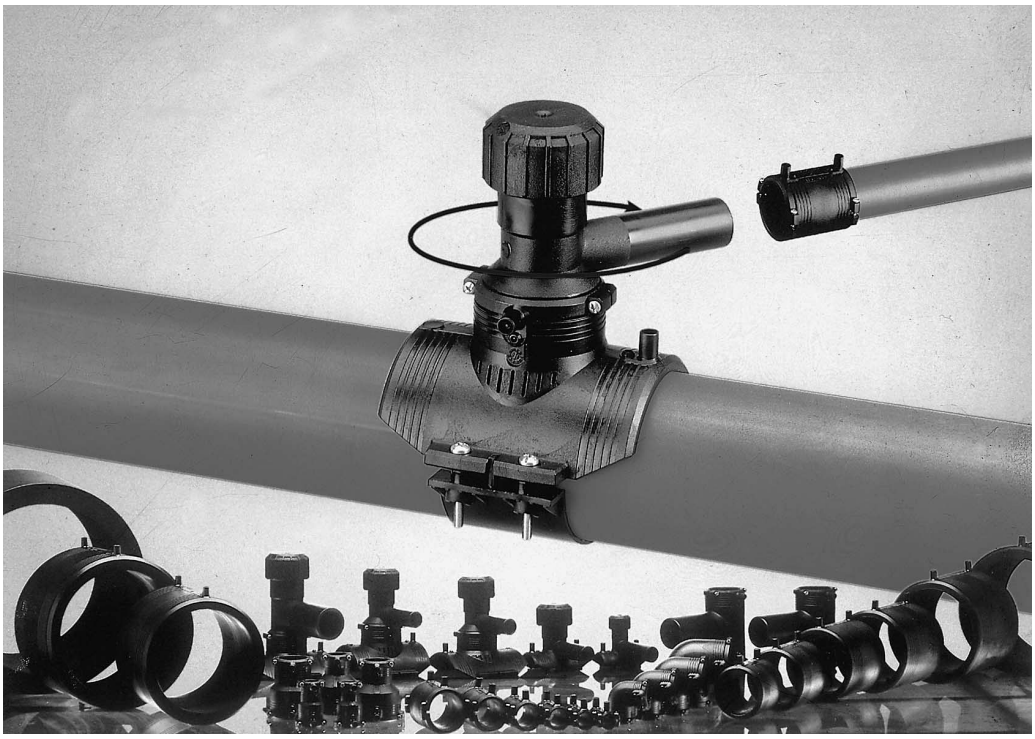
ELGEF® Plus assembly instructions

The powerful electro-fusion system

for PE pressure pipelines



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**The technical data are not binding.
They are not warranted characteristics and
are subject to change.
Please consult our General Conditions of Supply.**

Assembly and operating instructions

ELGEF Plus electrofusion fittings

Fundamental tips
Electrofusion for PE pipes and PE fittings enable safe, efficient and economical installation of piping systems.
Owing to the high quality standards of our products, tools and resources, the joints are easy to make.

However, careful preparation of the fusion surface is the absolute prerequisite and should not be neglected!

General tips for preparation and assembly of Georg Fischer fittings:
Fusion zones should be well protected from moisture during inclement weather (rain, snowfall etc.).

Georg Fischer Fittings are supplied with the appropriate magnet card in a polythene bag. Fittings that arrive at the place of installation in their original packing, must neither be machined nor cleaned with the PE cleaner. If the products (spigots) are nevertheless machined, then it will not reduce the quality if it is done professionally. However, it is not necessary.
Exception: If the fusion zones are touched by hand during assembly, the fittings must be cleaned with the PE cleaner.

The pipe should be wiped, scraped and finally cleaned with the PE cleaner. Scraping tools should be used for even and time-saving pipe preparation.

