FloPlast

building the future

Underground Drainage Systems

www.floplast.co.uk

UNDERGROUND DRAINAGE SYSTEMS

Introduction to FloPlast's Underground Drainage Systems

FloPlast are an established market leader in the manufacture and supply of Plastic Building and Plumbing systems in the UK. The Company's specialises in the following:

- PVC-UE Roofline, Window & Cladding Systems
- Rainwater Systems
- Soil & Waste Systems
- Underground Drainage Systems.
- MDPE Pipe and Fittings
- Hot & Cold Plumbing Systems

FloPlast Underground Drainage Systems comply where applicable with the requirements of the following British Standards.

bsi. PVC-U, PP, PE Piping Drainage & Sewerage BS EN 13476-2 KITEMARK™ KM 563462

bsi. PVC-U Piping Systems Drainage & Sewerage BS EN 1401-1 KITEMARK™ KM 563461

bsi. PVC-U Piping Systems Drainage & Sewerage BS EN 1401-1 KITEMARK™ KM 544332

BS EN 1401-1 PVC-U
Underground Drainage Systems (SN4)

BS EN 13476-2
Structured Wall Piping Systems (SN8)

BS EN 124
Access Covers, Gratings and Frames.

BS EN 13598 - 1
Plastic Inspection Chamber for Drainage.

"Plastic piping systems for non-pressure underground drainage and sewerage. Unplasticised polyvinyl chloride (PVC-U). Polypropylene (PP) and Polyethylene (PE)."

Part 1: Specification for ancillary fittings including shallow inspection chambers.

For CE DOP's (Declaration of Performance), please refer to our website at www.floplast.co.uk.

Drainage Pipe has a British Standard Kitemark.

Standards/Quality Control
FloPlast operations embrace quality, environment and energy management systems which have been accredited by BSI to BS EN ISO 9001:2015 Certificate No. FM 501414, BS EN ISO 14001:2015 Certificate No. EMS 538445, BS EN ISO 18001:2007 Certificate No. OHS 593622 501414 and ISO 50001:2011 Certificate No. ENMS 638370.

bsi. ISO 9001 Quality Management FM 501414 | ISO 14001 Environmental Management EMS 538445 | ISO 45001 Occupational Health and Safety Management OHS 593622 | ISO 50001 Energy Management ENMS 638370

All products are subject to continuous quality control procedures and products manufactured to British Standard Specifications are marked accordingly.

Transport, Handling & Storage

Storage
FloPlast PVC-U pipes are supplied in secure bales bound with straps within timber frames, FloPlast recommend that the movement of bales is carried out by the fork lift or other mechanical device, using webbing or rope ties.

The bales may be stacked up to a maximum of three high, providing that the timber frames are placed on each other.

Fittings are generally supplied in plastic bags and should be stored away from direct sunlight. If they have to be stored outside, the bags should be opened to prevent temperature build-up.

Application
FloPlast Underground Drainage Systems are designed for use in gravity drainage and sewerage installations, at depths of up to ten metres.

Composition
All drainage pipes and the majority of fittings are manufactured from unplasticised Polyvinyl Chloride (PVC-U).

Inspection chambers, 0 - 90° adjustable bends, gully traps and gully grids are manufactured from polypropylene.

Colour
Pipes and fittings are manufactured in golden brown (terracotta) with exceptions as indicated in the product guide.

Terms & Conditions of Sale
Goods are sold subject to our Standard Terms and Conditions of Sale, copies of which are available upon request.

FloPlast Limited reserve the right to modify or extend any product range or published information without prior notice.

110mm Pipe & Fittings

Material: PVC-U Standard: BS EN 1401-1, BS EN 13476-2

FloPlast socketed underground pipe incorporates the latest blown end technology. The easy fit rubber seal is held in place via a circular plastic insert allowing a retention of the seal in transit and a perfect connection for jointing.

All Push-Fit underground fittings have a captive seal and snap cap which are designed to be user-friendly with no sharp edges, and with space restrictions in mind, will facilitate an easy fit connection. The seal is double ribbed, and the sockets incorporate a recessed area to provide space for the rubber seal to locate as the pipe is inserted, forming a high-capacity pressure point.

Manufacturers that produce to these standards: BS EN 1401/BS 4660/BS 7158/ BS EN 124

Brand	110mm	160mm
Hepworth	✓	✓
Brett Martin	✓	✓
Osma/Wavin	✓	✓
Polypipe	✓	✓
Polypipe Terrain	✓	✓
Marley	✓	✓
Hunter	✓	✓

FloPlast Installation Videos

Our step-by-step installation videos (available online), make it clear and easy to get to grips with all the technical elements involved in what may be a complex process.

Visit www.floplast.co.uk and download a pdf step by step guide to help with your installation.

Product		Code
Pipe - 3/6m		
 Plain Ended (Bale quantity 50)	3m	D043
	6m	D046
 Perforated Plain Ended (Bale quantity 50)	6m	D046P
 Single Socket (Bale quantity 50)	3m	D143
	6m	D146
Pipe Coupling		
 Single Socket Coupling		D124
 Double Socket Coupling Removable centre stop for use as slip coupling		D105
Single Socket Bends		
 87½° Bend (Socket/Spigot)		D161
 45° Bend (Socket/Spigot)		D163
 30° Bend (Socket/Spigot)		D164
 15° Bend (Socket/Spigot)		D167
Double Socket Bends		
 87½° Bend		D561
 45° Bend		D563
 30° Bend		D564
 15° Bend		D567

110mm Pipe & Fittings

Material: PVC-U Standard: BS EN 1401-1, BS EN 13476-2

Product	Code
Rest Bends	
 87½° Rest Bend	D571
 87½° Settlement Rest Bend	D570
Adjustable Bends	
 0-90° Adjustable Bend	D560
Large Radius Bends	
 87½° Plain End	D281
 45° Plain End	D283
 87½° Plain End with Channel Access	D581
 45° PE with Channel Access	D583
Equal Junctions Double Socket	
 87½° Junction	D190
 45° Junction	D210
Equal Junctions Triple Socket	
 87½° Junction	D191
 45° Junction	D211

Product	Code
Access Fittings	
 87½° Access Bend (Socket/spigot)	D169
 Access Pipe (Socket/spigot)	D274
 Screwed Access Cap	D292
 Channel Access Pipe PE 1mtr	D870
Rodding Points	
 PVC Oval Rodding Point (Spigot)	D881
 PVC Oval Rodding Point (Socketed)	D882
 PVC Square Rodding Point (Spigot)	D883
 PVC Square Rodding Point (Socketed)	D884
(45° rodding point with sealed access cover suitable for loading up to 10kN (1 tonne) where the frame of the cover is supported by a concrete plinth)	
110mm Non-Return Valve CE	
 110mm Non-Return Valve-Single Flap	D550
DrainGuard	
 Fits round and square downpipe	DG1

110mm Fittings

Material: PVC-U Standard: BS EN 1401-1, BS EN 124

Product		Code
Universal Traps		
	Universal Gully Trap (Socket/Spigot 45°)	D500
	Low Back 'P' Trap	D501
	Leaf/Debris Interceptor Gully	D94
	Spare Square Grid	D502
	Square Blank Cover Grid	D508
	Square Hopper Including Polypropylene Grid	D504
	Rectangle Blank Cover Grid	D507
	Rectangular Hopper Including Polypropylene Grid	D506
Bottle Gully Traps		
	Bottle Gully Circular Grid	D510
	Bottle Gully Square Grid	D515
	Bottle Gully Rectangular Grid	D520
	Back Inlet Bottle Gully Rectangular Grid	D530
	Back Inlet Bottle Gully Circular Grid	D540
	200mm Riser	D505

Product		Code
Hopper and Grid		
	Round Hopper and Grid	D514
	Square Hopper and Grid	D518
	Rectangular Hopper and Grid	D524
Adaptors		
	110mm Waste Available in B W G	SP95*
	110x68mm Rainwater Available in B W G	SP96
	Universal Waste (32/40/50mm)	D95
	Universal Rainwater (Square/Round)	D96
	80x110mm	D97
	160x110mm Level Invert (Socket/Spigot)	D99
	Supersleve Clay DS	D100
	Hepsleve Clay DS	D101

Important when ordering: Please add colour reference to code: B Black W White G Grey

110mm Fittings

Material: PVC-U Standard: BS EN 1401-1, BS EN 124

Product	Code
Drain Connector	
 Available in B G	SP107
Connects directly into socket of a cast iron clay or plastic pipe system to provide a socket for plastic pipe.	
Flexible Couplings, Connectors and Adaptors	
 Coupling 98mm-115mm	D102
 Adaptor A: 98mm-115mm B: 120mm-136mm	D103
Socket Plug	
	D296

Features & Benefits

- Provides an efficient means of waste water drainage and foul discharge from above ground drainage systems.
- Manufactured in PVC-U to give a strong durable product which is lightweight and easy to work with.
- Suitable for high temperature waste discharge.
- Fittings have an aesthetic modern look, are compact in size, yet remain within the British Standard specification.
- Push-Fit joint through an innovatively designed seal and snap cap system.
- Comprehensive range of fittings to suit most installations and which integrate with all FloPlast above and below ground drainage systems.

Important when ordering: Please add colour reference to code: B Black G Grey

110mm Fittings

Material: Polypropylene Standard: BS EN 1401-1, BS EN 124, BS EN 13598-1 & 2

Product	Code
Large Inspection Chamber - 450mm Diameter (LIC)	
 270mm Deep Chamber Base **5x110mm flexible inlets** Supplied with 4 socket plugs (Allows for 0-20° of movement)	D900
 270mm Deep Chamber Base **5x110mm fixed inlets** Supplied with 4 socket plugs	D910
 235mm Extension Riser (Can be cut to size)	D915
 235mm Extension Riser and Seal (Can be cut to size)	D916
 Riser Sealing Ring (Use with each riser)	D935
 450mm Plastic Cover and Frame (A15 rating)	D930
 450mm Plastic Cover and Frame with 350mm restricted access (A15 rating) (For use with I.C. over 1.2mtr deep up to 3mtr)	D931
 Cast Iron Cover and Plastic Frame (A15 rating) (For replacement purposes only)	D923
 Block Paving Cover 450mm Square/Round	D933
 450mm Ductile Iron Cover/Frame (B125 rating) (Conforms to the requirements of SfA7)	D934
 **NEW** 450mm Plastic Cover and Square Frame (A15 rating)	D940
 **NEW** 450mm Plastic Cover and Square Frame (A15 rating) restricted access (For use with I.C. over 1.2mtr deep up to 3mtr)	D941

To conform with document H Building Regulations H2015 use D930/D931/D940/D941 as required.
450mm inspection chamber covers are compatible with the 160mm Inspection Chamber base.

Product	Code
Mini Access Chamber - 300mm Diameter (MAC)	
 270mm Deep Chamber Base **5x110mm flexible inlets** Supplied with 4 socket plugs (Allows for 0-20° of movement)	D800
 270mm 45° Inlet Chamber Base **3x110mm flexible inlets** Supplied with 2 socket plugs (Allows for 0-20° of movement)	D801
 270mm 90° Inlet Chamber Base **3x110mm flexible inlets** Supplied with 2 socket plugs (Allows for 0-20° of movement)	D802
 270mm 45° Inlet Chamber Base **3x110mm fixed inlets** Supplied with 2 socket plugs	D810
 100mm Chamber Riser With integral rubber ring (60mm cut down facility)	D820
 200mm Chamber Riser With integral rubber ring (60/100/150mm cut down facility)	D822
 Square 340mm Sealed Plastic Screw Down Cover and Frame (A15 rating)	D830
 Round 300mm Sealed Plastic Screw Down Cover and Frame (A15 rating)	D831
 Block Paving Cover 300mm Square/Round	D932
800g Lubricant Gel	
	SG800

Inspection Chambers (Polypropylene)

FloPlast 300mm Mini Access Chamber and 450mm Large Inspection Chamber offer an alternative to traditional manholes and may be used in depths of up to 600mm for the MAC, 1200mm and 3000mm for the Large Inspection Chamber.

300mm Mini Access Chamber (MAC)
FloPlast innovative design for the MAC, brings unrivalled flexibility to the underground drainage market.

The MAC has flexible connections for all inlets, allowing a 10° movement in any direction. This is of great assistance to the installer where the connecting pipes are not perfectly aligned with the MAC inlets. In many instances it will eliminate the need to install an extra bend and provide a saving on the cost of the installation.

In addition, the variety of inlet combinations available on the FloPlast Mini Access Chamber and the choice 100mm and 200mm chamber risers, provide installers with a significant advance in the ease of which they can plan and install their drainage system. The MAC base is designed to facilitate the stacking of bases on top of one another to give a space saving storage solution for the merchant stockist.

In summary, the FloPlast Mini Access Chamber design and flexibility provides a practical, innovative and cost effective solution for the provision of access in a drainage system.

BS EN 13598 - 1: 2010 Plastic Inspection Chamber for drainage.

UK Patent No. GB2357127.

450mm Diameter Large Inspection Chamber (LIC)
FloPlast product innovation is again demonstrated with its 450mm Diameter Large Inspection Chamber.

To comply with the changes to Approved Document H of The Building Regulations 2000, significant research and development has gone into the design of this unique product. The chamber base incorporates five 110mm flexible inlets, which allow 10° of movement in any direction.

The plastic cover and frame can take loadings of up to a maximum of 35kN. Should the connection of D930/D931 cover and frame be required directly to the base D900/D910, then riser D915 must be used and cut to suit, by cutting just above the bottom most large flange/rib.

(Please ensure sealing rings are used in conjunction with each riser section).

FloPlast installation details are concise, however they are provided for general guidance only.

FloPlast recommend that reference should be made to the appropriate Codes of Practice for Underground Drainage Systems.

European Standards BS EN 752:2008 Drain and sewer systems outside buildings and BS EN 1610:2015 Construction and testing of drains and sewers, have been introduced. These have replaced British Standards BS8301 (Code of Practice for Building Drainage).

Meets with the requirements of Sewers for Adoption - 7th Edition (SfA7), type 3 and 4 typical inspection chamber detail.

Useful Measurements for Installation of MAC & LIC

	Mac	inc' Lid
Base only	270	300
Base + one riser (100mm)	370	400
Base + one riser (200mm)	470	500
Base + (1 x 100 x 1 x 200) risers	570	600

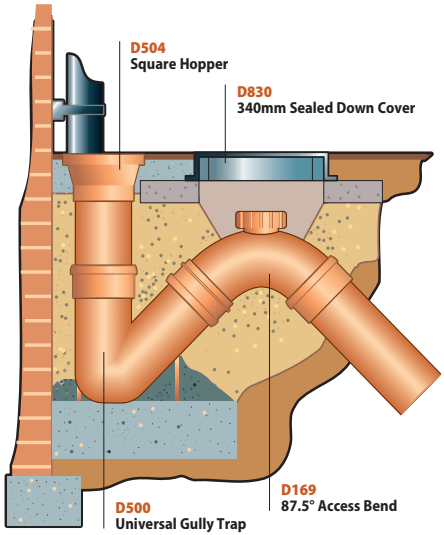
LIC Invert Depth (mm)	270	505	740	975	1210	1445	1680	1915	2150	2385	2620	2855	3090
Number of Riser Required	Base only	1	2	3	4	5	6	7	8	9	10	11	12
Cover Required	(D930) 450mm opening up to a maximum of 1200mm					(D931) 350mm opening up to a maximum of 3000mm							

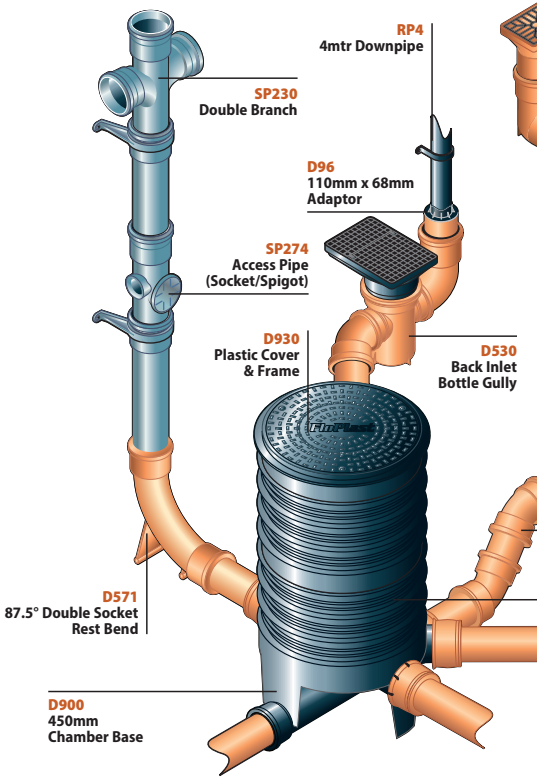
Underground Drainage

Installation guide - Universal gully trap with access facility

- The gully should be assembled out of the ground.
- Place the gully on a substantial base e.g. Pre-cast concrete slab, bricks etc and stabilise by concreting base up to the level where the supporting feet meet the gully body. Ensure that concrete does not enter the ring seal joint.
- Connect the Access Bend (D169) onto the 45° spigot end of the gully using FloPlast Silicone lubricant to assist with easy insertion.
- Make connection to drainage run using socketed pipe (D146).
- Backfill with suitable material to the required level.
- To complete the access installation, set in concrete an airtight 340mm Sealed PVC Cover and Frame (D830).

D560
0-90° Adjustable Bend



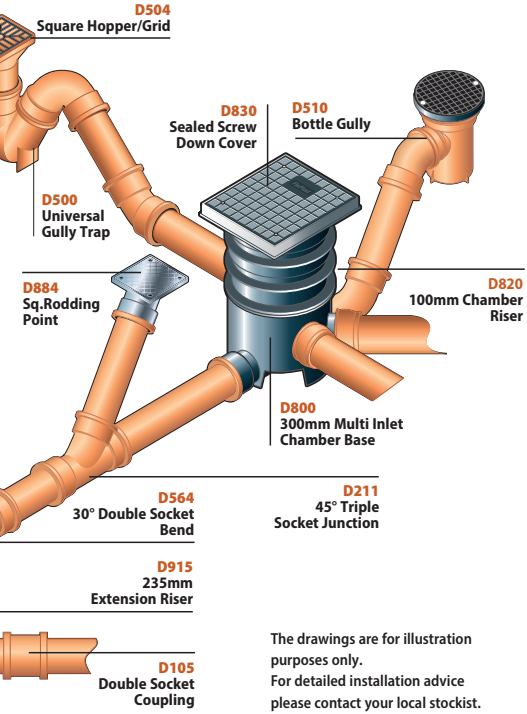


Underground Drainage

Back Inlet Bottle Gully (BIG)

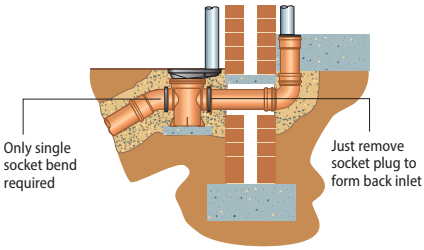
- Screw down, hinged rectangular heavy duty hopper.
- Heavy duty circular hopper available (D540).
- Both hoppers allow for height adjustment of 32mm.
- Sealed dip tube easily removed for rodding purposes.
- Gully riser allows an increase of invert depth up to 200mm (D505). Maximum of one riser only.
- Back inlet socket plug easily removed. No need to drill.

D530
Back Inlet Bottle Gully with Rectangular Lid

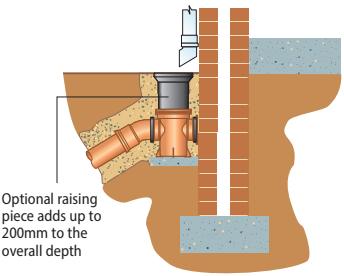


The drawings are for illustration purposes only.
For detailed installation advice please contact your local stockist.

Bottle Gully with rectangular hopper



Bottle Gully with circular hopper



160mm Pipe & Fittings

Material: Polypropylene/PVC-U Standard: BS EN 1401-1, BS EN 13598-1&2, BS EN 13476-2, BS EN 124

Product		Code
Pipe - 3/6m		
 Plain Ended (Bale quantity 35)	6m	6D046
 Single Socket (Bale quantity 35)	3m	6D143
	6m	6D146
Pipe Coupling		
	Double Socket	6D105
Single Socket Bends		
	87½° Bend (Socket/spigot)	6D161
	45° Bend (Socket/spigot)	6D163
	30° Bend (Socket/spigot)	6D164
	15° Bend (Socket/spigot)	6D167
Double Socket Bends		
	87½° Bend	6D561
	45° Bend	6D563
	30° Bend	6D564
	15° Bend	6D567
Adaptors		
	160x110mm Level Invert (Socket/spigot)	D99
	Flexi-Adaptor Cast iron/160mm	6D102
	Clay Adaptor A: 160mm-180mm B: 180mm-200mm	6D104
Socket Plug		
		6D900P

Product		Code
Equal Junctions		
	87½° Junction (Double Socket)	6D190
	45° Junction (Double Socket)	6D210
	87½° Junction (Triple Socket)	6D191
	45° Junction (Triple Socket)	6D211
160/110mm Unequal Junctions		
	87½° Junction (Double socket)	6D198
	45° Junction (Double socket)	6D218
160mm Large Inspection Chamber - 450 Diameter (LIC)		
	160mm x 160mm 90° Chamber Base with two 45° 110mm Inlets	6D900
	235mm Extension Riser (Can be cut to size)	D915
	235mm Extension Riser and Seal (Can be cut to size)	D916
	Riser Sealing Ring (Use with each riser)	D935
	450mm Plastic Cover and Frame (A15 rating)	D930
	450mm Plastic Cover and Frame with 350mm restricted access (A15 rating) (For use with I.C. over 1.2mtr deep up to 3mtr)	D931
	Cast Iron cover and Plastic Frame (A15 rating)	D923
	**NEW** 450mm Plastic Cover and Square Frame (A15 rating)	D940
	**NEW** 450mm Plastic Cover and Square Frame (A15 rating) restricted access (For use with I.C. over 1.2mtr deep up to 3mtr)	D941

To conform with document H Building Regulations H2015 use D930/D931/D940/D941 as required. 450mm inspection chamber covers are compatible with the 160mm Inspection Chamber base.

Pipe Weights

Single socket pipe

Size	Length	Weight (kg/m)	Code
110mm	3m	1.63	D143
	6m	1.63	D146
160mm	3m	3.03	6D143
	6m	3.21	6D146

Plain ended pipe

Size	Length	Weight (kg/m)	Code
110mm	3m	1.6	D043
	6m	1.26	D046
160mm	6m	3.03	6D046

Plain ended perforated pipe

Size	Length	Weight (kg/m)	Hole size	Hole Centres	No. of Holes	Code
110mm	6m	1.72	7mm	20mm	210	D046P

Pipe & Fitting Dimensions

Wall Thickness

Product	Min/Max	110mm	160mm
Pipes	min	3.2	4
Fittings	min	3.2	4

Mean outside diameter pipe and fittings spigot

Min/Max	110mm	160mm
Min	3.2	4
Max	3.8	4.6

Size of bales

Product	No. of 3m/6m lengths per bale	Dimensions height	width	Weight per bale
D043 (PE)	50	3m	1.2m	245kg
D143 (SS)	50	3m	1.2m	245kg
D046 (PE)	50	6m	1.2m	490kg
D046P (PE)	50	6m	1.2m	516kg
D146 (SS)	50	6m	1.2m	490kg
6D143 (SS)	35	3m	1.2m	337kg
6D046 (PE)	35	6m	1.2m	657kg
6D146 (SS)	35	6m	1.2m	674kg

(PE): Plain ended pipe (SS):Single socket pipe

Installation Guide - Pipe & Fittings

Trench Detail and Backfill Material

The trench should be constructed 300mm wider than the outside diameter of the pipe to be installed. Where the "as dug" material is suitable, the bottom of the trenches may be trimmed to form a pipe bed. The material can also be used as a sidefill and backfill. Imported granular backfill materials such as pea shingle, used in accordance with the recommendations of BS5955 Part 6: 1980 Appendix A, having a nominal particle size not exceeding 10mm, should be used as required up to and over the crown of the pipe. When this has been achieved the "as dug" material can be replaced into the trench. Once 300mm of material has been replaced, mechanical compaction can commence.

Testing

Testing of all drainage installations should be carried out in accordance with the requirements of the appropriate approving authority, using either air or water testing. References should be made to current editions of Building Regulations (Approved Document 'H') BS EN 752:2008 and BS EN 1610:2015. Where drainage appears inside buildings BS EN 12056 should also be consulted.

Jointing

Pipe End Preparation

When cutting pipes ensure that all ends are chamfered and are free from swarf, grit and dirt.

Ring Seal Joints

The FloPlast Ring Seal Joint acts as both a seal and expansion joint. The following sequence should be adhered to:

- Check that all ring seal sockets are properly located in their recessed position.
- Ensure spigots and ring seal sockets are dry, clean and free from grit and dirt.
- Lubricate all ring seal fittings. This will allow for a fast and efficient connection.
- Ensure all pipes and fittings are in the correct position.
- Insert pipe fully into the socket, then withdraw pipe by a minimum of 12mm. This will allow for expansion.

Adaptors

External rainwater downpipes can be connected directly to a surface water drain or, depending on the design, via a gully trap to the underground drainage system. The diameter of FloPlast's 110mm PVC- U above and below ground drainage systems are the same and therefore a direct connection may be achieved without the use of an adaptor. Where rainwater pipes connect directly to a drain, a suitable reducer will be required as follows:

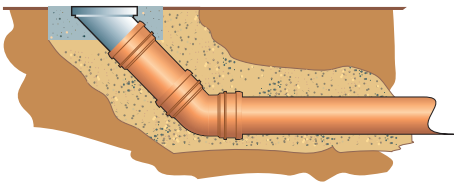
- **SP96**: 110mm x 68mm Rainwater Adaptor for round downpipe. RDS2 should be used with SP96 for connection to 65mm square downpipe.
- **D96**: Universal Rainwater Adaptor for square and round downpipe.
- **D95**: Universal Waste Adaptor for 32mm, 40mm and 50mm waste pipe connection to 110mm Soil/ Drainage.

Connection to other materials such as Cast Iron, Supersleve and Hepsleve, is achieved by the use of a range of rigid and flexible couplings and adaptors.

Access and Rodding Points

Access is very important on all installations for testing, inspection, and removal of any blockage or debris. Rodding in both directions can be achieved by using a Mini Access Chamber (MAC) or 450mm Large Inspection Chamber (LIC) in conjunction with access fittings.

Rodding points are more commonly used in storm water drainage systems where the rodding point is located at the head of the drain run connection to a chamber, and being no further than 22 metres away from the chamber. The rodding point should be enclosed in a concrete surround to provide support and to ensure that it does not become mislaid at ground level.



Installation Guide - Mini Access Chamber (MAC)

A mini access chamber has a relatively narrow riser shaft, and is used for inspecting, clearing, and rodding a drain line.

The narrowness of the riser shaft permits limited clearing and rodding to a maximum depth to invert of 600mm.

For SfA7 installations this chamber can be installed up to 2000mm.

Any unused side connections should be sealed with a plain socket plug.

Should bends be required to change direction, these should be sited at the point of entry to the chamber.

Side branches of the chamber should not be used to change direction of the main flow, as a self-cleansing flow through the chamber cannot be guaranteed.

Intermediate depths can be achieved by cutting a riser at the indicated points.

The frame and cover should also be adjusted to suit the level of the adjacent ground and surrounded in a minimum of 50mm of concrete.

Installation Guide - Large Inspection Chamber (LIC)

The large diameter of the riser shafts of inspection chambers enables them to be installed to a maximum depth to invert of 1200mm when used in conjunction with a 450mm opening cover and frame. The chamber complies with Approved Document H of the Building Regulations 2000 by using the 350mm reduced opening cover and frame for installations over 1200mm up to a maximum of 3000mm invert depth. For SfA7 installations the invert depths are 1000mm and 3000mm.

The chamber is installed on a suitable bed dependent on the quality of the trench and backfill materials.

Backfilling is continued up to approximately 50mm of the finished ground level.

The frame and cover are placed on a bed of concrete around the top of the uppermost shaft, and adjusted to the finished level.

The frame is securely fixed through the wall of the chamber at the set location points using self-tapping screws. The cover is then secured to the frame with the captive screws. It is impossible for the cover to be removed without undoing the screws.

Intermediate depths can be achieved by cutting the riser at 60mm intervals; the frame also has 55mm of telescopic adjustment.

Any unused side connections should be sealed with a plain socket plug.

Should bends be required to change direction, these should be sited at the point of entry to the chamber.

Side branches of the chamber should not be used to change the direction of the main flow, as a self-cleansing flow through the chamber cannot be guaranteed.

Should the connection of D930/D931/D940/D941 cover and frame be required directly to the base D900/D910, then riser D915 must be used and cut to suit, by cutting just above the bottom most large flange/rib.

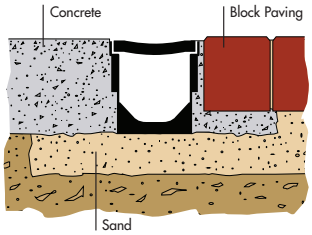
FloDrain 110mm Domestic Channel Drainage

Material: Polypropylene/Galvanised steel Standard: BS EN 1433 Attestation level 3

Product	Code
Channel Drain with Plastic Grate - 1mtr (Pallet qty 90) CE	
	D700
Drain Corner with Plastic Grate CE	
	D710
Garage Pack with Plastic Grate (Pallet quantity 16) CE	
	D750
(Consists of 3x1m Channel lengths plus 1x End cap & 1x End outlet)	
Sump/Trap Unit and Basket with Plastic Grate CE	
	D732
End Cap CE	
	D711
End Outlet CE	
	D712
Balloon Guard	
	D714

Product	Code
Channel Drain with Galvanised Grate - 1mtr (Pallet qty 90) CE	
	D701
Drain Corner with Galvanised Grate CE	
	D720
Garage Pack with Galvanised Grate (Pallet quantity 16) CE	
	D751
(Consists of 3x1m Channel lengths plus 1x End cap & 1x End outlet)	
Sump/Trap Unit and Basket with Galvanised Grate CE	
	D733
Threshold Channel Drain - 1mtr CE	
	D730
Channel Drain Jointing Clip	
	D734
Corner Spacer CE	
	D715

- Quality domestic surface Channel Drainage 110mm x 100mm (Internal channel dimensions).
- Anti-slip heel guard grating.
- Garage Pack available (3 x 1m length, end cap and outlet).
- 5 tonne spread load. 1.5 tonne point load.
- 4 outlets per length for maximum flexibility.
- Quad section for corners and junctions.
- Concave grid for maximum flow.



