PRODUCT & TECHNICAL PT003/4

PROTECTA-LINE

BARRIER PIPE AND FITTINGS SYSTEM

For complete peace of mind

Product and Technical Guide

www.gpsuk.com

GPS
PE PIPE SYSTEMS

Our Company

GPS PE Pipe Systems is a member of the international Aliaxis Group of Companies who manufacture and sell pipe systems and related products for residential and commercial construction, industrial and public utilities.

We specialise in the research, development and manufacture of polyethylene and multi-layer pipe systems including fittings for gas and water transportation in the utilities, offshore and industrial markets.

Resulting from the amalgamation of two market leading companies, GPS PE Pipe Systems brings together over one hundred years of experience and knowledge in plastic pipe systems.

The Environment

We actively and consistently strive to reduce our impact on the environment. We have measured our performance against various environmental indicators since 1997 and operated an environmental management system accredited to ISO 14001 since 1999. We are currently working towards an independent verification of our carbon footprint under the Certified Emissions Measurement And Reduction Scheme (CEMARS).

Market Oriented

GPS PE Pipe Systems products have a broad range of applications in the industrial and utilities markets on a worldwide basis. The utilities of water and gas distribution are important sectors for high integrity products where the maintenance of water quality and the safe transport of gaseous fuels are of paramount importance. Industrial applications include: alternative energy installations in landfill gas systems; effluent transportation and mineral slurries.

Many of the brands in the GPS portfolio have a long record of innovation in meeting the needs of the water and gas utilities. One of the foremost pioneers in polyethylene pipe systems, GPS is continually improving and updating its offering to meet the ever growing needs of the distribution engineer, ensuring they stay at the forefront of world gas and water distribution/treatment systems.

Manufactured in the UK, our products are sold to more than 60 countries worldwide.

Customer Focus

The key to our success lies in the commitment we pledge to provide the highest quality service and support to our customers and industry end-users. We are a team of highly motivated and experienced individuals who are dedicated to helping our customers achieve their goals.

We place the utmost importance in meeting the needs of our customers, constantly evolving our extensive product portfolio to meet the ever changing demands of the water and gas utilities, industrial and offshore markets.

Quality

Designed, manufactured and supplied under a BS EN ISO 9001:2008 accredited Quality Management System, GPS products comply with relevant national, European and international product standards to ensure peace of mind for our customers.

Certificate No. fm 34819

Certificate No. E 51385

Business in the Community AWARDS 2010

World leaders in the design, manufacture, marketing and sales of high performance, high integrity plastic and composite piping systems.

Confidence in safe drinking water supply

Protecta-Line is the UK leading, award winning fully integrated barrier pipe and fittings system for safe transportation of water through contaminated land.

Its tough multi-layer construction ensures that any contaminants remaining in brownfield sites and former industrial land cannot permeate into the water supply. The Protecta-Line system offers complete performance assurance thanks to its second-to-none approval status and Kitemark to WIS 4-32-19. It is also the most comprehensive PE barrier pipe system available, incorporating a full range of pipes and dedicated, approved fittings.

For over 15 years, water companies, contractors and self-lay organisations have trusted Protecta-Line with maintaining the long term safety and quality of the water supply. It is an established favourite in the UK and abroad, and with a wealth of approval, installation and cost benefits, it remains the market leader.

Applications

- Drinking water distribution in contaminated land (brownfield sites)
- Drinking water distribution in sites with potential future contamination issues (eg: new petrol station forecourts).

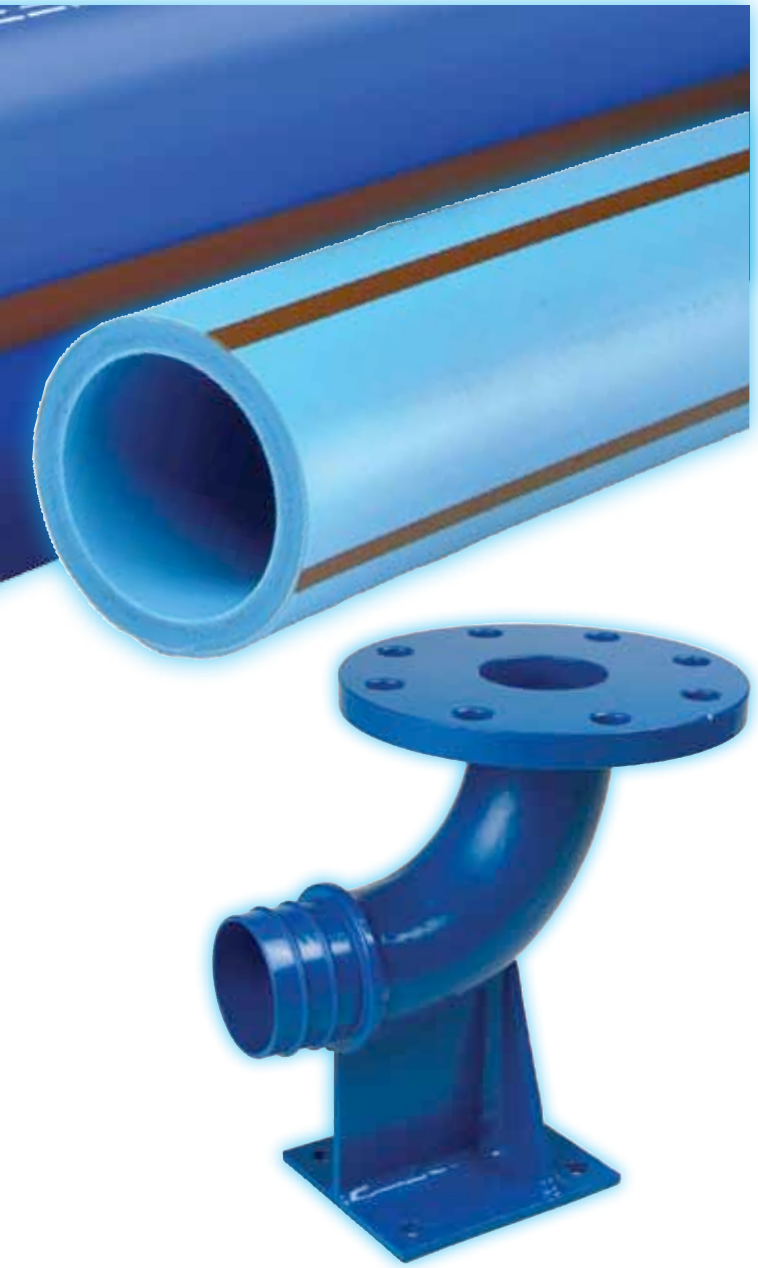
Features

- Prevents the tainting that can be caused by through-wall permeation by hydrocarbons and related chemicals that might be present in contaminated land
- Proven protection against all recognised brownfield contaminants, both organic and inorganic, even in their maximum reported concentrations
- Suitable for corrosive conditions
- Second–to-none approval status for total peace of mind to the highest standards of safety demanded by water companies and other installers
- Fully integrated range of pipe and approved dedicated fittings
- May be used for trenchless installations or subjected to cold bending as standard polyethylene pipes

Benefits

- All the installation advantages of conventional PE pipe – a lightweight, flexible pipe in longer lengths that is fast and easy to install
- Reduced leakage
- Long-term security of supply
- Avoids the need for expensive soil sampling and remediation
- Lower cost of installation than metallic pipe and is significantly less disruptive
- Excellent lifetime cost savings

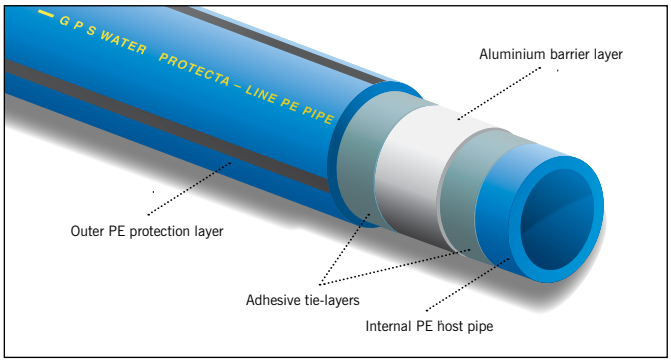
Tel: +44 (0)1480 442600 **Fax:** +44 (0)1480 458829 **Technical Support:** +44 (0)1480 442620



Design

Introduced to the UK market in 1996, Protecta-Line won the IWEX Innovation Award for its design, which prevents any chemicals left in the land from damaging the pipe wall, ensuring preservation of long-term strength, many years of usage and whole-life cost savings.

The double bonded five-layer construction comprises of an internal standard PE host pipe (PE80 or PE100 conforming to BS EN 12201) for carrying water, an impermeable aluminium barrier layer to stop the ingress of contaminants, an outer polyethylene protection layer and two adhesive tie-layers.



Second-to-none Approval Status

- Regulation 31/27/30 approved (England & Wales/Scotland/NI)
- WRAS approved **(complete** system**)**
- Protecta-Line system is Kitemarked to WIS 4-32-19, the only industry standard for pipe systems for potable water in contaminated land
- BS EN 12201 (25mm – 630mm – core pipes)
- System permeation tests independently verified.

WRAS
1109402
1105515
1109400
1410516
1102074

BS EN 12201-2
508224

WIS 4-32-19
KM 514626

No Expensive Soil Sampling

According to UKWIR Guidance (10/MW/03/21), PE barrier pipes provide sufficient protection from all recognised brownfield site conditions where there is no expectation of toxic substances.

This means that choosing Protecta-Line can help developers avoid the cost of expensive soil sampling. Conversely, wrapped metal pipes can corrode under certain soil conditions, so if metallic pipes are selected, soil sampling is required to establish how corrosive the site could be.

Lower Installation Costs

Lightweight and flexible for ease of handling and efficient logistics; supplied in longer lengths for fewer joints and with no requirement for thrust blocks, Protecta-Line is easier and faster to install than its metallic alternatives.

The system provides cost and ease of installation advantages with a comprehensive range of fittings and, thanks to PE's corrosion resistance, maintenance is minimised too, making it cost effective at the installation level and throughout its lifespan.

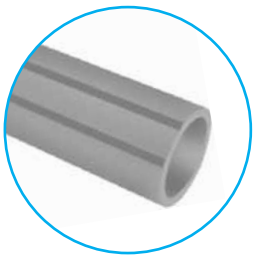
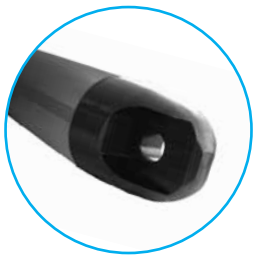
System Notice

Protecta-Line is an approved system. Only Protecta-Line fittings shall be used with Protecta-Line pipe.
The use of alternative fittings will have the following effects on your Protecta-Line system:

- Invalidation of WRAS approval and manufacturer's system performance warranty.
- Compromised permeation resistance (causing non-compliance with WIS 4-32-19 and possible risks to health).
- Danger of pipe-layer delamination, compromising system performance integrity and risking pipe bursts.
  It would be illegal to install non-WRAS approved fittings.

USE ONLY PROTECTA-LINE APPROVED FITTINGS

Product Range Overview

		DESCRIPTION	STANDARDS/APPROVALS	MATERIAL	SIZE RANGE
Protecta-Line Pipe		PE barrier pipe for water distribution through contaminated land	• Regulation 31/27/30 • WRAS • WIS 4-32-19 • BS EN 12201 (core pipes)	Polyethylene Aluminium	25mm – 630mm (SDR11) 90mm – 630mm (SDR17)
Protecta-Line 3^{C} and 3^{CTH} Coils		Clean, capped and coiled PE barrier pipe for installation without pre-chlorination	• Regulation 31/27/30 • WRAS • WIS 4-32-19 • BS EN 12201 (core pipes)	Polyethylene Aluminium	90mm – 180mm
Mechanical Compression Fittings		Mechanical compression fittings for service connections	• WRAS • WIS 4-32-19	Acetal	25mm – 63mm
Mechanical Fittings		Mechanical compression fittings for mechanical jointing without the need for pipe preparation or welding	• WRAS • WIS 4-24-01 Type 1 • WIS 4-32-19	Stainless steel Rilsan coated steel	63mm – 180mm
Ferrule Off-Takes		Saddle ferrules for live off-takes wthout any flow restrictions	• WRAS • WIS 4-32-19 • WIS 4-22-02	Gunmetal Acetal Stainless steel	25mm & 32mm (for 63mm – 355mm mains) 63mm (for 90mm to 355mm mains)
Electrofusion Fittings		Electrofusion fittings with a bar coding system or rapid and convenient jointing	• WRAS • WIS 4-32-19	Polyethylene	90mm – 630mm
Pupped Fittings		Extended spigots suitable for electrofusion and butt-fusion jointing	• WRAS • WIS 4-32-19	Polyethylene	90mm – 630mm

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Protecta-Line Pipe

Features

- Black PE100 (Excel) or blue PE80 (MDPE) core pipe with aluminium barrier layer and protective outer PE skin
- Suitable for corrosive conditions
- Can be used for trenchless installations
- Brown stripes provide easy identification and comply with NJUG regulations

Benefits

- Proven protection against all recognised brownfield contaminants
- All the installation advantages of polyethylene
- No need for expensive soil sampling
- Lower cost of installation than metallic pipe and is significantly less disruptive
- Excellent lifetime cost savings.