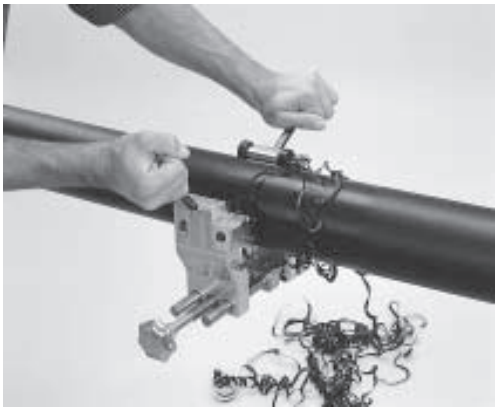
The following scraping measurements should be maintained:

d Pipe	Min. chip thickness	Max. chip thickness*
20–25 mm	0.20 mm	0.20 mm*
32–63 mm	0.20 mm	0.25 mm*
75–225 mm	0.20 mm	0.30 mm*
> 225 mm	0.20 mm	0.35 mm*

Tip: Maximum permissible pipe ovalness 1.5%
* the specifications refer to the pipe inner diameter without "+ tolerance"
As a result: If the average pipe outer diameter is equal to the upper tolerance limit, the pipe can be cut out by scraping until the permissible pipe outer diameter. In this case, the chip thickness can be greater than 0.3 mm.

Permissible minimum pipe outer diameter

d Pipe	Min. chip thickness	Per. minimum pipe outer diameter
20 mm	0.20 mm	19.6 mm
25 mm	0.20 mm	24.6 mm
32 mm	0.20 mm	31.5 mm
40 mm	0.20 mm	39.5 mm
50 mm	0.20 mm	49.5 mm
63 mm	0.20 mm	62.5 mm
75 mm	0.20 mm	74.4 mm
90 mm	0.20 mm	89.4 mm
110 mm	0.20 mm	109.4 mm
125 mm	0.20 mm	124.4 mm
140 mm	0.20 mm	139.4 mm
160 mm	0.20 mm	159.4 mm
180 mm	0.20 mm	179.4 mm
200 mm	0.20 mm	199.4 mm
225 mm	0.20 mm	224.4 mm
250 mm	0.20 mm	249.3 mm
280 mm	0.20 mm	279.3 mm
315 mm	0.20 mm	314.3 mm
355 mm	0.20 mm	354.3 mm
400 mm	0.20 mm	399.3 mm
450 mm	0.20 mm	449.3 mm
500 mm	0.20 mm	499.3 mm



The stability and surface hardness of PE 100 is greater than that of PE 80. This is especially noticeable when the scraping tools become blunt. Therefore regular testing and maintenance of wear parts is required. We recommend servicing the units at least once a year.

Use only PE cleaner with soft, absorbent paper to clean the fusion zones. Dusters soaked in PE cleaner are allowed.

Clean only the scraped fusion surface. Otherwise, there is danger of tranferring dirt to the already cleaned surface.

When using markers, check that no ink reaches the fusion zone. Even when cleaning marker ink, take care that no ink touches the fusion zone.

Ink in the fusion zone **cannot** be removed completely despite repeated cleaning. The pipe piece should be remachined or replaced.

Pipes that are oval or not round should be rounded using rounding clamps in the connection zone.

Use brackets or suitable devices to fix the pipes and fittings. In particular when working with roller pipes, ensure that no force is applied between the pipe and fusion zone during the fusion and cooling phase.

To transfer the fusion data to the fusion unit, you must always use the magnet card and the barcode supplied in the original bag.

Wait until minimum cooling times before removing brackets, tapping and conducting the pressure test.

Observe the assembly instructions.

Refusion
If there is power failure caused by external influences (for ex. generator failure) and if

the electrofusion is subsequently interrupted, you can refuse the joint. The following points should be kept in mind during refusion:

- Check and correct the cause of the fault. Appropriate error messages on the fusion unit might provide tips on the possible cause.
- Do not remove the brackets.
- Cool the fitting completely again, i. e. cool to the ambient temperature. Do not use other resources to cool the fitting (cold water etc.).
- Protect the joint from dirt and moisture during the cooling phase.
- Carry out the fusion again in accordance with the assembly instructions and the specifications on the data carrier.
- Test the fusion for leaks, conduct a pressure test.

If the fusion joint fails in the pressure test, refusion is no longer possible.