Installation Guide - FloDrain 110mm Domestic Channel Drainage

Domestic Channel Drainage
Easy to install with concrete or paving

1. Dig trench for FloDrain, allowing for 50mm deep compacted sand base and wide enough for a minimum of 100mm backfill of concrete on each side.
2. Fix a string line to finishing height of grate 2mm below final surface level.
3. Allow a fall of approx. 5mm for every 1m length (1:200).
4. Start installation at lowest point of the run to accommodate any cut lengths which should be installed at the point furthest from the outlet.
5. FloDrain joints and end caps to be sealed with silicone sealant.
6. Use an end cap at highest point of FloDrain.
7. Connect the lowest end of FloDrain to 110mm PVC- U BS EN 1401 drainage pipe using either an end outlet or the preformed channel bottom outlet to allow water to drain away. Contact FloPlast for additional coupling details for other connections e.g. clay pipes etc.
8. FloDrain can be cut to length with a hacksaw. Install with grate fitted.
9. Protect grate with tape before concrete is poured.
10. Finish concrete 2mm above level of grate.
11. Allow 72 hours to cure before vehicle use or removing grates.
12. To remove grate, simply run a screwdriver along the edge of the grate to dislodge.
13. If installing block paving or paving slabs, haunch around channel with concrete to a height which allows the depth of the block or slab to finish 2mm above the level of grate.

All FloDrain installations must be set in concrete.

Easy to use channel to channel locking system

Certified to Load Class A15 BS EN 1433 = 1.5 tonne

Built in heel guard and anti slip system

90° Tee

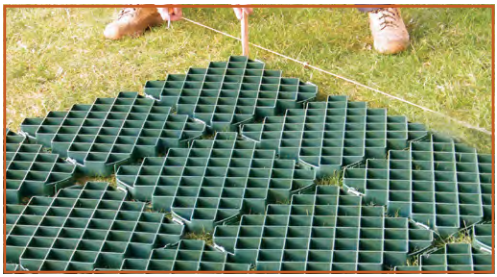
4 Way Junction

90° Bend

GroundGuard

Lightweight ground reinforcement system suitable for pedestrian areas and light vehicle access

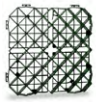
Ground Guard is a linked paving system, manufactured from Polyethylene, that provides a durable safe and eco-friendly surface for grass reinforcement, ground stabilisation and gravel retention for pedestrian and vehicle access areas.



Suitable for:

- Additional/overflow grass car parks.
- Walkways and disabled access routes.
- Golf buggy paths.
- Driveways and residential lawn parking.

Please visit www.floplast.co.uk for installation instructions.

Product		Code
GroundGuard Tiles		
	Pack of 20 = 3 square metres 1 Tile = 390 x 390 x 40mm Tested in excess of 200 tonnes per square metre spread load	G40

Land Drainage

Standard: BS 4962, Licence No: KM557607

Land Drainage is used to remove excess water from fields and gardens, in fact any area where excessive water is a problem.

The perforations allow seeping water to ingress the pipe, capillary action then maintains the water within the pipe allowing it to flow to its destination i.e. Stormwater Attenuation Tanks, also known as Modular Plastic Geo Cellular Units (egg crates) or a watercourse (stream, lake etc).

System Features:

- Perforated and coiled land drainage pipe is manufactured in HDPE.
- Normally used in agriculture and in building construction sites.
- Particularly beneficial in areas with heavy ground conditions i.e. clay.
- Relieves hydrostatic pressure.

Product			Code
Pipe			
	Perforated Plain Ended (Bale quantity 50)	6m	D046P

Product	No Size O.D	Code
Couplings		
	80mm	LC80
	100mm	LC100
Multi-Junction Branch		
	60/80/100mm	LJ100
Land Drainage - 25m Coil		
	80mm x 25m	L8025
	100mm x 25m	L10025

Ancillaries

Product	Code
40ml Compressed Silicone Lubricant Spray	
	SL40
100g Silicone Grease	
	SG100
800g Lubricant Gel	
	SG800

Product	Code
125ml Solvent Cement CE	
	SC125
250ml Solvent Cement CE	
	SC250

Number of joints achievable (for guidance only)

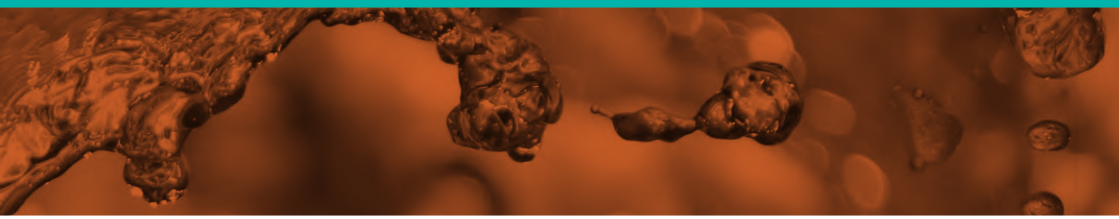
Lubricant	32mm	40mm	50mm	110mm
100g Silicone Grease	160	120	100	60
800g Lubricant Gel	1200	950	800	450
40ml Silicone Spray	600	420	400	225

Number of joints achievable (for guidance only)

Solvent Cement	32mm	40mm	50mm	110mm
125ml	27	27	27	7
250ml	55	55	55	15

FloPlast

building the future



Contact Details:
FloPlast Limited
Castle Road
Eurolink Business Park
Sittingbourne
Kent ME10 3FP
UK

Tel
01795 431731

Sales Office Direct Line
01795 421422

Fax
01795 431188

E-mail
sales@floplast.co.uk

Website
www.floplast.co.uk

Brochures available:

bsi. ISO 9001 Quality Management | ISO 14001 Environmental Management | ISO 50001 Energy Management | BS OHSAS 18001 Occupational Health and Safety Management

bsi. BS EN 607 BS EN 1329 BS EN 1462 BS EN 12380 BS EN 1401-1 BS EN 1455 BS EN 12200-1 BS 7291-1, 2 & 3 KITEMARK

20 YEAR CAST IRON GUARANTEE

10 | 20 | 10

nssPlus

PART H

BBA BRITISH BOARD OF AGREEMENT CERTIFICATE No.00/3775

BBA BRITISH BOARD OF AGREEMENT CERTIFICATE No.00/3776

CE www.floplast.co.uk

WRAS APPROVED PRODUCT

NMBS STRENGTHENING INDEPENDENTS

April 2020

Roofline, Window and Cladding Systems

Rainwater Systems

Soil & Waste Systems

Underground Drainage Systems

MDPE Systems

Hot & Cold Plumbing Systems

Marshalls
Civils & Drainage

Perfect Manhole Take-Off

Herne Bay Crematorium REV 1

Sealed Take-Off

Revision: 1

20/12/2022

Marshalls Civils & Drainage

Perfect Manhole Take-Off

Project:	Herne Bay Crematorium REV 1	Revision:	1	System:	Sealed
				Step Irons:	Yes
Production Site:	Pollington		Software Version: V8.3	Scottish Lothian Slab:	No

Manhole Reference	Production Site	Manhole Diameter (mm)	Cover Level (m)	Invert Level (m)	Main Channel Diameter (mm)	No. of Connections	Cover Size (mm)	Cover Class	No. Of Backdrops	Reduce Chamber To DN1200 if Possible	No. of Seating Rings
MG MH05	Pollington	1200	18.720	17.615	300	2	600x600	B125	0	No	3
MG MH06	Pollington	1200	18.560	17.415	300	2	600x600	B125	0	No	3
S10	Pollington	1200	17.400	16.270	150	3	600x600	D400	0	No	3
S11	Pollington	1200	17.110	16.000	150	4	600x600	D400	0	No	3
S12	Pollington	1200	17.080	15.840	150	3	600x600	D400	0	No	3
S13	Pollington	1200	17.400	16.270	150	3	600x600	D400	0	No	3
S14	Pollington	1200	17.110	16.000	150	4	600x600	D400	0	No	3
S16	Pollington	1200	17.050	15.655	225	3	600x600	D400	0	No	3
S18	Pollington	1200	17.705	16.625	150	2	600x600	D400	0	No	3
S19	Pollington	1200	17.365	16.285	150	3	600x600	D400	0	No	3
S20	Pollington	1200	17.270	16.190	150	2	600x600	D400	0	No	3
S22	Pollington	1200	16.915	15.500	225	3	600x600	D400	0	No	3
S24	Pollington	1200	16.595	15.605	150	3	600x600	D400	0	No	3
S25	Pollington	1500	16.935	14.605	375	3	600x600	D400	0	No	3
S32	Pollington	1200	17.930	16.580	150	2	600x600	D400	0	No	3
S33	Pollington	1200	17.680	16.200	225	3	600x600	D400	0	No	3
S40	Pollington	1200	17.270	15.770	300	3	600x600	D400	0	No	3
S41	Pollington	1200	17.060	15.560	300	4	600x600	D400	0	No	3
S43	Pollington	1200	17.170	15.380	300	4	600x600	D400	0	No	3
S50	Pollington	1200	16.850	15.200	300	4	600x600	B125	0	No	3
S51	Pollington	1500	16.750	14.825	450	3	600x600	B125	0	No	3
S53	Pollington	1200	16.890	14.490	300	3	600x600	D400	0	No	3
S54	Pollington	1200	15.400	14.265	300	2	600x600	B125	0	No	3

1200 Manholes

Item		MG MH05	MG MH06	S10	S11	S12	S13	S14	S16	S18	S19	S20	S22	S24	S32	S33	S40	S41	S43	S50	S53	S54
Cover Level, m		18.720	18.560	17.400	17.110	17.080	17.400	17.110	17.050	17.705	17.365	17.270	16.915	16.595	17.930	17.680	17.270	17.060	17.170	16.850	16.890	15.400
Invert Level, m		17.615	17.415	16.270	16.000	15.840	16.270	16.000	15.655	16.625	16.285	16.190	15.500	15.605	16.580	16.200	15.770	15.560	15.380	15.200	14.490	14.265
Internal Depth to Centre of Manhole, m (CL to Inlet Invert)		1.105	1.145	1.130	1.110	1.240	1.130	1.110	1.395	1.080	1.080	1.080	1.415	0.990	1.350	1.480	1.500	1.500	1.790	1.650	2.400	1.135
Effective Max Internal Depth, m (CL to Outlet Invert)		1.115	1.155	1.140	1.120	1.250	1.140	1.120	1.405	1.090	1.090	1.090	1.425	1.000	1.360	1.490	1.510	1.510	1.800	1.660	2.410	1.145
Base Core Height, mm (Nominal/Actual)		375/375	375/375	225/225	425/425	325/325	225/225	425/425	375/375	425/425	425/425	425/425	425/425	325/325	425/425	225/225	425/425	425/425	225/225	375/375	325/325	375/375
Base 1200x225-425x130 1:8	£1,035.47																					
Base 1200x225-425x130 1:7	£982.95																					
Base 1200x225-425x130 1:6	£930.43																					
Base 1200x225-425x130 1:5	£877.91																					
Base 1200x225-425x130 1:4	£825.39																					
Base 1200x225-425x130 1:3	£772.87				1			1										1	1	1		
Base 1200x225-425x130 1:2	£720.35			1		1	1		1		1		1	1		1	1				1	
Base 1200x225-425x130 1:1	£667.83	1	1							1		1			1							1
Base 1200x225-425x130 1:0	£667.83																					
1200mm x 1000mm Chamber Ring c/w seals	£296.17																					
1200mm x 750mm Chamber Ring c/w seals	£222.13																		1		1	
1200mm x 500mm Chamber Ring c/w seals	£211.96															1				1	1	
1200mm x 250mm Chamber Ring c/w seals	£147.38			1		1	1		1				1		1		1	1				
1200 c/slab 1200X675	£293.34																					
1200 c/slab 750x600	£184.52																					
1200 c/slab 675sq	£184.52																					
1200 c/slab 600sq	£184.52	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1200x675 Seating Rings	£80.91																					
750x600 Seating Rings	£39.27																					
675x675 Seating Rings	£39.27																					
600x600 Seating Rings	£39.27	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Cost of Manhole		£970.16	£970.16	£1,170.06	£1,075.20	£1,170.06	£1,170.06	£1,075.20	£1,170.06	£970.16	£1,022.68	£970.16	£1,170.06	£1,022.68	£1,117.54	£1,234.64	£1,170.06	£1,222.58	£1,297.33	£1,287.16	£1,456.77	£970.16
Remaining Make-up, mm		-15	25	-20	15	-10	-20	15	20	-15	-15	-15	-10	-5	0	5	0	0	-10	25	-5	15

1500 Manholes

Item		S25	S51
Cover Level, m		16.935	16.750
Invert Level, m		14.605	14.825
Internal Depth to Centre of Manhole, m (CL to Inlet Invert)		2.330	1.925
Effective Max Internal Depth, m (CL to Outlet Invert)		2.343	1.938
Base Core Height, mm (Nominal/Actual)		425/425	275/275
Base 1500x325-525x230 1:8	£2,252.84		
Base 1500x325-525x230 1:7	£2,153.48		
Base 1500x325-525x230 1:6	£2,054.12		
Base 1500x325-525x230 1:5	£1,954.76		
Base 1500x325-525x230 1:4	£1,855.40		
Base 1500x325-525x230 1:3	£1,756.04		
Base 1500x325-525x230 1:2	£1,656.68		
Base 1500x325-525x230 1:1	£1,557.32		
Base 1500x325-525x230 1:0	£1,557.32		
Base 1500x275-475x160 1:8	£1,973.69		
Base 1500x275-475x160 1:7	£1,874.33		
Base 1500x275-475x160 1:6	£1,774.97		
Base 1500x275-475x160 1:5	£1,675.61		
Base 1500x275-475x160 1:4	£1,576.25		
Base 1500x275-475x160 1:3	£1,476.89		
Base 1500x275-475x160 1:2	£1,377.53	1	1
Base 1500x275-475x160 1:1	£1,278.17		
Base 1500x275-475x160 1:0	£1,278.17		
1500mm x 1000mm Chamber Ring c/w seals	£475.96	1	
1500mm x 750mm Chamber Ring c/w seals	£356.97		1
1500mm x 500mm Chamber Ring c/w seals	£346.80		
1500 c/slab 1200x675 c/w 250mm extension	£724.60		
1500 c/slab 750x600 c/w 250mm extension	£601.59		
1500 c/slab 675sq c/w 250mm extension	£601.59		
1500 c/slab 600sq c/w 250mm extension	£601.59		
1500 c/slab 1200x675	£534.64		
1500 c/slab 750x600	£411.63		
1500 c/slab 675sq	£411.63		
1500 c/slab 600sq	£411.63	1	1
1500mm to 1200mm Reducing Slab c/w seals	£559.00		
1200mm x 1000mm Chamber Ring c/w seals	£296.17		
1200mm x 750mm Chamber Ring c/w seals	£222.13		
1200mm x 500mm Chamber Ring c/w seals	£211.96		
1200mm x 250mm Chamber Ring c/w seals	£147.38		
1200 c/slab 1200X675	£293.34		
1200 c/slab 750x600	£184.52		
1200 c/slab 675sq	£184.52		
1200 c/slab 600sq	£184.52		
1200x675 Seating Rings	£80.91		
750x600 Seating Rings	£39.27		
675x675 Seating Rings	£39.27		
600x600 Seating Rings	£39.27	3	3
Cost of Manhole		£2,382.93	£2,263.94
Remaining Make-up, mm		-2	-7

Marshalls
Civils & Drainage

Sales Order

Order Total **£28,369.08**

Item Number	Item Name	Qty	Unit Price	Sub Total
FQP001	SEALED BASE 1200X225-425X130 1:1 DS PPB/000/MG MH05	1	£667.83	£667.83
FQP001	SEALED BASE 1200X225-425X130 1:1 DS PPB/000/MG MH06	1	£667.83	£667.83
FQP002	SEALED BASE 1200X225-425X130 1:2 DS PPB/000/S10	1	£720.35	£720.35
FQP003	SEALED BASE 1200X225-425X130 1:3 DS PPB/000/S11	1	£772.87	£772.87
FQP002	SEALED BASE 1200X225-425X130 1:2 DS PPB/000/S12	1	£720.35	£720.35
FQP002	SEALED BASE 1200X225-425X130 1:2 DS PPB/000/S13	1	£720.35	£720.35
FQP003	SEALED BASE 1200X225-425X130 1:3 DS PPB/000/S14	1	£772.87	£772.87
FQP002	SEALED BASE 1200X225-425X130 1:2 DS PPB/000/S16	1	£720.35	£720.35
FQP001	SEALED BASE 1200X225-425X130 1:1 DS PPB/000/S18	1	£667.83	£667.83
FQP002	SEALED BASE 1200X225-425X130 1:2 DS PPB/000/S19	1	£720.35	£720.35
FQP001	SEALED BASE 1200X225-425X130 1:1 DS PPB/000/S20	1	£667.83	£667.83
FQP002	SEALED BASE 1200X225-425X130 1:2 DS PPB/000/S22	1	£720.35	£720.35
FQP002	SEALED BASE 1200X225-425X130 1:2 DS PPB/000/S24	1	£720.35	£720.35
FQP001	SEALED BASE 1200X225-425X130 1:1 DS PPB/000/S32	1	£667.83	£667.83
FQP002	SEALED BASE 1200X225-425X130 1:2 DS PPB/000/S33	1	£720.35	£720.35
FQP002	SEALED BASE 1200X225-425X130 1:2 DS PPB/000/S40	1	£720.35	£720.35
FQP003	SEALED BASE 1200X225-425X130 1:3 DS PPB/000/S41	1	£772.87	£772.87
FQP003	SEALED BASE 1200X225-425X130 1:3 DS PPB/000/S43	1	£772.87	£772.87
FQP003	SEALED BASE 1200X225-425X130 1:3 DS PPB/000/S50	1	£772.87	£772.87
FQP002	SEALED BASE 1200X225-425X130 1:2 DS PPB/000/S53	1	£720.35	£720.35
FQP001	SEALED BASE 1200X225-425X130 1:1 DS PPB/000/S54	1	£667.83	£667.83
FQP014	SEALED BASE 1500X275-475X160 1:2 DS PPB/000/S25	1	£1,377.53	£1,377.53
FQP014	SEALED BASE 1500X275-475X160 1:2 DS PPB/000/S51	1	£1,377.53	£1,377.53
EHSMH1510DS	1500 X 1.00M SEALED MANHOLE RING DOUBLE STEPS	1	£475.96	£475.96
EHSMH1207DS	1200 X 0.75M SEALED MANHOLE RING DOUBLE STEPS	2	£222.13	£444.26
EHSMH1507DS	1500 X 0.75M SEALED MANHOLE RING DOUBLE STEPS	1	£356.97	£356.97
EHSMH1205DS	1200 X 0.50M SEALED MANHOLE RING DOUBLE STEPS	3	£211.96	£635.88
EHSMH1202DS	1200 X 0.25M SEALED MANHOLE RING DOUBLE STEPS	8	£147.38	£1,179.04
EHSCS1260	1200 SEALED COVER SLAB 600SQ ACCESS	21	£184.52	£3,874.92
EHSCS1560	1500 SEALED COVER SLAB 600SQ ACCESS	2	£411.63	£823.26
EHA605	600SQ ACCESS ADJUSTING UNIT 65MM THICK - PACKED IN 5'S	70	£39.27	£2,748.90

These prices are based on the current information submitted. Any future alterations/changes received may result in a price revision.

Please note: you may need to include the Perfect Manhole in the Section 104 application as the choice of manhole construction.

Part Load Charges:	0 - 10 tonnes	£293.34
	11 - 23 tonnes	£264.95

Please consult your account manager for delivery on a specialist vehicle.

Lifting Sets:	1200mm lifting strap	£448.10 each
	1500mm lifting strap	£633.90 each
	1800mm lifting clutches x3	£218.59 per set

When using 150-300mm Ultrarib pipes additional couplers MUST be used.

150mm coupler	£19.12 each
225mm coupler	£28.42 each
300mm coupler	£31.69 each

KETLEY BRICK

Bricks, Slips and Pavers

Staffordshire Clay Building Products



100 Year Tradition

Ketley was founded over 100 years ago and forms part of the Hinton Perry & Davenhill family business, which began making Dreadnought Clay Roof Tiles in 1805. The company has a long tradition of clay craft and a passion to create the finest natural clay building materials.

For further information on Dreadnought Tiles visit the website **www.dreadnought-tiles.co.uk**

Clay Specialists

At Ketley we manufacture Staffordshire clay bricks and clay pavers which we make from Etruria Marl, the strongest clay. This focus and depth of experience is unique and enables us to tackle even the most demanding requirements for specialist clay bricks and pavers. All Ketley products are made to engineering brick specifications.

Ketley have recently introduced extruded brickslips and quarry tiles which are manufactured in a range of colours including the 3 traditional Ketley colours. The brick slips are available in a smooth, sanded or rustic finish and with only 30% of the embodied carbon of a traditional cut brick slip they are a highly durable, sustainable and cost effective choice for construction.

Manufacturing Process

Ketley Bricks and Pavers conform to BS EN 771-1:2011+A1:2015.
Our modern plant gives us a unique level of flexibility and range for the manufacture of specials.

At Ketley Brick Company we combine the traditional values embodied in our 100 year history with the determination to be a highly efficient manufacturer of consistently high quality product.

Quality and Service

Ketley is quality assured to ISO 9001:2015 and we pride ourselves on our tradition, our commitment to quality and Ketley Brick's 100 year reputation for excellence.

One hundred year continuity of family ownership ensures an enthusiastic sales support team with unrivalled experience. You will find us easily accessible and ready to give advice from design stage to completion of a project.

We also have a team of experts across the country who are available to provide advice and to discuss the details and requirements for your projects.

Contact us to view completed projects using Ketley Bricks and Pavers in your area or for any additional information or advice.

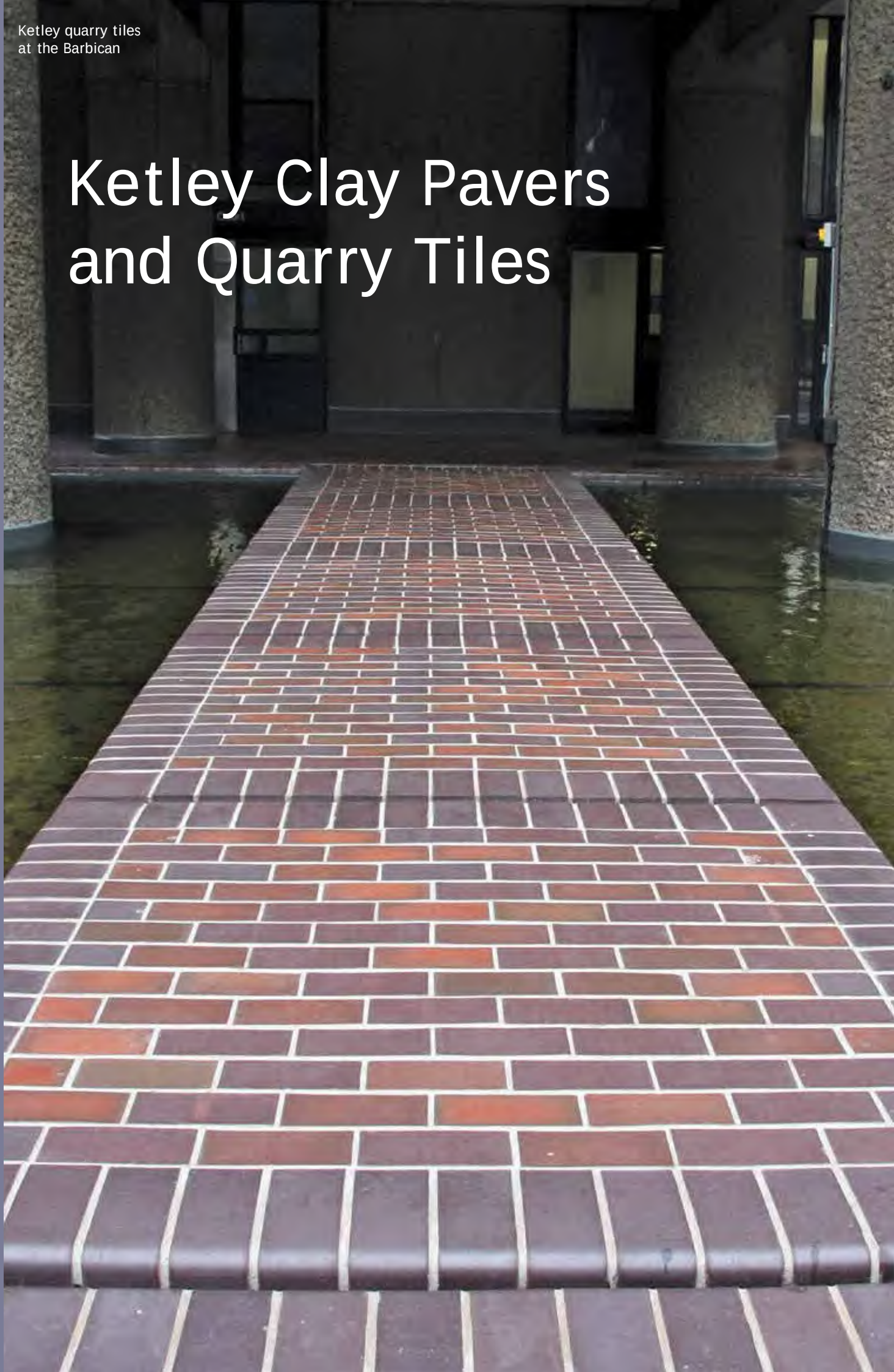
The Environment and Sustainability

We take our environmental commitments seriously and exceed all the necessary legislation in this area. Our modern plant operates an Environmental Management System accredited to ISO 14001:2015 and we are consistently working to improve our energy and production efficiency.

Sustainable development is about delivering a better quality of life for everyone, now and for generations to come. Our task is to use resources as efficiently as possible, to reduce waste, to minimise the energy used in manufacture and to ensure that our products have the longest possible lifespan.

Ketley Bricks manufactured over 100 years ago are still in use today. This surely demonstrates their sustainability. We believe that the most reliable measure of sustainability is to calculate the embodied energy in production, divided by the useful life of the products.

Ketley Brick



Ketley quarry tiles
at the Barbican

Ketley Clay Pavers and Quarry Tiles

Clay Pavers - Pages 3-4

Ketley Clay Pavers have an inherent natural beauty and strength. Widely used by the Victorians beside their canal and railway systems and in their industrial and urban developments, Ketley Pavers have passed the ultimate test - **“the test of time”.**

The continuing popularity of Ketley Pavers lies in their depth and consistency of colour permanence and their strength and durability. With a wide range of patterns, designs and natural colour, Ketley Pavers provide solutions that add value and beauty to any built environment.

Natural Beauty in Clay

Colours that do not fade over time

High durability in heavy use areas

Available in traditional patterns

With a full range of specials and fittings

With most paving projects over 80% of the expense is in the laying and fitting, so choosing a high quality clay paver will only marginally affect the overall cost.



Plain Staffordshire Blue

Inherent natural beauty and strength

Manufactured to the same specification for over 100 years, Ketley Staffordshire Blues are the original product with a rich distinctive colour that is permanent. Made from the finest Etruria Marl fired at over 1130°, Ketley Pavers are of unrivalled strength and durability.

Dragfaced Chamfered

Dragfaced Square edged



Plain Staffordshire Red

Permanent natural colour and strength

Ketley Staffordshire Red Pavers provide a rich colour which won't fade over time. They are highly durable and justify a classification as Heavy Duty - suitable for channelised traffic flow in public pedestrianised areas.

Dragfaced Chamfered

Dragfaced Square edged



Plain Staffordshire Brown Brindle

Ketley Brown Brindle Pavers are a unique product, the result of careful control of the kiln atmosphere during the firing process, which produces an aesthetically pleasing random colour variation and an organic appearance when laid.

Ketley Brown Brindle Pavers are the authentic traditional product, a perfect match for restoration projects such as canal towpaths where they are widely used.

Dragfaced Chamfered

Dragfaced Square edged

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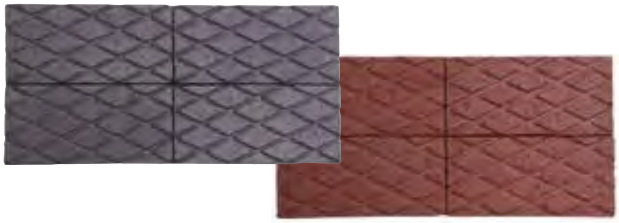
Patterned Staffordshire Pavers

Typical of the Victorian era, Ketley Staffordshire Blue Diamond Chequered Pavers are the authentic product, the perfect match for restoration or an ideal means of achieving a traditional, period look.

Ketley Chequered and Panelled Pavers were widely used by the Victorians beside their canal and railway systems and in their industrial and urban developments. They have passed the ultimate test - the test of time.

Patterned designs not only shed water rapidly and provide enhanced traction, but their traditional designs add a long established look and a strong aesthetic appeal.

Ketley Patterned Pavers are also particularly effective when used to break up large areas, by providing contrasting banding or by adding interest and texture.



Staffordshire Diamond Chequered Paver Square Edged

Available in Blue, Red & Brown Brindle

Staffordshire 2 Panel Paver Chamfered

Available in Blue, Red & Brown Brindle

Staffordshire 8 Panel Paver Chamfered

Available in Blue, Red & Brown Brindle

Staffordshire Star Paver Chamfered

Available in Blue, Red & Brown Brindle

Bespoke Staffordshire clay pavers to your own design Square Edged or Chamfered

Available in Blue, Red & Brown Brindle

Plain and Patterned Paver Specifications

Colour: Staffordshire Blue, Red and Brown Brindle
Finish: Dragfaced or Patterned
Raw Material: Etruria Marl
Manufacture: Extruded, Wirecut and fired above 1130°C
Bulk Density: 2,300 kg/m^3

NB When laying clay pavers, it is important to provide a finished joint width between pavers of approx 2-5mm beyond any edge protection nibs to permit infill and to minimise damage in compaction and subsequent use. Failure to do this may result in chipping of the clay pavers.

