safety fittings, FRIALEN XL large pipe technique, the FRIAFIT sewage system, our FRIATOOLS technical equipment, and the quality of fusion joints as a result of these components' interactions. The operation and functional reliability of equipment provided by other manufacturers (third party equipment) are not subjected to our specifications and control procedures. When installing pipe systems, please proceed in accordance with the fitting instruction manuals and equipment operating instructions.

### Certifications of our management systems

In addition to the quality management system certified under DIN EN ISO 9001:2015 FRIATEC AG, Technical Plastics, has introduced an environmental management system certified under DIN EN ISO 14001:2015 and an energy management system certified under ISO 50001:2011.

This is to testify to our endeavours targeting the sustainable development, manufacture, and use of our products.

The current certificates can be found on our homepage.

### Processing and additional information

Processing is described in our assembly instructions, which is also available for download on the internet at [www.frialen.com](http://www.frialen.com). This address also provides further details on the products and their processing, approvals, publications and contacts.

### Technical details

The technical details presented on this product range are incomplete. Details can be taken from our data sheets that are also available in the download section at [www.friatec.com](http://www.friatec.com). Technical instructions for processing and use may be delivered with the product and, in this case, must be observed without fail.

### Up-to-dateness / technical progress

All details were up to date at the time of printing. Changes serving the advancement of our technologies may be made without prior announcement. We accept no liability for printing errors.

### Brand names

For easier reading, this price list dispenses with the symbols® and™ in continuous text. The following trademarks are registered: FRIALEN®, FRIAFIT®, FRIATOOLS®, FRIALOC®, FRIAMAT®, Sentry GS®, BAIO® and Gas-Stop™.

**FRIALEN®**  
Safety Fittings

**FRIAFIT®**  
Sewage System

**FRIATOOLS®**  
Technical Equipment

9584



 Aliaxis



## FRIALEN<sup>®</sup> SAFETY FITTINGS

The safe jointing technology for gas, water and industrial pipings made of HD-PE and PE-Xa

Product Range ES 39/19



## ELBOWS 11° AND 30° MORE POWER TO YOUR ELBOW!

perfect for changes of direction  
in the pipe routing

FRIALEN elbows for high cost effectiveness

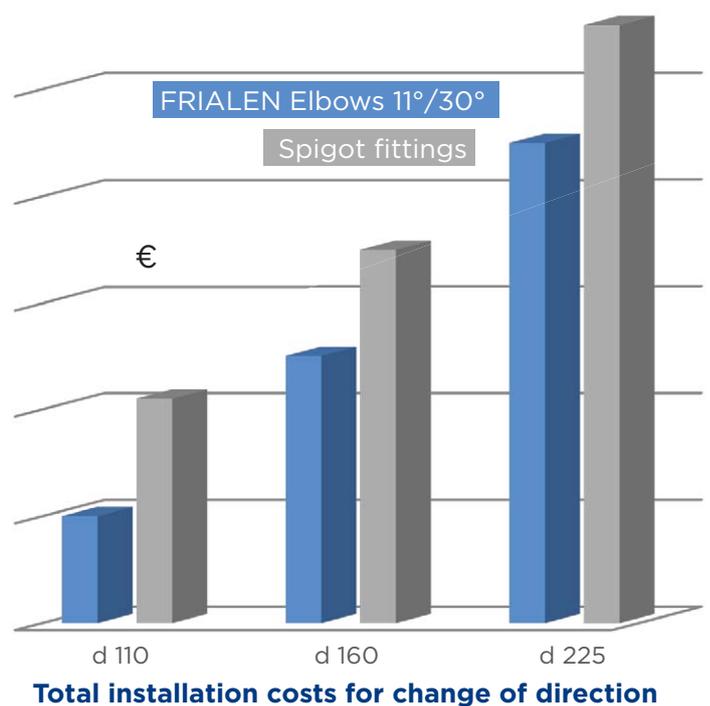
45°, 90° and extra 11° and 30° elbows for  
maximised flexibility

Combined 11° + 11°, 30° + 11°, or 45° + 11°, etc.,  
for universal changes of direction

Special solution for service lines:  
Swan neck bend



**DATA SHEETS**



# ELBOWS 11° AND 30° MORE POWER TO YOUR ELBOW!

Perfect for changes in direction due to elbows  
in 45°, 90° and additionally in 11° and 30°



## Virtual Reality:

The roller coaster is here!  
VR glasses are available from  
your area sales manager.



## Things worth knowing about FRIALEN® Safety Fittings and this Product Range

### Component traceability

Each component is provided with an additional barcode for its traceability.

### Certification

FRIALEN safety fittings, FRIALEN XL large pipe technique, the FRIAFIT coupler AM, shut-off valves included, fulfill the requirements of relevant standards, e.g. for gas according to EN 1555-3, -4, ISO 4437-3, -4, for drinking water and pressure drainage systems according to EN 12201-3, -4 and ISO 4427-3, -4.

Specific application areas are termed by the description of the product. Worldwide certifications underline the highest quality level of FRIALEN, FRIALEN XL and FRIAFIT safety fittings, shut-off valves, which comply also with the other following quality marks:



The current certificates can be found at [www.frialen.com](http://www.frialen.com), Downloads.

The scope of the respective certifications for individual products is determined by their applicability and market requirements. Therefore, please check in each individual case whether the required certification is available for the respective product.

### Fusability

FRIALEN safety fittings can be fused to pipes SDR17.6 (s min = 3 mm) to SDR11 or as given in the product description. Processing of other SDR stages on request.

FRIAFIT couplers AM SDR 17 can be fused to pipes SDR 33 to SDR 17.

FRIALEN saddles and tapping tees  $\leq d 63$  can be processed only with pipes  $\leq$  SDR11. Pressure tapping tees with fast clamping system DAA from  $d 50$  are also processible with pipes SDR 17.6 to SDR 11. Please also note the details for each of the fusible SDR sizes given on the fitting's barcode label as well as all other binding codes affixed directly to the product.

Please consult our application engineering department before processing thin walled pipes  $>$  SDR 17.6.

FRIALEN, FRIALEN XL and FRIAFIT safety fittings can be processed with pipes of PE 100 and PE 100-RC, PE 80, PE 63, PE 50 according to DIN 8074/75, EN 1555, EN 12201, ISO 4437, and ISO 4427, PE-Xa on request, LDPE according to DIN 8072/73. For PE pipes, the melt flow rate shall be MFR 190/5 0.2–1.7 g / 10 min.

Components with an MFR  $<$  0.20 require confirmation of suitability. LDPE pipes can be fused at ambient temperatures  $>$  0 °C.

FRIALEN, FRIALEN XL safety fittings and FRIAFIT couplers made of PE 100 fulfil the requirements under EN 1555-3, EN 12201-3, ISO 4427-3, ISO 4437-3. FRIALEN, FRIALEN XL and FRIAFIT safety fittings can be processed with FRIAMAT fusion units at ambient temperatures from -10 °C to +45 °C.

Joinings, which require material transition, e.g. threaded joints or welds must in addition comply with the relevant component standards and installation instructions, especially with respect to sealing, heat transfer during welding and corrosion protection.

In case of restricted application for processing or installation of FRIALEN, FRIALEN XL and FRIAFIT safety fittings in general, please read our assembly instructions.

Also our area sales managers will be pleased to answer any questions you may have.

### Pressure bearing capacity

The maximum design pressure ure bearing capacity of FRIALEN/ FRIALEN XL/FRIAFIT safety fittings made of PE 100 is defined by SDR (standard dimension ratio).

$SDR = \text{pipe outer dia. } d / \text{ pipe wall thickness } s$

The maximum design pressure depends on the design factor C, which is given in the relevant application standard for gas (e.g. EN12007-2) and for pressure piping systems (e.g. EN 805). With respect to „C“ the following maximum operating pressures may apply:

Fitting material PE 100 (FRIALEN standard)	Water	Gas
SDR level	maximum operating pressure in bar at C = 1,25	maximum operating pressure in bar at C = 2
26	6	-
17	10	5
11	16	10
9	20	-
7,4	25	-

### Fusion process

FRIALEN/FRIALEN XL/FRIAFIT safety fittings can be processed with universal fusion units, e.g. the FRIAMAT series. The fusion parameters are transferred automatically from the fitting's barcode.

FRIALEN/FRIALEN XL/FRIAFIT safety fittings can also be processed with fusion units delivering a fixed output voltage of 39.5 V following the manual entry of the fusion time. The fusion parameters entered manually require the fusion time on the barcode.

PLEASE NOTE! Fixed voltage fusion units can be used to process our products at ambient temperatures of -5 °C to +35 °C.

The fusion time given on the fitting's barcode applies to the whole temperature range.

PLEASE NOTE! The 39.5V fusion time and the barcode fusion time can be different!

### Cooling times

FRIALEN/FRIALEN XL/FRIAFIT couplers / elbows / T pieces / transition fittings:

The cooling times (CT) given on the barcode labels specify the times until the fused joint can be moved.

Longer cooling times must be observed until pressurisation. Please read our assembly instructions.

FRIALEN/FRIALEN XL/FRIAFIT saddles, tapping tees and -valves:

The cooling times (CT) given on the barcode labels specify the times until the tap.

The saddle fusion joint can be pressure tested earlier. Please read our assembly instructions.

### Processing and additional information

Processing is described in our assembly instructions, which is also available for download on the internet at [www.frialen.com](http://www.frialen.com). This address also provides further details on the products and their processing, approvals, publications and contacts.

### FRIALEN saddle fittings top-loading

The specified dimensions, including the values in brackets, define the permitted assembly and fusion area for the saddle fitting. The standard application range may be restricted by technical constraints (e.g. drill length, pipe wall thickness, tapping diameter, required diameter for balloon insertion for SPA-TL). Divergent uses require a suitability test.

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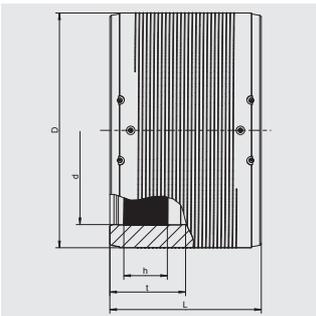
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## UB SDR 11

## Slide-over Couplers, SDR 11



With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices. With separate fusion zone and one indicator per fusion zone for visual fusion control.

With pre-heating technology (d 400 – d 450 optional use; d 500 – d 900 required).

Special sizes, pressure stages and designs on request

## PE 100 SDR 11

## Maximum working pressure 16 bar (water)/10 bar (gas)

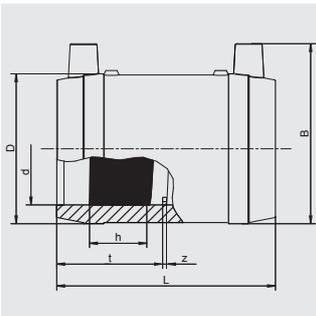


d	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
16	616577	1	135	4.320	29	60	0.030
32	612662	1	60	1.920	45	77	0.064
40	612663	1	40	1.280	54	86	0.096
50	612664	1	25	800	68	98	0.151
63	612665	1	15	480	82	112	0.225
75	612666	1	50	400	98	122	0.360
90	612667	1	30	240	114	157	0.510
110	612668	1	24	192	137	159	0.705
125	612669	1	16	128	156	172	0.946
140	615001	1	12	96	174	184	1.270
160	612671	1	8	64	199	190	1.772
180	612672	1	6	48	220	210	2.088
200	612673	1	1	56	247	220	2.798
225	612674	1	1	36	277	236	3.950
250	612675	1	1	24	315	246	5.800
280	615073	1	1	18	347	285	7.740
315	612670	1	1	18	390	300	10.040
355	615074	1	1	9	445	300	14.600
400	615075 <sup>①</sup>	1	1	4	500	320	20.800
450	615076 <sup>①</sup>	1	1	4	560	340	30.000
500	615124 <sup>①</sup>	1	1	2	630	360	40.000
560	616312 <sup>①</sup>	1	1	2	715	380	55.000
630	616269 <sup>①</sup>	1	1	2	810	420	79.600
710	616313 <sup>①</sup>	1	1	1	900	442	101.000
800	616314 <sup>①</sup>	1	1	1	1000	500	138.800

① separate fusion zones

**MB**

**Couplers with removable stop**



Can also be used as repair couplers. With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices.

Other pressure stages and designs on request.

**PE 100 SDR 11**

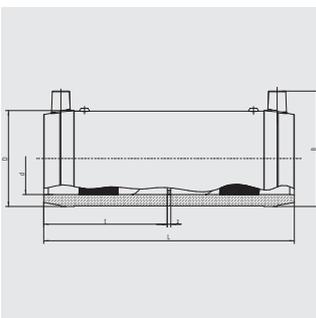
**Maximum working pressure 16 bar (water)/10 bar (gas)**



d	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
20	612680	1	110	3520	33	60	0.040
25	612681	1	90	2880	38	66	0.047
32	612682	1	60	1920	45	78	0.064
40	612683	1	40	1280	54	86	0.100
50	612684	1	25	800	68	98	0.150
63	612685	1	15	480	82	110	0.221
75	612686	1	50	400	98	122	0.360
90	612687	1	30	240	114	157	0.510
110	612688	1	24	192	137	159	0.710
125	612689	1	16	128	156	172	0.950
140	612690	1	12	96	174	184	1.270
160	612691	1	8	64	199	190	1.770

**FRIALONG**

**Long Couplers with removable center stop**



The coupler with more safety aspects. With exposed heating coils for optimal heat transfer, extra large insertion depth, extra wide fusion zones plus cold zones at the end. For best possible pipe installation and tension-free fusion without holding devices.

**PE 100 SDR 11**

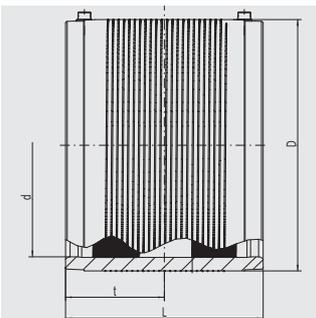
**Maximum working pressure 16 bar (water)/10 bar (gas)**



d	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
32	615736	1	40	1280	45	136	0.110
40	615737	1	30	960	54	146	0.140
50	615608	1	16	512	68	175	0.250
63	615738	1	10	320	82	197	0.370

## AM

## Couplers SDR 17



For the jointing of HD-PE pipes in non-pressure and pressure systems for sewerage, wastewater or drinking water pipes. With exposed heating coils for optimal heat transfer, large insertion depth, extra wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material for use without holding devices. With pin indicator for visually checking fusion.

## PE 100 SDR 17

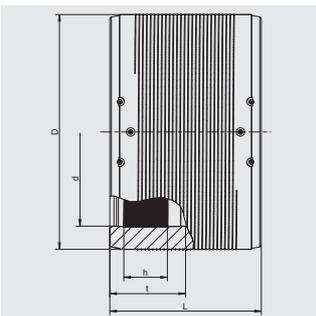
Maximum working pressure 10 bar (water, sewage)



d	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
110	680001	1	24	192	130	160	0.600
125	680013	1	22	176	146	160	0.650
160	680002	1	12	96	184	180	1.100
180	680003	1	8	64	207	180	1.450
200	680004	1	1	75	236	180	2.070
225	680005	1	1	52	263	200	2.723
250	680006	1	1	44	282	220	2.200
280	680007	1	1	32	316	220	3.800

## UB SDR 17

## Slide-over Couplers, SDR 17



With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices. With separate fusion zones.

UB d 1000 and above can only be fused with the FRIAMAT XL.

From d 560 with pre-heating technology.

Special sizes, pressure stages and designs on request.

## PE 100 SDR 17

Maximum working pressure 10 bar (water)/5 bar (gas)

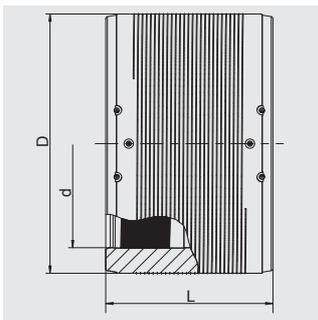


d	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
315	616529	1	1	18	356	280	5.880
355	616530	1	1	9	400	290	7.600
400	616531①	1	1	9	450	300	10.100
450	616532①	1	1	4	506	320	13.650
500	616533①	1	1	2	562	350	18.250
560	615706①	1	1	2	630	380	24.190
630	615726①	1	1	2	710	420	34.870
710	615994①	1	1	2	800	442	46.000
800	616290①	1	1	1	900	500	65.900
900	616345①	1	1	1	1024	500	91.500
1000	616403①	1	1	1	1130	610	128.000
1200	616416①	3	1	1	1356	670	205.000

① separate fusion zones

**UB SDR 9**

**Slide-over Couplers, SDR 9**



With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices. With separate fusion zone and one indicator per fusion zone for visual fusion control.

With pre-heating technology (d 400 – d 450 optional use; d 500 – d 630 required).

Special sizes, pressure stages and designs on request

**PE 100 SDR 9**

**Maximum working pressure 20 bar (water)**

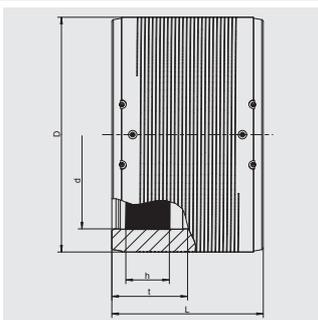


d	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
400	616441 <sup>①</sup>	1	1	4	500	320	20.800
450	616447 <sup>①②</sup>	3	1	4	560	340	30.000
500	616445 <sup>①②</sup>	3	1	2	630	360	40.000
560	616446 <sup>①②</sup>	3	1	2	715	380	55.000
630	616439 <sup>①②</sup>	3	1	2	810	420	79.600

- ① separate fusion zones
- ② minimum order quantity = 1 palette unit

**UB SDR 7.4**

**Slide-over Couplers, SDR 7.4**



With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices. Processing range SDR 11 – SDR 7.4.

Diameter d 280 and bigger with pre-heating technology (optional use).

**PE 100 SDR 7.4**

**Maximum working pressure 25 bar (water)**

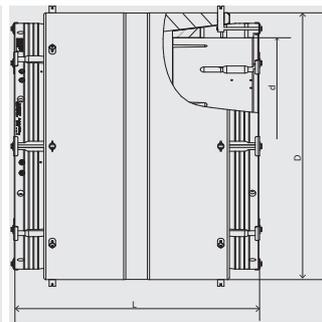


d	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
90	616270	1	30	240	117	138	0.530
110	616271	1	24	192	142	159	0.870
125	616272	1	16	128	160	172	1.230
140	616273 <sup>②</sup>	3	12	96	181	184	1.640
160	616274	1	8	64	206	203	2.360
180	616282	1	6	48	225	210	2.700
200	616283	1	2	36	250	224	3.610
225	616284	1	1	33	280	240	4.900
250	616285	1	1	24	315	246	6.700
315	616287 <sup>①</sup>	1	1	18	400	285	12.100
355	616288 <sup>①</sup>	1	1	9	450	300	16.700

- ① separate fusion zones
- ② minimum order quantity = 1 packaging unit

# KM XL

## Conical ring Couplers



Easy and quick assembly, also as slide over coupler and given limited space. Variable diameter range to bridge large tolerance conditions of the outer pipe diameter and out-of-roundness. With flexible fusion conical ring for easy assembly given pronounced pipe out-of-roundness. The installation is made without fixing device and rounding clamp. Mechanical minimisation of the joint gap thanks to flex ring system. Integrated tensioning device for assembly and gap minimisation. Exposed, fixed heating coil, for optimal heat transfer during fusion, broad fusion zones as well as melt flow-inhibiting cold zones at the fronts and the centre for improved pipe guidance and prevention of melt release.

The KM-XL can only be fused with the FRIAMAT XL with Y connector (see Product Range FRIATOOLS).

Other dimensions or pressure rating as well as special dimensions on request.

### PE 100 SDR 17

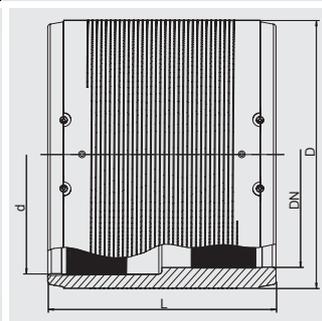
Maximum working pressure 10 bar (water)/5 bar (gas)



d	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
355	616535	3	1	1	497	705	36.500
400	616536	3	1	1	550	730	46.000
450	616537	3	1	1	602	750	54.000
560	616539	3	1	1	730	850	88.100
630	616523	3	1	1	805	940	135.000
800	616541	3	1	1	1005	1065	207.000
1000	616434	3	1	1	1245	1145	350.000
1200	616435	3	1	1	1450	1290	500.000

# REM

## Relining Slide-over Couplers



For connection from relining pipe to standard pipe. With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zone plus cold zones at the end and in the transition area to prevent the flow of molten material for use without holding devices. Gap reduction between coupler and pipe possible through special preheating barcode. For processing refer to relining installation instructions. For processing refer to the FRIALEN XL-Assembly Instructions for laying large pipes and relining pipe networks. Other pressure stages and designs on request.

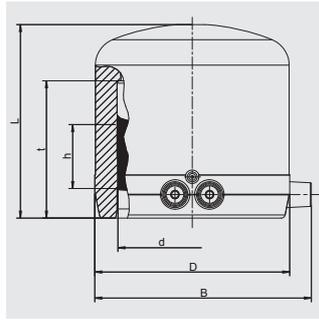
With pre-heating barcode

### PE 100 SDR 17

Maximum working pressure 10 bar (water)/5 bar (gas)



d/DN	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
110/100	615569	1	24	192	127	150	0.680
160/150	615571	1	12	96	180	180	1.540
315/300	615576	1	1	18	355	285	7.950

**MV****End Caps**

With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zone plus cold zones at the end to prevent the flow of molten material, for use without holding devices.

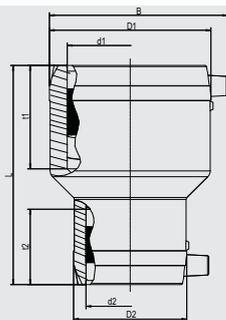
**PE 100 SDR 11**

**Maximum working pressure 16 bar (water)/10 bar (gas)**



d	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
20	<b>612025</b>	1	50	2500	31	62	0.035
25	<b>612026</b>	1	50	2500	35	65	0.040
32	<b>612027</b>	1	60	1920	44	70	0.060
40	<b>612028</b> ①	1	50	1600	55	75	0.090
50	<b>612029</b>	1	30	960	67	80	0.125
63	<b>612030</b>	1	20	640	84	88	0.210
75	<b>612031</b>	1	20	640	99	99	0.320
90	<b>612032</b>	1	16	288	118	114	0.500
110	<b>612033</b>	1	12	216	143	125	0.825
125	<b>612034</b>	1	8	144	163	135	1.160
160	<b>612035</b>	1	10	60	208	160	2.240
180	<b>616183</b>	1	6	48	225	195	2.800
200	<b>616184</b>	1	4	32	250	210	3.900
225	<b>616185</b>	1	4	32	280	230	5.050

① Also recommended as fused caps for the dome of FRIALEN-Pressure Tapping Tees DAA (models without fast clamping lever)/DAP ≤ d63.

**MR****Electrofusion Reducers**

With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices.

FRIALEN®

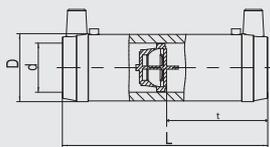
**PE 100 SDR 11****Maximum working pressure 16 bar (water)/10 bar (gas)**

d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	PU	D <sub>1</sub> /D <sub>2</sub>	L	Weight kg/each
20	16	<b>616824</b> ①	1	70	2240	32/28	75	0.035
32	16	<b>616452</b> ①	1	70	2.240	45/28	91	0.060
32	20	<b>615386</b>	1	80	2560	45/32	88	0.060
32	25	<b>615502</b>	1	70	2240	45/38	88	0.070
40	20	<b>615387</b>	1	60	1920	54/32	98	0.080
40	25	<b>616751</b> ①	1	120	1280	54/38	101	0.090
40	32	<b>615388</b>	1	50	1600	54/45	98	0.090
50	20	<b>612069</b>	1	32	1024	68/32	110	0.130
50	25	<b>616752</b> ①	1	130	960	66/38	107	0.120
50	32	<b>612070</b>	1	32	1024	68/45	110	0.140
50	40	<b>612071</b>	1	25	800	68/54	110	0.140
63	32	<b>615389</b>	1	18	576	82/45	125	0.210
63	40	<b>615390</b>	1	16	512	82/54	125	0.220
63	50	<b>612072</b>	1	16	512	82/68	125	0.230
75	63	<b>616583</b>	1	15	270	94/79	143	0.325
90	50	<b>615391</b>	1	15	270	117/68	160	0.470
90	63	<b>615392</b>	1	15	270	117/82	160	0.510
90	75	<b>616582</b>	1	15	270	113/94	159	0.505
110	63	<b>615393</b>	1	10	180	142/82	160	0.730
110	90	<b>615693</b>	1	8	144	140/115	180	0.900
125	90	<b>615694</b>	1	8	144	155/115	200	0.980
125	110	<b>616510</b>	1	16	128	157/137	202	1.300
160	110	<b>615695</b>	1	8	64	201/140	230	1.990
180	125	<b>616511</b>	1	1	60	214/155	275	2.600
225	160	<b>616356</b>	1	1	36	282/203	270	4.860

① Design deviates from product description

## FRIASTOPP

## Long Couplers with integrated Mertik Maxitrol excess flow valve



FRIALONG long coupler with integrated SENTRY GS safety equipment which automatically shuts down gas flow in the event of pipe damage caused e.g. by digging or drilling. Exposed heating coils for optimum heat transfer, large insertion depth, wide fusion zones as well as cold zones preventing molten material escape at the front and in the centre for processing without holding device. The universal type Z meets all practical requirements of the operating pressure range and the required flow quantity. Type D and Z with overflow.

## PE 100 SDR 11

## Maximum working pressure type Z, B: 5 bar (gas), type D: 1 bar (gas)

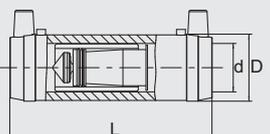


d	Type	Order Ref.	Operating pressure range $p_{\min} - p_{\max}$	VN	Stock-status	BX	PU	D	L	Weight kg/each
32	Z	616187	35 mbar - 5 bar	17 - 40	1	40	1280	45	136	0.140
40	Z	616188	35 mbar - 5 bar	26 - 62	1	30	960	54	146	0.220
50	Z	616189	35 mbar - 5 bar	41 - 99	1	16	512	68	175	0.380
63	Z	616190	35 mbar - 5 bar	66 - 158	1	10	320	82	197	0.530
32	D	616191	25 mbar - 1 bar	11 - 16	1	40	1280	45	136	0.140
40	D	616193 <sup>①</sup>	25 mbar - 1 bar	19 - 27	3	30	960	54	146	0.220
50	D	616195	25 mbar - 1 bar	28 - 40	1	16	512	68	175	0.380
63	D	616197	25 mbar - 1 bar	51 - 72	1	10	320	82	197	0.530
32	B	616192	100 mbar - 5 bar	26 - 60	1	40	1280	45	136	0.140
40	B	616194 <sup>①</sup>	100 mbar - 5 bar	39 - 90	3	20	640	54	146	0.220
50	B	616196 <sup>①</sup>	100 mbar - 5 bar	58 - 135	3	10	320	68	175	0.380
63	B	616198 <sup>①</sup>	100 mbar - 5 bar	94 - 219	3	8	256	82	197	0.530

<sup>①</sup> minimum order quantity = 1 packaging unit

## FRIASTOPP

## Long Couplers with integrated Pipelife Gas-Stop™ system



FRIALONG long coupler with integrated Gas-Stop™ safety equipment which automatically shuts down gas flow in the event of pipe damage caused e.g. by digging or drilling. Exposed heating coils for optimum heat transfer, large insertion depth, wide fusion zones as well as cold zones preventing molten material escape at the front and in the centre for processing without holding device. The universal type U meets all practical requirements of the operating pressure range and the required flow quantity. Type A/D, U<sub>ue</sub> and S with overflow.

