Technical Guide

Soil & Waste

Brett Martin

Brett Martin

Brett Martin is a multi-site international organisation producing not only an extensive range of plastic Underground, Rainwater and Plumbing systems but also Europe's largest range of GRP, PVC, Polycarbonate and Acrylic rooflight sheet products.

Our reputation for excellence in product quality and technical service is founded on over 60 years manufacturing experience.

SOIL & WASTE

TECHNICAL GUIDE

Brett Martin Plumbing & Drainage is the UK and Ireland's largest independent plastic building products manufacturer offering complete drainage solutions.

Brett Martin's Soil & Waste ranges include both Push-fit and Solvent Weld options in a variety of dimensions and a comprehensive range of components for the complete assembly of soil ventilation stacks on domestic, commercial and industrial buildings.

A comprehensive range of polypropylene traps and adaptors facilitate connection of any appliance and an Overflow System in PVC-C is also available, completing the package offered.

Flexible Plumbing Systems

Brett Martin also offers the Plumbfit flexible plumbing system for hot and cold water installations as well as a range of MDPE potable water pipe and a comprehensive range of fittings in sizes 20mm - 63mm. Details of these systems are available on request.

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PRODUCT GUIDE

BRETT MARTIN SOIL & WASTE SYSTEMS

Brett Martin Soil & Waste System are comprehensive above ground plastic drainage systems, suitable for conveying sanitary waste from domestic, commercial and public buildings.

Installers can select either push-fit or solvent weld systems. Both types offer easy and fast installation and excellent durability. Traps and an overflow system are also provided.

In view of the diversity of new and refurbished buildings, systems are provided in a range of colours to provide the most aesthetic options for any specific building.

Soil & Waste Systems are complemented by Brett Martin Underground Drain in 110 and 160mm diameters manufactured to BS EN 1401, and Brett Martin Sewer systems in diameters up to 400mm manufactured to BS EN 1401.

PRODUCT AND COLOUR RANGE

BRETT MARTIN PUSH-FIT SOIL

Brett Martin Push-fit Soil systems are highly adaptable 110mm and 160mm diameter systems, manufactured to BS EN 1329, and compatible with any other 110mm and 160mm above ground drainage systems. The 110mm diameter system is available in white, grey, black and brown, the 160mm diameter system in grey only.

BRETT MARTIN SOLVENT WELD SOIL

The Brett Martin Solvent Weld Soil system is a complete 110mm diameter system, also manufactured to BS EN 1329, with all components specifically designed for jointing with solvent cement. This system is available in white, olive grey and black.

Both types of system include several different branches, bends, boss fittings and adaptors to give maximum versatility and efficiency in installation.

BRETT MARTIN PUSH-FIT WASTE

Brett Martin Push-fit Waste systems, manufactured in polypropylene, are cost effective, easy to install, and ideal for domestic and commercial installations, particularly in conditions where access is limited.

The ring sealed push-fit joints not only permit ease of assembly, but also produce watertight connections which can accomodate thermal movement. Brett Martin Push-fit Waste 32mm and 40mm diameter systems are available in grey, white, black and brown, while the 50mm system is available in grey and black.

BRETT MARTIN SOLVENT WELD WASTE

Brett Martin Solvent Weld Waste fittings are manufactured to BS EN 1566-1 in PVC-C, a very durable material designed to provide secure solvent welding Jointing. VC-C exhibits superior fire performance to other thermoplastics, and its high softening point means it is not adversely affected by very hot water discharges over prolonged periods. Brett Martin Solvent Weld Waste is available in 32, 40, and 50mm diameter systems, in olive grey, white, black and brown.

BRETT MARTIN COMPRESSION WASTE

Brett Martin Compression Waste systems are produced in white polypropylene, in 32mm and 40mm diameters. Effective sealing is produced by tightening of the threaded seal retaining rings. The Compression Waste system can take high temperature discharges, and thermal movement allowances are accommodated in the design. It is often used for refurbishing and extending existing waste systems.

BRETT MARTIN WASTE TRAPS

A comprehensive range of traps is available to suit the 32mm and 40mm systems, manufactured in white polypropylene, and conforming to BS EN 274. These include bottle, tubular, "P" and "S" traps, as well as traps for specific appliances, such as washing machines and baths. All have compression joints for ease of connection.

BRETT MARTIN OVERFLOW SYSTEM

Brett Martin Overflow System, manufactured in white and grey PVC-C, can be push-fit assembled or solvent weld jointed. It can cope with hot as well as cold water overflows, and is 21.5mm in diameter.

All push-fit components, compression components and traps have long lasting rubber seals, manufactured to BS EN 681, and retained by strong snap caps. These components offer advantages with quick and easy installation, instant and reliable sealing and can accommodate thermal movement.

PRODUCT GUIDE

The Brett Martin Technical Guide illustrates all the components of the systems as well as information relating to dimensions, performance, design criteria and installation, making it a a comprehensive manual for architect architect, specifier and builder alike.

The information provided in this Technical Guide is based on BS EN 12056-2:2000 Gravity drainage systems inside buildings. Sanitary pipework, layout and calculation, and all reasonable care has been taken in its compilation. However, Brett Martin accepts no responsibilities for any errors or omissions: it is the specifier's / installer' responsibility to ensure that each product is fit for its intended purpose, and that the actual conditions of use are suitable.

AVAILABILITY

Soil & Waste Systems are available throughout the UK and Ireland from builders' merchants who can, by agreement, make use of the Brett Martin direct-to-site delivery service which is available for larger quantities of material.

CONDITIONS OF SALE

Soil & Waste Systems are sold subject to the Brett Martin standard Conditions of Sale, copies of which are available on request.