Straight Lengths

Size* (mm)	SDR	Pressure Rating (bar)	Material	6M Code	12M Code
63	11	12.5	PE80 (MDPE)	44 512 311	-
90	11	16	PE100 (Excel)	44 512 313	44 527 313
	17	10	PE100 (Excel)	44 653 313	44 654 313
110	11	16	PE100 (Excel)	44 512 314	44 527 314
	17	10	PE100 (Excel)	44 653 314	44 654 314
125	11	16	PE100 (Excel)	44 512 315	44 652 315
	17	10	PE100 (Excel)	44 653 315	44 654 315
160	11	16	PE100 (Excel)	44 512 317	44 652 317
	17	10	PE100 (Excel)	44 653 317	44 654 317
180	11	16	PE100 (Excel)	44 512 318	44 652 318
	17	10	PE100 (Excel)	44 653 318	44 654 318
225	11	16	PE100 (Excel)	44 512 320	44 652 320
	17	10	PE100 (Excel)	44 653 320	44 654 320
250	11	16	PE100 (Excel)	44 512 321	44 652 321
	17	10	PE100 (Excel)	44 653 321	44 654 321
280	11	16	PE100 (Excel)	44 512 322	44 652 322
	17	10	PE100 (Excel)	44 653 322	44 654 322
315	11	16	PE100 (Excel)	44 512 323	44 652 323
	17	10	PE100 (Excel)	44 653 323	44 654 323
355	11	16	PE100 (Excel)	44 512 324	44 527 324
	17	10	PE100 (Excel)	44 653 324	44 654 324
400	11	16	PE100 (Excel)	44 512 325	44 527 325
	17	10	PE100 (Excel)	44 506 325	44 507 325
450	11	16	PE100 (Excel)	44 512 326	44 527 326
	17	10	PE100 (Excel)	44 506 326	44 507 326
500	11	16	PE100 (Excel)	44 512 327	44 527 327
	17	10	PE100 (Excel)	44 506 327	44 507 327
560	11	16	PE100 (Excel)	44 512 328	44 527 328
	17	10	PE100 (Excel)	44 506 328	44 507 328
630	11	16	PE100 (Excel)	44 512 329	44 527 329
	17	10	PE100 (Excel)	44 506 329	44 507 329

Coils

Size* (mm)	SDR	Pressure Rating (bar)	Material	25M Code	50M Code	100M Code
25	11	12.5	PE80 (MDPE)	44 658 307	44 659 307	-
32	11	12.5	PE80 (MDPE)	44 658 308	44 659 308	-
63	11	12.5	PE80 (MDPE)	44 658 311	44 659 311	44 660 311
90	11	16	PE100 (Excel)	-	44 659 313	44 660 313
	17	10	PE100 (Excel)	-	44 655 313	44 656 313
110	11	16	PE100 (Excel)	-	44 659 314	44 660 314
	17	10	PE100 (Excel)	-	44 655 314	44 656 314
125	11	16	PE100 (Excel)	-	44 659 315	44 660 315
	17	10	PE100 (Excel)	-	44 655 315	44 656 315
160	11	16	PE100 (Excel)		44 659 317	44 660 317
	17	10	PE100 (Excel)	-	44 655 317	44 656 317
180	11	16	PE100 (Excel)	-	44 659 318	44 660 318
	17	10	PE100 (Excel)	-	44 655 318	44 656 318

Protecta-Line 3^{C} and 3^{CTH} Coils

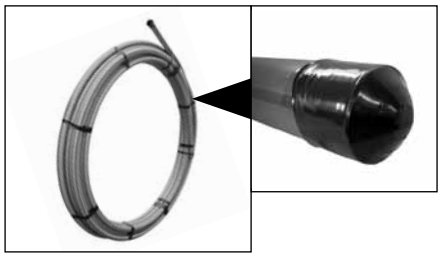
Features

- Protecta-Line PE100 pipe coils with factory-sealed pipe ends
- Factory-clean pipe bore when delivered to site
- Regulations 31, 27 and 30 approved for installation without pre-chlorination
- 3^{C} has factory heat sealed protective caps on both ends. 3^{CTH} has a factory heat sealed protective cap on one end and an integral Towing Head on the other.

Benefits

- All the advantages of conventional PE and Protecta-Line pipes
- Immediate installation from stock, without lengthy pre-chlorination
- Less disruption to water supply
- Higher installation productivity compared to unsealed coils
- Post-installation sterilisation for 30 minute contact only – DWI recognised methodology.
- Significant installation cost savings
- Ready to use at the point of delivery
- Fewer visits to site needed – reduced traffic disruption

3^{C} (Clean, Capped, Coiled) Coils



Size* (mm)	SDR	Pressure Rating (bar)	Coil Length Available (m)	50M Code	75M Code	100M Code
90	11	16	PE100 (Excel)	44 845 313	44 862 313	44 860 313
	17	10	PE100 (Excel)	44 846 313	44 847 313	44 849 313
110	11	16	PE100 (Excel)	44 845 314	44 862 314	44 860 314
	17	10	PE100 (Excel)	44 846 314	44 847 314	44 849 314
125	11	16	PE100 (Excel)	44 845 315	44 862 315	44 860 315
	17	10	PE100 (Excel)	44 846 315	44 847 315	44 849 315
160	11	16	PE100 (Excel)	44 845 317	44 862 317	44 860 317
	17	10	PE100 (Excel)	44 846 317	44 847 317	44 849 317
180	11	16	PE100 (Excel)	44 845 318	44 862 318	44 860 318
	17	10	PE100 (Excel)	44 846 318	44 847 318	44 849 318

Protecta-Line 3^{C} is a factory clean, capped and coiled pipe solution to negate the need for the lengthy pre-chlorination process prior to installation of potable water pipes. The DWI recognised methodology allows post-installation sterilisation for 30 minutes contact only.

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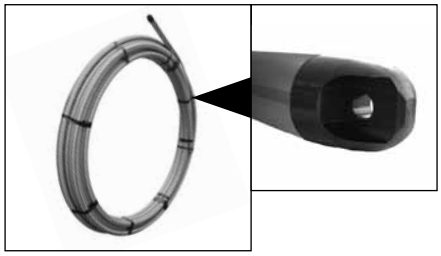
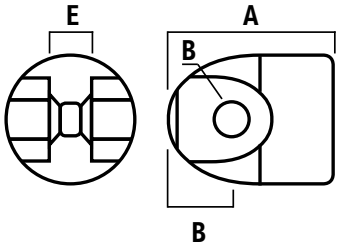
3CTH (Clean, Capped, Coiled with Towing Head) Coils



Size* (mm)	SDR	Pressure Rating (bar)	Coil Length Available (m)	50M Code	75M Code	100M Code
90	11	16	PE100 (Excel)	44 850 313	44 851 313	44 852 313
	17	10	PE100 (Excel)	44 853 313	44 854 313	44 855 313
110	11	16	PE100 (Excel)	44 850 314	44 851 314	44 852 314
	17	10	PE100 (Excel)	44 853 314	44 854 314	44 855 314
125	11	16	PE100 (Excel)	44 850 315	44 851 315	44 852 315
	17	10	PE100 (Excel)	44 853 315	44 854 315	44 855 315
160	11	16	PE100 (Excel)	44 850 317	44 851 317	44 852 317
	17	10	PE100 (Excel)	44 853 317	44 854 317	44 855 317
180	11	16	PE100 (Excel)	44 850 318	44 851 318	44 852 318
	17	10	PE100 (Excel)	44 853 318	44 854 318	44 855 318

Protecta-Line 3CTH is supplied with a factory fitted towing head, ready to be attached to a towing shackle. It is a factory clean, capped and coiled pipe solution to negate the need for the lengthy pre-chlorination process prior to installation of potable water pipes. The DWI recognised methodology allows post-installation sterilization for 30 minutes contact only.

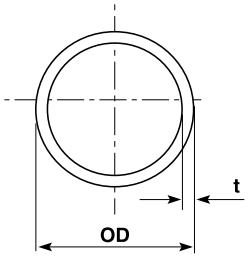
Towing Head Dimensions



Size * (mm)	A (mm)	B (mm)	C (mm)	E (mm)	Max Towing Load (tonnes) SDR11	Max Towing Load (tonnes) SDR17	Shackle Size (tonnes)
90	123	27	44	28	2.1	1.4	4.8
110	131	30	51	32	3.1	1.6	6.5
125	149	33	62	38	4.1	2.7	8.5
160	166.5	40	72.5	46	6.8	4.5	12
180	171.5	40	72.5	46	8.6	5.7	12

* The nominal size is the nominal core pipe outside diameter.

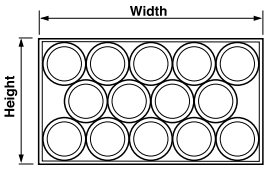
Pipe Dimensions



Size * (mm)	SDR	Min OD (mm)	Max OD (mm)	Mean Bore (mm)	Min Wall Thickness (mm)	Min Wall Thickness (mm)	Approx Weight (kg/m)
25	11	26.2	27.4	20.0	3.0	3.7	0.3
32	11	33.3	34.5	26.0	3.7	4.4	0.4
63	11	64.3	65.6	50.9	6.5	7.6	1.3
90	11	92.2	93.5	72.9	9.3	10.7	2.6
	17	92.2	93.5	78.8	6.5	7.5	1.9
110	11	112.2	113.5	89.2	11.1	12.7	3.7
	17	112.2	113.5	96.3	7.7	8.8	2.7
125	11	127.2	128.5	101.2	12.5	14.2	4.7
	17	127.2	128.5	109.6	8.5	9.8	3.4
160	11	163.2	165.1	130.4	15.8	17.9	7.6
	17	163.2	165.1	141.1	10.7	12.4	5.4
180	11	183.3	185.4	146.8	17.6	20.0	9.5
	17	183.3	185.4	158.8	11.9	13.7	6.8
225	11	227.3	229.5	182.5	21.7	24.4	14.5
	17	227.3	229.5	197.4	14.6	16.6	10.3
250	11	252.3	254.9	203.0	23.9	26.8	17.7
	17	252.3	254.9	219.6	16.0	18.3	12.4
280	11	282.3	285.1	227.4	26.6	29.8	22.0
	17	282.3	285.1	245.9	17.8	20.1	15.4
315	11	317.3	320.2	255.7	29.8	33.3	27.6
	17	317.3	320.2	276.6	19.9	22.4	19.3
355	11	357.3	360.6	288.3	33.4	37.3	34.8
	17	357.3	360.6	311.6	22.3	25.1	24.3
400	11	402.3	405.8	324.8	37.5	41.8	43.9
	17	402.3	405.8	351.3	24.9	27.9	30.4
450	11	452.3	456.1	365.4	42.1	46.8	55.3
	17	452.3	456.1	395.2	27.9	31.2	38.2
500	11	502.3	506.4	406.0	46.6	51.8	67.9
	17	502.3	506.4	439.0	30.9	34.5	46.9
560	11	562.3	566.8	454.9	52.0	57.7	84.7
	17	562.3	566.8	491.8	34.4	38.4	58.4
630	11	632.3	637.2	511.6	58.4	64.8	106.9
	17	632.3	637.2	553.2	38.6	43.0	73.6

* The size is the nominal core pipe outside diameter.
Other diameters, SDRs and lengths can be made to order subject to a minimum order value.

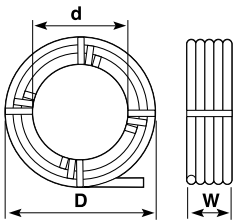
Lengths & Bundles



Size (mm)	Length (m)	No/Bundle	Width (mm)	Height (mm)	Weight SDR11 (Kg)	Weight SDR17 (Kg)
63	6	210	1238	750	1616	-
90	6/12	100	1188	795	1558/3116	1139/2278
110	6/12	67	1238	795	1488/2979	1088/2179
125	6/12	50	1238	750	1427/2839	1032/2054
160	6/12	33	1238	795	1455/2895	1040/2069
180	6/12	22	1188	730	1226/2553	870/1812
225	6/12	5	1125	335	436/872	310/620
250	6/12	4	1000	360	429/858	301/602
280	6/12	4	1120	390	529/1058	369/738
315	6/12	3	945	425	501/1002	350/700
355	6/12	3	1065	465	631/1261	440/880
400	6/12	3	1200	510	793/1586	550/1103
450	6/12	3	1350	560	998/1996	691/1385
500	6/12	2	1000	610	818/1635	566/1137
560	6/12	2	1120	670	1019/2038	704/1412
630	6/12	2	1260	740	1286/2571	886/1777

Due to continuous development, bundle sizes and weights may vary from that shown.

Coil Dimensions



Size (mm)	Coil Length (m)	d (mm)	D (mm)	W (mm)	Weight SDR11 (Kg)	Weight SDR17 (Kg)
25	25	1000	1200	200	7.5	-
	50				15	-
32	25	1000	1200	200	10	-
	50				20	-
63	25	1900	2200	200	32	-
	50		2300	200	63	-
	100		2400	300	126	-
90	50	2500	3100	300	130	95
	100		3300	400	260	190
110	50	2500	2900	500	185	135
	100		3200	600	370	270
125	50	2500	3000	500	235	170
	100		3200	700	470	340
160	50	3000	3900	500	380	270
	100		3900	700	760	540
180	50	3000	4000	600	475	340
	100		4000	700	950	680

Non standard diameters and lengths are usually available to order subject to a minimum order value.

Protecta-Line Mechanical Compression Fittings

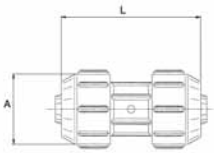
Features

- Acetal fittings for jointing Protecta-Line service pipes or connecting to standard PE pipe
- Feature a unique pipe insert that seals securely against the pipe bore
- WRAS approved
- Meet the requirements of WIS-4-32-19
- No pipe preparation, wrapping or specialist equipment required

Benefits

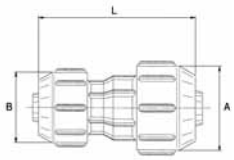
- Proven barrier protection against contamination
- No contact between the pipe's protective aluminium layer and drinking water
- No risk of joint corrosion
- Easy and rapid all weather installation

PE to PE Couplers



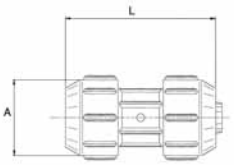
Size (mm)	A (mm)	L (mm)	Weight (kg)	Code
25 x 25	51	93	0.1	44 100 307
32 x 32	60	99	0.2	44 100 308
63 x 63	105	155	0.7	44 100 311

PE to PE Reducing Couplers



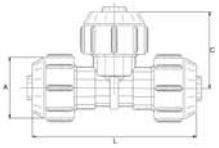
Size (mm)	A (mm)	B (mm)	L (mm)	Weight (kg)	Code
32 x 25	60	51	100	0.2	44 114 409
63 x 25	105	81	155	0.6	44 114 412
63 x 32	105	105	155	0.8	44 114 415

PE to Copper Couplers



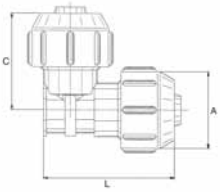
Size (mm)	A (mm)	L (mm)	Weight (kg)	Code
25 x 15	51	93	0.1	44 996 005
25 x 22	51	93	0.1	44 996 006
32 x 28	60	93	0.2	44 996 007

Equal Tees



Size (mm)	A (mm)	C (mm)	L (mm)	Weight (kg)	Code
25 x 25	51	64	134	0.2	44 122 307
32 x 32	60	68	146	0.3	44 122 308
63 x 63	105	100	216	1.3	44 122 311

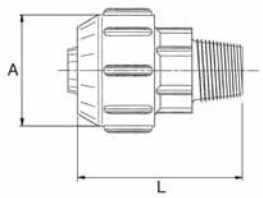
90º Elbows



Size (mm)	A (mm)	C (mm)	L (mm)	Weight (kg)	Code
25	51	68	93	0.1	44 115 307
32	60	71	97	0.2	44 115 308
63	105	105	158	0.9	44 115 311

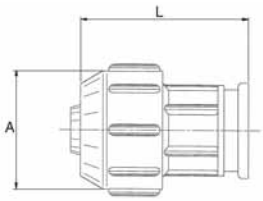
Tel: +44 (0)1480 442600 **Fax:** +44 (0)1480 458829 **Technical Support:** +44 (0)1480 442620

End Connectors – PE x Male Iron BSP Tapered



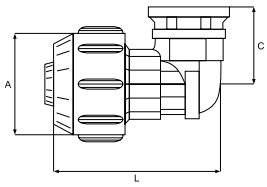
Size (mm x inch)	A (mm)	L (mm)	Weight (kg)	Code
25 x ¾	51	64	0.1	44 151 608
32 x ¾	60	74	0.1	44 151 611
32 x 1	60	77	0.1	44 151 612
63 x 1½	105	100	0.4	44 151 628
63 x 2	105	105	0.4	44 151 629

End Connectors – PE x Female Iron BSP Tapered



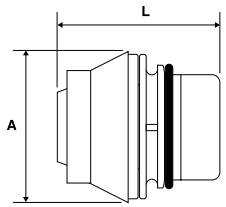
Size (mm x inch)	A (mm)	L (mm)	Weight (kg)	Code
25 x ¾	51	67	0.1	44 101 608
32 x 1	60	75	0.1	44 101 612
63 x 2	105	100	0.4	44 101 629

90º Elbows – PE x Female Iron BSP Tapered



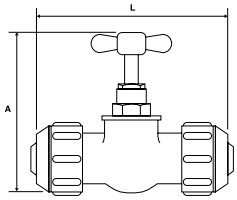
Size (mm x inch)	A (mm)	C (mm)	L (mm)	Weight (kg)	Code
25 x ¾	51	35	73	0.1	44 396 608
32 x 1	60	39	80	0.2	44 396 612
63 x 2	105	62	145	0.6	44 396 629

Reducing Sets – to allow easy Protecta-Line diameter changes



Size (mm x inch)	A (mm)	L (mm)	Weight (kg)	Code
32 x 25	44	42	0.1	44 105 409
63 x 32	80	51	0.2	44 105 415

Stop Cocks – BS 5433 Type



Size (mm x inch)	A (mm)	L (mm)	Weight (kg)	Code
25*	140	135	0.9	44 142 307
32**	165	170	1.7	44 142 308

* Includes 22mm copper Type A insert
** Includes 28mm copper Type A insert

Only Protecta-Line fittings shall be used with Protecta-Line pipe. The use of alternative fittings will have the following effects on your Protecta-Line system:

- Invalidation of WRAS approval and manufacturer's system performance warranty.
- Compromised permeation resistance (causing non-compliance with WIS 4-32-19 and possible risks to health).
- Danger of pipe-layer delamination, compromising system performance integrity and risking pipe bursts.
- It is illegal to install fittings non-compliant with the Water Fittings Regulations (or Byelaws in Scotland).

