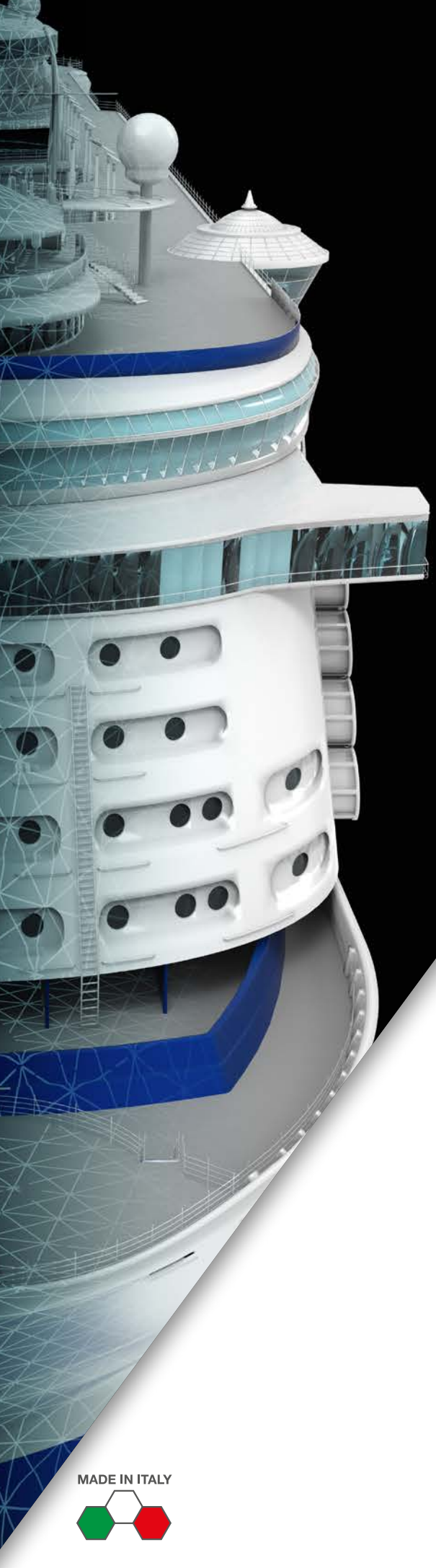


13

TECHNICAL MANUAL

MARINE APPLICATION

Couplings and testing of waste systems

MADE IN ITALY

valsir®

QUALITY FOR PLUMBING

13

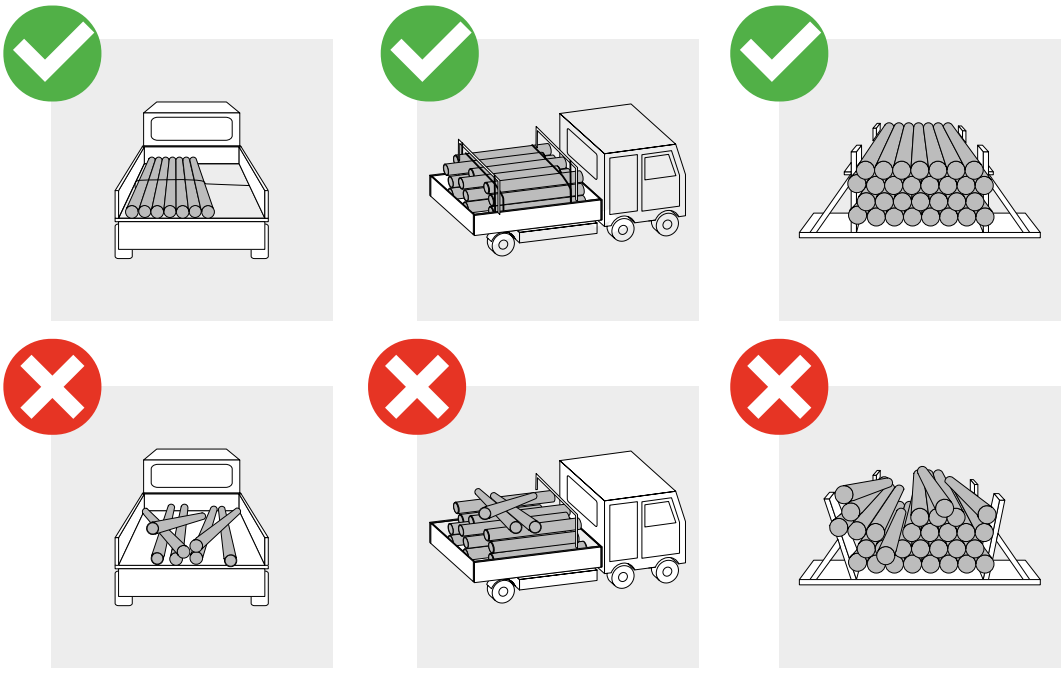
COUPLINGS AND TESTING OF WASTE SYSTEMS

13 COUPLINGS AND TESTING OF WASTE SYSTEMS

13.1 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 1.50 m for White Marine® 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. White Marine® systems can be stored outdoor for a maximum of 18 months, but not in direct contact with sunlight.
- 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.