Assembly instructions for sockets, fittings and adaptors

Sequence of tasks

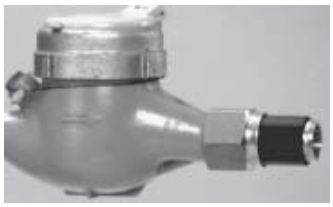
1 Clean pipe(s), cut at right angles and trim

2 Remove oxide film of pipe(s) using scraper (adhere to max. permissible wall thickness reduction)

3 Clean pipe(s) in fusion zone with duster and PE cleaner

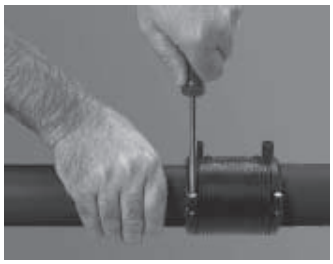
4 Mark the insertion depth on the pipe

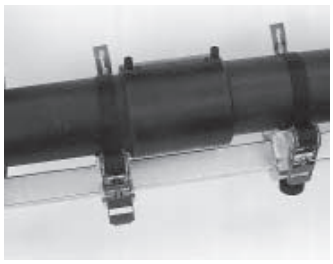
5 Remove the fitting(s) from the packaging without touching the fusion surface.



6 Screw or unscrew transition adaptor

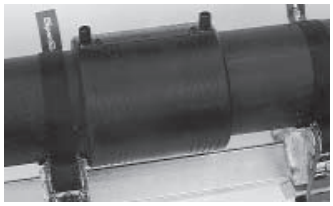
7 Push in the PE pipe until the center stop or marking
8 Firmly fasten integrated clamp
9 Mount and fix assembly attachment





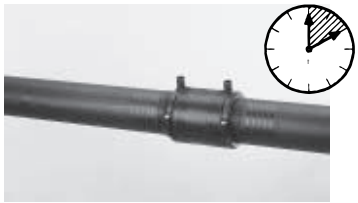
10 Slide in second pipe up to center stop or marking
11 Firmly fasten integrated clamp
12 Mount and fix assembly attachment

13 Follow operating instructions for fusion



14 After fusion: Check fusion indicator on fitting and fusion unit display, then remove cable
15 Wait for cooling, finally remove assembly attachment. Refer to magnet card imprint and fusion unit display for cooling time

16 Screw or unscrew transition-adaptor with loose clamping nut (if required)



17 Wait minimum waiting time until pressure test, then conduct pressure test

ELGEF Plus assembly instructions for sockets, fittings and transition adaptors

Sequence of tasks	Socket Fittings d 20–d 63	Socket Fittings d 75–d 500	Terminal caps d 20–d 63	Terminal caps kit d 75–d 225	Transfition adaptor d 20–d 63	Transitionadaptor with loose cl nut d 20–d 63
						
1 Clean pipe(s), cut at right angles and trim	■	■	■	■	■	■
2 Remove oxide film of pipe(s) using scraper	■	■	■	■	■	■
3 Clean pipe(s) in fusion zone with duster and PE cleaner	■	■	■	■	■	■
4 Mark the insertion depth on the pipe *1	▒	▒	▒	▒		
5 Remove fitting(s) from the packaging without touching the fusion surface	■	■	■	■	■	■
6 Screw or unscrew transfer adaptor					■	▒
7 Push in the PE pipe up to center stop or marking	■	■	■	■		
8 Firmly fasten integrated bracket	■		■			
9 Mount and fix assembly attachment		■		■		
10 Slide in second pipe up to center stop or marking	■	■			■	■
11 Firmly fasten integrated bracket	■				■	■
12 Mount and fix assembly attachment		■		■		
13 Fusion in accordance with operating instructions of the unit	■	■	■	■	■	■
14 After fusion: Check fusion indicator on fitting and fusion unit display, then remove cable	■	■	■	■	■	■
15 Wait for cooling, finally remove assembly attachment *2		■		■		
16 Screw or unscrew transition adaptor with loose clamping nut (if required)						▒
17 Wait minimum waiting time until pressure test, then conduct pressure test *2	■	■	■	■	■	■

■ = compulsory ▒ = if required

*1 Insertion depth L1 in mm

d		(mm)	20	25	32	40	50	63	75	90	110	125	140	160	180	200	225	250	280	315	355	400	450	500
L1	SDR 11	(mm)	34	34	36	40	44	48	55	62	72	79	84	90	97	104	112	112	112	112	122	122	–	–
L1	SDR 17	(mm)	–	–	–	–	–	–	–	–	–	–	–	95	100	105	110	123	135	123	123	123	145	145

*2 Minimum cooling time for sockets and fittings in minutes

d	SDR	Remove bracket	Pressure test p<= 6 bar	p<= 24 bar
(mm)		(min)	(min)	(min)
20– 63	11	6	10	30
75–110	11	10	20	60
125–160	11	15	30	75
180–225	11	20	45	90
250–400	11	30	60	150
450–500	–	–	–	–

