RURAL

Precision Farming Solutions

TECHNICAL DESIGN GUIDE

IPLEX Pipelines

Contents

iPLEX Pipelines

Stock Water

Things to consider

- How much water does your stock/crop require to maximise production?
- Why spend money on genetics, animal health and pasture management if you don't provide enough water?
- How effective is your current water system?
  - pumping costs
  - ability to provide peak demand requirements
  - maintenance costs
  - ability to meet future requirements
  - labour requirements
- System design – have you considered
  - peak water demand
  - length of pipeline
  - pump duty
  - changes in height
  - maximum working pressure of pipe
  - bloat treatment
  - installation methods
  - choice of pipeline materials
  - type of fittings to be used

Desired Outcome

A system designed around specific requirements which maximises production for economic development and running costs.

Helpful Information

Water requirements of the average New Zealand farm (approximate daily consumption rates)

Animals	Litres/Head/Day	Peak Flow Litres/ Head/Hour
Sheep:		
Ewes	4	0.40
Lambs	2.5	0.25
Cattle:		
Cows in milk	70	14.0
Beef cattle	45	7.5
Calves	25	4.2
Red Deer:		
Fawning Hinds	7.6	0.76
Mature Stags	8.8 - 10	0.88 - 1.0
Horses:		
Working	54	5.4
Grazing	36	3.6
Pigs:		
Brood sows	25	2.5
Mature pigs	10	1.0
	Litres/100 Birds/ Day	**Peak Flow Litres/ Hour**
Poultry:		
Laying hens	32	3.2
Pullets	18	1.8
Turkeys	54	5.4
Domestic:		
4 person household		920
Garden per m^2		4

Pressure Conversion Table

Bar	Metres Head	KPa	PSI
6	60	600	87
8	80	800	116
9	90	900	131
12	120	1200	173
16	160	1600	232

Pressure Conversion Formulas

1 Bar	=	14.564 PSI
1 PSI	=	6.89 KPa
1 KPa	=	0.145 PSI
100 KPa	=	1 Bar
1 mPa	=	1000 KPa
1m	=	10 KPa

greenline

6.3 BAR - PE 100 PRESSURE PIPE

Code Explanation

Product Code — Pressure Class

370.40PN6.3.50

OD (mm) — Coil Length (metres)

More litres per metre

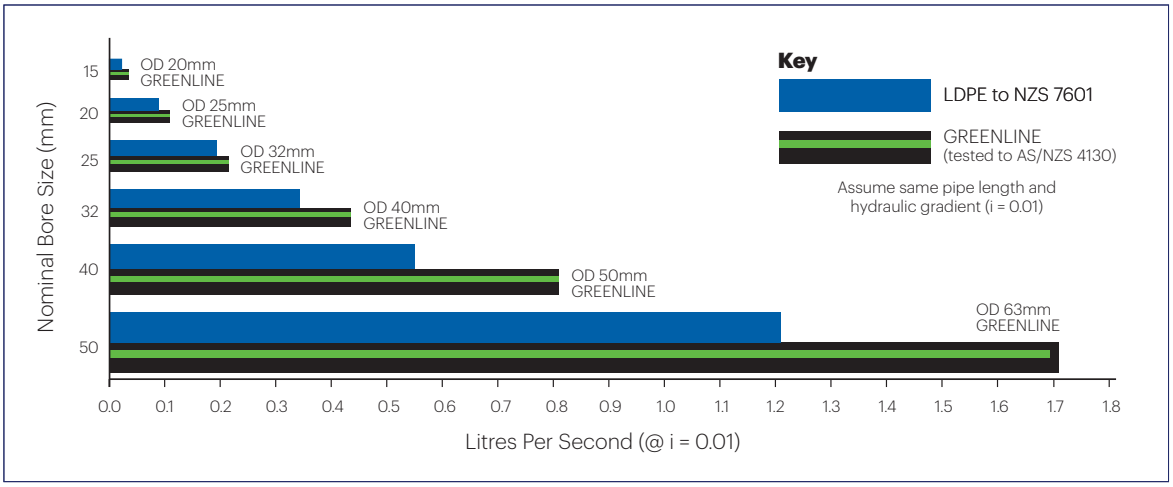
370 Series

Iplex Pipelines' GREENLINE is a metric OD diameter PE 100 polyethylene pipe (PE) manufactured to international standards. PE 100 is a popular material for rural water reticulation, being lightweight, strong and durable. GREENLINE is a pipe system that has been specifically developed to suit today's modern farming practices. It is a reliable, economical system which maintains a consistent pressure rating across a range of pipe diameters. The GREENLINE system uses the technically superior PLASSON range of compression pipe fittings.

Features and Benefits

Efficient	GREENLINE transports more litres per metre and has a larger bore size compared to traditional LDPE pipe.
Reliable	GREENLINE is a reliable and economical system that maintains a consistent pressure rating across a range of pipe diameters. GREENLINE is rated 9 bar in 20mm and 8 bar in 25mm and 32mm, and 6.3 bar in 40mm, 5mm and 63mm diameters.
Flexible	GREENLINE is a metric OD diameter pipe that is light-weight, strong and flexible.
Suitable	GREENLINE is suitable for use with in-line bloat dispensing systems, based on testing in accordance with ASTMD 1693 "Environmental Stress Crack Resistance".
Compatible	The GREENLINE system is easily connected to existing high density (HDPE) and low density (LDPE) polyethylene pipes as well as PVC and GWI systems, using threaded fittings or a PLASSON Universal Coupling (code 2512).
Versatile	GREENLINE, when used in conjunction with our comprehensive and technically superior range of PLASSON compression pipe fittings, builds a total system. PLASSON fittings are easy to assemble – there's no need for hot water. When correctly assembled, PLASSON fittings won't pull apart around troughs and gateways even when kicked or trodden on. PLASSON fittings are simple to use and have been put to the test, with years of demanding use in agricultural applications in New Zealand and throughout the world.
Durable	GREENLINE is manufactured from PE 100 polyethylene.
Visible	The three permanent green stripes on GREENLINE ensure instant identification.
Economical	GREENLINE is available in 3 different coil lengths (50, 100 and 200 metres) to suit a wide range of applications.
Quality	GREENLINE is manufactured in New Zealand by Iplex Pipelines using a Quality Management System accredited to AS/NZS ISO 9001:2008.
	GREENLINE is tested to AS/NZS 4130 - "PE Pipes for Pressure Applications" damaged.

Flow rate comparison



redline™

9 BAR - PE 100 PRESSURE PIPE

Code Explanation

Product Code	Pressure Class
360.40	PN9.50
OD (mm)	Coil Length (metres)

Improved performance under pressure

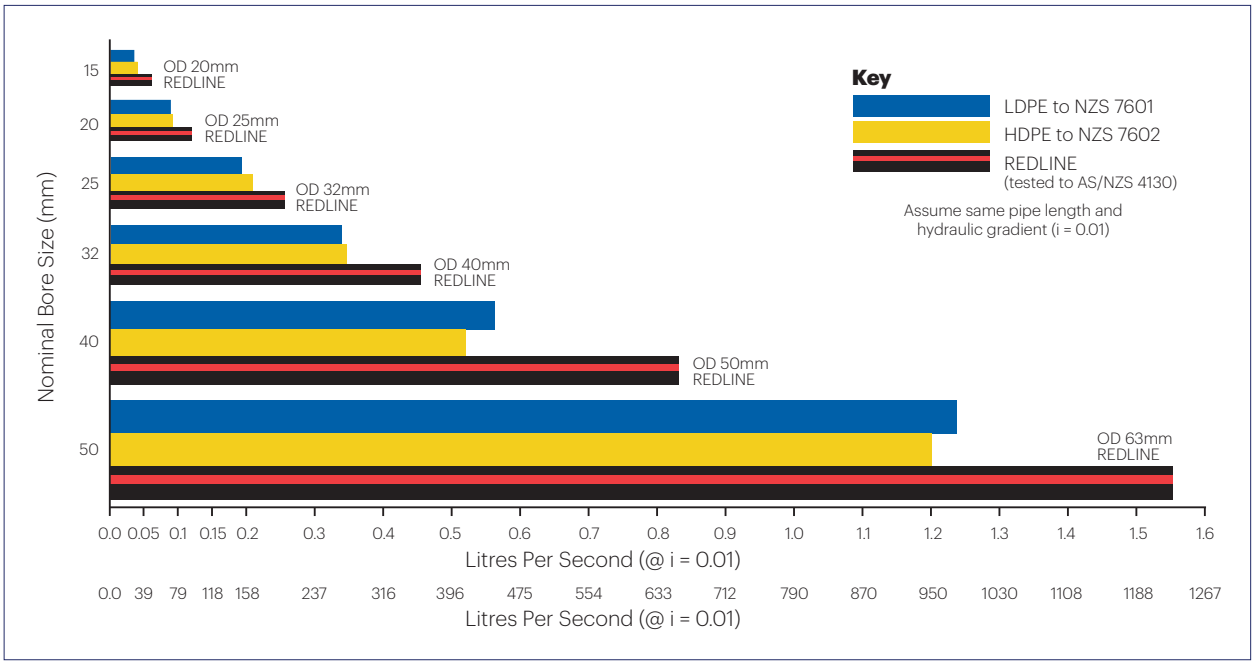
360 Series

REDLINE™ is a metric pipe made from flexible, PE 100 high performance polyethylene to international standards. Iplex Pipelines' REDLINE™ is a reliable, economical system which maintains a consistent pressure rating across a range of pipe diameters. A popular material for urban and rural water supplies, PE 100 is lightweight, strong and flexible. The REDLINE™ system uses the technically superior PLASSON range of compression fittings.

Features and Benefits

Efficient	REDLINE™ transports greater volumes of water more efficiently than either the same nominal sized HDPE or LDPE pipe.
Reliable	REDLINE is a reliable and economical system that maintains a consistent pressure rating across a range of pipe diameters. REDLINE™ is rated to 12.5 bar in 20mm and 25mm diameters and 9 Bar in 32mm, 40mm, 50mm and 63mm diameters.
Flexible	REDLINE™ is a high performance polyethylene pipe that is light-weight, strong and flexible.
Suitable	REDLINE™ is suitable for use with in-line bloat dispensing systems.
Compatible	The REDLINE™ system is easily connected to existing high density (HDPE) and low density (LDPE) polyethylene pipes as well as PVC and GWI systems using threaded fittings or a PLASSON Universal Coupling (code 2512).
Versatile	REDLINE™, when used in conjunction with our comprehensive and technically superior range of PLASSON compression pipe fittings, builds a total system. Our fittings are simple to use and have been put to the test, with many years of demanding use in agricultural and mining applications in New Zealand, Australia and throughout the world.
Durable	REDLINE™ is made from tough PE 100 polyethylene.
Visible	The three permanent red stripes on REDLINE™ ensure instant identification.
Economical	REDLINE™ is available in three different coil lengths (50, 100 and 200 metres) to suit a wide range of applications.
Quality	REDLINE™ is manufactured in New Zealand by Iplex Pipelines using a Quality Management System accredited to AS/NZS ISO 9001:2008.
	REDLINE™ is tested to AS/NZS 4130 - "PE Pipes for Pressure Applications."

Flow rate comparison



ruralblack

12.5 BAR - PE 100 PRESSURE PIPE

Code Explanation

Product Code | Pressure Class

340.32PN12.5.50

OD (mm) | Coil Length (metres)

340 Series

RURAL BLACK is a metric pipe made from flexible, PE 100 to international standards. Iplex RURAL BLACK is a reliable, economical system which maintains a consistent pressure rating across a range of pipe diameters. A popular material for urban and rural water supplies, PE 100 is lightweight, strong and flexible. The RURAL BLACK system uses the technically superior PLASSON range of compression fittings.