13.2 Waste system jointing methods

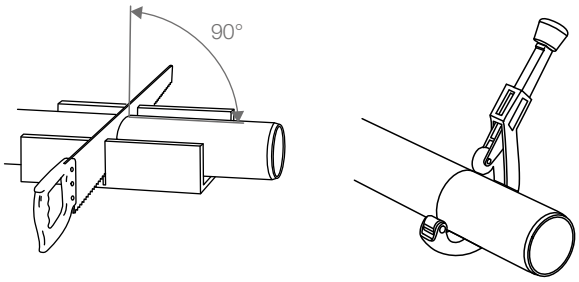
The jointing method that can be adopted depends on the type of waste system chosen.

13.2.1 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 White Marine® waste systems
Diameters	40÷250 mm
Removable	Yes
Tension resistant	No
Connection difficulty	Low
Necessary tools	Pipe-cutter, chamfering tool, lubricant, pencil, ruler



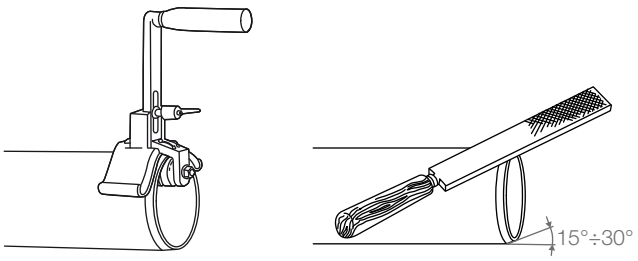
Installation instructions



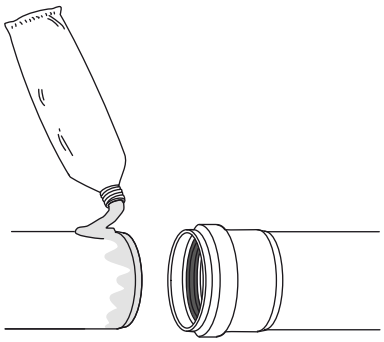
1) Cut the pipe using a suitable pipe cutter or a fine-tooth saw that is suitably guided to guarantee a perpendicular cut.



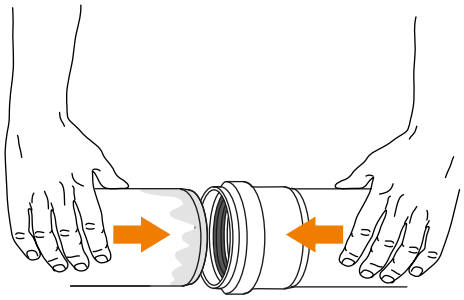
2) Do not shorten the fitting spigots, this would compromise the required insertion depth and the guarantee of a watertight seal.



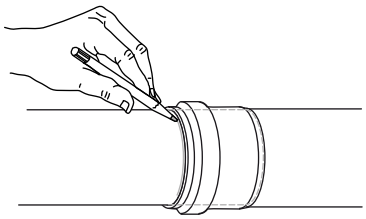
3) Chamfer and bevel the pipe ends to an angle of roughly 15° to 30° using a suitable chamfering tool or a fine file.
The chamfered surface must be smooth to avoid damaging the ring seal inside the socket when the pipe is inserted.



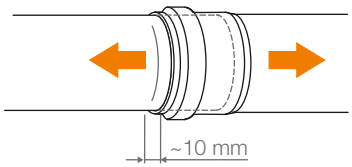
4) Ensure that the inside of the socket, the seal and the spigot of the piece to be inserted are perfectly clean. Lubricate the spigot with the appropriate Valsir lubricant (do not use mineral oil or grease).



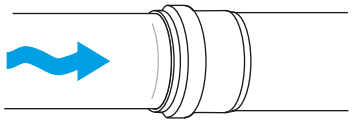
5) Join the pipes and/or fittings together by inserting the spigot into the socket to maximum socket depth.



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.



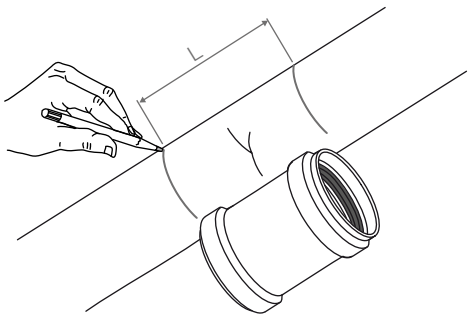
8) Note that the spigot must be upstream of the ring-seal socket. During installation excessive misalignments of the pipes should be avoided because they would compromise the seal of the joint. The pipes must be suitably anchored to the wall to prevent them sliding back into the socket, due to their own weight, and cancelling the extraction length (for more details on installation and bracketing rules, please see Chapter 12).

13.2.2 Repair of pipes using sliding sleeves

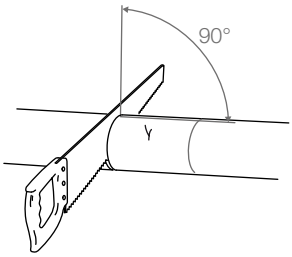
Main characteristics	
Type	This jointing method avails of special sliding sleeves for the repair of damaged pipes. These sliding sleeves are also used for modifying existing pipelines, for example, to install additional fittings such as a branch fitting.
Applicability	Valsir White Marine® waste systems
Diameters	40÷250 mm
Removable	Yes
Tension resistant	No
Connection difficulty	Medium
Necessary tools	Pipe cutter, chamfering tool, lubricant, pencil, ruler

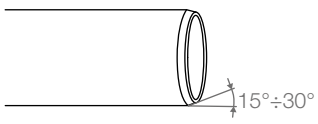


Installation instructions

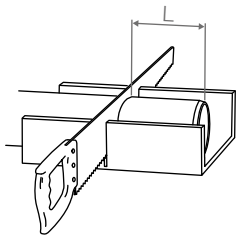


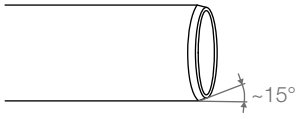
1) Indicate the area to be cut at a distance L that is at least equal to the length of the sliding sleeve and which includes the damaged area.