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PRODUCT CATALOGUE

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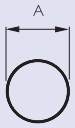
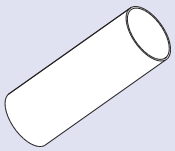
PUSH-FIT SOIL SYSTEM

110mm & 160mm PVCu PIPE & FITTINGS TO BS EN 1329

SOIL PIPE - PLAIN ENDED

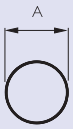
CODE	LENGTH	SIZE - A	CODE	LENGTH	SIZE - A
BS402	2.5m	110	**BS603**	3m	160
BS403	3m	110	**BS604**	4m	160
BS404	4m	110	**BS605**	6m	160
BS405	6m	110			

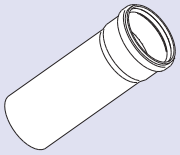




SOIL PIPE - SINGLE SOCKET

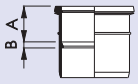
CODE	LENGTH	SIZE - A	CODE	LENGTH	SIZE - A
BS413	2.5m	110	**LG03**	3m	110
BS414	3m	110	**LG04**	4m	110
BS415	4m	110	**LG06**	6m	110
BS430	6m	110			
BS623	3m	160	Note: LG03, LG04 and LG06 Single		
BS624	4m	160	Socket Pipes are manufactured for		
BS625	6m	160	Republic of Ireland.		





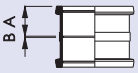
PIPE CONNECTOR - SINGLE SOCKET

CODE	SIZE	A	B
BS432	110	60	10
BR607	160	80	13



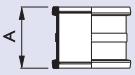
PIPE CONNECTOR - DOUBLE SOCKET

CODE	SIZE	A	B
BS406	110	51	2
BR627	160	80	4



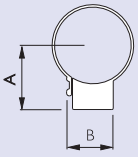
SLIP COUPLER - DOUBLE SOCKET

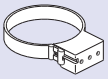
CODE	SIZE	A
BS478	110	104



SOIL PIPE BRACKET - SINGLE FIXING

CODE	SIZE	A	B
BS438	110	90	67
BR619	160	121	88

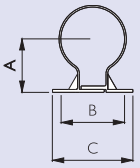


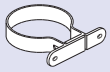


PUSH-FIT SOIL SYSTEM
110mm & 160mm PVCu PIPE & FITTINGS TO BS EN 1329

SOIL PIPE BRACKET - DOUBLE FIXING

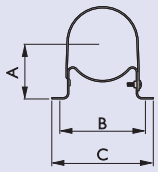
CODE	SIZE	A	B	C
BS407	110	92	109-135	139-165

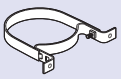




METAL PIPE BRACKET

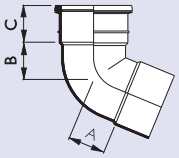
CODE	SIZE	A	B	C
BR450	110	93	150	172
BR620	160	116	220	240

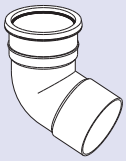




BEND - 11½° SINGLE SOCKET TOP OFFSET

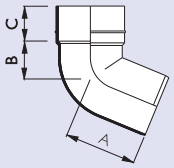
CODE	SIZE	A	B	C
BS408	110	64	63	63
BR630	160	99	67	79

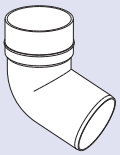




BEND - 11½° SINGLE SOCKET BOTTOM OFFSET

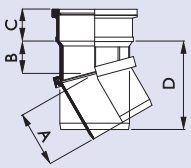
CODE	SIZE	A	B	C
BS409	110	124	65	61
BR631	160	161	88	76

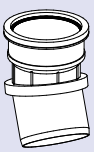




BEND - SINGLE SOCKET ADJUSTABLE 0° - 30°

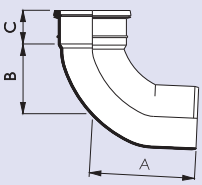
CODE	SIZE	A	B	C	D
BS424	110	88	51	50	140





BENDS - SINGLE SOCKET

CODE	SIZE	ANGLE	A	B	C
BS420	110	92½°	156	100	50
BS421	110	112½°	125	63	63
BS422	110	135°	116	50	63
BR608	160	92½°	212	141	80
BR609	160	112½°	169	83	80
BR610	160	135°	128	59	80

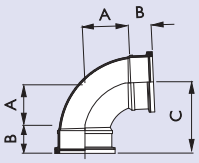


PUSH-FIT SOIL SYSTEM

110mm & 160mm PVCu PIPE & FITTINGS TO BS EN 1329

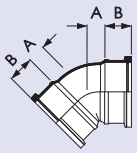
BENDS - DOUBLE SOCKET 92½°

CODE	SIZE	A	B	C
BS480	110	101	50	168



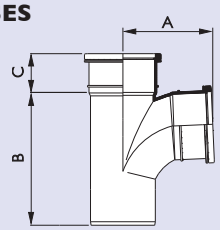
DOUBLE SOCKET BEND 135°

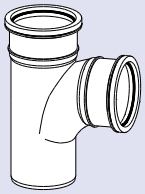
CODE	SIZE	A	B
BS482	110	34	50



BRANCHES - DOUBLE SOCKET WITHOUT BOSSES

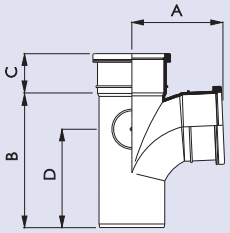
CODE	SIZE	ANGLE	A	B	C
BS417	110	92½°	156	228	67
BS419	110	135°	145	253	58
BR615	160	92½°	223	312	80
BR616 (110mm Branch)	160	135°	180	334	80
BR617	160	135°	205	334	80

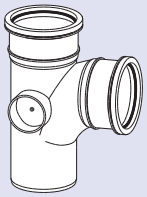




BRANCHES - DOUBLE SOCKET WITH BOSSES

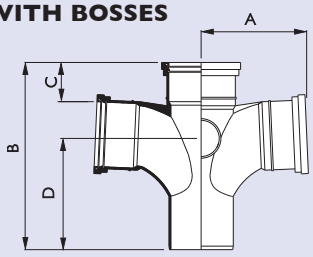
CODE	SIZE	ANGLE	A	B	C	D
BS451	110	92½°	156	228	67	167
BS458	110	104°	147	234	67	155

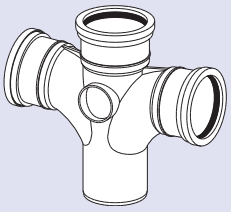




DOUBLE BRANCH - 92½° TRIPLE SOCKET WITH BOSSES

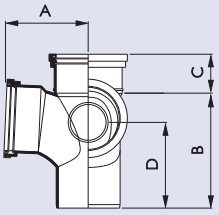
CODE	SIZE	A	B	C	D
BS490	110	156	253	67	167

