

PVC-U STORMWATER PIPE & FITTINGS SYSTEM

INSTALLATION

One of the most significant advantages of Iplex PVC-U Stormwater pipe system is its light weight. This means that the pipe can be easily handled and longer lengths can be installed without sophisticated lifting machinery and with minimum in-trench labour.

6 metre lengths increase the speed with which a system can be installed.

Stormwater pipelines rely on gravity to ensure adequate flow of fluid. Strict adherence to the designed grade along the entire pipeline is essential and the line must be maintained to specification between inspection position.

Installation of PVC-U Stormwater pipelines will be fast and efficient provided the following guidelines are followed. The installer must ensure that pipeline system installation is performed in accordance with AS/NZS 2032 "Installation of PVC-U Pipe Systems", and "AS/NZS 3500 National Plumbing Standard" together with the requirements of local authorities, where applicable.

JOINTING METHODS

PVC-U pipelines are easy to assemble. While Iplex rubber ring jointed pipes can be fully assembled above the trench. Stormwater solvent welded pipe may be fully jointed above the trench, but not lowered into the trench until the solvent has taken its initial set. Care must be taken to ensure joints do not pull apart during lowering into the trench and all joints should be subsequently inspected

SOLVENT WELD JOINT

Iplex Pipelines premium solvent cements and benzene free priming fluids are manufactured to AS/NZS 3879. Solvent cements and priming fluids for use with PVC-U pipes and fittings.

To achieve strong leak free joints tradespeople should:

- 1) Select the correct solvent cement for the application
Type N - for non-pressure joints that may have a small clearance.
- 2) Select the correct pipe and fitting using the Iplex Pipelines part list.
- 3) Follow jointing steps 1 - 8 carefully (page following). Short cuts will result in poor joints that are likely to cause system failure.

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HOW SOLVENT CEMENT WORKS:

Iplex solvent is a solution of resin in a mixture of solvents, which soften the surfaces when applied to PVC-U pipe and fittings. It is not a glue. A thin uniform coat is applied to both the spigot and socket and the joint is assembled while the surfaces are still wet and fluid. The cement layers intermingle and become one. The strength of the joint develops as the solvent permeates the PVC-U and the volatile constituents evaporate.

IPLEX PIPELINES - SOLVENT CEMENT - TYPE N:

Type N is used for non-pressure applications and is formulated with the gap filling properties needed with clearance fits.

THE IMPORTANCE OF IPLEX PIPELINES PRIMING FLUID:

Before applying the solvent cement, it is essential to use Iplex Priming Fluid for successful jointing as the fluid not only cleans and degreases, but removes the glazed surface from PVC-U which allows the solvent cement to permeate into the wall of the pipe or fitting. It must be applied with a clean, lint free cotton cloth. Brushing the priming fluid on or simply pouring the fluid over the pipes and fittings does not remove grease and dirt.

AVERAGE NUMBER OF JOINTS PER LITRE OF IPLEX PRIMER AND SOLVENT:

For larger size pipes, a large brush should be used to apply the priming fluid and solvent cement.

NOMINAL PIPE SIZE (MM)	APPROX. JOINTS PER LITRE	
	SOLVENT	PRIMER
75	42	126
90	34	102
100	26	78
150	12	36
225	6	18
300	4	12
375	2	6

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JOINTING INSTRUCTIONS

Do not work with hot pipes or on hot windy days without protecting pipes from the wind. Keep lid on solvent cement to minimise evapo-ration. Do not use solvent over 12 months old.

STEP 1 - CUT SPIGOT SQUARE AND DEBURR:

Cut the spigot as square as possible using a mitre box and hacksaw or power saw. Remove all swarf and burrs from both inside and outside edges with a knife, file, reamer or sandpaper. Swarf and burrs if left, will wipe off the solvent cement and prevent proper jointing. Also swarf inside pipes can become dislodged and jam taps and valves.



STEP 2 - CHECK ALIGNMENT:

Check the pipe and spigot or fittings for proper alignment. The time for any adjustments is now, not later.



STEP 3 - MARK CLEARLY:

Mark the spigot with a pencil or marker at a distance equal to the internal depth of the socket. Only use pencil or a marker. Do not score or damage the surface of the pipe or fitting.



STEP 4 - CLEAN AND SOFTEN THE SURFACE:

Thoroughly clean the inside of the socket and the area between the pencil mark and the spigot end with a clean, lint free cotton cloth dipped in priming fluid (do not use synthetic material). This removes dirt and grease and softens the PVC-U surface. Do no brush or pour the priming fluid on.