Features and Benefits

Efficient	Coiled pipe is more efficient to install on farm.
Flexible	Reliable and economical system that has a constant 12.5 bar pressure rating across the range of pipe diameters
	Structual pipe work - available in straight 6-metre lenghts in diameters 32mm, 40mm and 63mm for ease of forming pipework around tanks, troughs and farm buildings.
Suitable	RURAL BLACK is suitable for use with in-line bloat dispensing systems.
Compatible	Connects easily to other pipe systems through the use of BSP threaded fittings or a PLASSON Universal Coupling (code 2512).
Versatile	RURAL BLACK when used with PLASSON compression fittings builds a total system.
Durable	RURAL BLACK is made from tough high performance PE 100 polyethylene.
Economical	RURAL BLACK is available in three different coil lenghts (50, 100 and 200 metres) 32mm, 40mm & 63mm RURAL BLACK is also available in 6-metre lengths for straight pipe connections to tanks & troughs.
Quality	Pipe is manufactured and tested to AS/NZS 4130 - "PE Pipes for Pressure Applications".
	RURAL BLACK is manufactured in New Zealand by Iplex Pipelines using a Quality Management System accredited to AS/NZS ISO 9001:2008.

blackline PN 16

16 BAR - PE 100 PRESSURE PIPE

Code Explanation

Product Code | Pressure Class

3500.50PN16.100BTS – Blue Tri Stripe

OD (mm) | Coil Length (metres)

High performance under pressure

3500 BTS Series

BLACKLINE PN16 is a metric pipe made from PE 100 to international standards. Iplex BLACKLINE PN16 has been specifically developed to work in higher pressure situations such as occur on steeper country. Together with PLASSON compression fittings, BLACKLINE PN16 offers the farmer a new flexiblity in design choice.

Features and Benefits

Efficient	Coiled pipe is more efficient to install on farm.
Flexible	Reliable and economical system that has a constant 16 bar pressure rating across the range of pipe diameters.
Suitable	BLACKLINE PN16 is suitable for use with in-line bloat dispensing systems.
Compatible	Connects easily to other pipe systems through the use of BSP threaded fittings or a PLASSON Universal Coupling (code 2512).
Versatile	RURAL BLACK when used with PLASSON compression fittings builds a total system.
Durable	BLACKLINE PN16 is made from tough PE 100 polyethylene.
Visible	The three permanent blue stripes on BLACKLINE PN16ensure instant identification.
Quality	Pipe is manufactured and tested to AS/NZS 4130 - "PE Pipes for Pressure Applications".
	BLACKLINE PN16 is manufactured in New Zealand by Iplex Pipelines using a Quality Management System accredited to AS/NZS ISO 9001:2008.

blackline HP

20 & 25 BAR - PE 100 PRESSURE PIPE

Code Explanation

Product Code | Pressure Class | Black Stripe

3500.63PN25.100B –

OD (mm) | Coil Length (metres)

3500 B Series

The BLACKLINE HP system is a range of high pressure polyethylene pipe and ductile iron fittings designed to offer a flexible pipeline solution for water reticulation pipes operating up to 20 and 25 bar. BLACKLINE HP pipe is manufactured from tough and durable PE 100 material in metric OD diameters 63mm, 90mm and 110mm and coil lengths 50-metre and 100-metre. BLACKLINE HP fittings are mechanical Ductile Iron (D.I.) fittings, which have a series of machined teeth, specifically designed to positively grip and retain PE 100 pipe, while the C-shaped gasket forms a water seal. The "shouldered" BLACKLINE HP Transition Coupling used in conjunction with a BLACKLINE HP Universal Flange Adapter or Stainless Steel Threaded Adapter, make this system easy to connect to other types of pipes, valves and pumps. Now contractors and farmers alike, have an option other than traditional metal pipes joined together in lengths by threaded couplings or buttwelding PE pipe in remote areas, with the hassles and expense involved in this process. The BLACKLINE HP system delivers an affordable and practical solution for high pressure water reticulation schemes.

Features and Benefits

Efficient	Supplied in 50-metre and 100-metre coils, BLACKLINE HP pipe reduces the joint cost and installation time.
Flexible	The BLACKLINE HP (20-bar & 25-bar) high-pressure PE pipe and Ductile Iron (D.I.) fittings system offers an affordable, flexible and easy to connect pipeline choice.
Suitable	BLACKLINE HP is suitable for use with in-line bloat dispensing systems.
Compatible	BLACKLINE HP mechanical fittings are easy to use and readily adaptable to either flanged or threaded joints, for quick coupling to other types of pipes, pumps and valves.
Versatile	BLACKLINE HP is manufactured from flexible High Performance Polyethylene (PE100), making it cheaper and easier to install than rigid pipes that require costly fittings and thrust blocks for changes in pipeline direction.
Durable	PE 100 Polyethylene is a tough pipe material designed to provide a long service life.
Quality	BLACKLINE HP pipe is manufactured and tested to AS/NZS 4130: "PE Pipes for Pressure Applications" BLACKLINE HP pipe is manufactured in New Zealand by Iplex Pipelines using a Quality Management System accredited to AS/NZS ISO 9001:2008.
	BLACKLINE HP D.I. fittings conform to the ASTM and AWWA standards
	BLACKLINE HP fittings are manufactured in a production facility certified to ISO 9001

Assembly Instructions

BLACKLINE HP Ductile Iron fittings are designed to provide a fast and easy way to mechanically join PE 100 pipe, up to pressure rating PN25 (25-bar). Note: BLACKLINE HP fittings are not intended for use on other types of pipe.

1. Marking: Use a pen and tape measure to place marks 25mm from the end of each pipe.

2. Gasket Mounting: Using a silicone based lubricant; slip the gasket over the pipe ends and center the gasket between the marks. Ensure the pipe ends are squarely and accurately butted together.

3. Fitting Assembly: Place the housing over the gasket and insert bolts. Then tighten the nuts by hand.

4. Tightening Nuts: Using an appropriate tool, tighten the nuts sequentially until the fittings' housing bolt pads meet, metal to metal.

Specifications - Fittings

	Product Code	Description	Pipe OD (mm)
	DIC63PE	Ductile Iron Coupling 63mm PN25	63
	DIC90PE	Ductile Iron Coupling 90mm PN25	90
	DIC110PE	Ductile Iron Coupling 110mm PN25	110
	Product Code	**Description**	**Pipe OD (mm)**
	DITC63PE	Ductile Iron Transition Coupling 63mm PN25	63
	DITC90PE	Ductile Iron Transition Coupling 90mm PN25	90
	DITC110PE	Ductile Iron Transition Coupling 110mm PN25	110
	Product Code	**Description**	**Pipe OD (mm)**
	SSMTA50	Stainless Steel Male Threaded Adapter 50mm BSP PN25	63 x 2"
	SSMTA80	Stainless Steel Male Threaded Adapter 80mm BSP PN25	90 x 3"
	SSMTA100	Stainless Steel Male Threaded Adapter 1100mm BSP PN25	110 x 4"

	Product Code	Description	Pipe OD (mm)	PCD (mm)	Hole Number
	DIUFA50	Ductile Iron Universal Flange Adapter 50mm PN25	63	120 - 125	4
	DIUFA80	Ductile Iron Universal Flange Adapter 80mm PN25	90	150 - 160	8
	DIUFA100	Ductile Iron Universal Flange Adapter 100mm PN25	110	175 - 191	8

Metric Pipe Comparison

		Greenline (370 series)		**Redline™** (360 series)		**Rural Black** (340 series)		**Blackline PN16** (3500 BTS series)		**Blackline HP PN20** (3500 B Series)		**Blackline HP PN25** (3500 B Series)	
		Bar	PSI	Bar	PSI	Bar	PSI	Bar	PSI	Bar	PSI	Bar	PSI
Pressure Rating*	20	9	131	12.5	182	✘	✘	✘	✘	✘	✘	✘	✘
	25	8	116	12.5	182	✘	✘	16	233	✘	✘	✘	✘
	32	8	116	9	131	12.5	182	16	233	✘	✘	✘	✘
	40	6.3	91	9	131	12.5	182	16	233	✘	✘	✘	✘
	50	6.3	91	9	131	12.5	182	16	233	✘	✘	✘	✘
	63	6.3	91	9	131	12.5	182	16	233	20	291	25	364
	75	✘	✘	✘	✘	12.5	182	16	233	✘	✘	✘	✘
	90	✘	✘	✘	✘	12.5	182	16	233	20	291	25	364
	110	✘	✘	✘	✘	12.5	182	16	233	20	291	25	364
Mean Internal Diameter (mm)	20	16.7		16.7		✘		✘		✘		✘	
	25	21.7		21.1		✘		20.2		✘		✘	
	32	28.3		28.3		27.0		26.0		✘		✘	
	40	36.1		35.5		33.8		32.3		✘		✘	
	50	45.1		44.5		42.4		40.5		✘		✘	
	63	56.9		56.1		53.3		51.0		48.2		45.01	
	75	✘		✘		63.7		61.0		✘		✘	
	90	✘		✘		76.5		73.1		69.01		64.5	
	110	✘		✘		93.3		89.4		84.5		78.6	
Standard Coil Sizes (M)	25	✘		✘		✘		✓		✘		✘	
	50	✓		✓		✓		✓		✓		✓	
	100	✓		✓		✓		✓		✓		✓	
	200	✓		✓		✓		✘		✘		✘	
Pipe Material	Bloat resistant	✓		✓		✓		✓		✓		✓	
	PE100	✓		✓		✓		✓		✓		✓	

**Maximum operating pressure at 20°C*

Technical Specifications

Operating Temperature

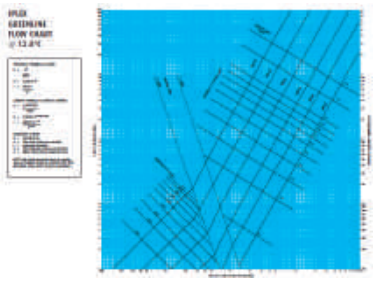
–10°C to + 60°C*
*Pressure derating must be applied for operating temperatures above 20°C.

MINIMUM COLD BENDING RADII (M)

	20°C	0°C
PIPE OD (mm)	(m)	(m)
20	0.44	1.0
25	0.55	1.2
32	0.71	1.6
40	0.88	2.0
50	1.10	2.5
63	1.39	3.2

Pipe Flow and Head Loss charts

Pipe flow and head loss charts are available for all Iplex rural PE and PVC pipes Contact Iplex Pipelines at www.iplex.co.nz



Mole-ploughing

These pipes can be installed by the mole-plough method providing that the mole-plough is specifically designed and maintained for this application and will not subject the pipe to stretching, scoring or any other damage during installation.

Mole Plough installation of Iplex PE pipes.

Depth of cover

These pipes should be laid at a sufficient depth to protect them from damage by normal agricultural/ horticultural cultivation or other operations. It makes good sense to record the location of buried pipes so they can be located again as needed.

These pipes are not suitable for use:*

1 As a conductor used for earthing electrical appliances.
2 In all fire rated applications.
3 For continuous service above 20°C internal or external temperature, where provision for pressure derating appropriate to the temperature has not been made.

NOTE: Iplex Pipelines' strongly recommend that these systems be buried in service to give protection from high climatic temperatures, ultra-violet light and physical damage. High climatic temperatures may reduce the pipe's pressure rating.

*Suitability for conveying a wide range of chemicals is tabulated in the Iplex Pipelines' POLIPLEX Polyethylene Pipe Design Textbook and also in our publication, "A Guide to Chemical Resistance of Thermoplastics and Elastomeric Materials".

alkathene™

VARIABLE PRESSURE RATINGS - LDPE PRESSURE PIPE

Code Explanation ID (mm)
Product Code
300-40-50
Coil Length (metres)

Tried and true

300 Series

ALKATHENE™ is manaufactured from a "new generation" low density polyethylene material, improving the pipe's performance characteristics. It's robust wall section and flexibility make it a reliable choice for on farm day to day water reticulation needs.