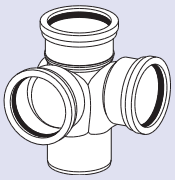




CORNER BRANCH - 92½° TRIPLE SOCKET WITH BOSS

CODE	SIZE	A	B	C	D
BS491	110	156	228	67	167

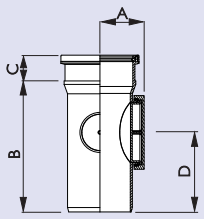


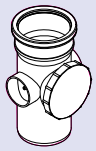


PUSH-FIT SOIL SYSTEM
110mm & 160mm PVCu PIPE & FITTINGS TO BS EN 1329

ACCESS PIPE - SINGLE SOCKET

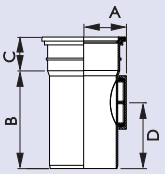
CODE	SIZE	A	B	C	D	E
BS410	110	75	213	53	135	103

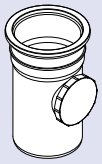




ACCESS PIPE - SINGLE SOCKET

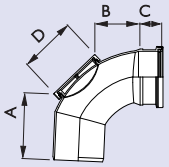
CODE	SIZE	A	B	C	D	E
BS629	160	100	230	78	155	103

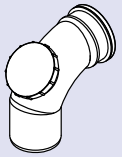




ACCESS BEND - 92½° SINGLE SOCKET

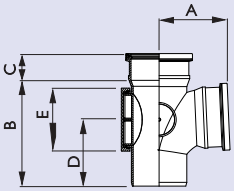
CODE	SIZE	A	B	C	D
BS436	110	142	94	53	103





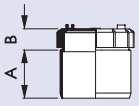
ACCESS BRANCH - 92½° DOUBLE SOCKET

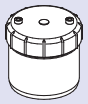
CODE	SIZE	A	B	C	D	E
BS447	110	135	210	53	132	103



ACCESS PLUG

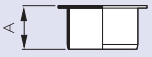
CODE	A	B
BS431	75	33





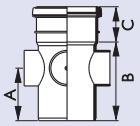
SOCKET PLUG

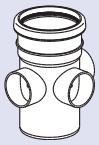
CODE	SIZE	A
BS439	110	55



TRIPLE BOSS PIPE - SINGLE SOCKET

CODE	A	B	C
BS445	100	150	68

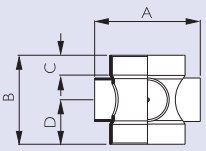


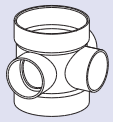


PUSH-FIT SOIL SYSTEM
110mm & 160mm PVCu PIPE & FITTINGS TO BS EN 1329

SHORT BOSS PIPE - DOUBLE SOLVENT WELD

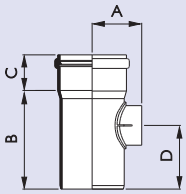
CODE	SIZE	A	B	C	D
BS425	110	165	138	31	69

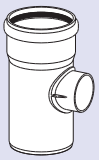




SINGLE BOSS PIPE

CODE	SIZE	A	B	C	D
BS444	110	85	169	61	109

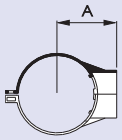


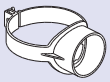


Ireland Only

STRAP-ON BOSS - 50mm OPEN BOSS

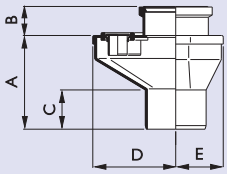
CODE	SIZE	A
BS426	110	85
BS626	160	109

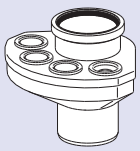




WASTE INLET MANIFOLD

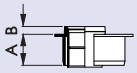
CODE	SIZE	A	B	C	D	E
BS435	110	169	53	71	150	86





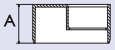
SOLVENT WELD WASTE ADAPTOR - 50mm

CODE	SIZE	A	B
BS441	110	55	14



PUSH-FIT WASTE ADAPTOR - 50mm

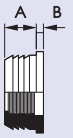
CODE	SIZE	A	B
BS442	110	55	3



PUSH-FIT SOIL SYSTEM
110mm & 160mm PVCu PIPE & FITTINGS TO BS EN 1329

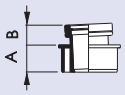
WASTE ADAPTORS - RUBBER FOR PUSH-FIT
(For connecting push-fit waste system to soil stack)

CODE	SIZE	A	B
BW1	1¼"/32mm	26	3
BW2	1½"/40mm	26	3
BW3	2"/50mm	26	3



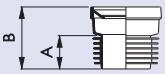
2½° ANGLED WASTE BOSS ADAPTORS - RING SEAL CONNECTION
(For solvent welding BS EN 1566 waste systems to soil stack)

CODE	SIZE	A	B
BW4	1¼"/32mm	30	22
BW5	1½"/40mm	30	22
BW6	2"/50mm	30	37



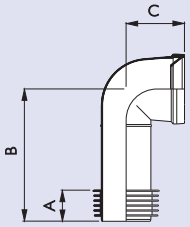
WC ADAPTOR - STRAIGHT

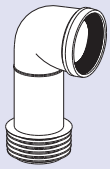
CODE	A	B
B5151	57	115



WC ADAPTOR - BENT

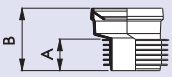
CODE	A	B	C
B5152	54	227	115





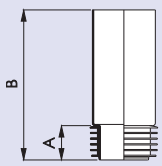
WC ADAPTOR - OFFSET

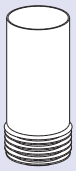
CODE	A	B
B5153	54	115



WC ADAPTOR - EXTENSION PIECE

CODE	A	B
B5154	55	258



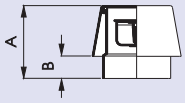


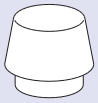
PUSH-FIT SOIL SYSTEM

110mm & 160mm PVCu PIPE & FITTINGS TO BS EN 1329

AIR ADMITTANCE VALVE

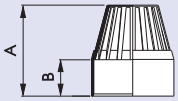
CODE	A	B
BS487	125	39

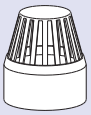




VENT COWL

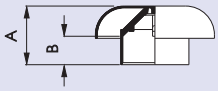
CODE	SIZE	A	B
BS427	110	129	52
BS627	160	69	24

