Water Supply and Sewerage Approved Products Manual - February 2006

Gravity Sewerage Products – PVC Pipeline System

Section SGPS 01

PowerWater

PVC GRAVITY PIPELINE SYSTEM CONTENTS

SGPS 01-1 SPIGOT-SOCKET PVC-U PIPES

STANDARD	AS/NZS 1260:2002 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. The ID of ribbed wall and sandwich construction pipes varies from around –7 mm (DN 150) to –19 mm (DN 375) less than the nominal.
	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 ribbed 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 and 6 m (availability of either is dependent on manufacturer and stiffness class)	
STIFFNESS CLASSES	DN 100:	SN10 (closely approximates Class SEH from the earlier standard)
	DN 150 and larger:	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. Do not use 3 m pipe lengths in lieu of 6 m pipe lengths except for drops, maintenance hole connections etc.	

SGPS 01-2 PVC-U FITTINGS

STANDARD	AS/NZS 1260:2002 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 ribbed 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
STIFFNESS CLASSES	Injection moulded:	SN6 - plain wall SN8 - structured wall
	Fabricated:	SN6 or SN10
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, either SN6 or SN10 (fabricated fittings only), SN8 (moulded SN8 fittings only) 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.	

SGPS 01-3 JOINT SEALS

STANDARD	AS 1646:2000 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 $\geq 55 < 85$
	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).

SGPS 01-4 JOINTING LUBRICANT

STANDARD	AS 4020: 2002 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.

SGPS 01-5 SOLVENT CEMENTING

STANDARD	AS/NZS 3879: 1995	Solvent cements and priming fluids for use with unplasticized PVC (uPVC) pipes and fittings
DESIGN	Solvent cement:	The solvent in the cement softens and swells a layer of the PVC on the spigot and socket mating surfaces and these layers combine with the PVC already in the solvent cement to create a bond on drying of the solvent.
	Priming fluid:	The priming fluid cleans the joint mating surfaces of dirt, oil and other contamination prior to application of the solvent cement and removes the surface sheen on the PVC to aid action of the solvent cement.
MATERIALS	Solvent cement:	Consists of one or more solvents and a sufficient quantity of base PVC material dissolved in the solvent/s to give the cement the body and consistency required for proper application. Small amounts of inert fillers are sometimes added to control shrinkage during drying. The principal solvent used is tetrahydrofuran (THF).
	Priming fluid:	

MARKING

Manufacturer's name
Marking 'Type N' to indicate solvent cement for non-pressure applications.
Net mass or volume
Date of manufacture
Recommended storage life
Instructions for storage and use
The statement 'Priming fluids shall be used to prepare the jointing surface prior to solvent cement application.'
A statement of any toxic vapour or flammability hazards associated with the solvent cement or priming fluid.
The statement ' No additives of any kind shall be mixed with this solvent cement/priming fluid.' (as applicable)
The number of the Australian Standard, i.e. AS/NZS 3879

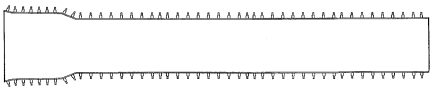
COLOUR	Solvent cement:	Blue for non-pressure applications.
	Priming fluid:	Pink or Red

USE LIMITS

Clear solvent cement is not permitted.
Do not use solvent cement where 12 months past the date on the container.

SPIGOT-SOCKET RRJ PIPES

Sandwich construction (SC)/ Plain wall (PW)



Ribbed wall (RW)

CLASS SN 8

Nominal Size DN x length	Iplex (PW / SC)[1]	Key Plastics (SC-BIPEX)[2]	Vinidex (PW / SC)[1]	Vinidex (RW-Ultrarib)[3]
150 x 3		✔		✔
150 x 6	✔	✔	✔	✔
225 x 3		✔		✔
225 x 6	✔	✔	✔	
300 x 3		✔		✔
300 x 6	✔	✔	✔	
375 x 3				✔
375 x 6				✔

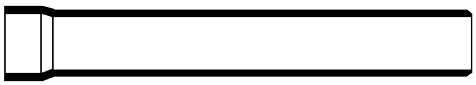
CLASS SN 10

Nominal Size DN x length	Iplex (PW / SC)[1]	Vinidex (PW / SC)[1]
100 x 6	✔	✔

NOTES

1. Some sandwich construction using PVC recycled from the process and the core may be a different colour
2. BIPEX is a sandwich construction pipeline system with a foam core.
3. Ultrarib is an annular, ribbed wall pipeline system.