## PE 100 SDR 11

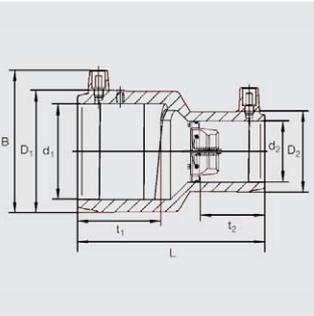
Maximum working pressure type U, U<sub>ue</sub>, S: 5 bar (gas), type A/D: 1 bar (gas)

d	Type	Order Ref.	Operating pressure range $p_{\min} - p_{\max}$	VN	Stock-status	BX	PU	D	L	Weight kg/each
32	U	616199	35 mbar - 5 bar	16 - 38	1	40	1280	45	136	0.140
50	U	616201	35 mbar - 5 bar	38 - 91	1	20	640	68	175	0.350
63	U	616203	35 mbar - 5 bar	58 - 140	1	12	384	82	197	0.560
32	UUE	616200	35 mbar - 5 bar	16 - 38	1	40	1280	45	136	0.140
50	UUE	616202	35 mbar - 5 bar	38 - 91	1	20	640	68	175	0.350
63	UUE	616204	35 mbar - 5 bar	58 - 140	1	12	384	82	197	0.560
32	A/D	616205	25 mbar - 1 bar	10 - 14	1	40	1280	45	136	0.140
50	A/D	616207	25 mbar - 1 bar	25 - 36	1	20	640	68	175	0.350
63	A/D	616209	25 mbar - 1 bar	40 - 55	1	12	384	82	197	0.560
32	S	616339	200 mbar - 5 bar	36 - 80	1	40	1280	45	136	0.140
50	S	616340 <sup>①</sup>	200 mbar - 5 bar	110 - 240	3	20	640	68	175	0.350
63	S	616341 <sup>①</sup>	200 mbar - 5 bar	180 - 400	3	12	384	82	197	0.560

<sup>①</sup> minimum order quantity = 1 packaging unit

**MR STOPP**

**Electrofusion Reducers with integrated Mertik Maxitrol excess flow valve**



Reducer MR with integrated SENTRY GS safety equipment which automatically shuts down gas flow in the event of pipe damage caused e.g. by digging or drilling. Exposed heating coils for optimum heat transfer, large insertion depth, wide fusion zones as well as cold zones preventing molten material escape at the front and in the centre for processing without holding device. The universal type Z meets all practical requirements of the operating pressure range and the required flow quantity. Type D and Z with overflow.

**PE 100 SDR 11**

**Maximum working pressure Type Z: 5 bar (gas), Type D: 1 bar (gas)**

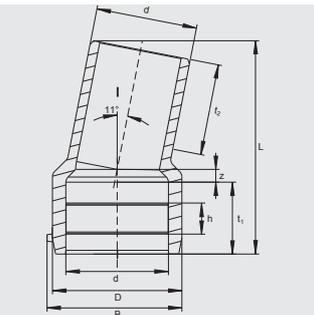


d <sub>1</sub>	d <sub>2</sub>	Type	Order Ref.	Operating pressure range p <sub>min</sub> - p <sub>max</sub>	VN	Stock-status	BX	PU	D <sub>1</sub> /D <sub>2</sub>	L	Weight kg/each
50	40	Z	<b>616218</b> ①	35 mbar - 5 bar	26 - 62	3	12	600	68/54	110	0.210
63	32	Z	<b>616219</b>	35 mbar - 5 bar	17 - 40	1	18	576	82/45	125	0.240
63	40	Z	<b>616220</b> ①	35 mbar - 5 bar	26 - 62	3	8	400	82/54	125	0.290
63	50	Z	<b>616221</b>	35 mbar - 5 bar	41 - 99	1	8	400	82/68	125	0.360
63	32	D	<b>616238</b> ①	25 mbar - 1 bar	11 - 16	3	10	500	82/45	125	0.240
63	50	D	<b>616240</b>	25 mbar - 1 bar	28 - 40	1	16	512	82/68	125	0.360

① minimum order quantity = 1 packaging unit

**WS11**

**I/A Elbows 11°**



For universal and stress free changes in direction even in restricted spaces. Optimum flexibility through male/female design. Elbows of 22°, 33° etc. can be set up thanks to multiple application. Coupler side with exposed heating coils for optimum heat transfer, large insertion depth and wide fusion zone. Spigot for processing with FRIALEN MB or UB couplers.

**PE 100 SDR 11**

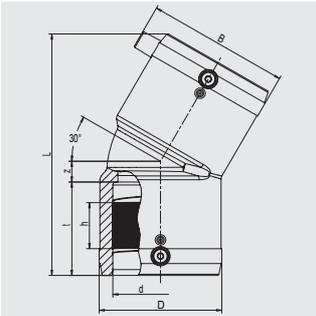
**Maximum working pressure 16 bar (water)/10 bar (gas)**



d	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
110	<b>616139</b>	1	8	144	141	235	0.920
125	<b>616140</b>	1	5	90	160	250	1.250
160	<b>616141</b>	1	8	64	200	295	2.260
180	<b>616142</b>	1	4	32	226	310	3.050
225	<b>616143</b>	1	1	18	280	350	5.280

**W30**

**Elbows 30°**



With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices.

**PE 100 SDR 11**

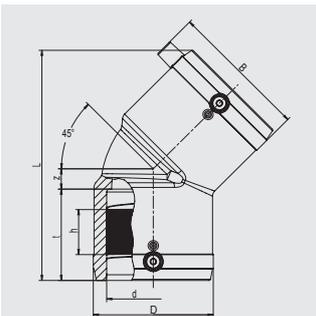
**Maximum working pressure 16 bar (water)/10 bar (gas)**



d	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
90	615272	1	8	144	115	224	0.780
110	615273	1	6	108	142	252	1.260
125	615274	1	4	72	158	270	1.640
160	615340	1	5	40	199	350	3.870
180	616261	1	3	24	229	390	4.990
200	616262	1	1	18	254	412	6.350
225	616263	1	1	18	281	456	8.220

**W45**

**Elbows 45°**



With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices.

**PE 100 SDR 11**

**Maximum working pressure 16 bar (water)/10 bar (gas)**

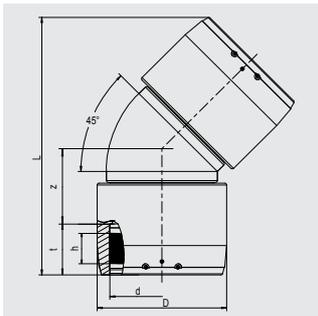


d	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
25	616687 <sup>①</sup> ②	3	150	2400	35	89	0.050
32	612092	1	50	1600	43	102	0.070
40	612094	1	30	960	54	120	0.110
50	612096	1	20	640	66	136	0.175
63	612098	1	10	320	82	158	0.295
75	612100	1	14	252	96	198	0.520
90	612102	1	8	144	115	232	0.810
110	612104	1	10	80	138	265	1.320
125	612106	1	10	80	157	279	1.770
160	615275	1	4	32	207	377	4.410
180	615687	1	3	24	228	382	4.610
200	616264	1	1	18	254	415	6.760
225	615688	1	1	8	280	450	8.290

① Design deviates from product description  
 ② minimum order quantity = 1 packaging unit

**W45 XL**

**Elbows 45° XL**



With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices. Separate fusion zones. Handling at the construction site is made easy thanks to the fused-on eyebolts.

**PE 100 SDR 11**

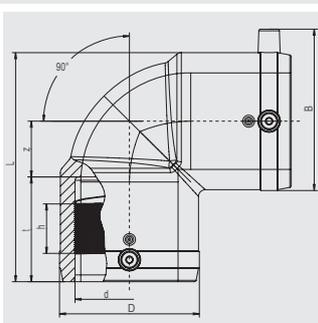
**Maximum working pressure 16 bar (water)/10 bar (gas)**



d	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
250	<b>616404</b>	1	1	6	310	621	17.300
280	<b>616405</b>	1	1	4	350	702	25.600
315	<b>616406</b>	1	1	2	396	755	36.000

**W90**

**Elbows 90°**



With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices.

**PE 100 SDR 11**

**Maximum working pressure 16 bar (water)/10 bar (gas)**

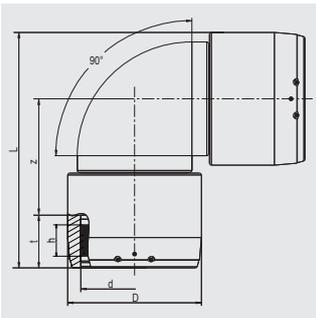


d	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
20	<b>616686</b> <sup>① ②</sup>	3	200	3200	28,5	71	0.040
25	<b>612091</b>	1	60	1920	37	73	0.060
32	<b>612093</b>	1	50	1600	43	82	0.070
40	<b>612095</b>	1	25	800	53	96	0.110
50	<b>612097</b>	1	20	640	66	113	0.190
63	<b>612099</b>	1	10	320	83	136	0.340
75	<b>612101</b>	1	12	216	96	170	0.600
90	<b>612103</b>	1	6	108	115	202	0.950
110	<b>612105</b>	1	10	80	138	234	1.560
125	<b>612107</b>	1	8	64	157	254	2.030
160	<b>615276</b>	1	3	24	207	329	4.850
180	<b>615689</b>	1	3	24	228	354	5.760
200	<b>616265</b>	1	2	16	254	392	8.557
225	<b>615690</b>	1	1	8	280	430	10.220

- ① Design deviates from product description
- ② minimum order quantity = 1 packaging unit

**W90 XL**

**Elbows 90° XL**



With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices. Separate fusion zones. Handling at the construction site is made easy thanks to the fused-on eyebolts.

**PE 100 SDR 11**

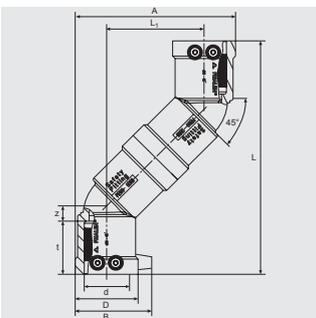
**Maximum working pressure 16 bar (water)/10 bar (gas)**



d	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
250	<b>616408</b>	1	1	6	310	534	19.100
280	<b>616409</b>	1	1	2	350	621	27.500
315	<b>616410</b>	1	1	2	396	677	40.000

**WET**

**Swan Neck Bend**



Compact fitting for jointing of pipes which are not aligned and for jointing of service lines with DAA/DAV pressure tapping valves when parallel-installing two mains with identical overlap height. With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zone plus cold zones at the end and in the transition area to prevent the flow of molten material for use without holding devices.

**PE 100 SDR 11**

**Maximum working pressure 16 bar (water)/10 bar (gas)**

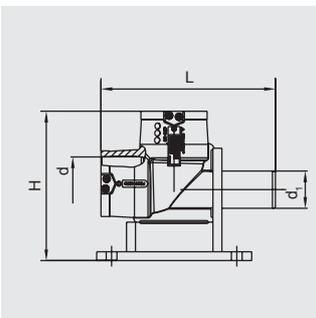


d	Order Ref.	Stock-status	BX	PU	D	L	L <sub>1</sub>	Weight kg/each
32	<b>616051</b>	1	15	750	49	177	74	0.220
40	<b>616052</b>	1	15	480	58	215	89	0.330
50	<b>616053</b>	1	15	270	70	242	101	0.510
63	<b>616699</b> ①	1	10	180	84	172	172	0.670

① both elbows 90°

**WF 90**

**90° Elbow with base unit**



Compact fitting in HD-PE to integrate a hydrant next to the mains. Base unit and elbow make up a homogenous unit, base plate can be mounted onto base. With spigot outlet d 63/SDR 11 for service pipe connections avoiding stagnation at dead ends of hydrant branches. For hydrants with flange connection we recommend our Full Faced Flanges EFL. The elbow with separate fusion zones enables simple and tension free fusion. With exposed heating coils for optimum heat transfer, large insertion depth, wide fusion zone plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices.

**PE 100 SDR 11**

**Maximum working pressure 16 bar (water)**

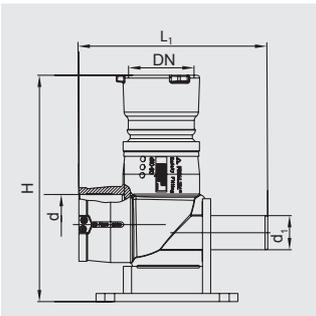


d	d <sub>1</sub>	Order Ref.	Stock-status	BX	PU	H	L	Weight kg/each
90	63	<b>615989</b>	1	3	54	253	293	2.250
110	63	<b>615998</b> ①	1	1	32	293	346	2.940

① see FLR flange reducer for connection to DN80

**WFGB**

**90° Elbow with base unit and HD-PE/GGG adapter for connection of BAIO® spigot hydrant**



For jointing of hydrant with spigot according to BAIO system as alternative to flange connection. Compact fitting manufactured from FRIALEN 90° elbow with base (see WF 90°) and BAIO coupler made from ductile cast iron including sealing ring. BAIO coupler anchored in PE moulded part. Cannot be released or rotated. Please observe specific processing instructions for „BAIO“ system. For below floor hydrants the safety device against dirt and distortion for BAIO spigots is required.

**PE 100 SDR 11**

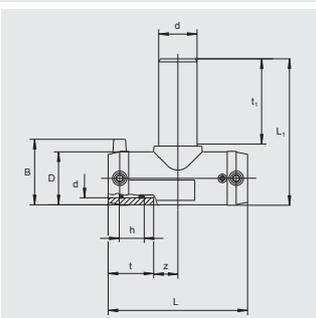
**Maximum working pressure 16 bar (water)**



d/DN	d <sub>1</sub>	Order Ref.	Stock-status	BX	PU	H	L <sub>1</sub>	Weight kg/each
110/80	63	<b>616150</b>	1	3	12	418	346	8.200

**TA**

**T-Pieces with extra long outlet spigot**



Straight connector with exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices. Up to and including d63 extra long outlet spigot dimensioned for 2 fusion operations.

**PE 100 SDR 11**

**Maximum working pressure 16 bar (water)/10 bar (gas)**

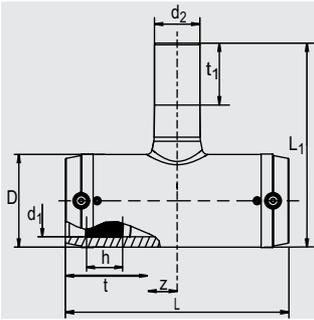


d	Order Ref.	Stock-status	BX	PU	D	L	L <sub>1</sub>	Weight kg/each
20/20	<b>616685</b> ①	3	200	3200	29	77	95	0.040
25/25	<b>616338</b>	1	50	900	36	108	110	0.080
32/32	<b>615719</b>	1	35	630	44	116	131	0.120
40/40	<b>615720</b>	1	20	360	53	146	151	0.210
50/50	<b>615721</b>	1	10	180	67	175	186	0.360
63/63	<b>615722</b>	1	10	180	81	197	203	0.530

① Design deviates from product description

**TA RED**

**T-Pieces reduced with extra long outlet spigot**



With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices. Separate fusion zones. Outlet spigot SDR 11 for processing couplers UB/MB.

**PE 100 SDR 11**

**Maximum working pressure 16 bar (water)/10 bar (gas)**

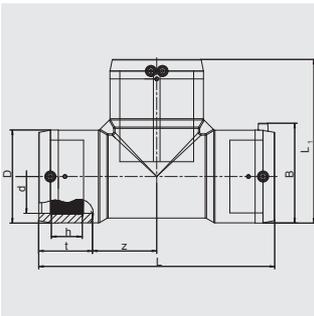
**Outlet spigot pipe SDR 11**



d	Order Ref.	Stock-status	BX	PU	D	L	L1	Weight kg/each
32/20	<b>616417</b>	1	30	540	46	116	117	0.110
40/32	<b>616418</b>	1	20	360	55	146	148	0.170
50/32	<b>616419</b>	1	10	180	69	175	158	0.295
50/40	<b>616420</b>	1	10	180	69	175	167	0.315
63/32	<b>616421</b>	1	10	180	84	197	173	0.435
63/40	<b>616422</b>	1	10	180	84	197	182	0.450
63/50	<b>616423</b>	1	10	180	84	197	197	0.490

**T**

**T-Pieces**



With exposed heating coils for optimal heat transfer on all 3 sides, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices. Straight passage fusible in one-step, therefore a total of only two fusions necessary.

**PE 100 SDR 11**

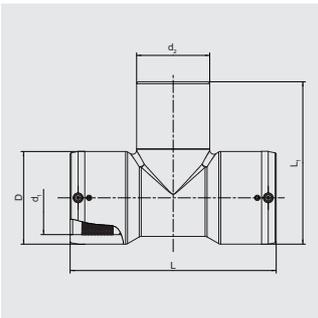
**Maximum working pressure 16 bar (water)/10 bar (gas)**



d	Order Ref.	Stock-status	BX	PU	D	L	L1	Weight kg/each
75	<b>612165</b>	1	8	144	96	278	187	0.980
90	<b>612166</b>	1	10	80	117	305	211	1.650
110	<b>612167</b>	1	6	48	142	355	248	2.580
125	<b>612168</b>	1	5	40	160	384	272	3.520
160	<b>615277</b>	1	3	24	200	430	315	5.820
180	<b>615691</b>	1	2	16	228	480	354	7.900
200	<b>616266</b>	1	1	8	251	550	400	11.130
225	<b>615692</b>	1	1	8	284	580	432	13.900

**T RED**

**T-Pieces reduced**



With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices. Separate fusion zones. Outlet spigot SDR 11 for processing couplers UB/MB.

**PE 100 SDR 11**

**Maximum working pressure 16 bar (water)/10 bar (gas)**

**Outlet spigot pipe SDR 11**

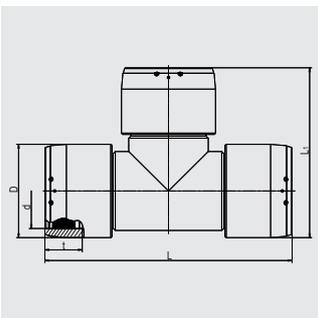


d <sub>1</sub>	d <sub>2</sub>	Order Ref.	BX	PU	D	L	L1	Weight kg/each
90	32	<b>616675</b> ①	10	80	116	280	172	1.050
90	63	<b>616676</b> ①	10	80	116	280	191	1.100
110	63	<b>616678</b> ②	6	48	141	310	216	1.700
110	90	<b>616679</b> ②	6	48	141	310	244	1.850
160	63	<b>616681</b> ③	3	24	203	390	305	4.400
160	110	<b>616682</b> ③	3	24	203	390	308	4.500
160	125	<b>616683</b> ③	3	24	203	390	313	4.600

- ① Available in Q3/2019
- ② Available in Q2/2019
- ③ Available in Q4/2019

**T XL**

**T-Pieces XL**



With exposed heating coils for optimal heat transfer on all 3 sides, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices. Separate fusion zones. Handling at the construction site is made easy thanks to the fused-on eyebolts.

**PE 100 SDR 11**

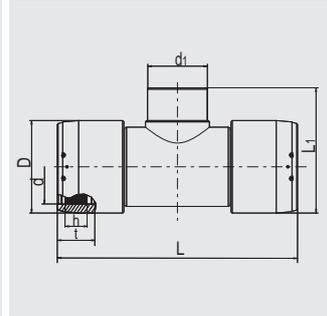
**Maximum working pressure 16 bar (water)/10 bar (gas)**



d	Order Ref.	Stock-status	BX	PU	D	L	L1	Weight kg/each
250	<b>616412</b>	1	1	4	310	770	540	27.400
280	<b>616413</b>	1	1	2	350	905	630	42.200
315	<b>616414</b>	1	1	1	396	940	670	55.900

**T RED XL**

**T-Pieces reduced XL**



With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices. Separate fusion zones. Outlet spigot SDR 11 for processing of UB/MB couplers. Other branch dimensions can be created using MR d 225/160 or MR d 110/90 and MR d 110/63. Handling at the construction site is made easy thanks to the fused-on eyebolts. Other dimensions on request.

**PE 100 SDR 11**

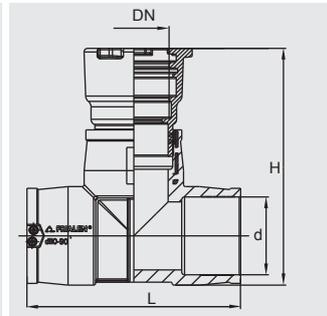
**Maximum working pressure 16 bar (water)/10 bar (gas) outlet spigot pipe SDR11**



d	d <sub>1</sub>	Order Ref.	Stock-status	BX	PU	D	L	L1	Weight kg/each
250	225	<b>616427</b>	1	1	2	310	770	440	23.500
280	225	<b>616429</b>	1	1	2	350	905	475	35.500
315	225	<b>616431</b>	1	1	2	396	940	525	43.500

**TGB**

**T-Pieces with HD-PE/GGG adapter for connection of BAIO® spigot hydrant**



For jointing of hydrant or shut-off valves with spigot according to the BAIO system as an alternative to flange connection. Compact fitting manufactured from FRIALEN T-piece and BAIO coupler connection at outlet made from ductile cast iron including sealing ring. BAIO coupler anchored in PE moulded part. Cannot be released or rotated. T-piece with exposed heating coils for optimum heat transfer, large insertion depth, wide fusion zone plus cold zone at the end and in the middle to prevent the flow of molten material, for use without holding devices. Please observe specific processing instructions for „BAIO“ system. For below floor hydrants the safety device against dirt and distortion for BAIO spigots is required.

**PE 100 SDR 11**

**Maximum working pressure 16 bar (water)**

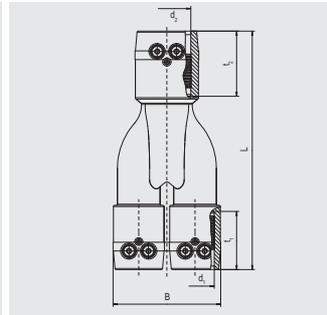


d/DN	Order Ref.	Stock-status	BX	PU	H	L	Weight kg/each
110/80	<b>616147</b>	1	4	16	337	302	7.530
125/80	<b>616148</b> ①	3	3	12	361	314	8.300
160/80	<b>616149</b>	1	2	8	380	390	12.000

① minimum order quantity = 1 packaging unit

**Y**

**Y-pieces with integrated heating coils**



Pipe junction (Y piece) in a compact design with 3 integrated couplers with exposed, fixed heating coils for direct heat transfer to the pipe.

SKZ mark A 500 (SKZ HR 3.26)

**PE 100 SDR 11**

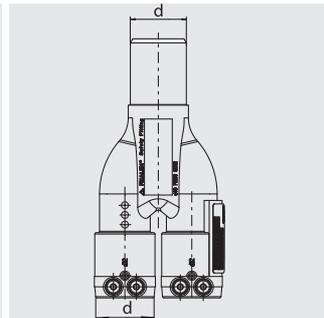
**Maximum working pressure 16 bar (water)/10 bar (gas)**



d	Order Ref.	Stock-status	BX	PU	L	Weight kg/each
32-32-40	<b>640034</b>	1	28	504	205	0.230
40-40-50	<b>640036</b>	1	18	324	219	0.340

**YS**

**Y-pieces with integrated heating coils and PE spigot end made of PE 100 SDR 11**



Pipe junction (Y piece) in a compact design with 2 integrated couplers and a PE spigot end to connect pipes e.g. FRIALEN elbow 90°.

SKZ mark A 500 (SKZ HR 3.26)

**PE 100 SDR 11**

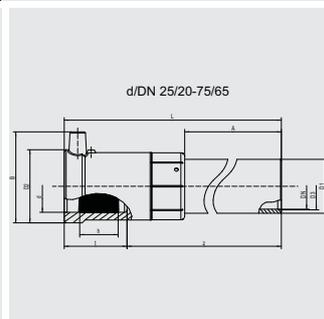
**Maximum working pressure 16 bar (water)/10 bar (gas)**



d	Order Ref.	Stock-status	BX	PU	Weight kg/each
32-32-40	<b>640035</b>	1	28	504	0.190
40-40-50	<b>640037</b>	1	18	324	0.300

**USTR**

**Transition Fittings HD-PE/Steel**



Compact transition fitting. HD-PE end with exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zone plus cold zones at the end and in the transition area to prevent the flow of molten material, for use without holding devices. Steel end permanently anchored in the HD-PE. Self sealing patented sealing geometry without elastomer seal. For use in gas systems. Steel pipe sockets marked by restrutting (for use with gas up to 10 bar).

**PE 100 SDR 11**

**Maximum working pressure 10 bar (gas)**

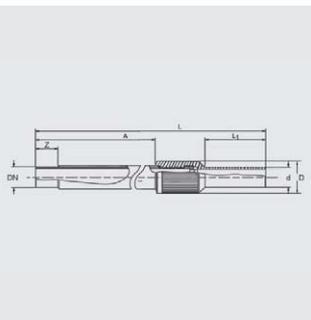


d/DN	Order Ref.	Stock-status	BX	PU	D <sub>1</sub>	L	Weight kg/each
32/25	<b>612780</b> ①	1	15	360	34	387	0.820
40/32	<b>612781</b> ①	1	10	240	42	393	1.070
50/40	<b>612782</b> ①	1	8	192	48	409	1.320
63/50	<b>612783</b> ①	1	6	144	60	410	1.880
75/65	<b>612789</b>	1	4	96	76	425	4.420
90/80	<b>612784</b> ①	1	1	77	89	405	5.350
110/100	<b>612785</b> ①	1	1	54	114	420	8.380
125/100	<b>612786</b> ①	1	1	45	114	425	8.870
160/150	<b>612787</b>	1	1	24	168	484	17.000
180/150	<b>615030</b>	1	1	18	171	500	21.250
200/200	<b>612795</b>	1	1	12	219	480	27.020
225/200	<b>612370</b>	1	1	11	219	505	27.350

① Front face of steel pipe according to DIN 2559-3, EN 10217-1; ASTM A106/A106M-14

## USTRS

## Transition Fittings HD-PE/Steel (Spigot fittings)



Compact transition fitting. HD-PE spigot for use with FRIALEN-couplers MB or UB. Steel pipe permanently anchored in HD-PE and pre-insulated with PE coating. For use in gas systems. Optional available with steel pipe marked by restrutting (according to DVGW for MOP > 5 bar).

## PE 100 SDR 11

## Maximum working pressure 10 bar (gas)

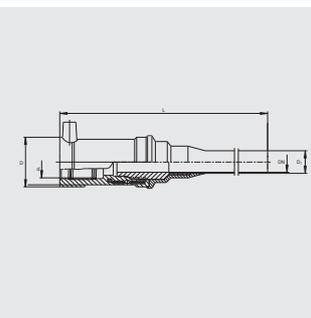


d/DN	Order Ref.	Stock-status	BX	PU	D	L	L <sub>1</sub>	Weight kg/each
20/15	616632	1	21	630	45	425	80	0.450
25/20	616633	1	21	630	45	460	90	0.650
32/25	616634	1	18	540	51	460	95	0.950
40/32	616635	1	12	360	63	470	100	1.250
50/40	616636	1	8	240	70	480	110	1.450
63/50	616637	1	6	216	89	480	110	2.150
75/65	616638	3	2	98	95	540	130	2.950
90/80	616639	1	2	98	117	580	140	3.950
110/100	616640	1	2	50	150	585	145	7.050
125/100	616641	1	2	50	150	585	150	7.300
140/125	616642	3	1	25	163	580	155	8.000
160/150	616643	1	1	25	210	610	160	10.500
180/150	616644	1	1	25	210	610	170	11.000
200/200	616645	1	1	16	259	630	155	17.500
225/200	616646	1	1	16	259	610	145	18.000
250/250	616647	3	1	8	324	640	140	30.500
280/250	616648	3	1	8	324	640	160	31.000
315/300	616649	1	1	6	368	725	220	46.500
355/300	616650	3	1	6	368	735	260	48.000
400/400	616651	3	1	3	475	770	190	83.200
500/500	616652	3	1	2	590	1050	365	127.500
630/600	616653	3	1	2	735	1100	430	242.000

Frontface of steel pipe according to: DIN EN ISO 3183, ASTM A106

## UFLG

## Transition Fitting for liquid gas HD-PE/Copper



Compact transition fitting for service pipes in liquefied natural gas installations for the operating of consumer installations from the gas phase. Exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zone plus cold zones at the end and in the transition area to prevent the flow of molten material for use without holding devices. Copper-side not detachable and anchored in HD-PE with no risk of turning. Self-sealing, patented sealing geometry without elastomere sealing. Copper-side from SF Cu-F25, EN 1057 can be connected with the copper pipe through hard-soldering (coupler soldering).

## PE 100 SDR 11

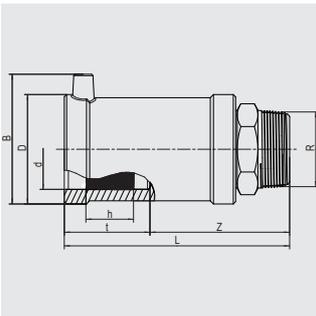
## Maximum working pressure 5 bar (gas)



d/DN	Order Ref.	Stock-status	BX	PU	D	D <sub>1</sub>	L	Weight kg/each
32/20	615733	1	25	750	49	22	340	0.510

**USTN**

**Transition Fittings HD-PE/Steel with male thread**



Compact transition fitting. HD-PE end with exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zone plus cold zones at the end and in the transition area to prevent the flow of molten material for use without holding devices. Steel end permanently anchored in the HD-PE. Self sealing patented sealing geometry without elastomer seal. For use in gas systems.

