8

TECHNICAL MANUAL

WASTE SYSTEMS

Joints and testing

MADE IN ITALY

valsir®

QUALITY FOR PLUMBING

8

JOINTS AND TESTING

8 JOINTS AND TESTING

8.1 Transportation and storage

The waste system components must be handled with care and protected from dirt and damage in the warehouse, during transportation and during the installation phases on the building site. It is therefore recommended to observe the following rules.

- During transport the pipes must be stacked in an orderly and rational manner, taking care that the entire length is lying flat (at suitable distances especially in the case of pipes with push-fit sockets).
- Care must be taken during loading and unloading operations to avoid violent knocks, abrasions and deformations, especially in winter months when freezing temperatures can cause the material to become brittle.
- Store the pipes on horizontal and even surfaces; in case of pipes with push-in sockets, lay them conveniently on wooden boards (or on the packaging elements if this is structured and made for a specific purpose, with suitable material such as wood, foam or plastic in general).
- Especially in the case of prolonged storage, avoid the formation of stacks that are higher than 3 m for pipes in HDPE and 1.50 m for PP/PP3®, Blackfire®, Triplus® and Silere® pipes, to prevent deforming or altering the shape of the pipes and sockets of the waste systems that would obviously compromise the creation of joints.
- Store the pipes in an environment protected from the weather, low temperatures and direct sunlight. **PP/PP3®, Triplus® and Silere® systems can be stored outdoor for a maximum of 18 months, but not in direct contact with sunlight**; HDPE and Blackfire® systems are UV stabilised, therefore they are not subject to exposure problems.
- Avoid deposits of earth, gravel, mud or any foreign matter in general, on the surfaces to be welded, on the ring seals and inside the sockets.

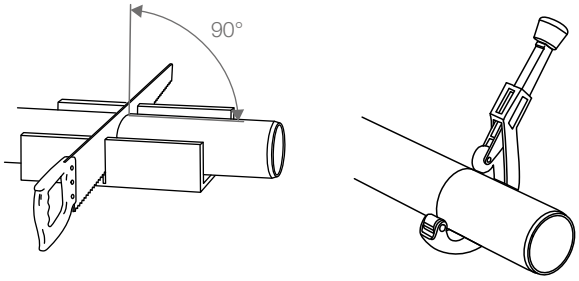
8.2 Waste system jointing methods

The jointing method that can be adopted depends on the type of waste system chosen.

8.2.1 Jointing with push-fit ring seal sockets

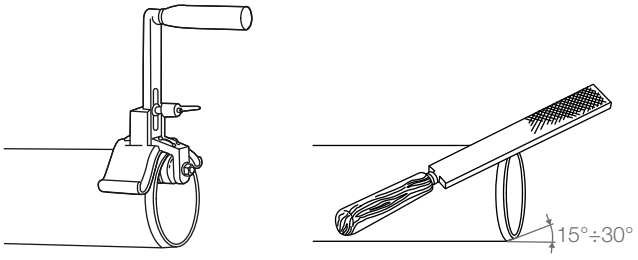
Main characteristics	
Type	Push-fit ring seal joints are commonly used for the connection of pipes and/or fittings.
Applicability	Valsir HDPE, PP/PP3®, Triplus®and Silere® waste systems
Diameters	32 to 315 mm (HDPE), 32 to 160 mm (PP/PP3®, Blackfire®), 32 to 250 mm (Triplus®), 58 to 160 mm (Silere®)
Removable	Yes
Tension resistant	No
Connection difficulty	Low
Necessary tools	Pipe-cutter, chamfering tool, lubricant, pencil, ruler

Installation instructions

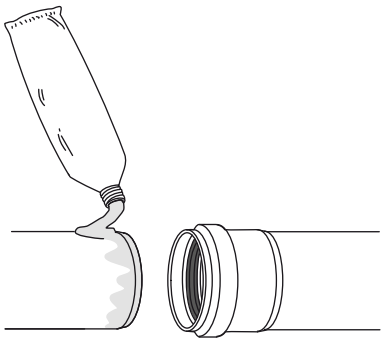


1) Cut the pipe using a suitable pipe cutter or a fine-tooth saw that is suitably guided to guarantee a perpendicular cut.

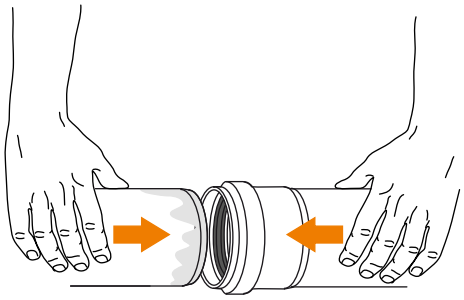
2) Do not shorten the fitting spigots, this would compromise the required insertion depth and the guarantee of a watertight seal.



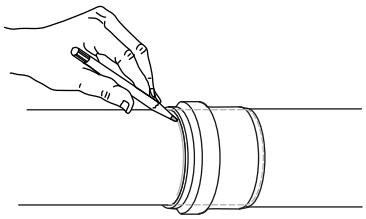
3) Chamfer and bevel the pipe ends to an angle of roughly 15° to 30° using a suitable chamfering tool or a fine file.
The chamfered surface must be smooth to avoid damaging the ring seal inside the socket when the pipe is inserted.



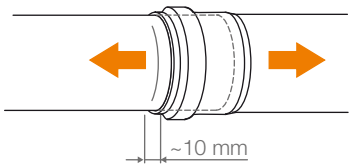
4) Ensure that the inside of the socket, the seal and the spigot of the piece to be inserted are perfectly clean. Lubricate the spigot with the appropriate Valsir lubricant (do not use mineral oil or grease).



5) Join the pipes and/or fittings together by inserting the spigot into the socket to maximum socket depth.

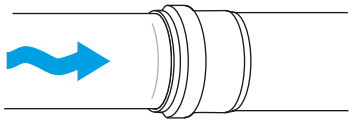


6) Mark the insertion depth.



7) Pull back the spigot about 10 mm, this length allows any thermal expansion to be accommodated. If the spigot is that of a fitting then this operation is not required.

Attention: do not pull back more than 10 mm as the seal of the joint would not be guaranteed or it could generate an excessive misalignment; on the other hand, if the spigot is pulled back less than 10 mm then the correct compensation of the thermal expansion would be prevented.

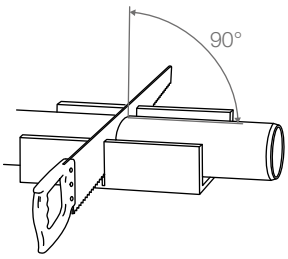


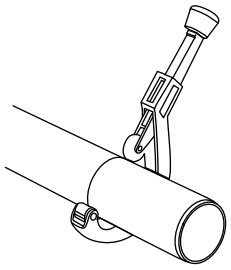
8) Note that the spigot must be upstream of the ring-seal socket. During installation excessive misalignments of the pipes should be avoided because they would compromise the seal of the joint. The pipes must be suitably anchored to the wall to prevent them sliding back into the socket, due to their own weight, and cancelling the extraction length (for more details on installation and bracketing rules, please see Chapter 7).

8.2.2 Joints with expansion sockets

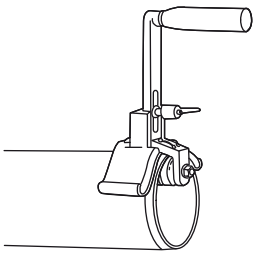
Main characteristics	
Type	Jointing methods that use expansion sockets with seals are used to accommodate the expansions and contractions for straight segments of Valsir HDPE waste systems. For more information on the positioning of expansion sockets in waste systems please see Chapter 7.
Applicability	Valsir HDPE waste system
Diameters	32 to 315 mm
Removable	Yes
Tension resistant	No
Connection difficulty	Low
Necessary tools	Pipe cutter, chamfering tool, lubricant, pencil, ruler

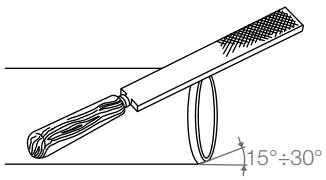
Installation instructions



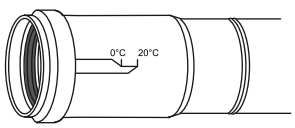


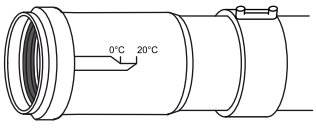
1) Cut the pipe using a suitable pipe cutter or a fine-tooth saw that is suitably guided to guarantee a perpendicular cut.



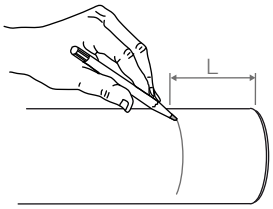


2) Chamfer and bevel the pipe end to an angle of roughly 15° to 30° using a suitable chamfering tool or a fine file.
The chamfered surface must be smooth to avoid damaging the ring seal inside the socket where the pipe is to be inserted.



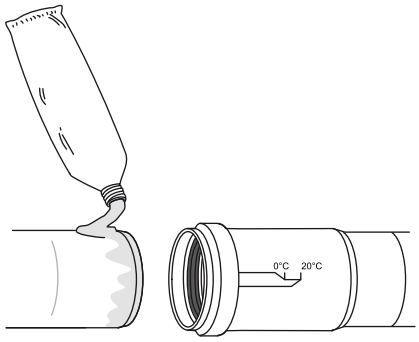


3) Weld the expansion socket to the pipe using the butt-welding method or an electrofusion sleeve (for more information please refer to the relative installation instructions).

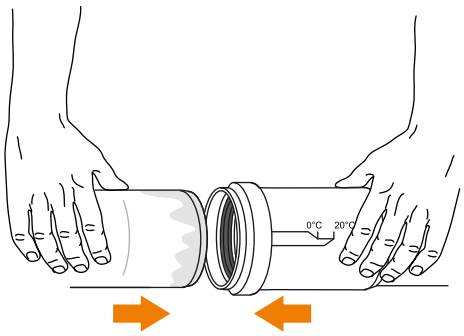


4) Mark the insertion depth according to the diameter of the pipe and installation temperature as specified in the following table.

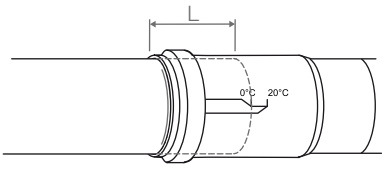
Installation temperature	Pipe diameter OD		
	40÷75 mm	90÷160 mm	200÷315 mm
	Insertion depth L		
-10°C	65 mm	75 mm	120 mm
0°C	75 mm	85 mm	130 mm
+10°C	90 mm	100 mm	145 mm
+20°C	100 mm	110 mm	155 mm
+30°C	110 mm	120 mm	170 mm



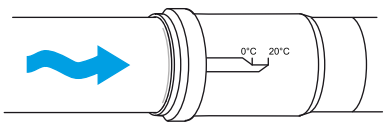
5) Ensure that the inside of the socket, the seal and the spigot of the piece to be inserted are perfectly clean. Lubricate the spigot with the appropriate Valsir lubricant (do not use mineral oil or grease).



6) Connect the pieces by inserting the pipe inside the expansion socket.



7) The pipe must be inserted as far as the mark made previously.

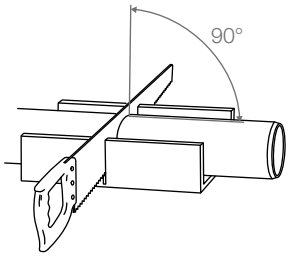


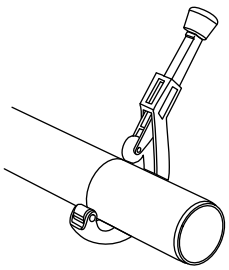
8) Note that the spigot must be upstream of the expansion socket. During installation excessive misalignments of the pipes should be avoided because this would compromise the seal of the joint. The pipes must be suitably anchored to the wall to prevent them sliding back into the expansion socket, due to their own weight, and cancelling the extraction length (for more details on installation and bracketing rules, please see Chapter 7).

8.2.3 Joints with bi-joint

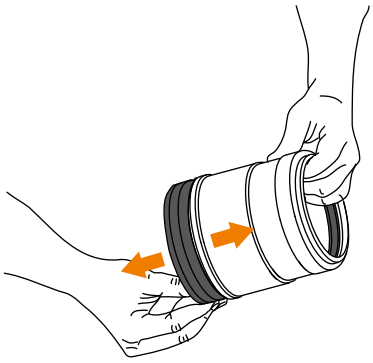
Main characteristics	
Type	This jointing method uses a bi-joint with a special seal and a pipe stopper in the middle, to connect two plain-end pipes together.
Applicability	Valsir Silere® waste system
Diameters	58 to 160 mm
Removable	Yes
Tension resistant	No
Connection difficulty	Low
Necessary tools	Pipe cutter, chamfering tool, lubricant, pencil, ruler

Installation instructions

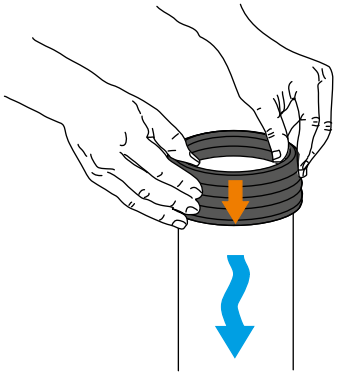




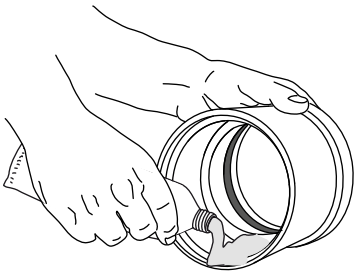
1) Cut the pipes with a suitable pipe cutter or a fine-tooth saw that is suitably guided to guarantee a perpendicular cut.



2) Inspect the condition of the bi-joint, clean the ends and remove the rubber grommet.

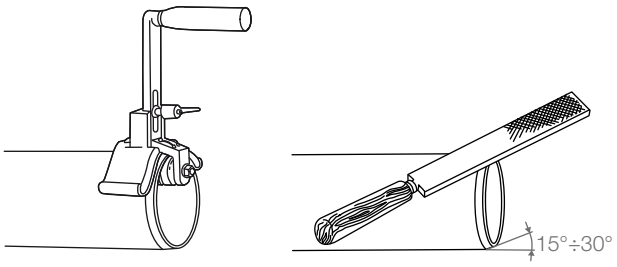


3) Fit the rubber grommet onto the pipe to be connected. The pipe onto which the grommet is fitted does not need to be chamfered. Attention: the position of the rubber grommet also defines the direction of the flow of the waste water.

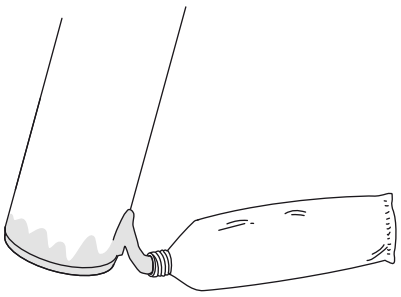


4) Spread both of the internal ends of the bi-joint with suitable Valsir lubricant (do not use mineral oils or grease).

5) Fit the bi-joint onto the pipe where the grommet has been placed until maximum socket depth and check that the grommet is positioned correctly.

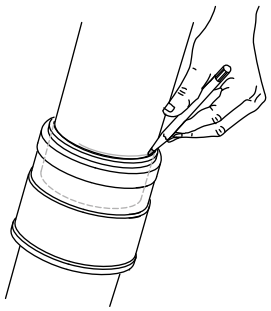


6) Chamfer and bevel the pipe end to an angle of roughly 15° to 30° using a suitable chamfering tool or a fine file.
The chamfered surface must be smooth to avoid damaging the ring seal inside the socket where the pipe is to be inserted

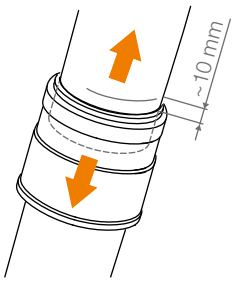


7) Spread the pipe to be inserted with a suitable Valsir lubricant (do not use mineral oils or grease).

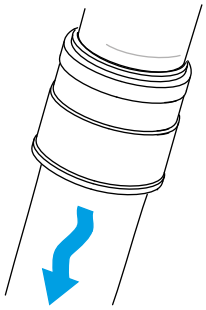
8) Make the joint by inserting the pipe inside the bi-joint.



9) Mark the insertion depth.



10) Pull back the spigot about 10 mm, this length allows any thermal expansion to be accommodated. If the spigot is that of a fitting then this operation is not required.
Attention: do not pull back more than 10 mm as the seal of the joint would not be guaranteed or it could generate an excessive misalignment; if the spigot is pulled back less than 10 mm then the correct compensation of the thermal expansion would be prevented.



11) Note that the lip seal must be upstream of the side with the grommet. During installation excessive misalignments of the pipes should be avoided because this would compromise the seal of the joint. The pipes must be suitably anchored to the wall to prevent them sliding back into the expansion socket, due to their own weight, and cancelling the extraction length (for more details on installation and bracketing rules, please see Chapter 7).

8.2.4 Repair of pipes using sliding sleeves

Main characteristics	
Type	This jointing method avails of special sliding sleeves for the repair of damaged pipes. These sliding sleeves are also used for modifying existing pipelines, for example, to install additional fittings such as a branch fitting.
Applicability	Valsir HDPE, PP/PP3®, Triplus®, and Silere® waste systems
Diameters	160 to 315 mm (HDPE), 32 to 160 mm (PP/PP3®, Blackfire®), 32 to 250 mm (Triplus®), 58 to 160 mm (Silere®)
Removable	Yes
Tension resistant	No
Connection difficulty	Medium
Necessary tools	Pipe cutter, chamfering tool, lubricant, pencil, ruler

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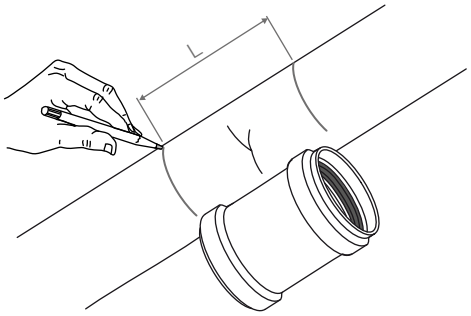
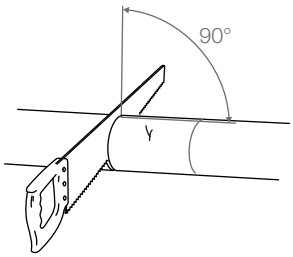
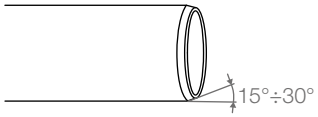
Installation instructions

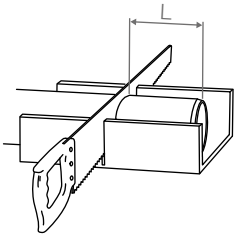


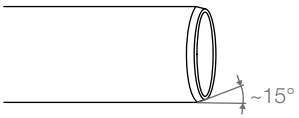
1) Indicate the area to be cut at a distance L that is at least equal to the length of the sliding sleeve and which includes the damaged area.