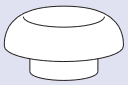




EXTRACT COWL

CODE	SIZE	A	B
BS497	110	100	48



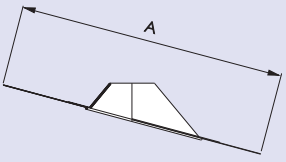


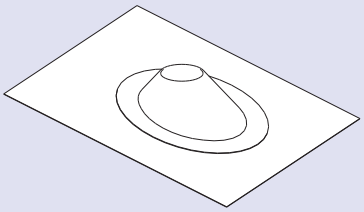
WEATHERING COLLAR

CODE	SIZE	A
BS428	110	57
BS628	160	57

WEATHERING SLATE

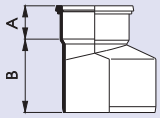
CODE	A
BS429	457 X 457





DRAIN CONNECTOR - 110mm SOIL PIPE TO 160mm DRAIN

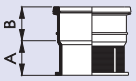
CODE	A	B
BS423	57	126



PUSH-FIT SOIL SYSTEM
110mm & 160mm PVCu PIPE & FITTINGS TO BS EN 1329
SOLVENT WELD SOIL SYSTEM
110mm PVCu PIPE & FITTINGS TO BS EN 1329

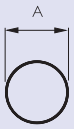
DRAIN CONNECTOR - TO CAST IRON & SALT GLAZE

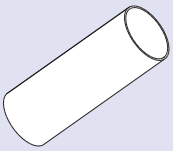
CODE	SIZE	A	B
BS434	110	59	58
BR621	160	107	95



SOIL PIPE - PLAIN ENDED

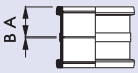
CODE	LENGTH	SIZE - A
BS402	2.5m	110
BS403	3m	110
BS404	4m	110





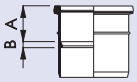
PIPE CONNECTOR - DOUBLE SOCKET

CODE	A	B
BS406	51	2



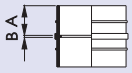
PIPE CONNECTOR - SINGLE SOCKET

CODE	A	B
BS432	60	10



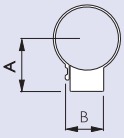
PIPE CONNECTOR - DOUBLE SOLVENT WELD SOCKET

CODE	A	B
BS460	51	3



SOIL PIPE BRACKET - SINGLE FIXING

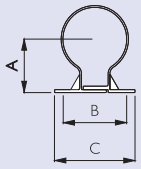
CODE	A	B
BS438	90	67

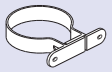


SOLVENT WELD SOIL SYSTEM
110mm PVCu PIPE & FITTINGS TO BS EN 1329

SOIL PIPE BRACKET - DOUBLE FIXING

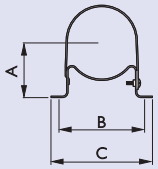
CODE	A	B	C
BS407	92	109-135	139-165

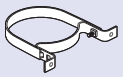




METAL PIPE BRACKET

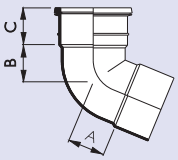
CODE	SIZE	A	B	C
BR450	110	93	150	172

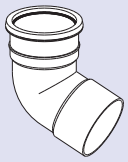




BEND - 11¼° SINGLE SOCKET TOP OFFSET

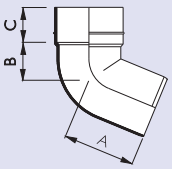
CODE	A	B	C
BS408	64	63	63

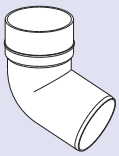




BEND - 11¼° SINGLE SOCKET BOTTOM OFFSET

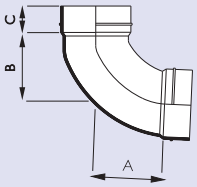
CODE	A	B	C
BS409	124	65	61

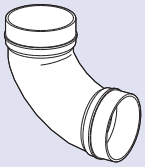




DOUBLE SOCKET BENDS

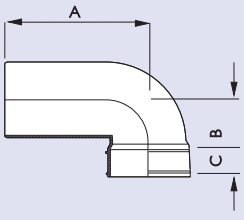
CODE	ANGLE	A	B	C
BS473	92½°	116	116	44
BS474	135°	51	51	45

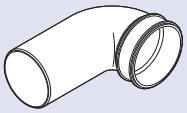




SOIL BEND - 92½° LONG SPIGOT

CODE	A	B	C
BS479	205	69	40

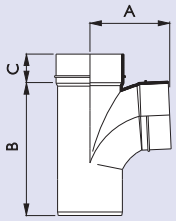


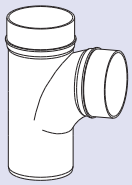


SOLVENT WELD SOIL SYSTEM
110mm PVCu PIPE & FITTINGS TO BS EN 1329

BRANCHES - DOUBLE SOCKET WITHOUT BOSSES

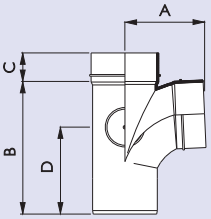
CODE	ANGLE	A	B	C
BS461	92½°	137	228	49
BS463	135°	135	252	43

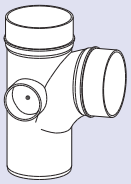




BRANCHES - DOUBLE SOCKET WITH BOSSES

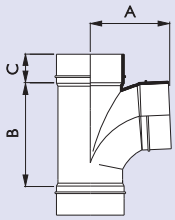
CODE	ANGLE	A	B	C	D
BS453	92½°	137	228	49	149
BS466	135°	135	252	43	153

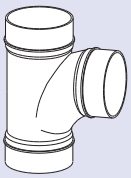




BRANCHES - TRIPLE SOCKET WITHOUT BOSSES

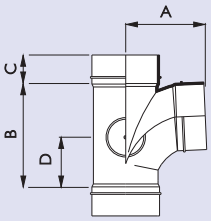
CODE	ANGLE	A	B	C
BS467	92½°	137	179	49
BS469	135°	135	187	43