SDR	Remove bracket	Pressure test p<= 6 bar	p<= 24 bar
	(min)	(min)	(min)
–	–	–	–
–	–	–	–
17	15	30	75
17	20	45	90
17	30	60	150
17	40	60	150

p = test pressure

Assembly instructions for saddles and tapping valves

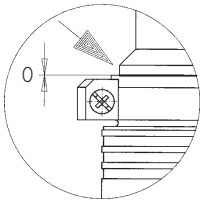
Sequence of work

1 Clean pipe in fusion zone, remove oxide film of pipe using scraper, (machine it, adhere to max. permissible wall thickness reduction)

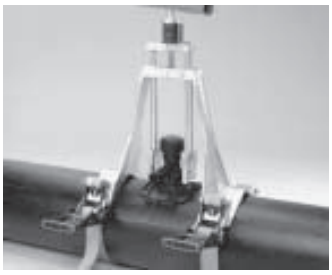
2 Clean pipe in fusion zone with duster and PE cleaner

3 Remove saddle from packaging without touching the fusion surface; hang lower part on its hinge; check if stop cams sit correctly in the recesses of the saddle upper part

4 Place saddle on pipe and tighten with pre-mounted screws (stress clamp for strengthening saddle)



5 Remove modular system component from the packaging and assemble (without touching fusion surfaces)



6 Place saddle on pipe and assemble with top-Load tool (detailed assembly instructions)

7 Align rotatable outlet and firmly fasten integrated clamp of saddle outlet

8 Fusion in accordance with operating instructions of unit

9 After fusion: Check fusion indicator of saddle; check fusion unit display, then remove cable
10 Wait for minimum time until pressure test, then conduct pressure test

11 Remove screw and fusion cap
12 Tap clockwise, withdraw drilling cutter up to the top stop; follow detailed assembly instructions!

13 Fasten screw and fusion cap by hand

14 Fusion in accordance with operating instructions of unit

ELGEF Plus Assembly Instructions for Saddles and Tapping Valves

Sequence of work	Tapping saddle Monoblock d 40–d 63	Tapping saddle with rotatable outlet d 63–d 315	Pressure tapping valve d 63–d 315	Spigot saddle d 63–d 315	Stopoff saddle d 63–d 315	Repair saddle d 63–d 315	Strengthening saddle (24 V) d 40–d 250
							
1 Clean pipe in fusion area, remove oxide film of pipe using scraper (machine it)							
2 Clean pipe in fusion area using duster and PE cleaner							
3 Remove saddle from packaging without touching; hang lower part on its hinge							
4 Place saddle on pipe and tighten with pre-mounted screws (stress clamp for strengthening saddle)		**<= 250**	**<= 250**	**<= 250**	**<= 250**	**<= 250**	
5 Remove modular system component from the packaging and assemble (without touching fusion surface)							
6 Place saddle on pipe and assemble with top-Load tool (detailed assembly instructions)		**>= 250**	**>= 250**	**>= 250**	**>= 250**	**>= 250**	
7 Align rotatable outlet and firmly fasten integrated bracket of saddle outlet							
8 Fusion in accordance with operating instructions of unit							
9 After fusion: Check fusion indicator; check fusion unit display, then remove cable							
10 Wait for minimum time until pressure test, then conduct pressure test *1							
11 Remove screw and fusion cap							
12 Tap clockwise, withdraw cutter up to top stop; (detailed assembly instructions) *1							
13 Fasten screw and fusion cap by hand							
14 Fusion in accordance with operating instructions of unit							

= compulsory **= if required**

*1 Minimum cooling time for saddles in minutes

d	Pressure test/Tapping p<= 6 bar	p<= 24 bar
(mm)	(min)	(min)
40	10	30
63–315	20	60

p = test pressure

Tapping saddle with rotatable outlet

General, preparatory work
Assembly is done according to our general assembly instructions.
Use 2 screws to fasten saddle bottom part for d 63 to d 160 mm.
The bottom part indicator bar must be in the region of the saddle attachment bar.

Use 4 screws to fasten saddle bottom part for d 180 till d 250 mm. Fasten the screws until the stop on the bottom part.

Mount tapping-T and saddle compactly. Align rotatable outlet and fix integrated bracket with screws.