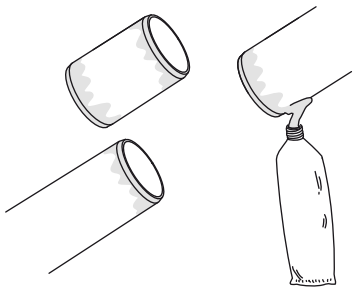


2) Cut the section of the pipeline with a suitable pipe cutter or with a fine-tooth saw that is suitably guided to guarantee a perpendicular cut. Chamfer and bevel the resulting pipe ends of the pipeline to an angle of roughly 15° to 30° using a suitable chamfering tool or a fine file. The chamfered surface must be smooth to avoid damaging the ring seal inside the sliding sleeve.

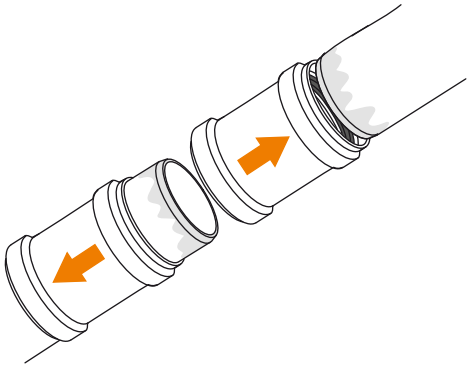




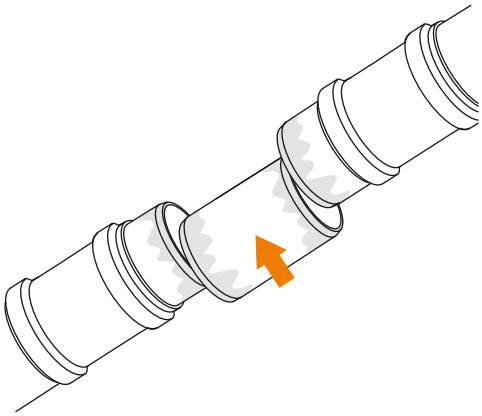
3) Cut a piece of pipe of length L with a suitable pipe cutter or with a fine-tooth saw that is suitably guided to guarantee a perpendicular cut. Chamfer and bevel the ends of the piece of pipe to an angle of roughly 15° to 30° using a suitable chamfering tool or a fine file. The chamfered surface must be smooth to avoid damaging the ring seal inside the sliding sleeves.



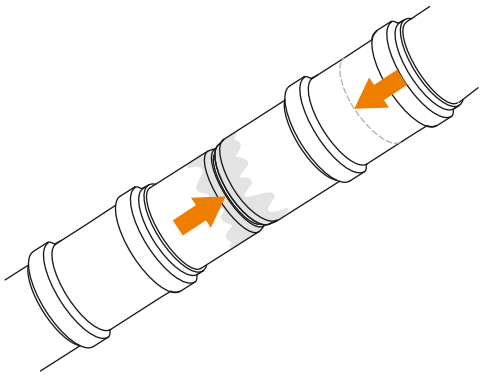
4) Spread the ends of the pipeline and the piece of pipe with a suitable Valsir lubricant (do not use mineral oils or grease).



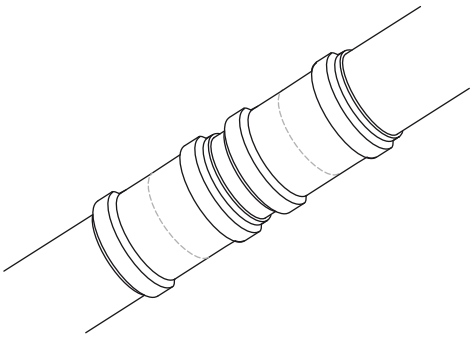
5) Position the sliding sleeves by inserting them in the space created between the two ends of the pipeline and slide them onto the pipe ends.



6) Position the piece of pipe in the space created between the two ends of the pipeline.



7) Slide the two sleeves toward the piece of pipe.

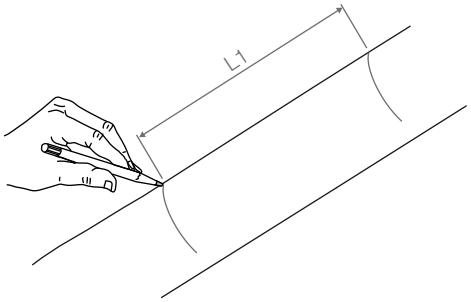


8) The two sliding sleeves must be positioned perfectly over the lines where the pipes were cut.

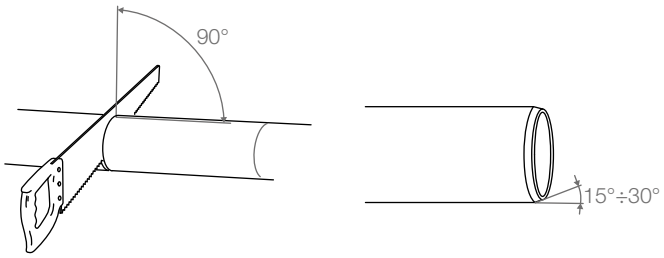
8.2.5 Modification of pipelines using sliding sleeves

Main characteristics	
Type	This jointing method avails of special sliding sleeves for the modification of existing pipelines, for example, to add a branch fitting.
Applicability	Valsir HDPE, PP/PP3®, Triplus®, and Silere® waste systems
Diameters	160 to 315 mm (HDPE), 32 to 160 mm (PP/PP3®, Blackfire®), 32 to 250 mm (Triplus®), 58 to 160 mm (Silere®)
Removable	Yes
Tension resistant	No
Connection difficulty	Medium
Necessary tools	Pipe cutter, chamfering tool, lubricant, pencil, ruler

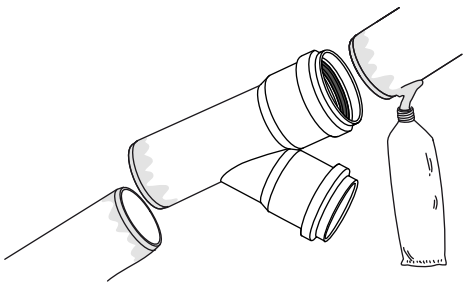
Installation instructions



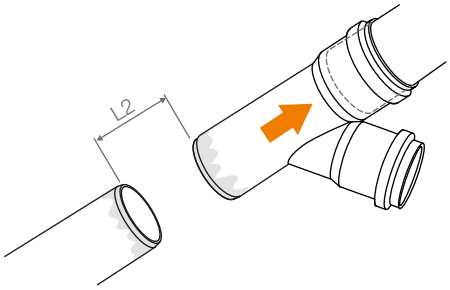
1) Indicate the area to be cut at a distance L1 at least equal to the length of the fitting to be inserted (in the example the branch fitting) plus a length equal to three times the pipe diameter.



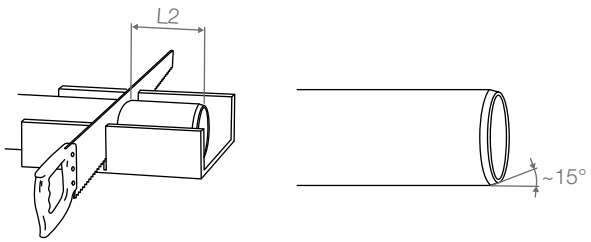
2) Cut the section of the pipeline with a suitable pipe cutter or with a fine-tooth saw, suitably guided to guarantee a perpendicular cut. Chamfer and bevel the resulting ends of the pipeline to an angle of roughly 15° to 30° using a suitable chamfering tool or a fine file. The chamfered surface must be smooth to avoid damaging the ring seal inside the fittings that will be used.



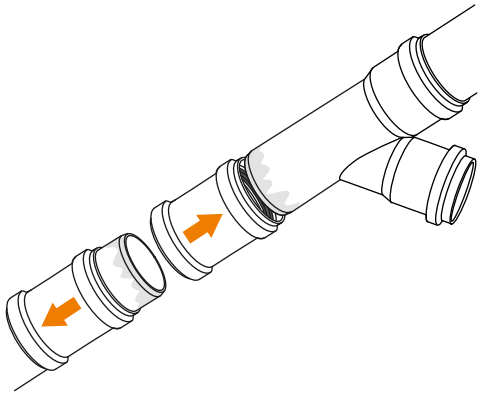
3) Spread the ends of the pipeline and the fitting with suitable Valsir lubricant (do not use mineral oils or grease).



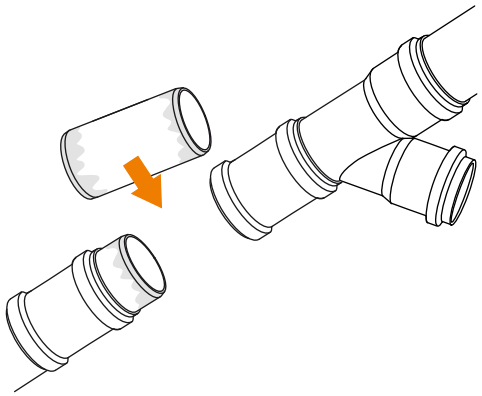
4) Insert the fitting onto the end of the pipeline to maximum socket depth and measure the resulting distance L2.



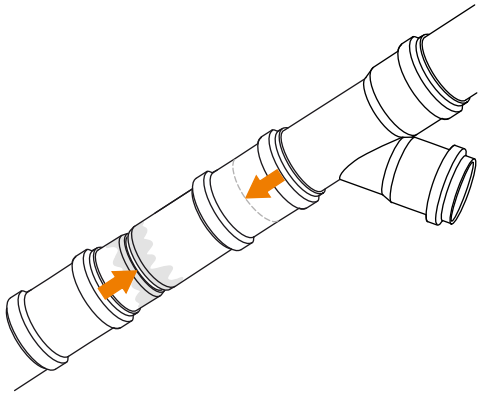
5) Cut a piece of pipe of length L2 with a suitable pipe cutter or with a fine-tooth saw, suitably guided to guarantee a perpendicular cut. Chamfer and bevel the ends of the piece of pipe to an angle of roughly 15° to 30° using a suitable chamfering tool or a fine file. The chamfered surface must be smooth to avoid damaging the ring seal inside the sliding sleeve.



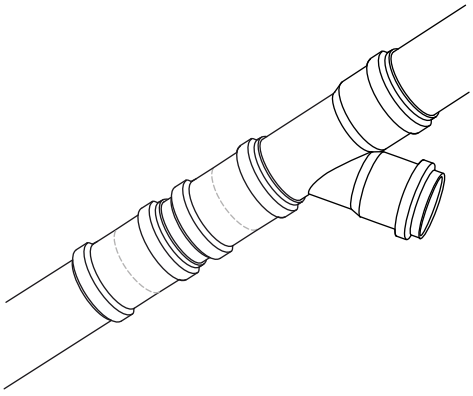
6) Position the sliding sleeves by inserting them in the space created between the pipeline and fitting that was inserted previously and sliding each of them onto the two ends.
If the spigot of the fitting is not long enough to accommodate the sliding sleeve, position both of them on the end of the pipeline, the sleeve will then be slid to the necessary position above the fitting.



7) Position the piece of pipe in the space created between the two ends of the pipeline.



8) Slide the two sleeves toward the piece of pipe.



9) The two sliding sleeves must be positioned perfectly over the lines where the pipes were cut.

8.2.6 Butt-welding by hand

Watch the video on website:
valsir.it/u/saldaturatestatesta

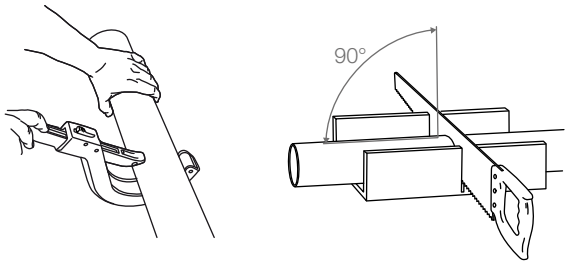
Main characteristics	
Type	This welding method allows the connection of pipes and/or fittings by using a completely manual procedure. Butt-welding consists of a heating process that produces the fusion of the surfaces to be welded using a metal plate (thermal plate). The surfaces are then united by creating the correct contact pressure. Butt-welding is characterised by a bulge of material that surrounds the area of the joint.
Applicability	Valsir HDPE waste system
Diameters	32 to 63 mm
Removable	No
Tension resistant	Yes
Connection difficulty	Medium
Necessary tools	Pipe cutter, welding plate

8

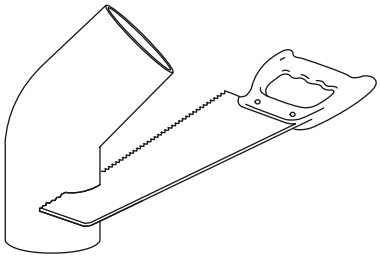
Installation instructions

CAUTION!

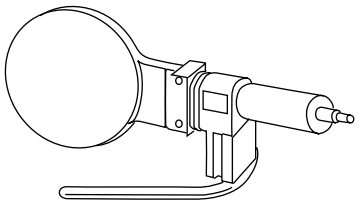
- The thickness and the diameters of the pipes to be welded together must be the same.
- Welding must be performed in favourable climatic conditions at environmental temperatures between -5°C and +40°C. In the presence of wind and/or humidity or in the event of temperatures below -5°C or greater than +40°C the work area will need to be heated or ventilated respectively by covering it with a canvas or other effective protective systems. At any rate it is recommended to perform a few welding tests.
- The temperature of the parts to be welded must be uniform at the time of welding. The ends of the joints that do not require welding must be closed with caps to avoid cooling the joints with the passage of air inside the pipes.
- The parts to be welded must be clean and kept clean throughout the welding process.
- The pipes, fittings and welding machine can be employed after they have been kept at the same room temperature to avoid an excessive or insufficient production of thermal energy. Pipes and/or fittings must not be exposed to rain, sun rays or sources of heat, before, during or immediately after welding.
- During welding and the other phases of the cycle (especially during cooling) the joint must absolutely not be subjected to any mechanical stress.
- The chemical and physical characteristics of the materials to be welded must be mutually compatible.



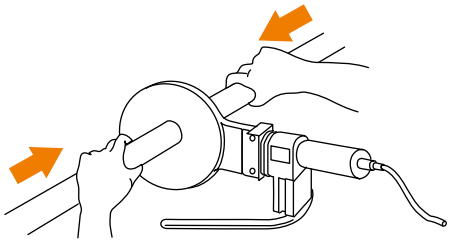
1) The pipes and/or fittings must always be cut square, accurately, with a clean cut, without burrs using a pipe cutter or fine-tooth saw. Clean the ends of the joints to be welded with a dry and clean cloth. It is recommended to chamfer the internal parts to be welded along the entire circumference in order to reduce the effect of the bulge in the internal cross-section of the pipe. Remove any burrs caused by chamfering from the inside of the pipe using a paper cloth or a clean brush. Do not touch the chamfered surfaces again with your hands.



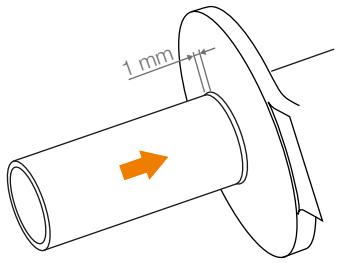
2) If necessary the ends of the fittings can be shortened by a length indicated with the letter K on the technical card. The ends of the fittings must at any rate be sufficiently long for them to be handled and then welded.



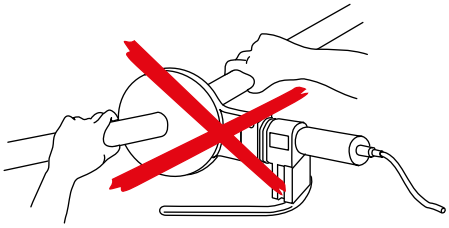
3) The temperature of the welding plate must be 210°C±5°C. For more information on use of the equipment, please consult the instructions in the handbook.



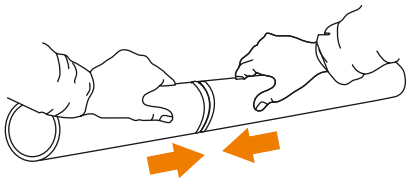
4) The first phase of the welding process consists of heating the parts to be welded. In this phase, place the welding plate between the parts to be welded, and hold them against the plate.



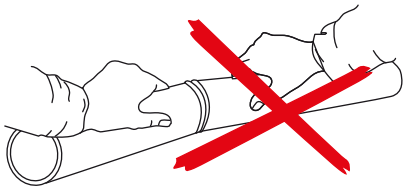
5) Apply enough pressure to create a bulge with a thickness of about 1 mm.



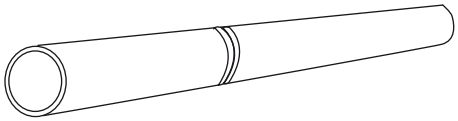
6) During the heating phase keep the parts to be welded perfectly aligned, avoiding movements or misalignments that would compromise the weld.



7) The second phase of the process consists of welding the parts together. Remove the parts therefore from the welding plate being careful not to damage the heated edges, and keeping them in axial alignment, bring them together in not more than 5 seconds to avoid them cooling. Then apply a uniform pressure until the welding seam has cooled.



8) During this phase avoid turning or flexing. To keep the parts in axial alignment during welding, a guide can be used.



9) The third and last phase of the process consists of cooling the joint. Keep the parts to be welded in position until the welding seal has solidified, this can be verified by pressing a finger on the seam. The welded joint must not be subjected to any mechanical stress until it has completely cooled down at room temperature. Do not accelerate the cooling process by contact with water or other liquids.