Other thread sizes on request

**PE 100 SDR 11**

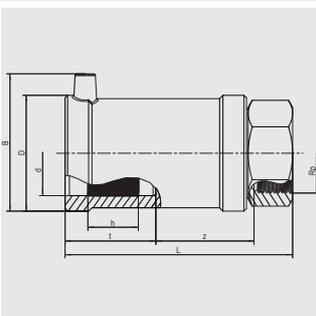
**Maximum working pressure 5 bar (gas)**



d	R	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
32	1''	<b>612580</b>	1	20	1080	47	119	0.345
40	1 1/4''	<b>612582</b>	1	20	800	58	131	0.530
50	1 1/2''	<b>612584</b>	1	15	600	70	146	0.700
63	2''	<b>612586</b>	1	10	400	84	152	1.050

**USTM**

**Transition Fittings HD-PE/Steel with female thread**



Compact transition fitting. HD-PE end with exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zone plus cold zones at the end and in the transition area to prevent the flow of molten material for use without holding devices. Steel end permanently anchored in the HD-PE. Self sealing patented sealing geometry without elastomer seal. For use in gas systems.

Other thread sizes on request

**PE 100 SDR 11**

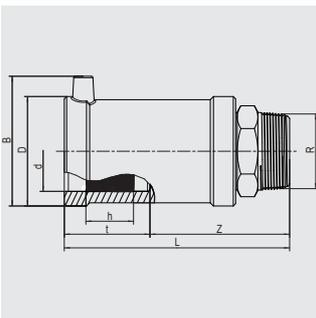
**Maximum working pressure 5 bar (gas)**



d	Rp	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
32	1''	<b>612570</b>	1	20	1080	47	112	0.340
40	1 1/4''	<b>612572</b>	1	20	800	58	121	0.500
50	1 1/2''	<b>612574</b>	1	15	600	70	136	0.650
63	2''	<b>612576</b>	1	10	400	84	141	1.010

## MUN

## Transition Fittings HD-PE/Brass with male thread



Compact transition fitting. HD-PE end with exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zone plus cold zones at the end and in the transition area to prevent the flow of molten material for use without holding devices. Brass end permanently anchored in the HD-PE. Self sealing patented sealing geometry without elastomer seal. For use in water systems.

Standard: Brass. Gunmetal on request

Other thread sizes on request

## PE 100 SDR 11

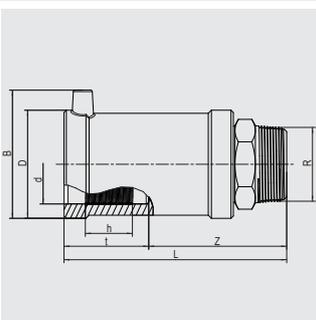
## Maximum working pressure 16 bar (water)



d	R	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
32	1"	612712	1	20	1440	47	112	0.310
32	1 1/4"	612709	1	20	1080	47	120	0.390
32	1 1/2"	612698	1	15	810	47	121	0.450
40	1"	612721	1	20	800	58	123	0.480
40	1 1/4"	612713	1	20	800	58	126	0.460
40	1 1/2"	612718	1	20	800	58	127	0.520
40	2"	612725	1	20	600	58	132	0.680
50	1"	612719	1	15	600	70	134	0.620
50	1 1/4"	612716	1	15	600	70	136	0.610
50	1 1/2"	612714	1	15	600	70	137	0.620
50	2"	612706	1	15	600	70	147	0.760
63	1 1/4"	612722	1	10	400	84	138	0.910
63	1 1/2"	612717	1	10	400	84	137	0.890
63	2"	612715	1	10	400	84	142	0.920
75	2"	612694	1	10	240	98	165	1.470
75	2 1/2"	612695	1	10	240	98	167	1.490

## MUN V2A

## Transition Fittings HD-PE/Stainless steel with male thread



Compact transition fitting. HD-PE end with exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zone plus cold zones at the end and in the transition area to prevent the flow of molten material for use without holding devices. Stainless steel end permanently anchored in the HD-PE. Self sealing patented sealing geometry without elastomer seal. For use in water systems.

Other thread sizes on request

## PE 100 SDR 11

## Maximum working pressure 16 bar (water)

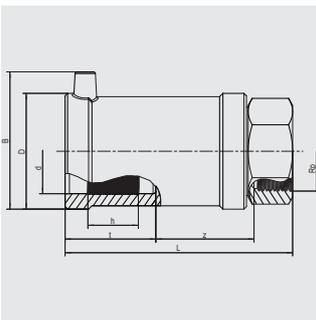


d	R	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
40	1"	616516 <sup>①</sup>	3	20	800	58	123	0.460
40	1 1/2"	612727	1	20	800	58	127	0.495
50	1 1/2"	612726	1	15	600	70	137	0.600
63	1 1/2"	612705	1	10	400	84	137	0.865
63	2"	612899	1	10	400	84	142	0.910

① minimum order quantity = 1 packaging unit

**MUM**

**Transition Fittings HD-PE/Gunmetal with female thread**



Compact transition fitting. HD-PE end with exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zone plus cold zones at the end and in the transition area to prevent the flow of molten material for use without holding devices. Gunmetal end permanently anchored in the HD-PE. Cannot be released or rotated. Self sealing patented sealing geometry without elastomer seal. For use in water systems.  
Standard: Gunmetal. Stainless steel on request.

Other thread sizes on request

**PE 100 SDR 11**

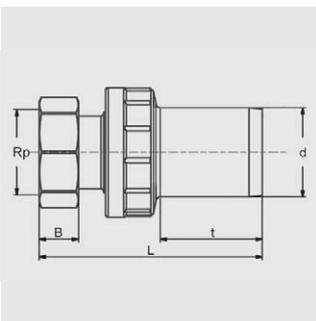
**Maximum working pressure 16 bar (water)**



d	Rp	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
32	1"	<b>612595</b>	1	20	1080	47	112	0.360
40	1 1/4"	<b>612596</b>	1	20	800	58	121	0.520
50	1 1/2"	<b>612692</b>	1	15	600	70	136	0.650
63	1 1/2"	<b>612708</b>	1	10	300	84	141	1.230
63	2"	<b>612693</b>	1	10	400	84	141	1.050

**UAM ET**

**Universal adapter HD-PE/Brass with travelling nut and female thread**



Transition adapter, brass end permanently anchored in HD-PE, with travelling nut for a simple and fast assembling on a fixed male pipe thread. For use in Water area. PE pipe spigot SDR11. Length of the spigot not suitable for FRIALONG couplers.

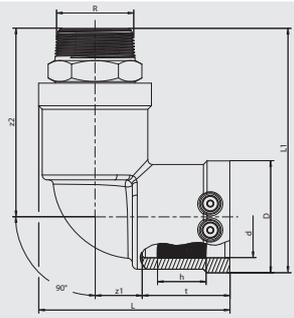
Other thread dimensions on request.

**PE 100 SDR 11**

**Maximum working pressure 16 bar (water)**



d	Rp	Order Ref.	Stock-status	BX	PU	L	t	Weight kg/each
25	3/4"	<b>616654</b>	1	60	2160	110	44	0.160
32	1"	<b>616655</b>	1	30	1080	120	47	0.330
40	1 1/4"	<b>616626</b>	1	20	720	145	56	0.520
50	1 1/2"	<b>616627</b>	1	16	576	150	57	0.650
63	1 1/2"	<b>616629</b>	1	9	324	160	63	0.740
63	2"	<b>616628</b>	1	9	324	170	63	0.920

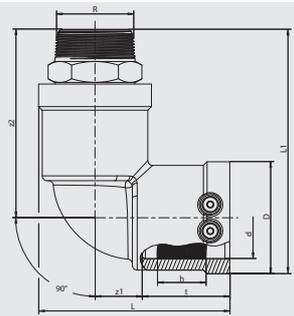
**WUN 90****Transition Elbows 90° HD-PE/Brass with male thread**

Compact transition fitting. HD-PE end with exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zone plus cold zones at the end and in the transition area to prevent the flow of molten material for use without holding devices. Brass end permanently anchored in the HD-PE. Cannot be released or rotated. Self sealing patented sealing geometry without elastomer seal. For use in water systems. Standard: Brass. Gunmetal on request.

Other thread sizes on request

**PE 100 SDR 11****Maximum working pressure 16 bar (water)**

d	R	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
32	1"	<b>612120</b>	1	20	1000	47	85	0.340
32	1 1/2"	<b>612140</b>	1	20	800	47	94	0.470
40	1"	<b>612127</b>	1	15	750	58	102	0.500
40	1 1/4"	<b>612122</b>	1	15	750	58	102	0.520
40	1 1/2"	<b>612121</b>	1	15	750	58	102	0.560
50	1"	<b>612119</b>	1	10	500	70	118	0.680
50	1 1/4"	<b>612123</b>	1	10	500	70	118	0.670
50	1 1/2"	<b>612124</b>	1	10	500	70	118	0.680
63	1 1/2"	<b>612125</b>	1	10	320	84	128	0.980
63	2"	<b>612126</b>	1	10	320	84	128	1.000

**WUN V2A 90****Transition Elbows 90° HD-PE/Stainless steel with male thread**

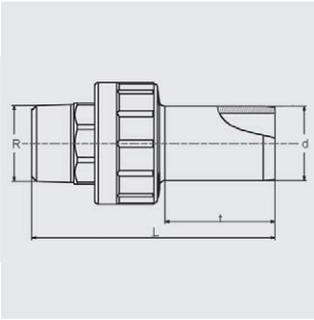
Compact transition fitting. HD-PE end with exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zone plus cold zones at the end and in the transition area to prevent the flow of molten material for use without holding devices. Stainless steel end permanently anchored in the HD-PE. Cannot be released or rotated. Self sealing patented sealing geometry without elastomer seal. For use in water systems.

Other thread sizes on request

**PE 100 SDR 11****Maximum working pressure 16 bar (water)**

d	R	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
40	1"	<b>616514</b>	1	15	750	58	102	0.540
40	1 1/2"	<b>612148</b>	1	15	750	58	102	0.535
50	1 1/2"	<b>612118</b>	1	10	600	70	118	0.650
63	1 1/2"	<b>612186</b>	1	10	320	84	128	0.980
63	2"	<b>616515</b> ①	3	10	320	84	128	0.950

① minimum order quantity = 1 packaging unit

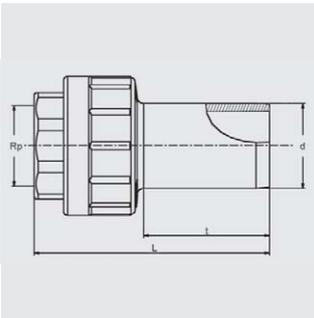
**UAN****Universal adapter HD-PE/Brass with male thread**

Compact fitting, spigot allows for assembly irrespective of its position and homogenous fusion joint with all suitable FRIALEN fittings. Brass side permanently and tightly connected with PE spigot. Cannot be released or rotated.

Other thread sizes on request  
Lead-free version available on request

**PE 100 SDR 11****Maximum working pressure 16 bar (water)/5 bar (gas)**

d	R	Order Ref.	Stock-status	BX	PU	L	t	Weight kg/each
20	1/2"	<b>616604</b>	1	70	4200	94	41	0.100
25	3/4"	<b>616605</b>	1	60	3600	92	44	0.150
32	1"	<b>616152</b>	1	30	1800	104	47	0.240
40	1 1/4"	<b>616153</b>	1	20	1200	121	56	0.400
50	1 1/2"	<b>616154</b>	1	16	960	123	57	0.520
63	1 1/2"	<b>616610</b>	3	9	540	136	63	0.620
63	2"	<b>616155</b>	1	9	540	140	63	0.730
75	2 1/2"	<b>616612</b>	1	10	300	155	70	1.200
90	3"	<b>616613</b>	1	8	240	172	78	1.600
110	4"	<b>616614</b>	3	4	120	200	87	2.900
125	4"	<b>616664</b>	3	4	120	200	92	2.950

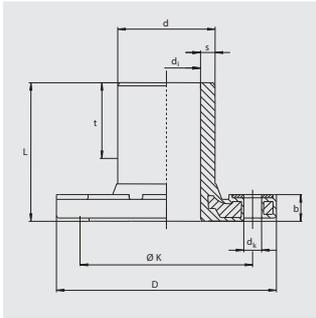
**UAM****Universal adapter HD-PE/Brass with female thread**

Compact fitting, spigot allows for assembly irrespective of its position and homogenous fusion joint with all suitable FRIALEN fittings. Brass side permanently and tightly connected with PE spigot. Cannot be released or rotated.

Other thread sizes on request  
Lead-free version available on request

**PE 100 SDR 11****Maximum working pressure 16 bar (water)/5 bar (gas)**

d	Rp	Order Ref.	Stock-status	BX	PU	L	t	Weight kg/each
20	1/2"	<b>616615</b>	1	80	4800	79	41	0.080
25	3/4"	<b>616616</b>	1	60	3600	77	44	0.120
32	1"	<b>616156</b>	1	36	2160	88	47	0.190
40	1 1/4"	<b>616157</b>	1	20	1200	100	56	0.290
50	1 1/2"	<b>616158</b>	1	16	960	102	57	0.350
63	1 1/2"	<b>616621</b>	3	10	600	115	63	0.450
63	2"	<b>616159</b>	1	10	600	120	63	0.580
75	2 1/2"	<b>616665</b>	3	10	300	128	70	0.760
90	3"	<b>616623</b>	1	8	240	144	78	1.030
110	4"	<b>616624</b>	3	6	180	161	87	1.870
125	4"	<b>616666</b>	3	6	180	161	92	1.990

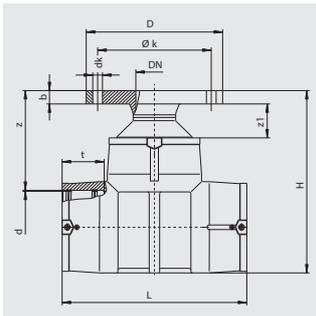
**EFL****Full Faced Flanges (Spigot fittings)**

Flange Adaptor and flange as a factory made flange piece. Metal insert in the flange to prevent creep. Spigot end for use with FRIALEN-couplers MB or UB. Steel-reinforced elastomeric gaskets recommended. Please observe the bolting torques of the gasket manufacturer. Additional washers are necessary.

**PE 100 SDR 11****Maximum working pressure 16 bar (water)/10 bar (gas)**

d/DN	Order Ref.	Stock-status	BX	PU	D	d <sub>i</sub>	d <sub>k</sub>	L	Ø k	Holes for screw	s	Weight kg/each
63/50	<b>615417</b>	1	5	250	169	51	17	105	125	4	5,8	1.500
90/80	<b>615418</b>	1	5	160	204	72	17	130	160	8	8,2	2.540
110/100	<b>615419</b>	1	3	96	224	87	17	150	180	8	10,0	3.310
125/100	<b>615605</b>	1	2	64	224	101	17	160	180	8	11,4	3.280
160/150	<b>615421</b>	1	2	36	288	127	21	190	240	8	14,6	6.140
180/150	<b>615927</b>	1	2	36	288	123	21	200	240	8	16,4	6.660
225/200	<b>615607</b> ①	1	1	27	343	180	21	225	295	8	20,4	9.100

① Flange bore for PN 10

**FLT****Flange T-Pieces**

Compact fitting in HD-PE. Factory made combination made from FRIALEN-T-Piece, Reducer and Full Faced Flanges (fixed flange). T-Piece with exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material for use without holding devices. No internal welding bead at the weld seam. Steel-reinforced elastomeric gaskets recommended. Additional washers are necessary for the flange reducer.

**PE 100 SDR 11****Maximum working pressure 16 bar (water)**

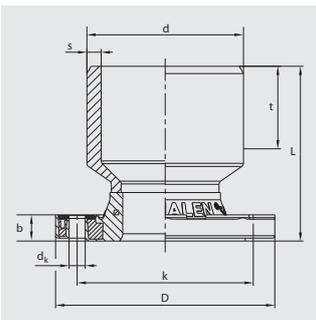
d/DN	Order Ref.	Stock-status	BX	PU	D	d <sub>k</sub>	H	L	Ø k	Holes for screw	Weight kg/each
110/80	<b>615590</b>	1	4	32	204	17	316	355	160	8	4.920
125/80	<b>615591</b>	1	3	24	204	17	343	384	160	8	5.480
160/80	<b>615592</b>	1	2	16	204	17	390	430	160	8	8.050
180/80	<b>615910</b>	1	1	8	204	17	416	480	160	8	10.000

**PE 100 SDR 17****Maximum working pressure 10 bar (water)**

d/DN	Order Ref.	Stock-status	BX	PU	D	d <sub>k</sub>	H	L	Ø k	Holes for screw	Weight kg/each
225/80	<b>616031</b>	1	2	4	204	17	465	580	160	8	15.420

**FLR**

**Flange Reducer**



Compact fitting manufactured by factory from HD-PE reducer and FRIALEN EFL Full Face Flanges. Specially suited for the horizontal connection of flange valves to FRIALEN T-pieces T for reduced branches in DN 80 and DN 100. For the vertical connection of hydrants using our elbow including foot support WF 90° d 110 or the T-piece T, the installation depth must be taken into consideration. No internal welding bead at the weld seam of the reduction. Steel-reinforced elastomeric gaskets recommended. Additional washers are necessary.

**PE 100 SDR 11**

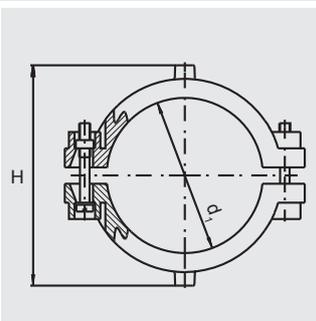
**Maximum working pressure 16 bar (water)**



d/DN	Order Ref.	Stock-status	BX	PU	D	d <sub>k</sub>	L	Ø k	Holes for screw	s	Weight kg/each
110/80	<b>616065</b>	1	3	96	204	17	161	160	8	10	3.500
160/100	<b>616241</b>	1	2	64	224	17	180	180	8	14,6	4.060

**RS**

**Reinforcing Saddle**



Compact fitting manufactured from 2 HD-PE saddles for the repair of minor pipe damage. With exposed heating elements for optimal heat transfer.

**PE 100 SDR 11**

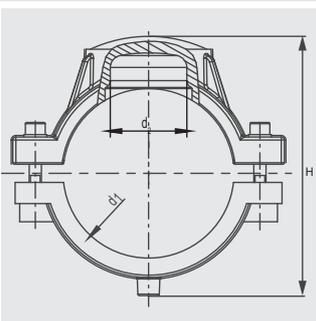
**Maximum working pressure 16 bar (water)/10 bar (gas)**



d <sub>1</sub>	Order Ref.	Stock-status	BX	PU	H	Weight kg/each
63	<b>612519</b>	1	20	360	106	0.260

**VVS**

**Repair and Reinforcing Saddles**



Compact fitting consisting of one repair saddle and one reinforcing saddle for the repair of minor pipe damage. With exposed heating elements for optimal heat transfer.

**PE 100 SDR 11**

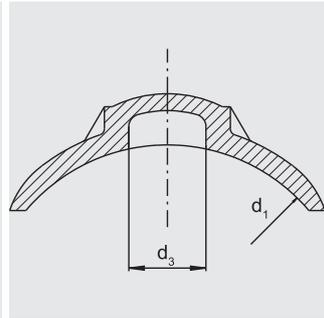
**Maximum working pressure 16 bar (water)/10 bar (gas)**



d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	PU	H	Weight kg/each
90	50	<b>615164</b>	1	24	192	148	0.920
110	50	<b>615165</b>	1	16	128	170	1.162
125	50	<b>615166</b>	1	15	120	183	1.360
160	50	<b>615168</b>	1	10	80	218	1.670
180	50	<b>615169</b>	1	6	48	238	1.810
200	50	<b>615170</b>	1	5	40	258	1.820
225	50	<b>615171</b>	1	5	40	283	1.900

**VSC TL**

**Repair Saddle Top-Loading**



Suitable for all pipe diameters in the given range by means of the FRIALEN-FRIATOP Clamping Unit (see Product Range FRIATOOLS). HD-PE saddle for the repair of minor pipe damage with or without escape of fluid. In order to avoid discharge of media the leak has to be sealed with a separate plug\* ( $\leq d_3$ ). With exposed heating element for optimal heat transfer.

\*The plug is not included in the scope of delivery.



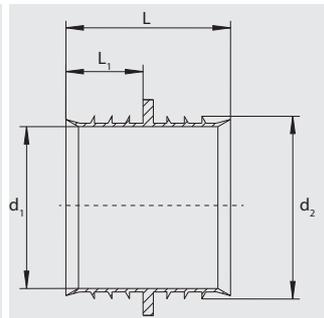
**PE 100 SDR 11**  
**Maximum working pressure 16 bar (water)/10 bar (gas)**



$d_1$	Order Ref.	Stock-status	BX	PU	$d_3$	Weight kg/each
250-560	615397	1	10	180	50	0.570

**RW**

**Repair Sleeves**



For the repair of water service pipes in the depressurised state. Prevents the ingress of water into the fused area of the FRIALEN MB or UB couplers. Measure d means: Repair Sleeves for pipe d xy.

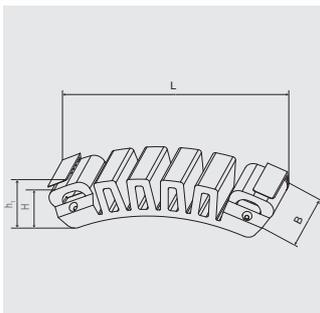
**Only suitable for pipes SDR 11**



d	$d_1$	$d_2$	Order Ref.	Stock-status	BX	PU	L	$L_1$	Weight kg/each
32	21	27	615127	1	50	4500	35	16	0.004
40	28	34	615128	1	50	2500	35	16	0.005
50	36	42	615129	1	50	2500	35	16	0.007
63	46	53	615130	1	40	2000	47	22	0.012

**FIXBLOC**

**Fixation for absorbing axial thrust and tensile forces**



The FIXBLOC is used on PE pipes for the creation of fixed point, as a pull-out protection, assembly aid or fixation to pipe bearing. Strength per fixed point up to 40 kN. Multiple applications possible around the pipe circumference. Processing is carried out with standard tensioning belts with belt width 50mm which are guided securely by two belt clips (easily removable). Minimum length approx. 3,5 x d pipe (longer for multiple applications). If the belt cannot be passed around the circumference of the pipe, the clamping device FIXBLOC-FWFB (only for hire, order no. 613380) can be used, e.g. in case of a PE-Liner, which must be anchored against the concrete wall of a manhole.



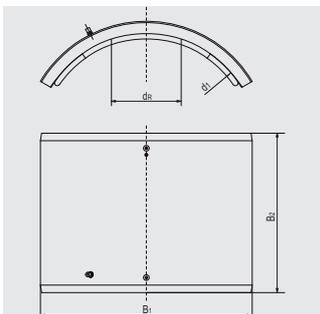
**PE 100**

**Maximum shear load per FIXBLOC: 40 kN**

d <sub>1</sub>	Order Ref.	Stock-status	BX	PU	H	L	Weight kg/each
160 - 1600	680600	1	15	750	40	220	0.310

**RS XL**

**Repair Saddle RS XL**



For the repair of damages such as scratches, grooves or pipe penetration. Compact fitting made of HD-PE. Saddle with exposed heating element for optimal heat transfer. The RS XL repair saddle is assembled using the FRIATOOLS vacuum pump (order no. 613827) and the corresponding FRIATOOLS plunger (see FRIATOOLS price list). The damage must be within the specified repair area d<sub>r</sub> and may not be covered by the fusion zone.

Version SDR11 (MOP 10 / PN16) available on request



**PE 100 SDR 17**

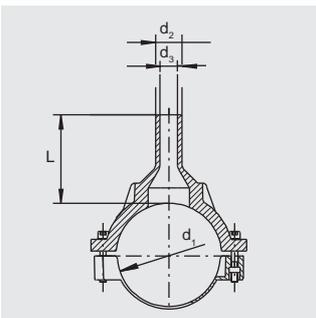
**Maximum working pressure 10 bar (water)/5 bar (gas)**



d <sub>1</sub>	Order Ref.	Stock-status	BX	PU	Repair area d <sub>r</sub>	Weight kg/each
500	616366	3	1	4	230	13.600
560	616367	3	1	4	230	14.300
630	616368	3	1	4	230	15.000
710	616369	3	1	4	230	18.900
800	616370	3	1	4	230	15.800
900	616371	3	1	4	230	17.600
1000	616372	3	1	4	230	16.400
1200	616379	3	1	2	230	16.250

SA

## Spigot Saddles



Compact fitting in HD-PE, saddle with exposed heating element for optimal heat transfer and outlet spigot for use with FRIALEN-couplers MB or UB. Swarfless tapping in the depressurised state by means of commercial drilling units (we recommend Hütz & Baumgarten ([www.huetz-baumgarten.de](http://www.huetz-baumgarten.de))).

For tapping under pressure, please contact our hotline: +49 621 486 2325.

## PE 100 SDR 11

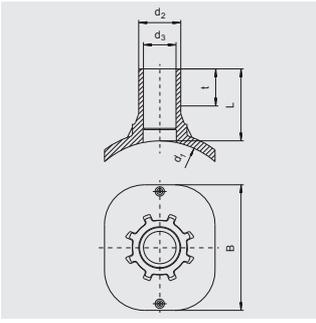
Maximum working pressure 16 bar (water)/10 bar (gas)



$d_1$	$d_2$	Order Ref.	Stock-status	BX	PU	$d_3$	Drilling $\varnothing d_a$	L	Weight kg/each
63	32	612757	1	20	360	22	20	100	0.330
63	50	612759	1	20	360	37	36	113	0.370
75	50	615020	1	15	270	38	36	82	0.430
90	32	615285	1	20	160	21	20	103	0.700
90	63	612819	1	20	160	50	46	103	0.720
110	32	615334	1	12	96	24	20	125	0.788
110	50	615031	1	12	96	39	36	132	0.816
110	63	612760	1	12	96	49	46	150	0.868
110	90	615411	1	12	96	70	65	115	0.960
125	32	615087	1	12	96	21	20	109	0.945
125	63	612761	1	12	96	47	46	109	0.990
125	90	615412	1	12	96	70	65	116	1.080
125	110	615584	1	10	80	86	84	116	1.150
160	32	612886	1	8	64	21	20	126	1.440
160	63	612762	1	6	48	47	46	140	1.520
160	90	615413	1	2	36	70	65	140	1.640
160	110	615739	1	2	36	86	84	140	1.765
160	125	615585	1	2	36	98	95	140	1.880
180	63	612763	1	6	48	47	46	109	1.190
180	90	615414	1	2	36	70	65	116	1.820
180	110	615948	1	2	36	86	84	136	1.960
180	125	615740	1	2	36	98	95	141	2.110
200	63	612764	1	5	40	47	46	109	1.260
225	63	612765	1	5	40	47	46	109	1.210
225	90	615415	1	5	40	70	65	130	1.950
225	110	616044	1	5	40	86	84	140	1.960
225	125	616045	1	4	32	97	95	146	2.240
225	160	616046	1	4	32	125	123	157	2.580

**SA TL**

**Spigot Saddles Top-Loading**



Suitable for all pipe diameters in the given range by means of the FRIALEN-FRIATOP Clamping Unit (see Product Range FRIATOOLS). Compact fitting in HD-PE. Saddle with exposed heating element for optimal heat transfer and outlet spigot for use with FRIALEN-couplers MB or UB. Swarfless tapping in the depressurised state by means of commercial drilling units (we recommend Hütz & Baumgarten ([www.huetz-baumgarten.de](http://www.huetz-baumgarten.de))).

$d_3$  = maximum tapping diameter in mm

For tapping under pressure, please contact our hotline: +49 621 486 2325.