Product Code	Pipe Size OD (mm)	Mean Bore ID (mm)	Pressure Rating*		Standard Coil Sizes (m)			
			(BAR)	(PSI)	25	50	100	200
300.15	17	12.8	9.7	141	✓	✓	✓	✓
300.20	25	19.0	9	131	✓	✓	✓	✓
300.25	31	25.3	8	116	✓	✓	✓	✓
300.32	38	31.1	7	102	✓	✓	✓	✓
300.40	44	37.5	6	87	✓	✓	✓	✓
300.50	57	50.0	5	73	✓	✓	✓	✓

**Maximum operating pressure at 20ºC*

Features and Benefits

Flexible	Higher pressure rating than traditional LDPE manufactured to NZS 7601. ALKATHENE™ can be used in a wider range of applications
Suitable	Resistant to bloat remedies, tested in accordance with ASTMD 1693 "Environmental Stress Crack Resistance". ALKATHENE™ is suitable for use with in-line bloat remedy dispensing systems
Compatible	Fully approved by Hansen Products (NZ) Ltd. for use with Hansen Polyethylene Pipe Fittings
Durable	Robust wall section, makes ALKATHENE™ resistant to kinking and able "to take the knocks"
Economical	Good flexibility, due to the "new generation" LDPE material makes ALKATHENE™ easy to uncoil and fast to install
Quality	The outside diameter of ALKATHENE™ conforms to NZS 7601. ALKATHENE ™ is manufactured from precompounded LDPE, ensuring consistent carbon black dispersion to maximise ALKATHENE's ability to resist UV degradation ALKATHENE™ is manufactured in New Zealand by Iplex Pipelines using a Quality Management System accredited to AS/NZS ISO 9001:2008.

novatube

5 BAR - HORTICULTURAL LATERAL TUBE

Code Explanation ID (mm)
Product Code
350-16-100
Coil Length (metres)

Growing your future

350 Series

NOVATUBE is a low density polyethylene pipe designed specifically for use in low pressure horticultural and viticultural irrigation lateral applications. Novatube is manufactured from pre-compounded LDPE, ensuring consistent carbon black dispersion to maximise Novatube's ability to give protection from UV degradation.

Product Code	Pipe Size OD (mm)	Mean Bore ID (mm)	Pressure Rating*		Standard Coil Sizes (m)			
			(BAR)	(PSI)	100	200	300	400
350.13	15.3	13.1	5	73	✓	✘	✘	✓
350.16	18.9	16.3	5	73	✓	✘	✘	✓
350.19	22.0	19.0	5	73	✓	✘	✓	✘
350.25	28.7	24.9	5	73	✓	✓	✘	✘

**Maximum operating pressure at 20ºC*

PLASSON

16 Bar - Plasson "Line 7" mechanical compression fittings

2500 Series

PLASSON "Line 7" fittings are an internationally recognised 16 Bar rated compression fitting, specifically designed for use with Iplex BLUELINE™, GREENLINE™, REDLINE™, RURAL BLACK™, BLACKLINE™ PN16 and Iplex Effluent Pipe. PLASSON fittings can also be used on 20mm or 25mm ALKATHENE™ low density polyethylene pipe .Plasson fittings offer exceptional joint security for metric OD polyethylene pipe and form a seal without distorting the pipe or restricting the pipe bore. A large range of threaded fittings and accessories make PLASSON a versatile product range and allow compatability with other pipe materials.

See our Product Catalogue on this website for our complete Plasson Range

Compression Fittings (20 - 110mm: 16 Bar)

90° Elbow

Code	Size mm
2501.20	20
2501.25	25
2501.32	32
2501.40	40
2501.50	50
2501.63	63
2501.90	90
2501.110	110

Slip Tee 90°

Code	Size mm
2502.20	20
2502.25	25
2502.32	32
2502.40	40
2502.50	50
2502.63	63

40 - 63mm: 12.5 Bar

Female Threaded Tee

Code	Size mm x BSP
2503.20.15	20 x ½"
2503.25.20	25 X ¾"
2503.32.25	32 x 1"
2503.40.32	40 x 1¼"
2503.50.40	50 x 1½"
2503.63.50	63 x 2"
2503.75.65	75 x 2½"
2503.90.80	90 x 3"
2503.110.100	100 x 4"

90mm: 10 Bar
110mm: 6 Bar

Tee 90°

Code	Size mm
2504.20	20
2504.25	25
2504.32	32
2504.40	40
2504.50	50
2504.63	63
2504.90	90
2504.110	110

Reducing Tee 90°

Code	Size mm
2505.25.20	25 x 20
2505.32.25	32 x 25
2505.40.32	40 x 32
2505.50.40	50 x 40
2505.63.50	63 x 50
2505.75.63	75 x 63

Female Threaded Adapter

Code	Size mm x BSP
2506.20	20 x ½"
2506.25	25 X ¾"
2506.32	32 x 1"
2506.40	40 x 1¼"
2506.50	50 x 1½"
2506.63	63 x 2"
2506.75.65	75 x 2½"
2506.90	90 x 3"
2506.110	110 x 4"

90mm: 10 Bar
110mm: 6 Bar

Male Threaded Elbow 90°

Code	Size mm x BSP
2507.20	20 x ½"
2507.25	25 X ¾"
2507.32	32 x 1"
2507.40	40 x 1¼"
2507.50	50 x 1½"
2507.63	63 x 2"

Female Threaded Elbow 90°

Code	Size mm x BSP
2508.20	20 x ½"
2508.25	25 X ¾"
2508.32	32 x 1"
2508.40	40 x 1¼"
2508.50	50 x 1½"
2508.63	63 x 2"

Wingback Female Adapter

Code	Size mm x BSP
2509.20	20 x ½"
2509.25	25 X ¾"

Coupling

Code	Size mm
2510.20	20
2510.25	25
2510.32	32
2510.40	40
2510.50	50
2510.63	63
2510.75	75
2510.90	90
2510.110	110

Slip Coupling

Code	Size mm
2511.20	20
2511.25	25
2511.32	32
2511.40	40
2511.50	50
2511.63	63

Designed for retrofit "slip" assembly into an existing pipeline

Universal Coupling

Code	Size mm
2512.25x15-22	20 x 15 to 22
2512.25x20-27	25 x 20 to 27
2512.25x27-35	25 x 27 to 35
2512.32x27-35	32 x 27 to 35
2512.50x35-50	50 x 35 to 50

50mm: 10 Bar

Adapts "metric OD" PE pipe to PVC, steel, copper and imperial OD LDPE or HDPE, within the OD size ranges above

Male Threaded Adapter

Code	Size mm x BSP
2513.20	20 x ½"
2513.25.15	25 X ½"
2513.25	25 x ¾"
2513.32	32 x 1"
2513.40	40 x 1½"
2513.50	50 x 1½"
2513.63	63 x 2"
2513.75.65	75 x 2½"
2513.90	90 x 3"
2513.110	110 x 4"

Female Threaded Branch Saddle

Code	Size mm x BSP
2519.25.20	25 x ¾"
2519.32.25	32 X 1"
2519.40.25	40 x 1"
2519.50.15	50 x ½"
2519.50.20	50 x ¾"
2519.50.25	50 x 1"
2519.50.32	50 x 1¼"
2519.63.15	63 x ½"
2519.63.20	63 x ¾"
2519.63.25	63 x 1"
2519.63.32	63 x 1¼"
2519.63.40	63 x 1¼"
2519.75.25	75 x 1"
2519.75.50	75 x 2"
2519.90.25	90 x 1"
2519.90.50	90 x 2"
2519.110.25	110 x 1"
2519.110.32	110 x 1¼"
2519.110.40	110 x 1½"

25 - 63mm: 12.5 Bar
75 - 110mm: 10 Bar

Reducing Coupling

Code	Size mm
2523.25.20	25 x 20
2523.32.25	32 x 25
2523.40.32	40 x 32
2523.50.40	50 x 40
2523.63.50	63 x 50
2523.75.63	75 x 63
2523.90.75	90 x 75
2523.110.90	110 x 90

Reducing Set

110mm x 75mm: 10 Bar
110mm x 90mm: 10 Bar

Reduces the size of any Plasson Line 7 mechanical socket

Code	Size mm
2524.25.20	25 x 20
2524.32.20	32 x 25
2524.32.25	40 x 32
2524.40.25	50 x 40
2524.40.32	63 x 50
2524.50.25	75 x 63
2524.50.32	90 x 75
2524.50.40	50 x 40
2524.63.25	63 x 25
2524.63.32	63 x 32
2524.63.40	63 x 40
2524.63.50	63 x 50
2524.75.63	75 x 63
2524.110.63	110 x 63
2524.110.75	110 x 75
2524.110.90	110 x 90

Shouldered Adapter

Code	Size mm
2525.63	63
2525.110	110

End Plug

Code	Size mm
2531.20	20
2531.25	25
2531.32	32
2531.40	40
2531.50	50
2531.63	63
2531.75	75
2531.90	90
2531.110	110

Barrel Union Threaded Male Adapter

75mm: 12 Bar

Code	Size mm x BSP
2572.25.15	25 x ½"
2572.25.20	25 X ¾"
2572.32.15	32 x ½"
2572.32.20	32 x ¾"
2572.32.25	32 x 1"
2572.40.25	40 x 1"
2572.40.32	40 x 1¼"
2572.40.40	40 x 1¼"
2572.50.25	50 x 1"
2572.50.32	50 x 1¼"
2572.50.40	50 x 1½"
2572.50.50	50 x 2"
2572.63.25	63 x 1"
2572.63.32	63 x 1¼"
2572.63.40	63 x 1½"
2572.63.50	63 x 2"
2572.63.65	63 x 2½"
2572.75.40	75 x 1½"
2572.75.50	75 x 2"
2572.75.65	75 x 2½"
2572.75.80	75 x 3"

Plug Adapter

12.5 Bar

Code	Size mm
2530.20	20
2530.25	25
2530.32	32
2530.40	40
2530.50	50
2530.63	63

Modular Adapter

Code	Size mm
2579.20	20
2579.25	25
2579.32	32
2579.40	40
2579.50	50
2579.63	63

Wrench

Code	Size mm
2550.40.75	40 to 75
2550.63.125	63 to 125

Designed for use with Plasson Line 7 fittings only

Chamfering Tool

Code	Size mm
2555.20.63	25 to 63

Plasson Threaded Fittings

Threaded Nipple

16 Bar

Code	Size BSP
2516.15	½"
2516.20	¾"
2516.25	1"
2516.32	1¼"
2516.40	1½"
2516.50	2"

Threaded Reducing Bush

½" - 1": 16 Bar
1¼" - 4": 10 Bar

Code	Size mm
2517.20.15	¾" x ½"
2517.25.15	1" x ½"
2517.25.20	1" x ¾"
2517.32.15	1¼" x ½"
2517.32.20	1¼" x ¾"
2517.32.25	1½" x 1"
2517.40.15	1½" x ½"
2517.40.20	1¼" x ¾"
2517.40.25	1½" x 1"
2517.40.32	1½" x 1¼"
2517.50.15	2" x ½"
2517.50.20	2" x ¾"
2517.50.25	2" x 1"
2517.50.32	2" x 1¼"
2517.50.40	2" x 1½"
2517.65.50	2½" x 2"
2517.80.25	3" x 1"
2517.80.32	3" x 1¼"
2517.80.40	3" x 1½"
2517.80.50	3" x 2"
2517.80.65	3" x 2½"
2517.100.50	4" x 2"
2517.100.80	4" x 3"

Threaded Tee

½" - 1": 16 Bar
1¼" - 2": 10 Bar

Code	Size BSP
2514.15	½"
2514.20	¾"
2514.25	1"
2514.32	1¼"
2514.40	1½"
2514.50	2"

Threaded Elbow

½" - 1": 16 Bar
1¼" - 2": 10 Bar

Code	Size BSP
2515.15	½"
2515.20	¾"
2515.25	1"
2515.32	1¼"
2515.40	1½"
2515.50	2"