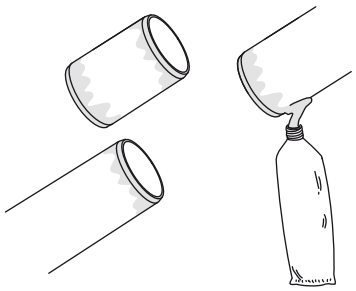


2) Cut the section of the pipeline with a suitable pipe cutter or with a fine-tooth saw that is suitably guided to guarantee a perpendicular cut. Chamfer and bevel the resulting pipe ends of the pipeline to an angle of roughly 15° to 30° using a suitable chamfering tool or a fine file. The chamfered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

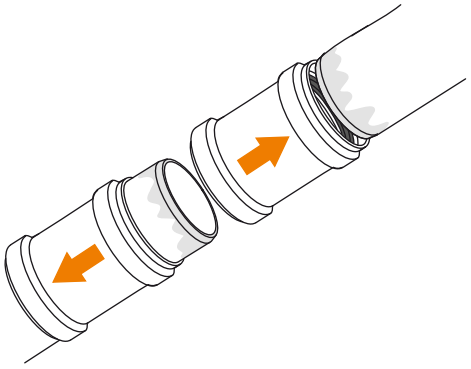




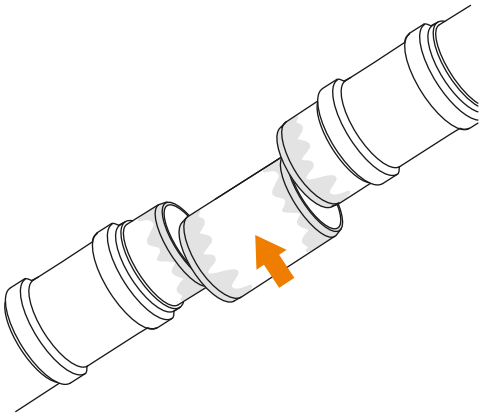
3) Cut a piece of pipe of length L with a suitable pipe cutter or with a fine-tooth saw that is suitably guided to guarantee a perpendicular cut. Chamfer and bevel the ends of the piece of pipe to an angle of roughly 15° to 30° using a suitable chamfering tool or a fine file. The chamfered surface must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



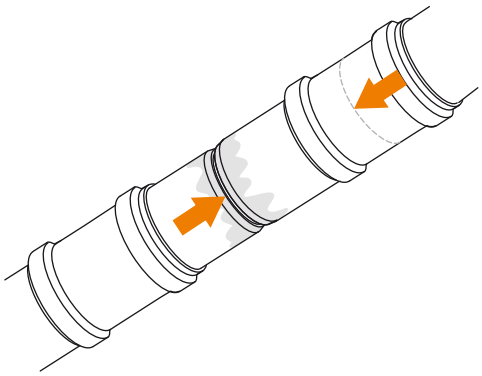
4) Spread the ends of the pipeline and the piece of pipe with a suitable Valsir lubricant (do not use mineral oils or grease).



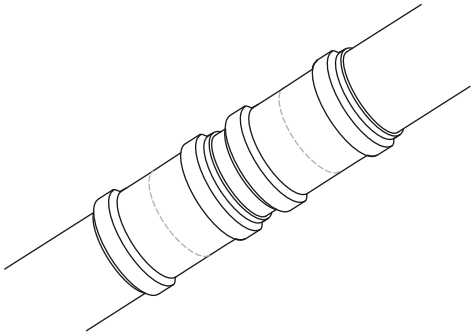
5) Position the sliding sleeves by inserting them in the space created between the two ends of the pipeline and slide them onto the pipe ends.



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.



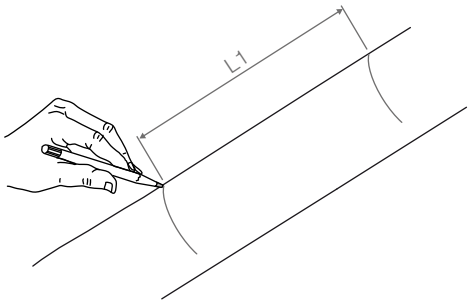
8) The two sliding sleeves must be positioned perfectly over the lines where the pipes were cut.