SPIGOT-SOCKET SCJ PIPES



Sandwich construction (SC)/ Plain wall (PW)

CLASS SN 8

Nominal Size DN x length	Iplex (PW / SC)[1]	Key Plastics (SC-BIPEX) [2]	Vinidex (PW / SC)[1]
150 x 3		✔	
150 x 6	✔	✔	✔
225 x 3		✔	
225 x 6	✔	✔	✔
300 x 3		✔	
300 x 6	✔	✔	✔

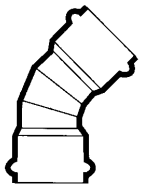
CLASS SN 10

Nominal Size DN	Iplex (PW / SC)[1]	Vinidex (PW / SC)[1]
100 x 6	✔	✔

NOTES

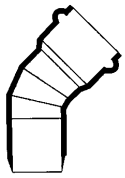
1. Some sandwich construction using PVC recycled from the process and the core may be a different colour
2. BIPEX is a sandwich construction pipeline system.

SOCKET-SOCKET RRJ BENDS



Nominal Size DN x degrees	Vinidex (PW - Marley)	Vinidex (PW)	Vinidex (RW-Ultrarib)
150 x 45		✔	✔
150 x 90	✔		

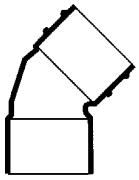
SOCKET-SPIGOT RRJ BENDS



Nominal Size DN x degrees	Vinidex (PW - Marley)	Vinidex (PW)
150 x 5		✔
150 x 15		
150 x 30		
150 x 42		
150 x 45	✔	
150 x 90		✔
225x 45 (gas trap)		✔ (F)

(F) Fabricated

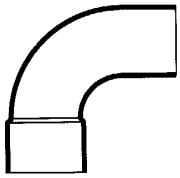
SOCKET-SOCKET SCJ BENDS



Nominal Size DN x degrees	Iplex (PW)	Vinidex (PW)	FABFIT (PW)
150 x 15	✔	✔	
150 x 45	✔	✔	
150 x 60			✔ (F)
225 x 15		✔ (F)	
225 x 45		✔ (F)	
225 x 60			✔ (F)
300 x 15			
300 x 45			
300 x 60			✔ (F)
375 x 15			
375 x 45			
375 x 60			✔ (F)

(F) Fabricated

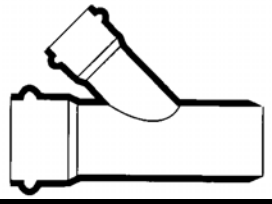
SOCKET-SPIGOT SCJ BENDS



Nominal Size DN x degrees	Iplex (PW)	Vinidex (PW)
150 x 45	✔	✔
150 x 90	✔	✔
225 x 45		✔ (F)
225 x 90		✔ (F)
300 x 45		✔ (F)
375 x 45		

(F) Fabricated

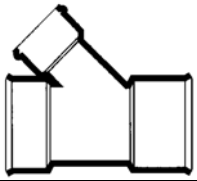
SPIGOT-SOCKET-SOCKET RRJ SLOPE JUNCTIONS



Nominal Size DN x dn	FABFIT (PW)	Vinidex (PW)	Vinidex (PW - Marley)
150 x 150	✔ (F)		✔
225 x 150		✔ (F)	
300 x 150		✔ (F)	
375 x 150			

(F) Fabricated

SOCKET-SOCKET-SOCKET RRJ SLOPE JUNCTIONS



Nominal Size DN x dn	Vinidex (PW)	Vinidex (RW-Ultrarib[1])	FABFIT (PW)
150 x 150		✔	✔ (F)
225 x 150	✔	✔	
300 x 150	✔	✔ (F)	
375 x 150		✔ (F)	

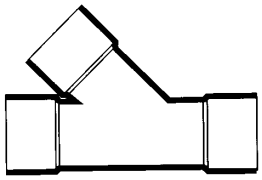
(F) Fabricated

NOTES: The RRJ branch on the Ultrarib fitting is for plain wall pipe

SOCKET-SPIGOT-SOCKET RRJ EQUAL JUNCTIONS

Nominal Size DN x Angle	Iplex (PW)
150 x 45	✔
150 x 90	✔

SOCKET-SOCKET-SOCKET SCJ
SLOPE JUNCTIONS



Nominal Size DN x Angle	Iplex (PW)	Vinidex (PW)	FABFIT (PW)
150 x 150	✔	✔	
225 x 150			✔ (F)
225 x 225		✔ (F)	✔ (F)
300 x 150			✔ (F)
300 x 225			✔ (F)
300 x 300		✔ (F)	✔ (F)
375 x 150			✔ (F)
375 x 225			✔ (F)
375 x 300			✔ (F)
375 x 375			✔ (F)