WIS 4-32-19
KM 514626

Protecta-Line Ferrule Off-Takes

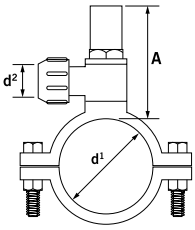
Features

- Enable live off-takes from Protecta-Line mains without any flow restrictions
- No contact between the pipe's aluminium barrier layer and the drinking water supply
- Self-locking liner sleeve
- WRAS approved and Kitemarked to WIS 4-32-19.

Benefits

- No disruption to water supply
- Secure isolation of drinking water from ground contaminants
- Simple, all weather installation with no wrapping or pipe preparation required
- Excellent headloss and flow characteristics
- Proven mechanical compression connections.

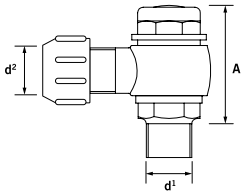
25mm and 32mm Self-Tapping Ferrule Off-Takes (for 63mm to 355m Protecta-Line mains)



Size d¹ x d² (mm)	A (mm)	Weight (kg)	Code
63 x 25	95	0.9	44 762 412
90 x 25	95	1.1	44 762 393
110 x 25	95	1.1	44 762 394
125 x 25	95	1.2	44 762 395
160 x 25	95	1.3	44 762 397
180 SDR17 x 25	95	1.4	44 762 398
180 SDR11 x 25	95	1.4	44 996 030
225 x 25	95	1.9	44 762 400
250 x 25	95	2.3	44 762 401
280 x 25	95	2.5	44 762 402
315 x 25	95	3.2	44 762 403
355 x 25	95	3.3	44 762 404

Size d¹ x d² (mm)	A (mm)	Weight (kg)	Code
63 x 32	100	1.2	44 762 415
90 x 32	100	1.3	44 762 417
110 x 32	100	1.4	44 762 418
125 x 32	100	1.4	44 762 419
160 x 32	100	1.5	44 762 421
180 SDR17 x 32	100	1.6	44 762 422
180 SDR11 x 32	100	1.6	44 996 031
225 x 32	100	2.1	44 762 424
250 x 32	100	2.5	44 762 425
280 x 32	100	2.7	44 762 426
315 x 32	100	3.4	44 762 427
355 x 32	100	3.5	44 762 428

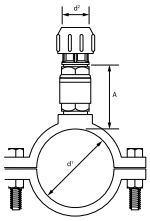
Ductile Iron Ferrule



Size d¹ x d² (mm)	A (mm)	Weight (kg)	Code
25mm x ¾ MI	60	0.5	44 762 407

For installation of Protecta-Line Service Off-Take onto existing ductile iron main

63mm Off-Takes (for 90mm to 355mm Protecta-Line mains)



Size (mm) d¹ x d²	A (mm)	Weight (kg)	Code
90 x 63	155	3.4	44 762 459
110 x 63	155	3.8	44 762 460
125 x 63	155	3.8	44 762 461
160 x 63	155	3.9	44 762 463
180 x 63	155	3.9	44 762 464

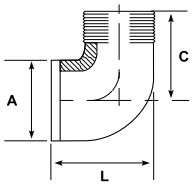
Size (mm) d¹ x d²	A (mm)	Weight (kg)	Code
225 x 63	155	5.0	44 762 466
250 x 63	155	5.1	44 762 467
280 x 63	155	5.3	44 762 468
315 x 63	155	5.5	44 762 469
355 x 63	155	6.1	44 762 470

Assembly includes 1 x 63mm PE x Male Iron BSP Tapered End Connector

Drill and Liner Tool Heads (for use with 63mm Off-Takes)

Size (mm) d¹ x d²	Code
Protecta-Line 2" Drill Head	44 794 003
Protecta-Line 2" Liner Head	44 794 004
Protecta-Line Drill/Liner Head O-Ring Kit	44 996 062

90º Gunmetal Elbows (optional for use with 63mm Off-Takes)



Size (mm)	A (mm)	C (mm)	L (mm)	Weight (kg)	Code
2" MI x 2" FI	72	70	90	0.9	44 996 050

Protecta-Line Mechanical Fittings

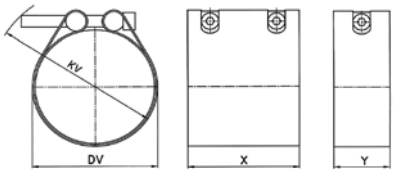
Features

- Supplied ready to install, as a full set of Rilsan coated steel liner insert and corrosion resistant stainless steel outer shells
- The shell mechanically swages Protecta-Line pipe onto the insert liner grooves to give a fully end load bearing joint (WIS 4-24-01 Type 1)
- Lightweight and with a low profile

Benefits

- Full barrier performance (WIS 4-32-19)
- Fast and easy all weather jointing by a single installer: no need for elastomeric seals, pipe end preparation or welding.
- Only a torque wrench with an Allen (hex) bit socket is required
- No need for specialist tooling (eg. hydraulic pump) or external power supply – reduced health & safety risk
- Can be installed in the tightest of spaces.

Outer Shells

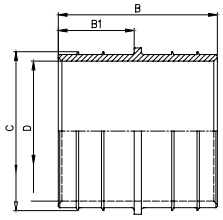


full sized shell half sized shell

Size (mm)	DV (mm)	KV (mm)	X (mm)	Y (mm)	Hex Size (mm)	Bolts	Torque (NM)
63	64	94	95	48	10	M12	**50**
90	94	120	95	48	10	M12	**60**
110	113	139	110	55	10	M12	**60**
125	129	155	110	55	10	M12	**60**
160	165	188	110	55	14	M16	**150**
180	184	216	110	55	14	M16	**160**

Protecta-Line Mechanical Fittings are supplied as a full set of liner insert and outer shell(s).
Weights shown are for the complete product.

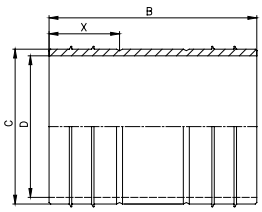
Couplers



Size (mm)	SDR	B (mm)	B1 (mm)	C (mm)	D (mm)	Weight (kg)	Code
63	11	95	45	50	41	1.5	PM 110 311
90	11	95	45	71	62	2.0	PM 100 313
	17	95	45	tbc	tbc	tbc	PM 109 313
110	11	110	53	88	76	2.6	PM 100 314
	17	110	53	tbc	tbc	tbc	PM 109 314
125	11	110	53	100	87	3.1	PM 100 315
	17	110	53	108	95	3.0	PM 109 315
160	11	110	53	128	114	4.4	PM 100 317
	17	110	53	139	125	4.3	PM 109 317
180	11	110	53	144	127	4.5	PM 100 318
	17	110	53	156	139	4.8	PM 109 318

Supplied as a set with 1 full shell.

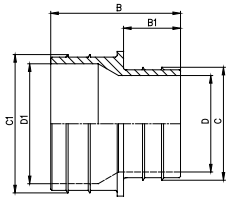
Repair Couplers



Size (mm)	SDR	B (mm)	X (mm)	C (mm)	D (mm)	Weight (kg)	Code
63	11	195	48	50	40	1.0	PM 246 311
90	11	195	48	71	61	2.4	PM 246 313
	17	195	55	tbc	tbc	tbc	PM 245 313
110	11	210	55	88	75	3.0	PM 246 314
	17	210	55	tbc	tbc	tbc	PM 245 314
125	11	210	55	100	86	4.0	PM 246 315
	17	210	55	108	94	4.4	PM 245 315
160	11	210	55	128	114	5.7	PM 246 317
	17	210	55	139	124	6.0	PM 245 317
180	11	210	55	144	127	6.6	PM 246 318
	17	210	55	156	140	7.0	PM 245 318

Supplied as a set with 2 half shells. Other repair liner lengths may be available on request.

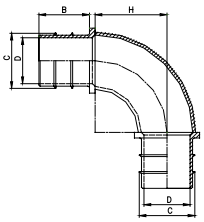
Reducers



Size (mm)	SDR	B (mm)	B1 (mm)	C (mm)	C1 (mm)	D (mm)	D1 (mm)	Weight (kg)	Code
90 x 63	11	95	45	50	71	41	62	2.0	PM 441 459
110 x 90	11	103	53/45	71	88	62	76	2.5	PM 441 483
	17	103	53/45	tbc	tbc	tbc	tbc	2.5	PM 440 483
125 x 110	11	110	53	88	114	76	87	3.2	PM 441 493
	17	110	53	88	100	tbc	tbc	3.2	PM 440 493
160 x 125	11	110	53	100	128	88	114	4.8	PM 441 504
	17	110	53	108	139	95	125	4.8	PM 440 504
180 x 125	17	110	53	108	156	95	139	6.0	PM 440 505

Consists of 1 x reducing liner and 2 x half sized shells.

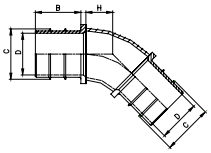
90° Elbows



Size (mm)	SDR	B (mm)	C (mm)	D (mm)	H (mm)	Weight (kg)	Code
63	11	45	50	41	69	2.1	PM 209 311
90	11	45	71	62	97	3.4	PM 210 313
	17	45	tbc	tbc	tbc	3.4	PM 208 313
110	11	53	88	76	122	4.4	PM 210 314
	17	53	tbc	tbc	tbc	4.4	PM 208 314
125	11	53	100	87	138	6.1	PM 210 315
	17	53	108	95	147	5.8	PM 208 315
160	11	53	128	114	180	9.3	PM 210 317
	17	53	139	125	195	10.1	PM 208 317
180	11	53	144	127	200	10.6	PM 210 318
	17	53	156	139	226	11.5	PM 208 318

Consists of 1 x elbow liner and 2 x half sized shells.

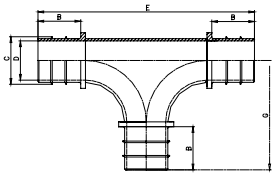
45° Elbows



Size (mm)	SDR	B (mm)	C (mm)	D (mm)	H (mm)	Weight (kg)	Code
63	11	45	50	41	32	1.8	PM 215 311
90	11	45	71	62	43	2.6	PM 216 313
	17	45	tbc	tbc	tbc	2.6	PM 214 313
110	11	53	88	76	53	3.6	PM 216 314
	17	53	tbc	tbc	tbc	3.6	PM 214 314
125	11	53	100	87	60	4.9	PM 216 315
	17	53	108	95	64	4.9	PM 214 315
160	11	53	128	114	78	7.4	PM 216 317
	17	53	139	125	84	7.7	PM 214 317
180	11	53	144	127	89	8.1	PM 216 318
	17	53	156	139	94	8.2	PM 214 318

Consists of 1 x elbow liner and 2 x half sized shells.

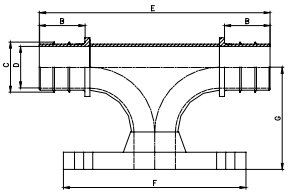
Equal Tees



Size (mm)	SDR	B (mm)	C (mm)	D (mm)	E (mm)	G (mm)	Weight (kg)	Code
63	11	45	50	41	214	62	3.0	PM 221 311
90	11	45	71	62	252	81	5.3	PM 222 313
	17	45	tbc	tbc	tbc	tbc	5.3	PM 220 313
110	11	53	88	76	287	91	7.4	PM 222 314
	17	53	tbc	tbc	tbc	tbc	7.4	PM 220 314
125	11	53	100	87	315	105	7.5	PM 222 315
	17	53	108	95	325	110	8.9	PM 220 315
160	11	53	128	114	355	125	11.6	PM 222 317
	17	53	139	125	363	129	11.6	PM 220 317
180	11	53	144	127	363	129	12.6	PM 222 318
	17	53	156	139	401	148	12.6	PM 220 318

Consists of 1 x equal tee liner and 3 x half sized shells.