13.2.3 Modification of pipelines using sliding sleeves

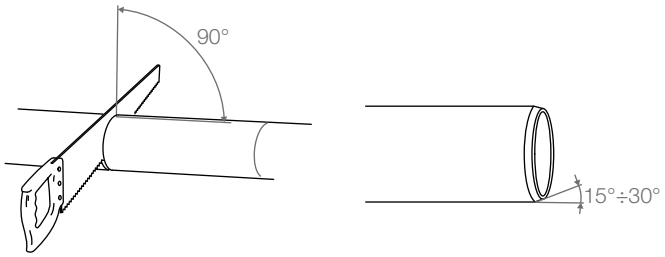
Main characteristics	
Type	This jointing method avails of special sliding sleeves for the modification of existing pipelines, for example, to add a branch fitting.
Applicability	Valsir White Marine® waste systems
Diameters	40÷250 mm
Removable	Yes
Tension resistant	No
Connection difficulty	Medium
Necessary tools	Pipe cutter, chamfering tool, lubricant, pencil, ruler



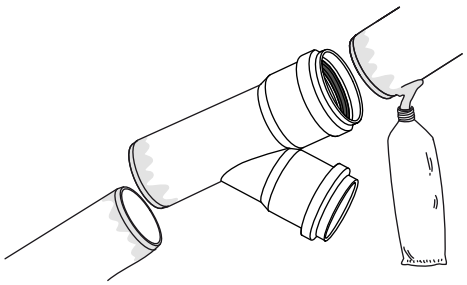
Installation instructions



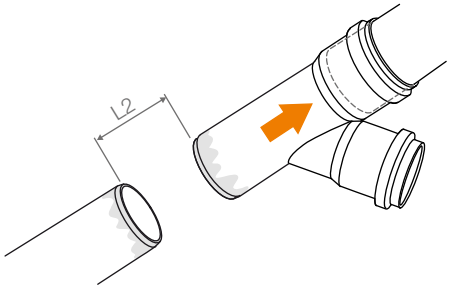
1) Indicate the area to be cut at a distance L1 at least equal to the length of the fitting to be inserted (in the example the branch fitting) plus a length equal to three times the pipe diameter.



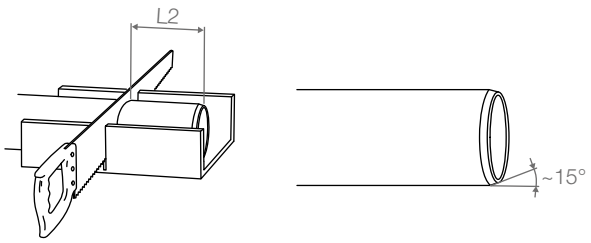
2) Cut the section of the pipeline with a suitable pipe cutter or with a fine-tooth saw, suitably guided to guarantee a perpendicular cut. Chamfer and bevel the resulting ends of the pipeline to an angle of roughly 15° to 30° using a suitable chamfering tool or a fine file. The chamfered surface must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



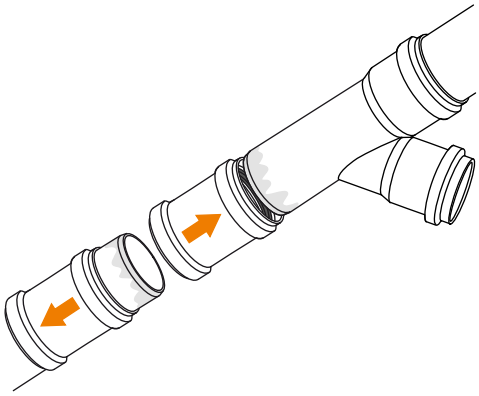
3) Spread the ends of the pipeline and the fitting with suitable Valsir lubricant (do not use mineral oils or grease).



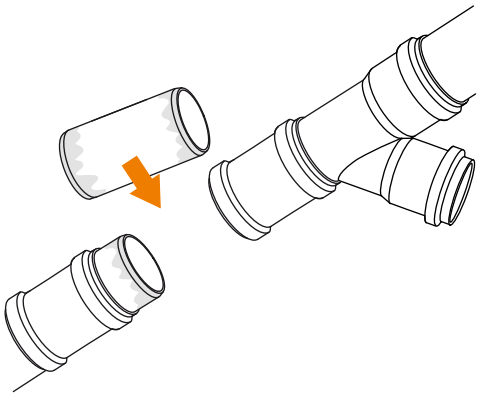
4) Insert the fitting onto the end of the pipeline to maximum socket depth and measure the resulting distance L2.



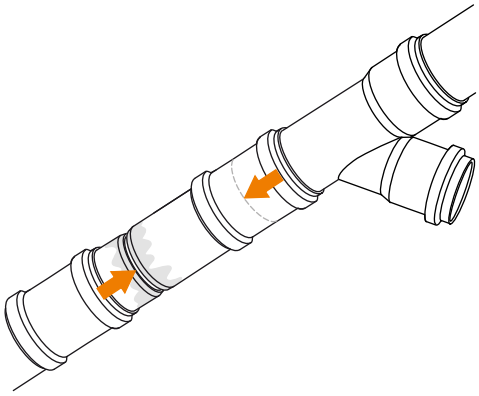
5) Cut a piece of pipe of length L2 with a suitable pipe cutter or with a fine-tooth saw, suitably guided to guarantee a perpendicular cut. Chamfer and bevel the ends of the piece of pipe to an angle of roughly 15° to 30° using a suitable chamfering tool or a fine file. The chamfered surface must be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



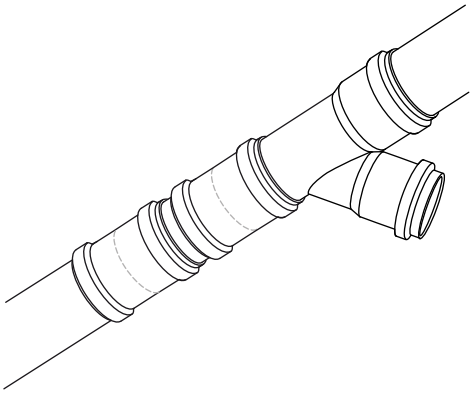
6) Position the sliding sleeves by inserting them in the space created between the pipeline and fitting that was inserted previously and sliding each of them onto the two ends.
If the spigot of the fitting is not long enough to accommodate the sliding sleeve, position both of them on the end of the pipeline,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



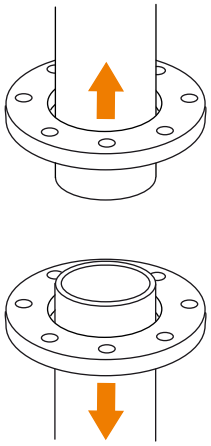
9) The two sliding sleeves must be positioned perfectly over the lines where the pipes were cut.