**PE 100 SDR 11**

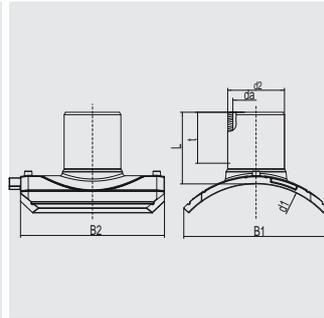
**Maximum working pressure 16 bar (water)/10 bar (gas)**



$d_1$	$d_2$	Order Ref.	Stock-status	BX	PU	$d_3$	Drilling $\varnothing d_s$	L	Weight kg/each
250-560	32	<b>615465</b>	1	5	90	21	20	109	0.621
250-560	63	<b>615466</b>	1	5	90	47	46	109	0.676

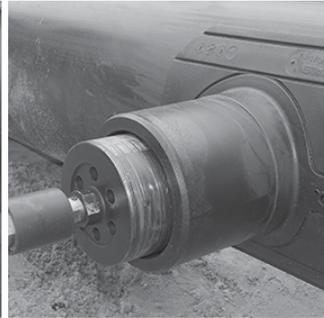
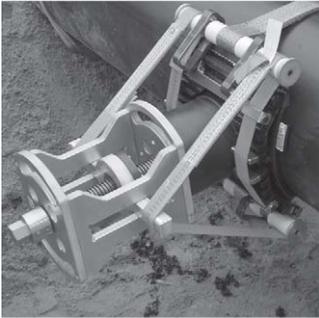
**SA UNI**

**Spigot Saddles SA UNI**



For integration of a branch line in PE pipelines –unpressurised or under operating pressure. Compact fitting made of HD-PE. Saddle with exposed heating element for optimal heat transfer. Outlet spigot for processing with FRIALEN couplers MB or UB. Suitable for all pipe diameters in the given range. Assembly with FRIATOOLS clamping unit UNITOP (see Product Range FRIATOOLS). Tapping in unpressurised condition with FRIATOOLS tapping kit FWAB XL (see Product Range FRIATOOLS). Pressure test of saddles fusion is possible before tapping via integrated pressure nozzle and pressure test adaptor FWDPA (see Product Range FRIATOOLS).

For tapping under pressure, please contact our hotline: +49 621 486 2325.



**PE 100 SDR 11**

**Maximum working pressure 16 bar (water)/10 bar (gas)**

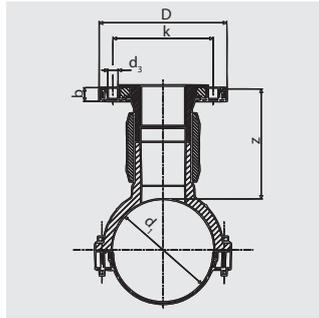


d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	PU	Drilling Ø d <sub>a</sub>	L	Weight kg/each
250-280	90	<b>616553</b>	1	5	40	66	130	1.465
250-280	110	<b>616554</b>	1	5	40	82	140	1.610
250-280	125	<b>616555</b>	1	5	40	94	146	1.790
250-280	160	<b>616556</b>	1	5	40	123	158	2.180
315-400	90	<b>616557</b>	1	5	40	66	130	1.485
315-400	110	<b>616558</b>	1	5	40	82	140	1.630
315-400	125	<b>616559</b>	1	5	40	94	146	1.810
315-400	160	<b>616560</b>	1	5	40	123	158	2.190
450-900	90	<b>616561</b>	1	5	40	66	130	1.500
450-900	110	<b>616562</b>	1	5	40	82	140	1.645
450-900	125	<b>616563</b>	1	5	40	94	146	1.820
450-900	160	<b>616564</b>	1	5	40	123	158	2.200

Also suitable for all special dimensions in relining application. For intermediate sizes in the diameter range d 280 - < d 315, please use SA UNI d 250 - 280.

## SAFL

## Spigot Saddles with flange outlet



Compact fitting in HD-PE. Manufactured combination of FRIALEN spigot saddle, coupler and FRIALEN Full Faced Flanges EFL (compact flange). Saddle with exposed heating coil for optimum heat transfer. Tapping in pressure free condition or, using an additional shut-off valve, under operating pressure by means of standard tapping equipment (we recommend Hütz & Baumgarten ([www.huetz-baumgarten.de](http://www.huetz-baumgarten.de))). We recommend steel-reinforced elastomeric gaskets.

Additional washers are necessary for the flange reducer.

For tapping under pressure, please contact our hotline: +49 621 486 2325.

## PE 100 SDR 11

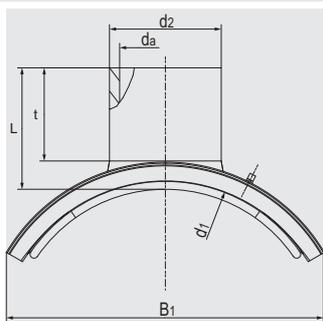
## Maximum working pressure 16 bar (water)/10 bar (gas)



d <sub>i</sub> /DN	Order Ref.	Stock-status	BX	PU	D	d <sub>k</sub>	Drilling Ø d <sub>a</sub>	H	L	Ø k	Holes for screw	Weight kg/each
110/80	<b>616016</b>	1	3	54	204	16.5	65	296	190	160	8	3.700
125/80	<b>616017</b>	1	2	36	204	16.5	65	311	205	160	8	3.940
160/80	<b>616018</b>	1	2	36	204	16.5	65	346	245	160	8	4.320
180/80	<b>616019</b>	1	2	36	204	16.5	65	366	285	160	8	4.610
225/80	<b>616020</b>	1	2	16	204	16.5	65	411	284	160	8	4.720
160/100	<b>616022</b>	1	2	36	224	16.5	84	346	245	180	8	5.270
225/100	<b>616024</b>	1	2	16	224	16.5	84	411	284	180	8	5.635

## SA XL

## Spigot Saddles SA XL



For integration of a branch line or vent in PE pipelines with large diameters – unpressurised or under operating pressure. Compact fitting made of HD-PE. Saddle with exposed heating element for optimal heat transfer. Outlet spigot for processing with FRIALEN couplers MB or UB. The SA XL spigot saddle is assembled using a FRIATOOLS vacuum pump (order no. 613827) and the corresponding FRIATOOLS plunger (see FRIATOOLS price list). Tapping in unpressurised condition with FRIATOOLS tapping kit FWAB XL (see Product Range FRIATOOLS) or, using an additional shut-off valve, under operating pressure using commercially available drilling equipment (we recommend Hütz & Baumgarten: [www.huetz-baumgarten.de](http://www.huetz-baumgarten.de)).

For tapping under pressure, please contact our hotline: +49 621 486 2325.



## PE 100 SDR 11

## Maximum working pressure 16 bar (water)/10 bar (gas)



d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	PU	Drilling Ø d <sub>a</sub>	L	Weight kg/each
400	225	616469	3	1	4	172	263	14.700
400	250	616779	3	1	4	187	261	15.200
450	225	616780	3	1	4	172	267	17.500
450	250	616781	3	1	4	187	272	18.000
500	225	616391	3	1	4	172	265	14.500
500	250	616782	3	1	4	187	263	15.500
500	280	616783	3	1	4	225	265	15.600
500	315	616784	3	1	4	254	268	21.600
560	225	616392	3	1	4	172	263	15.700
560	250	616785	3	1	4	187	263	17.000
560	280	616786	3	1	4	225	265	17.000
560	315	616787	3	1	4	254	268	19.800
560	355	616788	3	1	4	286	260	26.000
560	400	616789	3	1	4	322	260	27.200
630	225	616393	3	1	4	172	265	17.000
630	250	616790	3	1	4	187	267	17.500
630	280	616791	3	1	4	225	263	18.000
630	315	616792	3	1	4	254	265	20.900
630	355	616793	3	1	4	286	269	23.800
630	400	616794	3	1	4	322	267	25.000
710	225	616394	3	1	4	172	270	20.500
710	250	616795	3	1	4	187	265	22.100
710	280	616796	3	1	4	225	268	21.500
710	315	616797	3	1	4	254	268	23.800
710	355	616798	3	1	4	286	285	28.500
710	400	616762	3	1	4	322	275	29.500
800	225	616395	3	1	4	172	270	17.300
800	250	616799	3	1	4	187	275	18.600
800	280	616800	3	1	4	225	268	18.600
800	315	616801	3	1	4	254	268	20.500
800	355	616802	3	1	4	286	290	31.200
800	400	616803	3	1	4	322	275	31.600
900	225	616396	3	1	4	172	268	19.000
900	250	616804	3	1	4	187	278	20.700
900	280	616805	3	1	4	225	268	20.300
900	315	616806	3	1	4	254	269	23.000
900	355	616807	3	1	4	286	305	27.300
900	400	616808	3	1	4	322	275	28.000

## SA XL

## Spigot Saddles SA XL



## PE 100 SDR 11

Maximum working pressure 16 bar (water)/10 bar (gas)



d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	PU	Drilling Ø d <sub>a</sub>	L	Weight kg/each
1000	225	<b>616397</b>	3	1	4	172	270	18.000
1000	250	<b>616809</b>	3	1	4	187	280	19.300
1000	280	<b>616810</b>	3	1	4	225	270	19.000
1000	315	<b>616811</b>	3	1	4	254	270	21.000
1000	355	<b>616812</b>	3	1	4	286	305	30.800
1000	400	<b>616813</b>	3	1	4	322	278	31.300
1200	225	<b>616384</b>	3	1	4	172	270	17.500
1200	250	<b>616814</b>	3	1	4	187	284	19.200
1200	280	<b>616815</b>	3	1	4	225	270	18.600
1200	315	<b>616816</b>	3	1	4	254	270	20.800
1200	355	<b>616817</b>	3	1	4	286	305	29.600
1200	400	<b>616818</b>	3	1	4	322	278	30.300

## PE 100 SDR 17

Maximum working pressure 10 bar (water)/5 bar (gas)

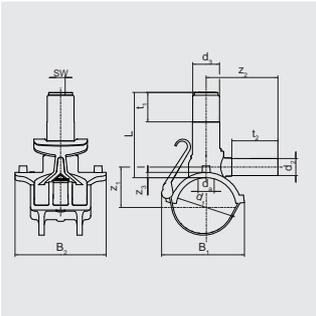


d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	PU	Drilling Ø d <sub>a</sub>	L	Weight kg/each
1000	160	<b>616378</b>	3	1	4	123	300	17.350
1200	160	<b>616383</b>	3	1	4	123	300	17.200

For other dimensions we refer to our new product Spigot Saddle SA UNI.

## DAA

## Pressure Tapping Tees with extra long outlet spigot



For leak-free and swarf-free tapping up to 10 bar (gas) or 16 bar (water). Integrated drill with solid upper and lower stop, incl. integrated torque limiter for protection against overcharge. A complete tool-free mounting of the saddle because of the new and innovative fast clamping system. With exposed heating element for optimal heat transfer. End plug with internal O-Ring seal. Optional protection against any access with fusion of the FRIALEN cap K d 50. Only one hexagonal wrench key with wrench size 17 (FWSS) for tapping all dimensions and for installing the end plug (see Product Range FRIATOOLS). Length of the outlet spigots dimensioned for two fusion operations.



## PE 100 SDR 11

## Maximum working pressure 16 bar (water)/10 bar (gas)



d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	PU	d <sub>3</sub>	Drilling Ø d <sub>a</sub>	L	Weight kg/each
40	20	612630	1	30	240	50	25	120	0.370
40	25	616473	1	30	240	50	25	120	0.380
40	32	616474	1	30	240	50	25	120	0.385
50	20	616475	1	28	224	50	25	120	0.385
50	25	612702	1	28	224	50	25	120	0.390
50	32	615080	1	28	224	50	25	120	0.400
63	20	612631	1	20	160	50	25	130	0.450
63	25	612633	1	20	160	50	25	130	0.460
63	32	612632	1	20	160	50	25	130	0.465
63	40	616472①	1	16	128	50	30	160	0.855
63	63	616334	1	16	128	50	30	160	0.635
75	32	616482	1	24	192	50	25	130	0.485
90	20	616483	1	14	112	50	30	160	0.600
90	25	616484	1	14	112	50	30	160	0.610
90	32	612634	1	14	112	50	30	160	0.615
90	40	615656①	1	14	112	50	30	160	0.950
90	50	616476①	1	14	112	50	30	160	0.960
90	63	612701	1	14	112	50	30	160	0.730
110	20	616487	1	14	112	50	30	160	0.620
110	25	616488	1	14	112	50	30	160	0.625
110	32	612637	1	14	112	50	30	160	0.630
110	40	615662①	1	14	112	50	30	160	1.000
110	50	616477①	1	14	112	50	30	160	1.010
110	63	612624	1	14	112	50	30	160	0.780
125	20	616491	1	12	96	50	30	160	0.650
125	25	616492	1	12	96	50	30	160	0.655
125	32	612649	1	12	96	50	30	160	0.670
125	40	615668①	1	12	96	50	30	160	1.020
125	50	616478①	1	12	96	50	30	160	1.030
125	63	612309	1	12	96	50	30	160	0.800
140	32	616495	1	12	96	50	30	160	0.700
140	63	616496	1	12	96	50	30	160	0.830
160	20	616497	1	10	80	50	30	160	0.730
160	25	616498	1	10	80	50	30	160	0.735
160	32	612641	1	10	80	50	30	160	0.745
160	40	615675①	1	10	80	50	30	160	1.095
160	50	616480①	1	10	80	50	30	160	1.105
160	63	612650	1	10	80	50	30	160	0.875

**DAA**

**Pressure Tapping Tees with extra long outlet spigot**



**PE 100 SDR 11**

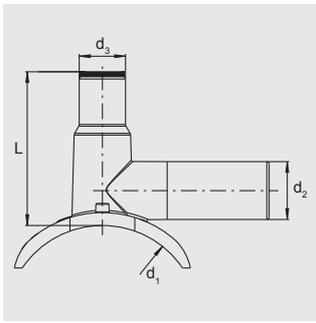
**Maximum working pressure 16 bar (water)/10 bar (gas)**



d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	PU	d <sub>3</sub>	Drilling Ø d <sub>a</sub>	L	Weight kg/each
180	20	<b>616501</b>	1	10	80	50	30	190	0.785
180	25	<b>616502</b>	1	10	80	50	30	190	0.790
180	32	<b>612651</b>	1	10	80	50	30	190	0.790
180	50	<b>616481</b> ①	1	10	80	50	30	190	1.170
180	63	<b>612652</b>	1	10	80	50	30	190	0.940
200	32	<b>612654</b>	1	8	64	50	30	190	0.810
200	63	<b>612659</b>	1	8	64	50	30	190	0.950
225	32	<b>612657</b>	1	8	64	50	30	190	0.835
225	50	<b>616486</b> ①	1	8	64	50	30	190	1.210
225	63	<b>612655</b>	1	8	64	50	30	190	0.980

**DAA TL**

**Pressure Tapping Tee Top-Loading and Top-Loading/Relining with extra long outlet spigot**



Suitable for all pipe diameters in the given range by means of the FRIALEN FRIATOP clamping unit (see Product Range FRIATOOLS). Leak free and swarfless tapping up to 10 bar (gas) or 16 bar (water). Integral drill with upper and lower stop, guided in a metal sleeve. With exposed heating element for optimal heat transfer. End plugs with internal O-ring seal. Fusible stack (d<sub>3</sub> 50 = K). Pressure test possible before tapping. For pressure test adapter and actuating key see Product Range FRIATOOLS. Length of the outlet spigots dimensioned for 2 fusion operations.

Other outlet dimensions with electrofusion reducers MR



**PE 100 SDR 11**

**Maximum working pressure 16 bar (water)/10 bar (gas)**

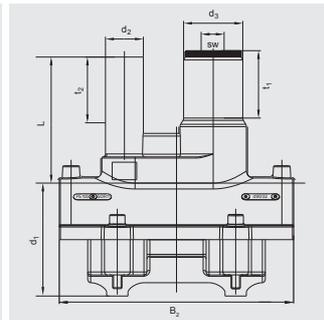


d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	PU	d <sub>3</sub>	Drilling Ø d <sub>a</sub>	L	Weight kg/each
250-315 (400)	63	<b>615339</b> ①	1	4	72	50	30	167	1.360

① d1: d 250 up to d 315 for pipes SDR 11 and 17;  
d1: > d 315 up to d 400 for pipes SDR 17

**DAP**

**Pressure Tapping Tees with parallel dome and extra long outlet spigot**



For space saving horizontal installation. Leak free and swarfless tapping up to 10 bar (gas) or 16 bar (water). Integral drill with upper and lower stop, guided in a metal sleeve. With exposed heating element for optimal heat transfer. End plugs with internal O-ring seal. Fusible stack ( $d_3$  40 = MV  $d$  40;  $d_3$  50 = K). Pressure test possible before tapping. For pressure test adapter and actuating key see Product Range FRIATOOLS. Length of the outlet spigots dimensioned for 2 fusion operations.



**PE 100 SDR 11**

**Maximum working pressure 16 bar (water)/10 bar (gas)**



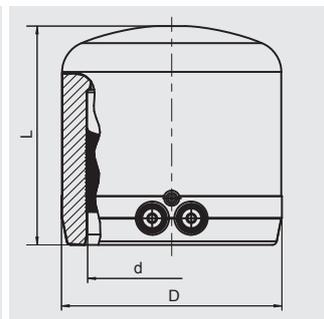
$d_1$	$d_2$	Order Ref.	Stock-status	BX	PU	$d_3$	Drilling $\varnothing d_a$	L	Weight kg/each
63	32	<b>616042</b>	1	16	288	40	21	125	0.630
90	32	<b>616043</b> ①	1	16	128	50	30	115	1.100
110	32	<b>615581</b>	1	12	96	50	30	158	1.280
110	50	<b>615606</b>	1	12	96	50	30	158	1.380
125	32	<b>615711</b>	1	12	96	50	30	158	1.310
125	50	<b>615712</b>	1	12	96	50	30	158	1.360
160	32	<b>615713</b>	1	8	64	50	30	170	1.540
160	50	<b>615714</b>	1	8	64	50	30	170	1.560
180	32	<b>615715</b>	1	6	48	50	30	170	1.540
180	50	<b>615716</b>	1	6	48	50	30	170	1.560
225	32	<b>615717</b> ②	3	6	48	50	30	170	1.570
225	50	<b>615718</b>	1	6	48	50	30	170	1.590

① max. working pressure 10 bar (water)/5 bar (gas)

② minimum order quantity = 1 packaging unit

**K**

**Cap for Pressure Tapping Tees**



With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zone plus cold zones at the end to prevent the flow of molten material.

**PE 100 SDR 11**

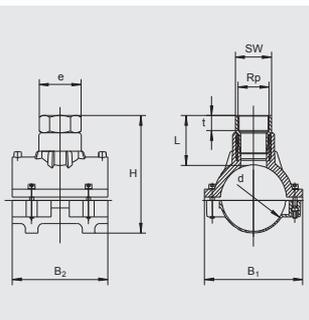
**Maximum working pressure 16 bar (water)/10 bar (gas)**



d	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
50	<b>612310</b>	1	30	960	69	72	0.110

**VAM RG**

**Valve Tapping Saddles with HD-PE/Gunmetal adapter, female thread**



Compact transition fitting. HD-PE-saddle with exposed heating element for optimal heat transfer. Gunmetal adapter permanently anchored in the HD-PE. Cannot be released or rotated. To accept normal commercial brass valves. Metallic materials in contact with drinking water acc. to the recommendation of Umweltbundesamt, Germany.

As a complete solution we recommend our Pressure Tapping Valve DAV.

**PE 100 SDR 11**

**Maximum working pressure 16 bar (water)/10 bar (gas)**

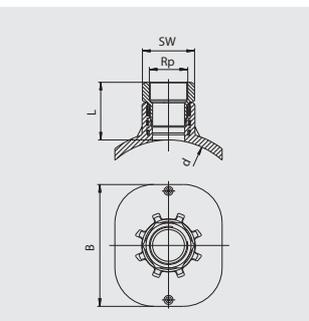


d	Rp	Order Ref.	Stock-status	BX	PU	H	L	Weight kg/each
63	1 1/4"	<b>612794</b> ①	3	20	360	146	75	0.730
63	1 1/2"	<b>612743</b>	1	20	360	149	78	0.780
75	1 1/4"	<b>615213</b>	1	15	270	161	76	0.850
90	1 1/2"	<b>612798</b>	1	16	128	172	68	1.370
90	2"	<b>612778</b> ①	3	16	128	199	95	1.560
110	1 1/2"	<b>612732</b>	1	12	96	182	70	1.488
110	2"	<b>612733</b>	1	12	96	205	92	1.684
125	1 1/2"	<b>612734</b> ①	3	12	96	207	68	1.610
125	2"	<b>612735</b>	1	12	96	234	95	1.850
160	1 1/2"	<b>612728</b> ①	3	8	64	242	68	1.800
160	2"	<b>612729</b>	1	8	64	269	95	2.040
180	1 1/2"	<b>612774</b>	1	7	56	250	68	1.780
180	2"	<b>612776</b>	1	7	56	277	95	1.990
225	2"	<b>612827</b>	1	5	40	322	95	1.990

① minimum order quantity = 1 packaging unit

**VAM RG TL**

**Valve Tapping Saddle Top-Loading with HD-PE/Gunmetal adapter, female thread**



Suitable for all pipe diameters in the given range by means of the FRIALEN FRIATOP Clamping Unit (see Product Range FRIATOOLS Technical Equipment). Compact transition fitting. HD-PE saddle with exposed heating element for optimal heat transfer. Gunmetal adapter permanently anchored in the HD-PE. Cannot be released or rotated. To accept normal commercial brass valves. Metallic materials in contact with drinking water acc. to the recommendation of Umweltbundesamt, Germany. Dimension range d 250 – d 560 fusible as standard using the top-loading method. Please note the maximum permissible wall thickness for tapping in the dimension range > d 315 - d 560. If required, please contact the manufacturer of the tapping equipment.

As a complete solution we recommend our Pressure Tapping Valve DAV-TL.

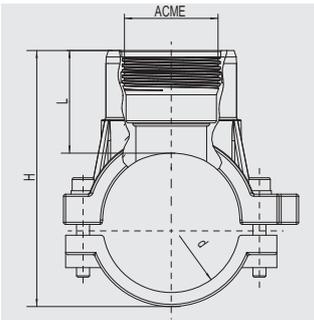


**PE 100 SDR 11**

**Maximum working pressure 16 bar (water)/10 bar (gas)**



d	Rp	Order Ref.	Stock-status	BX	PU	L	Weight kg/each
250-315 (560)	2"	<b>615470</b>	1	8	144	90	1.505

**VAM P****Valve Tapping Saddles for irrigation systems, female thread for adaption to PVC-U fittings**

Compact saddle fitting with threaded outlet for the jointing of irrigation systems for green fields, e.g. playing fields or golf courses. HD-PE saddle with exposed heating element for optimal heat transfer. Integrated threaded brass sleeve for safe adaption of PVC-ACME fittings.

**ACME - Thread****PE 100 SDR 11****Maximum working pressure 10 bar (water)**

d	Thread	Order Ref.	Stock-status	BX	PU	Drilling Ø d <sub>a</sub>	H	L	Weight kg/each
63	ACME 1"	<b>616544</b>	1	20	360	20	117	48	0.430
63	ACME 1 1/4"	<b>616543</b> ①	3	20	360	30	117	48	0.450
63	ACME 1 1/2"	<b>616551</b>	1	20	360	30	117	48	0.460

① minimum order quantity = 1 packaging unit

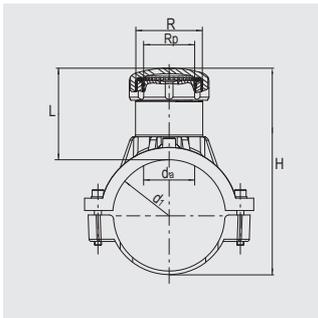
**BSP - Thread****PE 100 SDR 11****Maximum working pressure 10 bar (water)**

d	Thread	Rp	Order Ref.	Stock-status	BX	PU	Drilling Ø d <sub>a</sub>	H	L	Weight kg/each
63	BSP	1 1/4"	<b>616463</b> ①	3	20	360	28	117	48	0.450

① minimum order quantity = 1 packaging unit

**SPA**

**Balloon Shut off Saddles**



Compact fitting suitable for available balloon shut-off equipment. HD-PE saddle with exposed heating element for optimal heat transfer. Brass-guide thread permanently and immovably anchored in the HD-PE. Cannot be released or rotated. Includes brass plugs with square recess. Protection against access to the stack by fusing on a FRIALEN-SPAK (when using d 63 through cap K).



**PE 100 SDR 11**

**Maximum working pressure 16 bar (water)/10 bar (gas)**

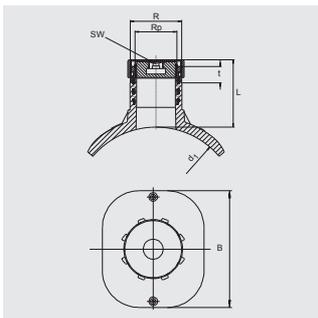


d <sub>1</sub>	R	Rp	Order Ref.	Stock-status	BX	PU	Drilling Ø d <sub>s</sub>	H	L	Weight kg/each
63	G 1 1/2	G 1 1/8	<b>612753</b> ①	1	20	360	31,0	151	80	0.610
90	G 2 1/2	G 2	<b>612677</b>	1	16	128	56,5	197	104	1.380
110	G 2 1/2	G 2	<b>612750</b>	1	12	96	56,5	217	104	1.540
125	G 2 1/2	G 2	<b>612751</b>	1	12	96	56,5	232	104	1.710
160	G 2 1/2	G 2	<b>612752</b>	1	8	64	56,5	267	104	1.860
180	G 2 1/2	G 2	<b>612754</b>	1	7	56	56,5	287	104	1.860
200	G 2 1/2	G 2	<b>612755</b>	1	6	48	56,5	307	104	1.830
225	G 2 1/2	G 2	<b>612756</b>	1	5	40	56,5	332	104	1.850

① Shut off Saddles d 63 may only be processed using pipes up to SDR 11.

**SPA TL**

**Balloon Shut off Saddles Top-Loading**



Suitable for all pipe diameters in the given range by means of the FRIATOP Clamping Unit (see Product Range FRIATOOLS Technical Equipment). Compact saddle fitting suitable for available balloon shut-off equipment. HD-PE saddle with exposed heating element for optimal heat transfer. Brass guide thread permanently anchored in the HD-PE. Cannot be released or rotated. Includes brass plugs with square recess. Protection against access to the stack by fusing on a FRIALEN-SPAK.

Dimension range d 250 – d 560 fusible as standard using the top-loading method. Please note the maximum permissible wall thickness for tapping in the dimension range > d 315 - d 560.

If required, please contact the manufacturer of the tapping equipment. Please note indications by shut-off saddles manufacturer.



**PE 100 SDR 11**

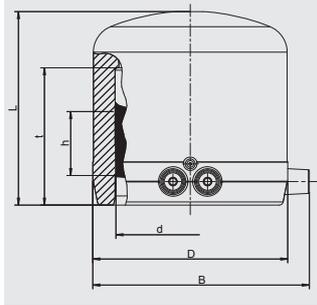
**Maximum working pressure 16 bar (water)/10 bar (gas)**



d <sub>1</sub>	R	Rp	Order Ref.	Stock-status	BX	PU	Drilling Ø d <sub>s</sub>	L	Weight kg/each
250-315 (560)	G 2 1/2	G 2	<b>615395</b>	1	18	144	56,5	115	1.358

**SPAK**

**Cap for Balloon Shut off Saddles**



With exposed heating coils for optimal heat transfer, large insertion depth, extra wide fusion zone plus cold zones at the end to prevent the flow of molten material.

**PE 100 SDR 11**

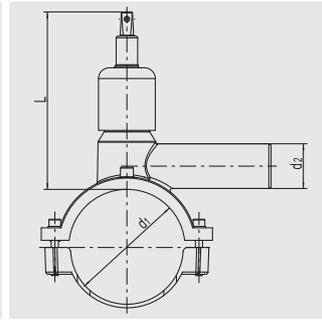
**Maximum working pressure 16 bar (water)/10 bar (gas)**



d	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
75	612311	1	20	640	99	99	0.280

## DAV

## Pressure Tapping Valves with extra long outlet spigot



Compact fitting in HD-PE with no threaded connections. Actuating spindle in stainless steel 1.4305. No re-insulating required. Leak free and swarfless tapping up to 10 bar (gas) or 16 bar (water). Integral drill with upper and lower stop, guided in a metal sleeve. Max. 10 turns to activate "OPEN/CLOSE". With exposed heating element for optimal heat transfer. Maintenance free, operating isolating valve actuated by a rod (e.g. FRIALEN- EBS). Length of the outlet spigots dimensioned for 2 fusion operations. Four cornered shaft wrench size 14.