Performance Data:
BS EN 1344 : 2013

Size Range	R1
Mean transverse Breaking load	T4
Unpolished slip/skid resistance	U3
Abrasion resistance	A3
Freeze/thaw resistance	FP100

Plain Dragfaced Pavers

Sizes and Coverage

Work Size mm	Pattern	Pack Weight	No. Per Pallet	Units per m^2	
				Rigid with 10mm Joint	Flexible Butt Jointed (3mm Joint)
215x102.5x50	Square Edged	1300kg	500	40	44
215x102.5x65	Square Edged	1320kg	400	40	44
200x100x50	Square Edged & Chamfered	1150kg	500	43	48
200x100x65	Square Edged & Chamfered	1200kg	400	43	48

Patterned Staffordshire Pavers

Sizes and Coverage

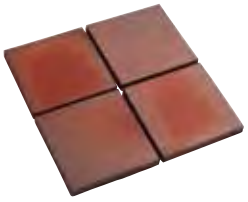
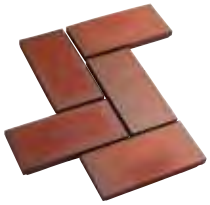
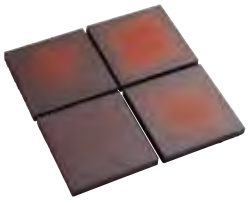
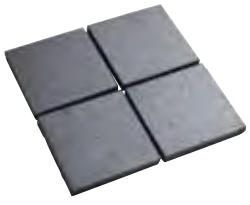
Work Size mm	Pattern	Pack Weight	No. Per Pallet	Units per m^2	
				Rigid with 10mm Joint	Flexible Butt Jointed (3mm Joint)
220 x 105 x 50	Diam Cheq/2 or 8 panel	1300kg	500	38	42
220 x 105 x 65	Diam Cheq/2 or 8 panel	1360kg	400	38	42
200 x 100 x 50	Diam Cheq/Star/2 or 8 panel	1150kg	500	43	48
200 x 100 x 65	Diam Cheq/Star/2 or 8 panel	1200kg	400	43	48

Brick Award Winner Ketley staffs blue quarry tiles inside merge with Ketley staffs blue pavers outside at Maggies Manchester, designed by Foster + Partners

Quarry Tiles

Ketley Quarry Tiles, sometimes known also as paving tiles, are available in a range of natural clay colours and provide a robust and hardwearing flooring solution. For restoration projects Ketley Quarry Tiles offer a very good match to the discontinued Hawkins and Dennis Ruabon Quarry tiles which can be found in many parts of the UK. They offer excellent slip resistance and suit most flooring and wall cladding applications indoors or externally, in commercial premises or the home.

18mm thick, they are manufactured from the proven Etruria Marl clay, which becomes dense when fired, and is hard wearing and resistant to acids, alkalis, oils, grease and fats. In pendulum tests where anything higher than 36 indicates low slip potential, they score a dry value average of 63 and a wet value average of 55 meaning they have excellent slip resistance in both wet and dry conditions. They can be classified as R11 and Category C which is the highest rating for slip resistance according to BS EN 14411.

	150mm x 150mm	215mm x 102.5mm	215mm x 65mm
Staffordshire Red			
Staffordshire Light Multi			
Staffordshire Dark Multi			
Staffordshire Brown Brindle			
Staffordshire Blue			

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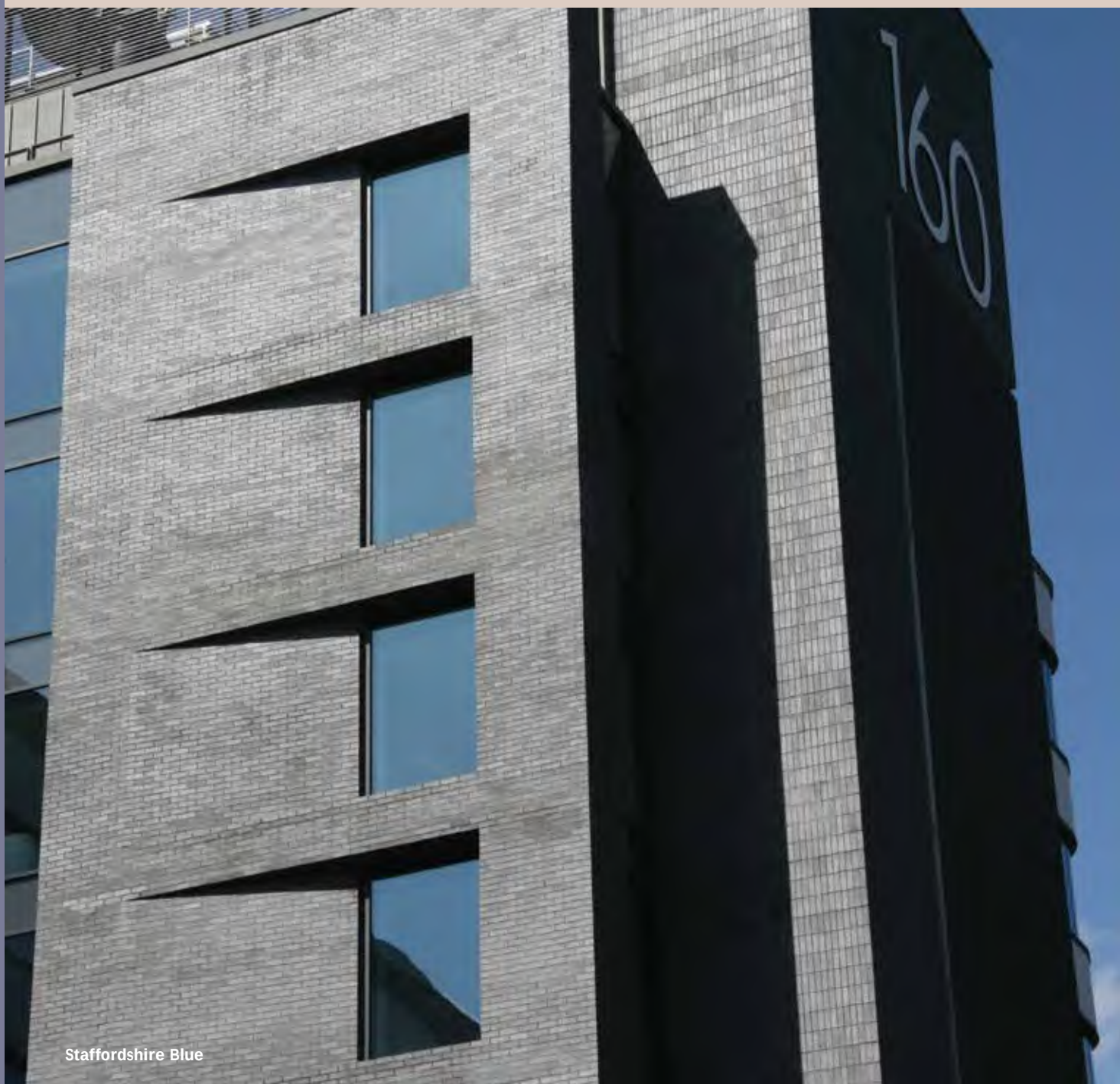
Technical Specifications for Quarry Tiles

COLOURS: Staffordshire Red / Staffordshire Light Multi / Staffordshire Dark Multi / Staffordshire Brown Brindle / Staffordshire Blue
SIZES: 215mm x 102.5mm, 215mm x 65mm and 150mm x 150mm
TEXTURE: Smooth **MANUFACTURE:** Extruded
PACKING ON PALLETS: 1350 pieces on a pallet for 215 x 102.5 x 18mm size 1890 for 215 x 65 x 18mm size
COVERAGE: per m² 40 for 215 x 102.5mm size with 10mm joint 60 for 215 x 65mm size with a 10mm joint

PROPERTIES	BS EN 14411 GROUP A1b REQUIREMENT	TYPICAL VALUES
Dimensions and surface quality		
Length x Width	Average tolerance ± 2%	within ± 2%
Thickness 18mm	Average tolerance is ± 10%	within ± 5.5%
Straightness of sides	within ± 0.6%	within ± 0.2%
Rectangularity	within ± 1%	within ± 0.2%
Surface flatness	Centre curvature ± 1.5%	Centre curvature ± 0.7%
	Edge curvature ± 1.5%	Edge curvature ± 1.0%
	Warpage ± 1.5%	Warpage ± 0.7%
Physical properties		
Water absorption	0.5 < 3%	1.50%
Breaking strength	Min 1100N	2995N
Resistance to deep abrasion	Max 275mm³	106mm³
Frost resistance	Value to be stated	No damage after 100 cycles
Slip resistance	Pendulum test results exceeding 36 indicate low slip potential	Dry value av 96 Wet value av of 58 on Slider 55 for Staffs Blue Dry value av 63 Wet value av of 55 on Slider 96 for Brown Brindle
	Inclined platform in shod conditions	Category R11 which indicates that they are considered not to be slippery in wet or greasy conditions.
	Inclined platform in wet barefoot conditions	Category C which is the highest rating for slip resistance.
Bond strength	C2 Cementatious adhesives	>1.0 N/mm²
	Reaction resin adhesives	>2.0 N/mm²
	Mortar	0.15 N/mm²
Moisture expansion	No requirement	Negligible
Reaction to fire	Value to be stated	A1
Chemical properties		
Resistance to staining	Minimum requirement 3	Paste stain 5 Chemical/oxydising stain 4 Film stain 3

Staffordshire Bricks

Class A Facing Bricks and Special Bricks
Staffordshire Blue, Staffordshire Brown Brindle, Staffordshire Red.



Staffordshire Blue

Where quality and durability are paramount, Ketley Bricks offer solid and perforated bricks, tried and tested in the toughest environments. Ketley Staffordshire Blue Bricks have always been regarded as the mark of durability and strength, making them the choice for highly demanding environments. They are an excellent choice for use in textured facades where more than one face of the brick is exposed to the weather.

Ketley Bricks and Specials also add character and distinction to a project. Whether it be to add contrast and detail in brickwork as a feature brick or to make a strong impression with contrasting banding or geometric patterns, Ketley Brick offer a reliable choice. We manufacture a wide range of Standard Specials as well as a bespoke service for more demanding requirements.

Ketley Bricks are available in metric and imperial sizes in a range of natural Staffordshire colours. They are a traditional Staffordshire product and are ideal for refurbishment where a close match to the original bricks is essential.

"Ketley Bricks have a natural beauty and a surface quality which makes their colour appear to change in different weather conditions. They take on a more reflective appearance in dry sunny weather and appear darker in wet conditions".

Stefan Mannewitz, Project Architect at Karakusevic Carson Architects.

2018 Brick Award Winner Best Refurbishment. The new Swift Tower at Walthamstow Wetlands is constructed from Ketley Brown Brindle bricks.



Staffordshire Blue ‘Class A’ Facing Bricks

Conform to BS EN 771-1: 2011+A1:2015
Class A.
Solid or Perforated.
Uniformly high crushing strength.
Low water absorption.
Resistant to acids, alkalis and abrasion.

Sizes:
215x102.5x50 mm 215x102.5x65 mm 215x102.5x73 mm

Ketley Staffordshire Blue Bricks provide unrivalled durability and strength, making them the choice for highly demanding environments. In the early part of the 20th Century this Staffordshire Blue colour was regarded as the ultimate stamp of strength and durability.

Projecting brickwork

The outstanding performance characteristics of Ketley Class A bricks, with their low water absorption makes them particularly suitable for textured facades where more than one face of the brick is exposed to the weather.

Aesthetics

Ketley Staffordshire Blue Bricks have a strong aesthetic appeal. They have a precise form and a distinctive quality which is equally suitable for contemporary projects as well as restorations. Combined with their unrivalled physical properties and range of colour matched specials, they are the ideal material for contrasting detailing in brickwork of less durable clay.

Special Shapes

A complete range of Special Shapes to BS 4729:2005 is available. We also undertake the manufacture of ‘non-standard’ specials to customers’ specification as required. Our specials are fired alongside our squares ensuring consistency of colour across all our special bricks.

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LING NATURE
OOD IS POWERFUL
age



Staffordshire Brown Brindle ‘Class A’ Facing Bricks

Conform to BS EN 771-1: 2011+A1:2015
Class A.
Solid or Perforated.
Uniformly high crushing strength.
Low water absorption.
Resistant to acids, alkalis and abrasion.

Sizes:
215x102.5x50 mm 215x102.5x65 mm 215x102.5x73 mm

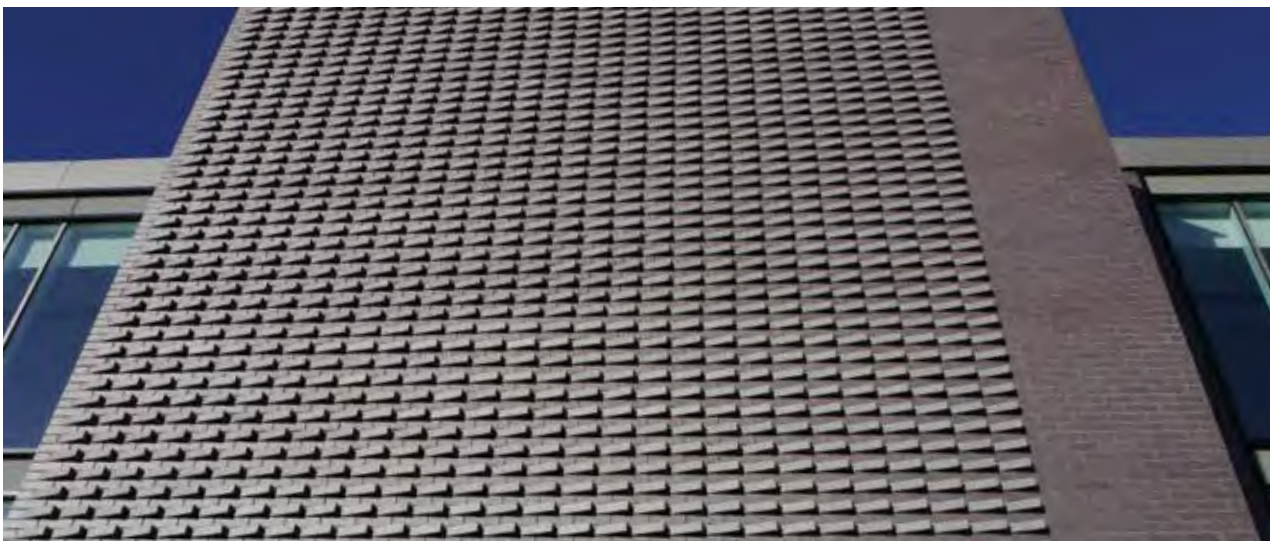
The Staffordshire Brown Brindle colour is manufactured only by Ketley Brick and provides an alternative to Blue as a feature Brick. These bricks are used on a wide range of projects both traditional and modern.

Aesthetics

Ketley Staffordshire Brown Brindle are attractive in larger commercial projects where they create a distinguished and unique appearance. Their unrivalled physical properties and range of colour matched specials makes them the ideal material for contrasting detailing in brickwork of less durable clay.

Applications

Staffordshire Brown Brindle Bricks are suitable for architectural use particularly in commercial developments. Their high resistance to acids, alkalis and abrasion makes them equally suitable for foundations, pickling tanks, chemical works, sewerage schemes, strongrooms, bridges, tunnels, retaining walls, bunker linings and walls.



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Staffordshire Red ‘Class A’ Facing Bricks

Conform with BS EN 771-1: 2011+A1:2015
Class A.
Solid or Perforated.
Uniformly high crushing strength.
Low water absorption.
Resistant to acids, alkalis and abrasion.

Sizes:
215x102.5x50 mm 215x102.5x65 mm 215x102.5x73 mm

Ketley natural Red Staffordshire Class A Facing bricks have a deserved reputation for excellence. They are solid or perforated and are a distinct rich red colour especially good for matching properties built during Victorian times.

Applications

Ketley Staffordshire Reds are frequently used for architectural purposes in commercial developments and for landscaping and structural use in urban renewal schemes and general improvement areas.

They are often used in conjunction with other less durable materials for cappings or copings and to add detail and interest.

Ketley Staffordshire Red Class A bricks are suitable for use in particularly exposed conditions such as the Cheltenham Flood Alleviation Scheme, seen in the photograph above right.

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Above: Three New Bailey,the new HMRC building in Salford shortlisted for Best Commercial Building and Best Innovative Use of Brick 2021 Brick Awards.

Right: A combination of Ketley brick slips and special bricks were used to create this impressive brick façade at the Victoria Gate shopping centre in Leeds. 2017 Brick Award Winner Best Commercial Building & Best Innovative Use of Brick.

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Brick Award Winner Ketley brick slips and pistols slips at Harvey Nichols

Brick Slips

All colours are available in a smooth, sanded, or textured and with the choice of either a flat back or dovetail key on reverse.

Ketley Brick's range of extruded brick slips eliminate the need and cost to cut down bricks for use with pre-fabricated panels and other cladding solutions. They have only 30% of the embodied carbon of a traditional cut brick slip and are a highly durable, sustainable and cost effective choice for construction.

Ketley Brick Slips are manufactured from the same clay, using the same processes as the Ketley Class A Engineering bricks and Dreadnought Roof Tiles to deliver the same technical characteristics of very low water absorption, very high strength and unrivalled frost resistance.

Ketley Brick Slips are the sustainable choice to create authentic brick facades for both external and internal applications. All the colours are achieved naturally through the careful control of the kiln atmosphere without the use of surface pigments or artificial stains. This generates a warmth and authenticity to the brick colours which cannot be matched.

dove tail key for precast applications

Staffordshire Red Sanded

Staffordshire Red Blue Sanded

Staffordshire Light Multi Textured

Staffordshire Dark Multi Textured

Staffordshire Brown Brindle Smooth

Staffordshire Blue Smooth



Special Shaped Bricks

The use of Ketley Specials to add a high quality finish to brickwork ensures extra durability and protection to vulnerable areas and will save time on-site by overcoming extensive hand cutting.

Because Special Shaped bricks are generally used in situations of severe exposure such as copings and cills, powerful resistance to water penetration and high durability have always been essential.

Ketley Brick manufactures a wide range of special shaped bricks for a multitude of applications. Most of the European Standard Special Shaped Bricks are supplied and Ketley will also manufacture specials from drawings supplied, allowing imaginative design options and decorative detail to be incorporated, confident that Ketley will be able to accurately match requirements.

Separate Ketley Special Shaped Bricks and Ketley Paver and Fittings brochures are available on request. Please contact our sales office for further details.

Orders for purpose made specials are always welcome at Ketley. A simple three dimensional drawing indicating dimensions and exposed faces can be discussed with our experienced representatives or submitted direct to the factory. Dedicated tooling may be required for purpose made specials and we recommend that discussions are undertaken early in the project. We welcome the opportunity to be included early in design discussions as we can often suggest ways to reduce cost.

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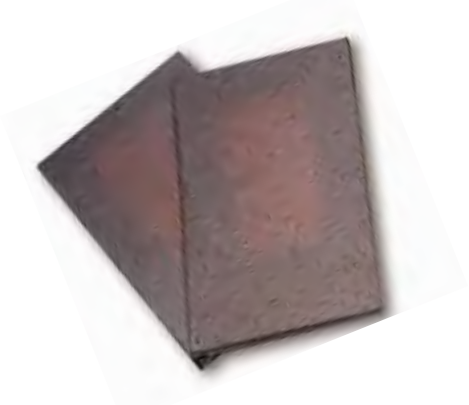
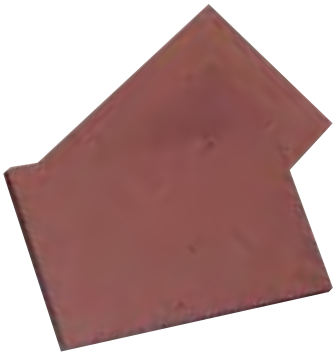
Creasing Tiles

Ketley Creasing Tiles are manufactured from Etruria Marls, which are recognised as the finest clay for strength and durability. Their low water absorption and durability make them ideal for exposed situations, subject to high degrees of weathering and rising or penetrating damp.

Creasing Tiles are plain clay tiles without nibs or camber and with a thickness of only 11mm, which makes them easier to cut to a high degree of accuracy than a brick. They are commonly used to add decorative finishes to brick and stone work in applications such as; cappings and copings, external cills, corbelling, arches, chimneys and decorative quoins.



Staffordshire Blue Brindle



Staffordshire Red

Staffordshire Brown Brindle

Technical Information

Size: 265mm x 165mm
Thickness: 11mm

There are no standards specifically covering Creasing Tiles, however Ketley Clay Creasing Tiles conform to BS EN 1304:2013 which covers Clay Roof Tiles and Fittings and they exceed the specification in terms of transverse strength and water absorption.

Finish	Smoothfaced
Weight per tile	1.05kg
Weight per pack	1.20 Tonnes
Number of Tiles per pack	1000
Transverse Strength	880N
Water Absorption	3.9%
Freeze/thaw resistance	Conforms to BS EN 539-2:1998

Laying Instructions

Creasing tiles should be laid with a broken bond and a minimum lap of 75mm. The joint width between creasing tiles should not exceed 10mm in all applications.

When cutting creasing tiles, a mechanical disc cutter is recommended over hand cutting particularly when used in exposed areas, as this will provide a neater appearance and help to avoid cracks that can reduce the performance of creasing tile.

For freestanding walls where creasing tiles are used under brick cappings, two courses of clay tiles should be laid with staggered joints in a 1:¼:3 mortar and a minimum projection from the wall of at least 45mm.

Brick Award Winner Best Refurbishment & Renovation project, Ace Hotel in Shoreditch with Ketley Staffs blue bricks and brick slips

Technical Specifications for Brick Slips

TYPE: Extruded Brick Slips
COLOUR: Staffordshire Blue / Staffordshire Brown Brindle / Staffordshire Red / Staffordshire Light Multi / Staffordshire Dark Multi / Staffordshire Red Blue
TEXTURE: Smooth / Sanded / Textured
MANUFACTURE: Extruded
REVERSE KEY: Flat back or Dovetail key (for precast concrete applications) key depth 4.5mm for 18mm slip

Dimensions	**Weight**	**No. per m²**
		(10mm joints)
215 x 65 x 18mm	0.57 kgs per slip	60
215 x 65 x 15mm	0.45 kgs per slip	60

Packing: Banded for fork lift off-loading - 1890 pieces per pallet 18mm
2170 pieces per pallet 15mm

Weight per pallet: Weight 1100kg 18mm Weight 1000 kg 15mm

European Standard BS EN 771-1: 2011+A1:2015

Masonry Unit Group	FL
Water Absorption	≤4.5%
Net Dry Density	2200 kg/m³ (Typically)
Soluble Salt Content	S2
Durability	F2 (Frost Resistant)
Fire Reaction	A1
Dimensional Tolerance Mean	T2
Dimensional Tolerance Range	R1

A complete range of Special Shapes to BS 4729 2005+A1:2016 is available. We also undertake the manufacture of 'non-standard' specials to customers' specification as required.

Technical Specifications for Bricks

TYPE: Extruded Wirecut Brick Class A
COLOURS: Staffordshire Blue, Staffordshire Brown Brindle, Staffordshire Red
STRUCTURE: Solid or perforated
TEXTURE: Smooth
SIZE: Complies with dimensions and tolerances of BS EN 771-1: 2011+A1: 2015

Dimensions	**Weight**	**No. per m²**
		(10mm joints)
215 x 102.5 x 65mm	3.3 Tonnes per 1,000	60
215 x 102.5 x 73mm	3.8 Tonnes per 1,000	53

Packing:	Banded for fork lift off-loading - 400 per pack 65mm	
		368 per pack 73mm
Weight per pack:	65mm 1320kg solid	73mm 1400kg solid
	65mm 980kg perf	73mm 1070kg perf

European Standard BS EN 771-1: 2011+A1:2015

Type of brick	Solid
Appearance	Blue Smooth / Brown Brindle Smooth / Red Smooth
Manufacture	extruded, wirecut
Compressive strength	≥ 125N/mm²
Category	II
Masonry Unit Group	HD
Engineering Grade	A
Water absorption	≤ 4.5%
Initial Rate of Water absorption	≤ 1.5kg/metre/minute
Thermal Conductivity	On Application
Bond Strength	0.15N/mm
Net Dry Density	2200 kg/m³ (Typically)
Density Tolerance	D1
Soluble salt content	S2
Durability	F2
Fire Reaction	A1
Dimensional Tolerance Mean	T2
Dimensional Tolerance Range	R1

KETLEY BRICK

Bricks, Slips and Pavers

Ketley Brick Company Ltd
Dreadnought Works
Pensnett, Brierley Hill
West Midlands, DY5 4TH

Tel: 01384 78361
Fax: 01384 74553
Email: sales@ketley-brick.co.uk
Web: www.ketley-brick.co.uk

RADIUS Systems

Polyethylene Pipes

for water, wastewater, gas, power & renewable energy applications

Innovators in pipeline technologies

RADIUS SYSTEMS

WHO WE ARE

First PE pipe supplied by Radius systems 1969

Since 1969, when we supplied the first polyethylene (PE) gas pipe into the UK, we have constantly been at the forefront of innovation, with the development and manufacture of smart and flexbile PE pipeline solutions.

Designed for new infrastructures and for the replacement or rehabilitation of existing pipelines, our pipe range is an innovative offering specifically engineered for the transportation and distribution of gas, water and wastewater. In addition, our PE pipes are the ideal solution for the protection of cables in the power and renewable energy sectors.

Polyethylene is lightweight, does not corrode and is the ideal material for the construction of all pipelines. Polyethylene is inert and offers excellent chemical resistance. It can be successfully combined with other materials such as polypropylene or aluminium to form multi-layer pipes designed for specialist installation techniques or for the protection of drinking water.

One of the other many benefits of polyethylene pipes is that they can be fused together to form a fully welded, one piece pipeline for maximum leak-tightness, with end load bearing properties, overcoming the need for restraints, such as concrete anchor blocks. The longevity and outstanding properties of polyethylene, which include flexibility, durability, smooth internal bore which increases the hydraulic characteristics of pipes, have made it the material of choice for utility companies, specifiers and contractors.

Available in diameters 20 to 1,200 mm in PE80, PE100 or in a multi-layer construction, our pipes are supplied in a wide range of SDRs and pressure ratings to suit your system's requirements and can be installed using open-cut or no-dig installation techniques. Our service and mains pipes are joined using industry standard butt-fusion or electrofusion welding techniques by trained installers.

Manufactured in our ISO 9001:2015 certified production facilities, our PE pipe solutions are approved to the most stringent national and international standards, to deliver a comprehensive service and mains pipe offering for all your pipeline network requirements.

CONTENTS

PIPES FOR DRINKING WATER

POLYETHYLENE WATER PIPES

ENGINEERED PIPE SOLUTIONS FOR MODERN WATER PIPELINE NETWORKS

As well as manufacturing solid wall PE pipes, Radius Systems have developed a state-of-the-art range of multi-layer pipes such as ProFuse®, a unique peelable pipe specially designed for maximum jointing integrity and ideally suited for no-dig installation techniques, and our Puriton® barrier pipe, which is part of an exclusive pipe system designed to protect drinking water through contaminated land.

Pipe type	Application and suitability
Puriton® Barrier pipe	• Barrier pipe for use in contaminated land for the protection of drinking water • Below ground potable water use up to 16 bar • A multi-layer pipe manufactured from PE80 or PE100 with an aluminum barrier layer • Used for new pipelines, network rehabilitation and pipe replacement • Installed using open-cut or suitable no-dig installation techniques
ProFuse® Peelable pipe	• A multi-layer pipe with a peelable outer skin for maximum jointing integrity and installation cost savings • Below ground potable water use up to 16 bar • Used for new pipelines, network rehabilitation and pipe replacement • Ideal for no-dig and open-cut installation techniques
CleanPipe™ Factory sealed coils	• Factory sealed coils to prevent pipe bore contamination • Manufactured from ProFuse® peelable pipe for maximum joint integrity • Below ground potable water use up to 10 bar • Ideal for no-dig and open-cut installation techniques
SC80 light blue Service water pipe	• Service pipe offering manufactured from PE80 with a black inner and a light blue outer • Below ground potable water use up to 12.5 bar • Used for new pipelines, network rehabilitation and pipe replacement • Installed using open-cut or no-dig installation techniques
SC100 dark blue Mains water pipe	• Mains pipe offering manufactured from PE100 with a black inner and a dark blue outer • Below ground potable water use up to 16 bar • Used for new pipelines, network rehabilitation and pipe replacement • Installed using open-cut or no-dig installation techniques

PURITON® BARRIER PIPE

Protecting your drinking water through contaminated land.

The barrier pipe system of choice for your new or replacement potable water supply, Puriton® is the cutting edge solution for the safe distribution of drinking water through contaminated land.

Designed to provide a high level of protection against soil contaminants commonly found in brownfield sites, Puriton® is a multi-layer composite structure pipe, combining the unique characteristics of polyethylene (PE) with the exceptional barrier properties of aluminium (Al).

Specifically designed to offer water companies and developers of new housing, warehouses and industrial buildings on brownfield sites an engineered pipe solution, Puriton® is lightweight, flexible, corrosion resistant and easy to install, without the need to post-wrap the finished joints. The pipe can be joined with our comprehensive range of approved electrofusion and mechanical fittings specifically developed for the Puriton® pipe, to give you the assurance of a safe and durable system that protects your drinking water.

Features and Benefits

- Multi-layer pipe construction PE-Al-PE.
- Brown stripes denote a multi-layer construction.
- Full barrier pipe system.
- Combines the flexibility of polyethylene with the barrier properties of aluminium.
- Safeguards drinking water quality.
- Easy to handle, flexible and lightweight.
- End load resistant system.
- Installation cost savings - no requirement for thrust blocks.
- No requirement to post-wrap the joints.
- Suitable for most installation techniques.
- Suitable for new and replacement drinking water supply systems.

Approvals

- Approved under regulation 31 of the Water Supply (Water Quality) Regulations 2000 for pipe diameters 90 to 180mm.
- WRAS approved PE80 material.
- BS 8588:2017 for 25 to 180mm pipe.
- WIS 4-32-19* for 25 to 180mm pipe.

WRAS APPROVED MATERIAL

bsi.

