Water Supply and Sewerage Approved Products Manual 2022

Gravity Sewerage Products – Polyvinyl Chloride (PVC) Pipeline Systems

Section SGPS 01

PowerWater

Contents

1 Pipes

1.1 Unplasticised polyvinyl chloride (U PVC), (DWV)

Compliance	Size DN (mm)	Length (m)	Products	Manufacturers
AS/NZS 1260 AS/NZS 2032 WSA PS – 230	150 225 300	3	 	Vinidex (SC/PW) Pipemakers (SC/PW) Iplex Pipelines Pipe King

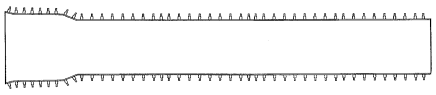
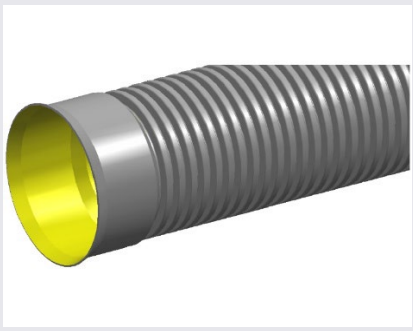
Notes: DN 150 to DN 300 pipes shall be SN8. Spigot-Socket RRJ pipes in sandwich construction (SC) solid core and plain wall (PW) used in wastewater reticulation only.

Some sandwich construction solid core using PVC recycled from the process may differ in colour.

Rubber Ring Joints (RRJ) to be used unless Solvent Welded Joint (SWJ) is specified.

Other lengths (6 m) and DWV products may be considered. For such circumstances, approval is required from a Power and Water representative.

1.2 Polypropylene pipe (structured wall) (PP)

Compliance	Size DN (mm)	Length (m)	Products	Manufacturers
AS/NZS 5065 WSA PS - 240	225 300 375	3	 	Iplex (SewerMAX)

Notes: DN 150 to DN 300 shall be SN10. Spigot-Socket RRJ pipes is required and where ribs are broken, the section of damaged pipe shall be replaced.

All cuts in Polypropylene structured wall pipe are to be made in the centre of two consecutive ribs.

All fittings shall be obtained from the same pipe manufacturer.

Alternative sizes and/or the use of SewerMAX+ for deep sewer requires approval from a Power and Water representative.

2 Fittings

2.1 U PVC (DWV)

All Drain Waste and Vent (DWV) fittings shall comply with AS/NZS 1260, AS/NZS 2032 and WSA PS – 230.

Notes: Reinforced fittings have been strengthened. All reinforced fittings used shall be approved by Power and Water. Suitable techniques for reinforcement may be either:

a) Injection moulded fitting manufactured with an increased wall thickness.

b) Standard fitting which has been enhanced by the application of layers of fibreglass wrapping and bracing.

Rubber Ring Joints (RRJ) to be used unless Solvent Welded Joint (SWJ) is specified. Refer to manufacturer regarding availability.

2.2 Reinforced heavy duty fittings

Type	Connectors	Products	Manufacturers
90° Plain bend	Female - female Male - female		Plastec
45° Plain bend	Female - female Male - female		
45° Angled junction	Female - female - female Male - female - female		
45° Reducing junction	Female - female - female Male - female - female		

Type	Connectors	Products	Manufacturers
Inspection opening tee	Female-female		Plastec
Level invert taper	Female-male		
90° angled junction	Female - female - female Male - female - female		
Slip coupling	Female-female		

3 Joint seals

All joint seals shall comply with the following:

- AS 1646 – Elastomeric seals for waterworks purposes
- AS 4020 – Testing of products for use in contact with drinking water
- WSA PS – 312 Flange gaskets and O-rings

Notes: Refer to manufacturer regarding availability.

Type	Products	Manufactures
Threaded cap		Plastec Holman Pipe King Vinidex Iplex
Elastomeric seal		Iplex (Gulf & Hultec) Viadux (Gulf)
Joint lubricant		Thomas Grozier & Son

4 Solvent cementing

All solvent cementing shall comply with AS/NZS 3879 – Solvent cements and priming fluids for PVC.

Type	Products	Manufactures
Priming fluid – Red		Iplex Vinidex
Type N – Blue		

5 Specifications

5.1 SGPS 01 - 1 Spigot-socket PVC-U pipes

Standard:

- AS/NZS 1260:2017 - PVC-U pipes and fittings for drain, waste and vent applications.

Design:

- **Hydraulic:** The ID of PVC-U (commonly referred to as 'PVC') plain wall pipes closely approximates to the nominal up to DN 225 but is less than nominal by +20 mm for larger sizes.
- **Structural**: The class of pipe is defined by the ring stiffness, which can be directly used in structural design calculations.
- **Material**: The polyvinyl chloride pipe material is unplasticised (i.e. has no added plasticisers) and this makes the material more hard and rigid and thus suitable for buried piping. PVC without plasticisers also has better tensile strength.