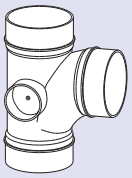




BRANCHES - TRIPLE SOCKET WITH BOSSES

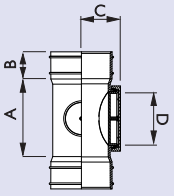
CODE	SIZE	A	B	C	D
BS452	92½°	137	179	49	86

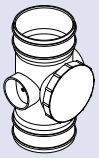




ACCESS PIPE - DOUBLE SOCKET

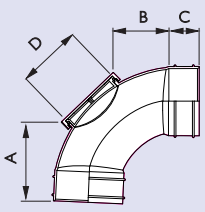
CODE	A	B	C	D
BS477	160	52	75	103

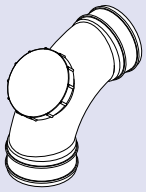




ACCESS BEND - 92½° DOUBLE SOCKET

CODE	A	B	C	D
BS476	81	92	52	103

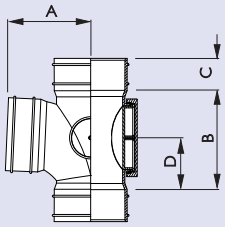


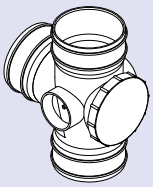


SOLVENT WELD SOIL SYSTEM
110mm PVCu PIPE & FITTINGS TO BS EN 1329

ACCESS BRANCH - 92½° TRIPLE SOCKET

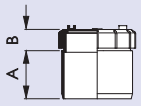
CODE	A	B	C	D	E
BS475	132	160	52	84	103

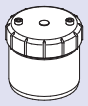




ACCESS PLUG

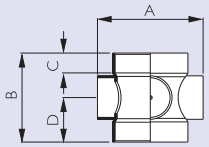
CODE	A	B
BS431	75	33

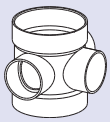




DOUBLE SHORT BOSS PIPE

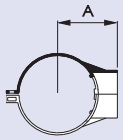
CODE	A	B	C	D
BS425	165	138	31	69

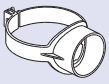




STRAP-ON BOSS - 50 mm OPEN BOSS

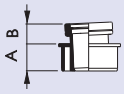
CODE	A
BS426	85





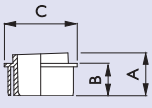
2½" ANGLED WASTE BOSS ADAPTORS - RING SEAL CONNECTION
(For solvent welding BS EN 1566 waste systems to soil stack)

CODE	SIZE	A	B
BW4	1¼"/32mm	30	22
BW5	1½"/40mm	30	22
BW6	2"/50mm	30	37



2½" ANGLED WASTE BOSS ADAPTORS - SOLVENT WELD CONNECTION
(For solvent welding BS EN 1566 waste systems to soil stack)

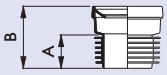
CODE	SIZE	A	B	C
BW7	1¼"/32mm	40	30	68
BW8	1½"/40mm	40	30	68
BW9	2"/50mm	53	30	68



SOLVENT WELD SOIL SYSTEM
110mm PVCu PIPE & FITTINGS TO BS EN 1329

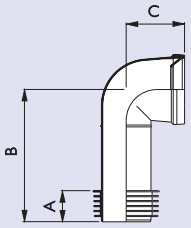
WC ADAPTOR - STRAIGHT

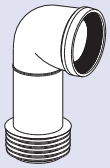
CODE	A	B
B5151	57	115



WC ADAPTOR - BENT

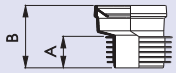
CODE	A	B	C
B5152	54	227	115





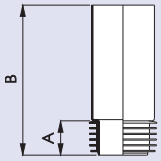
WC ADAPTOR - OFFSET

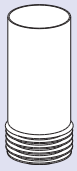
CODE	A	B
B5153	54	115



WC ADAPTOR - EXTENSION PIECE

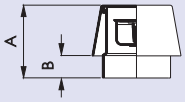
CODE	A	B
B5154	55	258

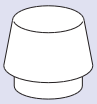




AIR ADMITTANCE VALVE

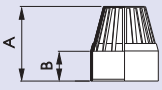
CODE	A	B
BS487	125	39





VENT COWL

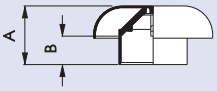
CODE	A	B
BS427	129	52

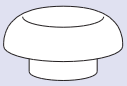


SOLVENT WELD SOIL SYSTEM
110mm PVCu PIPE & FITTINGS TO BS EN 1329

EXTRACT COWL

CODE	A	B
BS497	100	48



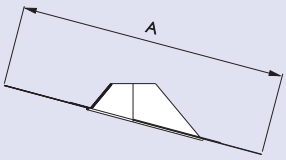


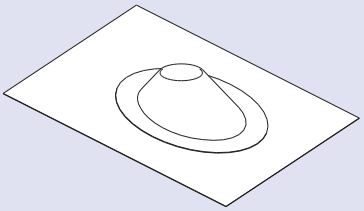
WEATHERING COLLAR

CODE	A
BS428	57

WEATHERING SLATE

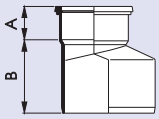
CODE	A
BS429	457 x 457





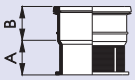
DRAIN CONNECTOR - 110mm SOIL PIPE TO 160mm DRAIN

CODE	A	B
BS423	57	126



DRAIN CONNECTOR - TO CAST IRON & SALT GLAZE

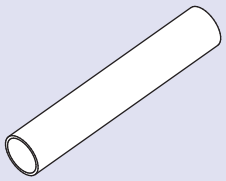
CODE	A	B
BS434	59	58



PUSH-FIT WASTE SYSTEM
32mm, 40mm & 50mm POLYPROPYLENE PIPE & FITTINGS

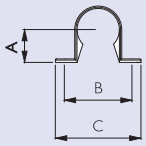
POLYPROPYLENE WASTE PIPE 3m - LENGTHS

CODE	SIZE - A
W9200	32
W9600	40
W9800	50



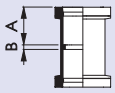
PIPE CLIP

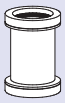
CODE	SIZE	A	B	C
W1180	32	28	53	69
W2180	40	33	58	74
W3180	50	40	72	88