KM 592372
KM 672956

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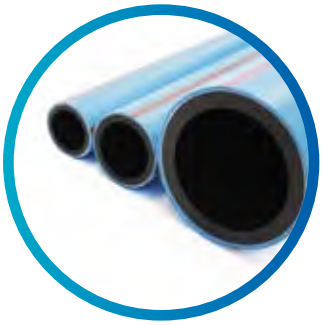
Product Range

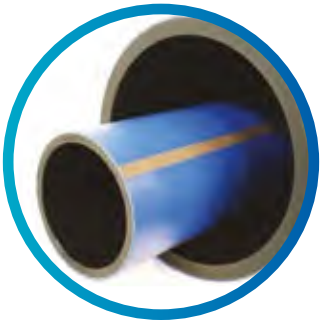


Puriton® service pipe

A 'Type A' pipe, as defined in BS8588 and WIS 4-32-19*.

Available in diameters 25 to 63 mm in coils or in straight lengths, our Puriton® service pipe is manufactured from a black PE80 core, an aluminium barrier layer and a light blue PE80 outer. Quick and easy to join without pipe surface preparation, the Puriton® service pipe uses our range of cutting edge mechanical fittings and Redman™ fittings for our 63 mm pipe.

Nominal diameter	SDR	Pressure rating	Product code straight pipe	Product code coiled pipe			Weight
mm		Bar	6m	25m	50m	100m	kg/m
25	11	12.5	-	-	XQ2528	-	0.3
32	11	12.5	-	-	XQ2535	-	0.5
63	11	12.5	XQ2568	XQ2570	XQ2571	XQ2572	1.5



Puriton® mains pipe

A 'Type A' pipe, as defined in BS8588 and WIS 4-32-19*.

Available in diameters 90 to 180 mm in coils or in straight lengths, our Puriton® mains pipe is manufactured from a black PE100 core, an aluminium barrier layer and a dark blue PE100 outer. Our Puriton® mains pipes are joined using our state-of-the-art range of Redman™ fittings and approved electrofusion fittings, or the butt-fusion jointing technique.

Nominal diameter	SDR	Pressure rating	Product code straight pipe		Product code coiled pipe		Weight
mm		Bar	6m	12m	50m	100m	kg/m
90	11	16	XQ0125	XQ0126	XQ0128	XQ0129	2.8
110	11	16	XQ0233	XQ0235	XQ0236	XQ0237	3.9
125	11	16	XQ0287	XQ0289	XQ0290	XQ0291	5.0
160	11	16	XQ0458	XQ0460	XQ0461	XQ0462	8.0
180	11	16	XQ0530	XQ0532	XQ0534	XQ0535	9.9
90	17	10	XQ0143	XQ0145	XQ0146	XQ0147	2.1
110	17	10	XQ0251	XQ0253	XQ0254	XQ0255	2.9
125	17	10	XQ0305	XQ0307	XQ0308	XQ0309	3.6
160	17	10	XQ0476	XQ0478	XQ0479	XQ0480	5.7
180	17	10	XQ0550	XQ0552	XQ0554	XQ0555	7.1

Note: Pipe weights shown are for lifting and handling purposes. They are based on the maximum diameter and pipe wall thicknesses as specified in BS 8588.

To ensure that the barrier properties of the Puriton® system are maintained, approved Puriton® fittings must be used with Puriton® pipe. The use of non Puriton® fittings may compromise the contamination resistance of the system. Please refer to our Puriton® brochure on how to join Puriton® pipe using our approved fittings. For more details, please contact our customer services team.
e: sales@radius-systems.com** or visit our **website www.radius-systems.com.

* WIS 4-32-19 is now superseded by BS 8588:2017

PROFUSE® PEELABLE PIPE

Maximum jointing integrity for asset longevity and installation cost savings.

ProFuse® is a leading pipe innovation offering a high performance solution with optimum joint integrity, damage protection and reduced installation time and costs to asset owners.

Manufactured from high performance PE100, ProFuse® has been designed with a unique peelable polypropylene skin that offers excellent abrasion resistance and protects the pipe during handling, transportation and installation. The skin, which is applied to the core pipe during the manufacturing process using melt on melt technology, is easily removed using our specially designed pipe exposure tool (PET). Once the skin is removed, the pipe surface is ready to be joined, without the need for further pipe preparation, using electrofusion and butt-fusion welding techniques, as well as our innovative range of Redman™ hydraulic compression fittings or other suitably approved mechanical fittings.

Ideal for open cut, slip lining, horizontal directional drilling and pipe bursting techniques, ProFuse® is a superior pipe solution especially suited to no-dig installation methods, as its tough protective skin absorbs damage normally associated with those installation technologies.

Designed for maximum jointing integrity, ProFuse® is the perfect solution for reduced installation costs, optimum installation quality, system reliability and longevity.

Features and Benefits

- **Optimum joint integrity**
  The peelable skin protects the pipe surface from contamination. Once removed, the pipe surface is in pristine condition, ready for jointing. This provides a high joint quality and maintains the integrity of your asset.

- **Reduced installation time and cost**
  ProFuse® offers reduced pipe preparation time, as the peelable skin is quick and easy to remove when a connection is required - it provides substantial installation time and cost benefits compared to hand scraping, specifically on large diameter pipes.

- **Damage protection**
  Trenchless installation methods such as pipe bursting or directional drilling can often damage the surface of polyethylene pipes. The tough ProFuse® skin protects the core of the pipe offering outstanding abrasion resistance during installation.

- **Designer pipe**
  A variety of pipe sizes, SDRs, pressure ratings and lengths are available to meet your exact project requirements.

Approvals

- Approved under regulation 31 of the Water Supply (Water Quality) Regulations 2000.
- BS EN 12201-2:2011+A1:2013.

KM 83015

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Product Range

SDR21 available on request

Profuse® pipe

Manufactured in diameters 75 to 630 mm in straight or coiled format, ProFuse® is available in SDR11 and SDR17 as standard. For special projects requiring bespoke pipe diameters, SDRs and lengths, please contact Radius Systems.

Nominal diameter	SDR	Pressure rating	Product code straight pipe		Product code coiled pipe		Weight
mm		Bar	6m	12m	50m	100m	kg/m
90	11	16	VE0125	VE0127	VE0128	VE0129	2.7
110	11	16	VE0233	VE0235	VE0236	VE0237	3.8
125	11	16	VE0287	VE0289	VE0290	VE0291	4.9
160	11	16	VE0458	VE0460	VE0461	VE0462	7.7
180	11	16	VE0530	VE0532	VE0534	VE0535	9.7
200	11	16	VE0607	VE0609	-	-	11.8
225	11	16	VE0711	VE0713	-	-	14.9
250	11	16	VE0766	VE0769	-	-	18.1
280	11	16	VE0879	VE0881	-	-	22.6
315	11	16	VE0985	VE0988	-	-	28.4
355	11	16	VE1044	VE1047	-	-	35.9
400	11	16	VE1104	VE1107	-	-	45.3
450	11	16	VE1219	VE1221	-	-	57.1
500	11	16	VE1327	VE1329	-	-	70.2
560	11	16	VE1383	VE1385	-	-	87.5
75	17	10	VE0108	VE0109	VE0110	VE0111	1.4
90	17	10	VE0143	VE0145	VE0146	VE0147	2.0
110	17	10	VE0251	VE0253	VE0254	VE0255	2.8
125	17	10	VE0305	VE0307	VE0308	VE0309	3.5
140	17	10	VE0359	VE0361	VE0362	VE0363	4.3
160	17	10	VE0476	VE0478	VE0479	VE0480	5.5
180	17	10	VE0550	VE0552	VE0554	VE0555	6.8
200	17	10	VE0621	VE0623	-	-	8.3
225	17	10	VE0725	VE0727	-	-	10.4
250	17	10	VE0784	VE0787	-	-	12.7
280	17	10	VE0895	VE0897	-	-	15.7
315	17	10	VE1003	VE1006	-	-	19.8
355	17	10	VE1062	VE1065	-	-	25.0
400	17	10	VE1122	VE1125	-	-	31.3
450	17	10	VE1235	VE1237	-	-	39.4
500	17	10	VE1343	VE1345	-	-	48.4
560	17	10	VE1399	VE1401	-	-	60.4
630	17	10	VE1455	VE1457	-	-	76.1

Note: Pipe weights shown are for lifting and handling purposes. They are based on the maximum diameter and pipe wall thickness as specified in BS EN 12201.

The Profuse® Pipe Exposure Tool (PET)

The only tool recommended for the quick, simple and safe removal of the ProFuse® skin. The hardened steel blade cuts the ProFuse® skin and lifts its edge to allow easy peeling from the pipe core.

- **Single size tool** for all sizes of ProFuse pipe
- **Spring-loaded blade** to minimise damage to the tip of the blade
- **Direction marking** for clear and simple operation
- **Plastic body** lightweight and durable
- **Sculpted runners** for blade protection and precise one handed control

Product code: FT0648

CLEANPIPE™ FACTORY SEALED

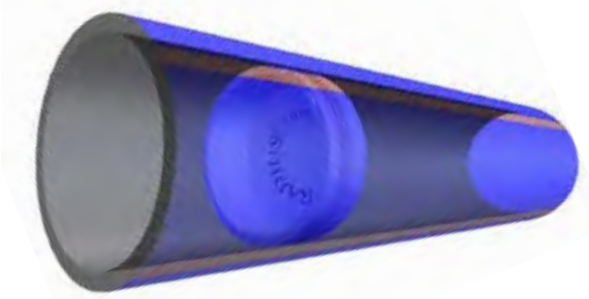
Factory sealed coils for optimum cleanliness.

A leading-edge pipe innovation, CleanPipe™ is Radius Systems' special range of factory sealed coils designed to reduce the risk of contaminants entering the drinking water network from manufacture to the connection point.

CleanPipe™ is fitted with factory fused internal seals, which ensure that the pipe maintains its cleanliness from manufacture through to installation. The seals remove the need for chlorination before the pipe is installed, as they provide a tamper-proof, air and pressure-tight seal solution up to the pipe's point of connection.

CleanPipe™ is ideal for no-dig installation techniques, as the recessed electrofusion seals inserted at both ends of the pipe and fused in place during the manufacturing process, facilitate the use of towing heads for trenchless installation techniques.

CleanPipe™ is available in ProFuse® peelable pipe in diameters 90 to 180 mm for maximum damage protection to the core of the pipe.



Features and Benefits

- **Factory welded internal electrofusion seals**
  Ensure the bore remains clean throughout storage, transportation, until the point of connection.
- **Sealed until connection**
  CleanPipe™ reduces the risk of contamination entering the water network.
- **Pressure and air-tight**
  CleanPipe™ eliminates the need for pre-chlorination before installation.
- **Sealed at both ends**
  The installer can pressure test the pipe directly after installation without the need for additional capping-off.
- **12 month shelf life**
  The internal bore of the pipe remains sterile for 12 months.
- **Ideal for trenchless techniques**
  The external peelable skin offers maximum pipe protection, with the recessed seals giving the ability to use conventional towing heads.

Approvals

- Approved under regulation 31 of the Water Supply (Water Quality) Regulations 2000.
- BS EN 12201-2:2011+A1:2013.

KM 83015

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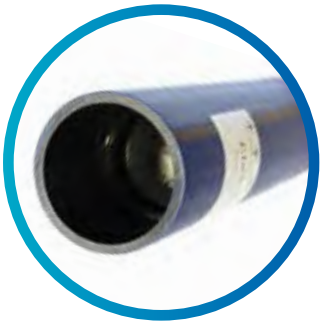
Product Range

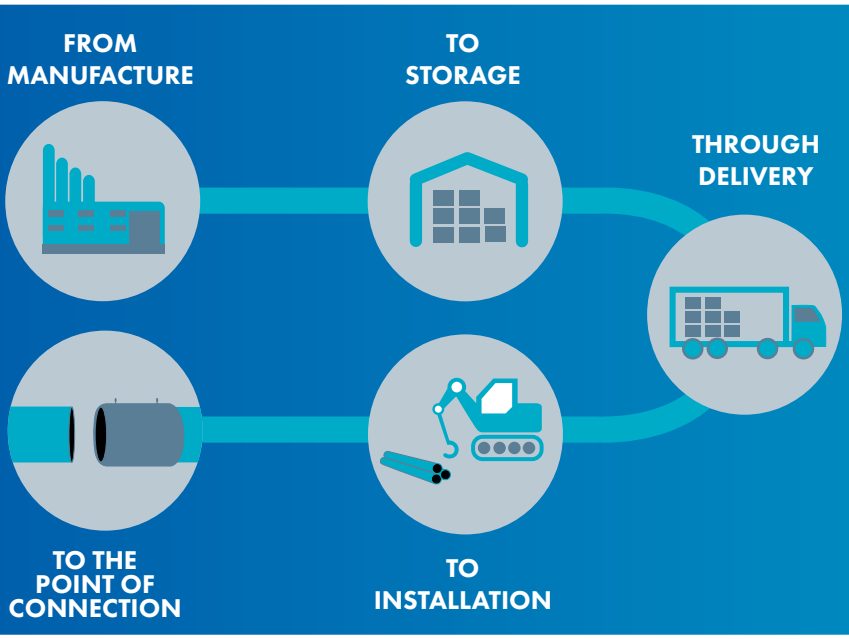


CleanPipe™

Manufactured using ProFuse® SDR17 pipe, CleanPipe™ is available in diameters 90 to 180 mm as standard, in 100m coils for longer, joint free pipeline installation.

Nominal diameter	SDR	Pressure rating	Product code coiled pipe	Weight
mm		Bar	100m	kg/m
90	17	10	VF0147	2.0
125	17	10	VF0309	3.5
180	17	10	VF0555	6.8

Note: Pipe weights shown are for lifting and handling purposes. They are based on the maximum diameter and pipe wall thickness as specified in BS EN 12201.



Guaranteed cleanliness

- CleanPipe™ coils are sealed at both ends of the pipe.
- The internal electrofusion caps are fused during the pipe's manufacturing process in a factory environment.
- CleanPipe™ remains contamination free until the point of connection.
- CleanPipe™ is the ideal solution for use in trenchless pipe installations.

CleanPipe™ shelf life

- CleanPipe's internal bore remains sterile for 12 months from the date of manufacture.
- The coils are individually coded with a month dependent coloured tape to indicate their shelf life. Operators should always check the expiry date shown on the CleanPipe™ label on the pipe coil end.
- If the expiry date passes, the CleanPipe™ seals can be removed and the pipe used as a standard ProFuse® pipe.
- Dated stock encourages good stock rotation.

Example of shelf life coloured tape

SC80 SOLID WALL PE80 PIPE

The flexible service pipe solution for the distribution of drinking water.

Our SC80 (PE80) service pipes are solid wall polyethylene pipes developed as part of Radius Systems' continuous product improvement process.

Manufactured using a specialist co-extrusion technique, the pipes are produced as a single layer pipe wall construction with a black inner and an integral colour coded light blue outer, denoting the pipe's material and application.

Available in diameters 20 to 63 mm in SDR9 and SDR11, our SC80 pipes can be joined using standard electrofusion techniques as well as our unique and innovative range of Redman™ hydraulic compression fittings and suitable mechanical fittings.

Features and Benefits

- Colour coded surface to easily identify the material and its application:
  - PE80 black inner
  - PE80 light blue outer
- Joined using electrofusion and approved mechanical jointing techniques.
- Simple pipe preparation using rotary or hand scraping tools for electrofusion jointing.
- Fully compatible with approved electrofusion, spigot, mechanical and Redman™ fittings.
- Standard and bespoke pipe sizes and SDRs available to meet your specific project requirements.
- Suitable for open-cut and no-dig installation techniques and for use in pipeline rehabilitation projects.
- All pipes supplied with end closures to protect the pipe from dust or rodent ingress from manufacturing to installation.

Approvals

- WRAS approved PE80 materials.
- Approved under regulation 31 of the Water Supply (Water Quality) Regulations 2000.
- BS EN 12201-2:2011+A1:2013.

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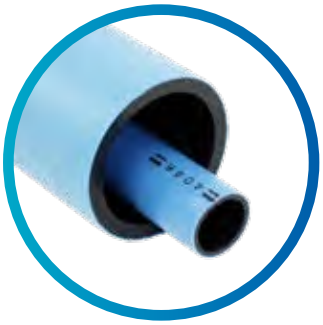
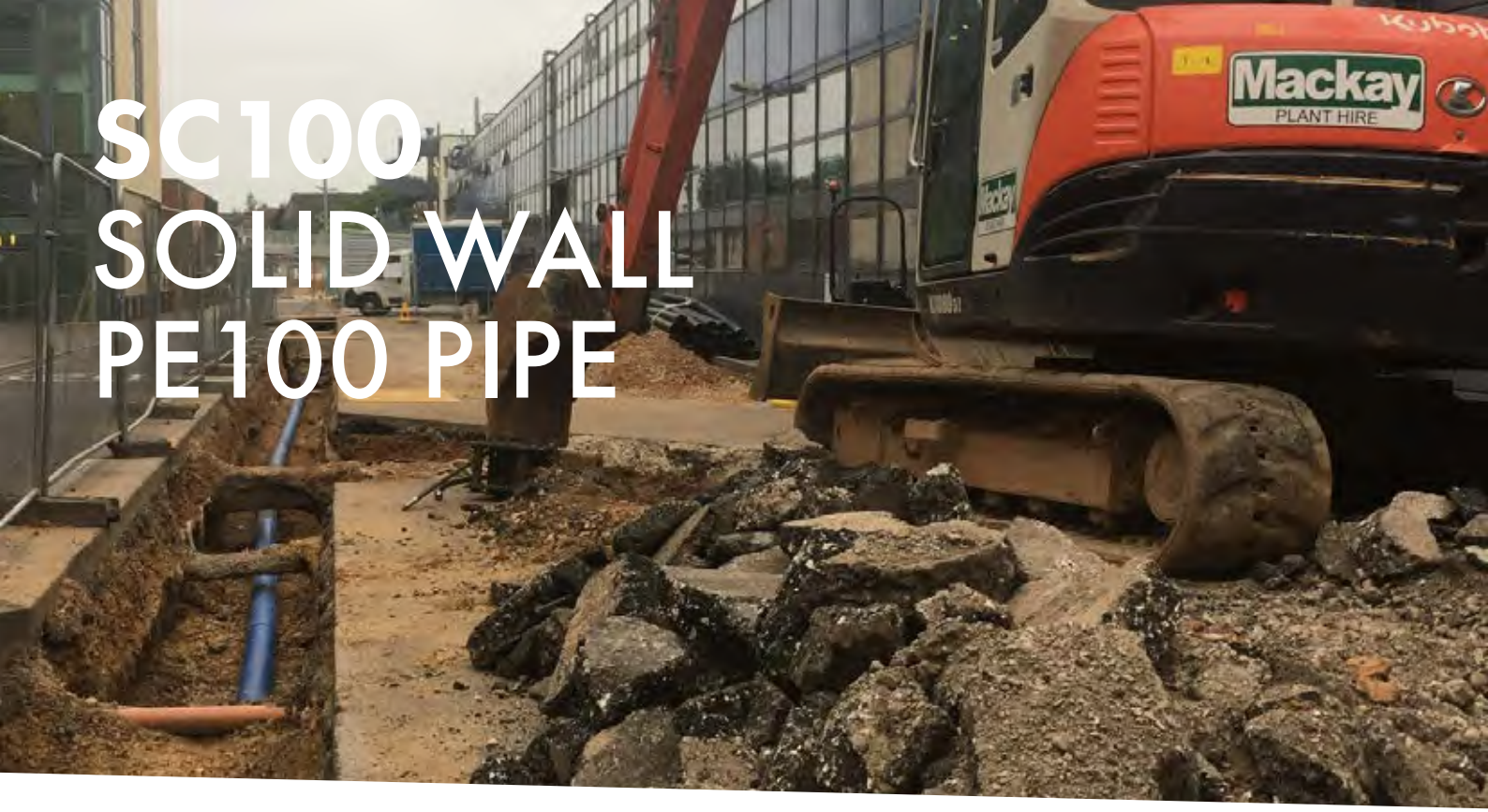
Product Range



SC80 pipe

Nominal diameter	SDR	Pressure rating	Product code straight pipe	Product code coiled pipe				Weight
mm		Bar	6m	25m	50m	100m	150m	kg/m
20	9	12.5	-	VA0020	VA0021	VA0022	VA0023	0.2
25	11	12.5	-	VA0027	VA0028	VA0029	VA0030	0.2
32	11	12.5	-	VA0034	VA0035	VA0036	VA0037	0.3
40	11	12.5	-	-	-	VA0041	-	0.5
50	11	12.5	VA0049	VA0054	VA0051	VA0052	VA0053	0.7
63	11	12.5	VA0068	VA0070	VA0071	VA0072	VA0073	1.1

Note: Pipe weights shown are for lifting and handling purposes. They are based on the maximum diameter and pipe wall thickness as specified in BS EN 12201.



SC100 SOLID WALL PE100 PIPE

The high performance polyethylene mains pipe offering by Radius.

Our SC100 mains pipes are solid wall polyethylene pipes developed as part of Radius Systems' continuous product improvement process.

Manufactured from high performance PE100 materials using a specialist co-extrusion technique, the pipes are produced as a single layer pipe wall construction with a black inner and an integral colour coded dark blue outer, denoting the pipe's material and application.

Available in diameters 90 to 630mm for water pipeline pressure up to 16 bar, our SC100 pipes can be joined using standard electrofusion and butt-fusion welding techniques as well as our unique and innovative range of Redman™ hydraulic compression fittings and suitable mechanical fittings.

Features and Benefits

- Manufactured from high performance PE100 material.
- Colour coded surface to easily identify the material and its application:
  - PE100 black inner
  - PE100 dark blue outer
- Joined using conventional electrofusion and butt-fusion techniques.
- Simple pipe preparation using rotary or hand scraping tools for electrofusion jointing.
- Fully compatible with approved electrofusion, spigot, mechanical and Redman™ fittings.
- Standard and bespoke pipe sizes and SDRs available to meet your specific project requirements.
- Suitable for open-cut and no-dig installation techniques and for use in pipeline rehabilitation projects.
- All pipes supplied with end closures to protect the pipe from dust or rodent ingress from manufacturing to installation.

Approvals

- Approved under regulation 31 of the Water Supply (Water Quality) Regulations 2000.
- BS EN 12201-2:2011+A1:2013.
- DVGW - DW-8143CR0347

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KM 83015

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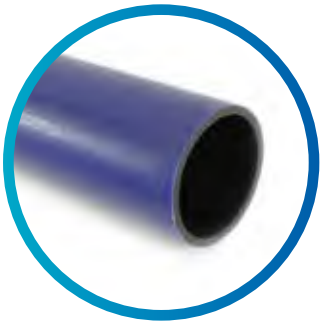
Product Range



SDR 21/26 available on request

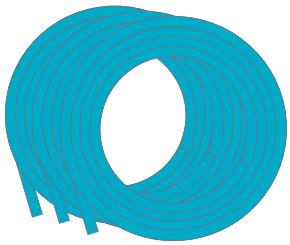
SC100 pipe

Nominal diameter	SDR	Pressure rating	Product code straight pipe			Product code coiled pipe		Weight
mm		Bar	6m	12m	13.5m	50m	100m	kg/m
90	11	16	VC0125	VC0127	-	VC0128	VC0129	2.3
110	11	16	VC0233	VC0235	-	VC0236	VC0237	3.3
125	11	16	VC0287	VC0289	-	VC0290	VC0291	4.3
160	11	16	VC0458	VC0460	-	VC0461	VC0462	7.1
180	11	16	VC0530	VC0532	-	VC0534	VC0535	9.0
200	11	16	VC0607	VC0609	VC0610	-	-	11.0
225	11	16	VC0711	VC0713	VC0714	-	-	14.0
250	11	16	VC0766	VC0769	VC0770	-	-	17.2
280	11	16	VC0879	VC0881	VC0882	-	-	21.5
315	11	16	VC0985	VC0988	VC0989	-	-	27.2
355	11	16	VC1044	VC1047	VC1048	-	-	34.5
400	11	16	VC1104	VC1107	VC1108	-	-	43.8
450	11	16	VC1219	VC1221	VC1222	-	-	55.5
500	11	16	VC1327	VC1329	VC1330	-	-	68.4
560	11	16	VC1383	VC1385	-	-	-	85.7
630	11	16	VC1439	VC1441	-	-	-	108.6
90	17	10	VC0143	VC0145	-	VC0146	VC0147	1.6
110	17	10	VC0251	VC0253	-	VC0254	VC0255	2.3
125	17	10	VC0305	VC0307	-	VC0308	VC0309	3.0
160	17	10	VC0476	VC0478	-	VC0479	VC0480	4.8
180	17	10	VC0550	VC0552	VC0558	VC0554	VC0555	6.1
200	17	10	VC0621	VC0623	VC0624	-	-	7.5
225	17	10	VC0725	VC0727	VC0728	-	-	9.5
250	17	10	VC0784	VC0787	VC0788	-	-	11.6
280	17	10	VC0895	VC0897	VC0898	-	-	14.6
315	17	10	VC1003	VC1006	VC1007	-	-	18.5
355	17	10	VC1062	VC1065	VC1066	-	-	23.6
400	17	10	VC1122	VC1125	VC1126	-	-	29.7
450	17	10	VC1235	VC1237	VC1238	-	-	37.7
500	17	10	VC1343	VC1345	VC1346	-	-	46.5
560	17	10	VC1399	VC1401	VC1402	-	-	58.3
630	17	10	VC1455	VC1457	-	-	-	73.8

Note: Pipe weights shown are for lifting and handling purposes. They are based on the maximum diameter and pipe wall thickness as specified in BS EN 12201.

Coil pack quantity and dimensions

Coil pack quantity



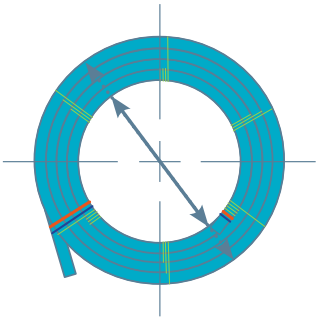
Puriton® pipe

Pipe nominal diameter	Pack quantity	Total pack length	Pack quantity	Total pack length	Pack quantity	Total pack length
mm	25 m	m	50 m	m	100 m	m
25	-	-	6	300	-	-
32	-	-	6	300	-	-
63	6	150	6	300	4	400

SC80 and universal black PE100

Pipe nominal diameter	Pack quantity	Total pack length	Pack quantity	Total pack length	Pack quantity	Total pack length	Pack quantity	Total pack length
mm	25 m	m	50 m	m	100 m	m	150 m	m
20	9	225	9	450	9	900	7	1050
25	10	250	8	400	7	700	5	750
32	8	200	8	400	4	400	4	600
40	-	-	-	-	6	600	5	750
50	9	225	5	250	5	500	4	600
63	9	225	6	300	4	400	3	450

Coil dimensions



Puriton® pipe

Pipe nominal diameter	SDR	Coil length	Coil outer diameter	Coil inner diameter	Coil width	Coil banding sequence	Coil weight
mm		m	mm	mm	mm		kg
25	11	50	965	785	175	-	14.5
32	11	50	1015	785	175	-	22.0
63	11	25	1510	1275	230	•	36.3
63	11	50	1815	1275	208	•	72.5
63	11	100	1815	1275	310	•	145.0
90	11	50	2220	1800	320	•	137.9
90	11	100	2440	1800	410	•	275.7
90	17	50	2930	2500	320	•	102.7
90	17	100	3000	2500	410	•	205.4
110	11	50	3000	2500	320	•	197.1
110	11	100	3200	2500	410	•	394.1
110	17	50	3000	2500	400	•	145.7
110	17	100	3200	2500	500	•	291.4
125	11	50	3000	2500	450	•	251.0
125	11	100	3200	2500	600	•	502.0
125	17	50	3000	2500	450	•	181.6
125	17	100	3200	2500	600	•	363.1
160	11	50	3590	3000	530	•	397.6
160	11	100	3850	3000	700	•	795.2
160	17	50	3590	3000	530	•	284.4
160	17	100	3850	3000	700	•	568.8
180	11	50	3800	3000	630	•	496.3
180	11	100	4000	3000	800	•	992.6
180	17	50	3800	3000	630	•	353.0
180	17	100	4000	3000	800	•	706.0

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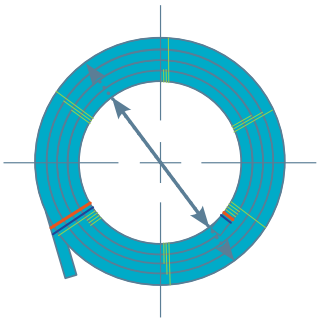
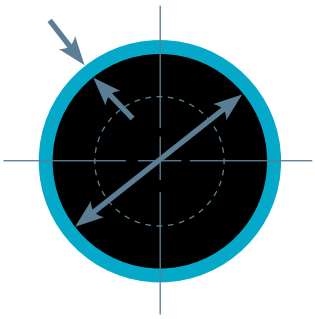


SC80, SC100, universal black PE100 and ProFuse® coil dimensions

Pipe nominal diameter	SDR	Coil length	Coil outer diameter	Coil inner diameter	Coil width	Coil banding sequence	Coil weight SC80 pipe	Coil weight SC100 PE100 pipe	Coil weight ProFuse® pipe
mm		m	mm	mm	mm		kg	kg	kg
20	9	25	710	600	100	-	3.5	3.5	-
20	9	50	780	600	100	-	7.0	7.0	-
20	9	100	885	600	120	-	14.0	14.0	-
20	9	150	885	600	180	-	21.0	21.0	-
25	11	25	740	600	150	-	4.5	4.5	-
25	11	50	780	600	150	-	9.0	9.0	-
25	11	100	910	600	175	-	18.0	18.0	-
25	11	150	910	600	225	-	27.0	27.0	-
32	11	25	875	700	145	-	7.3	7.5	-
32	11	50	990	700	145	-	14.5	15.0	-
32	11	100	990	700	275	-	29.0	30.0	-
32	11	150	1100	700	275	-	43.5	45.0	-
40	11	100	1800	1275	170	-	45.0	-	-
40	11	150	1780	1275	220	-	67.5	-	-
50	11	25	1600	1275	160	•	17.5	17.8	-
50	11	50	1800	1275	220	•	35.0	35.6	-
50	11	100	1880	1275	210	•	70.0	71.2	-
50	11	150	1880	1275	270	•	105.0	106.8	-
63	11	25	1740	1275	130	•	27.5	28.0	-
63	11	50	1815	1275	195	•	55.0	56.0	-
63	11	100	1810	1275	300	•	110.0	112.0	-
63	11	150	2035	1275	345	•	165.0	168.0	-
75	17	50	2220	1800	255	•	-	-	70.0
75	17	100	2220	1800	350	•	-	-	140.0
90	11	50	2220	1800	320	•	-	113.0	135.0
90	11	100	2440	1800	410	•	-	226.0	270.0
90	17	50	2930	2500	320	•	-	77.5	100.0
90	17	100	3000	2500	410	•	-	145.0	200.0
110	11	50	3000	2500	400	•	-	166.5	190.0
110	11	100	3200	2500	500	•	-	333.0	380.0
110	17	50	3000	2500	400	•	-	115.5	140.0
110	17	100	3200	2500	550	•	-	131.0	280.0
125	11	50	3000	2500	450	•	-	216.5	245.0
125	11	100	3200	2500	600	•	-	433.0	490.0
125	17	50	3000	2500	450	•	-	147.0	175.0
125	17	100	3200	2500	600	•	-	294.0	350.0
140	17	50	3530	3000	420	•	-	-	215.0
140	17	100	3700	3000	690	•	-	-	430.0
160	11	50	3590	3000	530	•	-	354.0	385.0
160	11	100	3850	3000	700	•	-	708.0	870.0
160	17	50	3590	3000	530	•	-	241.0	275.0
160	17	100	3850	3000	700	•	-	482.0	550.0
180	11	50	3800	3000	630	•	-	447.0	485.0
180	11	100	4000	3000	800	•	-	894.0	970.0
180	17	50	3800	3000	630	•	-	304.0	340.0
180	17	100	4000	3000	800	•	-	608.0	780.0

Note: The coil banding sequence can be found within this brochure. As part of Radius Systems' commitment to ongoing product development, pipe coil dimensions may be subject to change.