(F) Fabricated

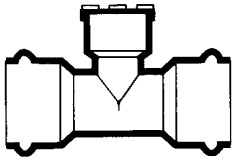
SOCKET-SOCKET-SOCKET RRJ
90º JUNCTIONS

Nominal Size DN x dN	FABFIT (PW)[1]
150 x 150	✔

NOTES:

1. Deep sewer reinforced junction

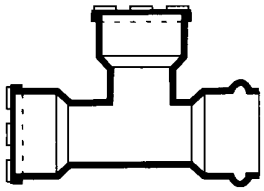
SOCKET-SOCKET-SOCKET RRJ INSPECTION TEES WITH CAP



Nominal Size DN x dn	Vinidex
150 x 150	✔
225 x 225	✔ (F)

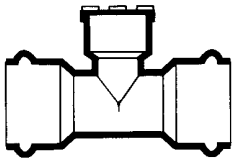
(F) Fabricated

SOCKET-SOCKET-SOCKET RRJ INSPECTION TEES WITH TWO CAPS



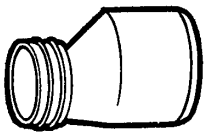
Nominal Size DN x dn	Vinidex
150 x 150	✔
225 x 225	

SOCKET-SPIGOT RRJ INSPECTION TEES WITH SCREWED CAP

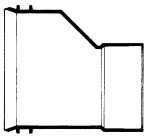


Nominal Size DN	Iplex
150	✔

SPIGOT-SOCKET(SCJ)
LEVEL INVERT TAPERS



Plain wall



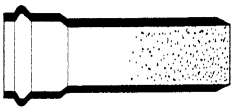
Ribbed wall

Nominal Size DN x dn	Iplex	Vinidex (PW)	Vinidex (Ultrarib)	FABFIT (PW)
150 x100	✔	✔	✔	✔ (F)
225 x 100				✔ (F)
225 x 150				✔ (F)
300 x 100				✔ (F)
300 x 150				✔ (F)
300 x 225				✔ (F)

SOCKET(SCJ)-THREADED END ACCESS COUPLINGS

Nominal Size DN	Iplex
150	✔

SOCKET-SPIGOT SANDED MH CONNECTORS



Nominal Size DN	Vinidex[1]	Vinidex (Ultrarib)[2]	FABFIT (PW)
150	✔	✔	✔ (3)
225	✔	✔	
300	✔	✔	
375		✔	

NOTES

1. SN6 - 400mm long
2. SN6 - 500mm long
3. SN10 – 500mm long

SPIGOT-SPIGOT SANDED MH CONNECTORS

Nominal Size DN	Vinidex	Vinidex (Ultrarib)	FABFIT (PW)
150	✔ (1)	✔ (4)	✔ (8)
225	✔ (2)	✔ (5)	
300	✔ (3)	✔ (6)	
375		✔ (7)	

NOTES

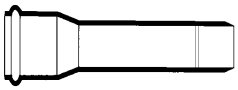
1. SN6 - 435mm long
2. SN6 - 460mm long
3. SN6 - 480mm long
4. SN6 or SN10 – 360mm long
5. SN6 or SN10 – 390mm long
6. SN6 or SN10 – 400mm long
7. SN6 or SN10 – 520mm long
8. SN10 – 500mm long

SPIGOT-SPIGOT SHORT PIPES

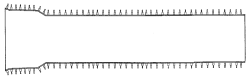
Nominal Size DN	Vinidex	FABFIT (PW)
150	✔ (1)	✔ (3)
225	✔ (2)	
300	✔ (1)	
375		