Threaded Socket

½" - 1": 16 Bar
1¼" - 2": 10 Bar

Code	Size BSP
2521.15	½"
2521.20	¾"
2521.25	1"
2521.32	1¼"
2521.40	1½"
2521.50	2"

Threaded Reducing Nipple

16 Bar

Code	Size mm
2518.20.15	¾" x ½"
2518.25.15	1" x ½"
2518.25.20	1" x ¾"
2518.32.15	1¼" x ½"
2518.32.20	1¼" x ¾"
2518.32.25	1¼" x 1"
2518.40.15	1½" x 1½"
2518.40.20	1¼" x 1¾"
2518.40.25	1½" x 1"
2518.40.32	1½" x 1¼"
2518.50.15	2" x ½"
2518.50.20	2" x ¾"
2518.50.25	2" x 1"
2518.50.32	2" x 1¼"
2518.50.40	2" x 1½"

Threaded Plug

16 Bar

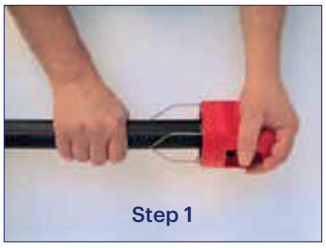
Code	Size BSP
2530T.15	½"
2530T.20	¾"
2530T.25	1"
2530T.32	1¼"
2530T.40	1½"
2530T.50	2"

PLASSON

Features and Benefits

Efficient	forms a fast, end load resistant, watertight joint, with no bore restriction.
Compatible	with GREENLINE, REDLINE™, RURAL BLACK, BLACKLINE PN16 and 20mm & 25mm diameters ALKATHENE™
Versatile	range allows joints to be formed with other pipe materials by way of male and female couplings with BSP threads or PLASSON Universal Coupler (code 2512).
Durable	manufactured from a high impact resistant polypropylene material.
Economical	rapid assembly, push-fit and tighten. PLASSON fittings from 20mm to 63mm diameter do not require to be diassembled before making a connection.
Quality	manufactured and tested to AS/NZS 4129 "Fittings for polyethylene (PE) pipe for pressure applications".

Assembly Instructions (20mm - 63mm)


Step 1


Step 1

General Instructions

Follow these assembly Instructions for a secure, leakproof connection to last a lifetime.

- Ensure the pipe end to be inserted into the fitting, and the fitting itself, are both totally free of dirt, grit, scratches and any other damage
- **Do not overtighten the Backing Nut** when closing. NEVER use wrenches with handle lengths longer than 22cm – excessive torque during tightening can spread the Backing Nut cone and result in pullouts.
- If fittings are reused, ensure the Split Grip Ring is sharp and can bite into thepipe to avoid pull outs. Alternatively replace the Split Grip Ring.

Note: *Use PTFE tape for all threaded connections.*

1. Cut the pipe square and remove burrs. It is good trade practice to chamfer (with a file or Plasson 2555 chamfering tool) and lubricate the pipe ends. (use Medlube or an approved equivalent). Chamfering and lubrication will ease insertion, particularly for sizes DN 40, DN 50 and DN 63, however these steps are optional.


Step 2

2. Undo the nut up to the last thread. **Do not remove the Backing Nut** from the fitting body.


Step 3

3. Twist the pipe into the fitting through the Backing Nut and through the Split Grip Ring until it meets the first resistance – pushing against the captive O-ring. Then push and twist the pipe **through and past the O-ring** until it stops at the pipe stop inside the fitting – the final stop.


Step 4

4. Firmly hand tighten the Backing Nut. Use a Plasson "C-Ring" wrench for a further half turn past hand tight for final tightening of fittings, for diameters DN40, DN 50 and DN 63. The full hydraulic seal is achieved when the pipe passes through the O-ring. Nut tightening is only to achieve pullout resistance – the hydraulic seal is automatically created when the pipe is pushed past the captive O-ring.

PLASSON

Assembly Instructions (75mm - 125mm)

General Instructions

Cut the pipe, square. Unscrew the Backing Nut and **remove the Split Grip ring.** Reposition Backing Nut, Follower Bush and O ring on the pipe, two diameters back. Lubricate pipe and O ring, with Medlube.

Push the pipe fully into the fitting body, up to the internal stop. Push the O ring and Follower Bush forward until they rest against the fitting (They will not enter the body of the fitting).

Tighten the Backing Nut to drive the Follower Bush and O ring together, right into the fitting until the Follower Bush is flush with fitting mouth. Use a Plasson C ring spanner to assist as needed.

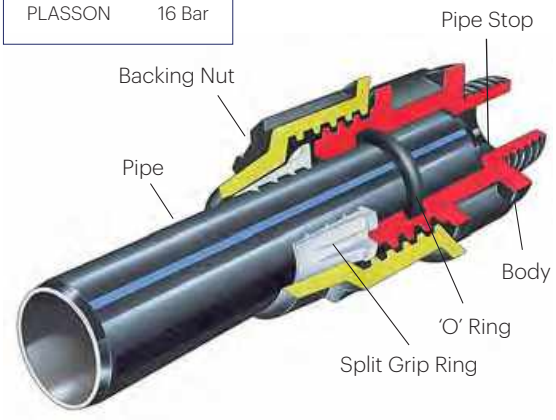
Fully unscrew the Backing Nut, and pull back along the pipe.

Now, open the Split Grip Ring and place directly over and onto the pipe, with the lugs and flat end, **facing and touching** the Follower Bush.

Firmly tighten the Backing Nut with **only** a Plasson "C-ring" spanner. **(Max handle length = 46cm) Do not overtighten.**

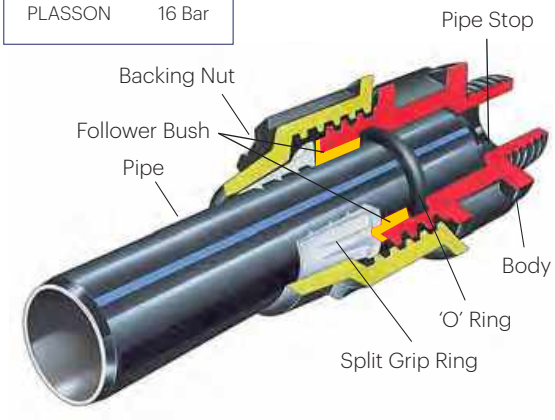
20mm - 63mm

Maximum operating pressure at 20°C	
PLASSON	16 Bar



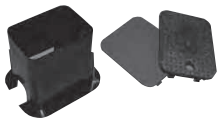
75mm - 125mm

Maximum operating pressure at 20°C	
PLASSON	16 Bar



PLASSON

10 to 16 Bar Valves

		Order Number	Size (mm)	
Quick Coupling Valve *(10 Bar Rating)*		2711	20 (¾")	• instant on/off water supply valve • compatible with GREENLINE, REDLINE™ and ALKATHENE™ pipes • ideal for wash down areas and filling spray tanks
		2712	25 (1")	
Valve *(10 Bar Rating)*		2731	20 (¾")	• economical BSP female threaded valve • small size and rugged polypropylene body make it ideal for use around the farm.
		2732	25 (1")	
Riser Key *(10 Bar Rating)*		2713 (Used with 2712)		• bayonet type fitting used on end of hose to turn on PLASSON quick coupling valves
Compression Stopcock *(16 Bar Rating)*		2741.20	20	• direct connection to GREENLINE, REDLINE™, RURAL BLACK and 20mm and 25mm ALKATHENE™ pipe • no more leaking threaded joints • cost effective – do away with threaded adapters, to connect valve to the pipe.
		2741.25	25	
		2741.32	32	
Angle Seat Valve *(8 Bar Rating)*		2735.32	32 (1¼")	• economical BSP male threaded valve • rugged polypropylene construction to take the knocks • full-bore flow performance when the valve is open
		2735.40	40 (1½")	
		2735.50	50 (2")	
Check Valve Insert *(16 Bar Rating)*		2720.25	25	• check valve designed to be inserted into 25mm PLASSON fittings • compatible with REDLINE™, RURAL BLACK, BLACKLINE PN16 and 20mm ALKATHENE™ pipes • used for backflow protection.
Valve Box		193*	155 x 200 x 200 high	• house and protect valves and meters • tough polyethylene construction • snap on lid for easy access • colour coded lids for asset identification **Notes:** *Valve box only - no lid **Green lid *** lue lid
		193LIDGR**	155 x 200	
		193LIDBL***	155 x 200	

Technical Specifications

Fittings

- Body - polypropylene - food grade polymer
- Backing nut - polypropylene - food grade polymer
- Split ring - acetyl
- 'O' ring - nitrile rubber (70 Shore A.NBR)

Saddles

- Reinforcing ring on BSP threaded outlets - stainless steel
- Nuts - stainless steel
- Bolts - stainless steel
- Threads - B.S.P. standard

PLASSON

16 Bar Plasson "Series 1" mechanical compression fittings

3500 Series

3501 - 90º Elbow

Iplex Code	Size mm
3501.20	20
3501.25	25
3501.32	32
3501.40	40
3501.50	50
3501.63	63

3503 - Female Threaded Tee

Iplex Code	Size mm x BSP
3503.20.15	20 x ½"
3503.25.15	25 x ½"
3503.25.20	32 x ¾"
3503.32.25	40 x 1"

3504 - 90º Tee

Iplex Code	Size mm
3504.20	20
3504.25	25
3504.32	32
3504.40	40
3504.50	50
3504.63	63

3505 - Reducing Tee

Iplex Code	Size mm
3505.25.20	25 x 20 x 25
3505.32.20	32 x 20 x 32
3505.32.25	32 x 25 x 32

3506 - Female Threaded Adaptor

Iplex Code	Size mm x BSP
3506.20.15	20 x ½"
3506.25.20	25 x ¾"
3506.32.25	32 x 1"
3506.40.32	40 x 1¼"
3506.50.40	50 x 1½"
3506.63.50	63 x 2"

3507 - 90º Male Threaded Adaptor

Iplex Code	Size mm
3507.25.20	25 x ¾"
3507.32.25	32 x 1"

3508 - 90º Female Threaded Adaptor

Iplex Code	Size mm x BSP
3508.20.15	20 x ½"
3508.25.15	25 x ½"
3508.25.20	25 x ¾"
3508.32.25	32 x 1"
3508.50.40	50 x 1½"
3508.63.50	63 x 2"

3509 - Female Wingback Adaptor

Iplex Code	Size mm x BSP
3509.20.15	20 x ½"

3510 - Coupling

Iplex Code	Size mm
3510.20	20
3510.25	25
3510.32	32
3510.40	40
3510.50	50
3510.63	63

3512 - Universal Coupling

Iplex Code	Size mm x mm
3512.25.14-18	25 x 14-18
3512.25.19-22	25 x 19-22
3512.25.24-28	25 x 24-28

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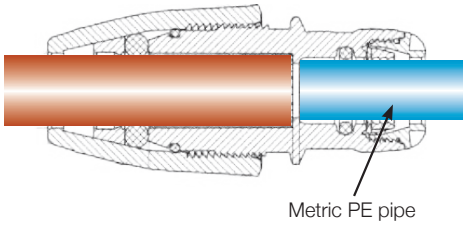
3512 - Universal Coupling - Installation Instructions

Installation Instructions:

- Cut pipe square and deburr as necessary
- Select correct fitting according to the pipe outer diameter
- Slide the fitting (universal side) onto the pipe, to the pipe stop
- Whilst holding the fitting body with wrench, use another wrench to tighten the nut (do not overtighten)
- Assemble the metric PE pipe according to Series 1 fitting instructions

Note: *If the fitting is re-used make sure metal teeth are present in the universal split ring.*