Pipe dimensions



SC80, SC100, universal black PE100 and ProFuse®* pipe dimensions

Nominal diameter	SDR	Outside diameter		Wall thickness		Internal diameter	
		Min	Max	Min	Max	Min	Max
mm		mm	mm	mm	mm	mm	mm
20	9	20.0	20.3	2.3	2.7	14.6	15.7
25	11	25.0	25.3	2.3	2.7	19.6	20.7
32	11	32.0	32.3	3.0	3.4	25.2	26.3
40	11	40.0	40.4	3.7	4.2	31.6	33.0
50	11	50.0	50.4	4.6	5.2	39.6	41.2
63	11	63.0	63.4	5.8	6.5	50.0	51.8
75	11	75.0	75.5	6.8	7.6	59.8	61.9
90	11	90.0	90.6	8.2	9.2	71.6	74.2
110	11	11.0	110.7	10.0	11.1	87.8	90.7
125	11	125.0	125.8	11.4	12.7	99.6	103.0
140	11	140.0	140.9	12.7	14.1	111.8	115.5
160	11	160.0	161.0	14.6	16.2	127.6	131.8
180	11	180.0	181.1	16.4	18.2	143.6	148.3
200	11	200.0	201.2	18.2	20.2	159.6	164.8
225	11	225.0	226.4	20.5	22.7	179.6	185.4
250	11	250.0	251.5	22.7	25.1	199.8	206.1
280	11	280.0	281.7	25.4	28.1	223.8	230.9
315	11	315.0	316.9	28.6	31.6	251.8	259.7
355	11	355.0	357.2	32.2	35.6	283.8	292.8
400	11	400.0	402.4	36.3	40.1	319.8	329.8
450	11	450.0	452.7	40.9	45.1	359.8	370.9
500	11	500.0	503.0	45.4	50.1	399.8	412.2
560	11	560.0	563.4	50.8	56.0	448.0	461.8
75	17	75.0	75.5	4.5	5.1	64.8	66.5
90	17	90.0	90.6	5.4	6.1	77.8	79.8
110	17	110.0	110.7	6.6	7.4	95.2	97.5
125	17	125.0	125.8	7.4	8.3	108.4	111.0
140	17	140.0	140.9	8.3	9.3	121.4	124.3
160	17	160.0	161.0	9.5	10.6	138.8	142.0
180	17	180.0	181.1	10.7	11.9	156.2	159.7
200	17	200.0	201.2	11.9	13.2	173.6	177.4
225	17	225.0	226.4	13.4	14.9	195.2	199.6
250	17	250.0	251.5	14.8	16.4	217.2	221.9
280	17	280.0	281.7	16.6	18.4	243.2	248.5
315	17	315.0	316.9	18.7	20.7	273.6	279.5
355	17	355.0	357.2	21.1	23.4	308.2	315.0
400	17	400.0	402.4	23.7	26.2	347.6	355.0
450	17	450.0	452.7	26.7	29.5	391.0	399.3
500	17	500.0	503.0	29.7	32.8	434.4	443.6
560	17	560.0	563.4	33.2	36.7	486.6	497.0
630	17	630.0	633.8	37.4	41.3	547.4	559.0
710	17	710.0	716.4	42.1	46.5	617.0	632.2
800	17	800.0	807.2	47.4	52.3	695.4	712.4
225	21	225.0	226.4	10.8	12.0	201.0	204.8
250	21	250.0	251.5	11.9	13.2	223.6	227.7
280	21	280.0	281.7	13.4	14.9	250.2	254.9
315	21	315.0	316.9	15.0	16.6	281.8	286.9
355	21	355.0	357.2	16.9	18.7	317.6	323.4
400	21	400.0	402.4	19.1	21.2	357.6	364.2
450	21	450.0	452.7	21.5	23.8	402.4	409.7
500	21	500.0	503.0	23.9	26.4	447.2	455.2
560	21	560.0	563.4	26.7	29.5	501.0	510.0
630	21	630.0	633.8	30.0	33.1	563.8	573.8
710	21	710.0	716.4	33.9	37.4	635.2	648.6
800	21	800.0	807.2	38.1	42.1	715.8	731.0

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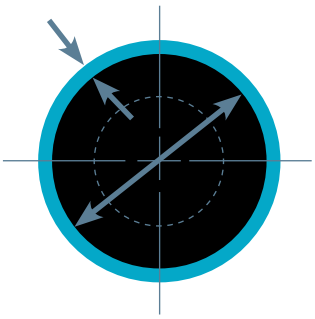


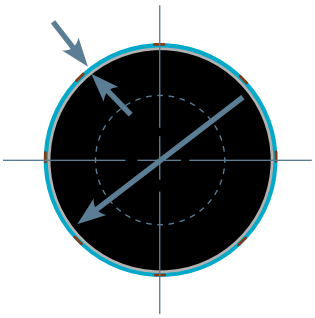
SC80, SC100, universal black PE100 and ProFuse®* pipe dimensions

Nominal diameter	SDR	Outside diameter		Wall thickness		Internal diameter	
		Min	Max	Min	Max	Min	Max
mm		mm	mm	mm	mm	mm	mm
900	21	900.0	908.1	42.9	47.3	805.4	822.3
1000	21	1000.0	1009.0	47.7	52.6	894.8	913.6
315	26	315.0	316.9	12.1	13.5	288.0	292.7
355	26	355.0	357.2	13.6	15.1	324.8	330.0
400	26	400.0	402.4	15.3	17.0	366.0	371.8
450	26	450.0	452.7	17.2	19.1	411.8	418.3
500	26	500.0	503.0	19.1	21.2	457.6	464.8
630	26	630.0	633.8	24.1	26.7	576.6	585.6
710	26	710.0	716.4	27.2	30.1	649.8	662.0
800	26	800.0	807.2	30.6	33.8	732.4	746.0
900	26	900.0	908.1	34.4	38.3	823.4	839.3
1000	26	1000.0	1009.0	38.2	42.2	915.6	932.6
1100[1]	26	1100.0	1109.9	42.3	46.6	1006.6	1025.3
1200	26	1200.0	1210.8	45.9	50.6	1098.8	1119.0

Note: Pipe dimensions based on the PE water pipe specification BS EN 12201:2 are provided for guidance only.

* For ProFuse® pipe, the dimensions within the table only relate to the PE100 core pipe and do not include the outer polypropylene skin. The thickness of the skin ranges between 0.6 and 1.2 mm across the range of pipe diameters.

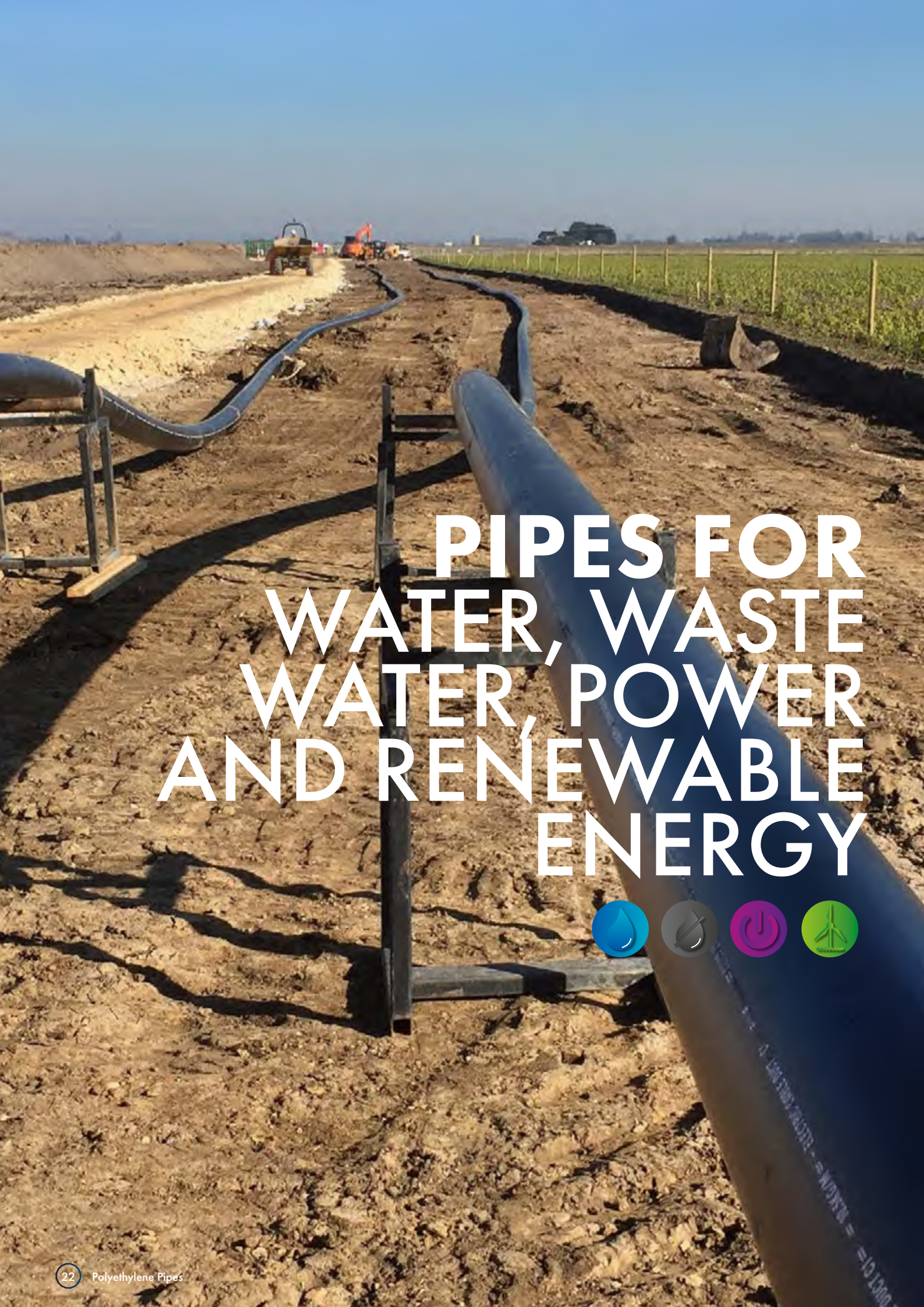
[1] Dimensions based on in-house specification.



Puriton® pipe dimensions

Nominal diameter	SDR	Core pipe outside diameter		Core pipe wall thickness		Overall external diameter		Internal diameter	
		Min	Max	Min	Max	Min	Max	Min	Max
mm		mm	mm	mm	mm	mm	mm	mm	mm
25	11	25.0	25.3	2.3	2.7	27.0	27.6	19.6	20.7
32	11	32.0	32.3	3.0	3.4	34.0	34.6	25.2	26.3
63	11	63.0	63.4	5.8	6.5	64.8	65.8	50.0	51.8
90	11	90.0	90.6	8.2	9.2	92.2	93.8	71.6	74.2
110	11	110.0	110.7	10.0	11.1	112.2	113.9	87.8	90.7
125	11	125.0	125.8	11.4	12.4	127.2	129.0	99.6	103.0
160	11	160.0	161.0	14.6	16.2	162.2	164.2	127.6	131.8
180	11	180.0	181.1	16.4	18.2	182.2	184.3	143.6	148.3
90	17	90.0	90.6	5.4	6.1	92.2	93.8	77.8	79.8
110	17	110.0	110.7	6.6	7.4	112.2	113.9	95.2	97.5
125	17	125.0	125.8	7.4	8.3	127.2	129.0	108.4	111.0
160	17	160.0	161.0	9.5	10.6	162.2	164.2	138.8	142.0
180	17	180.0	181.1	10.7	11.9	182.2	184.3	156.2	159.7

Note: The Puriton® core pipe dimensions are based on the PE water pipe specification BS EN 12201:2 and are provided for guidance only. They do not include the outer aluminium and PE layers.



PIPES FOR WATER, WASTE WATER, POWER AND RENEWABLE ENERGY

UNIVERSAL POLYETHYLENE PIPES

ENGINEERED PIPE SOLUTION FOR MODERN PIPELINE NETWORKS

The versatile pipe solution for water, power and renewable energy applications.

Radius Systems' universal black PE100 pipes are the most versatile and widest pipe offering for non potable, potable water, power and renewable energy pipeline projects. Manufactured from high performance polyethylene, with a solid wall construction, our universal black pipes are available in diameters 20 to 1200 mm in a range of SDRs and pressure ratings, and can be tailored to fit the most challenging pipeline projects.

The versatility of our black pipes means that they can be used above ground for potable water(*), and below ground in a diverse range of applications:

- Hydroelectricity schemes
- Geothermal pipework
- Buried fire protection ring mains
- Sewerage systems
- Rainwater drainage
- Fish farming (cage frames)
- Marine outfall
- Irrigation systems
- Ducting for electricity cabling in renewable energy projects

Our universal black pipes are easily joined using industry standard electrofusion and butt-fusion welding techniques, as well as our unique and innovative range of Redman™ hydraulic compression fittings and suitable mechanical fittings.

Features and Benefits

- A versatile black PE pipe offering suitable for a wide range of applications.
- Joined using conventional electrofusion and butt-fusion techniques.
- Simple pipe preparation using rotary or hand scraping tools for electrofusion jointing.
- Fully compatible with approved electrofusion, spigot, mechanical and Redman™ fittings.
- Standard and bespoke pipe sizes and SDRs available to meet your specific project requirements.
- Suitable for open-cut and no-dig installation techniques and for use in pipeline rehabilitation projects.

Approvals

- Approved under regulation 31 of the Water Supply (Water Quality) Regulations 2000.
- BS EN 12201-2: 2011+A1:2013.

KM 83015

(*) Approval should be sought from the water undertaker before installing PE black pipe above ground for potable water use.

Product Range

Universal black PE100 pipe

Nominal diameter	SDR	Pressure rating	Product code straight pipe			Product code coiled pipe				Weight
mm		Bar	6m	12m	13.5m	25m	50m	100m	150	kg/m
20	9	16	-	-	-	VC2520	VC2521	VC2522	VC2523	0.2
25	11	16	-	-	-	VC2527	VC2528	VC2529	VC2530	0.2
32	11	16	-	-	-	VC2534	VC2535	VC2536	VC2537	0.3
50	11	16	-	-	-	VC2554	VC2551	VC2552	VC2553	0.7
63	11	16	VC2568	-	-	VC2570	VC2571	VC2572	VC2573	1.1
90	11	16	VC2625	-	-	-	VC2628	VC2629	-	2.3
110	11	16	VC2733	VC2735	-	-	VC2736	VC2737	-	3.3
125	11	16	VC2787	VC2789	-	-	VC2790	VC2791	-	4.3
140	11	16	-	VC2843	-	-	-	-	-	5.4
160	11	16	VC2958	VC2960	-	-	VC2961	VC2962	-	7.1
180	11	16	VC3030	VC3032	-	-	VC3034	VC3035	-	9.0
200	11	16	VC3107	VC3109	-	-	-	-	-	11.0
225	11	16	VC3211	VC3213	-	-	-	-	-	14.0
250	11	16	VC3266	VC3269	-	-	-	-	-	17.1
315	11	16	VC3485	VC3488	-	-	-	-	-	27.2
355	11	16	VC3544	VC3547	-	-	-	-	-	34.5
400	11	16	-	VC3607	-	-	-	-	-	43.8
450	11	16	-	VC3721	-	-	-	-	-	55.5
500	11	16	-	VC3829	-	-	-	-	-	68.4
560	11	16	-	VC3885	-	-	-	-	-	85.7
90	17	10	VC2643	VC2645	-	-	VC2646	VC2647	-	1.6
110	17	10	VC2751	VC2753	-	-	VC2754	VC2755	-	2.3
125	17	10	VC2805	VC2807	-	-	VC2808	VC2809	-	3.0
160	17	10	VC2976	VC2978	-	-	VC2979	VC2980	-	4.8
180	17	10	VC3050	VC3052	-	-	VC3054	VC3055	-	6.1
200	17	10	VC3121	VC3123	-	-	-	-	-	7.5
225	17	10	VC3225	VC3227	VC3228	-	-	-	-	9.5
250	17	10	VC3284	VC3287	VC3288	-	-	-	-	11.6
280	17	10	VC3395	VC3397	-	-	-	-	-	14.6
315	17	10	VC3503	VC3506	VC3507	-	-	-	-	18.5
355	17	10	VC3562	VC3565	VC3566	-	-	-	-	23.6
400	17	10	VC3622	VC3625	-	-	-	-	-	29.7
450	17	10	VC3735	VC3737	VC3738	-	-	-	-	37.7
500	17	10	VC3843	VC3845	VC3846	-	-	-	-	46.5
560	17	10	VC3899	VC3901	VC3902	-	-	-	-	58.3
630	17	10	VC3955	VC3957	-	-	-	-	-	73.8
315	21	8	-	-	VC3524	-	-	-	-	15.0
400	21	8	-	-	VC3644	-	-	-	-	24.4
450	21	8	-	-	VC3754	-	-	-	-	30.8
500	21	8	-	-	VC3862	-	-	-	-	38.0
560	21	8	-	-	VC3918	-	-	-	-	47.5
630	21	8	-	-	VC3974	-	-	-	-	60.0
710	21	8	-	-	VC4030	-	-	-	-	72.8
800	21	8	-	-	VC4086	-	-	-	-	97.1
900	21	8	-	-	VC4142	-	-	-	-	122.8
1000	21	8	-	-	VC4190	-	-	-	-	151.6

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Universal black PE100 pipe - continued

Nominal diameter	SDR	Pressure rating	Product code straight pipe			Product code coiled pipe				Weight
mm		Bar	6m	12m	13.5m	25m	50m	100m	150	kg/m
315	26	6	-	-	VC3532	-	-	-	-	12.4
355	26	6	-	-	VC3592	-	-	-	-	15.6
400	26	6	-	-	VC3653	-	-	-	-	19.8
450	26	6	-	-	VC3762	-	-	-	-	25.0
500	26	6	-	-	VC3870	-	-	-	-	30.8
560	26	6	-	-	VC3926	-	-	-	-	38.6
630	26	6	-	-	VC3982	-	-	-	-	48.9
710	26	6	-	-	VC4038	-	-	-	-	62.3
800	26	6	-	-	VC4094	-	-	-	-	78.9
900	26	6	-	-	VC4150	-	-	-	-	100.5
1000	26	6	-	-	VC4198	-	-	-	-	128.0
1100	26	6	-	-	VC4254	-	-	-	-	148.0
1200	26	6	-	-	VC4310	-	-	-	-	177.1

Note: Pipe weights shown are for lifting and handling purposes. They are based on the maximum diameter and pipe wall thicknesses as specified in BS EN 12201.

PIPES FOR GAS

POLYETHYLENE GAS PIPES

ENGINEERED PIPE SOLUTIONS FOR MODERN GAS PIPELINE NETWORKS

As well as providing solid wall PE pipes for new installations and pipeline rehabilitation, Radius Systems have developed a range of solutions for metallic service pipe relining and a peelable pipe, ProFuse®, specially designed for use in open-cut and no-dig installations. Below is a summary of our pipe range with their key applications.

Pipe type	Application and suitability
SC80 yellow	• A solid wall PE80 pipe with a black inner and a yellow outer. • Approved to GIS/PL2-2 and BS EN 1555-2. • Used for new pipelines, network rehabilitation and pipe replacement. • Installed using open-cut or no-dig techniques.
SC100 orange	• A solid wall PE100 pipe with a black inner and an orange outer. • Approved to GIS/PL2-8 and BS EN 1555-2. • Used for new pipelines, network rehabilitation and pipe replacement. • Installed using open-cut or no-dig techniques.
ProFuse®	• A multi-layer pipe, manufactured from black PE100 and a yellow peelable polypropylene outer skin with stripes. • Approved to GIS/PL2-2 and BS EN 1555-2. • Used for new pipelines, network rehabilitation and pipe replacement. • Ideally suited for no-dig and open-cut installation techniques.
HY100	• A solid wall, single layer co-extruded pipe. • Approved to the UK Gas Industry specification GIS/PL2-2. • Manufactured from a PE100 black core and a PE80 yellow outer • For low and medium pressure gas pipeline projects with 2 bar MOP.
ServiFlex®	• A flexible twin-wall pipe manufactured from yellow PE80. • MOP 75 millibar. • Used for 1" steel pipe relining. • Installed using the no-dig insertion technique.
17.5 mm relining system	• Manufactured from PE80 with a black inner and a yellow outer. • Approved to GIS/PL2-2 (PE80 pipe), GIS/PL3 (service head adaptor) and GIS/PL2-4 (electrofusion reducer). • MOP 75 millibar. • Used for ¾" metallic pipe relining. • Installed using the no-dig insertion technique.

MOP = Maximum operating pressure.
For guidance on the MOP for our range of gas pipes, please contact Radius Systems.

SC80 SOLID WALL PE80 PIPE

The flexible service pipe solution for gas distribution.

Our range of SC80 gas pipes are innovative solid wall polyethylene pipes developed as part of Radius Systems' continuous product improvement process and are the ideal solution for the construction of gas pipelines.

Manufactured using a specialist co-extrusion technology, the pipe is produced as a single pipe wall construction with a black inner and an integral colour coded yellow outer, denoting the pipe's material and application.

Available in diameters 20 to 315 mm in a range of SDRs and pressure ratings to suit your gas pipeline project, our SC80 gas pipes can be joined using industry standard electrofusion and butt-fusion welding techniques.

Ideally suited for new pipeline installations, close-fit legacy pipe rehabilitation and pipe replacement projects, our SC80 gas pipes can be used in open-cut or no-dig installation techniques.

Features and Benefits

- Yellow colour coded outer to easily identify the pipe material and its application.
- Longer coil lengths reducing the number of joints in the pipeline.
- Flexible and easy to install.
- Corrosion free material for longer life.
- Fully compatible with approved electrofusion and spigot fittings.
- Joined using conventional electrofusion and butt-fusion techniques.
- Simple pipe surface preparation for electrofusion jointing using industry approved tooling.
- Suitable for open-cut and no-dig installation techniques.
- Ideal for use in pipe rehabilitation projects.

Approvals

- GIS/PL2-2 (KM 513530)
- BS EN 1555-2 (KM 575728

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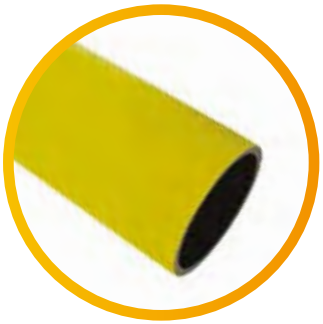
Product Range



SC80 pipe

Our SC80 pipes are manufactured from PE80 materials and are easily identifiable by their yellow coloured outer surface. Manufactured in sizes 20 to 315 mm as standard, in straight or coiled pipe, SC80 pipe are available in SDR9, 11, 13.6 and 17.6. For special projects requiring bespoke pipe diameters, SDRs and lengths, please contact Radius Systems.

Nominal diameter	SDR	Product code straight pipe		Product code coiled pipe					Weight
mm		6m	12m	50m	100m	150m	250m	500m	kg/m
20	9	-	-	-	FA0022	-	-	-	0.1
25	11	FA0026	-	FA0028	FA0029	-	-	-	0.2
32	11	FA0033	-	FA0035	FA0036	-	-	-	0.3
40	11	-	-	-	FA0041	-	-	-	0.5
63	11	FA0068	-	FA0071	FA0072	FA0073	-	-	1.1
75	11	FA0092	-	FA0094	FA0096*	-	FA0098	FA0091	1.5
90	11	FA0125	-	-	FA0129	-	-	-	2.2
125	11	FA0287	-	FA0290	FA0291	-	-	-	4.3
180	11	FA0530	FA0532	FA0534	FA0535	-	-	-	8.8
63	13.6	FA0076	-	FA0079	FA0080	FA0081	FA0082	FA0083	0.9
75	13.6	FA0100	-	-	FA0104*	-	FA0106	FA0107	1.3
90	17.6	FA0152	FA0154	FA0155	FA0156	FA0157	FA0158	FA0159	1.5
125	17.6	FA0314	FA0316	FA0317	FA0318	FA0319	-	-	2.8
140	17.6	FA0368	-	-	FA0372	-	-	-	3.5
180	17.6	FA0560	FA0562	FA0564	FA0565	-	-	-	5.8
250	17.6	FA0793	FA0796	-	-	-	-	-	11.1
315	17.6	FA1012	FA1014	-	-	-	-	-	17.5

Note:

- *Supplied in 120 m coils.
- Pipe weights shown are for lifting and handling purposes. They are based on the gas industry specification's maximum pipe diameter and wall thickness.
- For guidance on maximum operating pressures, please contact Radius Systems.

SC100 SOLID WALL PE100 PIPES

The high performance PE pipe for intermediate pressure pipelines.

Our range of SC100 gas pipes are innovative solid wall polyethylene pipes developed as part of Radius Systems' continuous product improvement process and are the ideal solution for the construction of gas pipelines.

Manufactured using specialist co-extrusion technology, the pipe is produced as a single pipe wall construction with a black inner and an integral colour coded orange outer, denoting the pipe's material and application.

Available in diameters 63 to 500 mm in SDR11 or SDR17.6 for pressure ratings to suit your pipeline requirements, our SC100 pipe can be joined using standard electrofusion and butt-fusion welding techniques.

Ideally suited for new pipeline installations, close-fit legacy pipe rehabilitation and pipe replacement projects, our SC100 gas pipes can be installed using open-cut or no-dig installation techniques.

Features and Benefits

- Orange colour coded outer to easily identify the pipe material and its application
- Fully compatible with approved electrofusion and spigot fittings.
- Joined using conventional electrofusion and butt-fusion techniques.
- Simple pipe surface preparation for electrofusion jointing using industry approved tooling.
- Suitable for open-cut and no-dig installation techniques.
- Ideal for use in pipe rehabilitation projects.

Approvals

- GIS/PL2-8 (KM 513620) - pressure rating up to 7 bar
- BS EN 1555-2 (KM 575728) - pressure rating up to 10 bar

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Product Range

SC100 pipe

Our SC100 pipes are manufactured from PE100 materials and are easily identifiable by their orange coloured outer surface. Manufactured in sizes 63 to 630 mm in straight or coiled pipe, SC100 pipes are available in SDR11 and SDR17.6. For special projects requiring bespoke pipe diameters, SDRs and lengths, please contact Radius Systems.

Nominal diameter	SDR	Product code straight pipe		Product code coiled pipe	Weight
mm		6m	12m	100m	kg/m
63	11	-	FC0069	FC0072	1.1
90	11	-	FC0127	FC0129	2.3
125	11	-	FC0289	FC0291	4.3
180	11	-	FC0532	FC0535	8.9
250	11	-	FC0769	-	17.1
315	11	-	FC0988	-	27.2
355	11	-	FC1047	-	34.6
400	11	FC1104	FC1107	-	43.9
450	11	FC1219	FC1221	-	55.4
500	11	FC1327	FC1329	-	68.5
90	17.6	-	FC0154	FC0156	1.5
125	17.6	-	FC0316	-	2.8
180	17.6	-	FC0562	-	5.9
250	17.6	-	FC0796	-	11.2
315	17.6	-	FC1015	-	17.7
355	17.6	-	FC1074	-	22.6

Note: Pipe weights shown are for lifting and handling purposes. They are based on the gas industry specification's maximum pipe diameter and wall thickness.

PROFUSE®
PEELABLE PIPE

Maximum jointing integrity for asset longevity and installation cost savings.

ProFuse® is a technologically advanced peelable pipe innovation for the transportation of natural and suitable manufactured gases in buried pipeline applications, offering a high performance solution with optimum joint integrity, damage protection and reduced installation time and costs to asset owners.

Manufactured from black PE100, ProFuse® has been designed with a unique polypropylene peelable skin, which is applied to the core pipe during the manufacturing process using melt on melt technology. The skin is tough and offers excellent abrasion resistance to protect the pipe during handling, transportation and installation. It is easily removed, using the pipe exposure tool (PET™), revealing a pristine pipe surface, ready to be joined using electrofusion or butt-fusion welding techniques.

Ideal for open cut, dead or live insertion, horizontal directional drilling and pipe bursting installation techniques, ProFuse® is a superior pipe solution, especially suited to no-dig installation techniques, as its tough protective skin absorbs damage normally associated with those installation methods.

Designed for maximum jointing integrity, ProFuse® is the perfect solution for reduced installation costs, optimum joint quality, system reliability and confidence in the longevity of your pipeline.

Features and Benefits

- Unique external skin
  Specifically developed with an external skin to minimise damage to the core pipe. The tough polypropylene skin offers excellent abrasion resistance to protect the pipe during handling, storage, transportation and installation.
- Installation damage protection
  Ideally suited for trenchless installation techniques such as pipe insertion, pipe bursting and horizontal directional drilling.
- Optimum joint integrity
  The ProFuse® peelable skin is removed locally with the PET tool, revealing a pipe surface in pristine condition, ready for jointing.
- Reduced installation time
  The peelable skin is easily removed, reducing pipe surface preparation time for electrofusion jointing compared to conventional PE pipe.