**Iplex recommends the use of gloves. If contact with skin occurs, wash affected area with soap and copious quantities of water immediately.*



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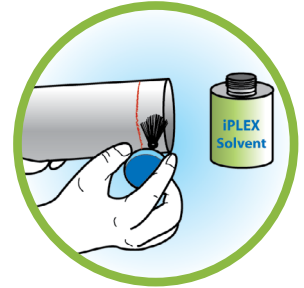


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STEP 5 - COAT SOCKET FIRST - THEN SPIGOT:

Apply a thin, uniform coat of Iplex solvent cement to the socket. Take care to ensure that solvent build up does not occur in the root of the socket - a pool of cement there will severely weaken the pipe or fitting. Now apply a uniform coat of solvent cement to the external surface of the spigot up to the pencil mark.



STEP 6 - ASSEMBLE-HOLD FOR 30 SECONDS:

Assemble the joint quickly before the cement dries by pushing the spigot firmly into the socket as far as the pencil mark, ending with a quarter turn to spread the cement evenly. Hold the joint in this position for at least thirty seconds without movement.



STEP 7 - A VITAL 5 MINUTES:

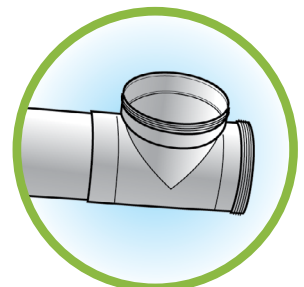
Wipe off the excess solvent cement from the outside of the joint and where possible from the inside of the joint. Do not disturb the joint for at least a further five minutes - movement may break the initial bond.



STEP 8 - CURING AND TESTING:

The cure time is the time taken for the joint to achieve sufficient strength to allow it to be tested by internal pressure or vacuum.

The minimum cure time for solvent weld joints in Iplex DWV pipes and fittings is 24 hours.



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STORAGE

- Solvent cement and priming fluids are highly flammable. In the event of fire, smother with sand or earth or use suitable fire extinguisher.
- Store solvent cements and priming fluid in a cool place away from heat, flames and sparks.
- Ensure can lids are tightly closed when not in use.
- Use solvent cements within twelve months of the date stamped on the bottom of the bottle/can. If the solvent cement has become so thick that it does not flow easily, discard.
- Do not add any other ingredients or solvents to these products.

SAFETY PRECAUTIONS

- Do not use solvent cements or priming fluid in confined spaces without adequate ventilation, or near open flames or sparks.
- Do not smoke while using these products.
- If spilt on skin, wash off with soap and water.
- If poisoning occurs, consult a doctor or Poisons Information Centre.
- Keep container sealed when not in use.

If swallowed:

Solvent cement	<ul style="list-style-type: none"> • Do not induce vomiting. • Call Poisons Information Centre or a doctor immediately.
Priming fluid	<ul style="list-style-type: none"> • Do not induce vomiting. • Call Poisons Information Centre or a doctor immediately.

Avoid contact with eyes:

- If contact occurs flush with copious amounts of water.

By following these steps exactly you should be able to make strong leak-free joints with Iplex Solvent Cement. Refer to AS/NZS 2032- Installation of PVC-U Pipe systems for further guidance. Correct pipe and fitting selection is also vital. See the Iplex Pipelines part list for correct selection. Iplex Pipelines Suppliers and Technical Representatives will be happy to answer any questions you have.

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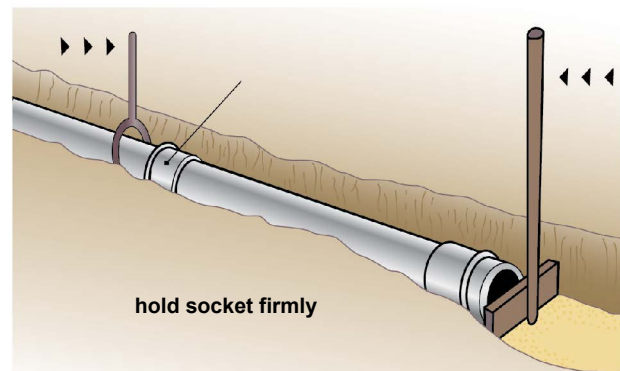
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TRENCHING

Trenches should be excavated in accordance with plans and specifications, and with reference to AS/NZS 2032. They should be as narrow as practicable at the level of the top of the pipe and, in a straight trench, have a bed width not less than 200mm wider than the pipe diameter, to provide working space for the laying crew. Trenches when excavated are either 'stable' or 'unstable'. The category into which a trench fits is affected by the soil conditions, width, depth and method of excavation. To ensure that maximum support is given to the buried pipe by the undisturbed ground the resultant stable or unstable trench should be treated in the following way:

PLACING PIPES INTO TRENCHES

Iplex solvent weld jointed PVC-U lines can be jointed outside the trench if required. Solvent weld jointed pipes can safely be handled without risk, provided that the joints have been allowed to develop sufficient strength. When pipes are jointed in the trench, the jointing procedures are described under solvent weld joints. Particular care should be taken to ensure that no dirt or moisture has collected on the joint surface during handling.