STRAIGHT CONNECTOR

CODE	SIZE	A	B
W902	32	33	2
W922	40	35	2
W982	50	36	2

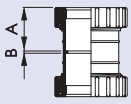


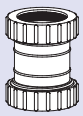


COMPRESSION STRAIGHT CONNECTOR

CODE	SIZE	A	B
W940	32	44	2
W941	40	45	2

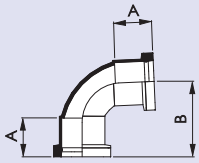
(white only)

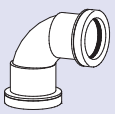




SWEPT BEND - 92½°

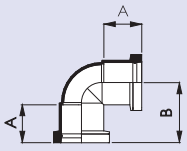
CODE	SIZE	A	B
W900	32	33	65
W920	40	35	79
W980	50	37	96

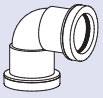




KNUCKLE BEND - 90°

CODE	SIZE	A	B
W907	32	33	53
W927	40	35	58
W987	50	37	65

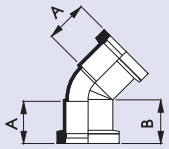




PUSH-FIT WASTE SYSTEM
32mm, 40mm & 50mm POLYPROPYLENE PIPE & FITTINGS

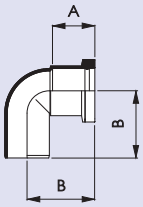
OBTUSE BEND - 135°

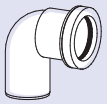
CODE	SIZE	A	B
W901	32	33	34
W921	40	35	37
W981	50	37	38



CONVERSION BEND - 90°

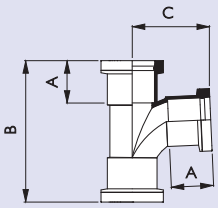
CODE	SIZE	A	B
W906	32	33	56
W926	40	35	58
W986	50	37	72

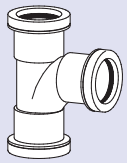




SWEPT TEE - 92½°

CODE	SIZE	A	B	C
W903	32	33	111	61
W923	40	35	129	75
W983	50	37	137	82



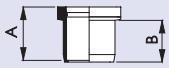


SOCKET PLUG

CODE	SIZE	A
W904	32	25
W924	40	27
W984	50	28

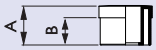
SOCKET REDUCER

CODE	REDUCTION	A	B
W928	40mm fitting to 32mm pipe	42	32



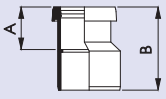
SOCKET REDUCER

CODE	REDUCTION	A	B
W909	32mm fitting to 21.5mm pipe	26	18
W929	40mm fitting to 21.5mm pipe	30	18



SOCKET REDUCER

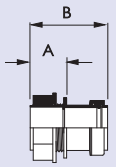
CODE	REDUCTION	A	B
W988	50mm fitting to 40mm pipe	34	82

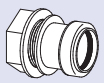


PUSH-FIT WASTE SYSTEM
32mm, 40mm & 50mm POLYPROPYLENE PIPE & FITTINGS
SOLVENT WELD WASTE SYSTEM
32mm, 40mm & 50mm PVC-C PIPE & FITTINGS

STRAIGHT TANK CONNECTOR

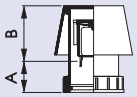
CODE	SIZE	A	B
W905	32	33	70
W925	40	33	73

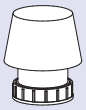




AIR ADMITTANCE VALVE - UNIFIX

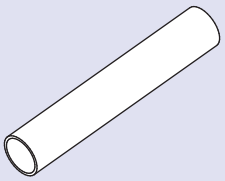
CODE	SIZE	A	B
W137	32	32	48
W237	40	40	48
W337	50	38	68





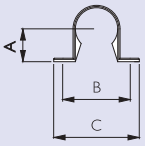
PVC-C WASTE PIPE - 3m LENGTHS

CODE	SIZE - A
W1010	32
W2010	40
W3010	50



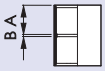
PIPE CLIP

CODE	SIZE	A	B	C
W1180	32	28	53	69
W2180	40	33	58	74
W3180	50	40	72	88



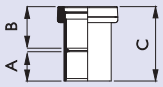
STRAIGHT CONNECTOR

CODE	SIZE	A	B
W1100	32	25	2
W2100	40	28	2
W3100	50	33	2



EXPANSION COUPLING

CODE	SIZE	A	B	C
W1200	32	25	36	64
W2200	40	27	36	65
W3200	50	33	36	72



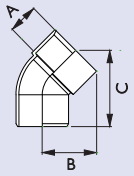
SOLVENT WELD WASTE SYSTEM
32mm, 40mm & 50mm PVC-C PIPE & FITTINGS

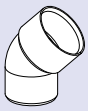
SOCKET REDUCER

CODE	REDUCTION	A	B
W1110	40mm fitting to 32mm pipe	25	33
W2110	50mm fitting to 32mm pipe	25	33
W3110	50mm fitting to 40mm pipe	27	33

OBTUSE SPIGOT BEND - 45°

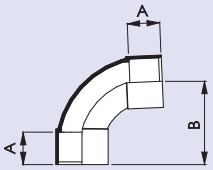
CODE	SIZE	A	B	C
W1230	32	21	37	52
W2230	40	24	45	67

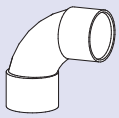




SWEPT BEND - 9½°

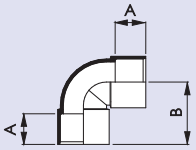
CODE	SIZE	A	B
W1140	32	25	65
W2140	40	28	68
W3140	50	33	95

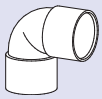




KNUCKLE BEND - 90°

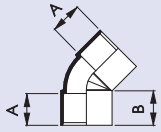
CODE	SIZE	A	B
W1120	32	24	49
W2120	40	28	56
W3120	50	33	67

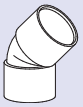




OBTUSE BEND - 135°

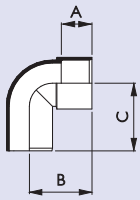
CODE	SIZE	A	B
W1130	32	25	27
W2130	40	28	30
W3130	50	33	35