Approvals

- GIS/PL2-2 (KM 513530)
- BS EN 1555-2 (KM 575728)

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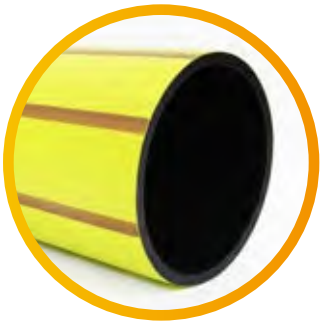
Product Range



ProFuse® pipe

Nominal diameter	SDR	Product code straight pipe		Weight
mm		6m	12m	kg/m
180	17.6	-	FE0562	6.5
250	17.6	-	FE0796	12.3
315	17.6	-	FE1015	19.1
400	17.6	-	FE1134	30.4
250	21	FE0802	FE0805	10.6
280	21	FE0910	FE0912	13.1
315	21	FE1020	FE1023	16.4
355	21	FE1079	FE1082	20.6
400	21	FE1140	FE1143	25.9
450	21	FE1251	FE1253	32.4
500	21	FE1359	FE1361	39.9
630	21	FE1471	FE1473	62.6

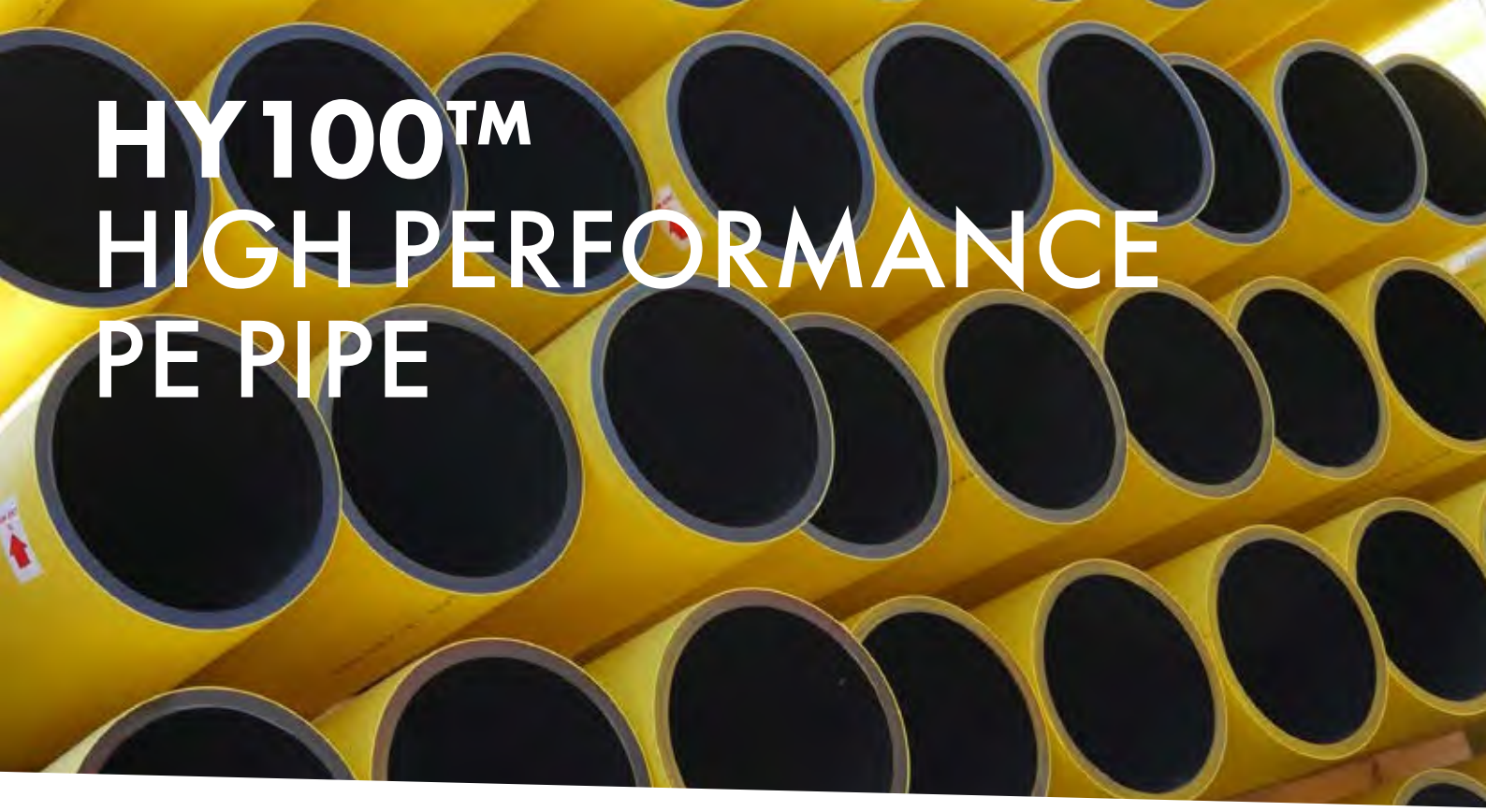
Note:

- Pipe weights shown are for lifting and handling purposes. They are based on the gas industry specification's maximum pipe diameter and wall thickness.
- For special projects requiring bespoke pipe diameters, SDRs and lengths, please contact Radius Systems.
- For guidance on maximum operating pressures, please contact Radius Systems.

The ProFuse® Pipe Exposure Tool (PET)

The only tool recommended for the quick, simple and safe removal of the ProFuse® skin. The hardened steel blade cuts the ProFuse® skin and lifts its edge to allow easy peeling from the pipe core.

- **Single size tool** for all sizes of ProFuse pipe
- **Spring-loaded blade** to minimise damage to the tip of the blade
- **Direction marking** for clear and simple operation
- **Plastic body** lightweight and durable
- **Sculpted runners** for blade protection and precise one handed control



HY100™ HIGH PERFORMANCE PE PIPE

A modern, high performance polyethylene pipe for twenty-first century gas pipeline networks.

Radius Systems' new HY100™ gas pipes have been specifically designed to deliver a complete high performance pipe offering for the construction of below ground low and medium pressure gas pipeline networks.

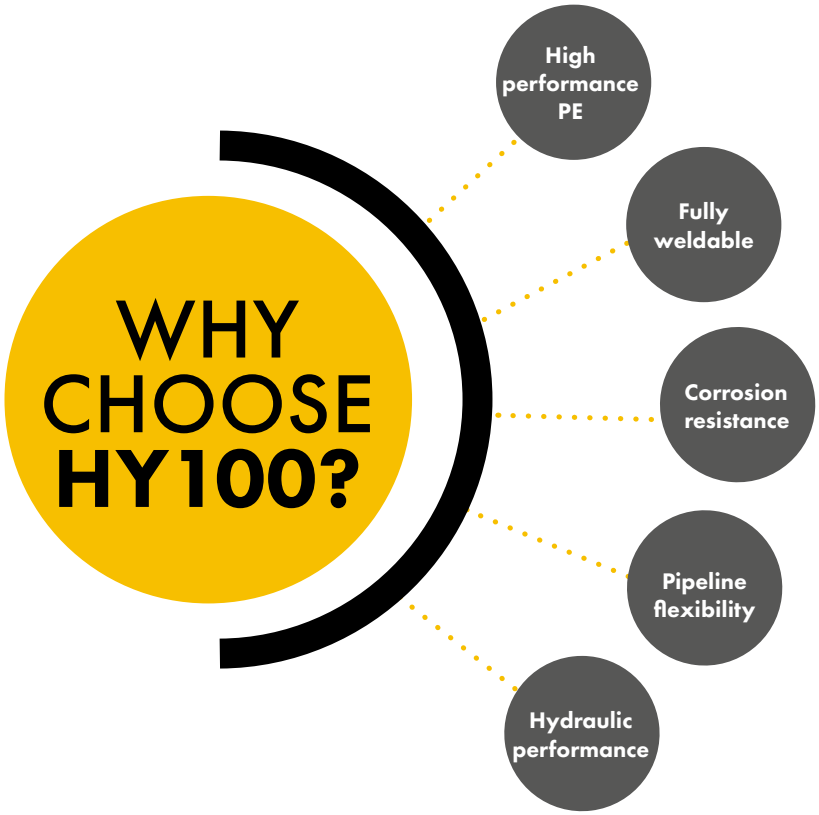
HY100™ is a pioneering class of co-extruded solid wall polyethylene (PE) pipes which combine the strength of PE100 at its core with a yellow PE80 outer for pipe identification and application recognition. The pipe range has been specifically developed to extend our gas pipe offering and provide our customers with a wider choice of high performance pipe solutions for the construction of gas distribution pipelines.

Our new HY100™ pipes are manufactured using a specialist co-extrusion technique, where the PE100 and PE80 materials are combined using melt-on-melt technology.

The use of PE100 high performance material in the production of HY100™ enables Radius Systems to offer a specially engineered SDR21 pipe solution, with a larger bore for greater gas carrying capacity. In addition, PE100 is a tough material, giving the confidence in a robust gas pipe solution that will last a lifetime.

Joined using industry standard electrofusion and butt-fusion welding techniques, HY100™ pipes are ideally suited for new pipeline installations, close-fit legacy pipe rehabilitation and pipe replacement projects and can be installed using open-cut or no-dig installation techniques.

The HY100™ pipe range is available in diameters 250 to 450 mm and is approved to the UK gas industry specification GIS/PL2-2:2016.



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HY100 at a glance

- A solid wall, single layer co-extruded pipe.
- Manufactured from a PE100 black core and a PE80 yellow outer.
- For low and medium pressure gas pipeline projects with 2 bar MOP.
- Diameter range 250 to 450 mm.
- Approved to the UK Gas Industry specification GIS/PL2-2.
- Used for new pipelines, network rehabilitation and pipe replacement.
- Installed using open-cut or no-dig techniques
- Complemented by a range of approved electrofusion and spigot fittings.

Features and Benefits

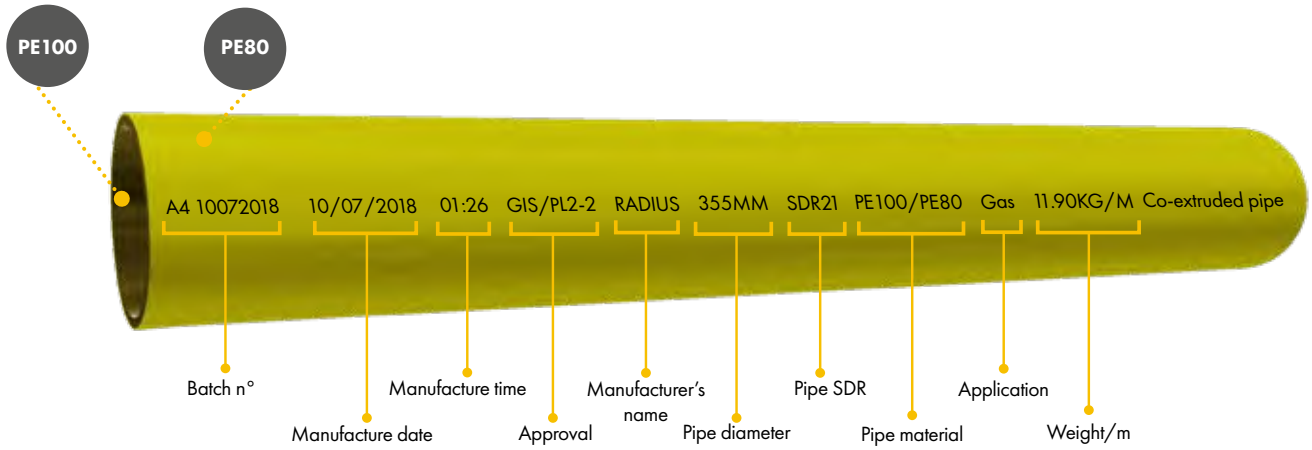
- A high performance pipe offering robustness and longevity.
- SDR21 pipe with a larger bore for greater gas carrying capacity
- Flexible and easy to install.
- Corrosion free material for longer life.
- Joined using conventional electrofusion and butt-fusion techniques.
- Simple pipe preparation for electrofusion jointing using rotary or hand scraping tools.
- Fully compatible with approved electrofusion and spigot fittings.
- Suitable for open-cut and no-dig installation techniques.
- Ideal for use in pipeline insertion and rehabilitation schemes.

Identifying HY100™

Manufactured from black PE100 and yellow PE80 materials, the pipes are easily identified by the markings on the pipe's outer surface, repeated every meter along its length.

Approvals

- Manufactured in ISO 9001:2015 approved manufacturing facilities.
- GIS/PL2-2:2016 (KM 513530).



Product Range

HY100™ pipe

Nominal diameter	SDR	MOP GIS/PL2:2	Product code		Weight
mm		bar	6m	12m	kg/m
250	21	2	FB0802	FB0805	9.5
280	21	2	FB0910	FB0912	11.9
315	21	2	FB1020	FB1023	15.0
355	21	2	FB1079	FB1082	19.1
400	21	2	FB1140	FB1143	24.1
450	21	2	FB1251	FB1253	30.6

Note: Pipe weights are for lifting and handling purposes. They are based on the pipe maximum diameter and wall thickness as specified in GIS/PL2-2.

Joining and making connections to HY100™

HY100™ are conventional solid wall PE pipes that are joined using industry standard electrofusion or butt-fusion welding techniques.

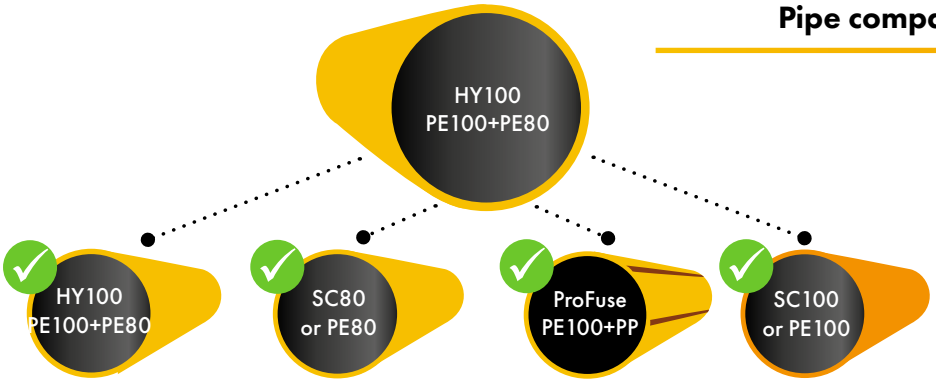
To comply with manufacturers' guidance and the gas industry best practice, butt-fusion jointing in the field is only permitted between pipes of the same diameter, SDR, polyethylene classification and colour. When using the butt-fusion jointing technique, HY100™ should only be joined to HY100 pipes. When connecting HY100™ pipes to other polyethylene pipes, Radius Systems recommend the use of approved electrofusion fittings.

Before making an electrofusion joint, the surface of HY100™ pipe must be prepared using industry approved tooling and techniques to ensure that the pipe is clean and free from contamination.

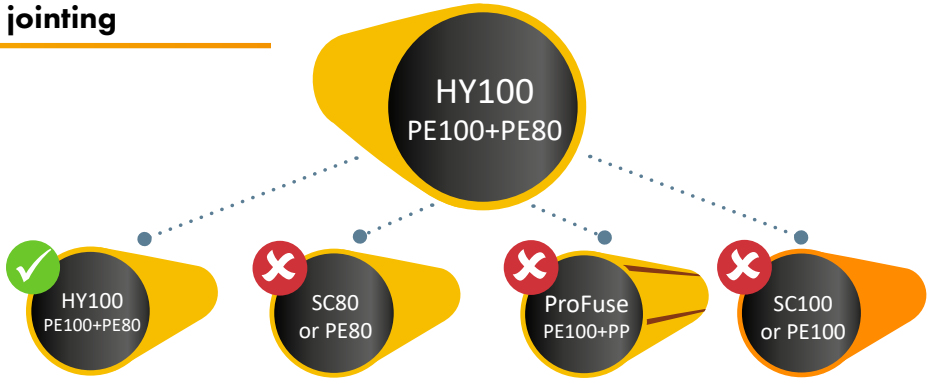
For pipe preparation when using socket electrofusion fittings, Radius Systems recommend the use of rotary pipe preparation tools as they remove a uniform layer of PE from the pipe's surface.

Welding equipment must be calibrated and in good working condition to ensure maximum joint integrity.

Pipe compatibility for electrofusion jointing



Pipe compatibility for butt fusion jointing



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SERVICE PIPE RELINING SOLUTIONS

A no-dig pipe relining solutions for minimal disruption.

Conventional PE pipes have been routinely used by utility companies as a relining solution to address their ageing metallic mains. Service pipes, often installed under footpaths and gardens have been a challenge to reline, due to the complexity of their layout, the changes in the pipe direction from the main to the gas meter and the numerous fittings used in the service pipe.

Working closely with our utility customers, we have developed a range of advanced PE pipeline solutions for the rehabilitation of 1" and ¾" metallic services using pipe insertion techniques. Unique to Radius Systems, our 20 mm ServiFlex® and 17.5 mm systems are innovative pipe relining solutions specifically engineered to maintain the leak-tightness of the service and at the same time, limiting the pipe pressure loss from the main to the meter.

Installed using no-dig pipe insertion techniques for minimal disruption to customers, our ServiFlex® and 17.5 mm kits are quick and easy to install and combined with our PE mains pipe offering, deliver a smart pipe rehabilitation alternative to traditional pipeline replacement from main to meter.

Features and Benefits

- **Cutting-edge offering**
  Unique engineered metallic service pipe relining solutions to maintain the integrity of the service pipe.
- **Optimum leak-tightness**
  The host pipe provides structural stability, whilst the PE liner provides leak-tightness.
- **Reduced number of joints in the system**
  The PE pipes are flexible and can accommodate changes in direction of the original service pipe without the need for additional fittings. ServiFlex® easily passes through 1" short radius bends and our 17.5 mm system can negotiate ¾" long radius bends.
- **Reduced disruption to customers**
  The pipe lining solutions are installed using no-dig insertion techniques, reducing disruption to utility customers.
- **Designer pipe solutions**
  Specifically designed to be inserted into 1" and ¾" metallic service pipes and negotiate bends without the need for additional fittings.

Approvals

- 17.5 mm system
  - 17.5 mm pipe GIS/PL2-2 (KM 513530)
  - Service head adaptor GIS/PL3 (KM 539621)
  - Electrofusion reducer GIS/PL2-4 (KM 538462)

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Product Range

ServiFlex® relining system

Unique to Radius Systems, ServiFlex® is a leading edge innovation consisting of a PE80 twin wall corrugated flexible pipe liner system specifically designed for the relining of 1" steel service pipes.

Quick and easy to install using pipe insertion techniques, ServiFlex® is a cost effective solution compared to pipe replacement, as excavations are kept to a minimum size, with little disruption to customers. Lightweight and flexible, ServiFlex® can be easily pushed through short radius bends during relining operations.

Nominal diameter	MOP	Product code	Weight
mm	millibar	6m	kg/coil
20	75	FA0017	2.5

Installation requirements: Radius Systems' ServiFlex® pipe relining system is installed using a pipe pushing technique. Specialist tooling is required to carry out the installation.

Training must be undertaken before carrying out the installation of ServiFlex®. Please contact Radius Systems for more information. t: +44 (0)1773 811112 or e: sales@radius-systems.com.

17.5 mm relining system

Specially manufactured by Radius Systems, the 17.5 mm system has been designed to offer a smart and easy solution for relining ¾" metallic service pipes with long radius bends. Our House Entry Kits are ideal for relining service pipes under gardens and footpaths, as they minimise the requirement for service relays and are supplied with all the appropriate electrofusion fittings and service head adaptors for inside the property. Flexible and easy to install, our 17.5 mm relining kits reduce excavation requirements and the need for meter relocation.

Nominal diameter	Description	SDR	MOP	Coil length	Product code	Weight
mm			millibar	m	6m	kg/coil
17.5	House entry kit	9.7	75	8.4	GZ0037	0.1

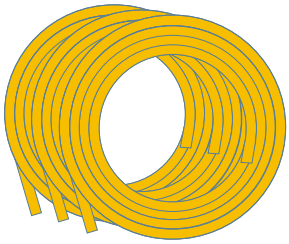
- **House entry kit:** 8.4 m of 17.5 mm pipe coil with wire cable, one 17.5 mm x ¾" service head adaptor for inside the property, one 17.5 x 32 mm reducer for the garden connection.

Installation requirements: Radius Systems' 17.5 mm pipe relining system is installed using a pipe pushing technique. Specialist tooling is required to carry out the installation.

Training must be undertaken before carrying out the installation of the system. Please contact Radius Systems for more information. t: +44 (0)1773 811112 or e: sales@radius-systems.com.

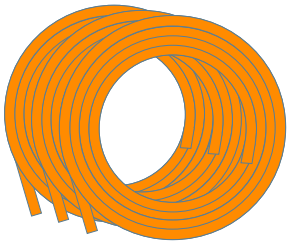
Coil pack quantity and dimensions

Coil pack quantity



SC80 solid wall PE80 pipes

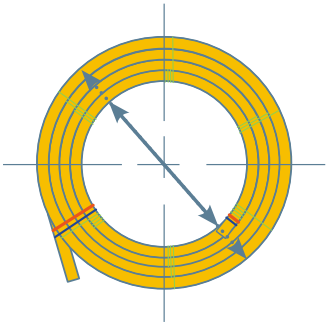
Pipe nominal diameter	Pack quantity	Total pack length	Pack quantity	Total pack length	Pack quantity	Total pack length	Pack quantity	Total pack length
mm	50 m	m	100 m	m	150 m	m	250 m	m
25	8	400	7	700	-	-	-	-
32	8	400	4	400	-	-	-	-
40	-	-	6	600	-	-	-	-
63	6	300	4	400	3	450	2	500



SC100 solid wall PE100 pipes

Pipe nominal diameter	Pack quantity	Total pack length	Pack quantity	Total pack length	Pack quantity	Total pack length	Pack quantity	Total pack length
mm	50 m	m	100 m	m	150 m	m	250 m	m
63	-	-	4	400	-	-	-	-

Coil dimensions



SC80 solid wall PE80 pipes

Pipe nominal diameter	SDR	Coil length	Coil outer diameter	Coil inner diameter	Coil width	Coil banding sequence	Coil weight
mm		m	mm	mm	mm		kg
20	9	50	780	600	100	-	7.1
20	9	100	885	600	120	-	14.2
25	11	50	780	600	150	-	9.1
25	11	100	910	600	175	-	18.2
32	11	50	990	700	145	-	14.7
32	11	100	990	700	275	-	29.3
40	11	100	1800	1275	170	-	45.3
63	11	50	1815	1275	195	•	55.1
63	11	100	1810	1275	300	•	110.3
63	11	150	2035	1275	345	•	165.4
63	11	250	2100	1275	470	•	275.7
63	11	500	2800	1800	570	•	551.3
75	11	50	2220	1800	255	•	76.9
75	11	120	2350	1800	340	•	184.6
75	11	250	2475	1800	535	•	384.6
75	11	500	3120	1800	565	•	769.3
90	11	50	2220	1800	320	•	111.6

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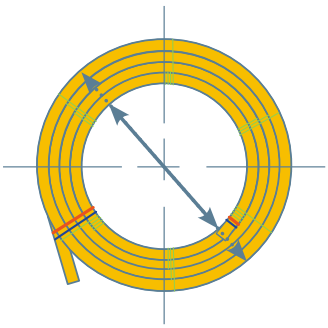
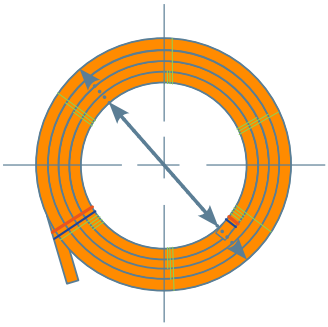


SC80 solid wall PE80 pipes - continued

Pipe nominal diameter	SDR	Coil length	Coil outer diameter	Coil inner diameter	Coil width	Coil banding sequence	Coil weight
mm		m	mm	mm	mm		kg
90	11	100	2440	1800	410	•	223.3
125	11	100	3200	2500	570	•	428.2
180	11	100	4000	3000	800	•	883.9
63	13.6	50	1815	1275	195	•	46.7
63	13.6	100	1810	1275	300	•	93.4
63	13.6	150	2035	1275	345	•	140.1
63	13.6	250	2100	1275	470	•	233.4
63	13.6	500	2800	1800	570	•	466.9
75	13.6	120	2350	1800	340	•	158.2
75	13.6	250	2475	1800	535	•	329.6
75	13.6	500	3120	1800	565	•	659.2
90	17.6	50	2220	1800	320	•	74.5
90	17.6	100	2440	1800	450	•	149
90	17.6	150	2400	1800	625	•	223.5
90	17.6	250	2600	1800	620	•	372.5
90	17.6	500	3075	1800	855	•	744.9
125	17.6	50	3000	2500	450	•	140.5
125	17.6	100	3200	2500	570	•	281
125	17.6	150	3200	2500	820	•	421.5
140	17.6	100	3765	3000	630	•	350.3
180	17.6	50	3800	3000	600	•	290.7
180	17.6	100	4000	3000	800	•	581.5

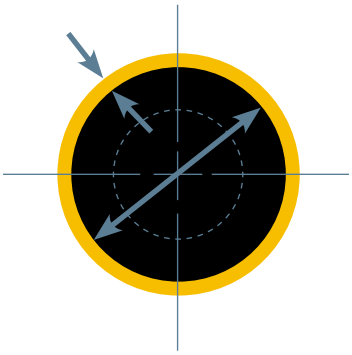


SC100 solid wall PE100 pipes

Pipe nominal diameter	SDR	Coil length	Coil outer diameter	Coil inner diameter	Coil width	Coil banding sequence	Coil weight
mm		m	mm	mm	mm		kg
63	11	100	1810	1275	300	•	111.43
90	11	100	2440	1800	410	•	225.6
125	11	100	3200	2500	570	•	432.8
180	11	100	4000	3000	800	•	893.2
90	17.6	100	2440	1800	450	•	150.6

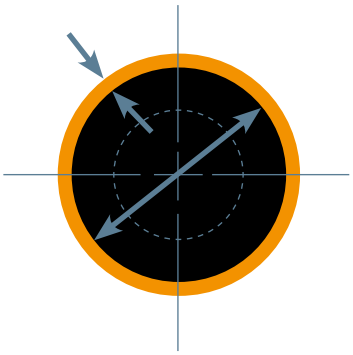
Note: The coil banding sequence can be found within this brochure. As part of Radius Systems' commitment to ongoing product development, pipe coil dimensions may be subject to change.

Pipe dimensions



SC80 solid wall PE80 pipes

Nominal diameter	SDR	Mean outside diameter		Wall thickness		Mean internal
		Min	Max	Min	Max	Diameter
mm		mm	mm	mm	mm	mm
20	9	20.0	20.3	2.3	2.7	15.2
25	11	25.0	25.3	2.3	2.7	20.2
32	11	32.0	32.3	3.0	3.4	25.8
40	11	40.0	40.4	3.7	4.2	32.3
63	11	63.0	63.4	5.8	6.5	50.9
75	11	75.0	75.5	6.8	7.6	60.9
90	11	90.0	90.6	8.2	9.2	72.9
125	11	125.0	125.8	11.4	12.7	101.3
180	11	180.0	181.1	16.4	18.2	146.0
63	13.6	63.0	63.4	4.7	5.4	53.1
75	13.6	75.0	75.5	5.6	6.4	63.3
90	17.6	90.0	90.6	5.2	5.9	79.2
125	17.6	125.0	125.8	7.1	8.0	110.3
140	17.6	140.0	140.9	8.0	8.9	123.6
180	17.6	180.0	181.1	10.3	11.5	158.8
250	17.6	250.0	251.5	14.2	15.8	220.8
315	17.6	315.0	316.9	17.9	19.8	278.3



SC100 solid wall PE100 pipes

Nominal diameter	SDR	Mean outside diameter		Wall thickness		Mean internal
		Min	Max	Min	Max	Diameter
mm		mm	mm	mm	mm	mm
63	11	63.0	63.4	5.8	6.5	50.9
90	11	90.0	90.6	8.2	9.2	72.9
125	11	125.0	125.8	11.4	12.7	101.3
180	11	180.0	181.1	16.4	18.2	146.0
250	11	250.0	251.5	22.7	25.1	203.0
315	11	315.0	316.9	28.6	31.6	255.8
355	11	355.0	357.2	32.3	35.7	288.1
400	11	400.0	402.4	36.4	40.2	324.6
450	11	450.0	452.7	40.9	45.1	365.4
500	11	500.0	503.0	45.5	50.2	405.8
90	17.6	90.0	90.6	5.2	5.9	79.2
125	17.6	125.0	125.8	7.1	8.0	110.3
180	17.6	180.0	181.1	10.3	11.5	158.8
250	17.6	250.0	251.5	14.2	15.8	220.8
315	17.6	315.0	316.9	17.9	19.8	278.3
355	17.6	355.0	357.2	20.2	22.4	313.5

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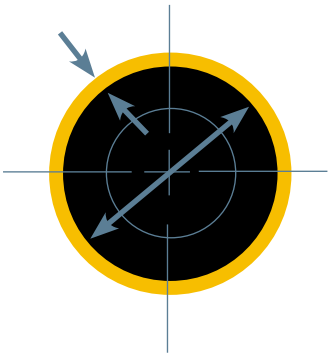
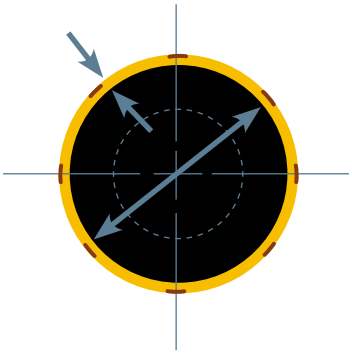


HY100 pipes

Nominal diameter	SDR	Mean outside diameter		Wall thickness		Mean internal
		Min	Max	Min	Max	Diameter
mm		mm	mm	mm	mm	mm
250	21	250	251.5	11.9	13.2	225.7
280	21	280	281.7	13.3	14.8	252.8
315	21	315	316.9	15.0	16.6	284.4
355	21	355	357.2	16.9	18.7	320.5
400	21	400	402.4	19.0	21.0	361.2
450	21	450	452.7	21.4	23.7	406.3



ProFuse® pipes

Nominal diameter	SDR	Mean outside diameter				Skin thickness		Wall thickness		Mean internal diameter
		Without skin		With skin						
		Min	Max	Min	Max	Min	Max	Min	Max	
mm		mm	mm	mm	mm	mm	mm	mm	mm	mm
180	17.6	180.0	181.1	181.2	183.5	0.6	1.2	10.3	11.5	158.8
250	17.6	250.0	251.5	251.2	254.5	0.6	1.5	14.2	15.8	220.8
315	17.6	315.0	316.9	316.2	319.9	0.6	1.5	17.9	19.8	278.3
400	17.6	400.0	402.4	401.2	405.4	0.6	1.5	22.8	25.2	353.2
250	21	250.0	251.5	251.2	254.5	0.6	1.5	11.9	13.2	225.7
280	21	280.0	281.7	281.2	284.7	0.6	1.5	13.3	14.8	252.8
315	21	315.0	316.9	316.2	319.9	0.6	1.5	15.0	16.6	284.4
355	21	355.0	357.2	356.2	360.2	0.6	1.5	16.9	18.7	320.5
400	21	400.0	402.4	401.2	405.4	0.6	1.5	19.0	21.0	361.2
450	21	450.0	452.7	451.2	455.7	0.6	1.5	21.4	23.7	406.3
500	21	500.0	503.0	501.2	506.0	0.6	1.5	23.8	26.3	451.4
630	21	630.0	633.8	631.2	636.8	0.6	1.5	30.0	33.1	568.8

Note: The mean internal diameter is based on the gas industry specification and is provided for guidance only.
Mean internal diameter = [mean external diameter] - [2 x mean pipe wall thickness].