Pipe		Universal Fitting Size Range (mm)		
Type	Standards	14-18 (mm)	19-22 (mm)	24-28 (mm)
		Nominal Size (DN)		
PE: Metric	AS/NZS 4130	-	20	25
PE: Imperial - LDPE	NZS 7601	15 (½")	-	20 (¾")
PE: Imperial - HDPE	NZS 7602	15 (½")	-	20 (¾")
Copper: NZ	NZS 3501	14.7	21	27.4
Copper: AS	AS3795	-	20 (¾")	25 (1")
PVC-U: AS/NZS	AS/NZS 4177	-	15	20
PB: AS/NZS	AS/NZS 2642.2	18	22	28
PE-X: AS/NZS	AS/NZS 4292	16	20	25
Galvanised Steel (Plain End)	AS 1074	10 (17.2mm OD)	15 (21.3mm OD)	20 (26.9mm OD)



3513 - Male Threaded Adaptor

Iplex Code	Size mm x BSP
3513.20.15	20 x ½"
3513.25.20	25 x ¾"
3513.32.25	32 x 1"
3513.40.32	40 x 1¼"
3513.50.40	50 x 1½"
3513.63.50	63 x 2"

3523 - Reducing Coupler

Iplex Code	Size mm
3523.25.20	25 x 20
3523.25.20	32 x 20
3523.25.25	32 x 25
3523.40.32	40 x 32
3523.50.25	50 x 25
3523.63.50	63 x 50

3530 - End Plug

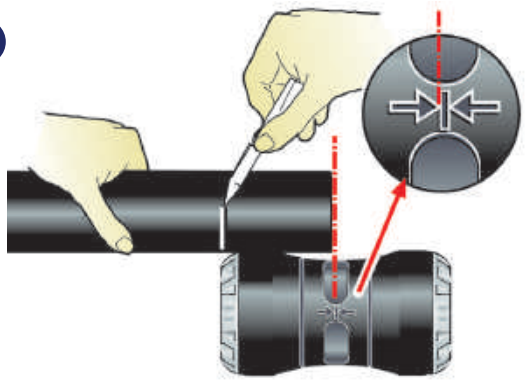
Iplex Code	Size mm
3530.20	20
3530.25	25
3530.32	32
3530.40	40
3530.50	50
3530.63	63

Plasson Series 1 Wrench

Iplex Code	Size
Wrench.20.32	20 - 32
Wrench.40.63	40 - 63

Installation Instructions

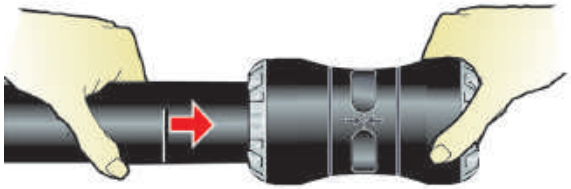
1



Step 1

- Clean pipe end
- Remove burs
- Mark insertion depth using guide on fitting
- Sizes 40mm and above – chamfering the pipe with a Plasson chamfer tool and using silicone lubricant will ease insertion

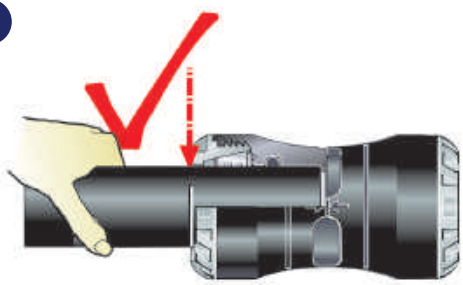
2



Step 2

- Insert pipe past O-ring until it meets the internal stop

3

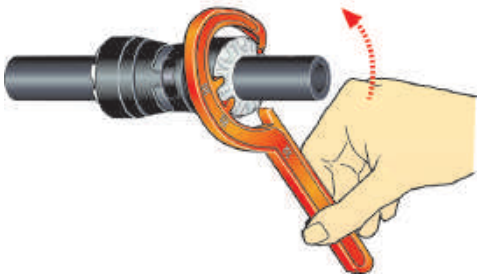


Step 3

- Check witness mark to ensure pipe is inserted correctly

Disassembly

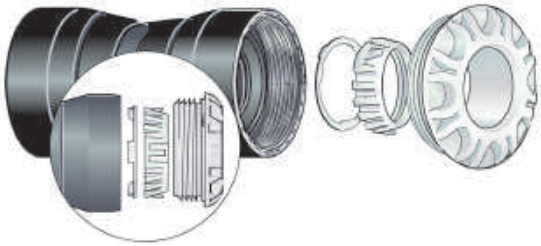
1



Step 1

- Use a Plasson Series 1 wrench to loosen the nut

Figure 1



Step 2

- Remove the nut and slide pipe from fitting. When reassembling the fitting, ensure the components are placed into the fitting body in the correct orientation and assembly order. *(Figure 1)* Ensure any damaged/ blunted grip or split rings are replaced.
- Note: If repeated disassembly/reassembly action is required, Iplex recommend that only the Plasson Line 7 fittings be used.

Land Drainage

How important is good land drainage?

Investment in land drainage leads to better utilisation of other farm inputs.

The benefits are long proven and numerous...

Installation of DN 110 NEXUSFLO subsoil drain by chain trenching, with laser control of gradient.

Improved pasture growth/crop yields

- higher soil temperatures extend growth season and increase kilograms of dry matter produced
- encourages root system development, improving yields and developing sturdier, well rooted plants more resistant to high winds and drought
- contributes to improved soil structure through encouraging worm activity
- better utilisation of pasture/crop management inputs, such as fertiliser and herbicides
- land dries more uniformly encouraging crops to germinate and emerge consistently

Increase in productive pasture area

- decrease in areas subject to pugging maximises productive area
- ability to do away with some open culverts by installing larger diameter subsurface drainage increases productive area

Improved animal health

- drier paddocks decrease stock health problems and provide improved conditions for lambing and calving

Increased land value

- Improved mobility around farm
- better operating conditions for farm machinery

Environmentally friendly

- Reduces surface compaction decreasing run-off to open waterways

Things to consider

- What is the return on investing in well drained land?
  - *better yields*
  - *longer growth season*
  - *maximising returns from fertiliser inputs*
- What cost reductions in hay and supplements could be expected by improving pasture production potential through land drainage?
- Benefits of a drainage system designed around Nexus™ technology - improved design options based around the increased flow capacity of NexusTM.

Desired Outcome

A land drainage system designed around your farm's requirements which maximises the land's production potential.

nexus flo™

PE LAND DRAINAGE PIPE (smooth bore)

Code Explanation

Product Code — Coil length (metres)

NEXUS110.100

OD (mm)

Efficient subsoil drainage

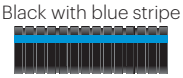
Nexusflo Series (punched) - Nexuscoil Series (unpunched)

NEXUS™ is a double wall polyethylene pipe, combining a smooth inner wall with a corrugated outer wall. During manufacture, the two walls are welded together. This results in a high stiffness wall section with smooth bore flow performance. NEXUSFLO is punched while NEXUSCOIL is unpunched. NEXUS™ is available in standard OD sizes 110mm, 160mm and 200mm.

Features and Benefits

Efficient	NEXUS™ smooth bore construction improves flow characteristics leading to earlier peak flow results
Reliable	NEXUS™ smooth bore construction maintains a high water velocity in the pipe, making it self cleaning and less prone to silting
Flexible	NEXUS™ corrugated outer wall and polyethylene construction give it excellent flexibility and strength
Suitable	NEXUS™ smooth bore construction allows installation in lower gradient situations
Compatible	NEXUS™ is compatible with NOVAFLO™ and NOVACOIL as well as a number of PVC pipeline products manufactured by Iplex Pipelines
Versatile	NEXUS™ is available in the standard diameters 110mm, 160mm as well as 200mm. The new 200mm diameter allows the possibility of designing open culverts out of some land drainage schemes thereby increasing productive area. NEXUS™ is available in lengths as well as a large range of coil sizes and together with a range of compatible fittings provide drainage solutions for a wide range of situations
Durable	The double wall construction of NEXUS™ allows Iplex Pipelines to offer a guaranteed stiffness resulting in a more robust product
Economical	The improved flow characteristics brought about by NEXUS™ smooth bore technology can lead to savings by: – increasing drainage row spacings – decreasing pipe diameter in low gradient situations – decreasing pipe diameter through better hydraulic performance. NEXUS™ light-weight and ease of handling makes it cost effective to install.
Quality	NEXUS™ technology offers the New Zealand land drainage market a new level of performance. NEXUS™ is manufactured in New Zealand by Iplex Pipelines using a Quality Management System accredited to AS/NZS ISO 9001:2008.
Visible	Colour coded for easy identification

Product Range

	Diameter OD (mm)	Length or Coil Size (metres)	Colour of pipe & stripe
NEXUSFLO (Punched)	110	15, 30, 50, 100, 450	Black with blue stripe 
	160	45, 185	
	200	5, 29, 120	
NEXUSCOIL (Unpunched)	110	15, 30, 50, 100, 450	Black with yellow stripe 
	160	45, 185	
	200	29, 120	

How to lay Nexus

NEXUSFLO can work effectively on low gradients. The minimum grade (slope) allowed for trench and pipe should be as follows:

NEXUSFLO nominal OD (mm)	Min. recommended gradient (%)*	Min. recommended gradient (m)*	Min. recommended gradient (m)
			Corrugated bore Novaflo™
110	0.1	1 in 1000	1 in 400
160	0.07	1 in 1500	1 in 1000
200	0.05	1 in 2000	n/a

Structural performance

NEXUSFLO offers a minimum Pipe Stiffness of SN8, for structural performance in ground.

(Tested to AS/NZS 1462.22)

**Based upon minimum recommended flow velocity of 0.2m/sec (small risk of silting from clay particles and fine silts). Where coarse silts or fine sands could enter the pipe, steeper gradients and higher minimum flow velocities should be used. Designers and installers of NEXUSFLO systems should refer to NZAEI Guide to Subsurface Land Drainage – May 1988 for more information.*

nexus flo™

PE LAND DRAINAGE PIPE (smooth bore)

Advantages of faster land drainage

Tests at Massey University have quantified the improved flow results achieved by NEXUS™ land drainage pipe compared to NOVAFLO™. Smooth bore NEXUS™ provides a less turbulent water flow through the pipe than the corrugated bore NOVAFLO™. This results in higher flow velocity, which translates to a greater volume of flow than for NOVAFLO™ given the same installation parameters.

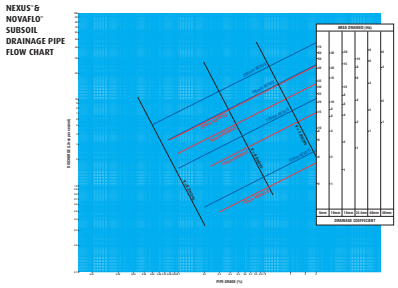
Faster drainage - why is it so important?