Materials:

- **Pipe:**
    - Polyvinyl chloride (not less than 80% by mass), recycled PVC (from outside production plant) not to exceed 15% by mass of total PVC content
    - Calcium-zinc to prevent PVC degradation from high processing temperatures
    - Lubricants to lower the viscosity of molten PVC during pipe processing
    - Fillers, e.g. calcium carbonate, to aid pipe processing
    - Rutile titanium dioxide to prevent ultraviolet degradation in the field (1.5 parts minimum per 100 parts PVC)
    - Pigment to achieve grey colour
- **Joint seal:** Approved elastomer to AS 1646 or solvent cement to AS/NZS 3879.

Jointing:

- **Elastomeric**:
    - Plain wall and structured wall pipe to have grooved sockets grooves and annular ribs respectively to capture elastomeric seals.
    - Minimum effective sealing length to Table 7.1 of AS/NZS 1260.
    - Seals of proprietary designs.
    - Joint lubricant supplied by pipe manufacturer.
    - Witness mark at spigot end showing insertion depth.
- **Solvent cement:** Uniformly tapered interference fit socket design to AS/NZS 1260.

Effective length:

- 3 m (availability dependent on manufacturer and stiffness class).

Stiffness classes:

    - DN150+
    - SN8 (closely approximates Class SEH from the earlier standard).

Markings:

- Manufacturer's name or registered trademark, or both
- Nominal size in the form 'DN 100' or'100', as appropriate
- The letters 'PVCU', 'PVC' or 'UPVC'
- Type as 'DWV', and for structural wall pipes of sandwich construction the letters 'SC'
- Classification in the form 'SN8 or SN10', as applicable
- Date of manufacture, using the ISO system in the form YYMMDD
- Identification of place of manufacture. The manufacturer's code is acceptable
- The Australian Standard number, i.e. AS/NZS 1260
- Product certification mark, e.g. StandardsMark.

Marking Method:

- Legible and durable marking in a distinctive colour along the pipe barrel with lettering height 5 mm minimum. Unmarked pipe length not to exceed 1 m.

Use limits:

- Use solvent cement jointed pipes for maintenance hole drop types 2, 3 and 4 and for both in-line and maintenance hole gas traps.
- Do not use above ground or in ground contaminated with chemicals deleterious to PVC.
- Do not use pipe stored unshaded for 6 months or more from date of manufacture.
- Do not use pipe older than 12 months from the date of manufacture.
- Do not mix pipes types (i.e. plain wall, ribbed wall, sandwich construction where internal diameters vary) in a section of a gravity sewer pipeline.

5.2 SGPS 01 - 2 PVC-U fittings

Standard:

- AS/NZS 1260:2017 - PVC-U pipes and fittings for drain, waste and vent applications.

Design:

- **Hydraulic:**
  - PVC-U (commonly referred to as 'PVC') fittings are to be injection moulded where available as smoother flow surfaces are achieved.
  - Moulded fittings have an internal diameter that closely approximates to the nominal diameter up to DN 225 but then is less than the nominal by over 20 mm for DN 300.
- **Structural:**
  - Fittings can be used in pipeline systems having pipes of stiffness class SN10 and less.
  - The pipe stiffness class selected for the pipeline, not the fitting stiffness class, is used for pipeline structural design.
  - Fittings are stiffer than pipes of the same wall thickness because of the fitting shape.
  - The stiffness of fittings of the same wall thickness will vary because of the fitting shape.
  - Some fabricated fittings made with thicker wall SN8 pipe sections have a higher stiffness class than moulded fittings.
- **Material**:
  - The polyvinyl chloride pipe material is unplasticised (i.e. has no added plasticisers) and this makes the material more hard and rigid and thus suitable for buried piping.
  - PVC without plasticisers also has better tensile strength.

Materials:

- **Fitting**:
  - Polyvinyl chloride (not less than 80 % by mass); recycled PVC not to exceed 15% by mass of total PVC content.
  - Calcium-zinc to prevent PVC degradation from high processing temperatures
  - Lubricants to lower the viscosity of molten PVC during pipe processing
  - Fillers, e.g. calcium carbonate, to aid pipe processing
  - Rutile titanium dioxide to prevent ultraviolet degradation in the field (1.5 parts minimum per 100 parts PVC). Not applicable to fittings greater than DN 150 with parallel sockets
  - Pigment to achieve grey colour.
- **Joint seal**: Approved elastomer to AS 1646 or solvent cement to AS/NZS 3879.