## PE 100 SDR 11

## Maximum working pressure 16 bar (water)/10 bar (gas)

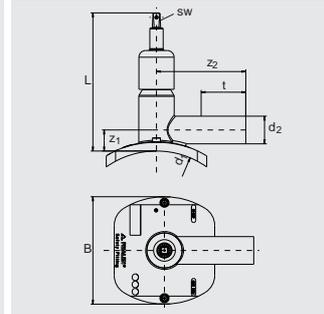


d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	PU	Drilling Ø d <sub>a</sub>	L	Weight kg/each
50	32	615955	1	16	288	20	164	1.310
63	32	615341	1	16	288	20	164	0.950
63	40	615342	1	16	288	20	164	0.970
75	32	615956	1	12	216	20	164	1.390
90	32	615344	1	12	96	30	200	1.750
90	40	615617 <sup>①</sup>	1	12	96	30	200	1.970
90	50	615346	1	12	96	30	200	1.800
90	63	615347	1	12	96	30	200	1.870
110	32	615348	1	10	80	30	200	1.990
110	40	615621 <sup>①</sup>	1	10	80	30	200	2.160
110	50	615350	1	10	80	30	200	2.060
110	63	615351	1	10	80	30	200	2.120
125	32	615352	1	10	80	30	200	2.185
125	40	615625 <sup>①</sup>	1	10	80	30	200	2.385
125	50	615354	1	10	80	30	200	2.245
125	63	615355	1	10	80	30	200	2.320
140	63	615930	1	10	80	30	200	2.290
160	32	615356	1	6	48	30	251	2.670
160	40	615629 <sup>①</sup>	1	6	48	30	251	2.965
160	50	615358	1	6	48	30	251	2.750
160	63	615359	1	6	48	30	251	2.810
180	32	615361	1	5	40	30	251	2.680
180	40	615633 <sup>①</sup>	1	5	40	30	251	2.975
180	50	615363	1	5	40	30	251	2.760
180	63	615364	1	5	40	30	251	2.820
200	32	615366	1	5	40	30	251	2.770
200	50	615368	1	5	40	30	251	2.830
200	63	615369	1	5	40	30	251	2.900
225	32	615374	1	5	40	30	251	2.790
225	40	615641 <sup>①</sup>	1	5	40	30	251	3.070
225	50	615376	1	5	40	30	251	2.850
225	63	615377	1	5	40	30	251	2.920

<sup>①</sup> with electrofusion reducers MR d 50/40.

**DAV TL**

**Pressure Tapping Valve Top-Loading with extra long outlet spigot**



For flexible adaptation to all pipe diameters in indicated range by means of the FRIALEN FRIATOP Clamping device (see Product Range FRIATOOLS Technical Equipment). Stainless steel activating spindle 1.4305. No further insulation necessary. Leak and swarf free tapping up to 10 bar (gas) and 16 bar (water). Integrated drill with upper and lower stop, guided in a metal sleeve. With exposed heating coils for optimal heat transfer. Maintenance free, operating shut-off valve actuated by a rod (e.g. FRIALEN-EBS). Length of the outlet spigot dimensioned for 2 fusion operations. Four cornered shaft wrench size 14.



**PE 100 SDR 11**

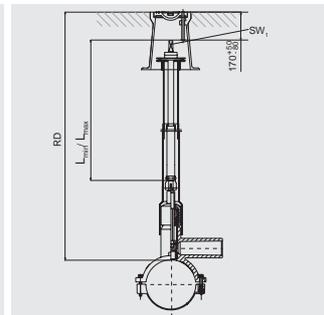
**Maximum working pressure 16 bar (water)/10 bar (gas)**



d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	PU	Drilling Ø d <sub>a</sub>	L	Weight kg/each
250-315	63	<b>616464</b>	1	7	56	30	251	2.455
355-400	63	<b>616465</b>	1	7	56	30	251	2.459

**EBS**

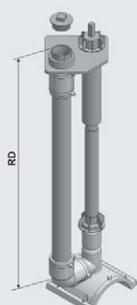
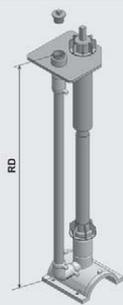
**Installation kits for Pressure Tapping Valves**



Telescopic actuating rod for operation of the FRIALEN-DAV from the street cap. Stepless adjustment in the stated range (RD) without the use of tools, even in the installed state. Self supporting in any extended position. Corrosion proof.

Dimension RD valid for DAV d<sub>1</sub> = 90 – 125.  
For DAV d<sub>1</sub> < 90 please deduct 50 mm and for d<sub>1</sub> > 125 please add 50 mm. (See also dimension L of the DAV)

RD in m	Order Ref.	Stock-status	BX	PU	SW <sub>1</sub>	Weight kg/each
0,45-0,7	<b>615866</b>	1	1	42	14	1.500
0,7-1,0	<b>615867</b>	1	1	42	14	1.950
0,9-1,3	<b>615335</b>	1	1	42	14	2.450
1,2-1,8	<b>615325</b>	1	1	42	14	3.350
1,8-2,7	<b>616327</b>	3	1	14	14	3.600
2,6-3,5	<b>616328</b>	3	1	14	14	4.500

**GAB 1 GAB 2****Purge stack 1" / 2" for venting PE-HD gas pipes****NEW**

The FRIALEN purge stack 1" / 2" is used for venting pressurized gas pipes during filling or in operation for use as a measuring point fitting for verification of the odorization content. The purge stack plate of the FRIALEN purge stack „1" is available in square design. The purge stack plate of the FRIALEN purge stack 2" is available in diagonal design. The venting pipe of the FRIALEN purge stack 1" / 2" is one metre long as standard and can be adapted to the respective cover height on site. Longer venting pipes are available on request, please note when ordering. The actuating rods (installation set EBS) can be infinitely adjusted within the specified range without additional tools.

**PE 100 SDR 11****Maximum working pressure 10 bar (gas)**

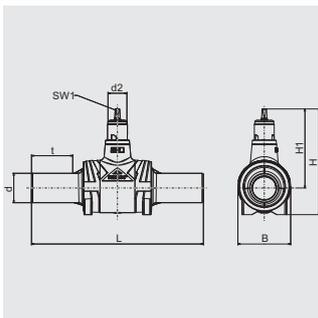
	RD in m	d <sub>i</sub>	Order Ref.	Stock-status	BX	PU
<b>NEW</b>	0,7 - 1,0	63 / 1"	<b>2006380</b>	3	1	1
<b>NEW</b>	0,7 - 1,0	90 / 1"	<b>2009080</b>	3	1	1
<b>NEW</b>	0,7 - 1,0	110 / 1"	<b>2011080</b>	3	1	1
<b>NEW</b>	0,7 - 1,0	125 / 1"	<b>2012580</b>	3	1	1
<b>NEW</b>	0,7 - 1,0	160 / 1"	<b>2016080</b>	3	1	1
<b>NEW</b>	0,7 - 1,0	180 / 1"	<b>2018080</b>	3	1	1
<b>NEW</b>	0,7 - 1,0	225 / 1"	<b>2022580</b>	3	1	1

**PE 100 SDR 11****Maximum working pressure 10 bar (gas)**

	RD in m	d <sub>i</sub>	Order Ref.	Stock-status	BX	PU
<b>NEW</b>	0,7 - 1,0	63 / 2"	<b>2006383</b>	3	1	1
<b>NEW</b>	0,7 - 1,0	90 / 2"	<b>2009083</b>	3	1	1
<b>NEW</b>	0,7 - 1,0	110 / 2"	<b>2011083</b>	3	1	1
<b>NEW</b>	0,7 - 1,0	125 / 2"	<b>2012583</b>	3	1	1
<b>NEW</b>	0,7 - 1,0	160 / 2"	<b>2016083</b>	3	1	1
<b>NEW</b>	0,7 - 1,0	180 / 2"	<b>2018083</b>	3	1	1
<b>NEW</b>	0,7 - 1,0	225 / 2"	<b>2022583</b>	3	1	1

## FRIALOC

## Shut-Off Valve with shut-off mechanism suitable for plastics Application: Water



Facilitates the completely fused and homogeneous PE piping. Thanks to the innovative mechanism, a reliable shut-off can be achieved with only 9 or 14 turns and without major force. Very low-wear drive. A forced flushing prevents dead spaces and stagnation. The small sealing area minimises biological growth. The free passage corresponds up to d180 mm to the connecting pipe SDR 11. Each individual FRIALOC PE shut-off valve is subjected to comprehensive tests at the factory. The valve is operated using the installation kit FBS. Four cornered shaft wrench size 19.

## PE 100 SDR 11

## Maximum working pressure 16 bar (water)



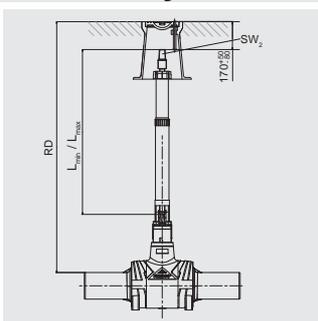
d	d <sub>2</sub>	Order Ref.	Stock-status	BX	PU	H	L	SW <sub>1</sub>	Weight kg/each
90	80	616293	1	1	8	450	720	19	13.900
110	80	616294	1	1	8	450	720	19	14.200
125	80	616295	1	1	8	450	720	19	14.500
160	80	616296	1	1	2	608	1010	19	37.900
180	80	616297	1	1	2	608	1030	19	39.000
200	80	616453 <sup>① ②</sup>	3	1	2	608	1030	19	44.600
225	80	616298 <sup>①</sup>	1	1	2	608	1030	19	45.500
250	80	616438 <sup>① ②</sup>	3	1	2	608	1030	19	46.000

① limited passage corresponds to dim. d 180

② minimum order quantity = 1 palette unit

## FBS

## Installation kits FBS for FRIALOC® PE shut-off valves with KlickFix® system.



To operate the FRIALOC PE shut-off valve from the surface box. Optimally matched, can be individually extended to the required covering height. With KlickFix coupler for easy installation. Made of galvanised steel or stainless steel.

## bars of hot zinc dipped steel

RD in m	Order Ref.	Stock-status	BX	PU	SW <sub>2</sub>	Weight kg/each
0,75 - 1,0	616308	1	1	42	30	2.500
0,9 - 1,3	616309	1	1	42	30	2.950
1,2 - 1,8	616310	1	1	42	30	3.850
1,5 - 2,3	616318	1	1	42	30	4.400

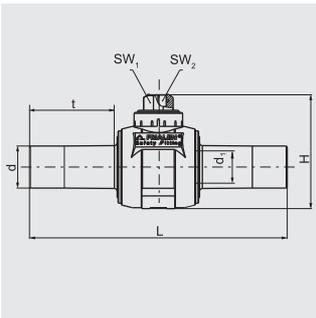
## bars of stainless steel

RD in m	Order Ref.	Stock-status	BX	PU	SW <sub>2</sub>	Weight kg/each
0,75 - 1,0	616315	3	1	42	30	2.400
0,9 - 1,3	616316	1	1	42	30	2.800
1,2 - 1,8	616317	1	1	42	30	3.450
1,5 - 2,3	616319	3	1	42	30	4.150
2,4 - 3,5	616326	3	1	30	30	6.350

Please note: For FRIALOC from d 160 RD - 0.1 m.  
Other lengths on request.

**KHP**

**Ball Valves in HD-PE with NBR-sealing, 1/4-Turn**



Compact ball valve in HD-PE with spigots for use with FRIALEN-couplers MB or UB. No corrosion proofing required. Open and closed position with definite stop. Maintenance free ball valve, operated by a rod (e.g. FRIALEN-BS).  
Passage in shut-off part  $d_1$ .

Please refer to your national requirements for components in contact with drinking water. We recommend KHW with EPDM sealing for this application.

**PE 100 SDR 11**

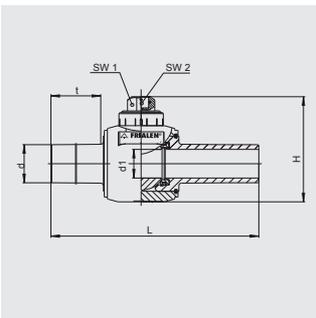
**Maximum working pressure 10 bar (gas)**



d	d <sub>1</sub>	Order Ref.	Stock-status	BX	PU	H	L	SW <sub>1</sub>	SW <sub>2</sub>	Weight kg/each
32	24	612490	1	1	170	136	310	50 x 50	20	0.540
40	24	612497	1	1	170	136	310	50 x 50	20	0.580
50	24	612492	1	1	170	136	310	50 x 50	20	0.680
63	43	612494	1	1	50	193	410	50 x 50	25	2.300
90	67	612495	1	1	24	241	553	50 x 50	25	4.200
110	67	612493	1	1	24	241	553	50 x 50	25	4.500
125	67	612496	1	1	24	241	553	50 x 50	25	5.200
160	98	612483	1	1	8	332	539	50 x 50	25	12.000
180	98	615309	1	1	8	332	539	50 x 50	25	12.500
200	98	612480	3	1	8	332	539	50 x 50	25	13.500
225	98	616186	1	1	8	332	539	50 x 50	25	14.500

**KH**

**Ball Valves in HD-PE with NBR-sealing, 1/4-Turn, full port passage**



Compact ball valve made from HD-PE with spigots for processing with FRIALEN MB or UB couplers. Full port valve passage in line with internal diameter of pipe socket. No corrosion prevention measures necessary. Open and closed position at defined stop. Maintenance free shut-off valve activated by a rod (e.g. FRIALEN BS).

Please refer to your national requirements for components in contact with drinking water. We recommend KHW with EPDM sealing for this application.

**PE 100 SDR 11**

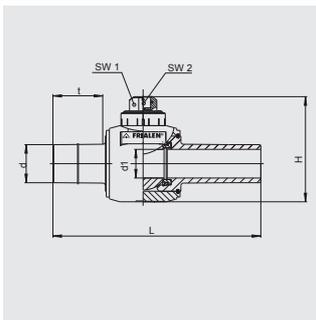
**Maximum working pressure 10 bar (gas)**



d	d <sub>1</sub>	Order Ref.	Stock-status	BX	PU	H	L	SW <sub>1</sub>	SW <sub>2</sub>	Weight kg/each
20	24	616470	1	1	170	138	310	50 x 50	20	0.500
25	24	616471	1	1	170	138	310	50 x 50	20	0.550
32	34	616176	1	1	100	156	324	50 x 50	20	0.770
40	34	616177	1	1	100	156	324	50 x 50	20	0.800
50	43	616178 <sup>①</sup>	1	1	50	193	405	50 x 50	25	2.240
63	51	616179	1	1	50	206	410	50 x 50	25	2.420
90	98	616180	1	1	18	288	577	50 x 50	25	6.600
110	98	616181	1	1	18	288	577	50 x 50	25	6.750
125	98	616182	1	1	18	288	577	50 x 50	25	6.900

① Please choose the suitable installation kit d 63 - d 225

**KHW** **Ball Valves in HD-PE with EPDM-sealing, 1/4-Turn, full port passage**



Compact ball valve made from HD-PE with spigots for processing with FRIALEN MB or UB couplers. Full port valve passage in line with internal diameter of pipe socket. No corrosion prevention measures necessary. Open and closed position at defined stop. Maintenance free shut-off valve activated by a rod (e.g. FRIALEN BS).

**PE 100 SDR 11**

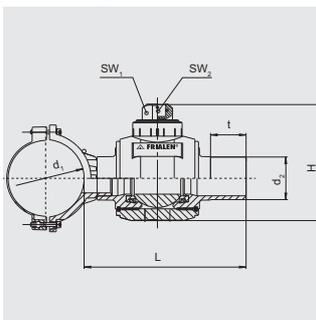
**Maximum working pressure 16 bar (water)**



d	d <sub>1</sub>	Order Ref.	Stock-status	BX	PU	H	L	SW <sub>1</sub>	SW <sub>2</sub>	Weight kg/each
32	34	<b>616656</b>	1	1	100	156	324	50 x 50	20	0.770
40	34	<b>616657</b>	1	1	100	156	324	50 x 50	20	0.800
50	43	<b>616658</b> ①	1	1	50	193	405	50 x 50	25	2.240
63	51	<b>616659</b>	1	1	50	206	410	50 x 50	25	2.420

① Please choose the suitable installation kit d 63 - d 225

**AKHP** **Tapping Ball Valves in HD-PE, 1/4 turn, for side tapping under pressure**



Compact tapping ball valve in HD-PE. Factory made combination of FRIALEN-Saddle Moulding and FRIALEN-Ball Valve with spigot for space and cost saving horizontal installation especially for integration of branches into mains under operating pressure. Leakage and swarf free tapping up to 10 bar (gas) and 16 bar (water) using standard tapping equipment (we recommend Hütz & Baumgarten ([www.huetz-baumgarten.de](http://www.huetz-baumgarten.de))). With exposed heating element for optimal heat transfer.

Please refer to your national requirements for components in contact with drinking water. We recommend KHW with EPDM sealing for this application.

**PE 100 SDR 11**

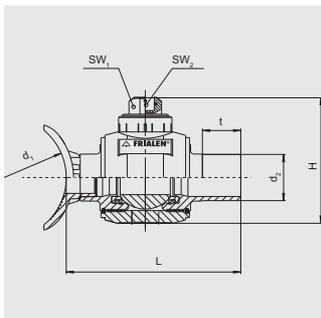
**Maximum working pressure 10 bar (gas)**



d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	PU	Drilling Ø d <sub>a</sub>	H	L	SW <sub>1</sub>	SW <sub>2</sub>	Weight kg/each
110	63	<b>615427</b>	1	6	48	42	180	330	50 x 50	25	3.070
110	90	<b>615428</b>	1	4	32	60	240	335	50 x 50	25	4.670
125	90	<b>615431</b>	1	4	32	60	240	335	50 x 50	25	4.790
160	63	<b>615433</b>	1	4	32	42	180	330	50 x 50	25	3.300
160	90	<b>615434</b>	1	4	32	60	240	335	50 x 50	25	5.000
180	90	<b>615437</b>	1	4	32	60	240	335	50 x 50	25	5.000
225	90	<b>615440</b>	1	4	32	60	240	335	50 x 50	25	5.000

**AKHP TL**

**Tapping Ball Valves in HD-PE, 1/4 turn, Top-Loading for side tapping under pressure**



Suitable for all pipe diameters in the given range by means of the FRIALEN FRIATOP Clamping Unit (see Product Range FRIATOOLS). Compact tapping ball valve in HD-PE. Factory made combination of FRIALEN-Saddle Moulding and FRIALEN-Ball Valve with spigot for space and cost saving horizontal installation especially for integration of branches into mains under operating pressure. Leakage and swarf free tapping up to 10 bar (gas) and 16 bar (water) using standard tapping equipment (we recommend Hütz & Baumgarten ([www.huetz-baumgarten.de](http://www.huetz-baumgarten.de))). With exposed heating element for optimal heat transfer. Please note the maximum permissible wall thickness for tapping.

Please refer to your national requirements for components in contact with drinking water. We recommend KHW with EPDM sealing for this application.



**PE 100 SDR 11**

**Maximum working pressure 10 bar (gas)**

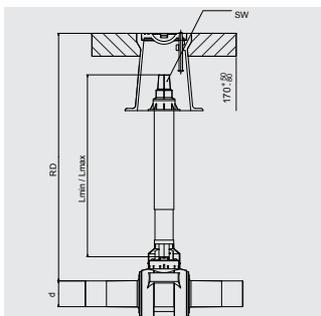


d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	PU	Drilling Ø d <sub>a</sub>	H	L	SW <sub>1</sub>	SW <sub>2</sub>	Weight kg/each
250-450 (560)	90	<b>615526</b> ①	1	4	32	60	240	335	50 x 50	25	4.470

① d1: d 250 up to d 450 for pipes SDR 11 and 17;  
d1: > d 450 up to d 560 for pipes SDR 17

**BS**

**Installation kits for Ball Valves and Tapping Ball Valves (Standard and Top-Loading)**



Telescopic actuating rod for operation of the FRIALEN-KHP, KH, KHW, AKHP and AKHP-TL from the valve cover. Stepless adjustment in the stated range (RD) without the use of tools, even in the installed state. Self supporting in any extended position. Corrosion proof. Wrench size 14 specially designed for domestic connection.

d	RD in m	Order Ref.	Stock-status	BX	PU	SW <sub>1</sub>	Weight kg/each
20-50	0,45-0,70	<b>615741</b> ①	1	1	42	30	1.800
20-50	0,60-1,00	<b>615957</b> ①	1	1	42	14	2.700
20-50	0,60-1,00	<b>615328</b> ①	1	1	42	30	2.000
20-50	1,00-1,50	<b>616466</b> ①	1	1	42	14	3.400
20-50	1,00-1,50	<b>615330</b> ①	1	1	42	30	3.400
20-50	1,20-2,00	<b>616068</b> ①	1	1	42	14	3.450
20-50	1,20-2,00	<b>615329</b> ①	1	1	42	30	3.650
63-225	0,60-1,00	<b>615958</b>	1	1	42	14	2.050
63-225	0,60-1,00	<b>615310</b>	1	1	42	30	3.050
63-225	1,00-1,50	<b>616467</b>	1	1	42	14	4.150
63-225	1,00-1,50	<b>615331</b>	1	1	42	30	4.150
63-225	1,20-2,00	<b>616069</b>	1	1	42	14	3.600
63-225	1,20-2,00	<b>615311</b>	1	1	42	30	5.250

① Solid fit of the pipe sleeve socket due to the covered housing design.



 **Aliaxis**



## FRIAFIT<sup>®</sup> SEWAGE SYSTEM

The safe jointing method for HD-PE pipes  
carrying sewage and waste water

Product Range AF 23/19



## FRIAFIT® CONNECTING SPIGOT ASA MULTI NO CHANCE FOR ROOTS!

No separation or complete exposure is required for new installation or renovation. The clay pipe is drilled for the installation of the connecting spigot. This is done with conventional core drills using a drill bit with a diameter of only  $\varnothing 172$  mm.

This means that a cost-effective connection is possible from DN 250 upwards, the installation of a branch is no longer necessary.

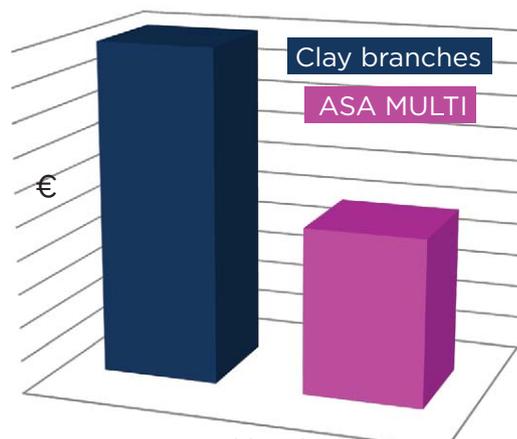
Savings are achieved through smaller assembly pits. This means less road construction, excavation and back-filling work.

There is no need to separate or completely uncover the main sewer in operation!

### Who still relies on CLAY branches DN 250?

The MULTI-TALENT saves time and money!

The PE outlet connection piece d 160/DN 150 can be connected directly to a PP or clay pipe with a double or slide-over coupler DN 150 and a transition piece UKG or USTZ, without any set-off.



Up to 50% savings potential depending on installation depth and regional conditions

Deutsches  
Institut  
für  
Bautechnik



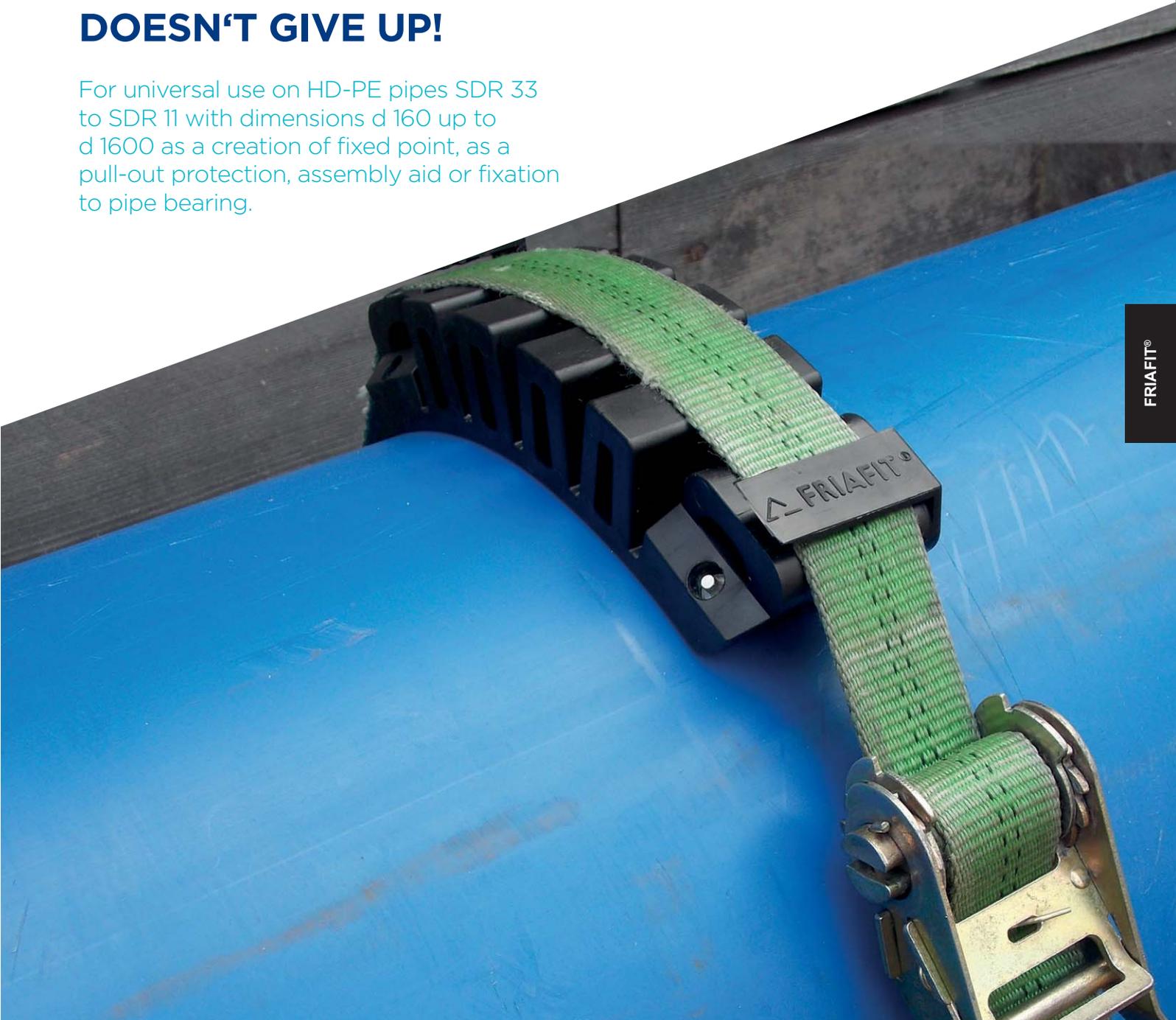
DIBt®-Certification granted: Z-42.5-531



MOVIE

# THE FRIAFIT® FIXBLOC DOESN'T GIVE UP!

For universal use on HD-PE pipes SDR 33 to SDR 11 with dimensions d 160 up to d 1600 as a creation of fixed point, as a pull-out protection, assembly aid or fixation to pipe bearing.



FRIAFIT®

The FRIAFIT FIXBLOC can be used anywhere, where high axial thrust and tensile forces must be absorbed.

High levels of push-pull forces of up to 40 kN

Multiple applications around the pipe circumference possible.

Easy processing with commercially available tension belts or ...

## **Processing using the FIXBLOC FWFB clamping unit**

Using the FRIATOOLS FIXBLOC FWFB clamping unit you can assemble the FIXBLOC on PE pipes with dimension range from d 160 to d 500 at the end of the pipe.

The fusion process is carried out using standard fusion units, e.g. using our FRIAMAT.



**MORE INFORMATION**

## Things worth knowing about FRIAFIT® Sewage System and this Product Range

### Component traceability

Each component is provided with an additional barcode for its traceability.

### Norm Conformity

The FRIAFIT sewage system of PE 100 complies with EN 12666 and hence is deemed a regulated construction product. It therefore does not need general approval from the building authorities. A certificate of conformity issued by DIBt® of Berlin has been submitted.

The FRIAFIT connecting spigot ASA MULTI has been granted general approval from the building authorities. The approval certificate can be found at [www.friafit.com](http://www.friafit.com) in the download area.

Moreover, FRIAFIT couplers AM SDR 17 comply with the requirements under EN 12201 and ISO 4427.

FRIAFIT couplers AM SDR 17 have been certified under DVGW GW 335-B2 (certificates DV-8606BO6114 and DV-8611BO6115) and are subjected to regular monitoring by external agencies.

The scope of the respective certifications for individual products is determined by their applicability and market requirements. Therefore, please check in each individual case whether the required certification is available for the respective product.



### Fusability

FRIAFIT safety fittings can be fused.

- Generally to SDR 33–SDR 11 pipes
- FRIAFIT couplers AM and sewage bends ABM/ABMS to SDR 33–SDR 17 pipes

Please also note the details for each of the fusable SDR sizes given on the fitting's barcode label as well as all other binding codes affixed directly to the product. Please consult our application engineering department before processing thin walled pipes > SDR 33.