13.2.4 Flanged joints

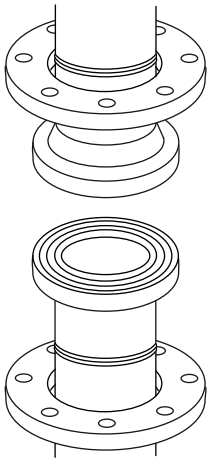
Main characteristics	
Type	Flanged joints are used principally in industrial plants and when an excellent tension resistance is required. The use of blind flanges allows inspection accesses to be made or the temporary closure of pipe sections.
Applicability	Valsir White Marine® waste systems
Diameters	40÷250 mm
Removable	Yes
Tension resistant	Yes
Connection difficulty	Medium/High
Necessary tools	Pipe cutter, welding machine, spanners to tighten the bolts



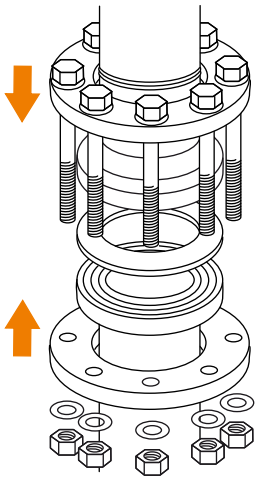
Installation instructions



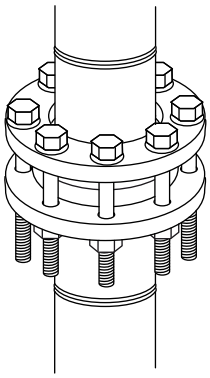
1) Position the flange on the ends of the two pipe sections to be connected.



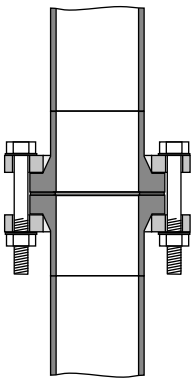
2) Using one of the welding techniques already described in this chapter, weld the flange adapters.



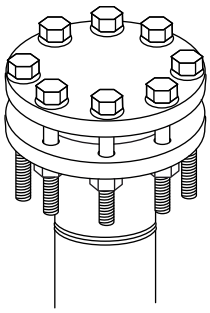
3) Place the flat seal between the two flange adapters and position the screws.



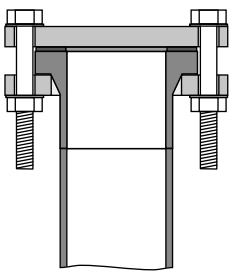
4) Gradually tighten all the bolts until the joint has been fully closed.



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.

13.2.5 Joint with electrofusion collar

Main characteristics	
Type	This welding system allow pipe and/or fitting to be connected using the electrofusion techniques with an electric sleeve.
Applicability	Valsir White Marine waste system
Diameters	50÷160 mm
Removable	No
Tension resistant	Yes
Connection difficulty	Low
Necessary tools	Pipe cutter, pipe scraper, welding machine

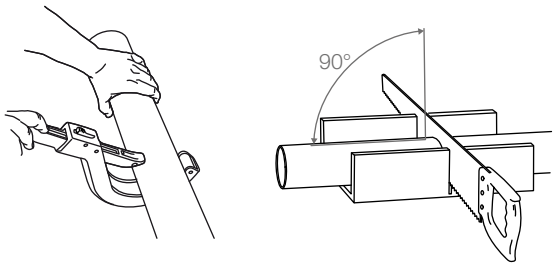


Installation instructions

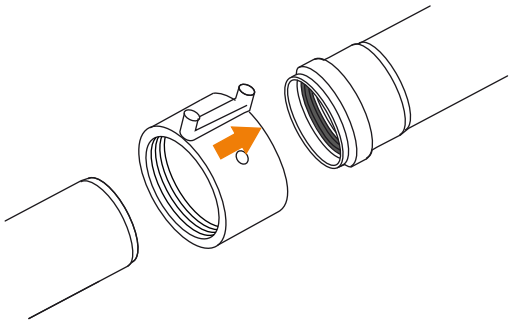


CAUTION!

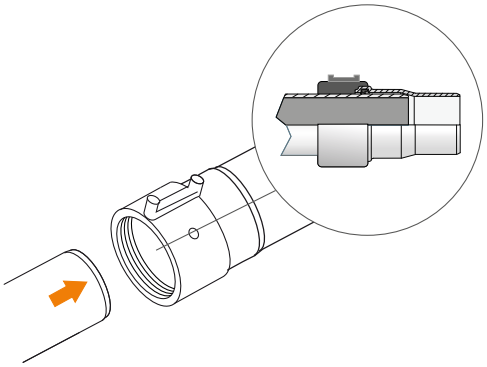
- Welding must be carried out in favourable climatic conditions at a temperature between -5°C and +40°C.
- In windy and/or dump conditions or if temperature fall below -5°C or are greater than +40°C the work area will need to heat or ventilated by covering it with a canvas or another effective protective 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 joint 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, fitting 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 be 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 roller guides.