8.2.7 Butt-welding by machine

Watch the video on website:
valsir.it/u/saldaturamacchina

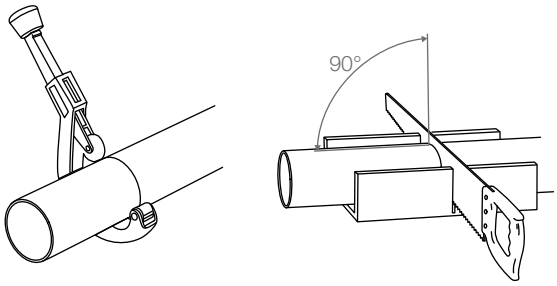
Main characteristics		
Type	This welding method allows the connection of pipes and/or fittings and requires the use of a welding machine. Butt-welding consists of a heating process that produces the fusion of the surfaces to be welded using a metal plate (thermal plate). The surfaces are then united using the welding machine and creating the correct contact pressure. Butt-welding is characterised by a bulge of material that surrounds the area of the joint.	
Applicability	Valsir HDPE waste system	
Diameters	40 to 315 mm	
Removable	No	
Tension resistant	Yes	
Connection difficulty	Medium/High	
Necessary tools	Pipe cutter, welding machine	

8

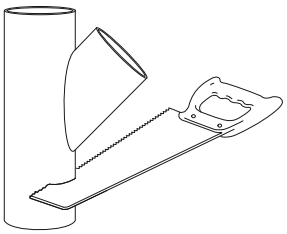
Installation instructions

CAUTION!

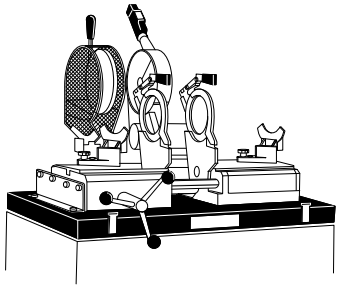
- The thickness and the diameters of the pipes to be welded together must be the same.
- Welding must be performed in favourable climatic conditions at environmental temperatures between -5°C and +40°C. In the presence of wind and/or humidity or in the event of temperatures below -5°C or greater than +40°C, the work area will need to be heated or ventilated respectively, by covering it with a canvas or other effective protective systems. At any rate it is recommended to perform a few welding tests.
- The temperature of the parts to be welded must be uniform at the time of welding. The ends of the joints that do not require welding must be closed with caps to avoid cooling the joints with the passage of air inside the pipes.
- The parts to be welded must be clean and kept clean throughout the welding process.
- The pipes, fittings and welding machine can be employed after they have been kept at the same room temperature to avoid an excessive or insufficient production of thermal energy. Pipes and/or fittings must not be exposed to rain, sun rays or sources of heat, before, during or immediately after welding.
- During welding and the other phases of the cycle (especially during cooling) the joint must absolutely not be subjected to any mechanical stress.
- The chemical and physical characteristics of the materials to be welded must be mutually compatible.
- If large diameter pipes are to be welded it is recommended to place them on guide rollers.



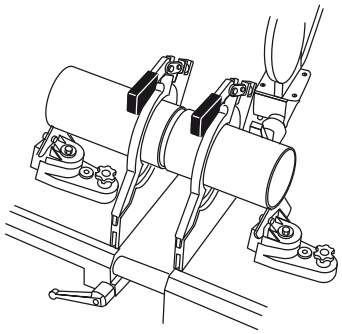
1) The pipes and/or fittings must always be cut square, accurately, with a clean cut and without burrs using a pipe cutter or fine-tooth saw. Clean the ends of the joints to be welded with a dry and clean cloth. It is recommended to chamfer the internal parts to be welded along the entire circumference in order to reduce the effect of the bulge in the internal cross-section of the pipe. Remove any burrs caused by chamfering from the inside of the pipe using a paper cloth or a clean brush. Do not touch the chamfered surfaces again with your hands.



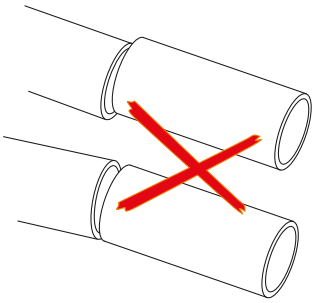
2) If necessary, the ends of the fittings can be shortened by a length indicated with the letter K on the technical card. The ends of the fittings must at any rate be sufficiently long for them to be handled and then welded.



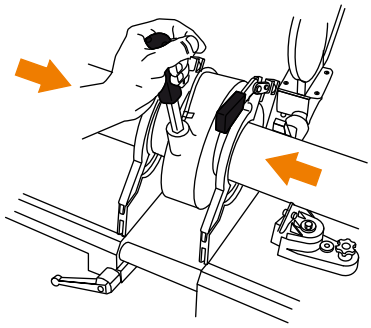
3) The temperature of the welding plate must be 210°C±5°C. For more information on the use of the equipment, please consult the instructions in the handbook.



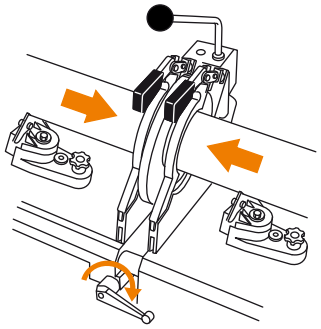
4) In the first phase the parts to be welded are blocked. Adjust the fasteners on the closing devices until the pipes and/or fittings have been correctly blocked in place; avoid excessive blocking as this causes crushing and ovalization of the pieces to be welded.



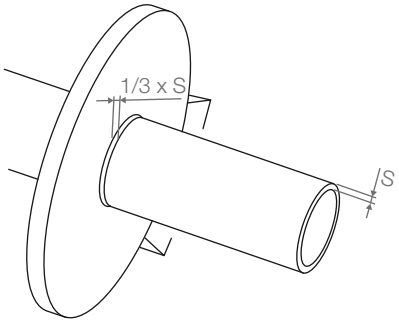
5) Block the pipes and/or fittings to be welded using the jaws of the welding machine, keeping them in axial alignment.



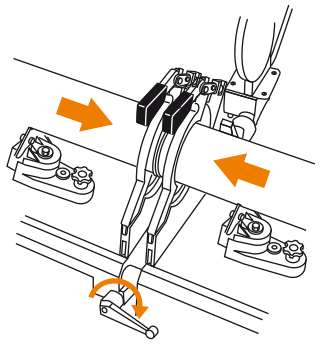
6) During the second phase the pipe parts are chamfered. The chamfering operation is fundamental to ensure that the surface of the ends is completely clean and plane. Insert the cutter between the pipe and/or fittings to be welded and activate the control on the hand grip. Push the pipe parts against the planing disc with a certain amount of pressure using the handwheel that moves the welding machine carriage. Remove the ends using the handwheel when the planing disc is still moving to avoid the formation of notches on the surfaces to be welded. Remove the internal and external burrs using a paper cloth or a clean brush. Do not touch the chamfered surfaces again with your hands. A continuous and uniform polyethylene shaving is an indication that the chamfering operation has been carried out correctly. Before welding, check the cut faces by bringing them together using the handwheel, they should be perfectly parallel.



7) The third phase, heating the parts to be welded. Position the heating plate between the parts to be welded and place them against it using the handwheel of the welding machine carriage.

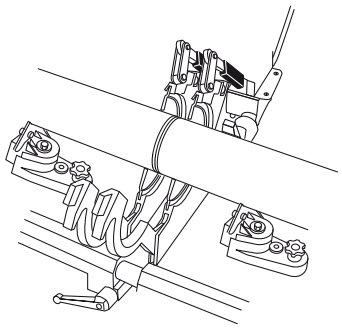


8) Apply sufficient pressure to create a melted bulge that is 1/3 of the wall thickness and/or the fitting. If necessary it is possible to block the parts to be welded in position until the bulge has formed completely using the appropriate locking device.



9) The fourth phase of the process is welding. Remove the parts to be welded from the heating plate, put the heating plate in the non-operating position to avoid damaging the heated heads and carefully press together both parts to be welded. This must be done in the space of a few seconds to avoid the pieces cooling down (from 5 seconds for diameters up to 110 mm and up to 8 seconds for diameter 315 mm). Using the carriage handwheel, progressively apply (in 5 seconds for diameters up 75 mm, to 9 seconds for diameter 315 mm) the necessary pressure F indicated in the table, according to the diameter OD and thickness s of the pipe and measured by the dynamometer on the welding machine. Once the welding pressure has been reached, block the carriage using the mechanical locking device and keep the parts in position for time Ts indicated in the table.

OD [mm]	40	50	56	63	75	90	90	110	110	125	125	160	160	200	200	250	250	315	315
s [mm]	3	3	3	3	3	3	3.5	3.4	4.2	3.9	4.8	4.9	6.2	6.2	7.7	7.7	9.6	10.9	12.1
F [kg]	5	7	7	8	10	12	14	17	21	22	27	36	45	57	70	88	109	140	173
Ts [min]	7	7	7	7	7	7	7	7	8	8	9	9	10	10	12	12	14	14	17



10) The last phase is cooling. Release the locking device but avoid sudden movements by controlling the handwheel. Open the clamps and remove the joint from the welding machine. Leave it to cool for the time Tr indicated in the table. During this phase the welded joint must not be subjected to any mechanical stress and do not accelerate cooling by contact with water or other liquids.

OD [mm]	40	50	56	63	75	90	90	110	110	125	125	160	160	200	200	250	250	315	315
s [mm]	3	3	3	3	3	3	3.5	3.4	4.2	3.9	4.8	4.9	6.2	6.2	7.7	7.7	9.6	10.9	12.1
Tr [min]	5	5	5	5	5	6	6	6	7	7	8	8	11	11	13	13	16	16	20

8.2.8 Electrofusion coupling

Watch the video on website:
valsir.it/u/saldaturaelettrica

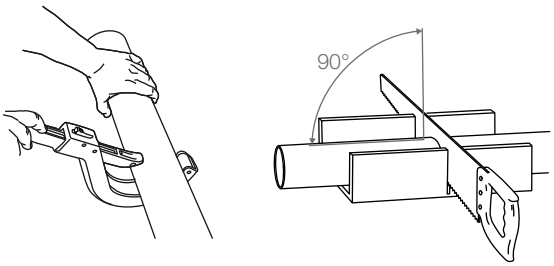
Main characteristics	
Type	This welding system allows pipes and/or fittings to be connected using electrofusion techniques with an electric sleeve.
Applicability	Valsir HDPE waste system
Diameters	40 to 315 mm
Removable	No
Tension resistant	Yes
Connection difficulty	Low
Necessary tools	Pipe cutter, pipe scraper, welding machine, pencil, ruler

8

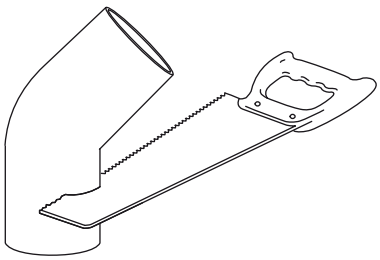
Installation instructions

CAUTION!

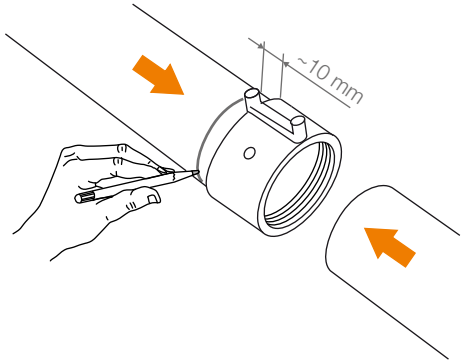
- Welding must be carried out in favourable climatic conditions at a temperature between -5°C and +40°C. In windy and/or damp conditions or if temperatures fall below -5°C or are greater than +40°C the work area will need to heating or ventilated by covering it with a canvas or another effective protective system. At any rate it is recommended to perform a few welding tests.
- The temperature of the parts to be welded must be uniform at the time of welding. The ends of the joints that do not require welding must be closed with caps to avoid cooling the joints with the passage of air inside the pipes.
- The parts to be welded must be clean and kept clean throughout the welding process.
- The pipes, fittings and welding machine can be employed after they have been kept at the same room temperature to avoid an excessive or insufficient production of thermal energy. Pipes and/or fittings must not be exposed to rain, sun rays or sources of heat, before, during or immediately after welding.
- During welding and the other phases of the cycle (especially during cooling) the joint must absolutely not be subjected to any mechanical stress.
- The chemical and physical characteristics of the materials to be welded must be mutually compatible.
- If large diameter pipes are to be welded it is recommended to place them on guide rollers.



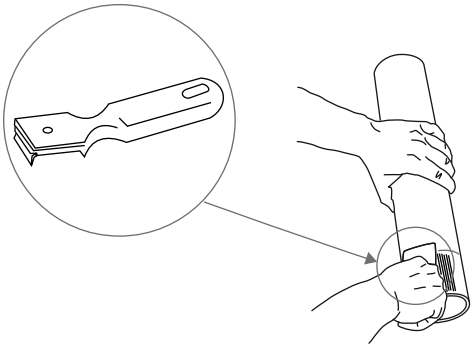
1) The pipes must be cut square so that the coils of the electric sleeve remain in contact with the pipe and/ or fitting. Use a pipe cutter or fine-tooth saw. Use centering rings if ovalization of the pipe and/or fitting exceeds 1.5% x OD (rounded down to 0.5 mm).



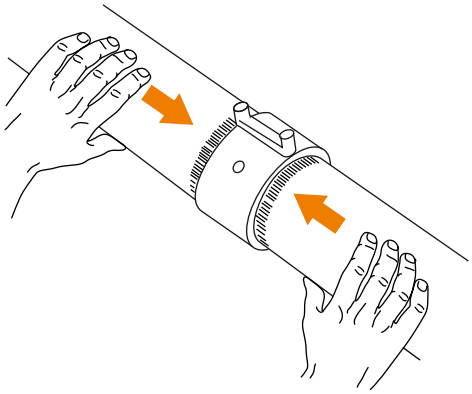
2) If necessary the ends of the fitting can be shortened as long as the remaining part is not shorter than the insertion depth of the electric sleeve as indicated on the technical card.



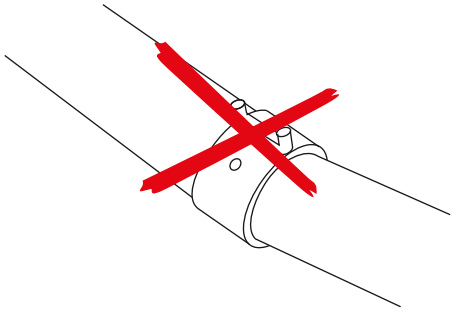
3) Clean and dry the welding ends. Mark a length of at least 10 mm greater that the insertion length of the electrofusion coupling on the pipe with a pencil, if necessary by temporarily inserting the parts into the coupler.



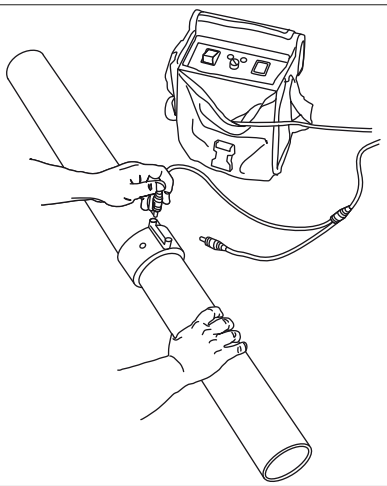
4) Scrape the welding ends; scraping must be uniform and complete to a depth of approximately 0.2 mm up to the pencil mark. Use appropriate pipe scrapers. In no case should cutters, sandpaper, files or emery-wheels be used.



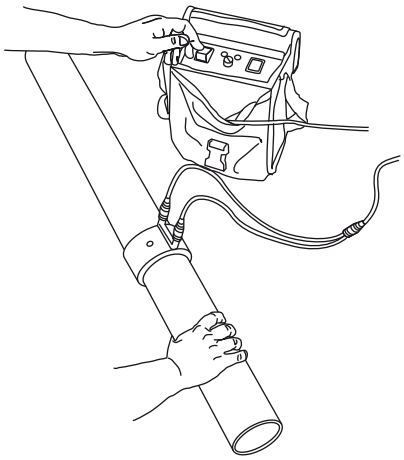
5) Inserts the parts to be welded into the sleeve coupling up to insertion depth. The connection with the sleeve must be free of tension such as those caused by any bracketing clips previously tightened near the weld area. The welding ends must remain dry during the whole welding process.



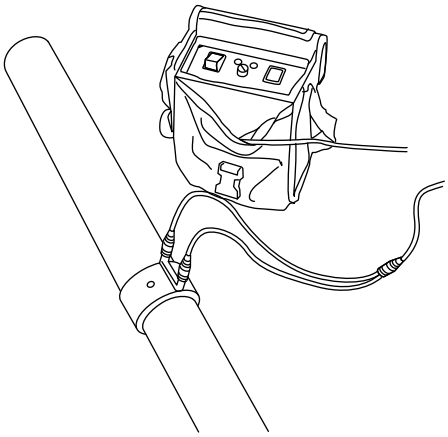
6) Keep the parts to be welded aligned and avoid any mechanical stress that could cause misalignment.



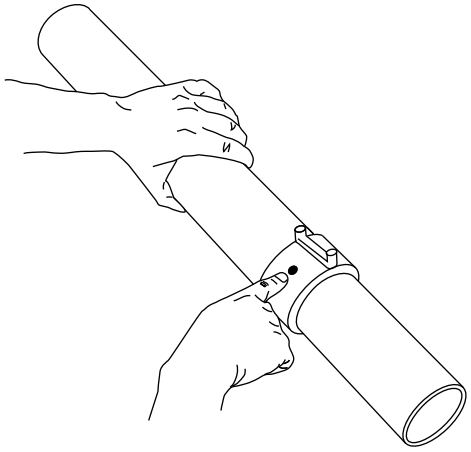
7) Connect the electrofusion sleeve to the welding machine using the appropriate plugs according to the diameter to be welded (for more information please see the welding machine handbook).



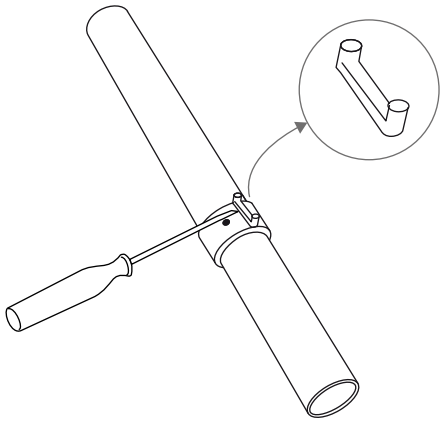
8) The welding time is determined automatically by the machine, which, when completed, will produce an audible signal. On no account can the same coupling be welded twice.