FRIAFIT safety fittings can be processed with pipes of PE 100 and PE 100-RC, PE 80 under EN 12666, DIN 8074/75, EN 1555-2, EN 12201-2, ISO 4437, and ISO 4427, PE-Xa under DIN 16892/93. For PE pipes, the melt flow rate 190/5 is 0.2–1.7 g / 10 min.

Components with an MFR < 0.20 require confirmation of suitability. FRIAFIT safety fittings can be processed with FRIAMAT fusion units at ambient temperatures from -10 °C to +45 °C.

Material transition fusions must comply in addition with the standards and assembly guidelines specific to these materials or this system.

On restrictions in certain cases affecting the installation and processing of FRIAFIT safety fittings in general, please read our assembly instructions. Also our inhouse customer advisers will be pleased to answer any questions you may have.

### Pressure bearing capacity

The FRIAFIT sewage system is designed for unpressurised pipes (open conduits). Under DIN EN 1610, the maximum test pressure is 0.5 bar.

FRIAFIT couplers AM SDR 17 are also approved for use in drinking water and PN 10 pressurised pipe systems.

FRIAFIT sewage bends ABM/ABMS and the sewage saddles ASA TL, ASA UNI and ASA VL are designed for pressurised pipe systems under a constant operating pressure of max 2.5 bar.

Details on pressure bearing capacities can be found in the product descriptions.

### Fusion process

FRIAFIT safety fittings can be processed with universal fusion units, e.g. the FRIAMAT series. The fusion parameters are transferred automatically from the fitting's barcode.

### Cooling times

FRIAFIT couplers, sewage insert sleeve, sewage bends, transition fittings and Fixbloc:  
The cooling times (CT) given on the barcodes specify the times until the fused join can be moved.

FRIAFIT sewage saddles ASA TL, ASA UNI, ASA VL and transition saddle ASA TL KG:  
The cooling time given on the saddle's barcode specifies the time until the tap.

Further details can be taken from our assembly instructions.

### Processing

Processing is described in our assembly instructions, which is also available for download on the internet at [www.friafit.com](http://www.friafit.com). This address also provides further details on the products and their processing, approvals, publications, seminar dates, and contacts.

### Statics

The static calculations on the HD-PE sewer pipe must take into account the ambient conditions in each and every case provided by the pipe manufacturer or engineering office.

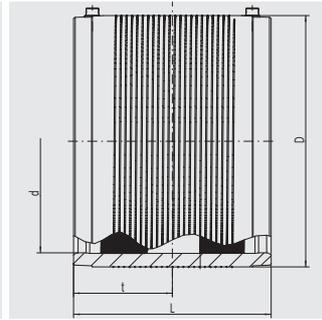
In all cases, the annular rigidity of the pipe join fused with FRIAFIT couplers is greater than the annular rigidity of the inserted pipe.

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## AM

## Couplers SDR 17



For the jointing of HD-PE pipes in non-pressure and pressure systems for sewerage, wastewater or drinking water pipes. With exposed heating coils for optimal heat transfer, large insertion depth, extra wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material for use without holding devices. With pin indicator for visually checking fusion.

## PE 100 SDR 17

## Maximum working pressure 10 bar (water, sewage)

d	Order Ref.	Stock-status	BX	PU	D	L	t	Weight kg/each
110	680001	1	24	192	130	160	80	0.600
125	680013	1	22	176	146	160	80	0.650
160	680002	1	12	96	184	180	90	1.100
180	680003	1	8	64	207	180	90	1.450
200	680004	1	1	75	236	180	90	2.070
225	680005	1	1	52	263	200	100	2.723
250	680006	1	1	44	282	220	110	2.200
280	680007	1	1	32	316	220	110	3.800
315	680008	1	1	24	355	220	110	4.750
355	680009	1	1	24	400	220	110	5.900
400	680010	1	1	12	450	220	110	7.300
450	680011	1	1	6	506	270	135	11.200
500	680012 <sup>①</sup>	1	1	4	562	270	135	14.450
560	680018 <sup>①②</sup>	1	1	2	630	380	190	24.350
630	680019 <sup>①②</sup>	1	1	2	710	420	210	35.000

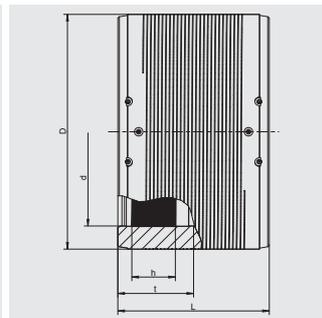
① separate fusion zones.

② with pre-heating barcode for compensation of a larger annular gap.

For the assembly on Close-Fit-Liner please contact our hotline +49 621/486-1896.

## UB SDR 17

## Slide-over Couplers, SDR 17



With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zones plus cold zones at the end and in the middle to prevent the flow of molten material, for use without holding devices. UB d 1000 and above can only be fused with the FRIAMAT XL.

With pre-heating technology.

Special sizes, pressure stages and designs on request.

## PE 100 SDR 17

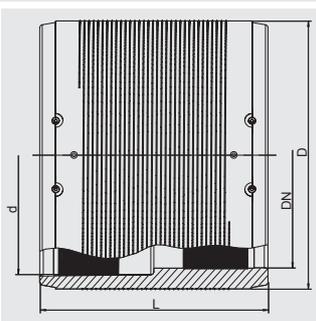
## Maximum working pressure 10 bar (water, sewage)

d	Order Ref.	Stock-status	BX	PU	D	L	B	t	Weight kg/each
710	615994 <sup>①</sup>	1	1	2	800	442	802	221	46.000
800	616290 <sup>①</sup>	1	1	1	900	500	902	250	65.900
900	616345 <sup>①</sup>	1	1	1	1024	500	1026	250	91.500
1000	616403 <sup>①</sup>	1	1	1	1130	610	1132	305	128.000
1200	616416 <sup>①</sup>	3	1	1	1356	670	1358	335	205.000

① separate fusion zones

## REM

## Relining Slide-over Couplers



For connection from relining pipe to standard pipe. With exposed heating coils for optimal heat transfer, large insertion depth, wide fusion zone plus cold zones at the end and in the transition area to prevent the flow of molten material for use without holding devices. Gap reduction between coupler and pipe possible through special preheating barcode. For processing refer to the FRIALEN XL-Assembly Instructions for laying large pipes and relining pipe networks. Other pressure stages and designs on request.

With pre-heating barcode

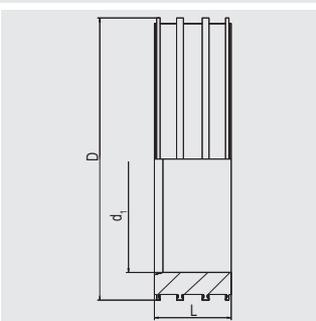
## PE 100 SDR 17

## Maximum working pressure 10 bar (water, sewage)

d/DN	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
110/100	<b>615569</b>	1	24	192	127	150	0.680
160/150	<b>615571</b>	1	12	96	180	180	1.540
315/300	<b>615576</b>	1	1	18	355	285	7.950

## ASF

## Sewage inspection chamber adapter



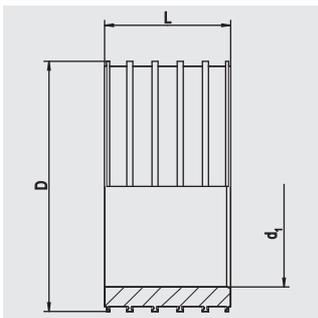
Connecting element between precast concrete manhole and the FRIAFIT sewage insert sleeve AEM. Relieved anchoring webs (T section) around the entire width for a secure seat in the concrete. Defined inner surface for reliable system seal with AEM. Stable inside diameter due to large wall thickness. Flush connection (inside and outside) at bottom of concrete manhole (DIN V 4034).

## PE 100

## Maximum testing pressure 0.5 bar in accordance to DIN EN 1610

Ø Pipe	d <sub>1</sub>	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
110	134	<b>680401</b>	1	12	96	200	135	1.600
160	190	<b>680402</b>	1	8	64	250	135	1.900
180	218	<b>680403</b>	1	6	48	280	135	2.300
200	250	<b>680404</b>	1	4	32	315	135	2.700
225	280	<b>680405</b>	1	4	32	355	135	3.700
280	316	<b>680407</b>	1	4	32	400	135	4.800
315	357	<b>680408</b>	1	1	18	450	135	6.200
355	402	<b>680409</b>	1	1	18	500	135	7.400
400	452	<b>680410</b>	1	1	12	560	135	9.300
450	502	<b>680411</b>	1	3	6	630	135	12.700
500	562	<b>680414</b>	1	3	6	670	135	11.300
560	628	<b>680412</b>	1	3	6	710	135	8.800
630	713	<b>680413</b>	1	1	6	800	135	10.700

Note: When processing pipe dimensions  $\geq d$  710 please contact our hotline +49 621 486-1896

**ASFL****Sewage inspection chamber adapter for masoned canals L = 250 mm**

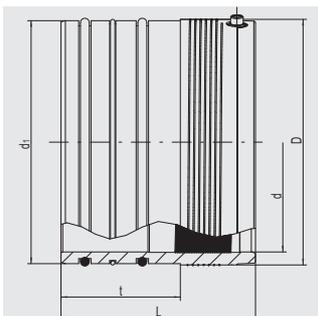
Connecting element between masonry manhole and the FRIAFIT sewage insert sleeve AEM. Relieved anchoring webs (T section) around the entire width for firm and secure fit in manhole with retrospective installation. Defined inner surface for reliable system seal with AEM. Stable inside diameter due to large wall thickness.

**PE 100**

Maximum testing pressure 0.5 bar in accordance to DIN EN 1610

Ø Pipe	d <sub>1</sub>	Order Ref.	Stock-status	BX	PU	D	L	Weight kg/each
225	280	<b>680505</b>	1	2	16	355	250	4.670
280	316	<b>680507</b>	1	2	16	400	250	6.650
315	357	<b>680508</b>	1	2	4	450	250	8.750
355	402	<b>680509</b>	1	1	6	500	250	11.050
450	502	<b>680511</b>	1	2	4	630	250	23.400
560	628	<b>680512</b>	1	1	2	710	250	16.400
630	713	<b>680513</b>	1	1	2	800	250	20.300

Note: When processing pipe dimensions  $\geq d$  710 please contact our hotline +49 621 486-1896

**AEM****Sewage insert sleeve**

For flexible integration of HD-PE pipes in concrete inspection manholes per DIN V 4034 and ATV-DVWK-A 157 in conjunction with the FRIAFIT adapter ASF/ASFL. Connection side to ASF/ASFL has 2 elastomer sealing rings as sealant joint and for optimal press fit. For extra safety, the water absorbent Q sealing ring is included. The jointing side to the HD-PE pipe has exposed heating coils for optimal heat transfer, large insertion depth, extra wide fusion zones plus cold zones at the end to prevent the flow of molten material, for use without holding devices.

Also available with sealing material NBR: Stock status 3

**PE 100**

Maximum testing pressure 0.5 bar in accordance to DIN EN 1610

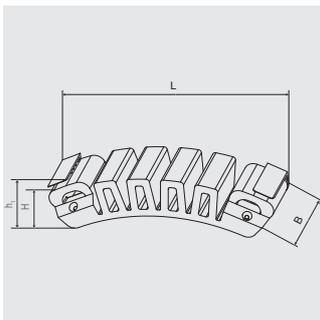
d	d <sub>1</sub>	Order Ref.	Stock-status	BX	PU	D	L	t	Weight kg/each
110	131	<b>680201</b>	1	8	144	133	165	135	0.700
160	187	<b>680202</b>	1	8	64	193	225	135	1.900
180	215	<b>680203</b>	1	1	54	225	220	135	3.100
200	247	<b>680204</b>	1	1	56	250	220	135	3.500
225	277	<b>680205</b>	1	1	32	280	220	135	4.600
250	277	<b>680206</b>	1	1	32	280	220	135	2.500
280	313	<b>680207</b>	1	1	32	315	220	135	3.600
315	354	<b>680208</b>	1	1	24	355	220	135	4.350
355	399	<b>680209</b>	1	1	20	400	220	135	5.800
400	449	<b>680210</b>	1	1	12	450	220	135	8.300
450	499	<b>680211</b>	1	1	8	500	220	135	8.900
500	559	<b>680214</b>	1	1	8	562	220	135	11.050
560	624	<b>680212</b> ①	1	1	4	630	220	135	13.400
630	709	<b>680213</b> ①②	1	1	3	710	270	135	22.400

① with pre-heating barcode for compensation of a larger annular gap

② for HD PE pipes SDR 17 - 33

**FIXBLOC**

**Fixation for absorbing axial thrust and tensile forces**



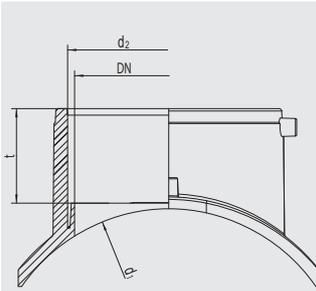
The FIXBLOC is used on PE pipes for the creation of fixed point, as a pull-out protection, assembly aid or fixation to pipe bearing. Strength per fixed point up to 40 kN. Multiple applications possible around the pipe circumference. Processing is carried out with standard tensioning belts with belt width 50mm which are guided securely by two belt clips (easily removable). Minimum length approx. 3,5 x d pipe (longer for multiple applications). If the belt cannot be passed around the circumference of the pipe, the clamping device FIXBLOC-FWFB (only for hire, order no. 613380) can be used, e.g. in case of a PE-Liner, which must be anchored against the concrete wall of a manhole.



**PE 100**

**Maximum shear load per FIXBLOC: 40 kN**

d <sub>i</sub>	Order Ref.	Stock-status	BX	PU	H	h1	L	B	Weight kg/each
160 - 1600	<b>680600</b>	1	15	750	40	45	220	60	0.310

**ASA TL****Sewage saddle top loading**

The FRIAFIT sewage saddle ASA-TL is a compact component consisting of a fusion saddle with an integral fusion coupler at its outlet (d 160). The FRIAFIT sewage saddle can be used to join sewer pipes to an existing main sewer system made of HD-PE. With exposed heating element for optimal heat transfer. Tapping area free of heating wires. The FRIAFIT sewage saddle is fixed onto the pipe using the FWFIT clamping and drilling unit, and tapping takes place after the specified cooling time.

When processing d 200 with pipes SDR 11 - 33 and d 225 - d 315 with pipes SDR 26 - 33 please take care of special assembly instructions.

**PE 100****Maximum operating pressure 2,5 bar**

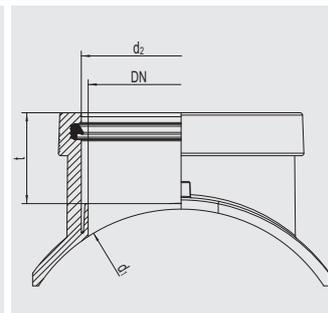
d <sub>1</sub>	d <sub>2</sub>	DN	Order Ref.	Stock-status	BX	PU	t	Weight kg/each
200	160	150	<b>682618</b>	1	8	64	76	1.000
225	160	150	<b>682613</b>	1	8	64	76	1.050
250	160	150	<b>682619</b>	1	10	80	76	0.990
280	160	150	<b>682614</b>	1	10	80	76	0.990
315	160	150	<b>682615</b>	1	10	80	76	0.990
355	160	150	<b>682620</b>	1	10	80	76	0.990
400	160	150	<b>682621</b>	1	10	80	76	0.890
450	160	150	<b>682616</b>	1	10	80	76	1.020
500/560/630	160	150	<b>682622</b>	1	10	80	76	1.020

For the assembly on Close-Fit-Inliner and d 560 and d 630 please contact our hotline +49 621/486-1896.



## ASA TL KG

### Transition saddle top loading



The FRIAFIT transition saddle ASA-TL/KG is a compact component consisting of a fusion saddle with an integral fusion coupler at its outlet (d 160). The FRIAFIT transition saddle is used to connect PVC/PP DN 150 sewer pipes to an existing HD-PE main sewer. With exposed heating element for optimal heat transfer. Tapping area free of heating wires. The FRIAFIT transition saddle is fixed onto the pipe using the FWFIT clamping and drilling unit and tapping takes place after the specified cooling time.

When processing d 225 - d 315 with pipes SDR 26 - 33 please take care of special assembly instructions.



#### PE 100

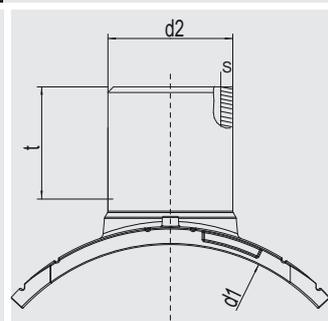
Maximum testing pressure 0.5 bar in accordance to DIN EN 1610

d <sub>1</sub>	d <sub>2</sub>	DN	Order Ref.	Stock-status	BX	PU	t	Weight kg/each
225	160	150	<b>682624</b>	1	8	64	76	1.192
280	160	150	<b>682625</b>	1	10	80	76	1.106
315	160	150	<b>682626</b>	1	10	80	76	1.106
355	160	150	<b>682627</b>	1	10	80	76	1.106
450	160	150	<b>682628</b>	1	10	80	76	1.136
500/560/630	160	150	<b>682629</b>	1	10	80	76	1.136

For the assembly on Close-Fit-Inliner and d 560 and d 630 please contact our hotline +49 621/486-1896.

## ASA UNI

### Spigot Saddles with outlet spigot SDR 17



For integration of a branch line in PE pipelines –unpressurised or under operating pressure. Compact fitting made of HD-PE. Saddle with exposed heating element for optimal heat transfer. The outlet spigot d 160 offers a levelled passage when using pipes SDR 17/17.6. For processing with FRIAFIT couplers AM or FRIAFIT bends ABM/ABMS. Suitable for all pipe diameters in the given range using the FRIATOOLS clamping unit UNITOP (Order Ref. 613385). Tapping in unpressurised condition with FRIATOOLS tapping kit FWAB XL (Order Ref. 613838). With pin indicator for visually checking fusion.

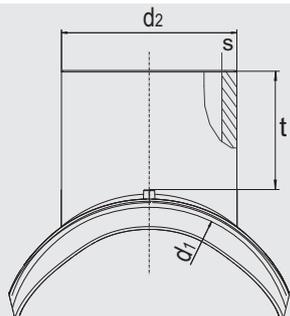


#### PE 100

Maximum working pressure 2,5 bar (sewage)

d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	PU	t	s	Weight kg/each
630-900	160	<b>682639</b>	1	5	40	98	9,5	1.650

Also suitable for all special dimensions in relining application. For intermediate sizes in the diameter range d 280 - < d 315, please use SA UNI d 250 - 280.

**ASA VL****Sewage Saddle Vacuum-Loading**

For jointing of large branches at HD-PE main pipes with less effort, minimal underground work and without interrupting the operation. HD-PE saddles with exposed heating element for optimal heat transfer. Outlet spigot d 225 for use with FRIAFIT-Coupler AM or transition coupler AMKG d225 on PVC/PP DN 200. Innovative vacuum clamping unit for safe bridging of even large pipe out-of-roundnesses and pipe shape deviations, which allows the additional possibility for a leak test before tapping.

**PE 100****Maximum working pressure 2,5 bar (sewage)**

d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	PU	t	s	Weight kg/each
355	225	<b>682640</b>	1	1	4	144	13,4	3.080
450	225	<b>682641</b>	1	1	6	144	13,4	2.900
560	225	<b>682642</b>	1	1	6	144	13,4	3.065
630	225	<b>682643</b>	1	1	6	144	13,4	3.080

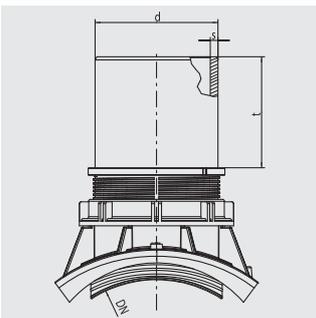
**Cross-dimensional processing**

Ø Pipe	d2	Order Ref.
315 + 400	225	682640
500	225	682641
710	225	682643

The assembly of the ASA-VL is carried out using the FRIATOOLS vacuum pump (Order Ref. 613827) and the FRIATOOLS plunger (Order Ref. 613823).

A cross-dimensional processing requires additionally the ASA-VL mounting aid (Order Ref. 613371).

Flush tapping with drilling equipment FWAB ASA 225 (Order Ref. 613835).

**ASA MULTI****Connecting Spigot to clay and concrete pipes**

For the connection of fused HD-PE service pipes or side branches to clay or concrete mains. For new installations as well as rehabilitation - without separating or completely exposing the main sewer. The outlet spigot d 160 offers a levelled passage when using pipes SDR17/17.6. Its bright inner surface facilitates an optimal view during camera inspection. Fusible with FRIAFIT coupler AM or FRIAFIT bends ABM/ABMS.

For the assembly of the FRIAFIT connecting spigot the assembly key ASA-MULTI-MS is required

**PE 100****Maximum testing pressure 0.5 bar in accordance to DIN EN 1610**

d	DN	Order Ref.	Stock-status	BX	PU	H	B	t	s	Weight kg/each
160	250	<b>682650</b> ①	1	5	40	250	265	146	9,5	2.700
160	250/300	<b>682651</b> ②③	1	5	40	250	265	146	9,5	2.800
160	300/350	<b>682651</b> ②③	1	5	40	250	265	146	9,5	2.800

① Suitable for connection to clay pipes DN 250 N and DN 250 H (standard and high-performance series EN 295)

② Suitable for connection to concrete pipes DN 250/DN 300 (EN1916)

③ Suitable for connection to clay pipes DN 300/350 N and DN 300/DN 350 H (standard and high-performance series EN 295)

**ASA MULTI MS****Assembly key**

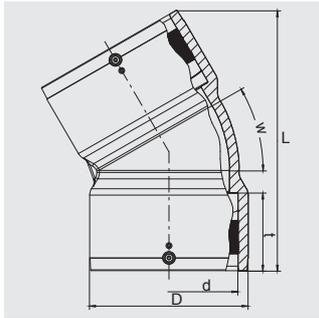
For the safe and quick installation of the FRIAFIT connecting spigot ASA-MULTI.

Order Ref.

**682660**

Stock-status

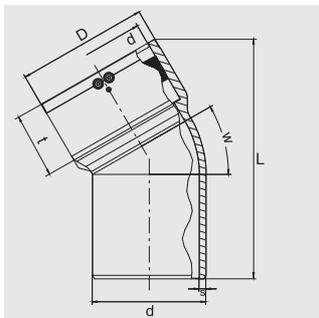
1

**ABM****Sewage bends (coupler/coupler)**

Little space required thanks to compact design as well as angle spacings of 15°, 30°, 45° facilitate a comfortable pipeline routing. Fusion couplers integrated on both ends to reduce the assembly time with exposed heating coils for an optimal heat transfer. The smooth, hydraulically optimised internal contour offers a level passage when pipes SDR 17/17.6 are used. The bright surface facilitates an optimal view during camera inspection. With pin indicator for visually checking fusion

**PE 100****Maximum working pressure 2,5 bar**

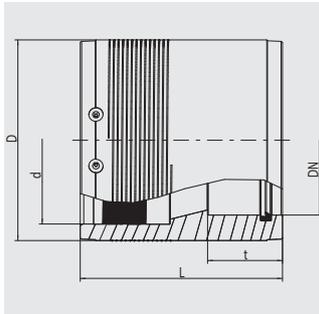
d	w	Order Ref.	Stock-status	BX	PU	D	L	t	Weight kg/each
160	15°	<b>681100</b>	1	6	48	185	279	92	1.870
160	30°	<b>681101</b>	1	6	48	185	306	92	2.100
160	45°	<b>681102</b>	1	6	48	185	320	92	2.060

**ABMS****Sewage bends (coupler/pipe spigot)**

Little space required thanks to compact design as well as angle spacings of 15°, 30°, 45° facilitate a comfortable pipeline routing. Coupler end with exposed heating coil for optimal heat transfer. Pipe spigots specifically suited for direct fusion into the FRIAFIT sewage saddle ASA-TL. Angles of 60°, 90° etc. can be produced by using ABM repeatedly. The smooth, hydraulically optimised internal contour offers a level passage when pipes SDR 17/17.6 are used. The bright surface facilitates an optimal view during camera inspection. With pin indicator for visually checking fusion.

**PE 100****Maximum working pressure 2,5 bar**

d	w	Order Ref.	Stock-status	BX	PU	D	L	t	s	Weight kg/each
160	15°	<b>681103</b>	1	6	48	185	286	92	9,5	1.510
160	30°	<b>681104</b>	1	6	48	185	329	92	9,5	1.680
160	45°	<b>681105</b>	1	6	48	185	325	92	9,5	1.730

**AMKG****Transition coupler PE - PVC/PP**

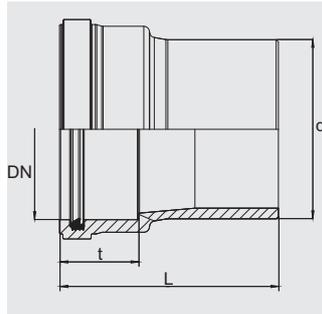
Smooth material transition of HD-PE pipes (SDR 33 - SDR 17) to PVC/PP pipes in house service connections. HD-PE end with integrated coupler. PVC/PP end as slip-on coupler with SBR lip seal and a large insertion depth.

**PE 100****Maximum testing pressure 0.5 bar in accordance to DIN EN 1610**

d/DN	Order Ref.	Stock-status	BX	PU	D	L	t	Weight kg/each
160/150	<b>682630</b>	1	1	120	193	183.5	80	1.780
225/200	<b>682631</b>	1	1	32	270	270	100	5.820

## UKG

## Transition piece PE – PVC/PP



Smooth material transition in domestic range between HD-PE pipes (SDR 33 - SDR 17) and PVC/PP pipes. HD-PE side can be fused with FRIAFIT AM sewage coupler, bends ABM/ABMS or with the outlet of the FRIAFIT ASA-TL sewage saddle. PVC/PP side as socket coupler with SBR lip seal gasket and large insertion depth.

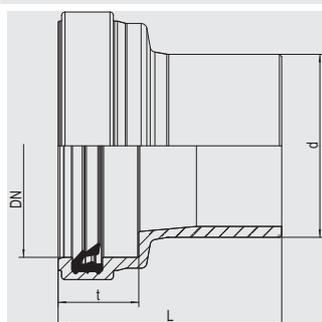
## PE 100

Maximum testing pressure 0.5 bar in accordance to DIN EN 1610

d/DN	Order Ref.	Stock-status	BX	PU	L	t	Weight kg/each
160/150	682617	1	12	96	194	70	1.070

## USTZ

## Transition piece PE - clay



Smooth material transition in domestic range between HD-PE pipes (SDR 33 - SDR 17) and clay pipes (spigot ends). HD-PE side can be fused with FRIAFIT AM sewage coupler, ABM/ABMS bends, or with the outlet of the FRIAFIT ASA-TL sewage saddle. Clay side as socket coupler with SBR lip seal gasket and large insertion depth.