Jointing:

- **Elastomeric:**
    - Plain wall and structured wall fittings to have sockets with grooves and annular ribs respectively to capture elastomeric seals.
    - Minimum effective sealing length to Table 7.1 of AS/NZS 1260. Seals of proprietary profile designs.
    - Joint lubricant supplied by pipe manufacturer.
- **Solvent cement**: Uniformly tapered interference fit socket design to AS/NZS 1260.

Markings:

- Manufacturer's name or registered trademark, or both
- Nominal size in the form 'DN 100' or '100', as appropriate
- The letters 'PVCU', 'PVC' or 'UPVC'
- Date of manufacture (fabricated fittings only)
- The angle of the fitting in the case of bends and branches
- Type as 'DWV'
- Class of fitting, i.e. SN 10, SN 8 etc.
- The Australian Standard number, i.e. AS/NZS 1260
- Product certification mark, e.g. StandardsMark

Marking Method:

- Legible and durable marking.

Use Limits:

- Solvent cement jointed fittings are to be used in maintenance hole drop types 2, 3 and 4 and for both in-line and maintenance hole gas traps.
- Do not use above ground or in ground contaminated with chemicals deleterious to PVC.
- Do not use fittings stored unshaded for 6 months or more from date of manufacture.
- Do not use fittings older than 12 months from the date of manufacture.

5.3 SGPS 01-3 Joint seals

Standard:

- AS 1646:2007 Elastomeric seals for waterworks purposes

Sealing design:

- Joint seals are to be of elastomeric compounds comprising suitable polymers. The elastomers have performance properties, which deteriorate with time and as such the design of the seal's profile and the compounding of the elastomer needs to ensure long term sealing of the joint. The elastomer properties affecting long term sealing performance are hardness, rate of compression stress relaxation, water absorption, resistance to ageing, resistance to chemicals and resistance to microbiological deterioration.

Compound materials:

- **Polymer for spigot-socket rings:**
  - Styrene Butadiene Rubber (SBR), 50% minimum volume of compound for IRHD of ≥55<85
- **Antidegradant:**
  - Based on the combined antioxidant-antiozonant N-(1,3-dimethyl-butyl)-N'-phenyl-p-phenylene diamine with a concentration (m/m) of not less than 1.5 parts per hundred of polymer.
- **Protective wax:**
  - Wax with a melting point of not less than 57□C and concentration (m/m) not greater than 3.0 parts per hundred of polymer.
- **Filler:**
  - Carbon black
- **Copper & manganese:**
  - Not greater than 0.0008% copper and 0.0005% manganese

Markings:

- **Rings:**
  - Manufacturer's identification mark, cavity number (if applicable), nominal size or nominal internal and cord diameters as appropriate, year of manufacture, e.g. 00 to represent year 2000, standard designation where the elastomeric ring is certified to AS 1646

Marking methods:

- Embossing with lettering 3 □ 1 mm high and 0.3 □ 0.1 mm proud of the surface; or Vulcanised transfer or permanent ink with lettering 3.5 □ 1.5 mm.

Elastomer type identification:

- **Marking colour:**
  - For SBR: Blue
- **Marking method:**

- Continuous durable stripe of width 3.5 ± 1.5 mm; or durable flash or dot of 6 mm minimum dimension

Storage:

- Prevent exposure to ozone from mercury lamps, high voltage electrical equipment, electric motors, or other equipment, which could cause electrical discharges.
- Store in a relaxed condition free from tension, compression or other deformation.
- Seal temperature not to exceed 35°C and preferably not more than 25°C or less than 5°C

Use limits:

- Do not use elastomeric seals older than 18 months from date of manufacture.
- Do not use elastomeric seals that have been in contact with chemicals, e.g. solvents (petrol).

5.4 SGPS 01-4 Jointing lubricant

Standard:

- AS 4020: 2005 Testing of products for use in contact with drinking water (in part)

Design:

- **Jointing lubricant is to achieve the following:**
  - Provide sufficient lubrication to prevent damage to joint seals or surfaces on jointing.
  - Enable correctly configured jointing when using jointing methods recommended by the pipe or fitting manufacturer.
  - Not affect the elastomer or pipe or fitting materials.
  - Remain an effective lubricant under wet conditions.
  - Not be hazardous to handle and be able to be applied by hand.
  - Be completely soluble in water.
  - Be able to be removed under standard flushing arrangements for commissioning.

Materials:

- Water based emulsion

Container markings:

- Manufacturer's name or trademark
- Proprietary name of joint seal with which the lubricant can be used.
- The words 'Jointing Lubricant' or 'Joint Lubricant'.
- Date of manufacture.
- Date of expiry for use.
- The specification to which it complies.
- The WaterMark or other mark to certify compliance with the specification.
- Instructions for use of lubricant.

Use limits:

- Do not use where past expiry date

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