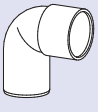




CONVERSION BEND - 90°

CODE	SIZE	A	B	C
W1210	32	24	49	53
W2210	40	28	56	64
W3210	50	33	68	82

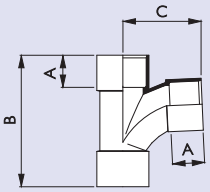


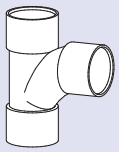


SOLVENT WELD WASTE SYSTEM
32mm, 40mm & 50mm PVC-C PIPE & FITTINGS

SWEPT TEE - 92½°

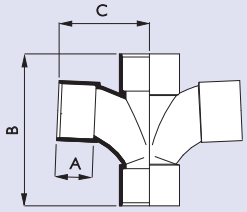
CODE	SIZE	A	B	C
W1160	32	25	103	61
W2160	40	28	114	71
W3160	50	33	136	80

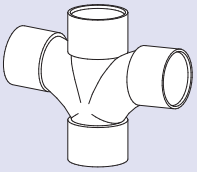




CROSS TEE - 92½°

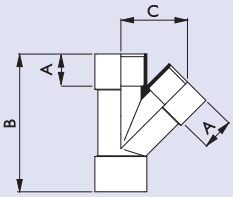
CODE	SIZE	A	B	C
W3150	50	33	136	80

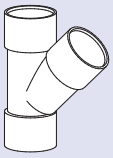




BRANCH - 135°

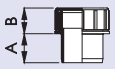
CODE	SIZE	A	B	C
W1170	32	25	108	52
W2170	40	28	123	60
W3170	50	33	154	76





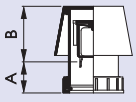
ACCESS PLUG

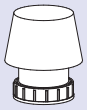
CODE	SIZE	A	B
W1190	32	25	22
W2190	40	28	24
W3190	50	33	25



AIR ADMITTANCE VALVE - UNIFIX

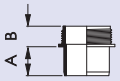
CODE	SIZE	A	B
W137	32	32	48
W237	40	40	48
W337	50	38	68





MALE IRON ADAPTORS

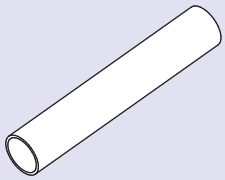
CODE	SIZE	A	B
W1111	32	25	20
W2222	40	27	20



COMPRESSION WASTE SYSTEM
32mm & 40mm POLYPROPYLENE PIPE & FITTINGS

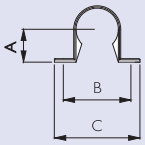
POLYPROPYLENE WASTE PIPE - 3m LENGTHS

CODE	SIZE - A
W9200	32
W9600	40



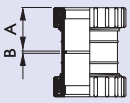
PIPE CLIP

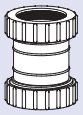
CODE	SIZE	A	B	C
W1180	32	28	53	69
W2180	40	33	58	74



STRAIGHT CONNECTOR

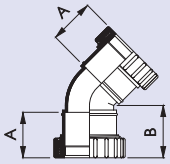
CODE	SIZE	A	B
W940	32	44	2
W941	40	45	2

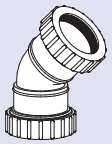




OBTUSE BEND - 135°

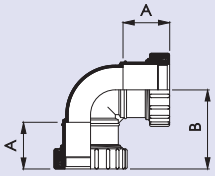
CODE	SIZE	A	B
W401	32	39	47
W411	40	39	45

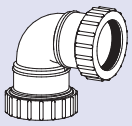




KNUCKLE BEND - 90°

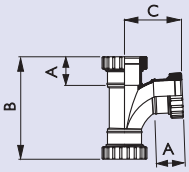
CODE	SIZE	A	B
W402	32	41	69
W412	40	40	68

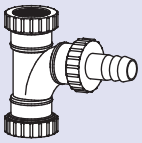




WASHING MACHINE TEE

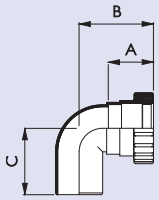
CODE	SIZE	A	B	C
W414	40	40	143	80

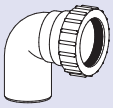




SWIVEL ELBOW - 90°

CODE	SIZE	A	B	C
W408	32	39	64	59
W418	40	39	64	58

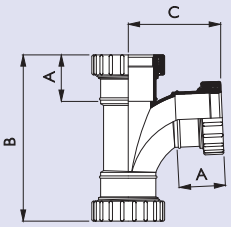


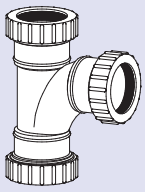


COMPRESSION WASTE SYSTEM
32mm & 40mm POLYPROPYLENE PIPE & FITTINGS

SWEPT TEE - 92½°

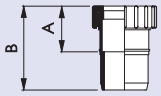
CODE	SIZE	A	B	C
W403	32	41	143	80
W413	40	40	143	80

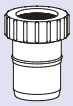




REDUCER - SINGLE

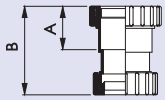
CODE	REDUCTION	A	B
W404	40mm fitting to 32mm pipe	39	72

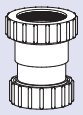




REDUCER - DOUBLE

CODE	REDUCTION	A	B
W416	40mm pipe to 32mm pipe	37	76

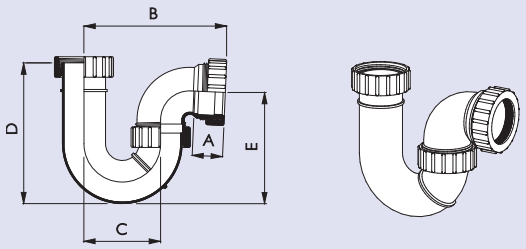




WASTE TRAPS
32mm & 40mm POLYPROPYLENE PIPE & FITTINGS

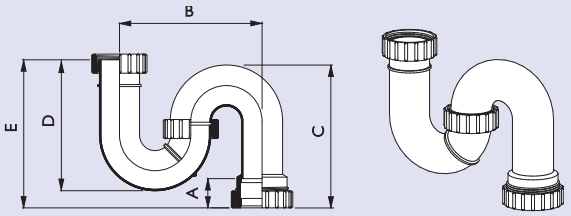
TRAP - 'P' OUTLET

CODE	SIZE	SEAL DEPTH	A	B	C	D	E
WTT100	32	38	40	140	76	151	95
WTT102	32	76	40	140	76	151	135
WTT104	40	38	40	134	72	165	104
WTT106	40	76	40	155	90	170	145