Higher flow velocity - reduced chance of silting

- less maintenance
- longer service life

Greater volume - faster and drainage

- less short term pasture damage - more palatable grazing
  - *faster pasture recovery*
- less long term soil damage (compaction) - improved surface drainage
  - *more pasture growth (kgDM/h)*
- reduced duration of water logging in the root zone
  - *more pasture growth (kgDM/h)*
- more flexibility in stock placement during wet months
  - *easier farm management.*



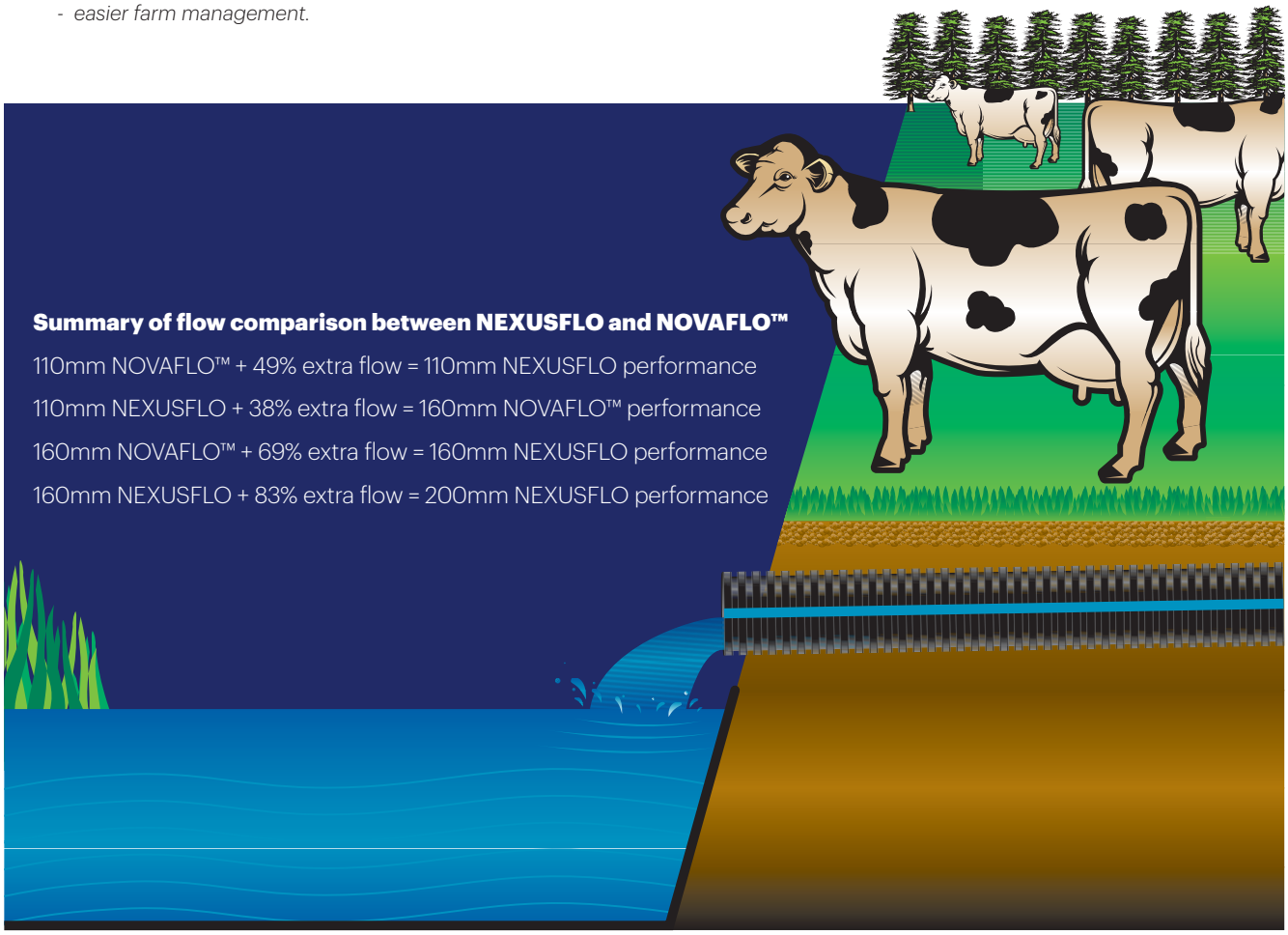
Pipe Flow charts

Pipe flow charts are available for Iplex Nexus and Novaflo pipes. Contact Iplex Pipelines at www.iplex.co.nz

160mm NEXUSFLO delivers
69% greater flow
than 160mm NOVAFLO™

110mm NEXUSFLO delivers
49% greater flow
than 110mm NOVAFLO™!

Refer Nexus & Novaflo Pipe Drainage Flow Chart - Page 25



novaflo™

SINGLE WALL PUNCHED LAND DRAINAGE PIPE

Code Explanation

Product Code — Coil length (metres)

400-110-100

OD (mm)

Efficient subsoil drainage

400 Series (punched)
500 Series (unpunched)

NOVAFLO™ is a single wall corrugated high density polyethylene land drainage pipe. NOVAFLO™ has been a leading brand name in the rural New Zealand land drainage market for over twenty years. During this time farmers have learned to rely on this quality product for delivering excellent drainage results. Such proven benefits as improved soil structure, larger root systems, better fertiliser uptake and reduction in surface pugging has made the use of NOVAFLO™ an integral part of the New Zealand farmer's search for greater productivity. Novacoil is the unslotted version of NOVAFLO™.

Features and Benefits

Reliable	NOVAFLO™ has a long track record of being a quality product in New Zealand
Flexible	NOVAFLO™'s single wall corrugated construction gives it excellent flexibility and strength
Compatible	NOVAFLO™ and NOVACOIL are compatible with the NEXUS™ range of pipe as well as a number of PVC pipeline products manufactured by Iplex Pipelines
Versatile	NOVAFLO™ and NOVACOIL's diameter and coil size range, together with a range of compatible fittings, provide drainage solutions for a wide range of situations
Durable	NOVAFLO™ is made from tough high density polyethylene
Economical	NOVAFLO™'s single wall construction, light weight and ease of installation, makes this product the cost effective choice for land drainage.
Quality	NOVAFLO™ and NOVACOIL are manufactured in New Zealand by Iplex Pipelines using a Quality Management System accredited to AS/NZS ISO 9001:2008
Visible	NOVAFLO™ and NOVACOIL are colour coded for easy identification

Product Range

	Diameter OD (mm)	Length or Coil Size (metres)	Colour of pipe & stripe
NOVAFLO™ (Punched)	65	15, 30, 150	Black with no stripe
	110	15, 30, 50, 100, 450	
	160	15, 45, 185	
NOVACOIL (Unpunched)	65	15, 30, 150	Black with white stripe
	110	15, 30, 100	
	160	15, 45	

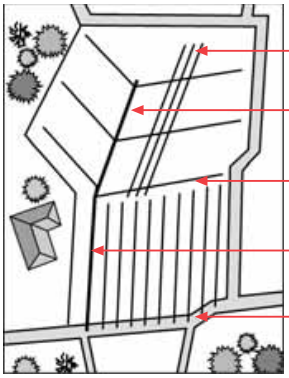
NEXUSFLO Couplers and associated fittings

NEXUSFLO drainage pipe and coils are connected using PVC couplers that are factory fitted. Additional couplers can be supplied as loose item. The range of PVC and PE fittings designed for use with NEXUSFLO range of pipes are available as follows:

		Order Code	Size (mm)			Order Code	Size (mm)
End Cap		430.110	110	**Level Invert**		123.150.100S	160 x 110
		430.160	160				
New Coupler		420.110	110	**45º Junction**		104.100.45	100 x 45
		420.160	160			704.150.45	160 x 45
		420.200	200			704.150.100.45	160 x 110 x 45

NEXUS™ and NOVAFLO™ Installation

How to install your NEXUS™ and NOVAFLO™



NEXUS™ and NOVAFLO™ complement existing drainage techniques, such as mole drainage; removing surplus water gathered by the mole network.


Nexusflo

External Load Strength

As a corrugated product, NEXUS™ and NOVAFLO™ have excellent strength to resist external loads from either soil, backfill or vehicle loads provided it is installed correctly.

Lightweight and Versatile

The light weight and long coil lengths of NEXUS™ and NOVAFLO™ minimise the physical effort required to lay pipe. Reduced operator fatigue and significant transportation savings can be achieved.

Depth of Drainage

The maximum depth of burial in agricultural applications is not often limiting and is usually determined by the nature of the soil/water profile. For NEXUS™ and NOVAFLO™ the most crucial factors are trench width and bedding/haunching. No rule of thumb can be given and the best information is available in AS/NZS 2566.

Backfill

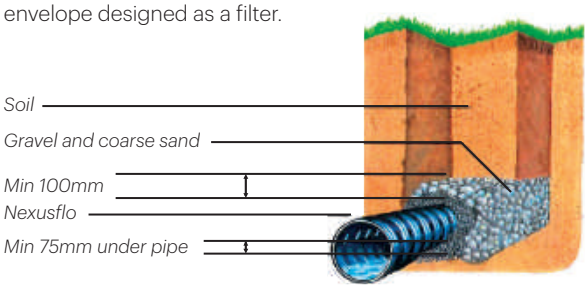
An envelope of granular aggregate around the drainage pipe improves the flow of soil water into the pipe by increasing the effective diameter of the drain and may under certain circumstances allow the spacing of drains to be increased. In permeable soils, water flows into the drain mainly through entry points at the sides and bottom of the drain pipe. It is therefore particularly important that the gravel envelope should completely surround the drain pipe in order to be fully effective. Such an envelope can also act as a partial filter, hence reducing the ingress of fines. In soils where particles can be washed into the pipe, eventually causing silting, a fabric filter can be used to impede the ingress of these fines.

Flexibility

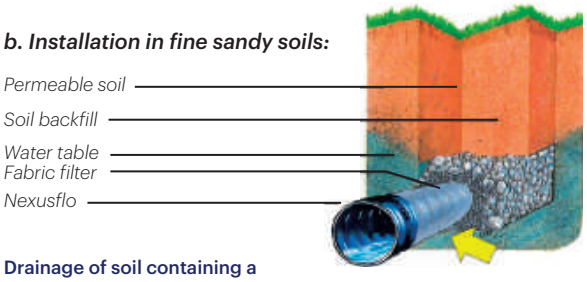
NEXUS™ and NOVAFLO™ pipe can be installed continuously around curves and bends, without the need for separate fittings, allowing NEXUS™ and NOVAFLO™ to be installed in continuous lengths.

Bedding and Backfill Alternatives

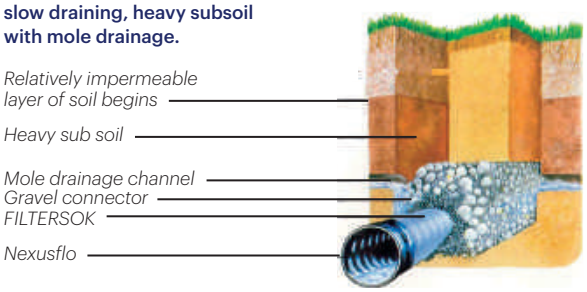
a. Standard installation in permeable non-sandy soils.
NEXUS™ and NOVAFLO™ encased in gravel and coarse sand envelope designed as a filter.



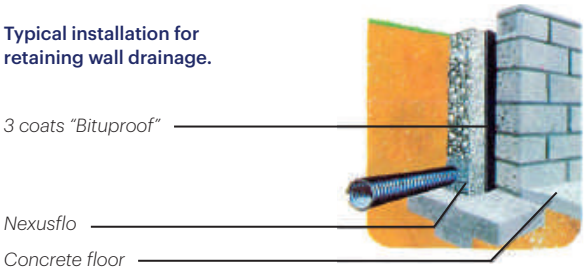
b. Installation in fine sandy soils:



Drainage of soil containing a slow draining, heavy subsoil with mole drainage.



Typical installation for retaining wall drainage.



Drain Spacing

The following table gives a guide for drain spacing proportional to drain depth and soil type. However, land utilisation factors such as paddock area, crop or tree spacing and vehicular access must all be considered. The standard suggested design is a 20m drain spacing for cattle farm drainage and 60m for sheep grazed pasture.

Drain Spacing vs Soil Type

Approximate Soil Textural Class	Suggested effective drainage distance each side of pipe (m) at a drainage depth of		Effective saturated hydraulic conductivity (mm/hour)	A General Description of Soil Permeability
	0.6 - 0.9m	0.9 - 1.2m		
Sand	15.2 - 22.9	22.9 - 45.7	more than 250	medium to high
Sandy Loam	12.2 - 15.2	15.2 - 22.90	125 - 250	medium
Loam	10.7 - 13.7	12.2 - 15.2	60 - 125	medium to low
Silt Loam	6.1 - 9.1	7.6 - 10.7	20 - 60	low
Clay Loam	5.3 - 6.1	6.1 - 7.6	1 - 5	very low
Clay	3.6 - 4.6	4.8 - 5.3	Less than 1	very low to practically impermeable

**k = coefficient of permeability*

Farm Dairy Effluent

"Waste or Useful By-Product"

Things to be considered

More and more dairy farmers have to look at installing land based dairy shed waste schemes these days. What has brought this sudden upturn in interest and what should the dairy farmer look at when considering effluent disposal?