GUIDANCE INFORMATION

Coil banding for safe handling & dispensing

When pipes are packaged into coils, Radius Systems use restraining straps around the pipe to retain the pipe's coil shape. Coils in diameters 75 to 180 mm contain a considerable amount of stored energy, which could potentially cause injury to personnel, if the coils are not handled and dispensed correctly. To allow the safe handling and dispensing of coils, Radius Systems use specialist straps, fitted at different positions around the turns and layers of pipe that form the coils. When the coil is ready to be dispensed, the straps are removed in sequence, ensuring that the energy contained in the coil is release in a controlled and safe manner. (See diagrams below and opposite).

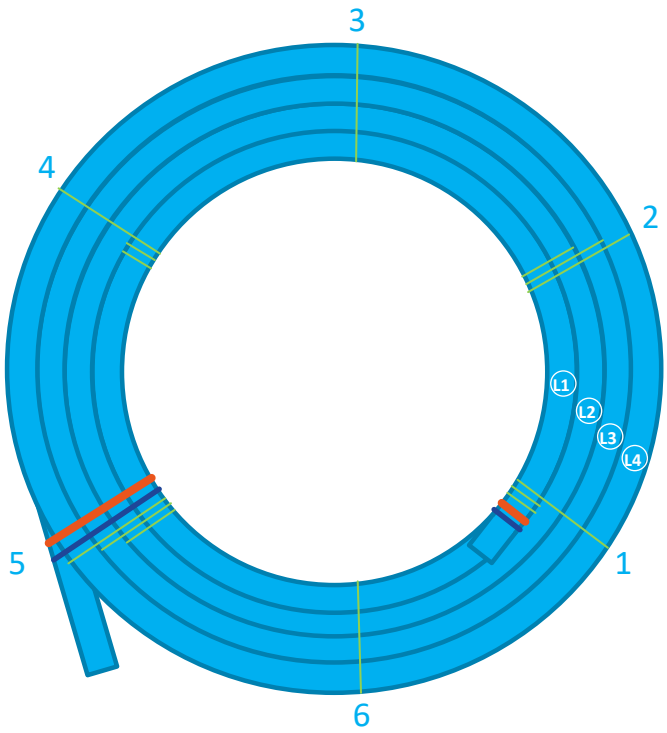
To ensure a safe working environment during the installation of pipe coils, these should only be dispensed from specially designed coil dispensers, supplied by a reputable manufacturer.

Radius Systems recommend that personnel involved in the handing and dispensing of pipe coils are adequately trained for this operation. Courses in the safe and correct handling and dispensing of pipe coils are available from industry bodies.

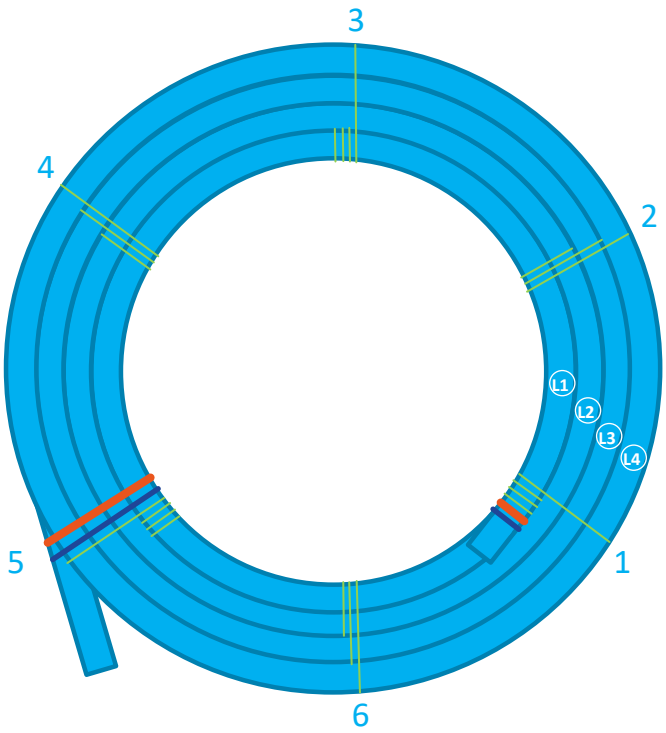
Minimum recommended personal protection equipment (PPE)

- Always wear the minimum PPE or the recommended PPE as identified by the risk assessment.
- Restrict the work area to essential personnel only.
- Always dispense coils from a coil dispenser.
- Take care when cutting the straps to release the pipe.
- Always ensure the tail ends of the coil are released in a restrained and controlled manner.
- Only use a suitable round-nosed cutting tool to cut the strap to prevent the pipe from being damaged.
- Never cut all of the restraining straps at once. Only cut the number of straps to allow the required pipe length to be dispensed.
- Ensure the tail ends of a part used coil are secured before transporting it from the site.
- Do not transport coiled pipes containing water.

● For coils with inner diameter ≤ 1.8 m



● For coils with inner diameter ≥ 2.5 m



Welded polyester strap
Steel security band
Coil length & caution tape

Illustrations showing the banding positions on a 4 layer coil

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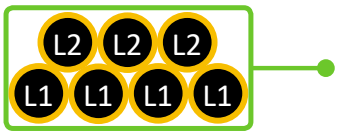
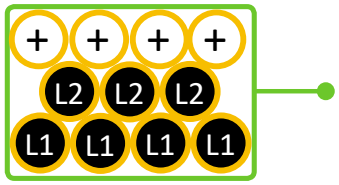
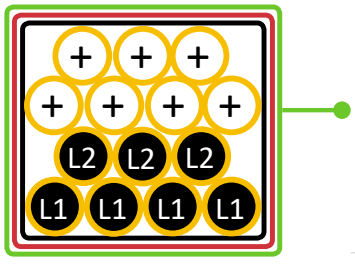
Coil banding

Banding position for coils 50 to 180 mm

Coils will consist of a minimum of 2 layers and the number of layers and turns in a coil will depend on its length and may exceed the ones shown below. If the coil consists of only 2 layers, the banding sequence for the 'Final layer' applies to the coil.

	• Coil internal diameter ≤ 1.8 m	• Coil internal diameter ≥ 2.5 m
Layer 1 (L1)		
	Steel security band* and length & caution tape are applied around turns T1 & T2 of layer 1 (L1) Position 1	Steel security band* and length & caution tape are applied around turns T1 & T2 of layer 1 (L1) Position 1
	Not applicable	Polyester strap around turns T1 & T2 of L1 Positions 1, 3 & 5
	Polyester strap Around turns T1, T2 & T3 of L1 Positions 1 & 4	Polyester strap around turns T1, T2 & T3 of L1 Positions 1, 3 & 5
	Additional turns on L1 follow the same banding sequence as above	Additional turns on L1 follow the same banding sequence as above
Additional layers		
	Once layer 2 (L2) is completed Polyester straps are applied around L1 and L2 Positions 2 & 5	Once layer 2 (L2) is completed Polyester straps are applied around L1 and L2 Positions 2, 4 & 6
	Additional layers follow the same banding sequence as above	Additional layers follow the same banding sequence as above
Final layer		
	Steel security band* and coil length & caution tape are applied to the coil end. Polyester straps are applied at all positions.	Steel security band* and coil length & caution tape are applied to the coil end. Polyester straps are applied at all positions.

* Steel security bands are applied to coils 75 mm and above.
Coil length + caution tape applied to 75mm+

Electrofusion on SC80 and SC100 pipe

For gas and water

SC80 and SC100 pipe preparation for electrofusion jointing

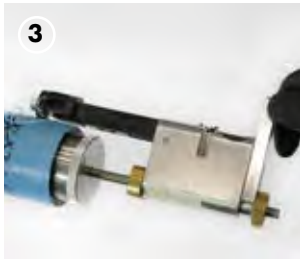
Ensure the pipes to be joined are free from damage and are cut square. Using an approved marker pen, mark the fitting's insertion depth + 25 mm.

Mark the pipe surface area to prepare.

...Using a rotary scraper or a hand scrapper

Minimum recommended personal protection equipment (PPE)

Rotary scrapper



Prepare the pipe surface using an industry approved pipe surface preparation tool.

Treat the pipe as a conventional PE pipe. DO NOT remove all of the blue outer surface as this may lead to a poor quality joint.

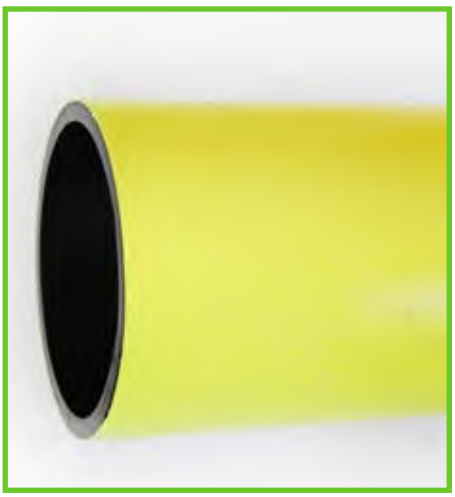
Immediately place the fitting on the pipe up to the insertion stop. Repeat steps 1 to 3 for the second pipe to be joined. Follow industry best practice when making the joint.

Hand scrapper

Prepare the pipe surface using an industry approved pipe surface preparation tool.

Treat the pipe as a conventional PE pipe. DO NOT remove all of the yellow outer surface as this may lead to a poor quality joint.

Immediately place the fitting on the pipe up to the insertion stop. Repeat steps 1 to 3 for the second pipe to be joined. Follow industry best practice when making the joint.



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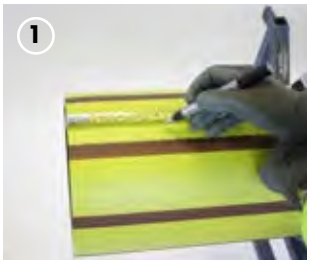
Electrofusion on ProFuse® pipe

For gas and water

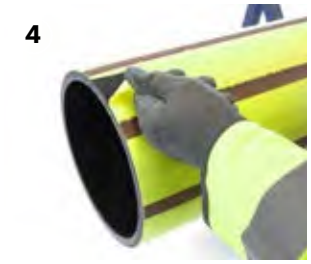
ProFuse® peelable pipe preparation for electrofusion jointing



Ensure the pipes to be joined are free from damage and are cut square. Using an approved marker pen, mark the fitting's insertion depth + 25 mm.

Using the ProFuse pipe exposure tool (PET™), score the external skin around the circumference of the pipe.

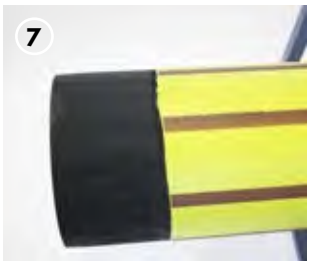
Rotate the PET™ 90° and score the external skin longitudinally towards the pipe end.



Lift the edge of the skin as shown above and peel the skin away from the core pipe.

Remove the skin carefully in one continuous process.

Ensure the skin is completely removed around the pipe's circumference.



Skin removed.
If the pipe surface becomes contaminated after skin removal, re-prepare the pipe using industry approved pipe surface preparation tools.

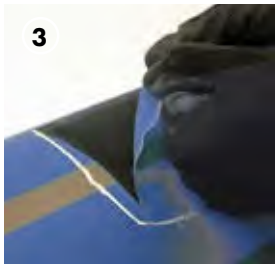
ProFuse® PET - Product code: FT0648

- The only tool recommended for the quick, simple and safe removal of the ProFuse® skin
- The minimum recommended skin removal is the fittings socket depth plus 25 mm
- For butt-fusion jointing, a minimum of 25 mm should be removed, to ensure enough of the core polyethylene material is exposed for the jointing process.

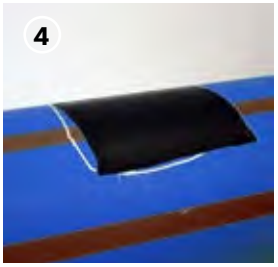
Using saddle fittings

Using an approved marker pen, mark the fittings outline on the pipe + 25 mm.

Using the ProFuse pipe exposure tool (PET™), score the external skin around the marked area.



Lift the edge of the skin as shown above and peel the skin away from the pipe's surface.



Skin removed.

Immediately secure the saddle fitting in place. Follow industry best practice when making the joint.

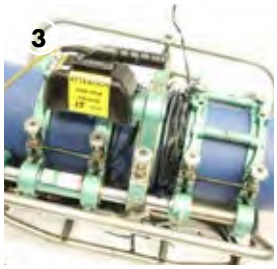
Butt-fusion overview

For gas and water

Solid wall PE pipe butt-fusion jointing overview

- Only use approved fully automatic butt-fusion equipment and follow industry best practice when joining SC80, SC100 and universal black PE100 pipes.
- Ensure that the print-line on the two pipes are in line to minimise pipe misalignment.
- To minimise contamination of the joint, the butt-fusion operation should be carried out in a suitable welding shelter.

Minimum recommended personal protection equipment (PPE)



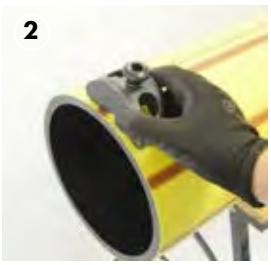
Butt-fusion on ProFuse® pipe

For gas and water

ProFuse® peelable pipe preparation for butt-fusion jointing

When welding ProFuse® pipe using the butt-fusion technique, a minimum 25 mm wide strip of skin must be removed from the pipe ends to ensure the polypropylene skin does not come into contact with the heater plate and that the bead can be correctly removed. The width of the strip will depend on the de-beading tool being used.

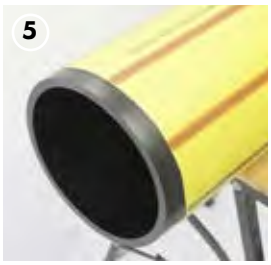
Ensure the pipes to be joined are free from damage and are cut square. Using an approved marker pen, mark a minimum of 25 mm around the pipe's circumference.



Using the ProFuse pipe exposure tool (PET™), score the external skin around the circumference of the pipe.

Rotate the PET™ 90° and score the external skin longitudinally towards the pipe end.

Lift the edge of the skin as shown above and peel the skin away from the core pipe.



Skin removed. Repeat steps 1 to 4 for the second pipe to be joined. Follow industry best practice when making the butt-fusion joint.

CleanPipe™ jointing guidance

Using CleanPipe™ in trenchless installations

Attach the towing head directly to the leading end of the pipe coil. This operation is undertaken without removing the CleanPipe™ seals, located internally, a short distance from the pipe ends.

The pipe remains sealed throughout the whole installation procedure. Contamination from the installation process remains outside the factory seal.

After the installation is complete, CleanPipe™ can be pressure tested without the need to fit end caps. De-pressurise the pipeline before cutting the pipe ends.

Cut the pipe ends beyond the arrows which identify the cutting position on the label. This removes the seals, ready for the pipe to be joined using Radius Systems' fittings.

Prepare the pipe ends following the ProFuse® pipe preparation for electrofusion jointing above. Follow industry best practice and water industry procedures to make the joint and cleanse and test the pipeline.

FAQs water and gas

Are SC80 and SC100 multi-layer pipes and should they have external stripes to identify their multi-layer construction?

SC80 and SC100 pipes are single layer solid wall pipes. They are therefore not multi-layer pipes and do not require external longitudinal stripes.

Should I completely remove the coloured outer when preparing SC80 and SC100 pipes for electrofusion jointing?

No. The coloured PE outer is not a 'scrape to' guide and should not be completely removed. Removing too much pipe material may lead to joint failure.

What equipment is recommended to prepare SC80 and SC100 pipe surface for electrofusion jointing?

For socket fittings, use a hand scrapper or an industry approved mechanical rotary tool as this removes a continuous and uniform ribbon of material. For saddle fittings, industry approved hand scraping tools should be used.

What is the thickness of SC80 outer and SC100 outer and does it differ for each pipe diameter?

The coloured PE outer thickness ranges from 0.7 to 1.2 mm. It does not differ through the pipe diameter range.

Why do ProFuse® pipes have external stripes?

Stripes identify the pipe as multi-layer. ProFuse® is manufactured from a PE100 core and an outer polypropylene skin.

Does the ProFuse® skin add to the pipe's pressure rating?

The external polypropylene skin applied to the ProFuse® pipe does not add to the pipe's pressure rating. It is a sacrificial layer and identifies the pipe's application and structure and is specifically designed to protect the core pipe from potential damage during handling, transportation and installation.

Should I remove the external skin when joining ProFuse® pipe using mechanical fittings?

Yes, the external polypropylene skin must be locally removed when joining ProFuse® using mechanical fittings, electrofusion fittings or the butt-fusion welding technique. Follow the pipe preparation overview within this brochure.

What should I do if the ProFuse® pipe surface becomes contaminated after removing the peelable skin in preparation for electrofusion jointing?

If the ProFuse® pipe surface becomes contaminated after removing the peelable skin, prepare the pipe surface in the same way as a conventional PE pipe, using industry approved pipe surface preparation tools (rotary or hand scraping tools).

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FAQs water and gas

Water specific

Why do the pipe dimensions for ProFuse® and Puriton® only cover the black core of the pipes?

ProFuse® and Puriton® are classed as multi-layer pipes and are manufactured in accordance with the PE water pipe specification BS EN 12201. The specification only provides dimensions for the pressure bearing structure of PE pipes. For ProFuse® and Puriton® pipes, the black PE core is the only pressure bearing structure within the pipe construction. The dimensions for the outer layers are therefore not included within the water specification.

How should I prepare the pipe surface for solid wall SC80 and SC100 pipes when using Redman™ mechanical fittings?

There is no requirement for any pipe surface preparation when joining SC80 or SC100 pipes. The pipe should be cut square and free from damage before making a joint.

Gas specific

What are the maximum pressure ratings for Radius Systems' gas pipes?

The maximum operating pressure for polyethylene pipes for gas application varies as it is dependent on the following:

- Pipe material
- Pipe diameter and wall thickness
- Operational temperature
- Applied safety factor or service design coefficient.

Values for the pipe safety factor or service design coefficient are quoted within the product manufacturing specifications, namely the Gas Industry Specification (GIS) PL2:2 & PL2:8 and the European gas specification BS EN 1555-2.

The reference specifications identify values for the pipe design stress with applicable operational temperature range and sub-zero temperature limitations to satisfy rapid crack considerations. In addition, where pipes are intended for use above the 20° C reference temperature, the pipe material design stress and calculated pressure rating must be de-rated to account for the material's reduction in tensile strength.

For guidance on the MOP of pipes for gas application manufactured in accordance with the above specifications please contact Radius Systems.

Reference specifications

- *GIS/PL2 'Specification for Polyethylene pipes and fittings for natural gas and suitable manufactured gas'.*
  - Part 2: Pipes for use at pressures up to 5.5 bar.
  - Part 8: Pipes for use at pressures up to 7.0 bar.

- *BS EN-1555 'Plastic piping systems for the supply of gaseous fuels'*
  - Part 2: Polyethylene (PE) pipes.

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FAQs HY100™

How do I identify Radius Systems' HY100 pipes?

Unlike other Radius Systems' solid wall pipes, HY100 have a dual material construction: black PE100 at its core and yellow PE80 for the outer. The PE materials PE100/PE80, together with the manufacturer's name are identified on the ink-jet and indented markings on the pipe surface. These markings are repeated every metre along the length of the pipe.

Why is HY100 not approved to EN 1555-2?

The scope of the EN 1555-2 specification does not allow the combination of different material classifications in the manufacture of co-extruded pipes. Therefore, HY100 pipes are only approved to the UK gas industry specification GIS/PL2-2.

Are HY100 multi-layer pipes and should they have external stripes to identify their multi-layer construction?

HY100 pipes are single layer solid wall pipes. They are therefore not multi-layer pipes and do not require external longitudinal stripes.

Why are HY100 pipes manufactured from two different material classifications of PE?

PE100 materials are increasingly becoming the norm, especially in larger pipe diameters and Radius Systems have developed their HY100 pipe range to meet with current customer and industry requirements.

GIS/PL2-2 stipulates that the outer surface of the pipe should be yellow to identify pipes for gas applications, and since there are currently no commercially available approved PE100 materials in yellow, Radius Systems have combined a PE80 yellow material with a PE100 black material to manufacture their HY100 pipes.

How should I join HY100 to alternative PE gas pipes?

To join HY100 to alternative PE gas pipes, Radius Systems recommend the use of approved electrofusion fittings. The butt-fusion technique is not recommended to join HY100 to alternative PE pipes.

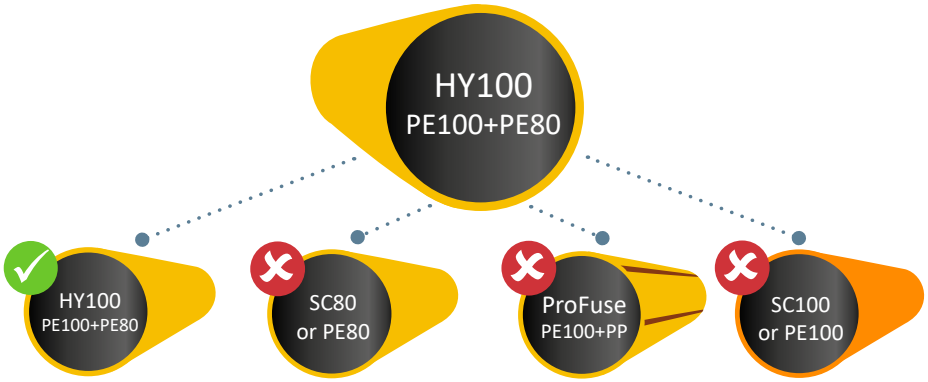
Should I completely remove the yellow outer when preparing HY100 pipe for electrofusion jointing?

No. The yellow PE outer is not a 'scrape to' guide and should not be completely removed. Removing too much pipe material may lead to joint failure.

Can I join HY100 to HY100 pipes using the butt-fusion welding technique and do I need specialist equipment?

HY100 pipes can be joined together using the butt-fusion welding technique. HY100 pipes are conventional solid wall PE pipes and as such, there is no requirement for specialist equipment to join the pipes.

Pipe compatibility for butt-fusion jointing:



What is the thickness of HY100 yellow outer and does it differ for each diameter?

The PE80 yellow outer thickness ranges from 0.7 to 1.2 mm. It does not differ through the pipe diameter range.

Radius Systems HY100 and SC80 pipes are identical in appearance. How do I differentiate them?

The differences between SC80 and HY100 pipes are identified on the ink-jet and indented markings applied to the surface of the pipes. SC80 is identified as a PE80/PE80 pipe approved to GIS/PL2-2 and EN 1555-2, whilst HY100 is identified as a PE100/PE80 pipe approved to GIS/PL2-2 only.

Correct pipe preparation for electrofusion

Incorrect pipe preparation for electrofusion

Radius Systems

Radius Systems are a market leader in the innovation and manufacture of plastic pipe systems for the utilities and construction industries. With extensive research and development at the heart of our products and systems, we take care of the entire pipe life cycle - from design and manufacture through to installation, repair and rehabilitation. We strive to improve industry practices, with good health and safety policies at the forefront of our philosophy of 'getting it right first time'. Our continuous customer inspired research and development, combined with successful customer partnerships represent our total dedication to the plastic piping industry.

- **Manufacturing facilities**
  With 2 production sites in the UK, we have complete control over quality and the ability to meet our customers' expectations.
- **Innovative approach**
  We are leaders in our field with a history of research and new product development. Practicality, durability and adaptability are all high on our agenda to meet our clients' needs.
- **Flexible product and service provision**
  Our comprehensive range of services is designed to fit the variable demands of our clients' developments in pipes, fittings, training and support services.
- **Reliability and safety**
  With 50 years experience in pipe design and manufacture, our clients know that they can count on us to meet not just their product and service needs, but also their delivery and safety requirements.
- **Great customer service**
  We have a dedicated Customer Services team to answer queries from our customers in the UK and overseas. Our service is not just about the delivery of products - contact our team if you have a product or installation enquiry or a post-delivery query.

For more information please visit our website.
www.radius-systems.com

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Lurgan, Co Armagh
BT66 8TP, UK

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e: info@radius-systems.com

RADIUS Systems

Laboratory Report	ARC/14848	Contract Sample No	C4276/161
Report Date	21/11/2022	Clients Reference	C4276/161
		Material Description	0-20mm IBAA
Blue Phoenix UK			
Victoria Stables		Date Sampled	06/10/2022
South Road		Source	Ridham
Bourne		Supplier	Blue Phoenix
Lincolnshire		Sampled By	CTS
PE10 9JZ		Sampling Environment	Sunny
		Sample Type	Bulk
		Location in sample	N/A
Ridham		Sample Location	Stockpile
		Sampling Plan	CTS Procedure
		Sampling Method	Sampling from conical stockpiles

CTS Group

Bootham Lane Industrial Estate
Dunscroft
Doncaster
DN7 4JU

UKAS TESTING 4161

Tel: (01302) 352652 Web: www.constructiontesting.co.uk
Email: enquiries@constructiontesting.co.uk

Date Received	06/10/2022
Date Tests Completed	14/11/2022

TEST REPORT

Determination of Water Content by Drying in a Ventilated Oven
Tested in Accordance with BS EN 1097-5:2008

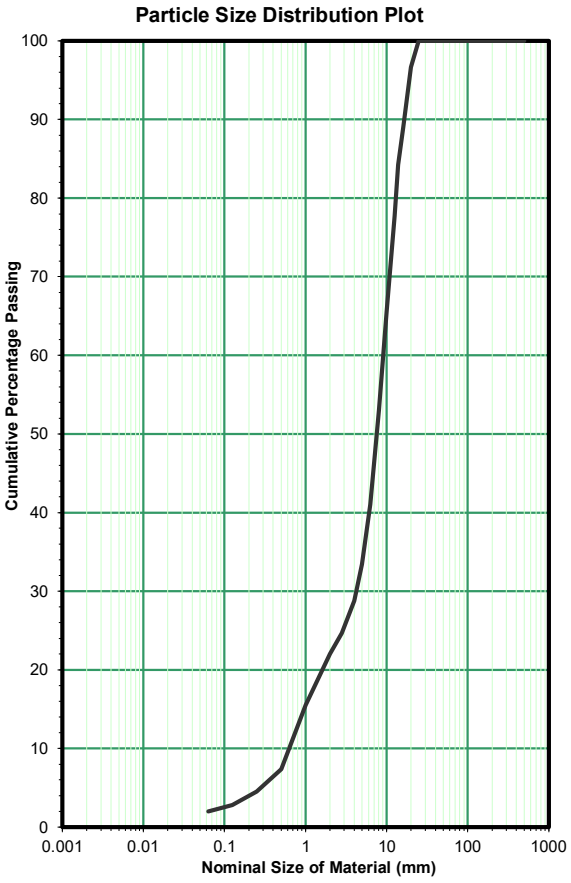
Water content of test portion *(w)* 7.4 %

Aggregate sampled in accordance with BSEN 932-1:1997

Aggregate Type
IBAA
Nominal Size (mm)
20

Determination of Particle Size Distribution (wet sieving method)
Tested in Accordance with BS EN 933-1: 2012

BS Sieve Size (mm)	Passing BS Sieve (%)
500	100
300	100
125	100
80	100
63	100
50	100
40	100
31.5	100
25	100
20	97
16	89
14	84
12.5	78
10	66
8	53
6.3	41
5	33
4	29
2.8	25
2	22
1	16
0.500	7
0.250	5
0.125	3
0.063	2.0



Specification

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation.
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Template Version: 1.7.1

Authorised Signatory

P Nodder – Technical Director

** END OF REPORT **

Laboratory Report	ARC/14847	Contract Sample No	C4276/160
Report Date	21/11/2022	Clients Reference	C4276/160
		Material Description	T1SB IBAA/Granite Blend
Blue Phoenix UK			
Victoria Stables		Date Sampled	06/10/2022
South Road		Source	Ridham
Bourne		Supplier	Blue Phoenix
Lincolnshire		Sampled By	CTS
PE10 9JZ		Sampling Environment	Sunny
		Sample Type	Bulk
		Location in sample	N/A
Ridham		Sample Location	Stockpile
		Sampling Plan	CTS Procedure
		Sampling Method	Sampling from conical stockpiles

CTS Group

Bootham Lane Industrial Estate
Dunscroft
Doncaster
DN7 4JU

UKAS TESTING 4161

Tel: (01302) 352652 Web: www.constructiontesting.co.uk
Email: enquiries@constructiontesting.co.uk

Date Received	06/10/2022
Date Tests Completed	14/11/2022

TEST REPORT

Determination of Water Content by Drying in a Ventilated Oven
Tested in Accordance with BS EN 1097-5:2008