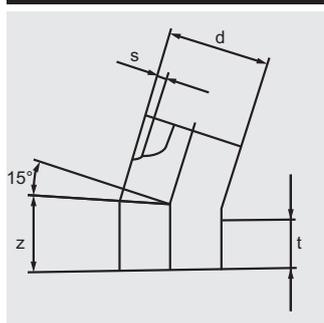
## PE 100

Maximum testing pressure 0.5 bar in accordance to DIN EN 1610

d/DN	Order Ref.	Stock-status	BX	PU	L	t	Weight kg/each
160/150	682623	1	2	36	194	70	1.250

## ABS 15

## Sewage bends 15° (spigot fittings)

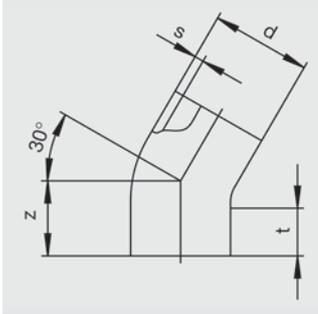


HD-PE fitting for use with FRIAFIT sewage sleeve AM without holding devices. Pipe colour black with bright inner surface (according to availability)

## PE 80/PE 100

Maximum testing pressure 0.5 bar in accordance to DIN EN 1610

d	Order Ref.	Stock-status	BX	Z	t	s	Weight kg/each
110	681004	3	1	230	170	6,6	1.050
125	681005	3	1	250	170	7,4	1.450
160	681006	3	1	280	170	9,1	2.780
180	681007	3	1	315	250	10,2	3.770
225	681008	3	1	370	250	12,8	6.870

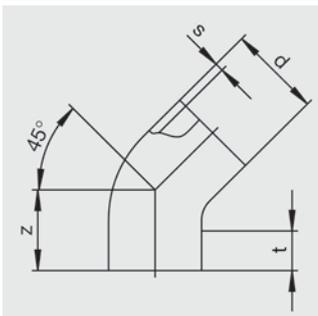
**ABS 30****Sewage bends 30° (spigot fittings)**

HD-PE fitting for use with FRIAFIT sewage sleeve AM without holding devices.  
Pipe colour black with bright inner surface (according to availability)

**PE 80/PE 100**

Maximum testing pressure 0.5 bar in accordance to DIN EN 1610

d	Order Ref.	Stock-status	BX	Z	t	s	Weight kg/each
110	<b>681009</b>	3	1	230	170	6,6	1.050
125	<b>681010</b>	3	1	250	170	7,4	1.450
160	<b>681001</b>	3	1	280	170	9,1	2.780
180	<b>681002</b>	3	1	317	250	10,2	3.770
225	<b>681003</b>	3	1	371	250	12,8	6.870
280	<b>681022</b>	3	1	440	300	15,9	12.500
315	<b>681021</b>	3	1	480	300	17,9	17.400
355	<b>681019</b>	3	1	520	300	20,1	22.100

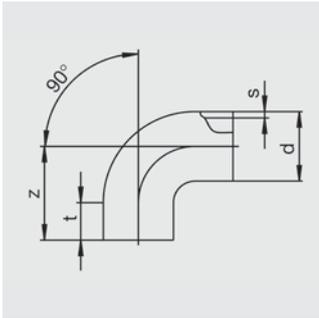
**ABS 45****Sewage bends 45° (spigot fittings)**

HD-PE fitting for use with FRIAFIT sewage sleeve AM without holding devices.  
Pipe colour black with bright inner surface (according to availability)

**PE 80/PE 100**

Maximum testing pressure 0.5 bar in accordance to DIN EN 1610

d	Order Ref.	Stock-status	BX	Z	t	s	Weight kg/each
110	<b>681011</b>	3	3	235	170	6,6	1.050
125	<b>681012</b>	3	3	250	170	7,4	1.450
160	<b>681201</b>	3	1	280	170	9,1	2.780
180	<b>681202</b>	3	1	320	250	10,2	3.770
200	<b>681203</b>	3	1	349	250	11,4	5.000
225	<b>681204</b>	3	1	380	250	12,8	6.870
250	<b>681205</b>	3	1	411	250	14,2	9.210
280	<b>681206</b>	3	1	448	300	15,9	12.500
315	<b>681207</b>	3	1	491	300	17,9	17.400
355	<b>681208</b>	3	1	541	300	20,1	24.300

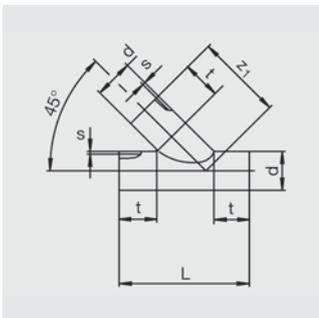
**ABS 90****Sewage bends 90° (spigot fittings)**

HD-PE fitting for use with FRIAFIT sewage sleeve AM without holding devices.  
Pipe colour black with bright inner surface (according to availability)

**PE 80/PE 100**

Maximum testing pressure 0.5 bar in accordance to DIN EN 1610

d	Order Ref.	Stock-status	BX	Z	t	s	Weight kg/each
160	<b>681601</b>	3	1	390	100	9,1	3.230
180	<b>681602</b>	3	1	420	150	10,2	4.370
225	<b>681603</b>	3	1	488	150	12,8	7.440

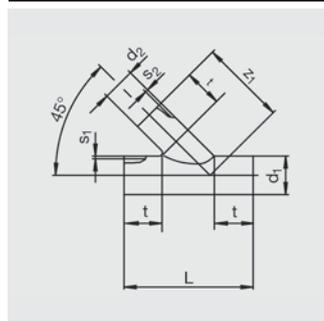
**ATS 45****Equal branch 45° (spigot fittings)**

HD-PE fitting for use with FRIAFIT sewage sleeve AM without holding devices.  
Pipe colour black with bright inner surface (according to availability)

**PE 80/PE 100**

Maximum testing pressure 0.5 bar in accordance to DIN EN 1610

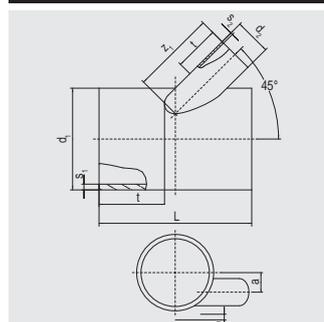
d	Order Ref.	Stock-status	BX	L	t	s	z <sub>1</sub>	Weight kg/each
110	<b>682001</b>	3	1	510	170	6,6	340	1.700
125	<b>681013</b>	3	1	530	190	7,4	340	2.400
160	<b>682002</b>	3	1	600	150	9,1	450	4.100
180	<b>682003</b>	3	1	680	230	10,2	450	5.400
200	<b>682004</b>	3	1	750	260	11,4	490	8.000
225	<b>682005</b>	3	1	800	270	12,8	530	10.500
250	<b>682006</b>	3	1	940	330	14,2	610	15.100
280	<b>682007</b>	3	1	1000	350	15,9	650	19.700
315	<b>682008</b>	3	1	1100	400	17,9	700	28.800
355	<b>682009</b>	3	1	1280	430	20,1	850	38.300

**ATSR 45****Unequal branch 45° (spigot fittings)**

HD-PE fitting for use with FRIAFIT sewage sleeve AM without holding devices.  
Pipe colour black with bright inner surface (according to availability)

**PE 80/PE 100****Maximum testing pressure 0.5 bar in accordance to DIN EN 1610**

d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	L	t	z <sub>1</sub>	s <sub>1</sub>	s <sub>2</sub>	Weight kg/each
160	110	<b>682201</b>	3	1	471	150	263	9,1	6,6	2.700
225	160	<b>682203</b>	3	1	626	200	359	12,8	9,1	7.200
280	160	<b>682204</b>	3	1	626	200	398	15,9	9,1	10.400
280	225	<b>682205</b>	3	1	718	200	398	15,9	12,8	13.400
315	160	<b>682206</b>	3	1	626	200	423	17,9	9,1	12.800
315	225	<b>682207</b>	3	1	718	200	423	17,9	12,8	16.300
355	160	<b>682208</b>	3	1	626	200	451	20,1	9,1	15.900
355	225	<b>682209</b>	3	1	718	200	451	20,1	12,8	19.900
450	160	<b>682210</b>	3	1	666	220	538	26,7	9,5	26.000

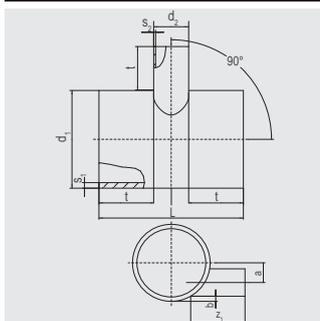
**ATSRS 45****Unequal branch 45° with excentric outlet (spigot fittings)**

HD-PE fitting with excentric outlet for use with FRIAFIT sewage coupler AM without holding devices. Pipe colour black with bright inner surface (according to availability)

Note: Please name the required outlet side (right/left) in flow direction when ordering

**PE 80/PE 100****Maximum testing pressure 0.5 bar in accordance to DIN EN 1610**

d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	L	t	z <sub>1</sub>	s <sub>1</sub>	s <sub>2</sub>	a	b	Weight kg/each
315	160	<b>682301</b>	3	1	630	200	320	17,9	9,1	50	30	13.400
315	225	<b>682302</b>	3	1	720	200	320	17,9	12,8	20	25	17.400
355	160	<b>682303</b>	3	1	630	200	335	20,1	9,1	68	30	16.600
355	225	<b>682304</b>	3	1	720	200	335	20,1	12,8	40	25	20.900
450	160	<b>682305</b>	3	1	670	200	370	25,5	9,1	115	30	26.600
450	225	<b>682306</b>	3	1	760	200	370	25,5	12,8	87	25	32.300
560	160	<b>682307</b>	3	1	670	200	410	31,7	9,1	170	30	39.900
560	225	<b>682308</b>	3	1	760	200	410	31,7	12,8	142	25	47.600
630	160	<b>682309</b>	3	1	670	200	440	35,7	9,1	205	30	49.900
630	225	<b>682310</b>	3	1	760	200	440	35,7	12,8	177	25	59.100

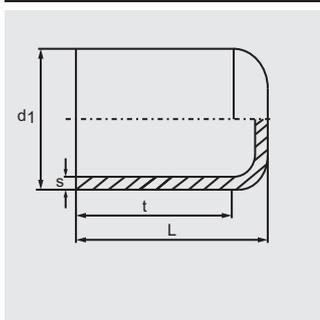
**ATSRS 90****Unequal branch 90° with excentric outlet (spigot fittings)**

HD-PE fitting with eccentric outlet for use with FRIAFIT sewage coupler AM without holding devices. Pipe colour black with bright inner surface (according to availability)

**PE 80/PE 100**

Maximum testing pressure 0.5 bar in accordance to DIN EN 1610

d <sub>1</sub>	d <sub>2</sub>	Order Ref.	Stock-status	BX	L	t	z <sub>1</sub>	s <sub>1</sub>	s <sub>2</sub>	a	b	Weight kg/each
315	160	<b>682401</b>	3	1	565	200	280	17,9	9,1	50	30	12.100
315	225	<b>682402</b>	3	1	630	200	280	17,9	12,8	20	25	15.300
355	160	<b>682403</b>	3	1	660	200	290	20,1	9,1	68	30	17.000
355	225	<b>682404</b>	3	1	730	200	290	20,1	12,8	40	25	20.700
450	160	<b>682405</b>	3	1	660	200	315	25,5	9,1	115	30	25.600
450	225	<b>682406</b>	3	1	730	200	315	25,5	12,8	87	25	30.700
560	160	<b>682407</b>	3	1	660	200	340	31,7	9,1	170	30	39.000
560	225	<b>682408</b>	3	1	730	200	340	31,7	12,8	142	25	45.300
630	160	<b>682409</b>	3	1	660	200	360	35,7	9,1	205	30	48.800
630	225	<b>682410</b>	3	1	730	200	360	35,7	12,8	177	25	56.200

**AES****Sewage end cap (spigot fittings)**

HD-PE fitting for use with FRIAFIT sewage sleeve AM without holding devices.

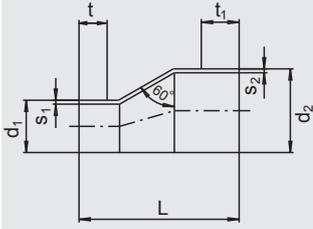
**PE 80/PE 100**

Maximum testing pressure 0.5 bar in accordance to DIN EN 1610

d <sub>1</sub>	Order Ref.	Stock-status	BX	L	t	s	Weight kg/each
110	<b>681014</b>	3	1	115	85	6,6	0.366
125	<b>681015</b>	3	1	125	95	7,4	0.450
160	<b>681016</b>	3	1	140	105	9,5	0.850
225	<b>681017</b>	3	1	145	127	13,4	2.000

**RES****Reducers excentric (spigot fittings)**

HD-PE fitting for use with FRIAFIT sewage sleeve AM without holding devices.

**PE 80/PE 100****Maximum testing pressure 0.5 bar in accordance to DIN EN 1610**

$d_1$	$d_2$	Order Ref.	Stock-status	BX	L	t	$t_1$	$s_1$	$s_2$	Weight kg/each
110	125	<b>681018</b>	3	1	264	85	85	6,6	7,4	1.000
110	160	<b>681801</b>	3	1	310	90	95	6,6	9,5	1.200
160	225	<b>681802</b>	3	1	404	100	150	9,5	13,4	2.530
225	280	<b>681810</b>	3	1	540	150	250	13,4	16,6	5.460

 Aliaxis



## FRIATOOLS® TECHNICAL EQUIPMENT

The matching equipment and tools  
for HD-PE pipe systems

Product Range EZ 32/19

## Things worth knowing about FRIATOOLS® Technical Equipment and this Product Range

### FRIAMAT area of application

FRIAMAT electrofusion units operate reliably at ambient temperatures from -20°C to +50°C. The range of application depends on the power requirement of the fitting to be welded and the respective processing temperature. FRIATEC recommends for the processing of FRIALEN and FRIAFIT couplers over the temperature range from -20°C up to +50°C the use FRIAMAT Universal Fusion Units up to d 900 and of FRIAMAT XL up to d 1200.

The use of FRIAMAT fusion units for the processing of fittings from other manufacturers, also up to d 1200 and bigger, is basically possible. Please refer to the specific performance requirements of fittings from other manufacturers in consideration of the predominant processing temperature.

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	Universal fusion unit without documentation function	FRIAMAT basic 89
NEW	Universal fusion unit without documentation function	FRIAMAT basic eco 89
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	Reader wand	FWLESST 89
	Memory-Stick	MEMSTICK 90
	Mini barcode scanner	MINISCAN 89
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**FRIAMAT prime****Universal fusion unit with traceability and documentation function**

Powerful electrofusion unit with state-of-the-art converter technology and active cooling.

Graphical maxi display for very easy operator guidance. Documentation of fusion and traceability data. Memory space for up to 1,000 fusion logs. USB interface for data transfer via FRIATEC memory stick (included). Data output formatted in FRIATRACE database, as pdf- or as csv-document.

Supervisor pass for the individual setting of unit functions (e.g. locking of functions, defaults for forced processes etc.).

With reader wand or optional with scanner for barcode reading, adapter bag, entry of GPS coordinates, entry of info texts via barcode, language selection, adjustable buzzer volume, manual emergency entry. Extra-long power cable (4 m) and extra-long fusion cable (5 m). Weight approx 12,8 kg. The tool is delivered in a transport box.

Version	Order Ref.	Stock-status
with reader wand	<b>613103</b>	3
with mini barcode scanner	<b>611103</b>	3

**FRIAMAT prime eco****Universal fusion unit with documentation and traceability function**

High performance due to innovative toroidal transformer technology with flow-optimized, active cooling.

High-resolution, extremely bright 4.3 "TFT color display. Bluetooth interface. Documentation of fusion and traceability data. Memory space for up to 20,000 fusion logs. CSV or PDF file or FRIATRACE format output to standard USB stick. With reader wand or Mini-scanner, adapter bag, language selection, adjustable buzzer volume, manual emergency entry. Extra-long power cable (4 m) and extra-long fusion cable (5 m). Weight approx 18,0 kg.

The tool is delivered in a transport box.

Version	Order Ref.	Stock-status
<b>NEW</b> with reader wand	<b>613124</b>	3
<b>NEW</b> with mini scanner	<b>611124</b>	3

**FRIAMAT XL****Large pipe fusion unit with traceability and documentation function**

Extra powerful FRIAMAT XL electrofusion unit for the processing of the FRIALEN XL product range. Also universally usable for the entire FRIALEN and FRIAFIT range.

Graphical maxi display for easy operator guidance. USB interface for data transfer via FRIATEC memory stick (included). Data output formatted in FRIATRACE database, or as pdf-document. With scanner for barcode reading and accessories bag on the rear. Entry of GPS coordinates, entry of info texts via barcode, language selection, adjustable buzzer volume, manual emergency entry. Extra-long power cable (4 m) with CEE connector 400 V. Extra-long fusion cable (4 m). Weight approx 50 kg. The tool is delivered in a transport box.

Version	Order Ref.	Stock-status
with barcode scanner	<b>613091</b>	3

**FRIAMAT print eco****Universal fusion unit with easy documentation function**

High performance due to innovative toroidal transformer technology with flow-optimized, active cooling.

High-resolution, extremely bright 4.3 "TFT color display. Easy documentation of fusion data. Memory space for up to 1,000 fusion logs. PDF file output to standard USB stick.

With reader wand or Mini-scanner, adapter bag, language selection, adjustable buzzer volume, manual emergency entry. Extra-long power cable (4 m) and extra-long fusion cable (5 m). Weight approx 18,0 kg.

The tool is delivered in a transport box.

Version	Order Ref.	Stock-status
<b>NEW</b> with reader wand	<b>613122</b>	3
<b>NEW</b> with mini scanner	<b>611122</b>	3

**FRIAMAT basic**

**Universal fusion unit without documentation function**



Powerful electrofusion unit with state-of-the-art converter technology and active cooling.  
 With reader wand or optional with scanner for barcode reading, adapter bag, clear display for very easy operator guidance, language selection, adjustable buzzer volume, manual emergency entry.  
 Extra-long power cable (4 m) and extra-long fusion cable (5 m). Weight approx 12,8 kg.  
 The tool is delivered in a transport box.

Version	Order Ref.	Stock-status
with reader wand	<b>613104</b>	3
with mini barcode scanner	<b>611104</b>	3

**FRIAMAT basic eco**

**Universal fusion unit without documentation function**

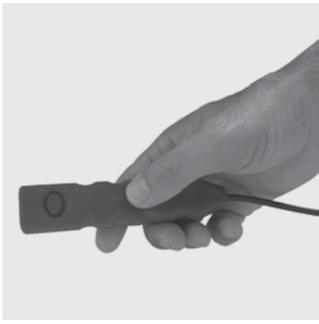


High performance due to innovative toroidal transformer technology with flow-optimized, active cooling.  
 High-resolution, extremely bright 4.3 "TFT color display.  
 With reader wand or Mini-scanner, adapter bag, language selection, adjustable buzzer volume, manual emergency entry. Extra-long power cable (4 m) and extra-long fusion cable (5 m). Weight approx 18,0 kg.  
 The tool is delivered in a transport box.

Version	Order Ref.	Stock-status
<b>NEW</b> with reader wand	<b>613120</b>	3
<b>NEW</b> with mini scanner	<b>611120</b>	3

**MINISCAN**

**Mini barcode scanner**



Handy and robust FRIAMAT mini scanner for reliable reading of fusion and traceability barcodes. With handy scanner bag for storage. Can be used for all current FRIAMAT electrofusion units in this product range, elderly units on request.

Order Ref.	Stock-status
<b>624005</b>	1

**FWLESST**

**Reader wand**



FRIAMAT reader wand for reading of fusion- and traceability barcodes.  
 Can be used for all FRIAMAT electrofusion units.

Order Ref.	Stock-status
<b>623645</b>	1

FRIATOOLS®

**MEMSTICK**

**Memory-Stick**



Memory-Stick for the storage of fusion data in FRIATRACE database, as pdf- or csv-data Transfer of fusion data from FRIAMAT electrofusion units (only documentation units) for processing to the PC.

Order Ref.	Stock-status
<b>624023</b>	1

**FRIATRACE**

**Database software FRIATRACE**



Software for processing of fusion data including traceability data from FRIAMAT fusion units with traceability- and documentation function. Suitable for operating systems Windows 2000/ XP / Windows 7. With database function (all fusion data in one database) for individual evaluation, copying, sorting, searching, formatting, editing etc.

Available as:

- FRIATRACE database software consisting of FRIATRACE CD-Rom, connecting cable PC – fusion unit and programme description or
- FRIATRACE combi-package consisting of FRIATRACE CD-Rom, Memory-Stick and programme description.

Article description	Order Ref.	Stock-status
FRIATRACE database software	<b>613280</b>	1
FRIATRACE combi-package	<b>624026</b>	1

**PA USB**

**FRIAMAT Parallel-USB-Adapter**



For the connection of a printer with USB Type-B port to FRIAMAT fusion units, manufactured from 2000 with parallel interface. It allows direct printing of fusion data to a USB printer (GDI printers are not supported). The power is supplied via the included power supply. Adapters included.

Order Ref.	Stock-status
<b>613263</b>	1

**SUPER P**

**Supervisor-Pass**



For individual adjustment of menu functions of FRIAMAT XL and FRIAMAT prime (e.g. blocking of functions, defaults for forced processes, etc.).

For ordering, please request a form.

Order Ref.	Stock-status
<b>623101</b>	3

**SPASS**

**Fusion-Pass**



Serves the identification of the welder and the protection of the FRIAMAT electrofusion units (only documentation units) against unauthorised access. The data stored in the fusion pass (welder number or welder's name) are transmitted to the fusion record.

For ordering, please request a form.

Order Ref.	Stock-status
<b>623100</b>	3

**FPASS**

**Remote Start/Stop Pass**



For the remote start of all FRIAMAT fusion units from the trench using a reader wand or barcode scanner. Lanyard included.

Order Ref.	Stock-status
<b>624003</b>	1

**ALTK FMT**

**Transport boxes**



For transport and storage of FRIAMAT fusion units. Transport boxes for older FRIAMAT types on request.

Version	Order Ref.	Stock-status
FRIAMAT prime / basic	<b>627600</b>	1
FRIAMAT prime eco / basic eco (from 2018)	<b>627001</b>	1
FRIAMAT prime eco / basic eco / geo print (up to 2018)	<b>627001</b>	1
FRIAMAT XL	<b>613302</b>	1

**CONTACT4**

**Socket contacts 4.0 mm**



Socket contacts 4.0 mm. Can be used for all FRIAMAT fusion units.

Order Ref.	Stock-status
<b>624529</b>	1

FRIATOOLS®

**ADFL****Adapter for flat contacts**

For sliding onto socket contacts of all FRIAMAT fusion units.

Order Ref.

**613236**

Stock-  
status

1

**ADBK****Adapter for 4.7 mm socket contacts**

For sliding onto socket contacts of all FRIAMAT fusion units.

Order Ref.

**613237**

Stock-  
status

1

**FWSG RA****Compact scraper tool for pipes and outlets d 25 - d 63**

Dimension-bound compact scraper tool for the reliable removal of the oxide layer of HDPE and PE-Xa pipes and at the outlets of FRIALEN safety fittings. Super long scraping length, in the diameter d 32 also for FRIALONG long couplers. Scraper blade made of carbide with 2 edges (twice the service life). Automatic compensation of pipe out-of-roundness and tolerances. Manual operation, with hand crank or cordless screwdriver.

Article description	Dimension	SDR	Order Ref.	Stock-status
<b>NEW</b> FWSG RA 25	d 25	SDR 11	<b>613576</b> ①	
FWSG RA 32	d 32	SDR 11	<b>613580</b>	1
FWSG RA 40	d 40	SDR 11	<b>613581</b>	1
FWSG RA 50	d 50	SDR 11	<b>613582</b>	1
FWSG RA 63	d 63	SDR 11	<b>613583</b>	1
Hand crank	all dimensions		<b>613579</b>	1
Transport box	all dimensions		<b>613586</b>	1

① Q1/2019

**FWSG 63****Scraper tools for pipes d 20 – d 63**

For the reliable removal of the oxide layer of HDPE and PE-Xa pipes. Scraper blade made of carbide designed as reversible blades with 2 cutting edges (twice the service life). Universal scraping ranges, no dimension adjustment required. Even swarf removal thanks to a spring-loaded scraper blade and automatic feed. The tool is delivered in a transport box.

Order Ref.	Stock-status
<b>NEW 613408</b>	1

**FWSG 225****Scraper tool for pipes d 75 – d 225**

For the reliable removal of the oxide layer of HDPE and PE-Xa pipes. Scraper blade made of carbide for a long life. Even swarf removal thanks to a spring-loaded scraper blade and automatic feed. Includes a replacement blade. The tool is delivered in a transport box.

Order Ref.	Stock-status
<b>613311</b>	1

**FWSG 710 L****Scraper tool for pipes d 250 – d 710**

For the reliable removal of the oxide layer of HDPE and PE-Xa pipes for half or entire coupler length. Scraper blade made of carbide for a long life. Even swarf removal thanks to a spring-loaded scraper blade and automatic feed. Includes a replacement blade. The tool is delivered in a transport box.

Order Ref.	Stock-status
<b>613642</b>	1

**FWSG 710 S****Scraper tool for pipes d 250 – d 710 and spigot fittings**

For the reliable removal of the oxide layer on spigot fittings. Additionally it is also possible to scrape HDPE and PE-Xa-pipes (maximum along half length of couplers d 710). Scraper blade made of carbide for a long life. Even swarf removal thanks to a spring-loaded scraper blade and automatic feed. Includes a replacement blade. The tool is delivered in a transport box.

Order Ref.

**613639**Stock-  
status

1

**FWSG 900 L****Scraper tool for pipes d 630 - d 900**

For the reliable removal of the oxide layer of HDPE pipes for half or entire coupler length. Scraper blade made of carbide for a long life. Even swarf removal thanks to a spring-loaded scraper blade and automatic feed. Includes a replacement blade. The tool is delivered in a transport box.

Order Ref.

**613644**Stock-  
status

1

**FWSG XL****Large pipe scraper tool for pipes d 800 to d 1200**

For the reliable removal of the oxide layer of large pipes made of HDPE in the diameter range d 800 to d 1200, SDR11-SDR33. Modular design for easy handling and quick assembly. Diameter adjustment through quick setting. Center-supported drive via hand crank. Automatic compensation of pipe out-of-roundness and tolerances through spring-supported adjustable blade unit. Scraper blade designed as turning blade with 2 cutting edges (twice the service life). The tool is delivered in a transport box.

Order Ref.

**613645**Stock-  
status

3

**FWSG SE****Scraper tools for pipe ends and saddle areas d 63 – d 315**

Dimension-bound scraper tool for the reliable removal of the oxide layer of HDPE and PE-Xa pipe ends and in the saddle area. Scraper blade designed as turning blade with 2 blades (twice the service life). Easy clamping thanks to the open design of the scraper tool. The tool is delivered in a transport box.

Article description	Dimension	Order Ref.	Stock-status
FWSG SE 63	d 63	<b>613562</b>	1
FWSG SE 75	d 75	<b>613563</b>	1
FWSG SE 90	d 90	<b>613564</b>	1
FWSG SE 110	d 110	<b>613565</b>	1
FWSG SE 125	d 125	<b>613566</b>	1
FWSG SE 140	d 140	<b>613567</b>	1
FWSG SE 160	d 160	<b>613568</b>	1
FWSG SE 180	d 180	<b>613569</b>	1
FWSG SE 200	d 200	<b>613570</b>	1
FWSG SE 225	d 225	<b>613571</b>	1
FWSG SE 250	d 250	<b>613572</b>	1
FWSG SE 280	d 280	<b>613573</b>	1
FWSG SE 315	d 315	<b>613574</b>	1

## FWSGE

## Replacement blades for scraper tools

Replacement blades made of carbide (long storage and service life).

(Fig. shows FWSGE 3)

Article description	Unit type	Marking	Order Ref.	Stock-status
FWSGE 3	FWSG 225	coloured red	<b>613322</b> ①	1
FWSGE 4	FWSG 63 (up to 2018)	coloured green	<b>613323</b> ①	1
FWSGE 5	FWSG 710 L/S / FWSG 900 L	coloured blue	<b>613324</b> ①	1
FWSGE 6	FWSGS 110 / FWSGS 180		<b>613325</b> ②	1

① consisting of 3 pieces replacement blades, 1 piece torx screw and 1 piece torx wrench.

② consisting of 1 pieces replacement blades, 2 piece torx screw and 1 piece torx wrench.

Replacement blade, designed as turning blade with 2 blades

(Fig. shows FWSGE 15)

Article description	Unit type	Marking	Order Ref.	Stock-status
FWSGE 15	FWSG 63 (from 2018)	coloured orange	<b>613336</b> ①	1

① consisting of 1 piece replacement blade with 2 blades, 1 piece torx screw and 1 piece torx wrench.

Replacement blade, designed as turning blade (with 2 blades).

(Fig. shows FWSGE 8)

Article description	Unit type	Order Ref.	Stock-status
FWSGE 8	FWSG SE (all types)	<b>613327</b> ①	1

① consisting of 1 piece replacement blade, 1 piece allen screw and 1 piece allen wrench.

Replacement blade, designed as turning blade (with 2 blades).

(Fig. shows FWSGE 10)

Article description	Unit type	Order Ref.	Stock-status
FWSGE 10	FWSG RA 32 and 40	<b>613329</b> ①	1
FWSGE 11	FWSG RA 50 and 63	<b>613330</b> ①	1
FWSGE 13	FWSG RA 25	<b>613332</b> ①	1

① consisting of 1 piece replacement blade, 1 piece torx screw and 1 piece torx wrench.

Replacement blade and guide plate designed for large pipe processing; designed as turning blade and turning plate (twice the service life).

(Fig. shows FWSGE 12)

Article description	Unit type	Order Ref.	Stock-status
FWSGE 12	FWSG XL	<b>613331</b> ①	1

① consisting of 1 piece replacement blade and guide plate, 2 pieces torx screws and 1 piece torx wrench.

**PFSP****FRIATEC maintenance spray**

For cleaning and caring for scraper tools. Content: 100 ml.  
Please observe appropriate safety and application instructions on the agent container and on operating instructions included with scraper tools.