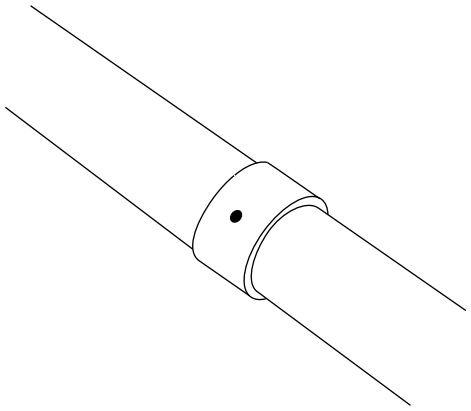
9) The parts to be welded must be kept in position and aligned; furthermore, they must not be subjected to any mechanical stress during welding. Any movement of the sleeve during the welding could cause a short circuit of the coils and an incorrect weld.



10) An incomplete welding can be verified by the fact that the indicator on the electrofusion sleeve has not changed colour (from white to black). Attention: the indicator does not guarantee a perfect weld which can be influenced by numerous factors such as dimensional tolerances, the ovality of the components to be welded, mechanical stress in the connection area. The parts to be welded must remain in position and aligned; they must not be subjected to any mechanical stress during cooling.



11) If required, the electrical connector sockets on the electrofusion couplings can be removed at the end of the cooling phase

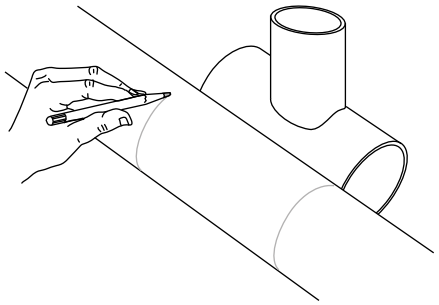


12) Water must not be poured over the joint nor should any other action be taken to accelerate cooling of the electrofusion coupling.

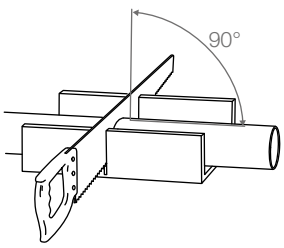
8.2.9 Repair or modification of the pipes using electrofusion welding

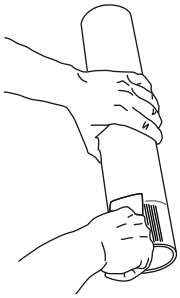
Main characteristics	
Type	This system allows the repair of damaged pipes or the alteration of existing pipes using electrofusion couplers.
Applicability	Valsir HDPE waste system
Diameters	40 to 315 mm
Removable	No
Tension resistant	Yes
Connection difficulty	Medium
Necessary tools	Pipe cutter, pipe scraper, welding machine, pencil, ruler

Installation instructions

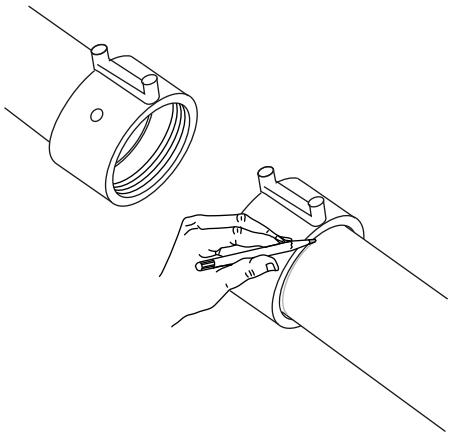


1) Indicate the area to be cut at a distance that is at least equal to the length of the electrofusion coupling or the fitting to be inserted in the pipe section.

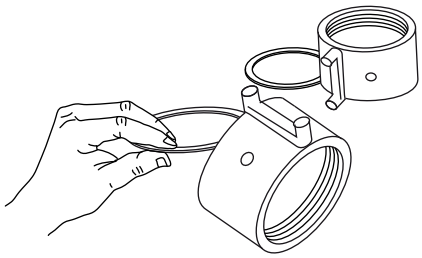




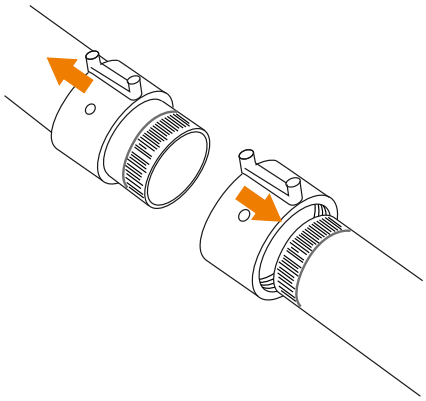
2) Cut the section of pipeline with a suitable pipe cutter or a fine-tooth saw that is suitably guided to guarantee a perpendicular cut. Scrape the welding ends; scraping must be uniform and complete (to a depth of approximately 0.2 mm) and a length of at least 10 mm longer that the insertion depth of the electrofusion coupling. Use appropriate pipe scrapers. In no case should cutters, sandpaper, files or emery-wheels be used.



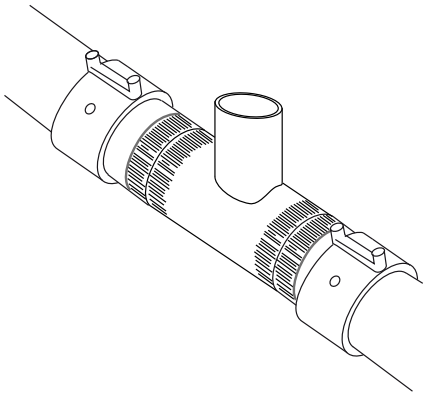
3) Insert the electrofusion sleeves onto each of the two ends and, when fully inserted, mark the insertion depth.



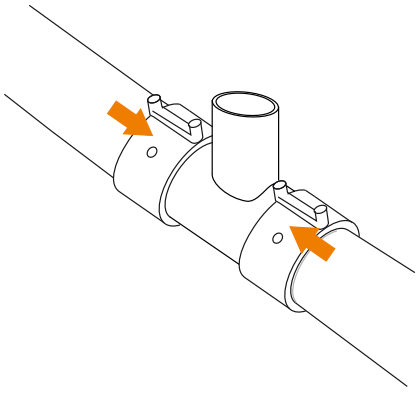
4) The electrofusion sleeves have a central ring that can be removed to turn the coupling into a sliding sleeve.



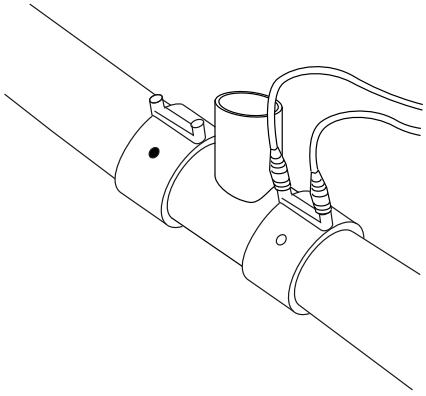
5) Position the electrofusion couplers in the space created between the two ends of the pipeline and slide them over the two ends.



6) Position the piece of pipe or fitting in the space created between the two ends of the pipeline.



7) Slide the two sleeves toward the piece of pipe; the lines where the pipes were cut must be exactly at the centre or each sleeve. Use the insertion marks as a reference for centering.

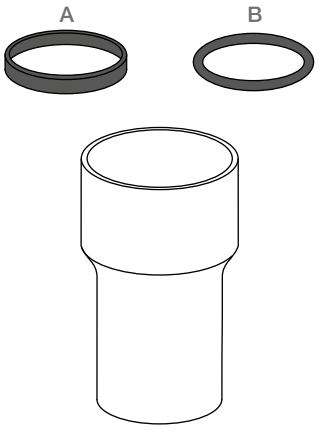


8) Proceed with the welding procedure for electrofusion as already described in this chapter.

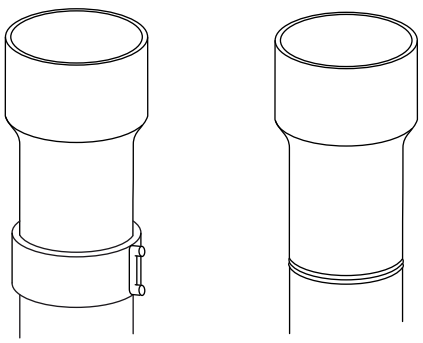
8.2.10 Jointing with contraction sleeves

Main characteristics	
Type	Jointing with contraction sleeves is used to connect Valsir HDPE pipes to pipes in metal, fibre cement or with pipes with irregular diameters.
Applicability	Valsir HDPE waste systems
Diameters	50 to 125 mm
Removable	Yes
Tension resistant	No
Connection difficulty	Medium
Necessary tools	Pipe cutter, flame or hot air heating tool, pencil, ruler

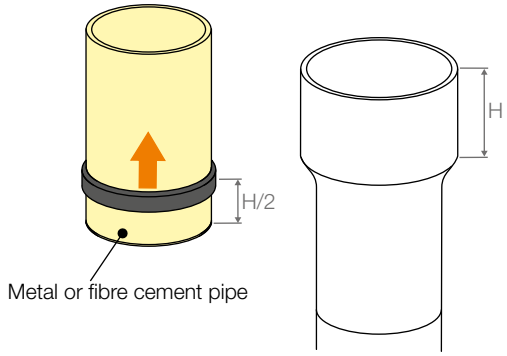
Installation instructions



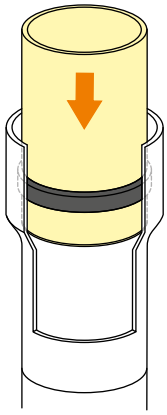
1) Inside the package two seals are supplied, one with a rectangular section (A) and one o-ring (B).
The decision as to which one to use depends on the diameter of the pipe to be connected (more details are provided in the section on sizing details of the HDPE catalogue in this manual.



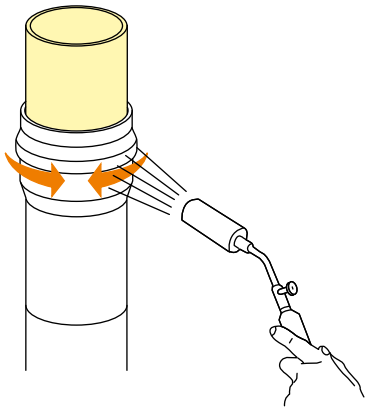
2) Weld the contraction sleeve to the pipeline using one of the techniques already described in this chapter.



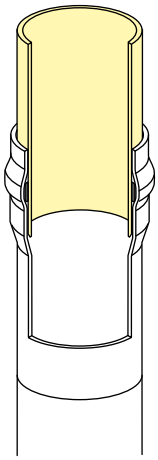
3) Fit the seal onto the pipe to be connected at a distance from the end that is roughly equal to half of the insertion depth of the contraction sleeve.



4) Push the pipe to be connected inside the contraction sleeve to insertion depth.



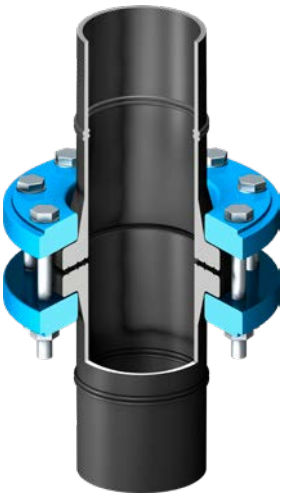
5) Heat the joint evenly without placing the flame in direct contact with the sleeve. The sleeve will start to shrink.



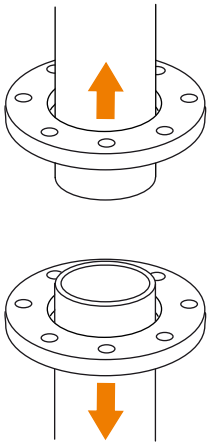
6) When completely cooled the sleeve will have shrunk completely and will give an absolutely watertight connection.

8.2.11 Flanged joints

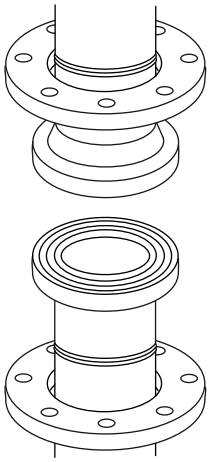
Main characteristics	
Type	Flanged joints are used principally in industrial plants and when an excellent tension resistance is required. The use of blind flanges allows inspection accesses to be made or the temporary closure of pipe sections.
Applicability	Valsir HDPE waste systems
Diameters	50 to 315 mm
Removable	Yes
Tension resistant	Yes
Connection difficulty	Medium/High
Necessary tools	Pipe cutter, welding machine, spanners to tighten the bolts



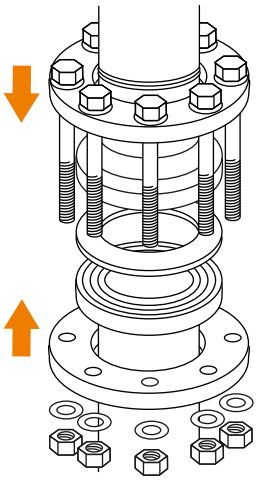
Installation instructions



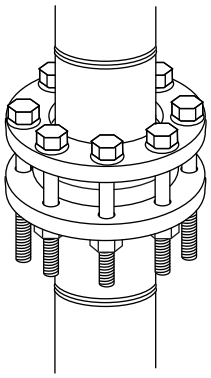
1) Position the flange on the ends of the two pipe sections to be connected.



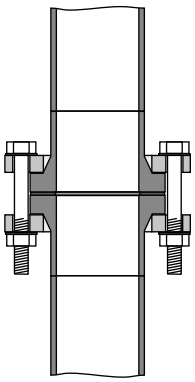
2) Using one of the welding techniques already described in this chapter, weld the flange adapters.



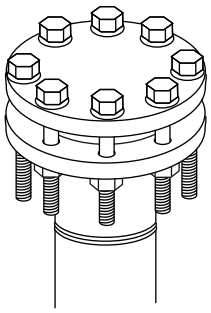
3) Place the flat seal between the two flange adapters and position the screws.



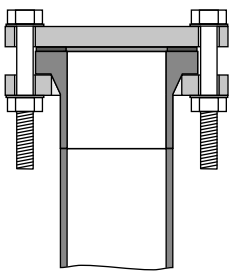
4) Gradually tighten all the bolts until the joint has been fully closed.



5) The bolts must be tightened evenly to keep a plane coupling of the two flange adapters.



6) If an inspection access or temporary closure needs to be made, use a blind flange.

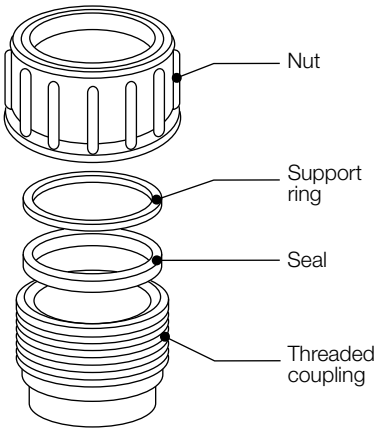


7) Also in this case the bolts need to be tightened evenly to maintain a plane joint of the flange adapter with a blind flange.

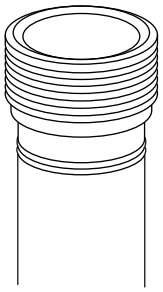
8.2.12 Screw-threaded joints

Main characteristics	
Type	This type of joint is used for the connection of system parts or when it is necessary to easily dismantle a system. This technique does not ensure tension resistance.
Applicability	Valsir HDPE waste system
Diameters	40 to 110 mm
Removable	Yes
Tension resistant	No
Connection difficulty	Medium
Necessary tools	Pipe cutter

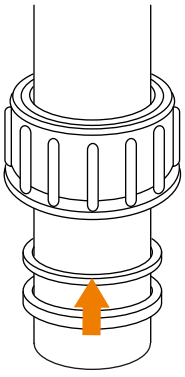
Installation instructions



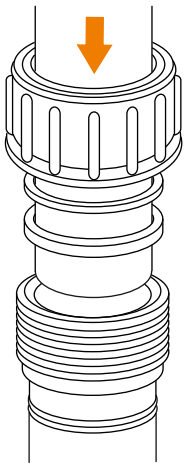
1) The screw joint is equipped with a threaded coupling, a nut and a seal that guarantees the hydraulic seal and a support ring which presses the rubber seal when the fitting is tightened.



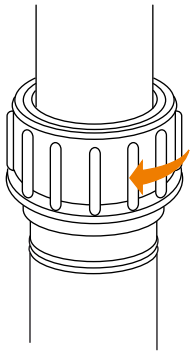
2) Using one of the welding techniques described previously in this chapter, weld the threaded coupling to one of the pipes to be connected.



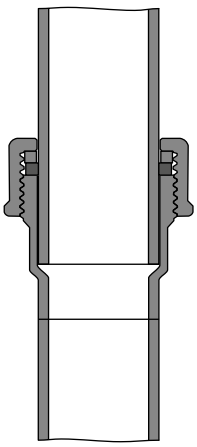
3) On the other pipe to be connected, position the nut, the support ring and the seal.



4) Insert the pipe inside the threaded coupling.
Move the support ring and seal toward the threaded coupling.



5) Screw the nut on tightly.

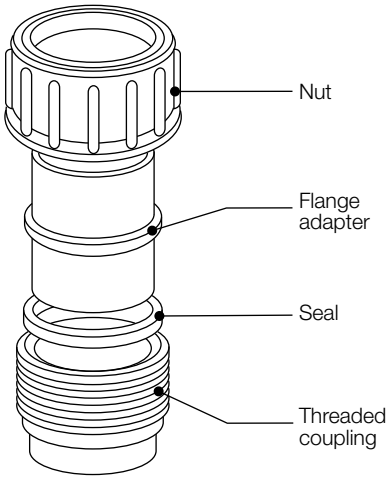


6) The hydraulic joint is guaranteed by the compression of the seal between the pipe, support ring and threaded coupling. This system does not guarantee an axial resistance.