Water content of test portion *(w)* 8.0 %

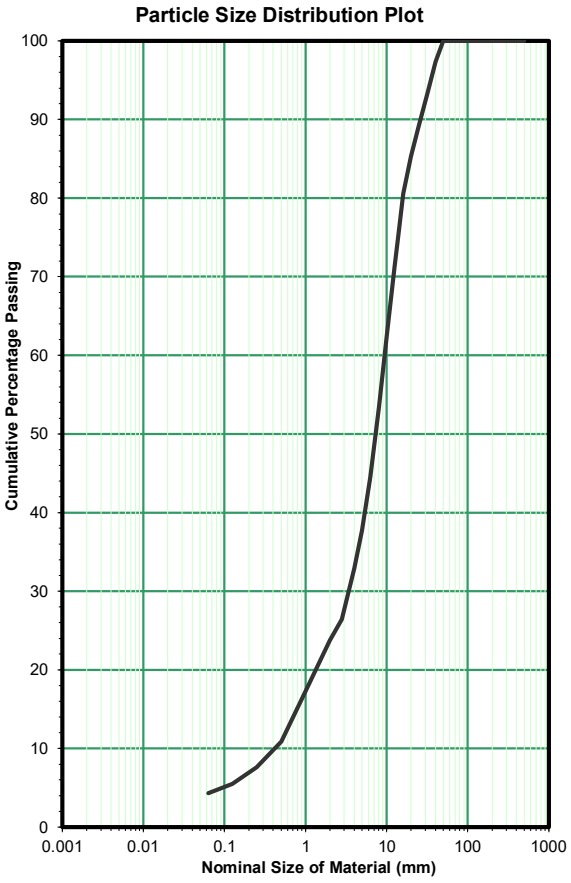
Aggregate sampled in accordance with BSEN 932-1:1997

Aggregate Type
IBAA/Granite
Nominal Size (mm)
40

Determination of Particle Size Distribution (wet sieving method)
Tested in Accordance with BS EN 933-1: 2012

BS Sieve Size (mm)	Passing BS Sieve (%)	Specification
500	100	MCHW. SHW Vol 1, Series 800 Table 8/6a
300	100	
125	100	
80	100	
63	100	
50	100	100
40	97	
31.5	93	
25	89	75 - 99
20	85	
16	81	
14	75	43 - 81*
12.5	71	
10	62	
8	53	
6.3	44	23 - 66*
5	38	
4	33	
2.8	26	12 - 53*
2	24	
1	17	6 - 42*
0.500	11	3 - 32*
0.250	8	
0.125	5	
0.063	4.4	0 - 9

*Suppliers Declared Limit Not Stated



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Authorised Signatory

P Nodder – Technical Director

** END OF REPORT **

Laboratory:
Unit 4
Rose Lane Industrial Estate
Lenham Heath
Kent ME17 2JN
01622 851176

UKAS TESTING
4727

XtraTec
CONSTRUCTION MATERIAL TESTING
A PHENNA GROUP COMPANY

TEST REPORT

Report No: **XTE 67671**
Page 1 of 1

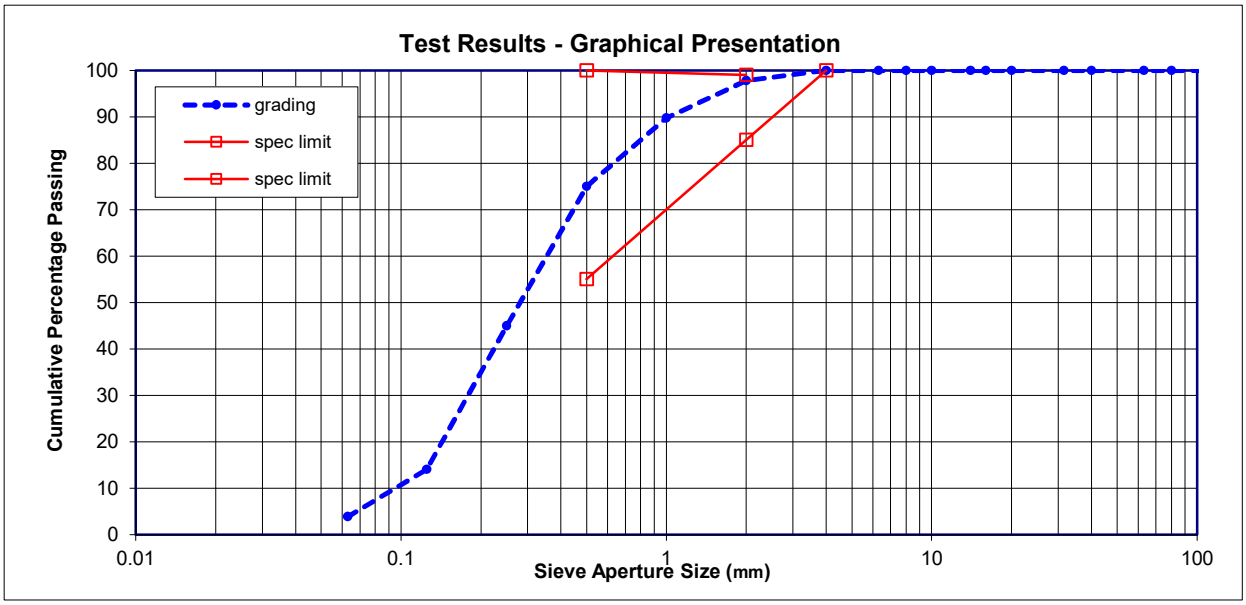
TEST REPORT OF PARTICLE SIZE DISTRIBUTION & WATER CONTENT OF AGGREGATES

Method: Particle Size Distribution: BS EN 933-1:2012. (washing & sieving)
Method: Water Content: BS EN 1097-5:2008

XTRATEC SAMPLE REF	XTE 67671
CUSTOMER/SITE SAMPLE REF	GM5
CLIENT	Thanet Waste Services Ltd
SITE	Sandwich
TYPE OF MATERIAL	Reclaimed
AGGREGATE TYPE	Fine Sand
NOMINAL SIZE	0/2mm
SPECIFICATION	PD6682-1 BS EN 12620:2002+A1 Table C.1
SUPPLIER/SOURCE	Thanet Waste/Screened onsite
SAMPLING LOCATION	Stockpiles
SAMPLING METHOD	DIHM 2.1
SAMPLED BY	Xtratec
DATE SAMPLED	03 March 2023
DATE RECEIVED	03 March 2023
DATE TESTED	06 March 2023

TEST RESULTS			
Sieve Size	Percent.	Specified	
		lower	upper
125	100		
80	100		
63	100		
40	100		
31.5	100		
20	100		
16	100		
14	100		
10	100		
8	100		
6.3	100		
4	100	100	
2	98	85	99
1	90		
0.5	75	55	100
0.25	45		
0.125	14		
0.063	4		

Water Content (%)	16.3



REMARKS: A certificate of sampling is available

ISSUE TO: Thanet Waste Services Ltd
Richborough Hall
Ramsgate Road
Sandwich, Kent
CT13 9NW

DATE: 25 March 2023

AUTHORISED BY: A Schofield Quality Manager

Laboratory:
Unit 4
Rose Lane Industrial Estate
Lenham Heath
Kent ME17 2JN
01622 851176

UKAS TESTING
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XtraTec
CONSTRUCTION MATERIAL TESTING
A PHENNA GROUP COMPANY

TEST REPORT

Report No: **XTE 67673**
Page 1 of 1

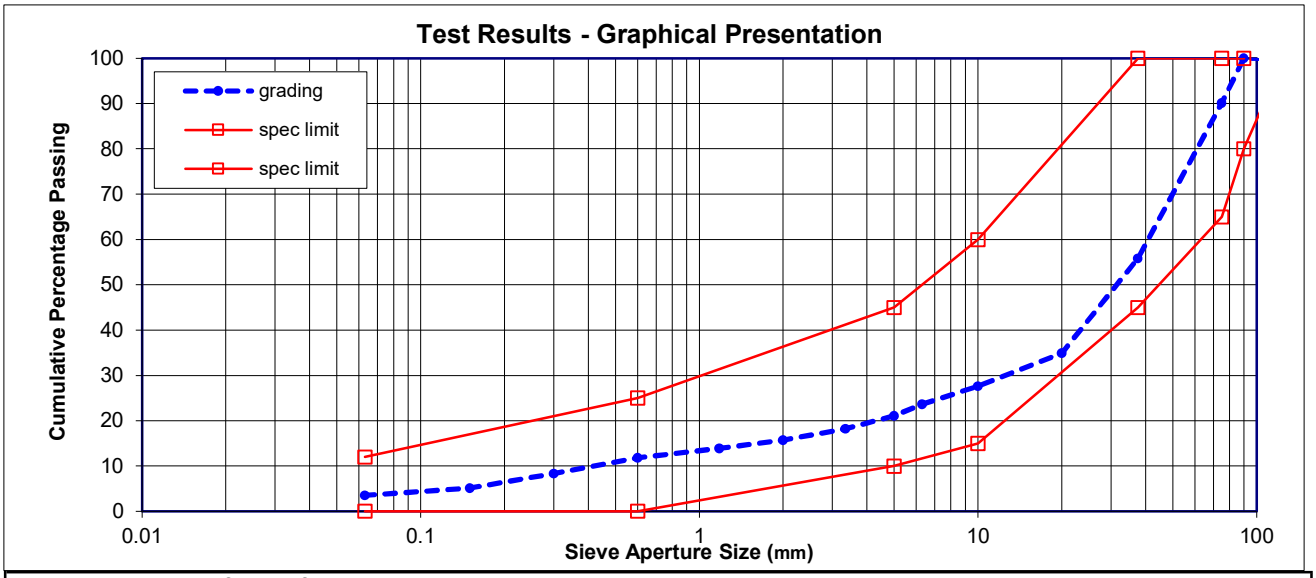
TEST REPORT OF PARTICLE SIZE DISTRIBUTION & MOISTURE CONTENT OF SOILS

Method: Particle Size Distribution: BS 1377-2:1990. (Method 9.2, wet sieving)
Method: Moisture Content: BS 1377-2:1990 (Method 3.2.3.3, oven drying)

XTRATEC SAMPLE REF	XTE 67673
CUSTOMER/SITE SAMPLE REF	GM7
CLIENT	Thanet Waste Services Ltd
SITE	Sandwich
TYPE OF MATERIAL	6F2
SOIL DESCRIPTION	Reclaimed Aggregate
SPECIFICATION	SHW Series 600 Table 6/2
SUPPLIER/SOURCE	Thanet Waste/Screened onsite
SAMPLING LOCATION	Stockpiles
SAMPLING METHOD	DIHM 4.3
SAMPLED BY	Xtratec
TYPE OF SAMPLE	Bulk
DATE SAMPLED	03 March 2023
DATE RECEIVED	03 March 2023
DATE TESTED	06 March 2023
PREPARATION METHOD	BS 1377-1. 7.3.5.2 (Sub dividing)

TEST RESULTS			
Sieve Size (mm)	Percent. Passing	Specified Limits (%) lower	upper
125	100	100	
90	100	80	100
75	90	65	100
37.5	56	45	100
20	35		
10	28	15	60
6.3	24		
5	21	10	45
3.35	18		
2	16		
1.18	14		
0.6	12	0	25
0.3	8		
0.15	5		
0.063	3	0	12

Moisture Content (%)	5.6



REMARKS: A certificate of sampling is available

ISSUE TO: Thanet Waste Services Ltd
Richborough Hall
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Sandwich, Kent
CT13 9NW

DATE: 25 March 2023

AUTHORISED BY: A Schofield Quality Manager

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01622 851176

UKAS TESTING
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XtraTec
CONSTRUCTION MATERIAL TESTING
A PHENNA GROUP COMPANY

TEST REPORT

Report No: XTE 67669
Page 1 of 1

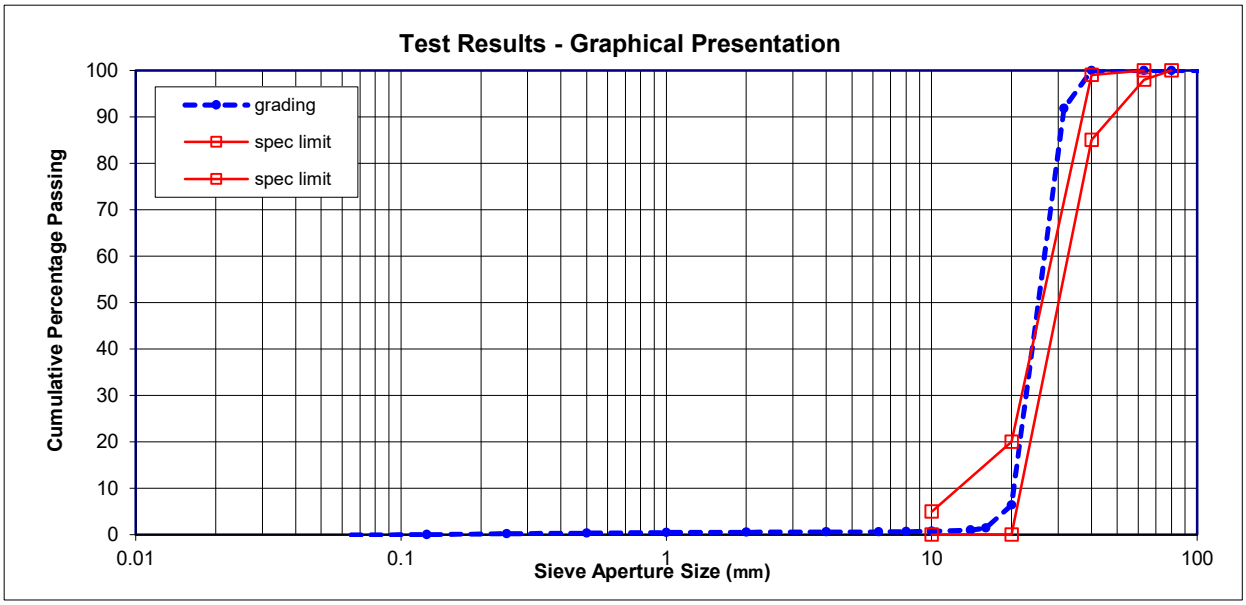
TEST REPORT OF PARTICLE SIZE DISTRIBUTION & WATER CONTENT OF AGGREGATES

Method: Particle Size Distribution: BS EN 933-1:2012. (dry sieving)
Method: Water Content: BS EN 1097-5:2008

XTRATEC SAMPLE REF	XTE 67669
CUSTOMER/SITE SAMPLE REF	GM3
CLIENT	Thanet Waste Services Ltd
SITE	Sandwich
TYPE OF MATERIAL	Reclaimed
AGGREGATE TYPE	Aggregate
NOMINAL SIZE	20/40mm
SPECIFICATION	PD6682-1 BS EN 12620:2002+A1 Table C.1
SUPPLIER/SOURCE	Thanet Waste/Screened onsite
SAMPLING LOCATION	Stockpiles
SAMPLING METHOD	DIHM 2.1
SAMPLED BY	Xtratec
DATE SAMPLED	03 March 2023
DATE RECEIVED	03 March 2023
DATE TESTED	06 March 2023

TEST RESULTS			
Sieve Size	Percent.	Specified lower	upper
125	100		
80	100	100	
63	100	98	100
40	100	85	99
31.5	92		
20	6	0	20
16	1		
14	1		
10	1	0	5
8	1		
6.3	1		
4	1		
2	1		
1	0		
0.5	0		
0.25	0		
0.125	0		
0.063	0		

Water Content (%)	3.9



REMARKS: A certificate of sampling is available

ISSUE TO: Thanet Waste Services Ltd
Richborough Hall
Ramsgate Road
Sandwich, Kent
CT13 9NW

DATE: 25 March 2023

AUTHORISED BY: A Schofield Quality Manager

Laboratory:
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01622 851176

UKAS TESTING
4727

XtraTec
CONSTRUCTION MATERIAL TESTING
A PHENNA GROUP COMPANY

TEST REPORT

Report No: **XTE 67674**
Page 1 of 1

TEST REPORT OF Testing For Constituent Materials

Method: BS EN 933-11:2009

XTRATEC SAMPLE REF	XTE 67674
CUSTOMER/SITE SAMPLE REF	GM8

CLIENT	Thanet Waste Services Ltd
SITE	Sandwich
MATERIAL	Recycled Type 1
SOURCE	Insitu
SAMPLING METHOD	DIHM 2.1
SAMPLED BY	Xtratec
DATE SAMPLED	03 March 2023
DATE RECEIVED	03 March 2023
DATE TESTED	06 March 2023
DRYING TEMPERATURE	(40 ± 5)°C

Class	Material	
FL	Floating Particles	1.4 cm^3/kg
Rc	Concrete/concrete products; mortar and Concrete masonry units	29%
Ru	Unbound Aggregate, natural stone, Hydraulically bound aggregate	12%
Rb	Clay masonry units, Calcium silicate masonry units, Aerated non-floating concrete	19%
Ra	Bituminous materials	39%
Rg	Glass	0.7%
X	Other clay & soil, metals,non floating wood,plastic rubber, Gypsum plaster	0.4%

REMARKS:

ISSUE TO: Thanet Waste Services Ltd
Richborough Hall
Ramsgate Road
Sandwich, Kent
CT13 9NW

DATE: 25 March 2023

AUTHORISED BY: A Schofield Quality Manager

Geogrid

Secugrid® Q (PP)

NAUE GmbH & Co. KG
Gewerbestrasse 2
32339 Espelkamp-Fiestel
Germany
Phone:+49 5743 41-0 Fax: :+49 5743 41-240
E-Mail: info@naue.com Internet: www.naue.com

0799-CPR-20

Product description:
Laid geogrid made of stretched, monolithic polypropylene (PP) flat bars with welded junctions used for the reinforcement in many fields of civil engineering including landfill engineering, road construction and hydraulic engineering

Property	Test method*	Unit	20/20 Q1	30/30 Q1	40/40 Q1	60/60 Q1	80/80 Q1
Raw material	-	-	polypropylene (PP), white				
Mass per unit area	EN ISO 9864	g/m²	155	200	240	360	440
Max. tensile strength, md / cmd**	EN ISO 10319	kN/m	≥ 20 / ≥ 20	≥ 30 / ≥ 30	≥ 40 / ≥ 40	≥ 60 / ≥ 60	≥ 80 / ≥ 80
Elongation at nominal strength, md / cmd**	EN ISO 10319	%	≤ 7 / ≤ 7				
Tensile strength at 1% elongation, md / cmd**	EN ISO 10319	kN/m	4 / 4	6 / 6	8 / 8	12 / 12	16 / 16
Tensile strength at 2% elongation, md / cmd**	EN ISO 10319	kN/m	8 / 8	12 / 12	16 / 16	22 / 22	25 / 25
Tensile strength at 5% elongation, md / cmd**	EN ISO 10319	kN/m	16 / 16	24 / 24	32 / 32	48 / 48	50 / 50
Aperture size, md x cmd**	-	mm x mm	approx. 33 x 33	approx. 32 x 32	approx. 31 x 31	approx. 31 x 31	approx. 31 x 30
UV-resistance (remaining tensile strength)	EN 12224	%	95.0				
Weather resistance	FGSV	class	high				
Production specific elongation	-	%	0				
Roll dimensions, width x length	-	m x m	4.75 x 100				

**based on, **md = machine direction, cmd = cross machine direction*

The listed technical values are guiding values, achieved in our laboratories and/or independent testing institutes. Our products are subject to changes without prior notice.

Geotextiles for filtration and separation

Secutex® HT

NAUE GmbH & Co. KG
Gewerbestrasse 2
32339 Espelkamp-Fiestel
Germany
Phone:+49 5743 41-0 Fax: :+49 5743 41-240
E-Mail: info@naue.com Internet: www.naue.com

0799-CPR-20

Product description:
Single layeres, needle punched and calendered nonwoven filter and separation geotextiles

Property	Test method*	Unit	HT 3	HT 4	HT 5	HT 6	HT 7
Raw material	-	-	polypropylene (PP), white				
Mass per unit area	EN ISO 9864	g/m²	150	165	200	250	300
Thickness	EN ISO 9863-1	mm	1.0	1.1	1.2	1.4	1.6
Max. tensile strength, md / cmd**	EN ISO 10319	kN/m	11.0 / 11.0	12.0 / 12.0	16.0 / 16.0	20.0 / 20.0	25.0 / 25.0
Elongation at max. tensile strength, md / cmd**	EN ISO 10319	%	45 / 50	45 / 50	45 / 50	45 / 50	45 / 50
Puncture force	EN ISO 12236	N	1,800	2,000	2,700	3,300	4,200
Displacement at static puncture strength	EN ISO 12236	mm	50	50	50	50	50
Dynamic perforation resistance	EN ISO 13433	mm	24	22	16	13	10
Characteristic opening size	EN ISO 12956	µm	90	90	80	80	70
Water permeability - V_{H50}-Index - Flow rate$_{H50}$	EN ISO 11058	m/s l/(m² s)	1.0×10^{-1} 100	9.0×10^{-2} 90	7.5×10^{-2} 75	6.0×10^{-2} 60	5.0×10^{-2} 50
Detector tested	-	-	yes	yes	yes	yes	yes

**based on, **md = machine direction, cmd = cross machine direction*

The listed technical values are guiding values, achieved in our laboratories and/or independent testing institutes. Our products are subject to changes without prior notice.

TDS0002 Issue 10 March 2016

BIODISC®
SEWAGE TREATMENT PLANTS
UNITS BA - BG

INTRODUCTION

BioDisc systems offer a cost effective and flexible solution to a wide range of domestic sewage treatment applications. The range employs Klargester's patented Managed Flow Technology to enhance the effectiveness and consistency of the treatment system. At the core of the BioDisc lies the Rotating Biological Contactor (RBC) Technology, which Klargester has developed and refined over a period of 25 years.

BioDisc units are designed and engineered to offer the highest level of reliability combined with the lowest possible running costs.

APPLICATIONS

Single Dwellings
Housing Estates
Golf Clubs
Schools
Hotels
Caravan Parks
Public Houses
Offices
Industrial Estates
Leisure Developments
Nursing Homes

DISCHARGES

BioDisc is designed to conform to the British Standard Code of Practice BS6297 relating to the design of small sewage treatment works.

Treated effluent from BioDisc units may be discharged directly to a watercourse where a consent has been obtained from the relevant authority; EA (England & Wales), SEPA (Scotland) Local Authority Public Health Department (N Ireland & Eire).

The units are configured to produce a final effluent quality of 20 mg/l BOD_5 (ATU), Biochemical Oxygen Demand, 30 mg/l Suspended Solids. If a more stringent quality effluent is required, or if an Ammonianical Nitrogen level is specified, the BioDisc may be reconfigured to meet the required specification. Details on application.

DESCRIPTION

The BioDisc unit utilises a series of connected reactors and chambers.

BioDisc units BA-BG are self contained, single piece units: BioDisc units BA-BE are available with varying inlet depths to suit site levels (see the table overleaf).

The main structure of the BioDisc unit is constructed from Glass Reinforced Plastic (GRP).

Biological treatment occurs on the Rotating Biological Contactor, or Rotor, in the BioDisc. The Rotor comprises banks of polypropylene discs (media) attached to a horizontal, zinc coated, steel shaft and is slowly rotated by an electric motor and gearbox.

The BioDisc has a low profile GRP cover, arranged in sections to facilitate access. A free-standing, weatherproof, local Control Panel is supplied with the BioDisc.

PROCESS

1. Primary Settlement Tank - Incoming sewage is received in the PST where settleable solids are separated and retained for periodic removal. The liquid level in the PST is allowed to fluctuate, to absorb incoming flow surges.

2. First Stage Biozone - The settled liquor passes from the PST into the first stage Biozone where it comes into close contact with natural micro-organisms (biomass) which colonise the surface of the media.

This first stage of the biological treatment acts as a roughing stage, absorbing fluctuations in the Biochemical Oxygen Demand (BOD_5) and detergent levels which would otherwise inhibit biological action in the second stage.

The patented managed flow system transfers the liquor to the second stage Biozone at a steady rate.

3. Second Stage Biozone - Treatment conditions in this stage are optimised, as the liquid level is constant. The media is partially submerged and, as it rotates, the biomass is alternately immersed in the liquor for adsorption and digestion of waste matter and exposed to the atmosphere for oxygenation.

4. Final Settlement Tank (FST) - Liquor containing excess biomass as fine settleable solids (humus) enters the FST through a submerged transfer pipe. Humus is settled out and retained for periodic removal at the same time as the sludge in the PST. The final discharge from the FST is by a dip-pipe (excepting units with integral discharge pump - see below).

DISCHARGE PUMPING

Effluent pumping stations are available (single or twin pump) for applications where the discharge has to be lifted to a higher level or pumped to remote discharge point. Details on request.

BA and BB BioDisc units can be supplied with an optional integral discharge pump.

ALARMS

Alarms are available to signal loss of rotation and failure of the discharge pump (where applicable). Details on request.

EQUIPMENT SELECTION

Maximum daily hydraulic and organic loads shown overleaf are for general guidance only. Please consult Klargester for site specific selection.

All applications are individually assessed, considering a number of factors, including the expected hydraulic flow, organic load, ammonia levels and treatability.

DELIVERY & INSTALLATION

Units are normally delivered by flat bed vehicle and the installer should provide lifting facilities for off-loading. BioDisc units are installed on a concrete base and surrounded with concrete. BA & BB units can be surrounded in pea shingle if ground conditions allow. Installation Guidelines are supplied with each unit.

MAINTENANCE

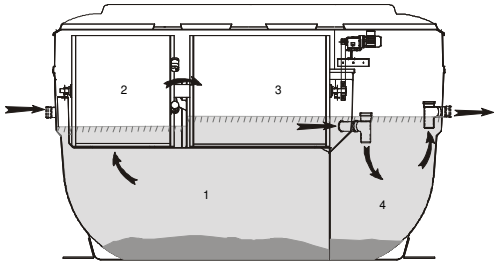
BioDisc units should be de-sludged as required (see table). Mechanical maintenance is minimal, but should not be neglected. Klargester offers a range of maintenance packages to support a long and trouble free service life.

GREASE SEPARATION

Klargester offer a range of grease traps and separators. These are required on sites with commercial catering facilities, to prevent excessive concentrations of fats, oils and greases interfering with the biological processes within the BioDisc.

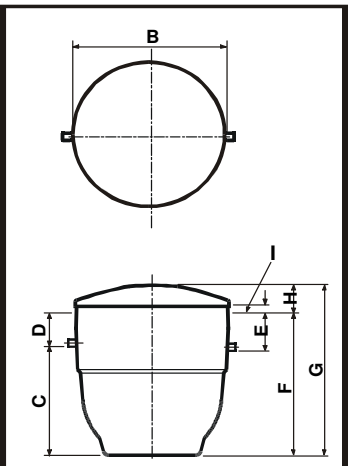
SAMPLE CHAMBERS

Pre-fabricated sample chambers are available to meet Environment Agency requirements.

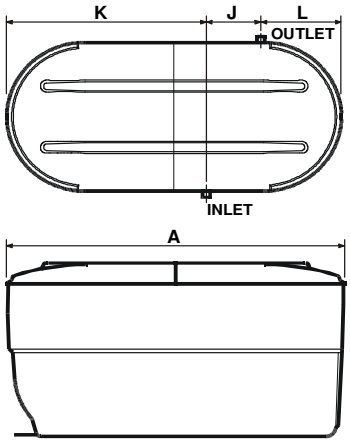


BIODISC PROCESS

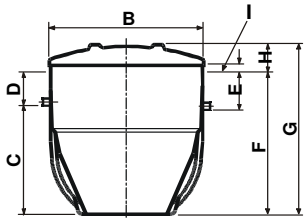
BA - BC BIODISCS



BD - BG BIODISCS



NOTE: Refer to detailed customer drawing for full dimensional data.



SINGLE-PIECE BIODISC SPECIFICATION BA-BG (Carbonaceous)

The sizing of Sewage Treatment Plant requires specialised knowledge and experience. Please consult Klargester for an assessment of your application

UNIT SIZE			BA 1 House	BB 2 Houses	BC 3-4 Houses	BD -	BE -	BF -	BG -
Max BOD (kg) per day			0.36	0.72	1.08	1.5	2.1	3.0	4.2
Max NH_4N (kg) per day			0.048	0.096	0.144	0.2	0.28	0.4	0.56
Design Flow Rate - DWF (m^3/day)			1.2	2.4	3.6	5	7	10	14
Peak Flow Rate (m^3/hr) (½ hr/2 hr period)			0.15	0.30	0.45	0.63	0.88	1.25	1.75
A	Length mm		-	-	-	3340	3340	4345	5235
B	Width mm		1995	1995	2450	2450	2450	2450	2450
C	Below Inlet Depth mm		1400	1400	1820	1825	1825	1820	1820
D	Inlet Invert Depth -	Shallow Invert	450	450	-	-	-	-	-
		Standard Invert	750	750	600	600	600	600	600
		Europe Invert	-	-	900	-	-	-	-
		Deep Invert	1250	1250	1100	1100	1100	-	-
E	Outlet Invert Depth -	Shallow Invert	535	535	-	-	-	-	-
		Standard Invert	838	835	685	685	685	700	700
		Europe Invert	-	-	985	-	-	-	-
		Deep Invert	1335	1335	1185	1185	1185	-	-
F	Depth Below G.L. -	Shallow Invert	1850	1850	-	-	-	-	-
		Standard Invert	2150	2150	2420	2425	2425	2420	2420
		Europe Invert	-	-	2720	-	-	-	-
		Deep Invert	2650	2650	2920	2925	2925	-	-
G	Overall Height -	Shallow Invert	2160	2160	-	-	-	-	-
		Standard Invert	2460	2460	2825	2830	2830	2825	2825
		Europe Invert	-	-	3125	-	-	-	-
		Deep Invert	2960	2960	3325	3330	3330	-	-
H	Height Above Ground Level		310	310	405	405	405	405	405
I	Ground Clearance		95	95	65	65	65	65	65
J	Drain Offset		-	-	-	855	855	1070	890
K	Inlet Position		-	-	-	1225	1225	2170	3120
L	Outlet Position		-	-	-	1260	1370	1105	1225
Desludge Period (approx.)			12 months	6 months	7 months	6 months	4 months	4 months	4 months
Motor Rating 1phase/3phase (Watts)			50	50	75/60	75/60	75/90	120	180
Full load current 1 phase (Amps)			0.51	0.51	1.00	1.00	1.00	1.30	1.57
Full load current 3 phase (Amps)			0.21	0.21	0.34	0.34	0.43	0.46	0.67
Weight (kg) -		Shallow Invert	310	335	-	-	-	-	-
		Standard Invert	325	350	650	1100	1200	1315	1660
		Europe Invert	-	-	700	-	-	-	-
		Deep Invert	380	405	750	1200	1300	-	-

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