What is the history of dairy shed effluent disposal in New Zealand?

It has been considered a waste product to be disposed of by the easiest and least expensive means possible with little consideration given to its value, utilization or the environmental effects.

Why has the thinking about the disposal of dairy shed effluent changed?

The Resource Management Act 1991 charged Regional Councils with preventing the pollution of water courses through promoting sustainable land management practices, e.g. encouraging "permitted" acitivities such as land drainage disposal recyclying of dairy shed effluent.

What is the nutrient value of your dairy shed effluent?

Dairy shed effluent should be thought of as a liquid fertilizer containing significant amounts of nitrogen (N), phosphorus (P), potassium (K), sulphur (S) as well as trace elements. It also adds organic matter to the soil which helps increase earthworm activity.

What land area requirement is needed for a dispersal system?

The maximum utilization rate of 150kg of nitrogen per hectare per year is the limiting factor determining minimum land area requirements. Rotational cropping which also ensures all surplus potassium is removed can increase this utilization rate. Recommended land area per 100 dairy cows is 4.5 hectares.

What are buffer zones?

Dairy Industry legislation requires that effluent be disposed of at least 50 metres from a dairy shed and accompanying yards. Local bylaws and town planning ordinances can and do specify other minimum distances for sprayed dispersal from domestic buildings, streams, drains and public roads.

What should be considered when looking at effluent collection systems?

There are two types of collection systems, effluent sumps and effluent ponds.

- An effluent sump should be sized to accommodate the size of the herd and is located at the shed. The drawback of sumps are that the dispersal process becomes a daily job, contingency measures have to be made machinery failure or excessive rainfall and it is hard to target paddocks that have just been grazed.
- Effluent ponds should be sized to hold one week's worth of dairy shed washdown. The advantage of a pond is that most dairy farms already have one, effluent dispersion can become a weekly job allowing a buffer for wet weather and machinery failure as well as offering the ability to target recently grazed paddocks.

What are the pipeline requirements for an effluent scheme?

Mainlines are either rigid Iplex PVC or Iplex flexible polyethylene pipe sized for the discharge flow and reticulation distance, installed below or above ground. Above ground polythylene systems utilizing camlock type fittings are able to be moved and offer some savings in main line costs.

What are the choices in application systems?

There are three main means of land application, tanker/spreader, sprinkler/honey pot and self-propelled effluent applicator/travelling irrigator. Travelling irrigators have the benefit of being able to achieve low even application rates with a minimum of labour input.

What are the considerations in looking at a dairy shed effluent pump?

The choice of a dairy effluent pump hinges around selecting a pump capable of supplying the required pump duty for a given situation.

Why is an effluent management programme such an important part of the overall package?

Good management programmes ensure:

- Lowest possible application rate onto short pasture, which maximises nutrient utilization ensuring regrowth is clean and palatable.
- Rotation of application minimizes risk of disease transmission.
- Soil moisture levels are maintained to maximise pasture growth.
- Nutrient monitoring through soil testing and herbage analysis help ensure nutrient levels are maintained to maximise pasture growth.

Desired outcome

An effectively managed effluent dispersal system that efficiently maximises the nutrient value of the effluent and meets the local authority's dispersal requirements.

effluent pipe

6.3 & 8 Bar - PE or PVC PRESSURE PIPE

Code Explanation

Product Code — Coil length (metres)

2200-90PN8-100

OD (mm) — Pressure class

2200 Series (PE) or Z822 Series (PVC)

Iplex Pipelines Effluent Pipe is either a metric OD sized PE polyethylene (PE) pipe, or a lilac coloured PVC pipe, designed specifically for the disposal of dairy shed effluent. The PE pipe is typically installed above ground and jointed using camlock type fittings. This allows the pipe to be moved easily for discharge to specific paddocks. The robust nature and ease of handling of Iplex effluent pipe has made it an economical and effective choice for effluent dispersal. The lilac coloured PVC pressure pipe, is used as an underground effluent main line alternative to PE pipe.

Features and Benefits

Efficient	Iplex PE effluent pipe is easily installed and lends itself to efficient relocation. Rubber ring joint PVC effluent pipe is quick and easy to join.
Reliable	Iplex PE effluent pipe has been well proven on New Zealand dairy farms.
Compatible	Iplex effluent pipe is compatible with other PE and PVC pipeline systems, through the use of threaded and solvent cement joint fittings and camlock type fittings.
Versatile	Iplex effluent pipe is available in a number of diameters and coil sizes. It is compatible with camlock fittings and PLASSON fittings. This range offers an effluent pipe solution for most applications whether it be used as a drag hose or as a main line. Iplex lilac coloured PVC effluent pipe allows installation without the need to handle large coils of PE pipe.
Durable	Iplex effluent pipe is manufactured from tough PVC or Polyethylene for a long service life.
Economical	Above ground installation of Iplex Pipelines polyethylene pipe is an efficient and economical solution to most effluent disposal needs. Iplex lilac coloured PVC effluent pipe provides a large bore for hydraulic efficiency.
Quality	Iplex Pipelines PE effluent pipe is tested to AS/NZS 4130 - "PE Pipes for Pressure Applications". Iplex PVC effluent pipe is dimensionally conformant to AS/NZS 1477 PVC pipe and fittings for pressure application Series 1. Iplex effluent pipe is manufactured in New Zealans by Iplex Pipelines using a quality system accredited to ISO 9002: 1987
Visible	Three permanent lilac stripes on Iplex PE and a solid lilac colour on PVC effluent pipe ensure instant identification.

Design Summary

Listed below are the critical design components associated with three herd sizes and their effluent disposal systems.

Herd Size (Cows)	Recommended area required (hectares)	Pump duty	Sump size (m^3)	Mainline size (mm)	Effluent applicator	Average application rate (mm/yr)	Annual nutrient deposit (270 day milking season) Nutrients		
							N	P	K
200	9.0	Min. flow 15m^3/hr Min. head 34m	4.0	65mm PVC PN6 75mm PE PN6.3 or PN8	As required	33	1296.0 Kg	135.0 Kg	1674.0 Kg
400	18.0	Min. flow 15m^3/hr Min. head 39m	6.0	65mm PVC PN6 75mm PE PN6.3 or PN8	As required	33	2592.02 Kg	270.0 Kg	3348.0 Kg
600	27.0	Min. flow 15m^3/hr Min. head 40m	8.0	80mm or 100mm PVC PN8 90mm or 110mm PE PN6.3 or PN8	As required	34	3888.0 Kg	405.0 Kg	5022.0 Kg

Product Range

PE Product Code	Nominal OD (mm)	Mean ID (mm)	Standard Coil Sizes (metres)			Pressure Rating*		Application
			50	100	200	(Bar)	(PSI)	
2230.45PN5	51.1	44.0		✓	✓	5	72	Pod irrigation
2200.63PN6.3	63	56.9	✓	✓	✘	6.3	91	Drag hose/main line
2200.75PN6.3	75	65.8	✓	✓	✘	6.3	91	Main line
2200.75PN8	75	65.8	✓	✓	✘	8	116	Main line
2200.90PN6.3	90	81.3	✓	✓	✘	6.3	91	Main line
2200.90PN8	90	81.3	✓	✓	✘	8	116	Main line
2200.110PN8	110	96.5	✓	✓	✘	8	116	Main line

**Maximum operating pressure at 20ºC*

PVC Product Code	Nominal OD (mm)	Mean ID (mm)	Effective Length (metres)	Pressure Rating*		Application
				(Bar)	(PSI)	
Z822.80PN6.6 LILAC	88.9	82.3	6	6	87	Main line
Z822.100PN6.6 LILAC	114.3	107.8	6	6	87	Main line
Z822.80PN8.6 LILAC	88.9	82.1	6	8	116	Main line
Z822.100PN8.6 LILC	114.3	105.7	6	8	116	Main line

**Maximum operating pressure at 20ºC*

Culvert Pipe

The installation and maintenance of access ways to and on farm is important in optimising the efficiency of moving around the farm. The choice of a culvert pipe system that is durable and easy to install is part of this process. FARMTUFF™ uPVC Culvert Pipe and NEXUS™ Culvert PE culvert pipe offer a flexibility of choice for these applications.

farmtuff™

PVC CULVERT PIPE

Code Explanation

Product Code **Socketed one end**

550-200-5 SOE

OD (mm) **Length (metres)**

Strength under foot

550 Series

FARMTUFF™ is the answer to the majority of on farm culvert pipe needs. This smooth bore, lightweight, easy to handle PVC pipe makes installation a breeze compared to culvert pipes made of more traditional materials. Correctly installed FARMTUFF™ will provide years of dependable service improving access around the farm and taking away stormwater.

Features and Benefits

Efficient — FARMTUFF's™ range of diameters and large, smooth bore size allows efficient selection of pipe for any given culvert pipe requirement. Smooth rather than corrugated-bore culverts have less chance of jamming up with branches and deliver greater flow at higher speed, lessening the chance of debris build up within the culvert pipe.

Reliable — High strength PVC construction gives FARMTUFF™ an excellent load-bearing capability and longitudinal rigidity to lie on grade for reliable long-term service.

Compatible — FARMTUFF™ pipe is compatible with a large range of injection moulded and fabricated PVC fittings and floodgates allowing greater flexibility of use.

Versatile — FARMTUFF™ is available in seven diameters with three length options. Apart from its usual culvert pipe application it can be used for piping dairy shed effluent to settling ponds and other on farm stormwater applications. Cut lengthwise it can be used as an open channel for water drainage around cow sheds and driveways or as economical stock feeding troughs.

Durable — FARMTUFF™ is manufactured from uPVC, a material which is both rust proof and abrasion resistant to give a long in-ground life. FARMTUFF™ has precision formed sockets, allowing push-fit or solvent cement water tight joints. Such joints lessen the chance of leakage, which can cause scouring, undermining the culvert pipe installation.

Economical — FARMTUFF's™ light-weight smooth bore PVC construction makes it an economical choice to purchase and install compared to traditional heavy culvert pipes.

Quality — FARMTUFF™ is manufactured in New Zealand by Iplex Pipelines using a Quality Management System accredited to AS/NZS ISO 9001:2008.

Product Range

Product Code	Nominal OD (mm)	Length available		
		3m	5m	6m
550.110	110		✓	✓
550.160	160		✓	✓
550.200	200	✓	✓	✓
550.250	250	✓	✓	✓
550.315	315	✓	✓	✓
550.400	400	✓	✓	✓
550.500	500	✓	✓	✓

nexus CULVERT™

PE HEAVY DUTY TWIN WALL SMOOTH BORE CULVERT PIPE

Code Explanation

Product Code **Length (metres)**

NEXUS CULVERT 2005

OD (mm)

Cost effective culvert

NEXUS™ Culvert Series

NEXUS™ Culvert is an economic alternative to PVC culvert pipes. The heavy duty polyethylene dual wall construction of NEXUS™ Culvert gives both excellent impact strength and crush resistance, while being extremely light-weight and easy to handle. The smooth internal bore gives good flow performance making NEXUS™ Culvert an ideal choice for culvert pipes around the farm.

Features and Benefits

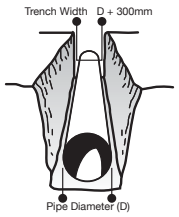
Efficient	NEXUS™ Culvert's smooth bore provides good hydraulic performance for efficient water relocation.
Reliable	NEXUS™ Culvert's corrugated outer wall gives it excellent load-bearing capability to provide reliable long-term service.
Compatible	NEXUS™ Culvert is compatible with a large range of inject moulded and fabricated PVC fittings allowing a greater flexibility of use.
Versatile	NEXUS™ Culvert is available in six diameters allowing a degree of choice to match the performance requirement. NEXUS™ Culvert is supplied with a PVC coupler or pre-formed socket on one end so culverts can be fabricated to the required length on site. NEXUS™ Culvert is flexible allowing culverts to be formed to fit most situations.
Durable	NEXUS™ Culvert is manufactured from polyethylene, a material which is both rust proof and abrasion resistant to give a long in-ground life.
Economical	NEXUS™ Culvert's light weight, smooth bore polyethylene construction makes it an economical choice to purchase and install compared to traditional heavy culvert pipes.
Quality	NEXUS™ Culvert is manufactured in New Zealand by Iplex Pipelines using a Quality Management System accredited to AS/NZS ISO 9001:2008.
Visible	NEXUS™ Culvert is colour coded for easy identification.