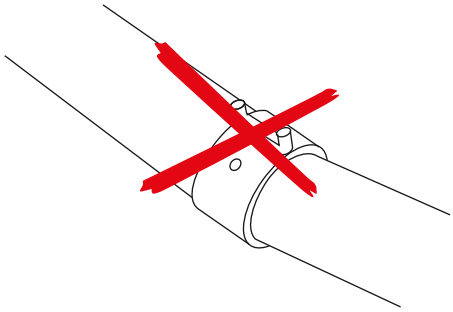
1) The pipes must be cut orthogonally so that the coils of the electric sleeve remain in contact with the pipe and/or fitting. Use a pipe cutter or fine-tooth saw.



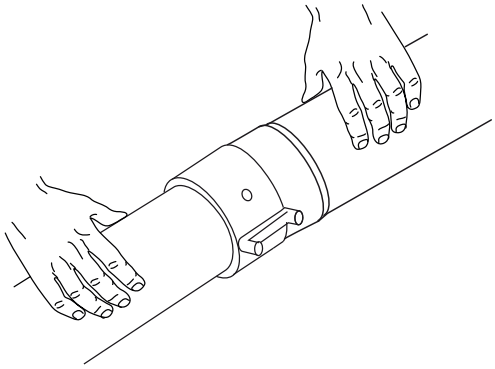
2) Place the electrofusion collar on the socket following the arrow direction.



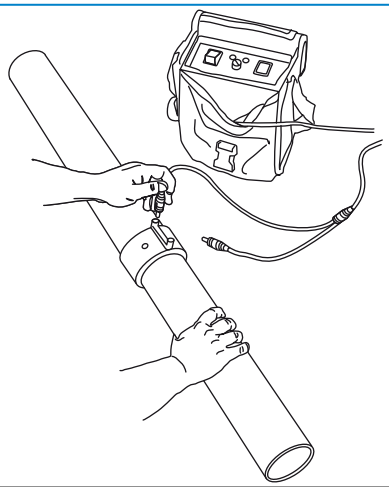
3) Once the collar was placed on the socket, we can proceed insert incoming pipe in the other side of the collar. (Follow orange arrow).



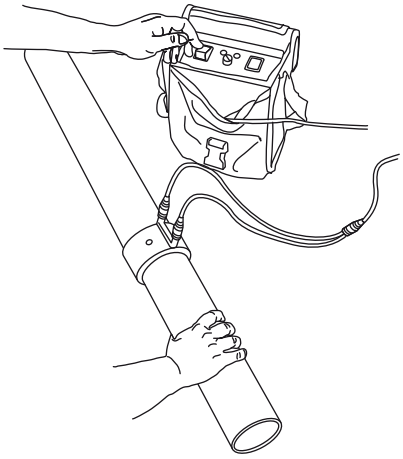
4) Keep aligned two parts to weld avoiding whatever type of stress.



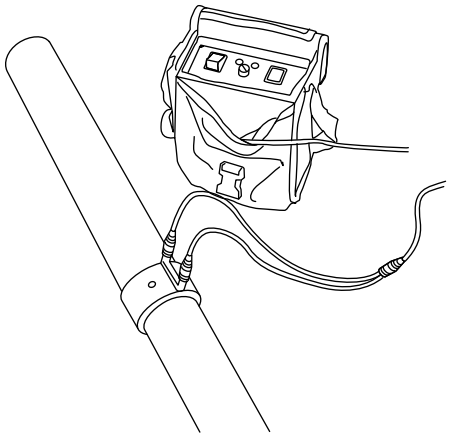
5) Once positioned well the parts, we can proceed with the welding phase.



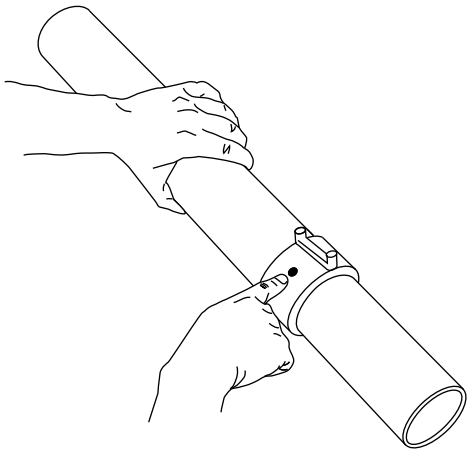
6) Connect the electrofusion sleeve to the welding machine using appropriate pins, according to the diameters to be weld. (To obtain more information please refer to the welding machine handbook).



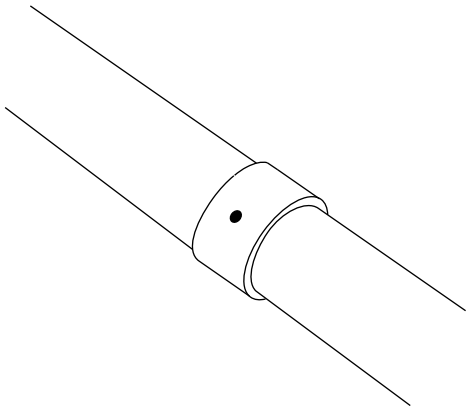
7) The welding time is determinates automatically by the welding machine, which, when completed, will produce an audible signal.
The same coupling cannot be welded twice.