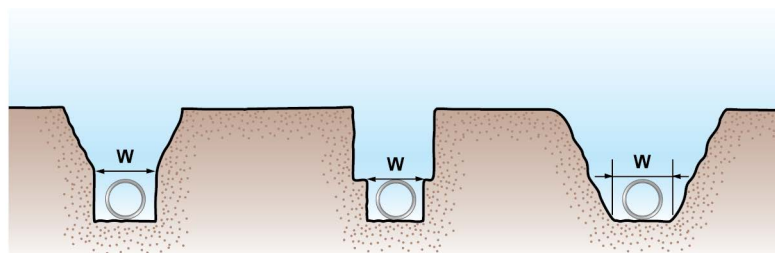
STABLE CONDITIONS:

Stable conditions are those where, after excavation, the trench walls remain solid and do not show any signs of collapse or cave-in. Under such conditions the recommended trench widths are shown in the following table:

PIPE DIAMETER (MM)	NOMINAL TRENCH WIDTH (MM)
75-100	400
150-200	600
225-300	750
375	900

UNSTABLE CONDITIONS:

Unstable conditions are those where, during or after excavation, the trench walls tend to collapse and cave-in. Under these conditions, in open or unrestricted areas, the top of the trench can be widened until stability is reached. A smaller trench should then be dug in the bottom of the excavation to contain the pipe as shown. In areas where space is limited, e.g. in streets, it may be necessary to support trench walls by timber or other suitable shoring.



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TRENCH DEPTHS

The minimum trench depth should be such that pressures created by the weight of fill material plus anticipated traffic or other superimposed loads will not damage the pipes. As a guide the recommended minimum clear cover above is listed below, but refer to AS/NZS 2032 for the latest information.

CONDITION	MINIMUM COVER DEPTH
Where no subject to vehicular loading:	300mm
Where subject to vehicular loading:	
Under driveways:	450mm
In sealed roadways:	600mm
In unsealed roadways:	750mm

LAYING AND COMPACTION

PREPARING THE TRENCH:

The trench bottom should be as level as possible, so that the barrel of the pipe is fully supported. The trench bottom should have sandy or loamy soil, free from rocks and stones to ensure continuous support for the pipe.

WET CONDITIONS:

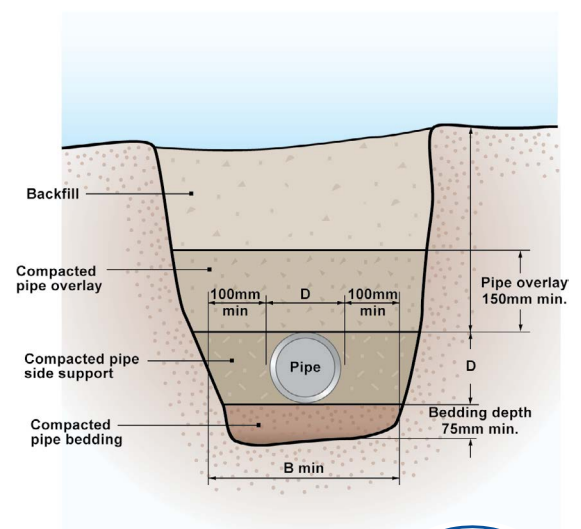
In wet ground, sloppy working conditions can be alleviated by first placing a layer of hard granular material, or by de-watering the area in and around the trench. If patches of ground are so wet that there is a risk of subsidence and possible damage to sections of the pipeline, these areas should be consolidated by the addition of suitable fill material.

TRENCH INSTALLATION:

The trench should be excavated deeply enough to allow for the specified grade, the required depth of bedding, and the minimum cover over the pipe. AS/NZS 2032 - "Installation of PVC-U Pipe Systems", suggests the following typical installation in a trench, which Iplex recommends.

AS/NZS 2032 suggests the following materials as suitable for bedding and overlay in the trench:

- Suitable sand, free from rock or other hard or sharp objects.
- Crushed rock or gravel of approved grading up to a maximum size of 14mm.
- The excavated material, if it is free from rock or hard matter and broken up so that it contains no soil lumps having any dimension greater than 75mm which would prevent adequate compaction of the bedding.
- Cement mortar, containing one part of cement and four parts of sand by volume, mixed with clean water to a workable consistency (bedding only).