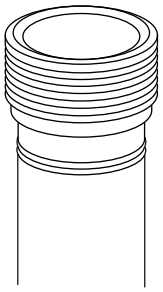
8.2.13 Screw-threaded joint with flange bushing

Main characteristics	
Type	This system is used to connect system parts together and when a certain tension resistance is required. This type of joint guarantees the possibility of easily dismantling system parts.
Applicability	Valsir HDPE waste system
Diameters	40 to 110 mm
Removable	Yes
Tension resistant	No
Connection difficulty	Medium
Necessary tools	Pipe cutter

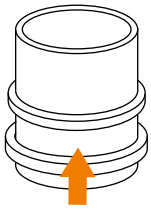
Installation instructions



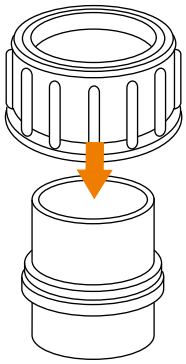
1) For this type of joint a threaded coupling and nut are required, as well as a seal that guarantees hydraulic seal and a flange bushing that presses the seal when the fitting is tightened and guarantees tension resistance.



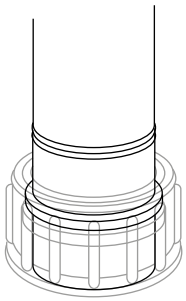
2) Using one of the welding techniques described previously in this chapter, weld the threaded coupling to one of the pipes to be connected.



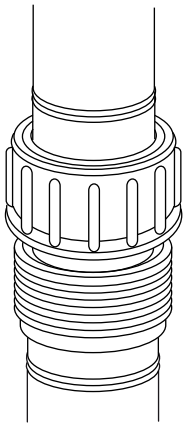
3) Position the seal on one of the ends of the flange bushing.



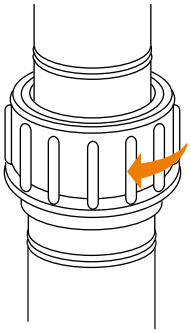
4) Slide the nut on the other end of the flange bushing.



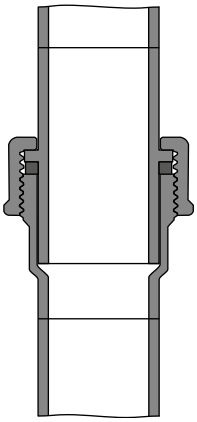
5) Using one of the welding techniques already described in this chapter, weld the flange bushing to one of the pipes to be connected.



6) Insert the pipe fully inside the threaded coupling.



7) Screw on the nut.



8) The hydraulic joint is guaranteed by the compression of the seal between the pipe, flange bushing and threaded coupling. This system guarantees an axial resistance.

8.3 Socket connection to the ventilation branch fittings

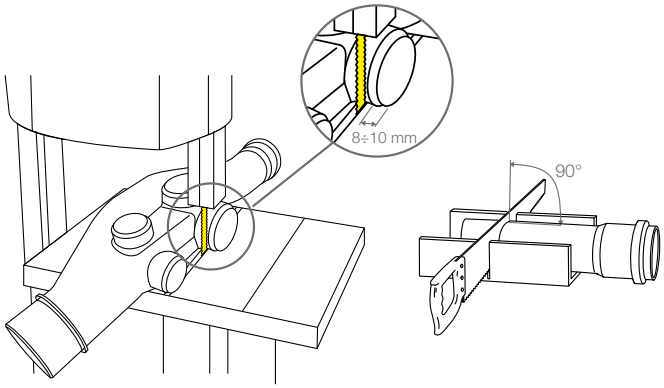
This chapter contains the instructions on how to weld the sockets to the ventilation branch fittings.
HDPE ventilation branch fittings are supplied with plugged inlets; after defining which inlets you intend to use, follow the instructions below to create a connection between the ventilation branch fitting and the rest of the waste system. Push-fit sockets or pipes coming from drainage branches or waste stack can be welded to the lateral inlets and the upper one.

PP3®, Blackfire®, Triplus® and Silere® ventilation branch fittings can be directly supplied by Valsir with the necessary inlets open and equipped with push-fit sockets. In any case, it is possible to add inlets to those provided or purchase fully closed ventilation branch fittings and make the inlets at a later stage.

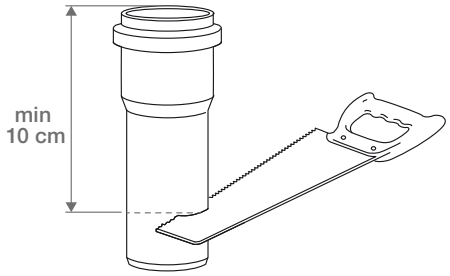
Installation instructions

CAUTION!

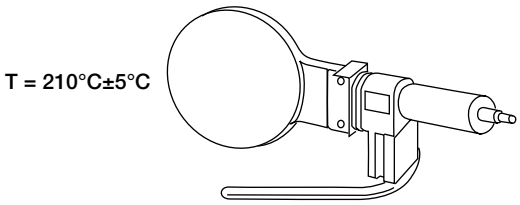
- For PP3®, Blackfire®, Triplus® and Silere® ventilation branch fittings there are proper welding sockets; the use of different types of fittings is not permitted.
- Welding must be carried out under favourable climatic conditions at temperatures between -5°C and +40°C. In case of wind and/or humidity or in case of temperatures below -5°C or above +40°C, the working area must be heated or ventilated, respectively, by covering it with a curtain or other effective protective systems. However, it is advisable to carry out some welding tests first.
- When welding, the temperatures of the parts to be welded must be uniform. The ends of the joints not involved in welding must be closed with plugs to prevent cooling of the joint due to the passage of air through the pipes.
- The parts to be welded must be clean and kept clean during the welding process.
- Pipes, fittings and the welding machine can be used after they have reached the same temperature to avoid excessive or insufficient production of thermal energy. Pipes and/or fittings must not be exposed to rain, sunlight or heat sources before, during or immediately after welding.
- During welding and the other cycle phases (in particular during cooling), the joint must not be subject to mechanical stress.
- Chemical and physical characteristics of the materials to be welded must be compatible with each other.



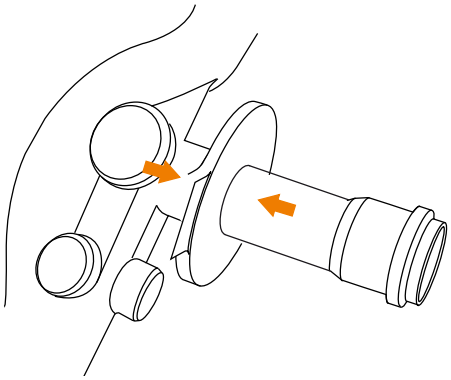
1) Cut the first 8÷10 mm (end of the rounded part) of the closed inlets of the ventilation branch fittings as perpendicularly as possible, accurately, with a clean cut and without burrs; for this operation, the use of a band saw machine is recommended.
Cut the pipes and/or fittings to be connected to the ventilation branch fitting as described above, using the same band saw machine or tube cutter or fine-toothed saw.
Clean the heads of the joints to be welded with a clean and dry cloth.
It is advisable to chamfer the inside of the parts to be welded in order to reduce the creation of the seam on the flow area.
Remove any chips due to the chamfer using paper towel or a clean brush.



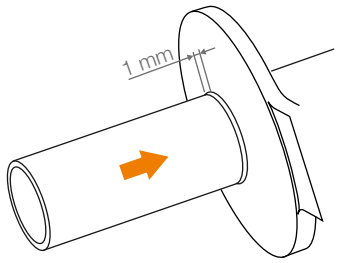
2) If necessary, it is possible to shorten the end of the welding sockets for the ventilation branch fittings to a minimum length of 10 cm. In any case, the end of the fittings must be long enough to allow ease of handling and subsequent welding.



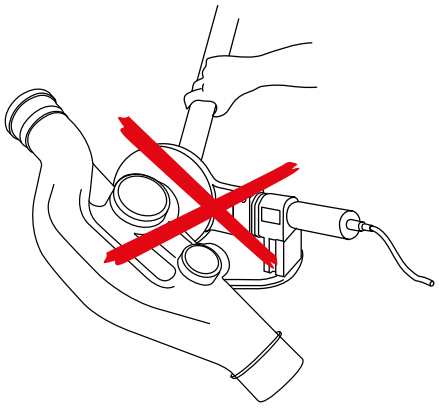
3) The heated plate temperature must be 210°C±5°C. For further information on the use of the equipment, refer to the instructions in the manual.



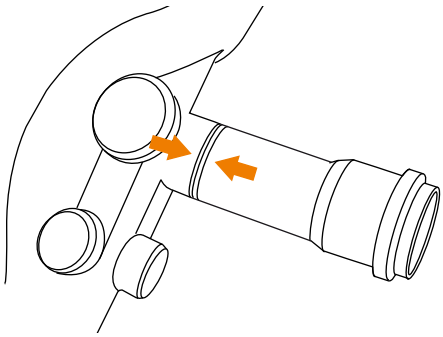
4) The first phase of the welding process is the heating of the parts to be welded; in this phase, place the heated plate between the parts to be welded positioned next to each other.



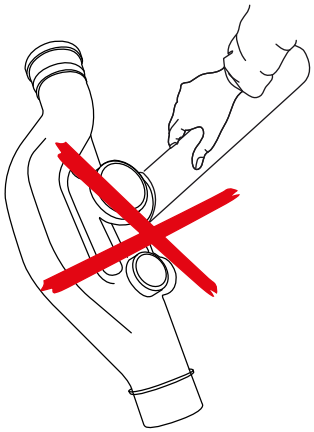
5) Apply a compression force sufficient to create a seam with thickness of approx. 1 mm.



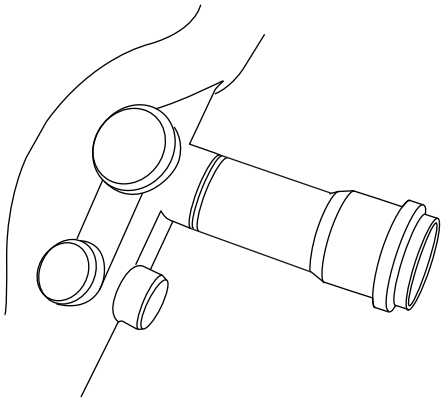
6) During the heating phase, keep the parts to be welded aligned, avoiding movements or misalignments that would compromise welding.



7) The second phase of the process is the welding of the parts. Move the parts to be welded away from the heated plate, paying attention not to damage the heated edges, and, keeping them aligned, position them next to each other for approx. 5 seconds to prevent their cooling. Apply an even pressure until the joint solidification.



8) During this phase, avoid rotation or bending. It is possible to use a guide to keep the parts aligned during the welding process

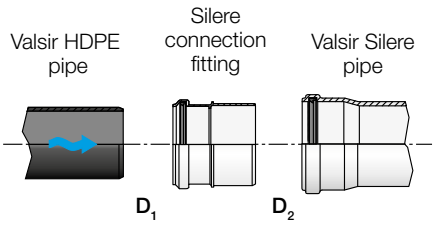
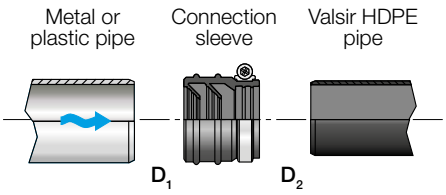
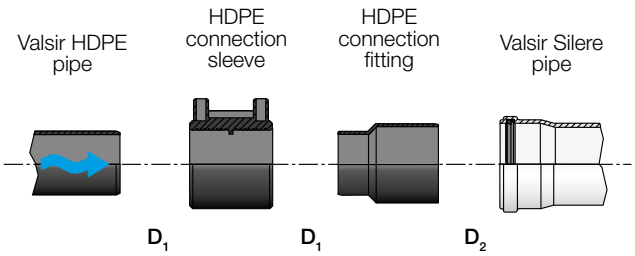
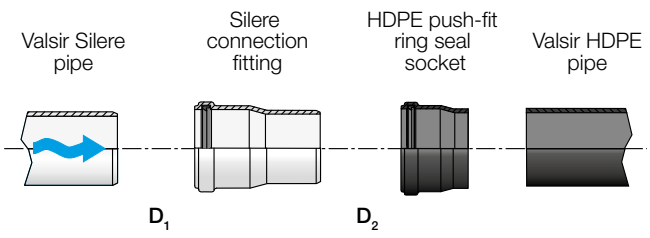
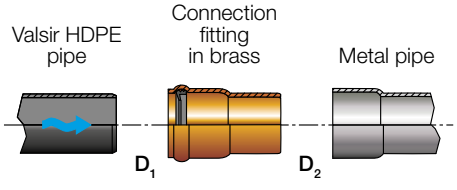


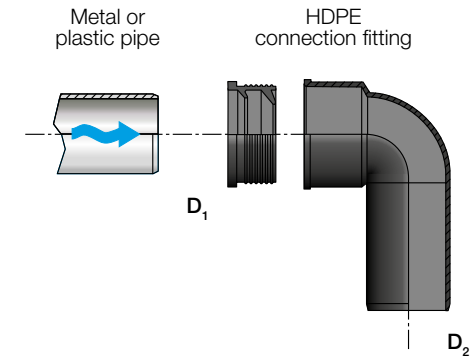
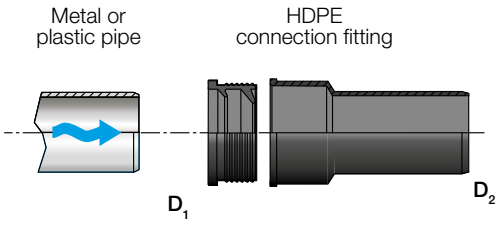
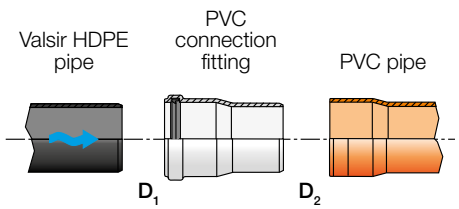
9) The third and last phase of the process is the joint cooling. Keep the parts to be welded in position until the welding seam has solidified, this can be checked by pressing on it with your fingers. Do not apply mechanical stress until they have completely cooled to room temperature. Do not accelerate the cooling process with water or other liquids.

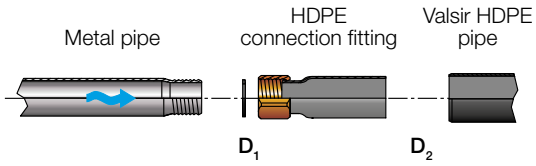
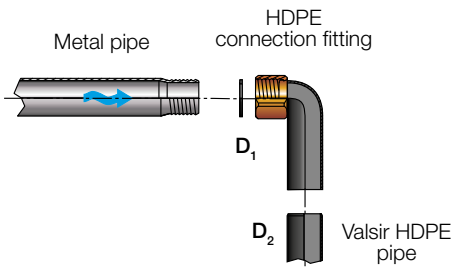
8.4 Connection to other waste systems

8.4.1 Jointing Valsir HDPE pipes to other materials

The following connection systems are given as examples of available possibilities, however, it is recommended to always verify other alternative systems on the catalogues or the last part of the technical manual.

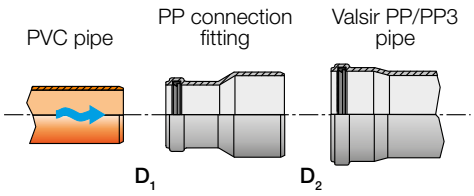
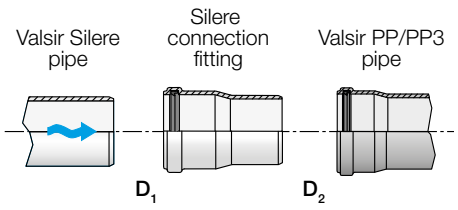
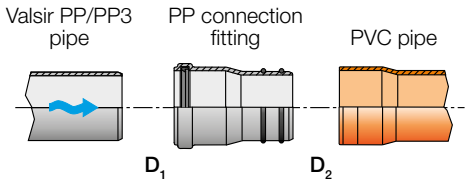
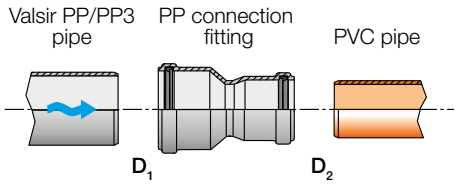
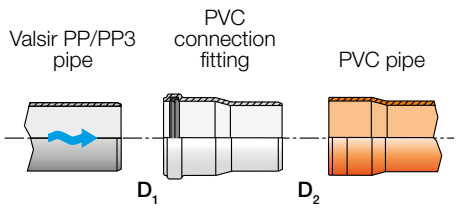
Connection system	Necessary parts	D_1	D_2
	VS0231001	OD 40 mm	OD 58 mm
	VS0231003	OD 50 mm	OD 58 mm
	VS0231005	OD 50 mm	OD 78 mm
	VS0231007	OD 75 mm	OD 78 mm
	VS0231013	OD 125 mm	OD 135 mm
	VS0272011	OD 104÷110 mm	OD 110 mm
	VS0336061 + VS0350004	OD 56 mm	OD 58 mm
	VS0336063 + VS0350005	OD 63 mm	OD 78 mm
	VS0237003 + VS0324003	OD 58 mm	OD 50 mm
	VS0237007 + VS0324007	OD 78 mm	OD 75 mm
	VS0237013 + VS0324013	OD 135 mm	OD 125 mm
	VS0570001	OD 32 mm	OD 32 mm
	VS0570002	OD 40 mm	OD 32 mm
	VS0570003	OD 40 mm	OD 40 mm