Recommended tapping tool
- Hexagonal tapping key s = 17 mm, Code-Nr. 799 198 079

or
- Tapping attachment for gas-free tapping under pressure
  Type S54 outlet ø 20, 25, 32, 40 mm, Code No. 799 100 061
  Type S67 outlet ø 50, 63 mm, Code No. 799 100 062

or
- Assembly and tapping key, Code No. 799 198 047

- **Do not use electrical tools for tapping!**

Tapping sequence

Wait minimum cooling time before tapping following the fusion process; turn clockwise using hexagon spanner until the pipe is tapped (note marking of cutter position on the tapping tool), as far as Georg Fischer tapping key.
Withdraw cutter anticlockwise until the top stop. The cutter is completely sealed in this position.

Tapping sequence with tapping tool type S54/S67
(Tapping without gas loss under pressure)

Wait minimum time before tapping.
Fix tapping attachment on the tapping saddle.
In attachment type S54, set the stop for the operating rod in the top nut. Place the operating rod in the cutter, if required twist the rod until the hexagon snaps shut.
With the Philips screwdriver lock the jointing element in the drill operating rod. Apply slight pressure on the Philips screwdriver when twisting, the jointing element is pushed into the cutter through the slot. After twisting further by 90° in clockwise, the jointing element pin is engaged deep in the cutter.
Check: The operating rod must no longer be pulled out by hand. Using a suitable tool, turn the cutter downwards over the operating rod until the stop (plug spring).
Now the pipe is tapped. Turn back the operating rod completely until the cutter stops in the top position.
For reasons of safety, the lock between the tapping attachment and the cutter must be released now.
Unscrew tapping attachment.
Always keep the tapping attachment clean, slightly oil the moving parts.

!Warning!
If the above instructions are not observed when tapping pipelines under pressure the operating rod can be pushed out suddenly.
!Danger of injury!

Pressure tapping valve

General, preparatory work
Assembly is done according to our general assembly instructions.
Use 2 screws to fasten saddle bottom part for d 63 to d 160 mm.
The bottom part indicator bar must be in the region of the saddle attachment bar.

Use 4 screws to fasten saddle bottom part for d 180 to d 250 mm. Fasten the screws until the stop on the bottom part.

Mount valve-T and saddle part compactly. Align rotatable outlet and fix integrated clamp with screws.

Recommended tapping tool
Operating key and operating rod with outer square, width over flats of hexagonal nut SW 14.
Do not use electrical tools for tapping.
Initiate tapping sequence, valve

After the fusion process, wait minimum cooling time before tapping.
With tee key turn clockwise until the bottom stop. The pipe is tapped, the valve is shut.
Torque moment 100 Nm.
Open the valve in anticlockwise until the top stop.

Spigot saddle with drilling cutter

General, preparatory work
Only suitable for tapping pressureless pipelines.
Assembly is done according to our general assembly instructions.
Use 2 screws to fasten saddle bottom part for d 63 to d 160 mm.
The bottom part indicator bar must be in the region of the saddle attachment bar.

Use 4 screws to fasten saddle bottom part for d 180 to d 250 mm. Fasten the screws till the stop on the bottom part.
Assemble spigots with integrated cutter and fix the integrated bracket with screws.

Recommended tapping tool
Hexagonal recess, width over flats of hexagonal nut SW 12,7, outlet ø 32 mm
Hexagonal recess, width over flats of hexagonal nut SW 17, outlet ø 63 mm

Tapping sequence
After the fusion process, wait minimum cooling time before tapping.

With hexagonal recess tap clockwise.
Withdraw cutter and remove anticlockwise.

Stop off saddle for bladder setting units

Stop off saddles with brass adaptors are designed for assembly bladder setting units.

General, preparatory work
Assembly is done according to our general assembly instructions.
Remove protective cap and plugs.
Use 2 screws to fasten saddle bottom part for d 63 to d 160 mm.
The bottom part indicator bar must be in the region of the saddle attachment bar.

Use 4 screws to fasten saddle bottom part for d 180 to d 250 mm. Fasten the screws until the stop on the bottom part.
Assemble stop off adaptors and fix integrated clamp with screws.

Recommended tapping tool
Tap and set bladder with standard setting units. Observe the appropriate assembly instructions of the manufacturer.
While turning the setting unit, check stop off adaptor using a suitable tool.

Tapping sequence
After the fusion process, wait minimum cooling time before tapping.
Tap and set bladder in accordance with the specifications of the manufacturer.