8) The part 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.



9) An incomplete welding can be verified by the fact that the indicator on the electrofusion sleeve has not changed colour (from white to black).
The parts to be welded must remain in position and aligned; they must not be subject to any mechanical stress during cooling.

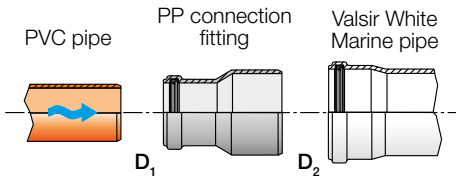
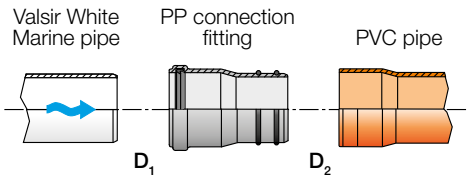
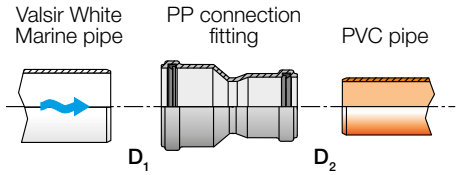
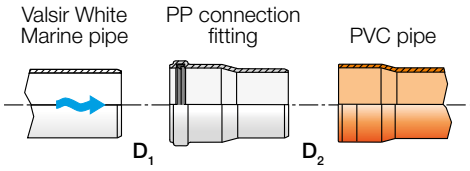


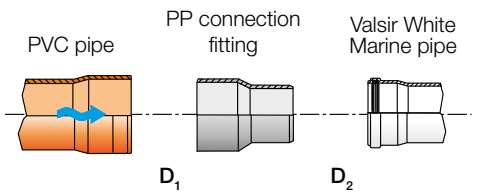
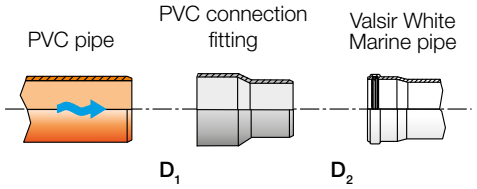
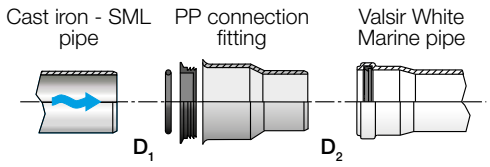
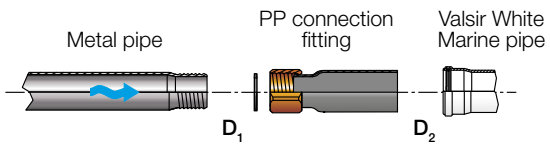
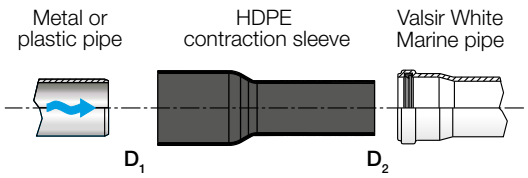
10) Water must not be poured over the joint nor should any other action be taken to accelerate cooling of the electrofusion coupling.

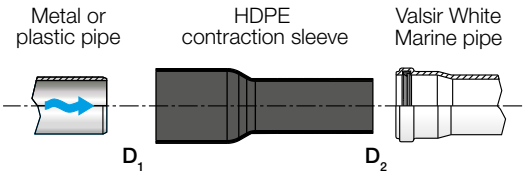
13.3 Connection to other waste systems

13.3.1 Jointing Valsir White Marine® 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
	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
	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
	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
	VS0383001	OD 50 mm	OD 60 mm
	VS0383003	OD 50 mm	OD 73 mm
	VS0383005	OD 50 mm	OD 80 mm
	VS0383007	OD 50 mm	OD 90 mm
	VS0383011	OD 56 mm	OD 60 mm
	VS0383013	OD 56 mm	OD 73 mm
	VS0383021	OD 63 mm	OD 73 mm
	VS0383023	OD 63 mm	OD 80 mm
	VS0383025	OD 63 mm	OD 90 mm
	VS0383029	OD 75 mm	OD 80 mm
	VS0383031	OD 75 mm	OD 90 mm
	VS0383033	OD 75 mm	OD 100 mm

Connection system	Necessary parts	D_1	D_2
	VS0382001	OD 90 mm	OD 110 mm
	VS0382003	OD 110 mm	OD 122 mm
	VS0382005	OD 110 mm	OD 140 mm
	VS0382007	OD 125 mm	OD 150 mm

13.4 Testing

The discharge system testing consists of tests and checks to be performed both during installation and when the system has been completed. It is always recommended to check the existence of local documents or national regulations requiring specific testing procedures.
There are two types of tests to be carried out:

- Gravity system (grey water, white water).
- Vacuum systems (black water).

13.4.1 Gravity systems

13.4.1.1 Water leak test

This test must be performed during installation and is as follows:

a) insulate one section at a time;
b) fill the section in question with water;
c) increase internal pressure to 20 kPa and maintain it for an hour;
d) no leaks of any type must occur during the test.