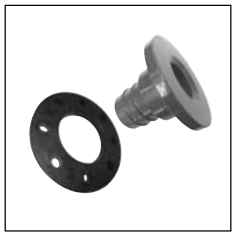
Flanged Branch Tees

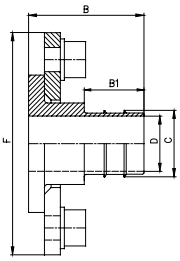


Size (mm x PN)	SDR	Bolts, Qty	Flange Torgue (NM±10%)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	Weight (kg)	Code
90 x DN80 PN16	11	8 x M16	70	45	71	62	252	200	176	8.9	PM 351 313
	17	8 x M16	70	45	tbc	tbc	tbc	200	tbc	8.9	PM 363 313
110 x DN80 PN16	11	8 x M16	70	53	88	76	287	200	136	9.5	PM 351 314
	17	8 x M16	70	53	tbc	tbc	tbc	200	tbc	9.5	PM 363 314
125 x DN80 PN16	17	8 x M16	70	53	108	95	287	200	136	12.0	PM 363 315
160 x DN80 PN16	17	8 x M16	70	53	139	125	287	200	161	16.2	PM 363 317
180 x DN80 PN16	17	8 x M16	70	53	156	139	325	200	174	19.6	PM 363 318
90 x DN100 PN16	11	8 x M16	80	45	71	62	252	220	178	9.1	PM 352 313
	17	8 x M16	80	45	tbc	tbc	tbc	220	tbc	9.1	PM 364 313
110 x DN100 PN16	11	8 x M16	80	53	88	76	287	220	188	9.7	PM 352 314
	17	8 x M16	80	53	tbc	tbc	tbc	220	tbc	9.7	PM 364 314
125 x DN100 PN16	17	8 x M16	80	53	108	95	325	220	157	12.2	PM 364 315
160 x DN100 PN16	17	8 x M16	80	53	139	125	325	220	169	16.9	PM 364 317
180 x DN100 PN16	17	8 x M16	80	53	156	139	325	220	182	20.0	PM 364 318
160 x DN150 PN16	17	8 x M20	120	53	139	125	363	285	229	20.4	PM 365 317
180 x DN150 PN16	17	8 x M20	120	53	156	139	401	285	198	23.4	PM 365 318

Consists of 1 x flanged branch tee liner and 2 x half sized shells.
The information given for bolting torque values are for metal to metal connections.
Flange bolts and gaskets are not included.
Drilled to BS EN 1092-1:2007 Table 13.

Stub Flange Adaptors

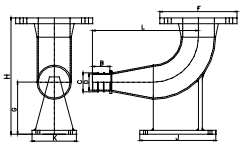




Size (mm x PN)	SDR	Bolts, Qty	Flange Torgue (NM±10%)	B (mm)	C (mm)	D (mm)	B1 (mm)	F (mm)	Weight (kg)	Code
63 x DN50 PN16	11	M16 X 4	60	83	50	41	45	165	3.1	PM 227 311
63 x DN80 PN16	11	M16 X 8	60	85	50	41	45	200	3.4	PM 228 311
90 x DN80 PN16	11	M16 X 8	70	85	71	62	45	200	6.0	PM 228 313
	17	M16 X 8	70	85	tbc	tbc	45	200	6.0	PM 226 313
110 x DN100 PN16	11	M16 X 8	80	93	88	76	53	220	8.9	PM 228 314
	17	M16 X 8	80	93	tbc	tbc	53	220	8.9	PM 226 314
125 x DN100 PN16	11	M16 X 8	80	93	100	87	53	220	10.9	PM 228 315
	17	M16 X 8	80	93	108	95	53	220	10.9	PM 226 315
160 x DN150 PN16	11	M20 X 8	120	105	128	114	53	285	17.9	PM 228 317
	17	M20 X 8	120	105	139	125	53	285	17.9	PM 226 317
180 x DN150 PN16	11	M20 X 8	120	105	144	127	53	285	21.9	PM 228 318
	17	M20 X 8	120	105	156	139	53	285	21.9	PM 226 318

Consists of 1 x stub flange liner, 1 x half sized shell and backing ring.
The information given for bolting torque values are for metal to metal connections.
Flange bolts and gaskets are not included.
Drilled to BS EN 1092-1:2007 Table 13.

Duck Foot Bends



Size (mm x PN)	SDR	Bolts, Qty	Flange Torgue (NM±10%)	B (mm)	C (mm)	D (mm)	F (mm)	G (mm)	H (mm)	J (mm)	K (mm)	L (mm)	Total Fitting Weight (kg)*	Code
63 x DN80 PN16	11	M16 x 8	70	45	50	41	200	135	302	152	90	275	6.8	PM 384 459
90 x DN80 PN16	11	M16 x 8	70	45	71	62	200	135	302	152	115	235	7.3	PM 384 313
110 x DN80 PN16	11	M16 x 8	70	53	88	76	200	135	302	152	130	231	8.0	PM 384 483
125 x DN80 PN16	17	M16 x 8	70	53	108	95	200	135	302	152	150	243	8.7	PM 385 484
160 x DN80 PN16	17	M16 x 8	70	53	139	125	200	135	302	152	180	310	10.0	PM 385 486
180 x DN80 PN16	17	M16 x 8	70	53	156	140	200	135	302	152	200	347	10.9	PM 385 487

Consists of 1 x flanged bend, 1 x half sized shell and gasket.
The information given for bolting torque values are for metal to metal connections.
Flange bolts and gaskets are not included.
Drilled to BS EN 1092-1:2007 Table 13.

Protecta-Line Electrofusion Fittings

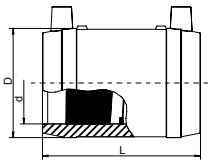
Features

- For use with pipe sizes in sizes 90mm to 630m.
- Each fitting has a barcode to allow Electrofusion Control Units (ECU's) to read information such as Product Type and Size, Fusion Time and Cooling Time to ensure quick and easy installation.
- Fittings can be jointed either in manual mode (where available) or by scanning their integral barcode label.
- Kitemarked to WIS 4-32-19

Benefits

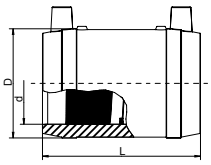
- Easy and rapid installation.
- Can be carried out in a trench, especially useful for repairs or tie-ins.
- Proven barrier protection against contamination.
- No risk of joint corrosion.
- No contact between the pipe's protective aluminium layer and drinking water.

Couplers - Removable Centre Stop (MB)



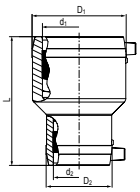
Size (mm)	SDR	D (mm)	L (mm)	Weight (kg)	Fusion Time* (Sec)	Cooling Time (mins)	Black Code	Old Black Code
90	11	119	127	0.4	65	10	PF 612 687	PL 100 313
110	11	141.5	135	0.7	120	10	PF 612 688	PL 100 314
125	11	158.5	147	1.0	225	15	PF 612 689	PL 100 315
160	11	198	164	1.8	360	20	PF 612 691	PL 100 317

Couplers - Slideover (UB)



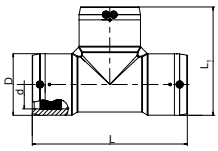
Size (mm)	SDR	D (mm)	L (mm)	Weight (kg)	Fusion Time* (Sec)	Cooling Time (mins)	Black Code	Old Black Code
180	11	220	210	2.1	480	20	PF 612 672	PL 100 318
225	11	277	236	4.0	550	20	PF 612 674	PL 100 320
250	11	315	246	5.8	620	30	PF 612 675	PL 100 321
280	11	347	285	7.7	barcode read	30	PF 615 073	PL 100 322
315	11	390	300	10.0	1250	30	PF 612 670	PL 100 323
355	11	445	300	16.7	barcode read	30	PF 615 074	PL 100 324
400	11	500	320	20.8	750	40	PF 615 075	
450	11	560	340	30.0	barcode read	40	PF 615 076	
500	11	630	360	39.8	barcode read	40	PF 615 124	
560	11	715	380	56.4	barcode read	40	PF 613 312	
	17	630	380	24.8	barcode read	40	PF 615 706	
630	11	810	420	80.6	barcode read	40	PF 616 269	
	17	710	420	36.8	barcode read	40	PF 615 726	

Reducers (MR)



Size (mm) d x d_1	D_1 (mm)	D_2 (mm)	L (mm)	Weight (kg)	Fusion Time* (Sec)	Cooling Time (mins)	Black Code	Old Black Code
110 x 90	140	115	180	0.9	180	10	PF 615 693	PL 402 483
125 x 90	155	115	200	1.0	240	15	PF 615 694	PL 402 484
125 x 110	156	142	201	1.3	240	14	PL 402 493	
160 x 110	201	140	230	2.0	300	20	PF 615 695	PL 402 495
180 x 125	214	156	276	2.6	300	16	PL 402 505	

Equal Tees (T)



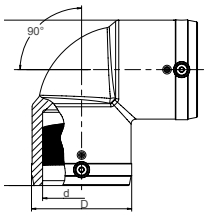
Size (mm)	D_1 (mm)	L (mm)	L_1 (mm)	Weight (kg)	Fusion Time (main)* (Sec)	Fusion Time (branch)* (Sec)	Cooling Time (mins)	Black Code	Old Black Code
90	117	305	211	1.1	90	90	10	PF 612 166	PL 408 313
110	142	355	248	2.2	140	160	10	PF 612 167	PL 408 314
125	160	384	272	2.7	180	200	15	PF 612 168	PL 408 315
160	200	430	315	4.9	400	400	20	PF 615 277	PL 408 317
180	228	480	354	7.8	440	440	20	PF 615 691	PL 408 318

Supplied factory-wrapped to ensure complete barrier perfomance.

* Manual fusion times are based on 39.5 volt fusion boxes. 4.0mm Terminal Pins.

When made in accordance with GPS PE Pipe Systems' recommended procedures, butt-fusion and electrofusion joints of the Protecta-Line System have been independently shown to meet the requirements of WIS 4-32-19 without any need for subsequent wrapping. This does not exempt installers from local regulations and the local Water Company preferences must be adhered to. See page 38 for details on wrapping tape.

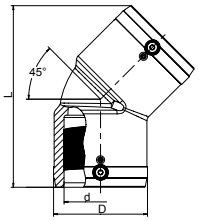
90° Elbows (W90°)



Size (mm)	D (mm)	L (mm)	Weight (kg)	Fusion Time* (Sec)	Cooling Time (mins)	Black Code	Old Black Code
90	115	202	1.0	90	10	PF 612 103	PL 104 313
110	138	234	1.6	140	10	PF 612 105	PL 104 314
125	157	254	2.0	180	15	PF 612 107	PL 104 315
160	207	329	4.9	360	20	PF 615 276	PL 104 317
180	228	354	5.8	440	20	PF 615 689	PL 104 318

* Manual fusion times are based on 39.5 volt fusion boxes. 4.0mm Terminal Pins.

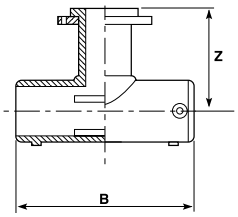
45° Elbows (W45°)



Size (mm)	D (mm)	L (mm)	Weight (kg)	Fusion Time* (Sec)	Cooling Time (mins)	Black Code	Old Black Code
90	115	232	0.8	90	10	PF 612 102	PL 105 313
110	138	265	1.3	140	10	PF 612 104	PL 105 314
125	157	279	1.8	180	15	PF 612 106	PL 105 315
160	207	377	4.4	360	20	PF 615 275	PL 105 317
180	228	382	4.6	440	20	PF 615 687	PL 105 318

* Manual fusion times are based on 39.5 volt fusion boxes. 4.0mm Terminal Pins.

Flanged Tees – 39.5 Volt



Supplied factory-wrapped to ensure complete barrier perfomance. Dimension Z is an approximate value, based on the dimensions of the component parts. The nature of the fabrication process is such that the final dimension may be slightly less than the Z value quoted.
Drilled to BS EN 1092-1:2007 Table 13.

Size (mm)	B (mm)	Z (mm)	Weight (kg)	Fusion Time (Sec)	Cooling Time (mins)	Black Code	Old Black Code
90 x 80 PN16	211	296	2.60	120	10	PF 301 313	PL 301 313
110 x 80 PN16	240	515	3.90	160	10	PF 301 314	PL 301 314
125 x 80 PN16	280	532	4.70	240	12	PF 301 315	PL 301 315
160 x 80 PN16	314	615	6.70	260	14	PF 301 317	PL 301 317
180 x 80 PN16	365	834	7.90	440	20	PF 301 318	PL 301 318
90 x 100 PN16	211	534	3.20	100	10	PF 302 313	PL 302 313
110 x 100 PN16	240	310	3.90	160	10	PF 302 314	PL 302 314
125 x 100 PN16	280	301	4.30	240	12	PF 302 315	PL 302 315
160 x 100 PN16	314	650	7.60	260	14	PF 302 317	PL 302 317
180 x 100 PN16	365	671	9.20	440	20	PF 302 318	PL 302 318
160 x 150 PN16	314	410	8.50	260	14	PF 303 317	PL 303 317
180 x 150 PN16	365	415	5.20	440	20	PF 303 318	PL 303 318

Flange Adaptor Kits

Adaptor Kit comprises of:-

1 x Stub Flange
1 x Gasket
1 X Coupler
1 x Backing Ring

Size (mm)	SDR	Black Code	Old Black Code
90 x 80	11	PF 251 313	PL 251 313
110 x 100	11	PF 251 314	PL 251 314
125 x 100	17	PF 250 315	PL 250 315
160 x 150	17	PF 250 317	PL 250 317
180 x 150	17	PF 250 318	PL 250 318
225 x 200	17	PF 250 320	PL 250 320
250 x 200	17	PF 250 534	PL 250 534

Size (mm)	SDR	Black Code	Old Black Code
250 x 250	17	PF 250 321	PL 250 321
280 x 250	17	PF 250 322	PL 250 322
315 x 250	17	PF 250 543	PL 250 543
315 x 300	17	PF 250 323	PL 250 323
355 x 300	17	PF 250 547	PL 250 547
355 x 350	17	PF 250 324	PL 250 324

Drilled to BS EN 1092-1:2007 Table 13.
Note: Sizes 250 and 315mm have sections of pipe butt-fused to the moulding.

Only Protecta-Line fittings shall be used with Protecta-Line pipe. The use of alternative fittings will have the following effects on your Protecta-Line system:

- Invalidation of WRAS approval and manufacturer's system performance warranty.
- Compromised permeation resistance (causing non-compliance with WIS 4-32-19 and possible risks to health).
- Danger of pipe-layer delamination, compromising system performance integrity and risking pipe bursts.
- It is illegal to install fittings non-compliant with the Water Fittings Regulations (or Byelaws in Scotland).

WIS 4-32-19
KM 514626

Protecta-Line Pupped Fittings

Features

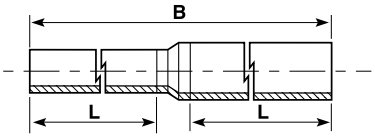
- Pupped fittings featuring extended spigots in various sizes made from Protecta-Line (PE100) pipe
- Suitable for electrofusion and butt-fusion
- 0.5m length pups as standard
- Bespoke fabrications can be made

Benefits

- Full barrier performance
- Flexibility to construct a pipeline to individual project needs
- Fully homogeneous pipeline

Pupped fittings up to 630mm are also available. please contact Sales office for details.