Repair saddle ELGEF Plus

General, preparatory work
Minor damage in PE pipes can be removed using the repair saddle and the tapping tool *(see Chapter Tools)*.
Saddles are assembled according to our general assembly instructions.

Require repair tools
Tapping unit with securing strap (Code 799 150 015)

Attachment prism (Code 799 150 352)

Ratchet (Code 799 150 032)

Cutter (Code 799 198 013 and 012)

PE repair plugs d 30 to d 39 mm (Code 799 199 033 and 089)

Repair sequence
Clean the pipe around the damaged area and fusion surface.

Fasten tapping tool on the pipe.

Drill out damaged part of pipe.
Pipe to d 63 mm, drill ⌀ 30 mm
Pipe from d 75 mm, drill ⌀ 39 mm
Remove tapping tool.

Push the PE repair plugs into the hole using a hammer until the top flange is adjacent to the pipe.

Use a file to machine the PE plugs, so that it is flush with the pipe surface.
Prepare fusion surface and saddle assembly according to our general assembly instructions.

Tapping saddles

Top-Load-assembly d 280 mm – d 315 mm

General, preparatory work
All branch and tapping saddles d 280 to d 315 mm are assembled in the top-Load System.
Fusion surface preparation and saddle assembly (remove oxide film, clean etc.) is done according to the general assembly instructions.
Assembly of saddles in accordance with the detailed instructions *(see below).*
Fusion is done according to the general assembly instructions.
Tapping sequence is done analogous to the general assembly instructions.

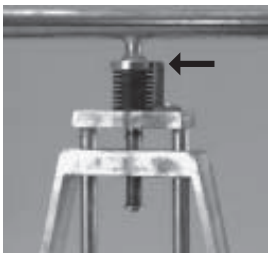
Required assembly tool
Top-Load tool (Code 799 350 368)

Assembly sequence Top-Load
Preparations for the saddle assembly (remove oxide film, clean etc.) is done according to the general assembly instructions.

Assembly Top-Load tool with securing straps.

Mount the saddle.

Press the saddle until it is in line with the pipe outer diameter.



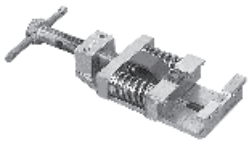
Indicator bar should be flush with the top part of the spring plate.

Fusion according to the general assembly instructions.
After successful fusion, wait cooling time and finally remove the Top-Load tool.
Pressure test and tapping according to the general assembly instructions.

Strengthening saddle 24 Volt

General, preparatory work
Small damages or weak points in the PE pipes can be repaired using the strengthening saddle and the tapping tool *(see Chapter Tools)* and strengthened later.
Preparation for saddle assembly (remove oxide film, clean) is done according to the general assembly instructions.
The strengthening saddle can be fused only by fusion units that can produce 24 Volt fusion voltage (MSA 300, MSA 350, MSA 400).

Required assembly tool
Tension clamp (Code 799 150 090)



Required repair tool
Tapping unit with securing strap (Code 799 150 015)

Attachment prism (Code 799 150 352)

Ratchet (Code 799 150 032)

Cutter (Code 799 198 013 and 012)

PE repair plugs d 30 to d 39 mm (Code 799 199 033 and 089)

Repair sequence
Clean the pipe around the damaged area and the fusion surface.

Fasten tapping tool on the pipe.

Drill out damaged part of pipe.
Pipe to d 63 mm, drill ⌀ 30 mm
Pipe from d 75 mm, drill ⌀ 39 mm
Remove tapping tool.

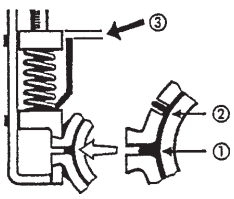
Push the PE repair plugs into the hole using a hammer until the top flange is adjacent to the pipe.

Use a file to machine the PE plugs, so that it is flush with the pipe surface.

Saddle assembly
Fusion surface preparation and saddle assembly is done according to the general assembly instructions.
Fasten saddle on the pipe using the tension clamp, check that the fusion mat is properly centered.

Clamp screws should be tightened until the red indicator plate is flush with the top edge of the tension clamp pressure bar.

Fusion sequence in accordance with the general assembly instructions.



The completed fusion is discernible on the joint area between top and bottom halves and on the fusion indicator by fused PE. In addition, the top edge of the red display plate is no longer flushed with the top edge of the pressure bar.

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