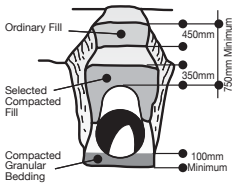
Product Range

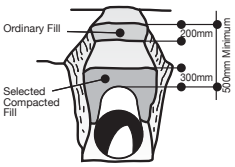
Product Code	Nominal OD (mm)	Length (m)	Coupling	Colour of pipe and stripe
NEXUS CULVERT 1105	110	5	c/w Push fit coupler	Black with brown stripe  Black with green stripe 
NEXUS CULVERT 1605	160	5	c/w Push fit coupler	
NEXUS CULVERT 2005	200	5	c/w Push fit coupler	
NEXUS CULVERT 2506	250	6	Socketed	
NEXUS CULVERT 3156	315	6	Socketed	
NEXUS CULVERT 4006	400	6	Socketed	
NEXUS CULVERT 5006	500	6	Socketed	

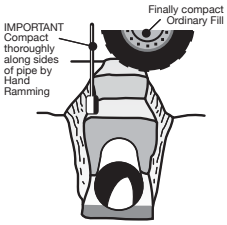
Installation Instructions

Important for the correct performance of FARMTUFF™ and NEXUS™ Culvert Pipe









Excavation

When digging a trench, ensure that the width of the trench at the top of the pipe is no greater than necessary to allow the bedding and side fill to be properly placed and compacted. As a rule, 300mm wider than the pipe is normally sufficient. This will minimise loading on the buried pipe.

Culverts Under Roads, Farm Tracks and Raceways

Compacted granular bedding material is preferred in the particle size range 5mm to 20mm. Suitable granular materials include scoria, pumice, river gravel, sandstone or limestone. The minimum depth of the cover for PVC culverts under roads, farm tracks, raceways, etc. should be 750mm.

Culverts Under Areas Not Subject to Traffic or Heavy Stock Movement

Selected excavation fill may be used as bedding. It should be substantially free from rock, tree roots or rubbish. Wet or saturated clay should not, under any circumstances, be used as bedding or surround material. The minimum depth of cover should be 500mm.

Compaction of Bedding

FARMTUFF™ and NEXUS™ Culvert pipes use their flexibility to transfer load to the surrounding bedding. One purpose of the bedding is to ensure longitudinal support to the pipe. Another purpose is to provide lateral support to the pipe and increase its load capacity. Thorough compaction of the fill along the pipe is important to ensure long, trouble free service from your FARMTUFF™ and NEXUS™ Culvert pipe. Fill should be carefully compacted by hand ramming along the sides and around the pipe, and built up to the finished ground surface.

Extra considerations

It's a good idea to project the end of the culvert pipe out from the surface of filled earth face (suggested 300-500mm) to prevent erosion of the fill. In hilly country, fluming is recommended to guard against surface erosion from culvert discharge.

Note: FARMTUFF™ and NEXUS™ Culverts are not approved for local authority stormwater or gravity sewer applications.

Typical location of Iplex Farmtuff PVC culvert under a farm vehicle access way, with bunded support walls to protect the fill from erosion, around the pipe entry and exit positions.

Farm Help

A number of services which Iplex Pipelines offer as part of providing a precision package are important asset management tools.

farmtrac™

FARM MAPPING USING GLOBAL POSITIONING SYSTEMS

The Global Positioning System (GPS) is a constellation of 24 satellites that orbit the earth at an altitude of 20,000 kilometres, constantly emitting GPS signals. GPS receivers on Earth calculate their positions by making distance measurements to four or more satellites. This satellite data can accurately plot heights and distances of various points for any given area of land. The GPS system was originally developed as a navigation and timing system for military applications. At Iplex Pipelines we use the GPS to assist the farmer in mapping installations of land drainage and farm water reticulation schemes. Typically with the FARMTRAC™ mapping of a NEXUS™ or NOVAFLO™ installation a minimum installation of 2,000 metres at one time is required for this service to be offered as part of the purchase price.

FARMTRAC™ mapping of farm water reticulation schemes after the installation of Iplex Pipelines product comes with a cost attached. This is negotiable at the time of purchase and depends on the size of the installation.

These maps of on-farm water and drainage systems are proving to be excellent asset management recording systems. They have the added benefit of simplifying future system additions or maintenance. This data can also be supplied in a digital format for use with a number of farm management software packages available in New Zealand. The digital data involved remains the property of Iplex Pipelines and its availability is negotiated on a job by job basis. Further information on the FARMTRAC™ service can be obtained from selected rural merchants or by phoning your local Iplex Sales Office on freephone 0800 800 262.

Other Services

Design assistance

Iplex Pipelines offer a number of levels of rural water reticulation design assistance. This ranges from our local Territory Manager offering on farm advice about simple gravity reticulation schemes to accurate satellite data collection to produce a full farm water reticulation design, guaranteed by a professional agricultural engineer.

Installation assistance

Pipe dispensing trailer

Can be provided subject to availability to assist in uncoiling Iplex Pipelines polyethylene pipe. This is a time saving alternative to uncoiling by hand.

Chamfering tool

Available to chamfer Iplex Pipelines polyethylene pipe prior to using Plasson compression fittings.

Technical backup

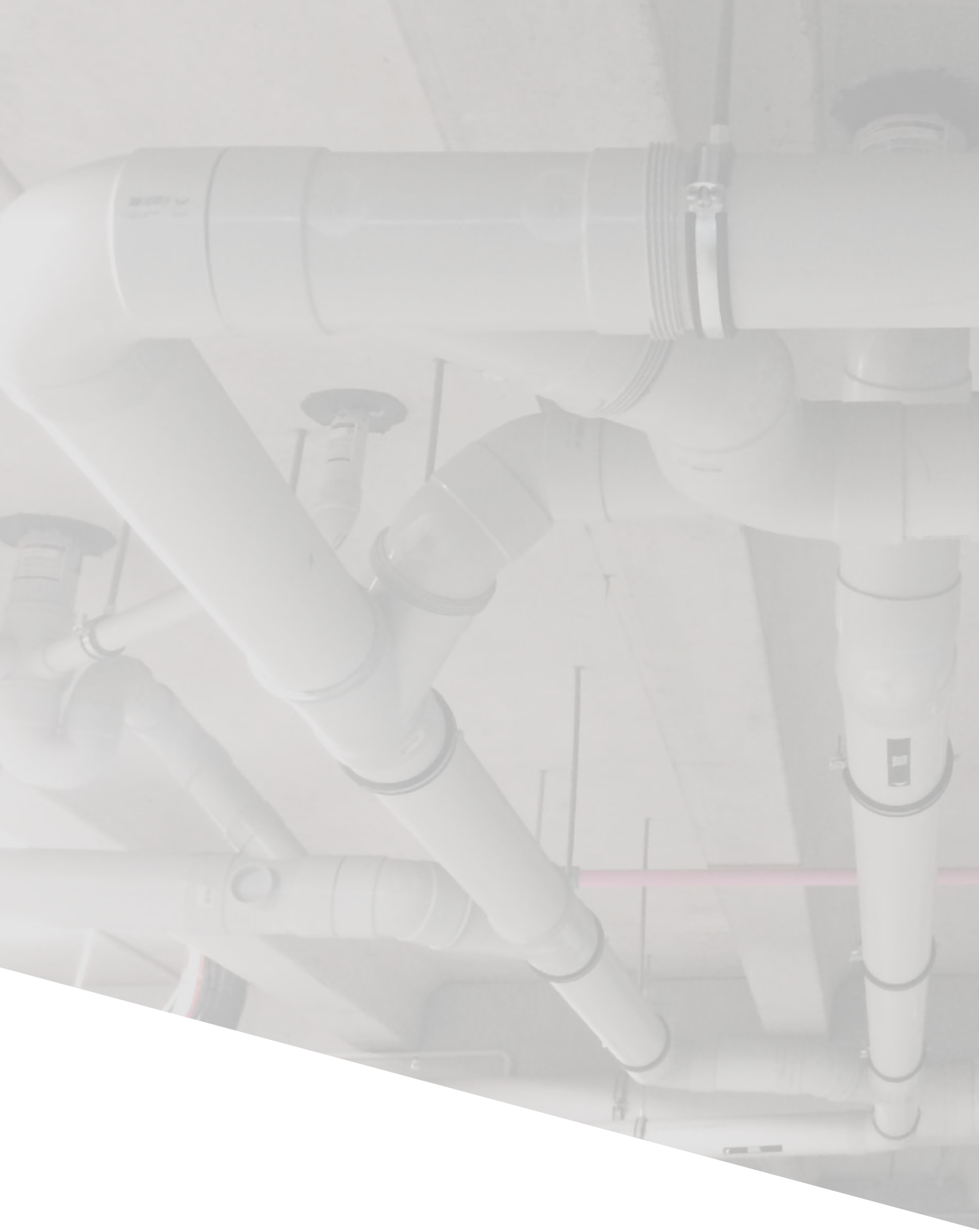
Iplex Pipelines technical and sales support staff are available to answer your questions on our range of products and their applications.

Other products

Iplex Pipelines manufactures in New Zealand a range of PVC and PE, pressure and non pressure pipe systems for the building, civil, export and rural markets.

This range and access to international product lines and technology, enables Iplex Pipelines to offer specialised products to meet the majority of our customers requirements. For further information on our range of products and added value services please contact one of our selected rural supply merchants or phone your local Iplex sales office on freephone 0800 800 262, Access to on-line technical support guidelines and brochures, with further contact details, and further contact details can be found by visiting the Resources section of our website at www.iplex.co.nz

NOTES



iPLEX Pipelines

More products from Iplex Pipelines

NOVADRAIN
DRAIN WASTE & VENT SYSTEMS

SUPERSTORM™ & STORMFIT
PVC STORMWATER DUCT SYSTEM

NEXUS™ HI-WAY
ROAD DRAINAGE SYSTEM

NOVAKEY™ & BLUE BRUTE
uPVC PRESSURE SYSTEMS

WHITE & BLUE RHINO™
HIGH IMPACT mPVC PRESSURE PIPE

BLUELINE
MEDIUM DENSITY POLYETHYLENE PIPE

POLIPLEX
POLYETHYLENE PRESSURE PIPE

ALKATHENE™
LOW DENSITY POLYETHYLENE PIPE

NOVATUBE
HORTICULTURAL LATERAL TUBE

GREENLINE, REDLINE™, RURAL BLACK & BLACKLINE
MEDIUM DENSITY POLYETHYLENE PIPE

PLASSON
METRIC COMPRESSION FITTINGS

NEXUS™FLO, NEXUS™COIL, NOVAFLO™ & NOVACOIL
LAND DRAINAGE SYSTEMS

IPLEX EFFLUENT PIPE
MEDIUM DENSITY POLYETHYLENE PIPE

FARMTUFF™ & NEXUS™ CULVERT
CULVERT PIPE

RAINWATER SYSTEMS
SPOUTING & DOWNPIPE

POLIGAS™
POLYETHYLENE GAS SYSTEMS

iplex.co.nz

Iplex Pipelines NZ Limited
Call 0800 800 262 or Fax 0800 800 804

Auckland: Private Bag 92 114, 810 Great South Road, Penrose
Palmerston North: Private Bag 11019, 67 Malden Street
Christchurch: PO Box 16225, 22 Braeburn Drive, Sockburn

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