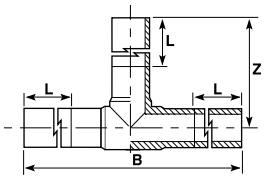
Reducers



Size (mm) d^1 x d^2	B (mm)	L (mm)	SDR11 Weight (kg)	SDR17 Weight (kg)	SDR11* Code	SDR17* Code
110 x 90	1190	500	3.7	2.7	44 323 483	44 322 483
125 x 90	1200	500	4.4	3.2	44 323 484	44 322 484
160 x 90	1240	500	6.2	4.6	44 323 486	44 322 486
160 x 110	1240	500	7.0	5.0	44 323 495	44 322 495
160 x 125	1230	500	7.5	5.4	44 323 504	44 322 504
180 x 90	1440	500	7.0	5.0	44 323 487	44 322 487
180 x 125	1240	500	8.9	6.3	44 323 505	44 322 505
225 x 160	1298	500	-	10.0	-	44 322 507
250 x 125	1530	500	13.5	10.4	44 323 508	44 322 508
250 x 180	1290	500	16.0	12.8	44 323 529	44 322 529
315 x 180	1620	500	30.1	24.6	44 323 531	44 322 531
315 x 250	1330	500	29.7	21.7	44 323 543	44 322 543
355 x 180	1420	500	28.9	21.6	44 323 532	44 322 532
355 x 250	1245	500	30.5	22.8	44 323 544	44 322 544
355 x 315	1245	500	34.7	25.5	44 323 547	44 322 547

Features a reducer pupped with Protecta-Line pipe. The reducer is factory wrapped to ensure complete barrier performance.

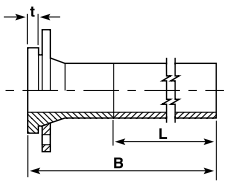
Equal Tees



Size (mm)	L (mm)	B (mm)	Z (mm)	SDR11 Weight (kg)	SDR17 Weight (kg)	SDR11 Code	SDR17 Code
90	500	1310	656	4.9	3.9	44 321 313	44 320 313
110	500	1326	670	7.3	5.5	44 321 314	44 320 314
125	500	1372	687	9.5	7.1	44 321 315	44 320 315
160	500	1419	708	15.5	11.2	44 321 317	44 320 317
180	500	1509	765	20.8	15.3	44 321 318	44 320 318
225	500	1550	775	32.7	24.5	-	44 320 320
250	500	1540	840	37.0	26.5	44 321 321	44 320 321
280	500	1680	840	50.4	34.4	-	44 320 322
315	500	1820	910	63.1	43.5	44 321 323	44 320 323
355	500	1690	845	84.4	58.2	44 321 324	44 320 324

Features a black tee pupped with Protecta-Line pipe. The tee is factory wrapped to ensure complete barrier performance.

Stub Flange Assemblies PN16

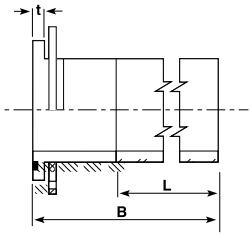


Size (mm)	B (mm)	t (mm) SDR11	t (mm) SDR17	SDR11 Weight (kg)	SDR17 Weight (kg)	SDR11 Code	SDR17 Code
90 x DN80	630	17	17	3.0	2.0	44 327 313	44 326 313
110 x DN100	630	18	18	4.0	2.9	44 327 314	44 326 314
125 x DN100	675	25	25	4.9	3.5	44 327 315	44 326 315
160 x DN150	675	25	25	7.4	6.0	44 327 317	44 326 317
180 x DN150	675	30	30	9.4	6.8	44 327 318	44 326 318
225 x DN200	675	32	32	12.2	9.7	-	44 326 320
250 x DN250	675	35	35	17.7	13.8	44 327 321	44 326 321
280 x DN250	602	35	29	19.8	15.0	-	44 326 322
315 x DN300	575	35	35	24.5	19.0	44 327 323	44 326 323
355 x DN350	610	41	30	31.5	27.7	44 327 324	44 326 324

Features a black stub pupped with Protecta-Line pipe.

Bespoke fabricated fittings up to 630mm are now available to order. Please contact our Sales Office for information.

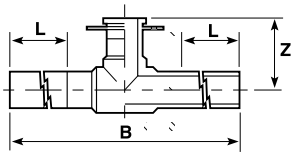
SlimFlange Assemblies



Size (mm)	L (mm)	B (mm)	t (mm) SDR11	t (mm) SDR17	SDR11 Weight (kg)	SDR17 Weight (kg)	SDR11 Code	SDR17 Code
250 x DN200	500	610	31	27	9.8	8.8	44 453 321	44 452 321
315 x DN250	500	610	35	30	16.0	13.0	44 453 323	44 452 323
355 x DN300	500	610	40	35	21.1	20.1	44 453 324	44 452 324

Features a black SlimFlange pupped with Protecta-Line pipe.

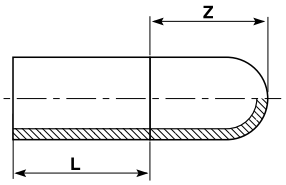
Flanged Short Branch Tees



Size (mm)	L (mm)	B (mm)	Z (mm)	SDR11 Weight (kg)	SDR17 Weight (kg)	SDR11 Code	SDR17 Code
90 x DN80	500	1310	165	5.2	3.9	44 341 313	44 310 313
110 x DN80	500	1326	259	5.7	4.3	44 341 314	44 310 314
125 x DN80	500	1372	260	9.1	6.3	44 341 315	44 310 315
160 x DN80	500	1419	330	10.1	7.1	44 341 317	44 310 317
180 x DN80	500	1509	335	18.9	12.8	44 341 318	44 310 318
225 x DN80	500	1550	492	-	15.8	-	44 310 320
250 x DN80	500	1430	580	33.5	22.1	44 341 321	44 310 321
280 x DN80	500	1692	1140	-	31.7	-	44 310 322
315 x DN80	500	1530	740	55.9	36.4	44 341 323	44 310 323
355 x DN80	500	1955	770	59.0	38.7	44 341 324	44 310 324
90 x DN100	500	1310	240	6.0	3.8	44 342 313	44 311 313
110 x DN100	500	1326	175	5.7	4.4	44 342 314	44 311 314
125 x DN100	500	1372	215	9.1	6.4	44 342 315	44 311 315
160 x DN100	500	1419	332	11.7	8.3	44 342 317	44 311 317
180x DN100	500	1509	290	19.0	12.0	44 342 318	44 311 318
225 x DN100	500	1550	494	-	16.0	-	44 311 320
250 x DN100	500	1430	520	33.5	22.2	44 342 321	44 311 321
280 x DN100	500	1692	1142	-	32.7	-	44 311 322
315 x DN100	500	1530	680	66.4	39.6	44 342 323	44 311 323
355 x DN100	500	1955	1515	75.2	45.2	44 342 324	44 311 324
160 x DN150	500	1310	340	13.7	10.0	44 343 317	44 312 317
180 x DN150	500	1326	230	19.8	13.8	44 343 318	44 312 318
225 x DN150	500	1372	363	-	17.6	-	44 312 320
250 x DN150	500	1419	410	34.4	23.3	44 343 321	44 312 321
280 x DN150	500	1509	430	-	34.0	-	44 312 322
315 x DN150	500	1550	570	66.9	40.7	44 343 323	44 312 323
355 x DN150	500	1955	1058	76.2	46.2	44 343 324	44 312 324

Features a black flanged branch tee pupped with Protecta-Line pipe.
The tee is factory wrapped to ensure complete barrier performance.

End Caps

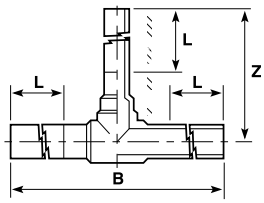


Size (mm)	L (mm)	Z (mm)	SDR11 Weight (kg)	SDR17 Weight (kg)	SDR11 Code	SDR17 Code
90	500	124	2.2	1.9	44 332 313	44 331 313
110	500	138	2.7	2.4	44 332 314	44 331 314
125	500	155	5.1	3.5	44 332 315	44 331 315
160	500	179	5.2	3.6	44 332 317	44 331 317
180	500	200	10.5	7.3	44 332 318	44 331 318
225	500	180	-	9.1	-	44 331 320
250	500	330	20.8	14.2	44 332 321	44 331 321
280	500	117	-	11.0	-	44 331 322
315	500	358	34.0	23.0	44 332 323	44 331 323
355	500	120	44.1	30.1	44 332 324	44 331 324

Features a black end cap pupped with Protecta-Line pipe.
The cap is factory wrapped to ensure complete barrier performance.

Bespoke fabricated fittings up to 630mm are now available to order. Please contact our Sales Office for information.

Reduced Branch Tees



Size (mm)		L (mm)	B (mm)	Z (mm)	SDR11 Weight (kg)	SDR17 Weight (kg)	SDR11 Code	SDR17 Code
90mm branch	110	500	1326	850	11.4	5.4	44 347 314	44 356 314
	125	500	1372	875	9	6.5	44 347 315	44 356 315
	160	500	1419	1120	9.4	6.6	44 347 317	44 356 317
	180	500	1509	1180	19.4	13.9	44 347 318	44 356 318
	225	500	1550	1550	-	15.3	-	44 356 320
	250	500	1440	1440	35.4	23.5	44 347 321	44 356 321
	280	500	980	980	-	40	-	44 356 322
	315	500	1820	1820	64.5	46	44 347 323	44 356 323
	355	500	1910	1910	78.4	51.9	44 347 324	44 356 324
125mm branch	180	500	1509	990	19.9	14.2	44 348 318	44 357 318
	225	500	1450	1270	-	23.1	-	44 357 320
	250	500	1430	1240	35.8	25.7	44 348 321	44 357 321
	280	500	1600	1680	-	41.2	-	44 357 322
	315	500	1530	1620	64.9	46.3	44 348 323	44 357 323
	355	500	1690	1290	54.2	52.2	44 348 324	44 357 324
180mm branch	225	500	1550	960	-	25.1	-	44 358 320
	250	500	1430	1000	36.6	26.3	44 349 321	44 358 321
	280	500	1600	1170	-	41.8	-	44 358 322
	315	500	1530	1380	65.6	46.9	44 349 323	44 358 323
	355	500	1790	1160	68.4	52.8	44 349 324	44 358 324
250mm branch	315	500	1530	1200	65.8	47.3	44 335 323	44 336 323
	355	500	1690	975	86.6	53.3	44 335 324	44 336 324

Features a black tee pupped with Protecta-Line pipe.
The tee is factory wrapped to ensure complete barrier performance.

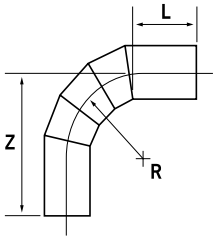
Bespoke fabricated fittings up to 630mm are now available to order. Please contact our Sales Office for information.

Only Protecta-Line fittings shall be used with Protecta-Line pipe. The use of alternative fittings will have the following effects on your Protecta-Line system:

- Invalidation of WRAS approval and manufacturer's system performance warranty.
- Compromised permeation resistance (causing non-compliance with WIS 4-32-19 and possible risks to health).
- Danger of pipe-layer delamination, compromising system performance integrity and risking pipe bursts.
- It is illegal to install fittings non-compliant with the Water Fittings Regulations (or Byelaws in Scotland).

WIS 4-32-19
KM 514626

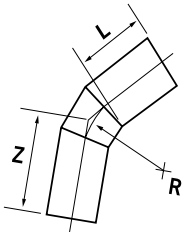
90° Mitred Elbows



Size (mm)	L (mm)	Z (mm)	SDR11 Weight (kg)	SDR17 Weight (kg)	SDR11 Code	SDR17 Code
90	500	617	3.6	2.6	44 244 313	44 243 313
110	500	643	5.3	3.9	44 244 314	44 243 314
125	500	663	6.9	5.0	44 244 315	44 243 315
160	500	708	11.6	8.2	44 244 317	44 243 317
180	500	734	14.9	10.7	44 244 318	44 243 318
225	500	793	-	17.1	44 244 320	44 243 320
250	500	825	30.2	21.2	44 244 321	44 243 321
280	500	864	-	27.2	44 244 322	44 243 322
315	500	907	50.6	35.4	44 244 323	44 243 323
355	500	962	66.7	46.6	44 244 324	44 243 324

The joints are factory wrapped to ensure complete barrier performance.

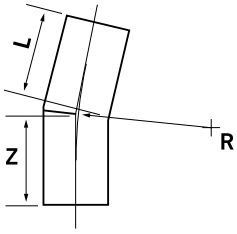
45° Mitred Elbows



Size (mm)	L (mm)	Z (mm)	SDR11 Weight (kg)	SDR17 Weight (kg)	SDR11 Code	SDR17 Code
90	500	538	3.1	2.2	44 242 313	44 241 313
110	500	546	4.4	3.2	44 242 314	44 241 314
125	500	553	5.7	4.1	44 242 315	44 241 315
160	500	568	9.4	6.7	44 242 317	44 241 317
180	500	576	11.9	8.5	44 242 318	44 241 318
225	500	596	-	13.3	44 242 320	44 241 320
250	500	606	23.2	16.2	44 242 321	44 241 321
280	500	618	-	20.5	44 242 322	44 241 322
315	500	632	37.5	26.2	44 242 323	44 241 323
355	500	650	48.4	33.8	44 242 324	44 241 324

The joints are factory wrapped to ensure complete barrier performance.

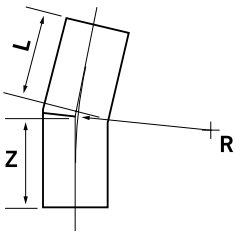
22.5° Mitred Elbows



Size (mm)	L (mm)	Z (mm)	SDR11 Weight (kg)	SDR17 Weight (kg)	SDR11 Code	SDR17 Code
90	500	509	2.8	2.0	44 317 313	44 316 313
110	500	511	4.0	2.9	44 317 314	44 316 314
125	500	513	5.1	3.7	44 317 315	44 316 35
160	500	516	8.3	5.9	44 317 317	44 316 317
180	500	518	10.4	7.5	44 317 318	44 316 318
225	500	523	-	11.4	44 317 320	44 316 320
250	500	525	19.6	13.8	44 317 321	44 316 321
280	500	528	-	17.2	44 317 322	44 316 322
315	500	531	31.0	21.7	44 317 323	44 316 323
355	500	536	39.3	27.5	44 317 324	44 316 324

The joints are factory wrapped to ensure complete barrier performance.

11.25° Mitred Elbows



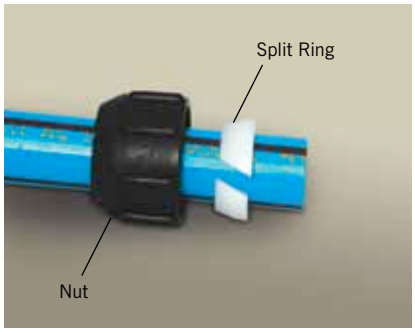
Size (mm)	L (mm)	Z (mm)	SDR11 Weight (kg)	SDR17 Weight (kg)	SDR11 Code	SDR17 Code
90	500	505	2.8	2.1	44 298 313	44 297 313
110	500	506	4.0	2.9	44 298 314	44 297 314
125	500	506	5.0	3.6	44 298 315	44 297 315
160	500	508	8.2	5.8	44 298 317	44 297 317
180	500	509	10.2	7.3	44 298 318	44 297 318
225	500	511	-	11.1	44 298 320	44 297 320
250	500	512	19.2	13.4	44 298 321	44 297 321
280	500	514	-	16.7	44 298 322	44 297 322
315	500	516	30.1	21.1	44 298 323	44 297 323
355	500	518	38.1	26.6	44 298 324	44 297 324

The joints are factory wrapped to ensure complete barrier performance.