NOTES
1. SN6 - 600mm long
2. SN10 – 600mm long
3. SN10 – 500mm long

SPIGOT-SOCKET SHORT PIPES



Plain wall

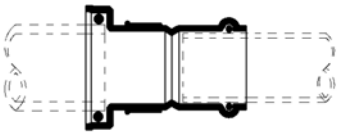


Ribbed wall

Nominal Size DN	Vinidex[1]	Vinidex (Ultrarib)	FABFIT (PW)
150	✔ (1)	✔ (1)	✔ (2)
225	✔ (1)	✔ (1)	
300	✔ (1)	✔ (1)	
375			

NOTES
1. SN6 - 600mm long
2. SN10 – 500mm long

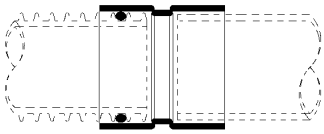
VC SPIGOT (RRJ) –PVC PLAIN WALL SPIGOT (RRJ) ADAPTORS



Nominal Size DN	Vinidex
150	✔ (fabricated)1
225	
300	
375	

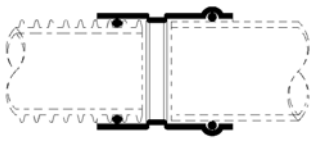
NOTES
1. The adaptor is only suitable for VC pipe conforming to either AS 1741 or system G in EN 295.

PVC RIBBED WALL SPIGOT (RRJ) - PVC PLAIN WALL SPIGOT (SCJ) ADAPTORS



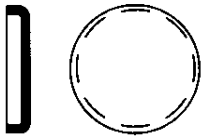
Nominal Size DN	Vinidex (Ultrarib)
150	✔
225	✔
300	
375	

PVC RIBBED WALL SPIGOT (RRJ) - PVC PLAIN WALL SPIGOT (RRJ) ADAPTORS



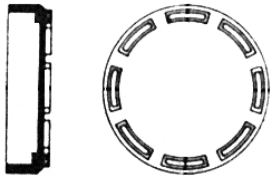
Nominal Size DN	Vinidex (Ultrarib)
150	✔
225	✔
300	✔
375	✔

SCJ CAPS



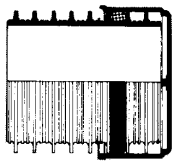
Nominal Size DN	Iplex	Vinidex	FABFIT
100	✔	✔	✔
150	✔	✔	✔
225	✔	✔	✔
300	✔	✔	✔
375	✔	✔	✔

THREADED CAPS



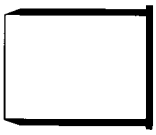
Nominal Size DN	Iplex	Vinidex
150	✔	✔
225		✔

RRJ CAPS FOR RIBBED WALL PIPE



Nominal Size DN	Vinidex Ultrarib
150	✔

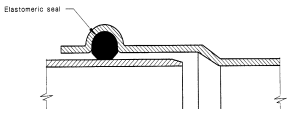
PLUGS



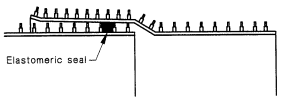
Nominal Size DN	Iplex	Vinidex
150		✔
225		✔ (F)

(F) Fabricated

ELASTOMERIC SEAL
(blue marking for SBR)



Plain wall



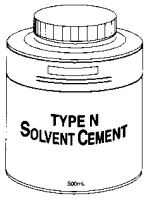
Ribbed wall

Nominal Size DN	Iplex (Gulf & Hultec)	Key Plastics (Gulf)	Vinidex (Gulf)
100	✔		✔
150	✔	✔	✔
225	✔	✔	✔
300	✔	✔	✔
375			✔ (Ultrarib only)

JOINTING LUBRICANT

Tin Size	Iplex (Thomas Grozier)	Key Plastics (Thomas Grozier)
500ml	✔	✔
1L	✔	✔
2L		
5L	✔	✔

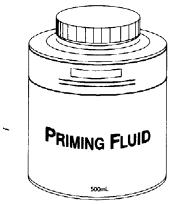
SOLVENT CEMENT (type N –colour blue)[1]



Tin Size	Iplex (Bostik)	Key Plastics (Bostik or Atherton)	Vinidex (Atherton)
125ml	✔	✔	✔
250ml	✔	✔	✔
500ml	✔	✔	✔
1L	✔	✔	✔
4L	✔	✔	✔

Note:
1. Use of clear solvent cement is not permitted

PRIMING FLUID (colour pink or red)



Tin Size	Iplex (Bostik)	Key Plastics	Vinidex (Atherton)
250ml	✔		✔
500ml	✔		✔
1L	✔		✔
4L	✔		✔