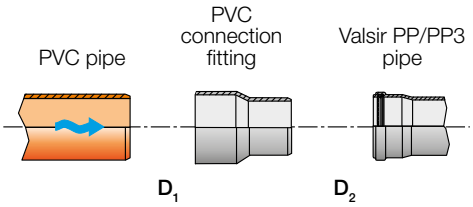
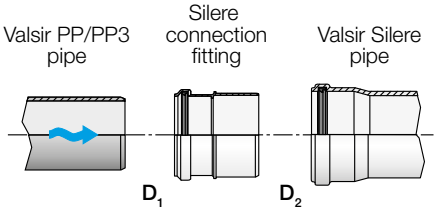
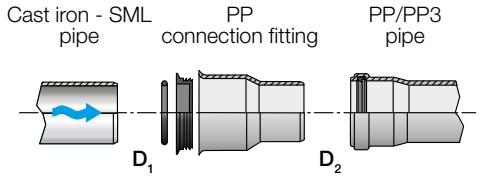
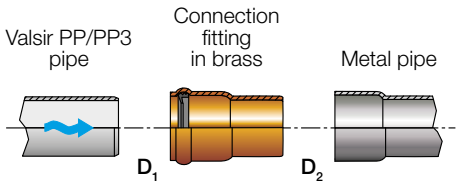
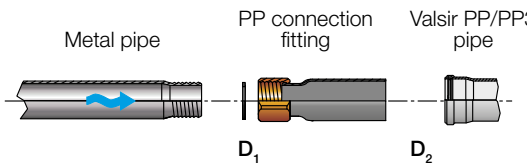
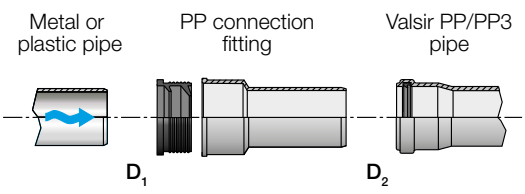
Connection system	Necessary parts	D_1	D_2
	VS0330001 + VS0334003	OD 24÷32 mm	OD 32 mm
	VS0330001 + VS0334005	OD 36÷40 mm	OD 32 mm
	VS0330003 + VS0334003	OD 24÷32 mm	OD 40 mm
	VS0330003 + VS0334005	OD 36÷40 mm	OD 40 mm
	VS0330005 + VS0334003	OD 24÷32 mm	OD 50 mm
	VS0330005 + VS0334005	OD 36÷40 mm	OD 50 mm
	VS0330007 + VS0334007	OD 36÷40 mm	OD 50 mm
	VS0330007 + VS0867655	OD 47÷50 mm	OD 50 mm
	VS0330009 + VS0334003	OD 24÷32 mm	OD 56 mm
	VS0330009 + VS0334005	OD 36÷40 mm	OD 56 mm
	VS0330011 + VS0334007	OD 36÷40 mm	OD 56 mm
	VS0330011 + VS0867655	OD 47÷50 mm	OD 56 mm
	VS0332000 + VS0334003	OD 24÷32 mm	OD 32 mm
	VS0332000 + VS0334005	OD 36÷40 mm	OD 32 mm
	VS0332001 + VS0334003	OD 24÷32 mm	OD 40 mm
	VS0332001 + VS0334005	OD 36÷40 mm	OD 40 mm
	VS0332003 + VS0334003	OD 24÷32 mm	OD 50 mm
	VS0332003 + VS0334005	OD 36÷40 mm	OD 50 mm
	VS0332005 + VS0334007	OD 36÷40 mm	OD 50 mm
	VS0332005 + VS0867655	OD 47÷50 mm	OD 50 mm
	VS0332007 + VS0334003	OD 24÷32 mm	OD 56 mm
	VS0332007 + VS0334005	OD 36÷40 mm	OD 56 mm
	VS0332009 + VS0334007	OD 36÷40 mm	OD 56 mm
	VS0332009 + VS0867655	OD 47÷50 mm	OD 56 mm
	VS0564121	OD 40 mm	OD 40 mm
	VS0564122	OD 50 mm	OD 43 mm
	VS0564123	OD 50 mm	OD 50 mm
	VS0564150	OD 50 mm	OD 100 mm
	VS0564075	OD 75 mm	OD 75 mm
	VS0564131	OD 75 mm	OD 80 mm
	VS0564182	OD 75 mm	OD 82 mm
	VS0564175	OD 75 mm	OD 100 mm
	VS0564190	OD 90 mm	OD 100 mm
	VS0564101	OD 110 mm	OD 100 mm
	VS0564251	OD 110 mm	OD 125 mm

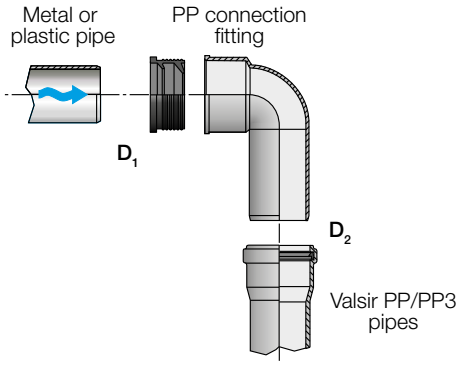
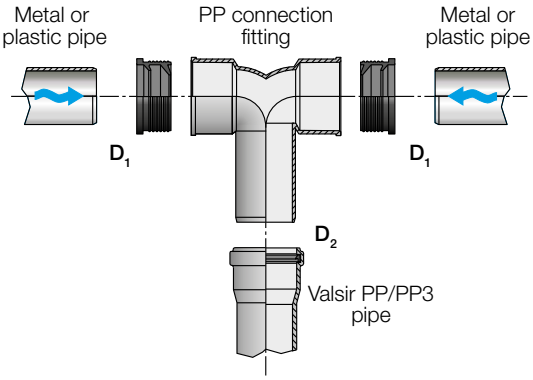
Connection system	Necessary parts	D_1	D_2
	VS0700038	G 1" 1/4	OD 32 mm
	VS0700043	G 1" 1/4	OD 40 mm
	VS0700045	G 1" 1/2	OD 40 mm
	VS0700062	G 1" 1/4	OD 50 mm
	VS0700063	G 1" 1/2	OD 50 mm
	VS0700238	G 1" 1/4	OD 32 mm
	VS0700243	G 1" 1/4	OD 40 mm
	VS0700245	G 1" 1/2	OD 40 mm
	VS0700262	G 1" 1/4	OD 50 mm
	VS0700263	G 1" 1/2	OD 50 mm
	VS0700051	G 1" 1/4	OD 40 mm
	VS0700053	G 1" 1/2	OD 40 mm
	VS0700058	G 1" 1/4	OD 50 mm
	VS0700060	G 1" 1/2	OD 50 mm
	VS0700251	G 1" 1/4	OD 40 mm
	VS0700253	G 1" 1/2	OD 40 mm
	VS0700254	G 1" 1/4	OD 48 mm
	VS0700256	G 1" 1/2	OD 48 mm
	VS0700258	G 1" 1/4	OD 50 mm
	VS0700260	G 1" 1/2	OD 50 mm
	VS0700180	G 1" 1/4	OD 40 mm
	VS0700190	G 1" 1/2	OD 40 mm
	VS0700059	G 1" 1/4	OD 40/50 mm
	VS0700061	G 1" 1/2	OD 40/50 mm
	VS0700261	G 1" 1/2	OD 40/50 mm

8.4.2 Jointing of Valsir PP/PP3® to other materials

The following connection systems are given as examples of available possibilities, however, it is recommended to always verify other alternative systems on the catalogues or the last part of the technical manual.

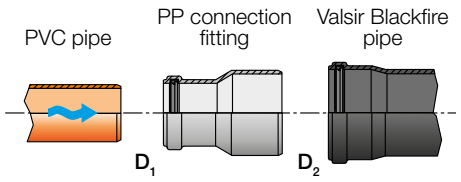
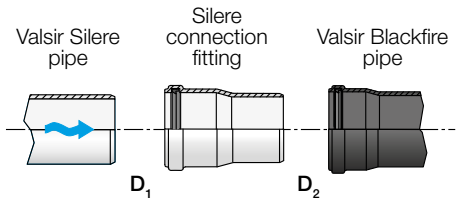
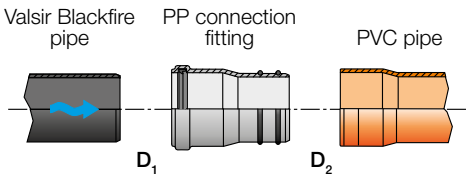
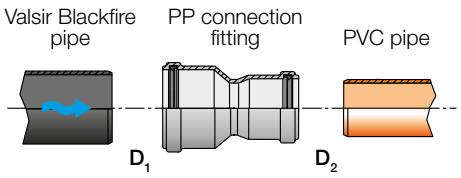
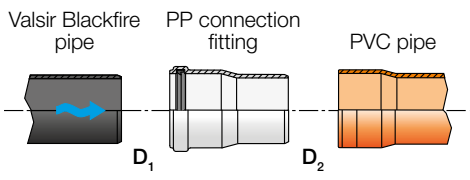
Connection system	Necessary parts	D_1	D_2
	VS0565001	OD 100 mm	OD 110 mm
	VS0237003	OD 58 mm	OD 50 mm
	VS0237007	OD 78 mm	OD 75 mm
	VS0237013	OD 135 mm	OD 125 mm
	VS0564001	OD 110 mm	OD 100 mm
	VS0564003	OD 110 mm	OD 100 mm
	VS0564080	OD 110 mm	OD 110 mm
	VS0564260	OD 110 mm	OD 110 mm
	VS0564005	OD 125 mm	OD 110 mm
	VS0565022	OD 110 mm	OD 100 mm
	VS0564121	OD 40 mm	OD 40 mm
	VS0564122	OD 50 mm	OD 43 mm
	VS0564123	OD 50 mm	OD 50 mm
	VS0564150	OD 50 mm	OD 100 mm
	VS0564075	OD 75 mm	OD 75 mm
	VS0564131	OD 75 mm	OD 80 mm
	VS0564182	OD 75 mm	OD 82 mm
	VS0564175	OD 75 mm	OD 100 mm
	VS0564190	OD 90 mm	OD 100 mm
	VS0564101	OD 110 mm	OD 100 mm
	VS0564251	OD 110 mm	OD 125 mm

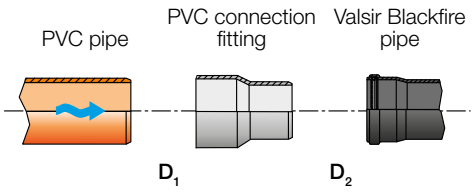
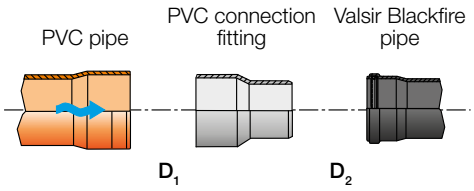
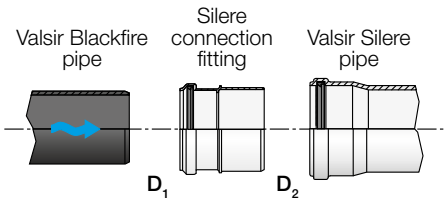
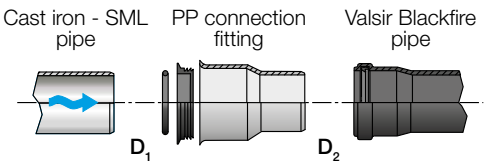
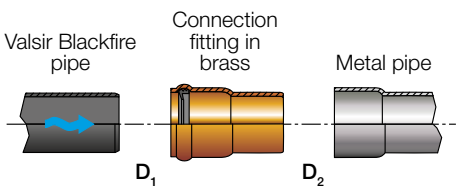
Connection system	Necessary parts	D_1	D_2
	VS0531323	OD 43 mm	OD 40 mm
	VS0531325	OD 56 mm	OD 50 mm
	VS0531326	OD 60 mm	OD 50 mm
	VS0531327	OD 70 mm	OD 75 mm
	VS0531333	OD 125 mm	OD 110 mm
	VS0531335	OD 140 mm	OD 110 mm
	VS0531337	OD 150 mm	OD 125 mm
	VS0231001	OD 40 mm	OD 58 mm
	VS0231003	OD 50 mm	OD 58 mm
	VS0231005	OD 50 mm	OD 78 mm
	VS0231007	OD 75 mm	OD 78 mm
	VS0231013	OD 125 mm	OD 135 mm
	VS0569001	OD 58 mm	OD 50 mm
	VS0569003	OD 78 mm	OD 75 mm
	VS0569005	OD 110 mm	OD 110 mm
	VS0569007	OD 135 mm	OD 125 mm
	VS0570001	OD 32 mm	DN 32 mm
	VS0570002	OD 40 mm	DN 32 mm
	VS0570003	OD 40 mm	DN 40 mm
	VS0700052	G 1”1/4	OD 40 mm
	VS0700064	G 1”1/2	OD 40 mm
	VS0700252	G 1”1/4	OD 40 mm
	VS0700264	G 1”1/2	OD 40 mm
	VS0700267	G 1”1/4	OD 50 mm
	VS0522103 + VS0334003	OD 24÷32 mm	OD 32 mm
	VS0522103 + VS0334005	OD 36÷40 mm	OD 32 mm
	VS0522107 + VS0334003	OD 24÷32 mm	OD 40 mm
	VS0522107 + VS0334005	OD 36÷40 mm	OD 40 mm
	VS0522113 + VS0523009	OD 24÷32 mm	OD 40 mm
	VS0522113 + VS0523011	OD 36÷40 mm	OD 40 mm
	VS0522117 + VS0523015	OD 24÷32 mm	OD 40 mm
	VS0522117 + VS0523017	OD 36÷40 mm	OD 40 mm
	VS0522121 + VS0523015	OD 24÷32 mm	OD 50 mm
	VS0522121 + VS0523017	OD 36÷40 mm	OD 50 mm

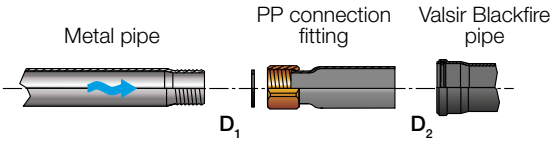
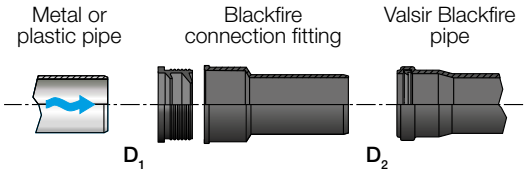
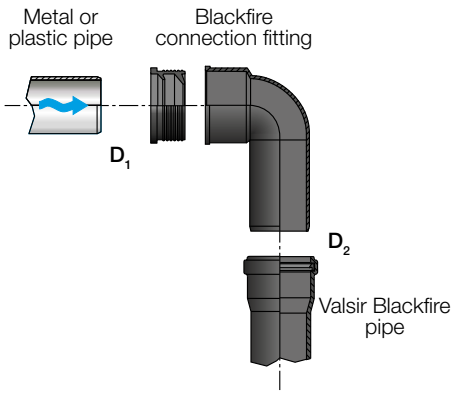
Connection system	Necessary parts	D_1	D_2
	VS0518103 + VS0334003	OD 24÷32 mm	OD 32 mm
	VS0520102 + VS0334003	OD 24÷32 mm	OD 32 mm
	VS0520103 + VS0523009	OD 24÷32 mm	OD 32 mm
	VS0518103 + VS0334005	OD 36÷40 mm	OD 32 mm
	VS0520102 + VS0334005	OD 36÷40 mm	OD 32 mm
	VS0520103 + VS0523011	OD 36÷40 mm	OD 32 mm
	VS0518107 + VS0334003	OD 24÷32 mm	OD 40 mm
	VS0520104 + VS0334003	OD 24÷32 mm	OD 40 mm
	VS0518113 + VS0523015	OD 24÷32 mm	OD 40 mm
	VS0520107 + VS0523009	OD 24÷32 mm	OD 40 mm
	VS0518107 + VS0334005	OD 36÷40 mm	OD 40 mm
	VS0520104 + VS0334005	OD 36÷40 mm	OD 40 mm
	VS0518113 + VS0523017	OD 36÷40 mm	OD 40 mm
	VS0520107 + VS0523011	OD 36÷40 mm	OD 40 mm
	VS0518117 + VS0523015	OD 24÷32 mm	OD 50 mm
	VS0518117 + VS0523017	OD 36÷40 mm	OD 50 mm
	VS0518121 + VS0523019	OD 46÷55 mm	OD 50 mm
	VS0519101 + VS0523009	OD 24÷32 mm	OD 50 mm
	VS0519101 + VS0523011	OD 36÷40 mm	OD 50 mm

8.4.3 Jointing of Valsir Blackfire® pipes to other materials

The following connection systems are given as examples of available possibilities, however, it is recommended to always verify other alternative systems on the catalogues or the last part of the technical manual.