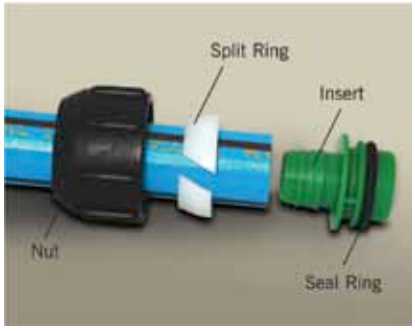
Tel: +44 (0)1480 442600 **Fax:** +44 (0)1480 458829 **Technical Support:** +44 (0)1480 442620

Jointing Instructions for 25mm-63mm Protecta-Line Mechanical Compression Fittings (Service Pipes)

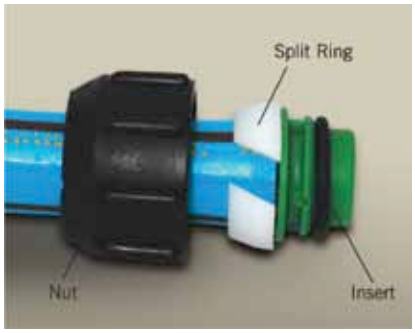
For use on GPS Protecta-Line pipe only.



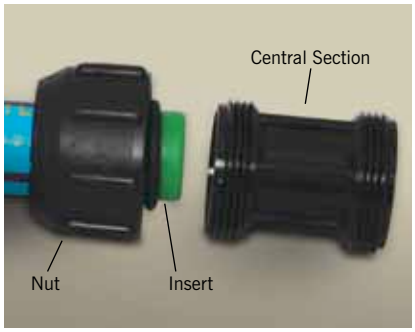
1. Cut the pipe square. Unscrew the Protecta-Line fitting and remove the nut and white split ring. Slide these on to the Protecta-Line pipe, first ensuring that the taper of the split ring faces towards the nut.



2. Tap the insert into the end of the Protecta-Line pipe with a flat wooden object. Ensure that the seal ring is correctly positioned on the pipe insert.

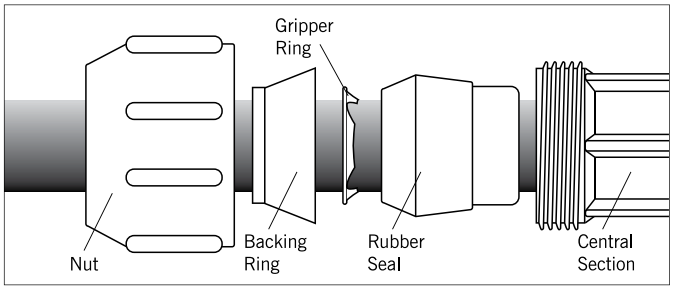


3. Slide the split ring along the Protecta-Line pipe until it is up against the insert. Snap the nut over the split ring.



4. Offer the body of the fitting to the Protecta-Line pipe end and screw the nut on to the fitting body. Continue to tighten the nut until the thread on the body is no longer visible.

Protecta-Line to copper joint (incorporates insert set for Copper Type A for above ground use on Table X tube).



1. Cut copper pipe square, preferably with cutters, and deburr.
2. Degrease pipe and roughen with wire wool or similar.
3. Unscrew nut from copper side of Protecta-Line fitting and slide this nut and plastic backing ring along copper pipe – with taper of backing ring towards nut.
4. Then slide metal gripper ring on to pipe and position it 10–15mm from end, ensuring flat face of gripper ring is facing towards backing ring/nut (i.e. slots in the gripper ring must face towards fitting body).
5. Next slide rubber seal on to copper pipe all the way up to internal stop – taper facing towards other parts already on pipe.
6. This will make certain that the metal gripper ring is pushed to correct location along pipe.
7. Slide backing ring forward to meet gripper ring/rubber seal.
8. Push assembly into body of Protecta-Line fitting and engage nut.
9. Tighten nut firmly with a wrench.
10. Ensure all pipework is securely anchored to counteract end loading.

Do not use heat near plastics and do not re-use gripper ring.

WATCH JOINING VIDEOS AT www.gpsuk.com/joiningvideos/

Connecting Protecta-Line mechanical compression fittings to iron fittings
When screwing Protecta-Line Mechanical Compression Fittings onto iron fittings it is important not to use excessive amounts of **thread** sealing tape or other material **because** this can result in unreasonable force needed to complete the joint. Thread sealing tape should be WRc approved.

Jointing Instructions for 25mm and 32mm Protecta-Line Gunmetal Self-Tapping Ferrule Off-Takes

For use on GPS Protecta-Line pipe only.
Gloves and safety glasses must be worn during the whole assembly process.
Do not remove cutter or sleeve from this product before use.
The ferrule strap cutter includes a sealing sleeve that prevents water contact with the aluminium barrier layer.

1. Clean the surface of the Protecta-Line main where the self-tapping ferrule strap is to be installed, avoiding areas which appear damaged. Ensure that the sealing "O" ring is in place under the upper ferrule strap and take care not to damage this on the protruding sleeve.

2. Fit the self-tapping ferrule squarely around the main and tighten the two strap bolts evenly and symmetrically.

Caution: Do not remove cutter or sleeve from this product before use.

3. Fit the Protecta-Line service pipe into the compression fitting on the outlet, as described in the instructions overleaf.
   After aligning the outlet to the desired position, tighten the securing collar and compression fitting.

4. Remove the plug from the top of the ferrule cap, and, using an 8 or 11mm square section key (depending on service pipe size), wind down the cutter assembly all the way until hard and solid resistance is felt. Note that before the solid resistance is felt there may be a temporary drop in resistance, followed by an increase as the sleeve around the cutter enters the main.

5. Withdraw the cutter all the way up to the top of the stem, employing a final counter-clockwise torque of approximately 15Nm to ensure a good seal. Some leakage through the plughole is normal before the cutter has been fully unscrewed.

6. Replace the plug.

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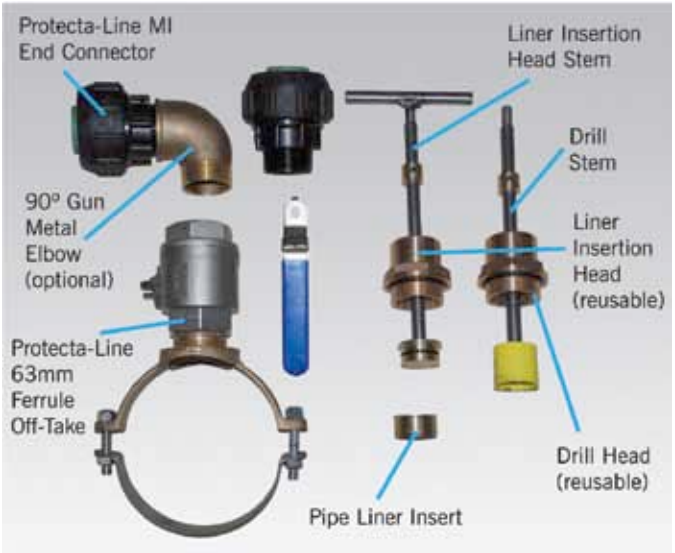
Jointing Instructions for 63mm Protecta-Line Gunmetal Ferrule Off-Takes



Accessory	Code
* Protecta-Line 2" Drill Head	44 794 003
**Protecta-Line 2" Liner Head	44 794 004
***Protecta-Line Drill/Liner Head O-Ring Kit	44 996 062

* Drill Head setting: fix stop at 230mm from base to drill tip

** Drill Liner setting: fix stop at 180mm from stop base to bottom of tip on liner head

*** Includes four O-rings for replacement in either Drill Head or Liner Head

Gloves and safety glasses must be worn during the whole assembly process.

1. Ensuring that the sealing O-ring is in place under the upper ferrule strap, fit the ferrule squarely around the main in the required position and tighten the two strap bolts evenly and symmetrically. Ensure that ball valve operates correctly before fitting.

2. After assembling the drill stem with a 48mm hole cutter, withdraw the drill stem fully into the drill head.

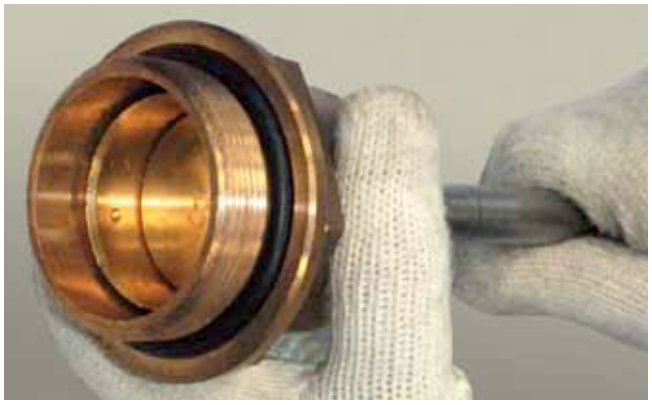
3. Ensure that the ball valve is in the fully open position (anticlockwise rotation). Fit the drill head to the outlet of the ferrule.

4. Attach the chuck of an electric drill to the top of the drill stem (ensuring that the power supply is disconnected). Re-connect the power supply to the electric drill and operate the drill with downward pressure until the stop on the drill stem contacts the top of the drill head.

5. Disconnect the power supply to the electric drill and remove the drill from the drill stem. Withdraw the drill stem, until the cutter is fully returned into the drill head and fully close the ball valve (clockwise rotation) before removing the drill head from the outlet of the ferrule.

6. Position the liner insert onto the carrier of the liner insertion head.

7. Fully withdraw the carrier and pipe liner insert into the liner insert head (indicated by the lower depth mark on the stem).



8. Fit the liner insertion head to the outlet of the ferrule. Open the ball valve (anti-clockwise rotation) and fully insert the liner insert, by applying downward pressure on the tee-bar handle on the shaft of the liner insertion head until the stop on the liner insertion head stem contacts the top of the liner insertion head.

9. Withdraw the liner insertion head stem until the carrier is fully withdrawn into the liner insert head (indicated by the lower depth mark on the stem). Close the ball valve (clockwise rotation) and remove the liner insertion head.

10. The communication pipe can now be fitted to the outlet of the ferrule utilising a Protecta-Line 63mm x 2" MI mechanical end connector, either directly to the ferrule outlet (side connection) or in conjunction with 2" MI/FI 90° elbow (top connection).

11. Open the ball valve (anti-clockwise rotation).

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Jointing Instructions for Protecta-Line Mechanical Fittings

These fittings are designed for use on GPS Protecta-Line pipes only and their performance on other piping systems is not approved or guaranteed.

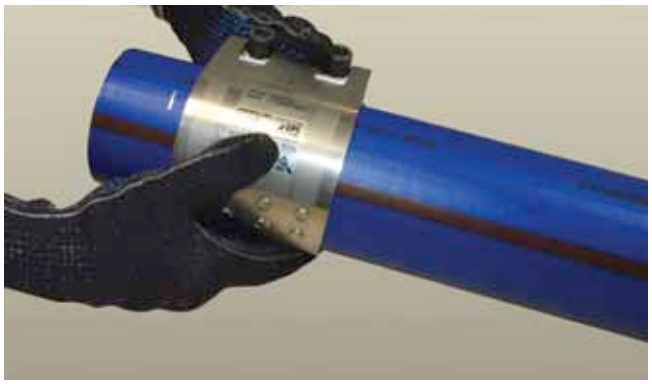
Gloves and safety glasses must be worn during the whole assembly process.

A torque wrench is required: with a 10mm allen (hex) socket for sizes 63mm – 125mm and a 14mm allen (hex) socket for 160mm – 180mm fittings.

1. **DO ensure that the pipe ends are cut square.**
2. **DO ensure that the pipe is correctly aligned onto the fitting spigot.**
3. **DO ensure that the pipe is butted up to the insert spigot's pipe stop.**
4. **DO ensure that the shell is flush with the pipe end on the spigot.**
5. **DO remember to re-torque the bolts.**
6. **DON'T remove the fitting and try to reinstall on the same section of pipe, this may create a leak path due to the grooves previously formed on the pipe bore.**

1. Ensure the pipe ends are cut square. With the insert in place in the pipes to be joined, or with a 5mm gap between them, centre the shells over the pipe ends and mark the penetration depth.

2. Slide the shell over one of the pipe ends to be joined.



3. Push the insert into the pipe end.

4. Offer up the second pipe end onto the insert and push the pipes together, ensuring both pipes are up against the pipe stops of the insert and correctly aligned on the pipe.

5. Ensure the shells are flush with the pipe ends or for the straight coupler, centre the shell between the depth penetration marks. The fitting is ready to be tightened. Set the torque wrench to the value indicated on the label of the shell.

6. Tighten the hex socket head bolts until the set torque is achieved in each bolt. The pipe will relax after the set torque is achieved, so after a minute or more, retighten the bolts to the set torque. Repeat until less than a quarter turn is needed to reach the set torque*.

7. For the straight couplers, which have two bolts on a double width shell, tighten the bolts alternately and evenly until set torque is achieved in each bolt. The pipe will relax after the set torque is achieved, so after a minute or more, retighten the bolts to the set torque. Repeat until less than a quarter turn is needed to reach the set torque*.

* Repeated tightening of the bolts up to the set torque is necessary and important to compensate for relaxation in the polyethylene. It's normal for the re-torquing process to be conducted three to four times over the course of 5 minutes, but a longer allowance for relaxation between re-torquing may be needed in extremely cold weather where 10 to 15 minutes may be needed for the complete installation process.

Tel: +44 (0)1480 442600 **Fax:** +44 (0)1480 458829 **Technical Support:** +44 (0)1480 442620

Repair Section Using 90mm – 180mm Protecta-Line Mechanical Repair Couplers

These fittings are designed for use on GPS Protecta-Line pipes only and their performance on other piping systems cannot be guaranteed.

Gloves and safety glasses must be worn during the whole assembly process.

A torque wrench is required: with a 10mm allen (hex) socket for sizes 63mm – 125mm and a 14mm allen (hex) socket for 160mm – 180mm fittings.

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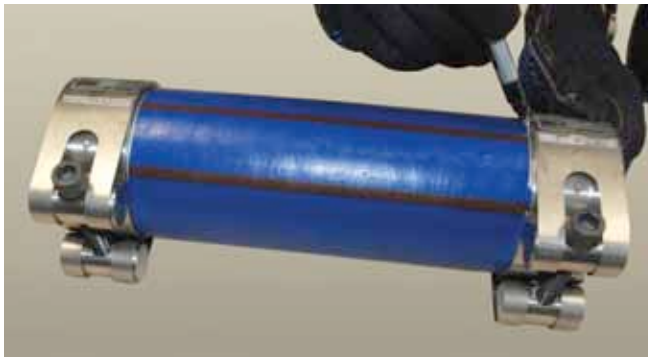
1. Cut out the damaged pipe section. The minimum length of the cut is shown in the table below.