Order Ref.	Stock-status
<b>613301</b>	1

**ALTK FWSG****Transport boxes**

For the transport and storage of scraper tools.

Unit type	Order Ref.	Stock-status
FWSG 63	<b>613307</b>	1
FWSG 225 and FWSG 63/225	<b>613309</b>	1
FWSG 710 S	<b>613308</b>	1
FWSG 710 L	<b>613314</b>	1
FWSG 900 L	<b>613304</b>	1
FWSG SE 63	<b>613303</b>	1
FWSG SE 75 - 140	<b>613319</b>	1
FWSG SE 160 - 225	<b>613318</b>	1
FWSG SE 250 - 315	<b>613320</b>	1

**FWZ****Hand scraper**

To remove oxidic layer on HD-PE pipes or fittings which are unable to treat using appropriate scraper tools.  
Also suitable for deburring cut edges.  
Replacement blades: 5 pieces per package.

Article description	Order Ref.	Stock-status
Hand scraper	<b>613300</b>	1
Replacement blades	<b>613270</b>	1

**FWZ XL****Hand scraper for large pipes**

For removing oxide layers on large HD-PE pipes which are unable to treat using appropriate scraper tools.  
Ideal for preparing surfaces for the processing of FRIALEN XL saddle fittings. Also suitable for deburring cut edges.

Article description	Order Ref.	Stock-status
Hand scraper for large pipes	<b>613299</b>	1

**FRIATOP**

**Clamping unit (Top Loading)**



For the assembly of FRIALEN XL Top Loading saddle parts without lower clamp for all pipe diameters in the appropriate range of dimensions with extra elastic pneumatic spring system and for the optimum build-up of jointing pressure during fusion process. The tool is delivered in a transport box.

Order Ref.	Stock-status
<b>613350</b>	1



**UNITOP**

**Clamping unit for FRIALEN spigot saddles SA UNI / ASA UNI**



For the assembly of FRIALEN spigot saddles SA UNI d 250 – d 900 with outlet d 90, d 110, d 125 and d 160. The tool is delivered in a transport box.

For the processing of FRIALEN spigot saddles SA UNI with UNITOP clamping unit but without using FRIAMAT fusion units ADWL angled fusion adapters for socket contacts 4,0 mm (Order Ref. 613241) may be required.

For the processing of FRIAFIT spigot saddles ASA UNI d 630 - 900 with outlet d 160 / SDR 17 an additional adapter (Order Ref. 613839) is required and has to be ordered separately.

Article description	Order Ref.	Stock-status
UNITOP clamping unit (d 250 - d 900)	<b>613385</b>	1
ADWL angled adapters for socket contacts 4,0 mm	<b>613241</b>	1
Clamping adapter for outlet spigot of ASA UNI d 160	<b>613839</b>	3

**VACUPUMP**

**Vacuum pump for building site operation**



For the assembly of FRIALEN XL spigot saddles SA XL, FRIALEN repair saddles RS XL as well as FRIAFIT sewage saddles ASA VL. Consisting of vacuum pump (110V/230V), manometer, and hose connections. No additional construction site compressor required for operation The tool is delivered in a transport box .

For the assembly of FRIALEN XL spigot saddles SA XL and FRIAFIT sewage saddles ASA VL, plungers (PRESSKO) are required.

Article description	Order Ref.	Stock-status
Vacuum pump 230V	<b>613827</b>	1
Vacuum pump 110V	<b>613828</b>	1



**PRESSKO****Plunger for VACUSET XL clamping unit**

Nominal width-related plunger with stop plate and plug connection NW 7.2 for assembly on the FRIALEN XL spigot saddle SA XL with outlet d 160 - d 400 or the FRIAFIT sewage saddle ASA VL with outlet d 225 and for the connection of the Vacuum pump.

Version	Order Ref.	Stock-status
FRIALEN SA XL d 160	<b>613821</b>	1
FRIALEN SA XL d 225	<b>613822</b>	1
FRIALEN SA XL d 250 / FRIAFIT ASA VL d225	<b>613823</b>	1
FRIALEN SA XL d 280	<b>613853</b>	1
FRIALEN SA XL d 315	<b>613854</b>	1
FRIALEN SA XL d 355	<b>613855</b>	1
FRIALEN SA XL d 400	<b>613837</b>	1

**FWAB****Drilling equipment**

Drilling equipment FWAB for drilling HDPE pipes in unpressurised condition through the outlet spigot of FRIALEN XL spigot saddles SA XL, FRIALEN spigot saddles SA UNI as well as FRIAFIT sewage saddles ASA VL. Drive with drilling machine. Consisting of hole saw (nominal width-related), hole saw adapter SDS max, extension for hole saw adapter, centre drill with ejector and retaining shell, and 1 x hexagon wrench. The tool is delivered in a transport box.

(Fig. shows FWAB XL 160)

Article description	Outlet dimension	Order Ref.	Stock-status
FWAB XL 90 for SA UNI	d 90	<b>613832</b>	1
FWAB XL 110 for SA UNI	d 110	<b>613833</b>	1
FWAB XL 125 for SA UNI	d 125	<b>613834</b>	1
FWAB XL 160 for FRIALEN SA UNI / SA XL	d 160	<b>613829</b>	1
FWAB XL 225 for FRIALEN SA XL	d 225	<b>613830</b>	1
FWAB XL 250 for FRIALEN SA XL	d 250	<b>613831</b>	1
FWAB XL 280 for FRIALEN SA XL	d 280	<b>613850</b>	1
FWAB XL 315 for FRIALEN SA XL	d 315	<b>613851</b>	1
FWAB XL 355 for FRIALEN SA XL	d 355	<b>613852</b>	1
FWAB XL 400 for FRIALEN SA XL	d 400	<b>613836</b>	1
FWAB XL 160 for FRIAFIT ASA UNI	d 160	<b>613838</b>	1
FWAB ASA 225 for FRIAFIT ASA VL	d 225	<b>613835</b>	1



**FWFIT****Clamping and drilling unit for FRIAFIT-Sewage saddles (ASA TL) and transition saddles (ASA TL KG)**

Combined clamping and drilling unit, universally designed for all FRIAFIT sewage saddles ASA TL and FRIAFIT transition saddles ASA TL KG. For clamping and creating the necessary joining pressure during fusion. For pressure free tapping through outlet socket on completion of prescribed cooling time. The tool is delivered in a transport box.

Order Ref.

**613480**Stock-  
status

1

**ASATOP****Clamping unit for Close-Fit-Inliner DN 200 - DN 500 (ASA TL) and transition saddles (ASA TL KG)**

Clamping unit designed for FRIAFIT sewage saddles ASA TL and FRIAFIT transition saddles ASA TL/KG, specifically for HDPE Close Fit Inliners DN 200 to DN 500 and for HDPE pipes d 630. For clamping and creating the necessary joining pressure during fusion. Comprising ASATOP clamping unit with toggle anchor, hole saw ( $\varnothing$  95 mm) with hole saw adapter SDS, centre drill and extension, and compressed air pump. The tool is delivered in a transport box.

For drilling through the outlet fitting in unpressurised state, the FWFIT clamping and drilling unit (Order Ref. 613480) is required.

Order Ref.

**613370**Stock-  
status

3



**RPS****Repair set**

Repair kit for containing residual water during repair and installation work on d 90 - d 900 HDPE water pipes. Consisting of a universal repair set with pump, pressure gauge, drill, connecting hose, and additionally repair balloons for each pipe dimensions. Optional extension set for the connection of an additional repair balloon, consisting of additional connection hose of 3m and pressure gauge.

From pipe dimensions d 355 the drilling equipment FWAB XL 225 (Order-Nr. 613830) is required.

The repair set up to d 225 requires VVS repair and reinforcing saddles. Pipe dimensions from d 250 require VSC TL or RS XL repair saddles.

Prices and availability on request.



Article description	Dimension	Order Ref.	Stock-status
Repair set	all dimensions	<b>613701</b>	1
Extension set	all dimensions	<b>613715</b>	1
Repair balloon type 1	d 90 - d 180	<b>613702</b>	1
Repair balloon type 2	d 200 - d 315	<b>613703</b>	1
Repair balloon type 3	d 355 - d 450	<b>613704</b>	1
Repair balloon type 4	d 500 - d 560	<b>613705</b>	1
Repair balloon type 5	d 630	<b>613706</b>	3
Repair balloon type 6	d 710	<b>613707</b>	3
Repair balloon type 7	d 800	<b>613708</b>	3
Repair balloon type 8	d 900	<b>613709</b>	3
Transport box		<b>613700</b>	1

**CLAMP 63****Alignment clamp d 20 – d 63**

Universal alignment clamp with angle adjustment (45°/90°) for heating coil fusion couplers, reducers, 45° and 90° elbows, and outlets on saddle fittings d 20–d 63.

Optional version CLAMP63L also applicable for long couplers FRIALONG.

Article description	Order Ref.	Stock-status
CLAMP63	<b>613020</b>	1
CLAMP63L	<b>613034</b>	1

**CLAMP 180****Alignment clamp d 63 – d 180**

Alignment clamp with angle adjustment (45°/90°) and two clamping elements for heating coil fusion couplers, reducers, and 45° and 90° elbows d 63, d 90, d 125, and d 180. Reduction shells can be inserted for various sizes. Delivered in a practical carrier bag.

Alignment clamp can be expanded with additional clamping element modules for use as fourfold alignment clamp for d 63, d 90, d 125, and d 180. This needs two additional clamping elements.

T-piece extension kit for alignment clamp. Variant with one clamping element. Additional clamping elements can be attached for a twofold alignment clamp on the branching pipe.

Reduction shell set for d 110 and d 160. One reduction shell set is needed for each clamping element.

(Figure shows fourfold alignment clamp)

Article description	Dimension	Order Ref.	Stock-status
Alignment clamp with two clamping elements	d 63, d 90, d 125 and d 180	<b>613021</b>	1
Additional clamping element	d 63, d 90, d 125 and d 180	<b>613022</b>	1
Reduction shell set d 110/d 160	d 110 and d 160	<b>613023</b>	1
T-piece extension kit	d 63, d 90, d 125 and d 180	<b>613024</b>	1

**SQM****Manual squeeze-off tool for pipes d 20 – d 125**

Manual squeeze-off tool for the temporary shutoff of HDPE and PE-Xa pipes d 63–d 125 in SDR 11 and SDR 17.6.

Article description	Dimension	SDR	Order Ref.	Stock-status
SQM63	d 20 - d 63	SDR 11	<b>613025</b>	1
SQM125	d 63 - d 90, d 90 - d 125	SDR 11, SDR 17,6	<b>613026</b>	1

**SQH****Hydraulic squeeze-off tool**

Hydraulic squeeze-off tool for the temporary shutoff of HDPE and PE-Xa pipes d 63–d 180 in SDR 11 and SDR 17.6.

Article description	Dimension	SDR	Order Ref.	Stock-status
SQH180	d 63 - d 180	SDR 11 / SDR 17,6	<b>613028</b>	1

**RRC****Re-rounding clamps for reinstating round cross section of squeezed-off pipes d 63 – d 180**

For re-rounding squeezed-off HDPE and PE-Xa pipes d 63–d 180.

RRC90 as universal re-rounding clamp for d 63, d 75, and d 90. Reduction shells can be inserted for various sizes. Key for activating the universal re-rounding clamps included.

RRC110–RRC180 as re-rounding clamps for each nominal diameter of d 110, d 125, d 160, and d 180.

Fig. 1 shows RRC90, Fig. 2 shows RRC180



Article description	Dimension	Order Ref.	Stock-status
RRC90	d 63, d 75, d 90	<b>613029</b>	1
RRC110	d 110	<b>613030</b>	1
RRC125	d 125	<b>613031</b>	1
RRC160	d 160	<b>613032</b>	1
RRC180	d 180	<b>613033</b>	1

**FWXR****Manual rounding clamps for pipes d 63 - d 250**

For retrospective rounding of HDPE and PE-Xa-pipes. Covering several dimensions due to the use of reducer spherical shells.

(Fig. shows FWXR-S1)

Article description	Dimension	Order Ref.	Stock-status
FWXR-S1	d 32, d 40, d 50, d 63	<b>613416</b>	1
FWXR-S2	d 90, d 110	<b>613431</b>	1
FWXR-S3	d 125, d 160	<b>613439</b>	1
FWXR-S4	d 180, d 200	<b>613443</b>	1
FWXR-S5	d 225, d 250	<b>613444</b>	1

**FWXRH****Hydraulic rounding clamps for pipes d 280 - d 900**

For the retrospective rounding of HDPE pipes. These rounding clamps are also available for hire.

Prices and availability of dimensions on request.

(Fig. shows hydraulic rounding clamp d 800)

Dimension	Order Ref.	Stock-status
d 280	<b>613452</b>	3
d 315	<b>613461</b>	3
d 355	<b>613462</b>	3
d 400	<b>613463</b>	3
d 450	<b>613464</b>	3
d 500	<b>613465</b>	3
d 560	<b>613467</b>	3
d 630	<b>613466</b>	3
d 710	<b>613468</b>	3
d 800	<b>613460</b>	3
d 900	<b>613458</b>	3

**FWXRB****Manual rounding clamps for pipes d 800 - d 1200**

For the retrospective rounding of HDPE pipes. These rounding clamps are also available for hire.

Prices and availability on request.

Dimension	Order Ref.	Stock-status
d 800 - d 1200	<b>613457</b>	3

**PCUT****Pipe cutter for d 20 – d 140**

Pipe cutter with rapid adjustment for HDPE pipes d 20–d 140 in SDR 11.

Article description	Dimension	Order Ref.	Stock-status
Pipe cutter d 63	d 20 - d 63	<b>613040</b>	1
Pipe cutter d 140	d 50 - d 140	<b>613041</b>	1
Replacement cutting wheel d 63	d 20 - d 63	<b>613042</b>	1
Replacement cutting wheel d 140	d 50 - d 140	<b>613043</b>	1

**PCUT S**

**Pipe shears for d 20 – d 63**

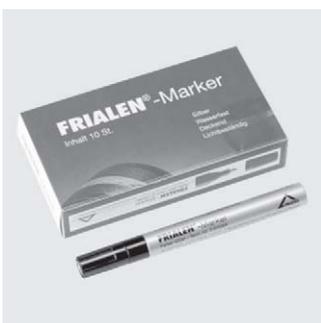


Lever action pipe shears for HDPE pipes d 20–d 63 in SDR 11.

Article description	Dimension	Order Ref.	Stock-status
Pipe shears d 40	d 20 - d 40	<b>613044</b>	1
Pipe shears d 63	d 20 - d 63	<b>613046</b>	1

**FWPM**

**FRIALEN-/FRIAFIT-Marker (silver)**



For the marking of HDPE and PE-Xa-pipes.  
Colour silver. 10 pieces per package.

Order Ref.	Stock-status
<b>613069</b>	1

**FWSS**

**Activating key for pressure tapping tees**



For drill activation subject to diameter (d<sub>1</sub>) of the FRIALEN pressure tapping tees DAA, DAA TL and DAA TL RE. Wrench size 17 can also be used for drill activation of all dimensions of SAB.

d <sub>1</sub>	WS in mm	Order Ref.	Stock-status
40-225	17	<b>613246</b> ①	1
90-315	19	<b>613250</b> ②	1

- ① An activating key wrench size 17 for all DAA (new model with lever), SAB, DAA d 50 - 75 and DAP d 63.
- ② Usable for DAA TL, DAA TL RE, DAA d 90 - d 225 old version and DAP d 90 - d 225.



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**FWSR****Activating key for pressure tapping tees with parallel dome**

For drill activation of FRIALEN pressure tapping tees with parallel dome DAP, consisting of ratchet and box spanner attachment.

Article description	Order Ref.	Stock-status
Ratchet 1/2"	<b>613610</b>	1
Socket SW 19	<b>613605</b>	1
Socket SW 17	<b>613606</b>	1

**FWSR T****Activating key for pressure tapping tees (new model with fast clamping lever)****NEW**

For drill activation of FRIALEN pressure tapping tees DAA (new model with fast clamping lever), consisting of telescopic ratchet including box spanner attachment SW17.

Article description	Order Ref.	Stock-status
<b>NEW</b> Ratchet 1/2" with socket SW17	<b>613615</b>	1

**FWDPA****Pressure test adapter**

Pressure test adapter for the use on FRIALEN pressure tapping tees DAP, DAA TL, DAA TL/RE  $d_1 = 61-315$ . Connection measurements internal thread = R 1/4".

Pressure test adapter for use on FRIALEN spigot saddles SA UNI; with with connetcion nipple  $\varnothing \frac{1}{2}$ " (see figure 2).

Article description	Order Ref.	Stock-status
FWDPA for FRIALEN DAP, DAA TL, DAA TL RE	<b>613595</b>	1
FWDPA for FRIALEN SA UNI	<b>613596</b>	1



# FRIALEN SAFETY FITTINGS

## NEW

Article	Dimension
Gas blower 1" / 2" used for venting pressurized gas pipes	GAB 1", GAB 2"

## NOT AVAILABLE ANYMORE

Article	Dimension	Alternative
Spigot saddles with integral drill <b>SAB</b>	d 63, d 90, d 110, d 125, d 160 / outlet d 32	Spigot saddle <b>SA</b> d 63, d 90, d 110, d 125, d 160 / outlet d 32
Pressure tapping tee Top-Loading / Relining with extra long outlet spigot <b>DAA TL RE</b>	d <sub>1</sub> > 98 - 130 outlet d 50 d <sub>1</sub> > 130 - 160 outlet d 50 d <sub>1</sub> > 160 - 210 outlet d 63	Please contact our Hotline: +49 621/486-2325.
T-Pieces reduced <b>T RED XL</b>	d 250 / d 110 d 280 / d 110 d 315 / d 110	Spigot saddle <b>SA UNI</b> d 250 - d 280 / d 110 d 315 - d 400 / d 110
Transition elbows 90° HD-PE/Steel with female thread <b>WUSTM 90</b>	d 32 1" d 40 1" d 40 1 1/4" d 50 1 1/2" d 63 2"	<b>UAM</b> / Elbows <b>W 90°</b> d 32 1" / d 32  d 40 1 1/4" / d 40 d 50 1 1/2" / d 50 d 63 2" / d 63
Transition elbows 90° HD-PE/Steel with male thread <b>WUSTN 90</b>	d 40 1 1/4 d 50 1 1/2 d 63 2"	<b>UAN</b> / Elbows <b>W 90°</b> d 40 1 1/4" / d 40 d 50 1 1/2" / d 50 d 63 2" / d 63

# FRIAFIT SEWAGE SYSTEM

## NEW

Article	Dimension
Slide-over couplers <b>UB SDR 17</b>	d 1000, d 1200

## NOT AVAILABLE ANYMORE

Article	Dimension	Alternative
Couplers SDR 17 <b>AM</b>	d 710, d 800, d 900	Slide-over couplers <b>UB SDR 17</b> d 710, d 800, d 900
Sewage inspection chamber adapter for masoned canals L = 250 mm <b>ASFL</b>	d 160	Sewage inspection chamber adapter <b>ASF</b> d 160
Sewage bends 60° (spigot fittings) <b>ABS 60</b>	d 160 d 180 d 225	
Unequal branch 60° (spigot fittings) <b>ATSR 60</b>	d 160/110, d 225/160, d 280/160, d 280/225, d 315/160, d 315/225, d 355/160, d 355/225	

# FRIATOOLS TECHNICAL EQUIPMENT

## NEW

### Article

**FRIAMAT prime eco** Universal fusion unit with documentation and traceability function

**FRIAMAT print eco** Universal fusion unit with easy documentation function

**FRIAMAT basic eco** Universal fusion unit without documentation function

Scraper tools for pipes d 20 - d 63 **FWSG 63**

Compact scraper tool **FWSG RA 25, Dimension d 25** SDR 7.4 and SDR 11

Activating key for pressure tapping tees **FWSR T** ratchet with socket

## NOT AVAILABLE ANYMORE

### Article

Clamping unit **VACUSET XL**

Barcode scanner **SCAN**

### Alternative

Vacuum pump **VACUPUMP**

Mini barcode scanner **MINISCAN**

# General conditions of supply and payment of FRIATEC GmbH - Technical Plastics Division

## 1. Scope

- 1.1 Terms and conditions as listed below apply to all deliveries. Other conditions do not automatically become contractual, even if not expressly contradicted by us.
- 1.2 Our delivery and payment terms apply only to companies as defined under § 13 BGB [German civil code], public law entities, and separate public estates.
- 1.3 All maintenance and repair services are subject to our General terms and conditions for services, maintenance and repair.
- 1.4 All rental services are subject to our General hire terms and conditions for electrofusion, scraping, and accessory equipment.

## 2. Conclusion of a Contract

- 2.1. Our quotations are not binding. A contract is made only when we confirm an order in writing. Our written order confirmation controls content and size of the order.
- 2.2. Alterations to the technical execution of ordered goods are acceptable unless they constitute essential functional changes or the customer proves that the alterations are unacceptable.
- 2.3. We will accept liability for the quality of an item only if this has been expressly stated in our order confirmation or in our advertisements.

## 3. Delivery

- 3.1. Delivery dates and deadlines are subject to ourselves being supplied appropriately and in good time.
- 3.2. Delivery deadlines are determined by the date of our order confirmation. They are regarded as fulfilled once the goods have left the factory or been released for shipment.
- 3.3. The deadline is extended if the customer desires changes retrospectively or if events occur for which we are not responsible.

## 4. Prices and Payment Conditions

- 4.1. Our prices are ex factory or ex warehouse, plus VAT. Insurance, packaging, shipment and customclearance charges are invoiced separately, unless expressly stated otherwise in our current pricelist.
- 4.2. Our invoices are payable net within 30 days from the invoice date. We offer 0.25% discount for payments within 14 days, but only if all other outstanding invoices have been paid.
- 4.3. We reserve the right to accept bills of exchange and cheques in individual cases. No discount is offered when paying by bill of exchange. Bills of exchange and cheques are accepted only on account of performance. The claim is regarded as fulfilled only once payment has been cashed or credited. All expenses which may arise must be met by the customer.
- 4.4. We are authorised to demand immediate cash payment for all deliveries, if payment conditions are not adhered to, or in circumstances causing the credit worthiness of a customer to be questioned. A possible deferral caused by the acceptance of bills of exchange becomes null and void. The customer is obliged to pay cash immediately on returning the bill of exchange. In addition we are authorised to carry out any remaining deliveries against advance or warranty payment or to rescind the contract and demand compensation. We are furthermore authorised to stop the onward sale of goods to be delivered and to retrieve the goods at the customer's expense if we have rescinded the contract.

## 5. Passage of Risk

The risk is transferred to the customer at the moment of the goods being ready for shipment and the notification thereof. This applies even if shipment is delayed due to circumstances not in our control. If there is no notification of readiness for shipment, the risk is passed to the transport company, and on to the customer no later than at the point of the goods leaving the factory or warehouse. This applies also if our own transport is used or carriage is paid.

## 6. Formal Complaints, Claims, Limitation Period

- 6.1. The customer must immediately check goods received for any defects. Formal complaints must be lodged immediately on receipt of the goods, and no later than a fortnight after receipt, in writing. The same timeframe applies to hidden defects after discovery. There can be no claims for defects which have not been notified within the appropriate period.
- 6.2. When a claim is justified, we will choose either to repair or replace the goods. If we do not rectify the defect or provide a substitute within an appropriate period, or following no more than two attempts, the customer is authorised to rescind the contract or demand a reduction in the purchasing price. It is not possible to rescind if there is only an insignificant violation on our part.
- 6.3. The limitation period for claims is
  - a) 5 years for building materials which have been installed and have caused defects within a pipe system.
  - b) 1 year for delivery of other new goods to contractor
  - c) 2 years for all others
  - d) For delivery of second-hand goods to companies, there is no liability for defects.
  - e) By way of derogation from b) - d) the statutory periods shall apply for claims for compensation due to a defect for which we are responsible for
    - damages due to physical injury to life, body or health, which are based on gross negligence by us or deliberate or gross negligence by one of our legal representatives or one of our agents or
    - damages, which are based on gross negligence by us or deliberate or gross negligence by one of our legal representatives or one of our agents.
- 6.4. The limitation period for claims for compensation commences on delivery of the goods; where an acceptance is required, then from acceptance.
- 6.5. The statutory period of limitation for replaced or subsequently rectified merchandise does not recommence even in cases of goodwill. Should defects be acknowledged in exceptional cases, such acknowledgments shall only apply to those defects that were the subject of a request for subsequent fulfilment.

## 7. Reservation of Ownership

- 7.1. Our deliveries are all subject to reservation of ownership. The goods remain in our ownership until payment of all claims arising from our business relationship with the customer is made. With an account current the reserved ownership constitutes the security for our balance claim.
- 7.2. The customer is authorised to resell delivered goods within the framework of his or her ordinary business procedures. He or she may not however pledge or transfer the conditional commodity by way of security.
- 7.3. In the event of resale the customer assigns to us all claims including all subsidiary rights which arise from the resale. This applies without taking into consideration whether he or she resells the conditional commodity unaltered, unprocessed, or in conjunction with other items. If the resale takes place including goods not owned by us, the assigning applies only up to the value of the conditional commodity. The value is determined according to our sales prices.
- 7.4. Processing of the conditional commodity always occurs according to § 950 BGB for us as manufacturers, but without obligation. The processed goods constitute the conditional commodity as part of these conditions. If the conditional commodity is processed together or is irretrievably mixed up with other items not owned by us, we will gain co-ownership of the new item at a ratio of conditional commodity invoice value to the invoice value of other used goods at the time of processing and mixing. The co-ownership rights thus created apply as conditional commodity in the context of these conditions. The customer is obliged, if requested by us, to point out our ownership rights to the prospective buyer.
- 7.5. The customer is authorised to collect the claim from the resale notwithstanding our own collection authorisation. While the customer meets his payment obligations appropriately, we will not put the claim into force. The customer has to inform us of the debtors of the assigned claims and to notify the assignment to them. Our right of informing third-party debtors of the assignment will not be affected by this. The customer is not allowed to assign the claim against third-party debtors to third parties or to negotiate an assignment ban with the third-party debtor.
- 7.6. The customer is obliged to notify us immediately and in the quickest way possible about a pledge or any other infringement of our security rights by third parties. The customer is obliged to hand over to us all documents required to preserve our rights, and to compensate us for any costs arising from a possible intervention.
- 7.7. We pledge to release existing securities of our choice up to the point where their value exceeds the claims to be secured by more than 25%.
- 7.8. The customer is obliged to insure the goods for the duration of our reservation of ownership.

## 8. Acts of God - Right to Rescind

If we are prevented from fulfilling our terms of delivery by acts of God or other circumstances not within our control, or if the fulfilment of our obligations becomes too great a burden for these reasons, we are authorised to rescind the contract. Compensation claims by the customer in such circumstances are not permitted. The right to rescind is effective also if the delivery period was initially extended.

## 9. Other Limitations of Liability

- 9.1. We are liable for any violations of life, body or health for which we are accountable in accordance with legal requirements.
- 9.2. For other damages the following applies:
  - a) We are liable for damages based on gross negligence by us or deliberate or gross negligence by our legal representatives or assistants in accordance with legal requirements.
  - b) For damages based on the violation of essential contractual obligations based on negligence by us, our legal representatives or assistants, our liability is limited to the predictable contractual damage up to a maximum of the value of the delivered item.
  - c) Claims for other damage on violating subsidiary obligations or inessential obligations based on negligence are excluded.
  - d) Claims for damages for delay caused by negligence are excluded. The customer's legal rights on completion of an appropriate period of time remain unaffected.
- 9.3. Liability exclusions or limitations do not apply if a defect has been deliberately concealed by us or if we have offered warranty on the quality of the item.
- 9.4. A customer's claim for compensation of time or costs invested in vain instead of compensation in place of time or costs, and the liability according to the product liability law remain unaffected.

## 10. Data protection

We store the customer's data, which may contain personal data, for the processing of the contractual relationship (Art. 6 Para. 1 1 Clause b) DSGVO. As far as necessary for the fulfillment of the contract, we transmit your data to third parties (e.g. insurance companies). You can find further information about our handling of personal data on our website [www.friatec.com](http://www.friatec.com). On request, we will be pleased to provide them in paper form.

## 11. Non-assignment clause

Unless something different has been expressly agreed with the customer, the customer is not authorised to transfer rights from the contract to third parties without our agreement.

## 12. Applicable rights, Place of Jurisdiction

- 12.1. Only German law applies under the exclusion of UN purchasing rights.
- 12.2. Exclusive place of jurisdiction for disagreements between contract parties is Mannheim, if the customer is a merchant, a legal person of public law or a special asset, or if the customer does not have a place of jurisdiction in Germany. We do however reserve the right to proceed against a customer who does not have a general place of jurisdiction in Germany within other courts of our choice.

Mannheim, September 2018

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