Water Supply and Sewerage Approved Products Manual 2022

Sewerage Gravity Pipeline Systems – Glass Reinforced Plastic (GRP) Pipeline System

Section SGPS 04

PowerWater

Contents

1 Pipes

1.1 Glass reinforced thermosetting plastic (GRP) – filament wound

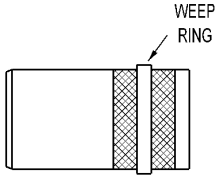
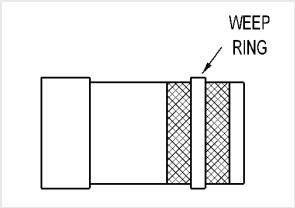
Compliance	Size DN (mm)	Product	Manufacturer
AS 3571	300 375 450 500 600 750	 	Iplex Flowtite

Notes:

- Use Rubber Ring Joint (RRG) pipes.
- Do not install in conditions deleterious to GRP.
- Fittings to be supplied from same pipe manufacturer.
- Use of GRP pipes must be approved by Power and Water representative.

2 GRP manhole connectors

2.1 Weep ring connectors

Type	Product	Manufacturer
Spigot-weep ring		Iplex Flowtite
Coupling-weep ring		

3 Specifications

3.1 SGPS 04 - 1 Centrifugally cast GRP pipes

Standard:

- AS 3571:2009 - Plastics piping systems - Glass-reinforced thermoplastics (GRP) systems based on unsaturated polyester (UP) resin - Pressure and non-pressure drainage and sewerage.

Design:

- Centrifugally cast (CC) GRP pipe to AS 3571 is manufactured with external diameters equivalent to that for DI pipe to AS/NZS 2280, i.e. Cast Iron Outside Diameter (CIOD) Series or Series 2. Centrifugally cast GRP pipe can thus be joined to ductile iron sockets.
- GRP non-pressure pipe for gravity sewers are defined only by stiffness class.
- For centrifugally cast GRP non-pressure pipe, the wall thickness is increased to increase the ring-bending stiffness.

Materials:

- **CC GRP Pipe:**
  - Polyester resin (inner corrosion barrier resin differs to structural layer resin)
  - Chopped glass filaments (E-glass) with coupling agent to bond to resin
  - Quartz sand (for central and outer layers only).
- **FW GRP Coupling for CC GRP Pipe:**
  - Polyester resin
  - Continuous glass rovings with either chopped strand mat or chopped rovings (E-glass) with coupling agent to bond to resin.
  - Coat the chopped roving couplings with pigmented resin or acrylic paint for above ground use.

Jointing:

- Plain ended CC GRP pipes are joined with a sleeve coupling, factory fitted to one pipe end.
- Couplings comprise a filament wound (FW) GRP outer shell and inner elastomeric membrane.
- The membrane seals each pipe with both an initial compression seal and secondary lip seal and also has a central pipe insertion stop.

Effective length:

- 6 m for CC GRP pipe (+0.12, -0 m).
- Optional pipe lengths available on request, 1m minimum.

Stiffness class:

- SN 10,000 and SN 15,000.

Pipe markings:

- Manufacturer's name and registered trademark. Application in form 'NON PRESSURE PIPE'
- Date of manufacture, using the ISO system
- Nominal size in the form 'DN 500'

- Unique pipe number (Iplex marking)
- Nominal stiffness class in the form ‘SN 10000’
- Australian Standard number, i.e. AS 3571
- Place of manufacture
- StandardsMark product certification mark
- Machine number (Iplex marking)
- StandardsMark license number.

Coupling markings:

- Nominal size in the form ‘DN 500’
- Shift of manufacture
- Nominal pressure class in the form ‘PN 12.5’
- Weight of coupling in kg
- Date of manufacture using the ISO system
- StandardsMark product certification mark
- Sequential coupling number
- StandardsMark license number.

Marking method:

- Permanent and indelible marking in lettering of 10 mm minimum height along the pipe barrel.

Use limits:

- Do not use pipes/couplings with chips, cracks, crazing, layer delamination or exposed fibres.
- Seal cut pipe ends with resin.
- Do not use pipe and couplings, stored unprotected from sunlight for more than 9 months.
- Do not use pipe older than 24 months from the date of manufacture.
- Pipe and couplings used above ground to have Power and Water approved UV protection.
- Do not use in ground conditions having low stiffness, e.g. tidal zones
- Do not use where ground is unacceptably contaminated with organic compounds.
- Use under railways only with an encasing pipe.

3.2 SGPS 04 – 2 Joint seals

Standard:

- AS 1646: 2007 - Elastomeric seals for waterworks purposes
- AS/NZS 4087: 2011 - Metallic flanges 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**:
  - Ethylene propylene diene monomer (EPDM), 40% minimum volume of compound for IRHD of ≥55<85
  - Styrene Butadiene Rubber (SBR), 50% minimum volume of compound for IRHD of ≥55<85.
- **Polymer for flange gaskets**:
  - Ethylene propylene diene monomer (EPDM), 30% minimum volume of compound for IRHD of ≥35<55 or 40% minimum volume of compound for IRHD ≥55≤65
  - Styrene Butadiene Rubber (SBR), 50% minimum volume of compound for IRHD of ≥35<55 or ≥55≤65.
- **Antidegradant**:
  - For EPDM: Not required
  - For SBR: 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**:
  - For EPDM: Not required
  - For SBR: 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 and manganese**:
  - For EPDM: Not applicable
  - For SBR: 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 compound 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**:
  - EPDM Green
  - 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:

- Do not store seals in a room with any equipment capable of generating ozone (eg. mercury lamps, electric motors, high voltage electrical equipment)
- Store in a relaxed condition free from tension, compression or other deformation
- Seal temperature not to exceed 35°C, preferably not more than 55°C and not less than 5°C
- For prolonged storage (in excess of 3 months), enclose or wrap seals in opaque material so as to prevent free access of air and to prevent UV damage (refer ISO 2230).

Use limits:

- Do not use elastomeric seals removed from packaging for more than 3 months
- Do not use elastomeric seals older than 18 months from date of manufacture unless supplier can demonstrate that seals have been stored in a cool, controlled environment
- Do not use SBR elastomeric seals older than 3 years from date of manufacture
- Do not use EDPM elastomeric seals older than 6 years from date of manufacture
- Do not use SBR seals that have been stored unprotected from sunlight for more than 7 days
- Do not use elastomeric seals that have been in contact with chemicals, e.g. solvents (petrol).

Contact

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