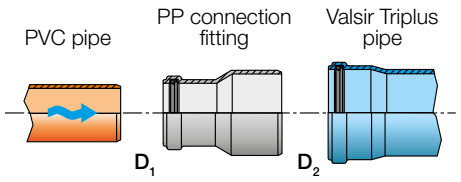
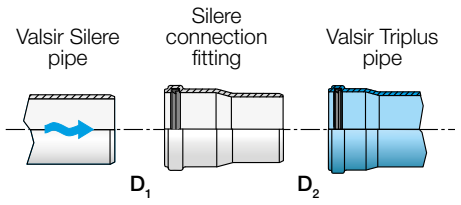
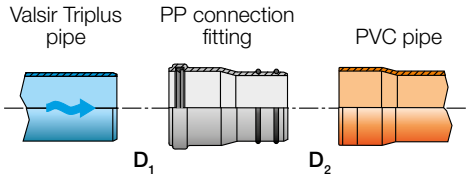
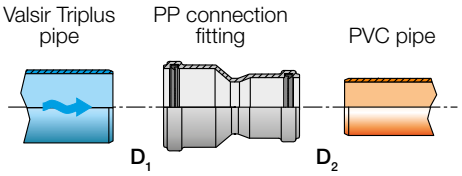
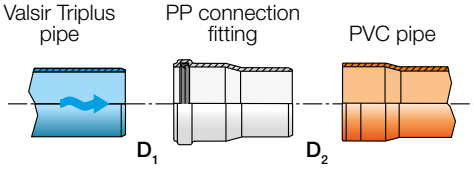
Connection system	Necessary parts	D_1	D_2
	VS0565001	OD 100 mm	OD 110 mm
	VS0237003	OD 58 mm	OD 50 mm
	VS0237007	OD 78 mm	OD 75 mm
	VS0237013	OD 135 mm	OD 125 mm
	VS0564001	OD 110 mm	OD 100 mm
	VS0564003	OD 110 mm	OD 100 mm
	VS0564080	OD 110 mm	OD 110 mm
	VS0564260	OD 110 mm	OD 110 mm
	VS0564005	OD 125 mm	OD 110 mm
	VS0565022	OD 110 mm	OD 100 mm
	VS0564121	OD 40 mm	OD 40 mm
	VS0564122	OD 50 mm	OD 43 mm
	VS0564123	OD 50 mm	OD 50 mm
	VS0564150	OD 50 mm	OD 100 mm
	VS0564075	OD 75 mm	OD 75 mm
	VS0564131	OD 75 mm	OD 80 mm
	VS0564182	OD 75 mm	OD 82 mm
	VS0564175	OD 75 mm	OD 100 mm
	VS0564190	OD 90 mm	OD 100 mm
	VS0564101	OD 110 mm	OD 100 mm
	VS0564251	OD 110 mm	OD 125 mm

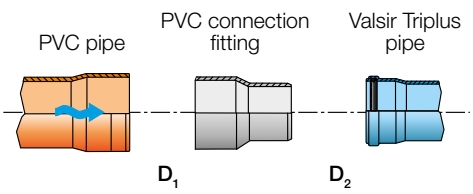
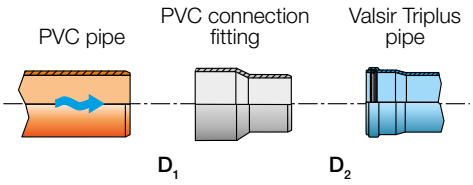
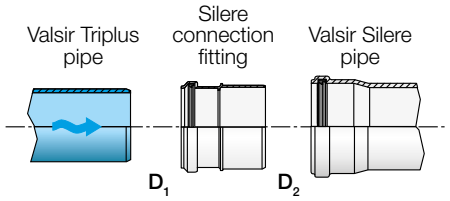
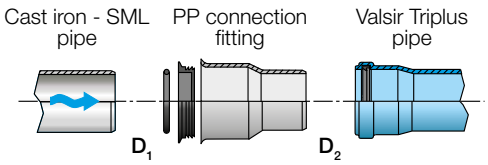
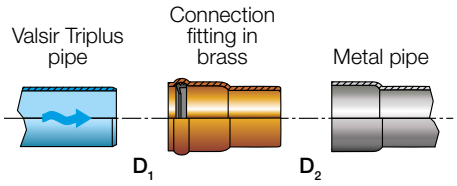
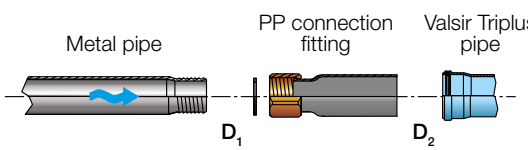
Connection system	Necessary parts	D_1	D_2
	VS0531323	OD 43 mm	OD 40 mm
	VS0531325	OD 56 mm	OD 50 mm
	VS0531326	OD 60 mm	OD 50 mm
	VS0531327	OD 70 mm	OD 75 mm
	VS0531333	OD 125 mm	OD 110 mm
	VS0531335	OD 140 mm	OD 110 mm
	VS0531337	OD 150 mm	OD 125 mm
	VS0531333	OD 125 mm	OD 110 mm
	VS0531335	OD 140 mm	OD 110 mm
	VS0531337	OD 150 mm	OD 125 mm
	VS0231001	OD 40 mm	OD 58 mm
	VS0231003	OD 50 mm	OD 58 mm
	VS0231005	OD 50 mm	OD 78 mm
	VS0231007	OD 75 mm	OD 78 mm
	VS0231013	OD 125 mm	OD 135 mm
	VS0569001	OD 58 mm	OD 50 mm
	VS0569003	OD 78 mm	OD 75 mm
	VS0569005	OD 110 mm	OD 110 mm
	VS0569007	OD 135 mm	OD 125 mm
	VS0570001	OD 32 mm	DN 32 mm
	VS0570002	OD 40 mm	DN 32 mm
	VS0570003	OD 40 mm	DN 40 mm

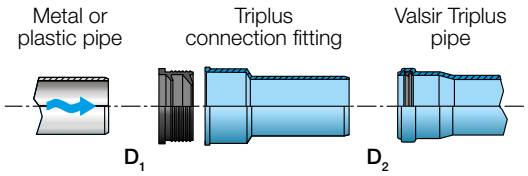
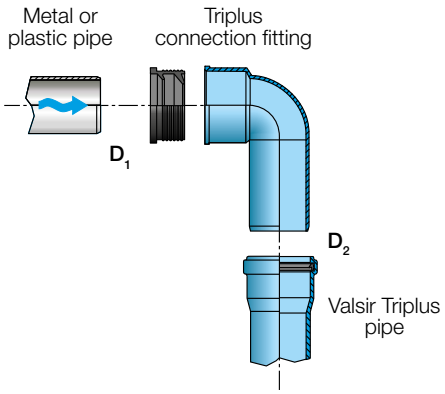
Connection system	Necessary parts	D_1	D_2
	VS0700052	G 1”1/4	OD 40 mm
	VS0700064	G 1”1/2	OD 40 mm
	VS0700252	G 1”1/4	OD 40 mm
	VS0700264	G 1”1/2	OD 40 mm
	VS0700267	G 1”1/4	OD 50 mm
	VS0660981 + VS0334003	OD 24÷32 mm	OD 32 mm
	VS0660981 + VS0334005	OD 36÷40 mm	OD 32 mm
	VS0660982 + VS0334003	OD 24÷32 mm	OD 40 mm
	VS0660982 + VS0334005	OD 36÷40 mm	OD 40 mm
	VS0660983 + VS0523011	OD 36÷40 mm	OD 40 mm
	VS0660984 + VS0523015	OD 24÷32 mm	OD 40 mm
	VS0660984 + VS0523017	OD 36÷40 mm	OD 40 mm
	VS0660985 + VS0523015	OD 24÷32 mm	OD 50 mm
	VS0660985 + VS0523017	OD 36÷40 mm	OD 50 mm
	VS0660971 + VS0334003	OD 24÷32 mm	OD 32 mm
	VS0660971 + VS0334005	OD 36÷40 mm	OD 32 mm
	VS0660991 + VS0334003	OD 24÷32 mm	OD 32 mm
	VS0660991 + VS0334005	OD 36÷40 mm	OD 32 mm
	VS0660996 + VS0523011	OD 36÷40 mm	OD 32 mm
	VS0660972 + VS0334003	OD 24÷32 mm	OD 40 mm
	VS0660972 + VS0334005	OD 36÷40 mm	OD 40 mm
	VS0660992 + VS0334003	OD 24÷32 mm	OD 40 mm
	VS0660992 + VS0334005	OD 36÷40 mm	OD 40 mm
	VS0660973 + VS0523015	OD 24÷32 mm	OD 40 mm
	VS0660973 + VS0523017	OD 36÷40 mm	OD 40 mm
	VS0660993 + VS0523011	OD 36÷40 mm	OD 40 mm
	VS0660974 + VS0523015	OD 24÷32 mm	OD 50 mm
	VS0660974 + VS0523017	OD 36÷40 mm	OD 50 mm
	VS0660975 + VS0523019	OD 46÷55 mm	OD 50 mm

8.4.4 Jointing of Valsir Triplus® pipes to other materials

The following connection systems are given as examples of available possibilities, however, it is recommended to always verify other alternative systems on the catalogues or the last part of the technical manual.

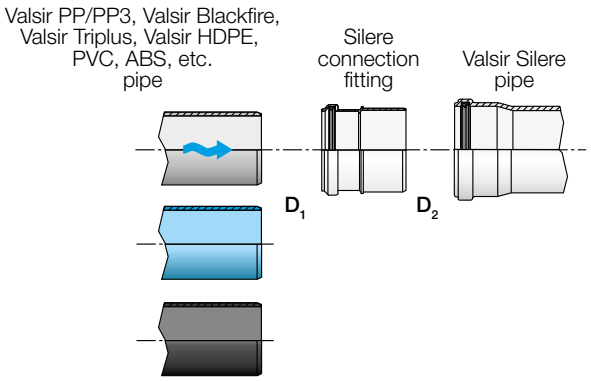
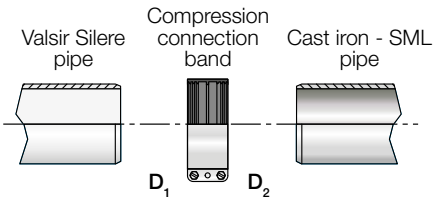
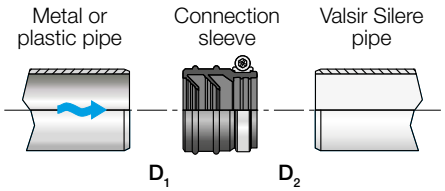
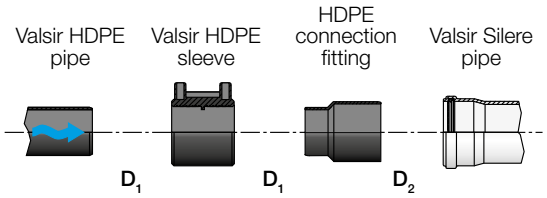
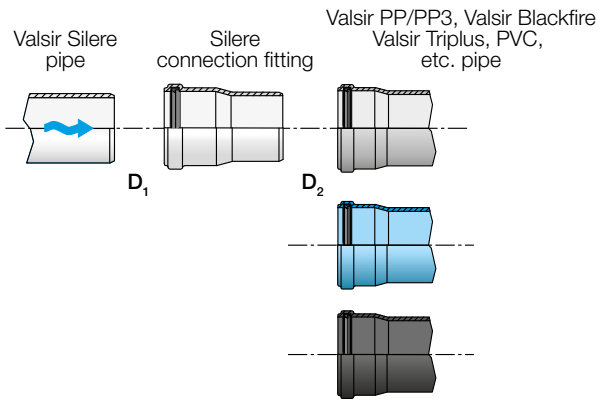
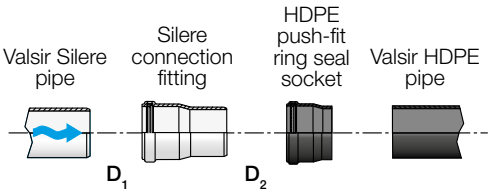
Connection system	Necessary parts	D_1	D_2
	VS0565001	OD 100 mm	OD 110 mm
	VS0237003	OD 58 mm	OD 50 mm
	VS0237007	OD 78 mm	OD 75 mm
	VS0237013	OD 135 mm	OD 125 mm
	VS0564001	OD 110 mm	OD 100 mm
	VS0564003	OD 110 mm	OD 100 mm
	VS0564080	OD 110 mm	OD 110 mm
	VS0564260	OD 110 mm	OD 110 mm
	VS0564005	OD 125 mm	OD 110 mm
	VS0565022	OD 110 mm	OD 100 mm
	VS0564121	OD 40 mm	OD 40 mm
	VS0564122	OD 50 mm	OD 43 mm
	VS0564123	OD 50 mm	OD 50 mm
	VS0564150	OD 50 mm	OD 100 mm
	VS0564075	OD 75 mm	OD 75 mm
	VS0564131	OD 75 mm	OD 80 mm
	VS0564182	OD 75 mm	OD 82 mm
	VS0564175	OD 75 mm	OD 100 mm
	VS0564190	OD 90 mm	OD 100 mm
	VS0564101	OD 110 mm	OD 100 mm
	VS0564251	OD 110 mm	OD 125 mm

Connection system	Necessary parts	D_1	D_2
	VS0531333	OD 125 mm	OD 110 mm
	VS0531335	OD 140 mm	OD 110 mm
	VS0531337	OD 150 mm	OD 125 mm
	VS0531323	OD 43 mm	OD 40 mm
	VS0531325	OD 56 mm	OD 50 mm
	VS0531326	OD 60 mm	OD 50 mm
	VS0531327	OD 70 mm	OD 75 mm
	VS0531333	OD 125 mm	OD 110 mm
	VS0531335	OD 140 mm	OD 110 mm
	VS0531337	OD 150 mm	OD 125 mm
	VS0231001	OD 40 mm	OD 58 mm
	VS0231003	OD 50 mm	OD 58 mm
	VS0231005	OD 50 mm	OD 78 mm
	VS0231007	OD 75 mm	OD 78 mm
	VS0231013	OD 125 mm	OD 135 mm
	VS0569001	OD 58 mm	OD 50 mm
	VS0569003	OD 78 mm	OD 75 mm
	VS0569005	OD 110 mm	OD 110 mm
	VS0569007	OD 135 mm	OD 125 mm
	VS0570001	OD 32 mm	DN 32 mm
	VS0570002	OD 40 mm	DN 32 mm
	VS0570003	OD 40 mm	DN 40 mm
	VS0700052	G 1”1/4	OD 40 mm
	VS0700064	G 1”1/2	OD 40 mm
	VS0700252	G 1”1/4	OD 40 mm
	VS0700264	G 1”1/2	OD 40 mm
	VS0700267	G 1”1/4	OD 50 mm

Connection system	Necessary parts	D_1	D_2
	VS0650981 + VS0334003	OD 24÷32 mm	OD 32 mm
	VS0650981 + VS0334005	OD 36÷40 mm	OD 32 mm
	VS0650982 + VS0334003	OD 24÷32 mm	OD 40 mm
	VS0650982 + VS0334005	OD 36÷40 mm	OD 40 mm
	VS0650983 + VS0523011	OD 36÷40 mm	OD 40 mm
	VS0650984 + VS0523015	OD 24÷32 mm	OD 40 mm
	VS0650984 + VS0523017	OD 36÷40 mm	OD 40 mm
	VS0650985 + VS0523015	OD 24÷32 mm	OD 50 mm
	VS0650985 + VS0523017	OD 36÷40 mm	OD 50 mm
	VS0650971 + VS0334003	OD 24÷32 mm	OD 32 mm
	VS0650971 + VS0334005	OD 36÷40 mm	OD 32 mm
	VS0650991 + VS0334003	OD 24÷32 mm	OD 32 mm
	VS0650991 + VS0334005	OD 36÷40 mm	OD 32 mm
	VS0650972 + VS0334003	OD 24÷32 mm	OD 40 mm
	VS0650972 + VS0334005	OD 36÷40 mm	OD 40 mm
	VS0650973 + VS0523015	OD 24÷32 mm	OD 40 mm
	VS0650973 + VS0523017	OD 36÷40 mm	OD 40 mm
	VS0650992 + VS0334003	OD 24÷32 mm	OD 40 mm
	VS0650992 + VS0334005	OD 36÷40 mm	OD 40 mm
	VS0650993 + VS0523011	OD 36÷40 mm	OD 40 mm
	VS0650974 + VS0523015	OD 24÷32 mm	OD 50 mm
	VS0650974 + VS0523017	OD 36÷40 mm	OD 50 mm
	VS0650975 + VS0523019	OD 46÷55 mm	OD 50 mm
	VS0650996 + VS0523011	OD 36÷40 mm	OD 50 mm

8.4.5 Jointing of Valsir Silere® pipes to other materials

The following connection systems are given as examples of available possibilities, however, it is recommended to always verify other alternative systems on the catalogues or the last part of the technical manual.

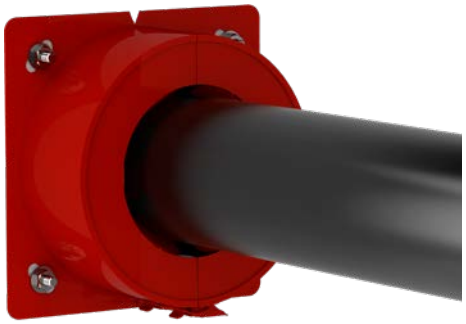
Connection system	Necessary parts	D_1	D_2
	VS0231001	OD 40 mm	OD 58 mm
	VS0231003	OD 50 mm	OD 58 mm
	VS0231005	OD 50 mm	OD 78 mm
	VS0231007	OD 75 mm	OD 78 mm
	VS0231013	OD 125 mm	OD 135 mm
	VS0271005	OD 58 mm	OD 58 mm
	VS0271007	OD 78 mm	OD 78 mm
	VS0271011	OD 110 mm	OD 110 mm
	VS0271013	OD 135 mm	OD 135 mm
	VS0271015	OD 160 mm	OD 160 mm
	VS0272005	OD 40÷56 mm	OD 58 mm
	VS0272007	OD 56÷75 mm	OD 78 mm
	VS0272011	OD 104÷110 mm	OD 110 mm
	VS0336061 + VS0350004	OD 56 mm	OD 58 mm
	VS0336063 + VS0350005	OD 63 mm	OD 78 mm
	VS0237003	OD 58 mm	OD 50 mm
	VS0237007	OD 78 mm	OD 75 mm
	VS0237013	OD 135 mm	OD 125 mm
	VS0237003 + VS0324003	OD 58 mm	OD 50 mm
	VS0237007 + VS0324007	OD 78 mm	OD 75 mm
	VS0237013 + VS0324003	OD 135 mm	OD 125 mm

8.5 Fire-stop sleeves

In case of installation of plastic waste pipes (Valsir HDPE, PP/PP3®, Blackfire®, Triplus®, Silere®, PVC-U, PVC-C, ABS, SAN+PVC) that cross walls or ceilings, it is necessary to comply with any fire prevention safety regulations in force in the country of installation. These regulations may require the use of fire stop collar, installed on the pipe near the crossing of the building structure, to prevent the passage of fire and smoke. Collars are made of intumescent material that, in the presence of fire, expands and forms a “plug”, cutting the fire front and preventing its spreading outside the separation.