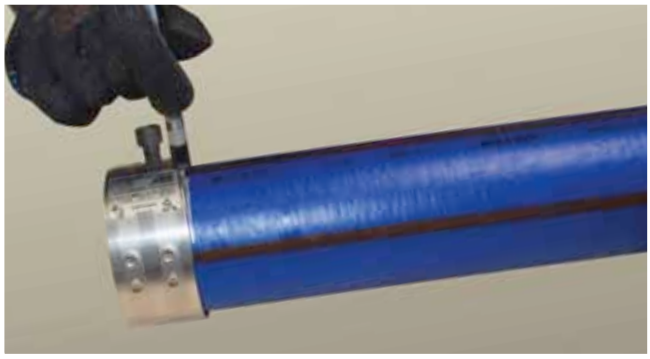
Pipe Size (mm)	Minimum Cut Out Length (mm)	Length of the Repair Piece (mm)
63	440	240
90	440	240
110	470	270
125	470	270
160	470	270
180	470	270

2. From an undamaged pipe length cut out a repair piece. The length of the repair piece should be equal to the length of the cut out less 200mm.

3. Fit the half shells to the ends of the cut out section and mark the penetration depths.



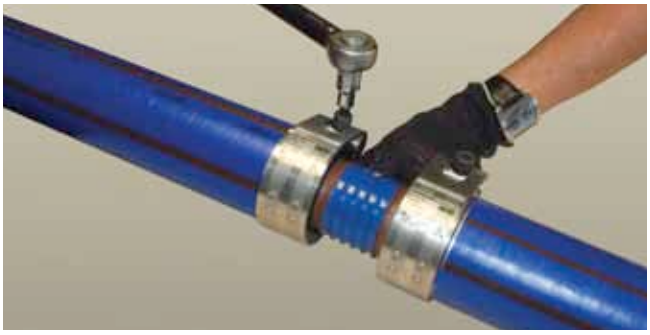
4. The penetration depths is shown in the table on the right. The table is in a separate document and to be added here.



5. Push the repair coupler inserts into the repair piece and position into the cut section.

6. Slide the repair coupler inserts into the cut pipe ends, so all of the depth marks are visible.

7. Tighten the hex socket head bolts until the set torque is achieved in each bolt. The pipe will relax after the set torque is achieved, so after a minute or more, retighten the bolts to the set torque. Repeat until less than a quarter turn is needed to reach the set torque.*



Nominal Pipe Size (mm)	Insertion depth (mm)	Bolt Hexagon (mm)	Torque Nm
63	45	10	50
90	45	10	60
110	52.5	10	60
125	52.5	10	60
160	52.5	14	160
180	52.5	14	160

* Repeated tightening of the bolts up to the set torque is necessary and important to compensate for relaxation in the polyethylene. It's normal for the re-torquing process to be conducted three to four times over the course of 5 minutes, but a longer allowance for relaxation between re-torquing may be needed in extremely cold weather where 10 to 15 minutes may be needed for the complete installation process.

Procedures for Butt-Fusion and Electrofusion of Protecta-Line Pipes (90mm-630mm)

When made in accordance with GPS PE Pipe Systems' recommended procedures, butt-fusion and electrofusion joints of the Protecta-Line system have been independently shown to meet the requirements of WIS 4-32-19 without any need for subsequent wrapping. This does not exempt installers from local regulations and the local Water Company preferences must be adhered to.

Standard butt-fusion and electrofusion procedures must be adhered to, but note the following additional points:

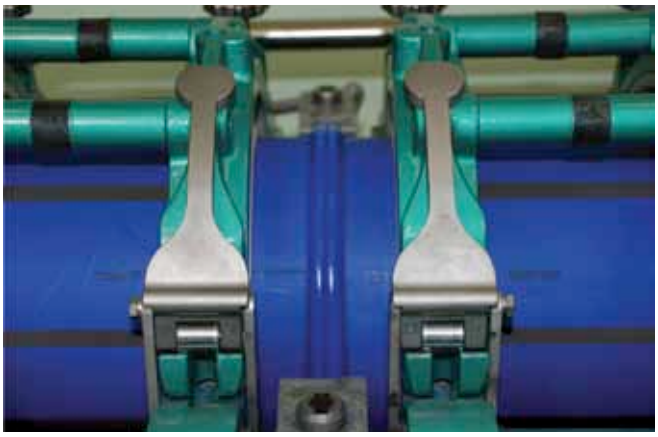
Butt-Fusion

Where this is permitted by the local water company, it is important that the outer PE and aluminium layers are removed far enough back, using the Protecta-Line Surprep tool (see the next pages), to prevent the aluminium from coming into contact with the butt-fusion machine trimmer or heater plates.

In addition, the outer PE and aluminium layers should be removed far enough back to permit normal debeading of the completed joint for normal quality control purposes.

It is recommended that the layers should be removed to a length equal to the width of the debeading tool on the end of each pipe. This should be increased by 50% when carrying out dummy weld procedures prior to final jointing.

Butt-fusion clamps should be checked for suitability before commencing work, particularly in larger sizes. Care should be taken not to damage the outer layers of Protecta-Line pipe when clamping it in the butt-fusion machine. In the case of some machines this may necessitate gently radiusing the edges of the jaw shutlines.



Electrofusion

It is essential that the Protecta-Line pipe is properly prepared prior to electrofusion jointing. It is necessary first to remove the outer PE layer, aluminium layer and any residual adhesive layer material.

It is potentially dangerous to carry out electrofusion jointing where the aluminium layer is still in place.

The Protecta-Line Surprep Scraper must be used for pipe end preparation, as it not only removes the outer layers, but it also prepares the core pipe for electrofusion jointing.

Electrofusion clamps should be checked for suitability before commencing work, particularly in larger sizes. All electrofusion joint assemblies must be held in clamps throughout the fusion and cooling periods.

Protecta-Line Jointing End Preparation for Electrofusion Procedures

Pipe Size (mm)	Length (B) (mm)	Register (Z) (mm)	Min preparation insertion depth (mm)	Max preparation depth (mm)
90	127	3	62	67
110	135	3	66	71
125	147	3	72	77
160	164	3	81	86
180	167	3	82	87
225	220	8	106	111
250	224	8	108	113
280	256	8	124	129
315	291	8	142	147
355	295	8	144	149

For diameters above 355mm, please contact GPS Technical Support on +44 (0)1480 442620 or enquiries@gpsuk.com

Only Protecta-Line fittings shall be used with Protecta-Line pipe. The use of alternative fittings will have the following effects on your Protecta-Line system:

- Invalidation of WRAS approval and manufacturer's system performance warranty.
- Compromised permeation resistance (causing non-compliance with WIS 4-32-19 and possible risks to health).
- Danger of pipe-layer delamination, compromising system performance integrity and risking pipe bursts.
- It is illegal to install fittings non-compliant with the Water Fittings Regulations (or Byelaws in Scotland).

WIS 4-32-19
KM 514626

Repair Using Electrofusion (for Protecta-Line pipe sizes from 225mm to 630mm)

The pipe stops incorporated in the Protecta-Line electrofusion couplers are shearable and have been provided for the specific purpose of using the fittings for making repairs or breaking into existing pipelines.

1. Cut out the damaged section of the Protecta-Line pipe at least four times the length of the electrofusion repair couplers and ensure the pipe ends are cut square.
2. Measure the distance between the exposed pipe ends and cut a length of plain PE100 pipe of the same diameter and wall thickness as the existing Protecta-Line pipe, equal to the measured distance less 10mm ensuring that the pipe ends are cut square
3. Clean the ends of the cut section of plain pipe, for a distance slightly greater than the overall length of the repair couplers.
4. Using the pipe end preparation tool, remove the entire surface of the pipe over the marked area, preferably as a continuous ribbon or strip. Note: The use of mechanical end preparation tools is preferred as hand scraping requires great care and can be time-consuming especially on larger diameter pipes. It is essential that material is removed by scraping or peeling; scratching or abrading is not sufficient.
5. Remove the pipe stops in the coupler. This can be most satisfactorily achieved by placing one end of a thoroughly cleaned short length of pipe into the coupler and striking the other end onto a hard surface. The pipe stops can also be removed using a sharp knife, but care must be taken not to damage the bore of the fitting.
6. Clean the ends of the Protecta-Line pipe for repair and prepare for electrofusion jointing using the Protecta-Line Suprep Scraper as described on pages 34 and 35.
7. Using a suitable marker pen, draw circumferential lines half the length of the repair coupler on the prepared Protecta-line pipe ends which will be used to indicate the location of each repair coupler prior to fusion.
8. Care should be taken to ensure any residual water in the mains is not allowed to come into contact with the electrofusion area.
9. Insert the new plain section of pipe with repair couplers and then slide the repair couplers onto the Protecta-Line pipe ends, ensuring that they are positioned up to the marks on the prepared Protecta-Line pipe ends. Ensure that the surfaces are clean and dry.
10. Carry out the electrofusion jointing procedure as described in the GPS Installation & Technical Guide.
11. After welding, the plain pipe should be wrapped with Protecta-Line aluminium tape followed by a proprietary waterproof petrolatum tape (equivalent to Denso™). A brief wrapping guideline is on page 38 and a full procedure can be obtained from our Sales Support.

Alternative Method

Alternatively, stub flange assemblies may be fitted to the ends of the Protecta-Line pipe (after preparation with the Protecta-Line Surprep Scraper) and then connected with a double flanged ductile iron spacer.

This method may be used where there is a risk of water in the pipe contaminating electrofusion joints during installation.

Foam pigs can be used to temporarily seal the pipe bore. When electrofusion jointing of the stub flange assemblies has been completed, they can be removed before installation of the double flanged ductile iron spacer.

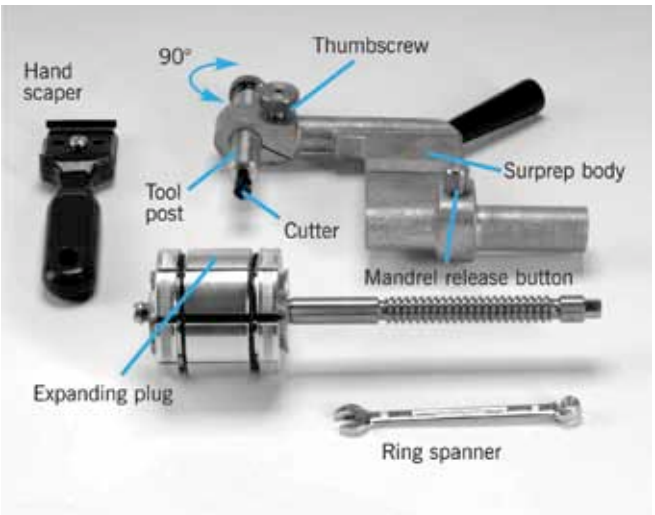
Squeezing Off

Protecta-Line pipe can be squeezed off in the industry-approved way, as summarised in the GPS Installation and Technical Guide.

However, as a precaution after re-rounding previously squeezed off areas should be wrapped with Protecta-Line aluminium tape followed by a proprietary waterproof petrolatum tape (equivalent to Denso™), in addition to any reinforcement bands that may be required to be fitted.

For information on acceptable usage conditions refer to Table 9.2 in the WRc PE Pipe Systems Manual version 01/02.

Procedure for Using the Protecta-Line Surprep Scraper (90mm-180mm)



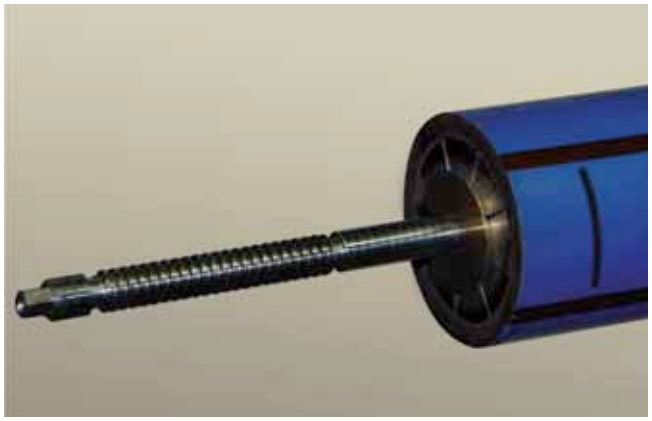
The Protecta-Line Surprep Kit has been designed to allow the correct scraping of Protecta-Line barrier pipe prior to electrofusion jointing.

Code	90mm	110mm	125mm SDR11	125mm SDR17	160mm	180mm
01-07-081	●	●	●			
01-07-083				●	●	●

To order, please contact Caldervale directly on 01924 469571 or sales@caldertech.co.uk

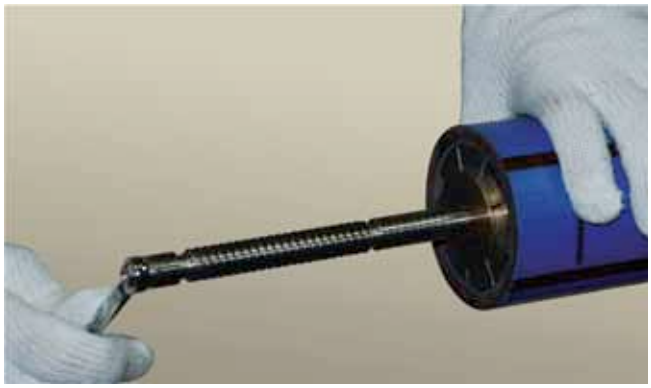
The Surprep Kit is available for hire through MCA Hire Services www.mcahire.com and Plant & Site Services Ltd. www.psshire.com

1. Measure the insertion depth of the electrofusion fitting to be used. Place a mark on both pipes to show the position where the edge of the fitting will be.
2. Clamp the pipe to be prepared taking care to avoid damage to the pipe's outer covering.
3. Separate the mandrel from the body of the Protecta-Line Surprep Scraper.

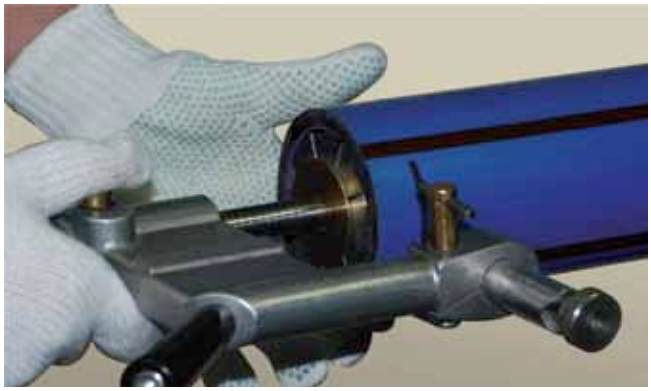


4. Hold the expanding plug and rotate the mandrel anticlockwise until the plug is a light interference fit in the pipe bore.
5. Push into pipe until edge of plug is level with edge of pipe. Expand plug further using the 10mm ring spanner.

   Do not over-tighten in order to avoid pipe distortion.