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BACKFILLING

USE OF SHORT LENGTHS OF PIPE

PVC-U pipe may be cut on site when shorter lengths are required for the installation of fittings.

The cutting of PVC-U pipe is easily achieved using a fine-toothed handsaw or a PVC-U pipe cutter. The position of the cut should be measured and carefully re-checked before cutting: reasonable accuracy should be exercised to ensure that the cut is square to the axis of the pipe and all burrs must be removed from the cut end before making a joint.

COMPLETING SITEWORK

Once the pipe is laid in the trench backfilling can commence. Two distinct phases are involved with pipelines:

- backfilling prior to testing the pipeline
- backfilling after testing the pipeline

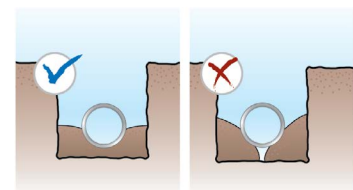
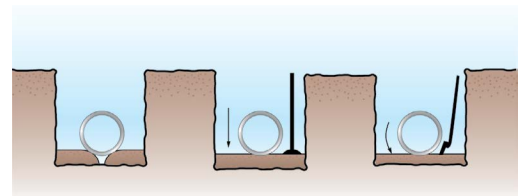
Backfilling usually follows pipe installation as closely as possible in order to protect the pipe from external damage. This eliminates the possibility of the pipe floating due to flooding of open trenches, and avoids shifting the pipe out of line due to cave-ins.

It should be remembered that the purpose of backfilling is not only to protect the pipe by covering it, but to provide firm continuous support under the pipe. Where concrete or mortar bedding has been used, the bedding has to take its initial set before overlay materials is added.

INITIAL BACKFILLING

The first step in providing firm continuous support for the pipeline is to tamp soil solidly under the entire barrel of the pipe, care being taken not to disturb the grade.

The embedment material should be free from stones, rock or clay. If the native, excavated soil is not suitable, then imported materials should be used for the embedment zone. The initial backfill should be placed by hand-shovel in layers not exceeding 100mm deep. Each layer should be well tamped round and under the pipeline using the long tamper illustrated. In this way air pockets are eliminated from beneath the pipe. The layers should be shovelled in and tamped, the process being repeated until the pipe is firmly bedded. The flat tamper illustrated is used to consolidate this fill to heights of 300mm above the top of the pipe for diameters up to 300mm. The illustrations A and B below show the wrong and right ways of tamping the initial backfill.

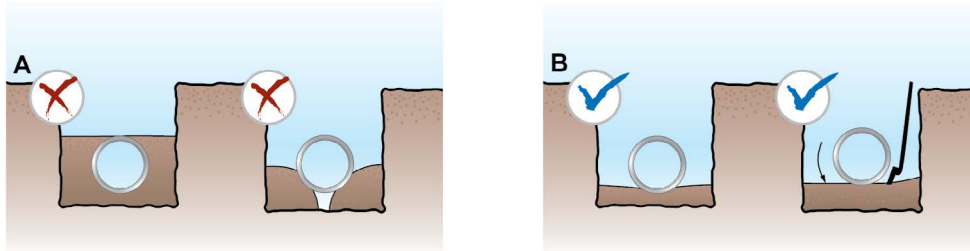


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Case A, too much soil is present and the tamping bar cannot compact it properly leaving a void underneath the pipe. Case B, shows the correct fill of a 100mm layer of soil which can be compacted to form a firm bed for the pipe. Pipe joints should be temporarily left exposed when placing the initial backfill, to enable pressure tests to be carried out. After testing the line, backfilling and final filling may be completed.



SUPPORTS FOR PVC-U PIPELINES:

- Fixed supports**
 - The purpose of a fixed support is to restraint all movement and to provide a fixed point in the installation
- Sliding supports**
 - The purpose of a sliding support or clip is to provide a guide without restraint on axial movement of the pipe
- Location of supports**
 - Refer to maximum spacing of pipe support table
 - PVC-U shall be supported at intervals dependent on the maximum temperature likely to be reached by the material
- PVC-U pipes through walls & floors**
 - Any pipe or fitting built into a wall or floor shall either be lagged with a suitable flexible material not less than 6mm thick, or pass through a sleeve providing an annular clear space of not less than 6mm, so as to permit the pipe to be sealed in position without restricting axial movement of the pipe

MAXIMUM SPACING OF PIPE SUPPORTS FOR NON-PRESSURE PIPES AS/NZS 2032:2006:

NOMINAL SIZE OF PIPE	GRADED PIPELINES (M)	VERTICAL PIPELINES (M)
32	0.90	1.80
40-50	1.00	2.00
65-150	1.20	2.50
>150	1.50	3.00

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