An alternative practical procedure that is quite used for discharge systems of multi-storey buildings, but at the same time is quite effective, is to test the part of the system between one floor and another.
The steps of this procedure are as follows:

a) insulate the discharge system between one floor and another (approx. 3÷4 m in height);
b) fill the part of system in question with water, from the upper floor;
c) maintain the filling for two hours;
d) no leaks of any type must occur during the test.

13.4.1.2 Discharge test

This test must be performed when the system has been completed and is as follows:

a) discharge simultaneously the equipment provided for by the calculation of maximum simultaneous flow rate for each stack of the system;
b) check that the discharge is regular and free of overflowing, bubbling or operating variations;
c) check that the vases can discharge light objects such as paper, cigarette butts, matchsticks, etc.

13.4.2 Vacuum system

13.4.2.1 Leak test

The vacuum system, as described above, is based on a totally different principle compared to the customary one. One of the worst conditions that may occur is the slug spillage. This may be caused by a sudden breakage, poor maintenance or line clogging. For proper operation inside the vacuum line, it is necessary to ensure a minimum negative pressure of -0.4 bar and a maximum negative pressure of -0.6 bar (vacuum pump disabling). Should unevenness occur along the line, such as clogging, the resulting air inflow could cause the pumps to overheat, be stressed and in the worst case lead to their breakage. Abnormal vacuum values would also lead to abnormal velocities in the line.

The tests to be performed on the vacuum line must be made during all the installation steps. When a section of the line has been laid, it must be tested by closing all outlets, bringing it to the desired vacuum value and checking that there are no leaks.
Proceed gradually by testing more and more sections of the system and then perform the final test on the entire equipment.
The vacuum values to be used are in the range of -0.5 to -0.3 bar for at least 30 min.

13.4.2.2 Tests to be performed on the line

- Generate a vacuum of -0.6 bar.
- Leave the entire line under vacuum for 1 h at -0.6 bar. The test is considered passed if after 60 min the measured vacuum value has risen to a maximum of -0.58 bar (tolerance +0.2 bar).

WASTE SYSTEMS

SUPPLY SYSTEMS

GAS SYSTEMS

FLUSHING SYSTEMS

BATHROOM SYSTEMS

TRAPS

RADIANT SYSTEMS

DRAINAGE SYSTEMS

HRV SYSTEM

ACADEMY

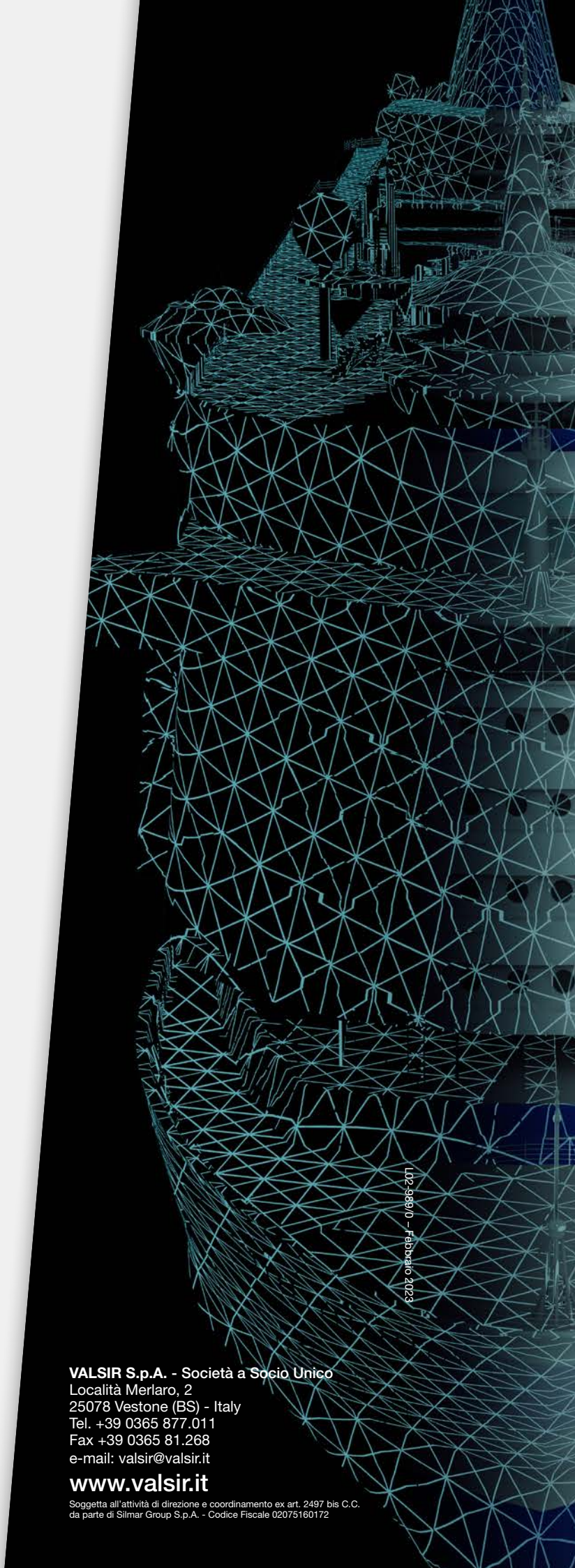
SEWER SYSTEMS

WATER TREATMENT

GROUP SILMAR

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QUALITY FOR PLUMBING



L02-9890 – Febbraio 2023

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