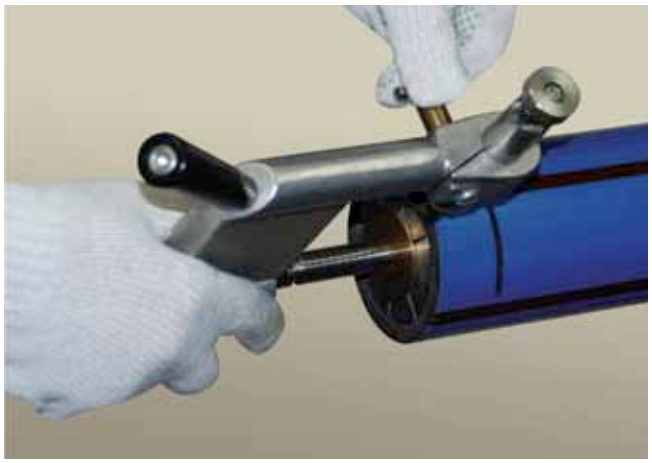


6. Slide the body of the Protecta-Line Surprep Scraper onto the mandrel, depress the release button and position the cutter close to the edge of the pipe.

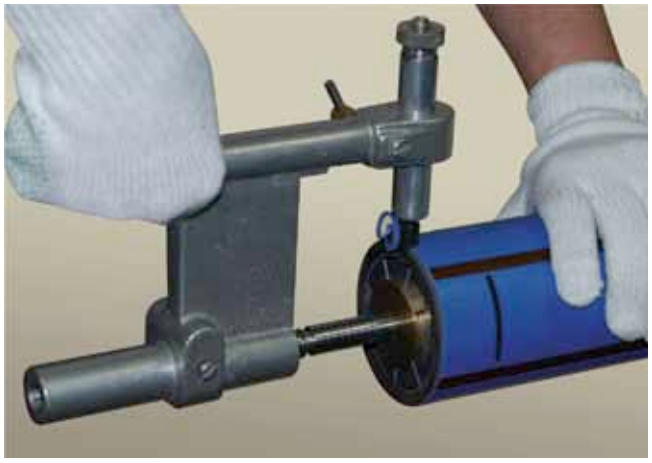


Note: Protecta-Line Surprep Scraper cuts in an anti-clockwise direction, beginning at the end of the pipe.

7. Rotate the knob on the top of the tool post through 90°, against the spring tension, such that the cutter is in its raised position.



8. Loosen the body thumbscrew and position the cutter shoe on the edge of the pipe. Tighten the thumbscrew.



9. Rotate the knob on top of the post through 90° so that spring pressure is applied to the cutter.
10. Rotate the tool anti-clockwise in a smooth continuous motion to remove the outer layers in a continuous strip.
11. Stop cutting when the socket depth mark is reached.

12. Rotate the knob on top of the tool post so that the spring pressure is released.
13. Use the hand scraper to remove the peeled strip from the pipe.

    Caution: Do not attempt to break the peeled strip by pulling with bare hands, it has a sharp edge!

    Remove the tool in the reverse order of assembly (steps 3-6).

14. Inspect the prepared surface to ensure:

    i) All of the metallic layer has been removed.
    ii) All of the adhesive which bonds the metallic layer to the core has been removed.

15. If, for any reason, the prepared surface is not a uniform colour all over, use the hand scraper to complete the preparation process.

    Never attempt a second pass with the Protecta-Line Surprep Scraper.

When made in accordance with GPS PE Pipe Systems' recommended procedures, butt-fusion and electrofusion joints of the Protecta-Line system have been independently shown to meet the requirements of WIS 4-32-19 without any need for subsequent wrapping. This does not exempt installers from local regulations and the local Water Company preferences must be adhered to.

WATCH JOINING VIDEOS AT www.gpsuk.com/joiningvideos/

Procedure for Using the Large Diameter Protecta-Line Scraper (above 180mm)

For Protecta-Line sizes above 180mm, the Surprep Scraper is a dedicated tool for each pipe size, with the cutter set to produce the required outside diameter. Adjustments must be done by a competent person and should not be carried out on site.

1. First mark the required length of pipe to be scraped (see table on page 32).

   Ensure that the correct size collet for the pipe to be scraped is fitted to the mandrel.

   Adjust the collet by twisting the mandrel shaft anti-clockwise until it achieves its smallest outside diameter.

   Slide the collet into the bore of the pipe, allowing 20mm of pipe to show after the collet, to allow for the barrelling effect found at the end of the pipe.

2. Adjust the collet by twisting the mandrel shaft clockwise until the mandrel becomes secure in the bore of the pipe and tighten with the mandrel spanner.

   To achieve the correct alignment parallel to the pipe bore, a joggling action in all directions is required.

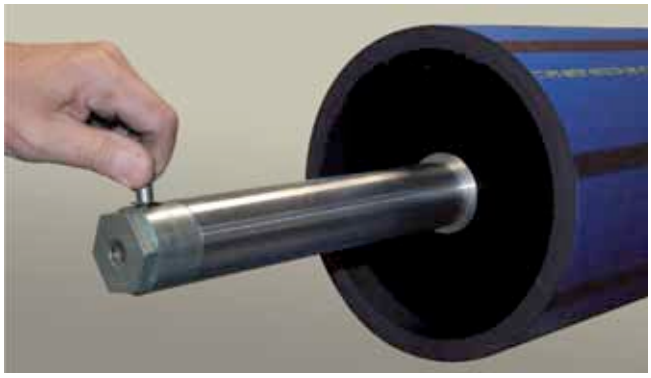
   The collet also acts to re-round the pipe so check for gaps between the collet and the bore of the pipe.

	225mm	250mm	280mm	315mm	355mm
Pipe insert collet					
01-07-255	●				
01-07-256		●			
01-07-257			●		
01-07-258				●	
01-07-259					●
Rotary tool c/w mandrill shaft*					
01-07-251	●	●	●	●	●

* Includes 2 collet expanding cones

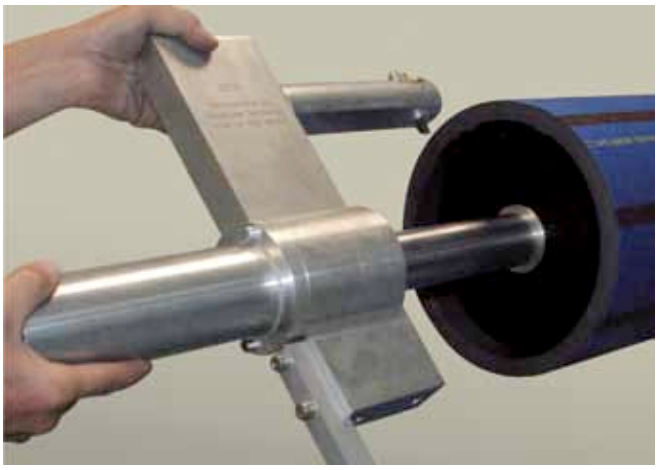
To order, please contact Caldervale directly on 01924 469571 or sales@caldertech.co.uk. The Large Diameter Scraper is available upto 355mm for hire through MCA Hire Services www.mcahire.com and Plant & Site Services Ltd www.psshire.com.

For information about the Scraper for Protecta-Line sizes above 355mm, please contact GPS Technical Support on + 44 (0)1480 442620 or enquiries@gpsuk.com.



3. Once the mandrel is secure and is parallel with the pipe bore, screw down the quick release screw to its full extent (about one and a half turns) using the adjuster, which is stored at the base of the tip arm support block.

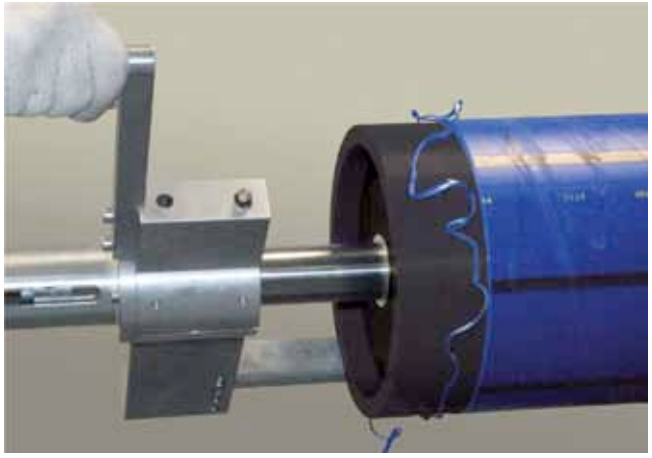
   Note: Remember the position of the quick release screw.



4. Ensure that the tip holder arm has been located in the hole corresponding to the pipe size in the tip holder support block.

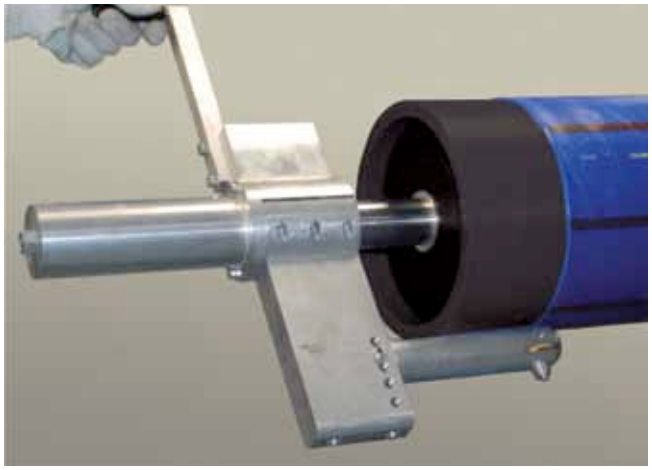
   Locate the tool onto the mandrel shaft taking care not to damage the bore of the tool.

   Slowly slide the tool along the mandrel shaft using a twisting action, until the feed screw touches the quick release feed screw nut.



5. Taking care to avoid damaging the quick release nut and feed screw, rotate the tool in a clockwise direction with a slight force pushing forward.

   Once the feed screw has engaged with the quick release nut, it will now proceed to travel along the length of the mandrel shaft, removing the outer barrier layers and preparing the pipe for electrofusion jointing.



6. When the required length of pipe has been prepared, raise the quick release screw to its top position (about one and a half turns).

   The quick release screw can be accessed through the slot in the feed screw housing tube.

7. The tool can now be removed from the mandrel shaft.

   Note: The tool should be removed to a clean dry and safe area.

8. Loosen the collet using the mandrel spanner on the mandrel shaft in an anti-clockwise direction until free.

9. Remove the collet and mandrel from the pipe.

   The collet should be removed to a clean dry and safe area. If there are any areas of pipe that have not been prepared properly, then the hand scraper should be used to complete the preparation process.

   Note: The barrelling effect found at the end of the pipe may result in the barrier layers remaining on the pipe surface for a short distance in from the end of the pipe.

When made in accordance with GPS PE Pipe Systems' recommended procedures, butt-fusion and electrofusion joints of the Protecta-Line system have been independently shown to meet the requirements of WIS 4-32-19 without any need for subsequent wrapping. This does not exempt installers from local regulations and the local Water Company preferences must be adhered to.

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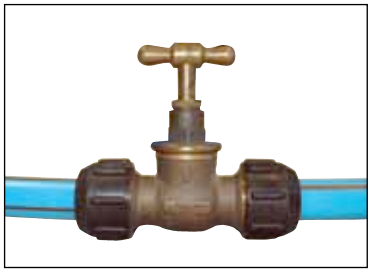
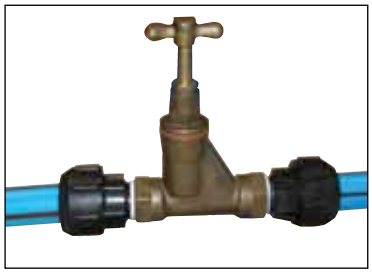
Enabling Products

Stop cocks (BS 5433 type) are available with integral Protecta-Line Mechanical Compression Couplers in sizes 25mm and 32mm.

For larger sizes and as an alternative to the above, stop cocks with threaded connections can be used in conjunction with Protecta-Line Mechanical Compression End Connectors.

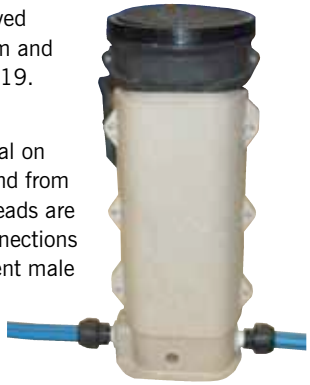




Boundary boxes may be used provided they are manufactured in accordance with the required standards, listed in the WRAS Approved Water Fittings directory (section 1520 or 1525) and comply with the requirements of WIS 4-37-01.

Connecting couplers must be approved for use with the Protecta-Line system and pass the requirements of WIS 4-32-19.

The pipe inserts of Protecta-Line Mechanical Compression Fittings seal on the pipe bore and isolate the pipe end from any water pressure. The fittings' threads are BSP taper (male or female) and connections should only be made to the equivalent male or female threaded connections of the boundary box.



Above ground mounted/built-in meter boxes should be considered when the internal components of a boundary box (manifold and/or meter) are of a polymeric material and there is a risk of contaminant ingress where Protecta-Line pipe feeds straight into the box.

Connections to the meter manifold inlet should only be made with fittings approved for use with the Protecta-Line System.

Connecting to Alternative Barrier Pipes Systems

To connect Protecta-Line to alternative barrier pipe systems, a mechanical connection should be used: either a threaded connection in the case of the service pipe sizes or a flange connection in the case of larger sizes. Contact our Technical Support for further details.

Capping Off

An appropriate Protecta-Line Mechanical Compression Fitting can be used to cap off Protecta-Line pipes as shown below.

Testing and Commissioning

The sequence of events for Protecta-Line includes the same basic testing procedures as for conventional PE pipes, but taking extra care appropriate for a contaminated environment as set out by the Local Water Undertaking.

As for standard PE pipes, these procedures will normally require as a minimum the adequate flushing of the services and the testing of all pipes and joints to the maximum head to which the system is to be subjected.

Wrapping

When made in accordance with GPS PE Pipe Systems' recommended procedures, butt-fusion and electrofusion joints of the Protecta-Line System have been independently shown to meet the requirements of WIS 4-32-19 without any need for subsequent wrapping. This does not exempt installers from local regulations and the local Water Company preferences must be adhered to.

Should wrapping be required, the following table can be used for guidance. The full wrapping procedure can be obtained from our Technical Support.

Aluminium Foil Wrapping Lengths – Foil width 50mm

Size (mm)	E/F fittinglength (mm)	Amount of foil required (metres)	Joints per roll
90	127	3.4	15
110	135	4.5	11
125	147	5.2	10
160	164	7.4	7
180	210	10.2	5
225	236	13.8	4
250	246	15.9	3
280	285	19.3	3
315	300	24.5	2
355	300	27.8	2
400	320	32.5	2
450	340	37.9	1
500	360	44.0	1
560	380	47.1	1
630	420	56.6	1

Size (mm) E/F fitting length (mm)	Amount of foil required (metres)	Code
Aluminium wrapping tape (45m long x 50mm wide)	0.5	44 996 008

Tel: +44 (0)1480 442600 **Fax:** +44 (0)1480 458829 **Technical Support:** +44 (0)1480 442620

Notes:

GPS
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