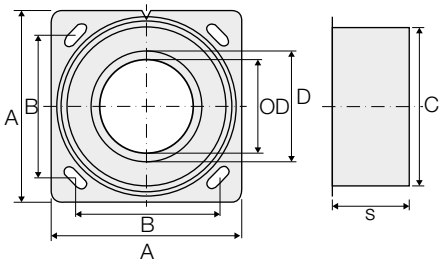
8.5.1 Collarwings fire stop collar

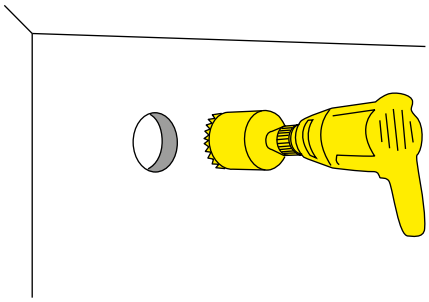
Main characteristics	
Type	Fire and smoke protection for penetrations of walls and ceilings with plastic pipes.
Applicability	Valsir HDPE, PP/PP3®, Blackfire®, Triplus®, Silere® waste systems, pipes in ABS, PVC-C, PVC-U, SAN+PVC.
Use	On vertical walls and in the ceiling and for ventilated waste pipes, non-ventilated waste pipes and rainwater drainage pipes.
Diameters	32÷160 mm
Fire resistance	EI 240 (EN 1366-3)
Removable	Yes



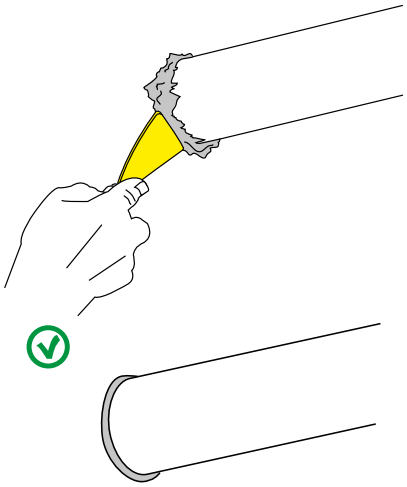
Dimensions

Code	OD pipe [mm]	D [mm]	A [mm]	B [mm]	C [mm]	s [mm]
VS0411000	32	42	101	77	79	49.5
VS0411001	40	50	114	87	92	49.5
VS0411003	50	60	129	95	107	49.5
VS0411005	56/58	68	142	106	120	49.5
VS0411007	63	75	154	115	132	49.5
VS0411009	75	87	171	126	149	49.5
VS0411010	78/80	94	188	133	156	49.5
VS0411011	90	106	193	145	171	89.5
VS0411012	100	116	212	156	190	89.5
VS0411013	110	128	225	167	202	89.5
VS0411015	125	143	248	181	226	89.5
VS0411016	135	155	260	193	238	89.5
VS0411017	160	180	294	217	272	89.5

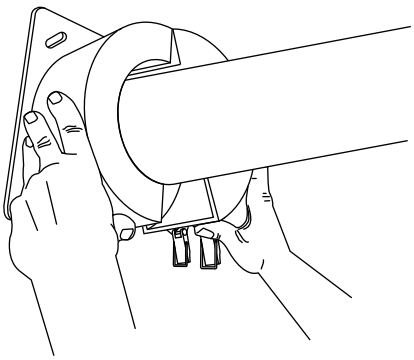




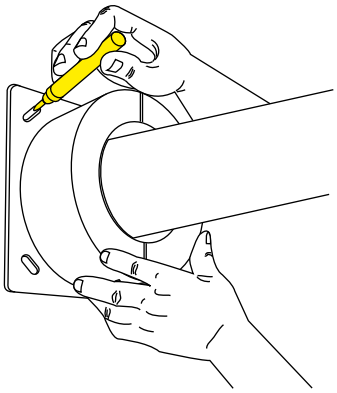
1) Preparation of the supporting construction.
To install the pipe make a hole in the wall and ceiling where the pipe is to be fitted.
This can be done by using a suitably sized core drill, that is, with a diameter that is 3 to 5 mm greater than the external diameter of the pipe.



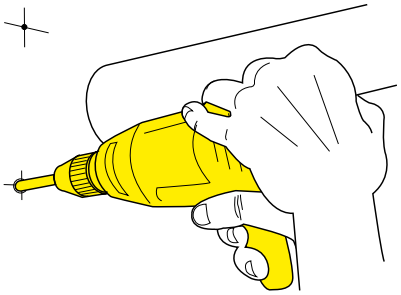
2) Sealing of opening.
Once the pipe has been fitted, the gaps in both sides of the wall or ceiling must be sealed between the pipe and the hole using a firestop mortar or sealant.
This can done with the use of a trowel. Fill the entire gap between the pipe and hole using the mortar.
To finish, smooth the mortar on both sides of the wall or ceiling.



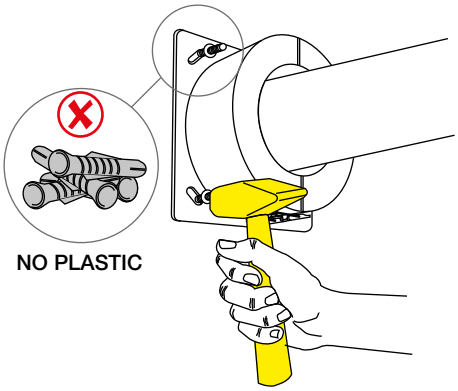
3) Mounting of the Collarwings collar.
The firestop collar can be fitted to the pipe also when it has already been laid.
Remove the product from the packaging; open the latches by acting on the levers.
Widen the two halves until the product has been placed around the pipe.



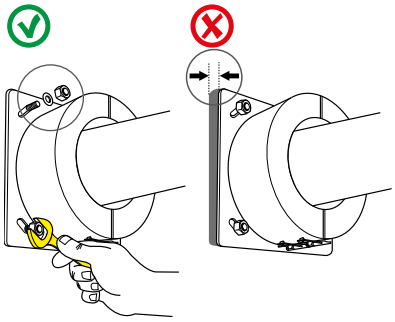
4) Then close it and lock the closure by applying pressure to the latches. Position the collar against the supporting construction or ceiling and using the slots on the fastening plate mark the position of the holes to be drilled with the use of a pencil.



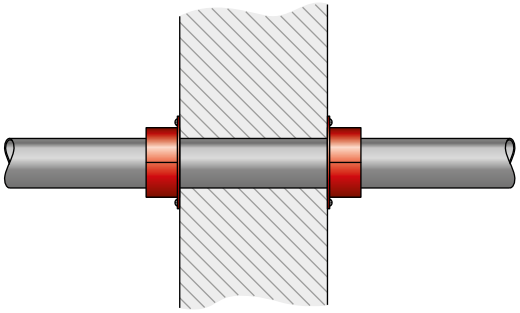
5) Drill the holes for the wall plugs and clean the holes of any debris. To fasten use Fischer FZA 10x40 M 6/10 or FAZ II 8/10 plugs that are suitable both for compact and cellular concrete.



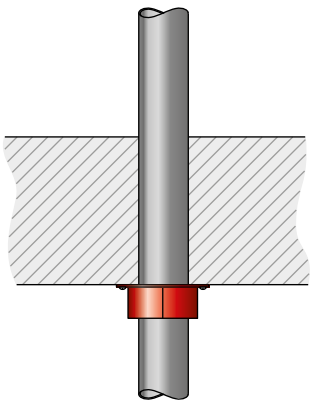
6) On no account should non-fire resistant products be used such as rubber or plastic wall plugs. Insert the plug leaving the threaded part jutting out of the supporting construction. The turn the collar with the latches facing downward (if fitted to a wall) so that the position of the plugs corresponds with the holds; mount the washers and screw on the nuts.



7) Using a suitable spanner tighten the nuts until the collar plate is adheres compactly to the supporting construction. When requested apply the identification label near the collar and fill in the installation data.



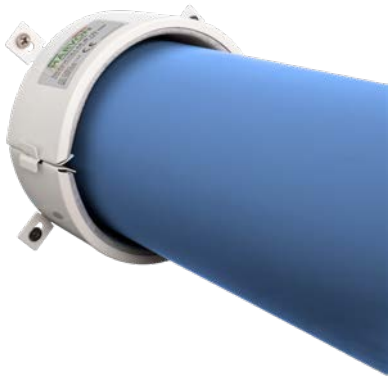
8) For installation on vertical walls, two fire-stop sleeves must be fitted on each side of the wall.



9) For installation on the ceiling, one fire-stop sleeve must be fitted on the lower side of the ceiling.

8.5.2 Tecnocollar fire stop collar

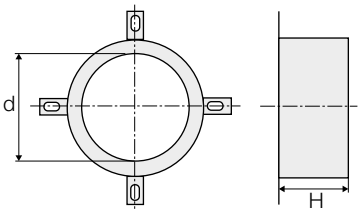
Main characteristics	
Type	Fire and smoke protection for penetrations of walls and ceilings with plastic pipes.
Applicability	Valsir HDPE, PP/PP3®, Blackfire®, Triplus®, Silere® waste systems, pipes in PE, LDPE, MDPE, ABS, PVC-C, PVC-U, SAN+PVC.
Use	On vertical walls and in the ceiling and for ventilated waste pipes, non-ventilated waste pipes and rainwater drainage pipes.
Diameters	32÷315 mm
Fire resistance	Up to EI 240*
Removable	Yes

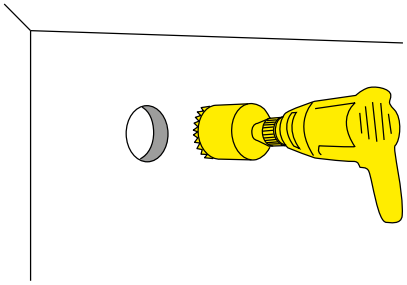


* For more information on the resistance class, check the positioning and installation configuration with Valsir technical department.

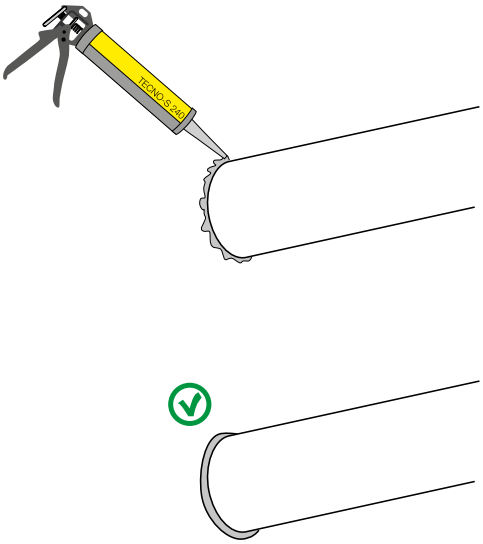
Dimensions

Code	d internal	H height	Nr. of fixing
VS0411051	32	50	4
VS0411053	40	50	4
VS0411055	55	50	4
VS0411057	63	50	4
VS0411059	75	50	4
VS0411061	82	50	4
VS0411063	90	50	4
VS0411065	110	50	4
VS0411067	125	60	4
VS0411069	140	60	4
VS0411071	160	60	4
VS0411073	200	75	6
VS0411075	250	75	6
VS0411077	315	75	6





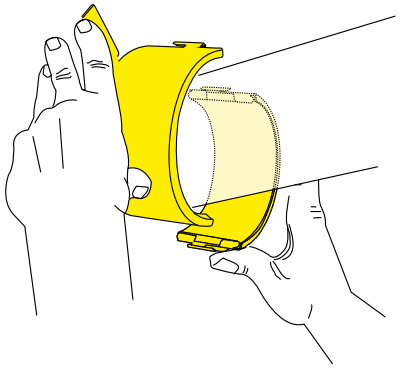
1) Preparation of the supporting construction.
To install the pipe make a hole in the wall or floor where the pipe will be fitted. This can be done with a suitably sized core drill, 3 to 5 mm larger than the external pipe diameter. Remove any debris by blowing air into the opening.



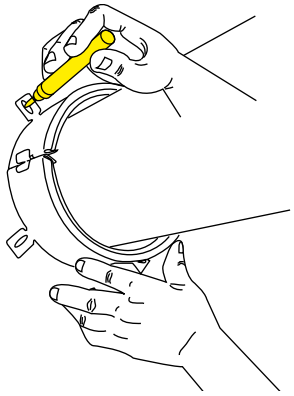
2) Sealing of opening.
Once the pipe has been fitted, ensure that any gaps between the pipe and the supporting construction are sealed with Marvon acrylic sealant TECNO-S 240.

- In flexible wall, gaps between the pipe and the construction smaller than 8 mm must have a bead of TECNO-S 240 to cover the opening, and for gaps smaller than 8 mm, the seal must be plugged with 25 mm deep TECNO-S 240.
- In rigid wall, gaps between the pipe and the construction smaller than 8 mm must have a bead of TECNO-S 240 to cover the opening, and for gaps smaller than 8 mm, the seal must be plugged with 20 mm deep TECNO-S 240 on 20 mm deep backing of rockwool.
- In floor, gaps smaller than 10 mm between the pipe and the construction, must have 20 mm rockwool layer to plug the opening, and for gaps bigger than 10 mm, the seal must be plugged with 10 mm deep TECNO-S 240 on
- For collars installed horizontally on floors, gaps between the pipe and the collar must have a bead of TECNO-S 240 to cover the opening.

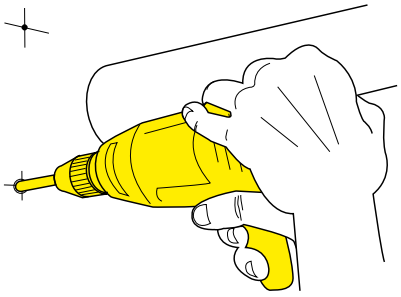
N.B. In the sealing, TECNO-S 240 can replace rockwool using the same thickness.



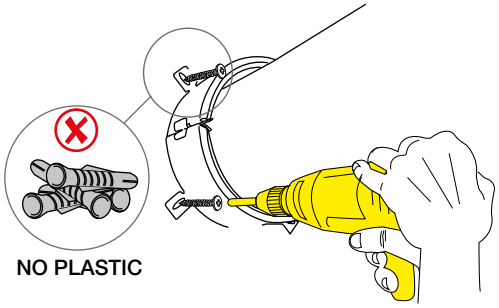
3) Mounting of the Tecnocollar collar.
The firestop collar can be fitted to the pipe also when it has already been laid.



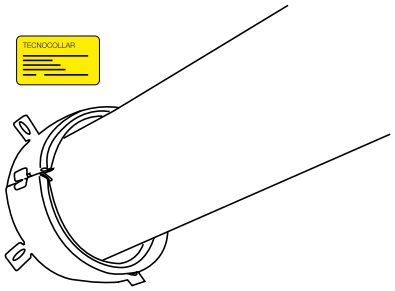
4) Position the collar against the supporting construction and using the slots on the fastening plate, mark with a pencil the position of the wholes to be drilled.



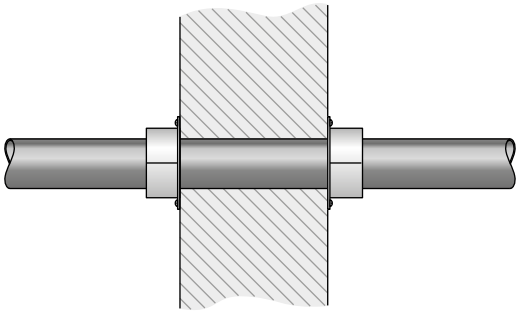
5) Drill the holes.
   - In flexible wall use ≥ Ø 4 mm wood/ drywall screws with a length suitable for the number of boards that form the wall.
   - In rigid wall and floor use ≥ Ø 4 x 40 mm long masonry screws or expansion bolts.



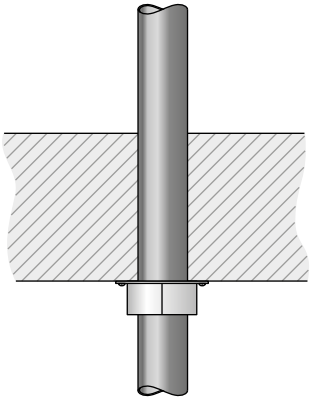
6) Do not use, in any case, non-fire resistant products such as rubber or plastic wall plugs.



7) If required apply the identification label next to the installation, and fill it out with the system info.



8) For installation on vertical walls, two fire-stop sleeves must be fitted on each side of the wall.



9) For installation on the ceiling, one fire-stop sleeve must be fitted on the lower side of the ceiling.

8.6 Testing

The testing of waste systems involves tests and controls to be performed, both during installation and when the system has been completed. It is recommended to always verify the existence of local documents or national standards that prescribe specific testing procedures.
Valsir proposes the tests contained in the Italian Standard UNI 9183:1987, which was replaced by UNI EN 12056-1 and UNI EN 12056-5, in that the latter regulatory package does not refer to any type of test to verify the acceptability of the system.

8.6.1 Water tightness test

This test is performed during installation and consists of:

a) isolating one segment at a time;
b) filling the segment in question with water;
c) increasing the internal pressure to 20 kPa and maintaining it for one hour;
d) there must be no leaks whatsoever during the test.

An alternative practical procedure that is quite commonly used for waste systems in multi-storey buildings but at the same time is rather effective, is the testing of the part of the system between one floor and another.
This procedure involves the following phases:

a) isolation of the waste system between one floor and another (about 3 to 4 m of height);
b) filling of the part of system in question with water from the floor above;
c) continuous filling for two hours;
d) there must be no leaks whatsoever during testing.

8.6.2 Discharge test

This test is carried out on system completion and consists of:

a) contemporarily draining the appliances provided for in the calculation of the maximum contemporary flow for each waste stack of the system;
b) verifying that the drainage is normal and without back-flows, gurgling noises or regime changes;
c) verifying that the wc pans are capable of flushing light objects such as paper, cigarette butts, matches, etc.

WASTE SYSTEMS

SUPPLY SYSTEMS

GAS SYSTEMS

FLUSHING SYSTEMS

BATHROOM SYSTEMS

TRAPS

RADIANT SYSTEMS

DRAINAGE SYSTEMS

HRV SYSTEM

ACADEMY

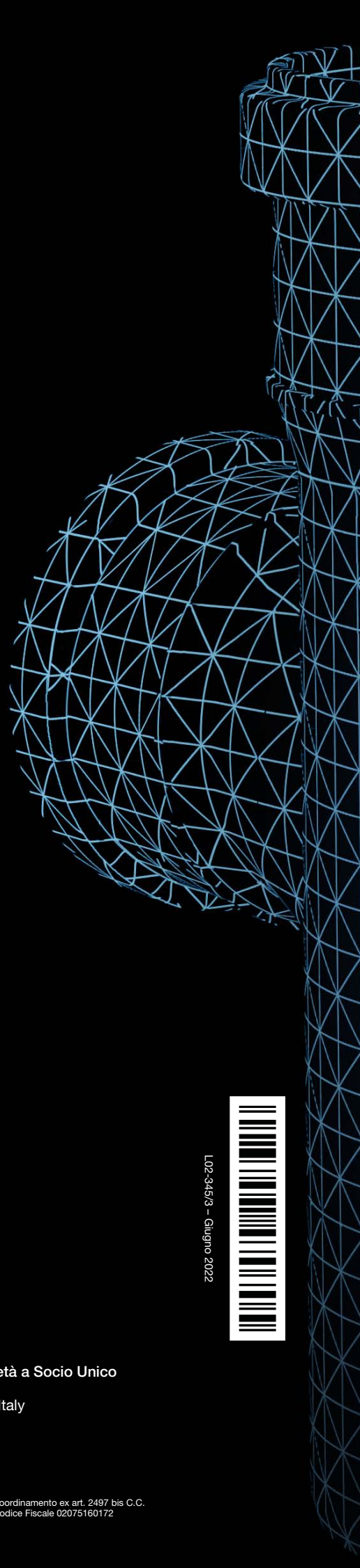
SEWER SYSTEMS

WATER TREATMENT

GROUP SILMAR

valsir®

QUALITY FOR PLUMBING



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