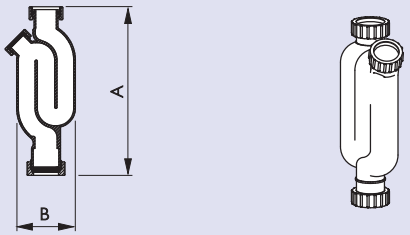
TRAP - 'S' OUTLET

CODE	SIZE	SEAL DEPTH	A	B	C	D	E
WTT101	32	38	40	135	134	124	146
WTT103	32	76	40	135	134	151	151
WTT105	40	38	29	144	144	132	149
WTT107	40	76	35	152	184	162	220



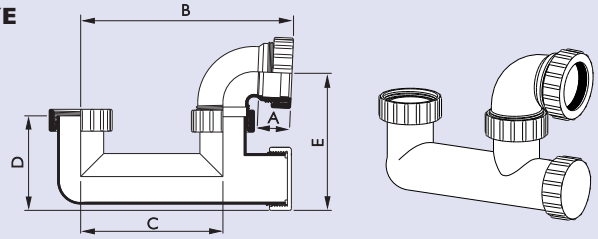
TRAP - PEDESTAL BASIN

CODE	SIZE	SEAL DEPTH	A	B
WPT120	32	50	244	85



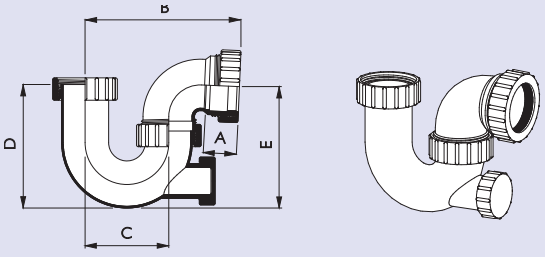
BATH & SHOWER TRAP WITH CLEANING EYE

CODE	SIZE	SEAL DEPTH	A	B	C	D	E
WBT602	40	50	29	184	125	73	115



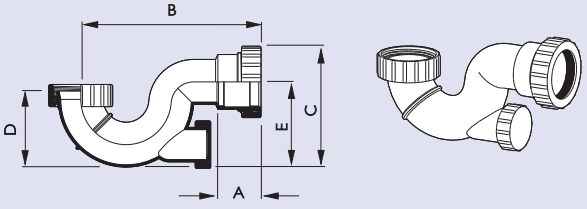
BATH & SHOWER TRAP - TWO PIECE

CODE	SIZE	SEAL DEPTH	A	B	C	D	E
WBT108	40	38	29	134	72	106	104
WBT110	40	76	31	165	72	129	127



BATH & SHOWER TRAP - WITH CLEANING EYE

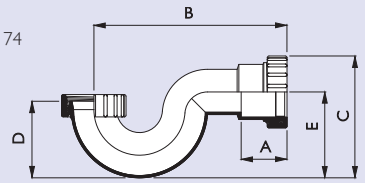
CODE	SIZE	SEAL DEPTH	A	B	C	D	E
WBT608	40	19	37	146	105	65	74

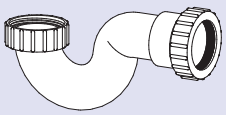


WASTE TRAPS
32mm & 40mm POLYPROPYLENE PIPE & FITTINGS

BATH & SHOWER TRAP

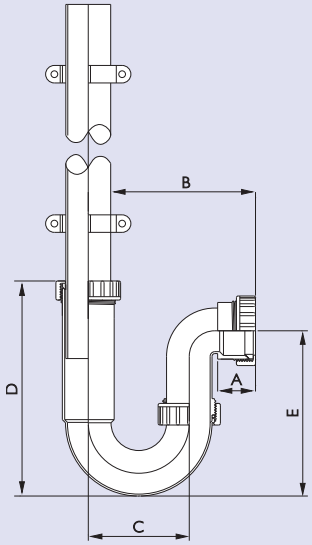
CODE	SIZE	SEAL DEPTH	A	B	C	D	E
WBT604	40	19	39	166	105	66	74

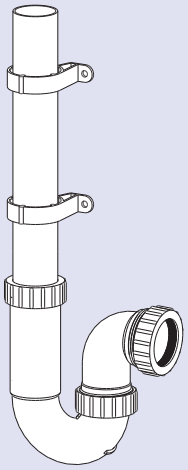




WASHING MACHINE TRAP

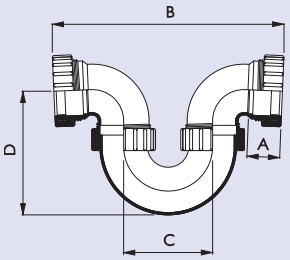
CODE	SIZE	SEAL DEPTH	A	B	C	D	E
WWT356 (with 600mm stand pipe)	40	76	37	163	90	160	140

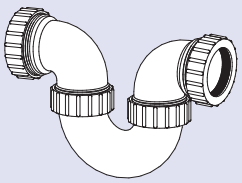




RUNNING TRAP

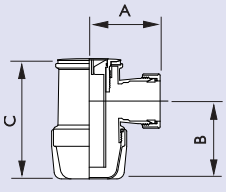
CODE	SIZE	SEAL DEPTH	A	B	C	D
WRT804	40	38	29	196	77	108
WRT806	40	76	31	252	77	136

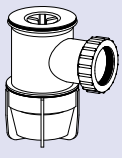




SHOWER BOTTLE TRAP (includes removable waste)

CODE	SIZE	SEAL DEPTH	A	B	C
WBT603	40	50	80	86	133

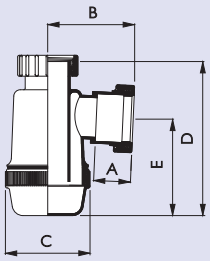


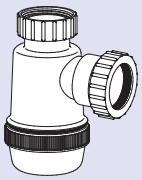


WASTE TRAPS
32mm & 40mm POLYPROPYLENE PIPE & FITTINGS

BOTTLE TRAP

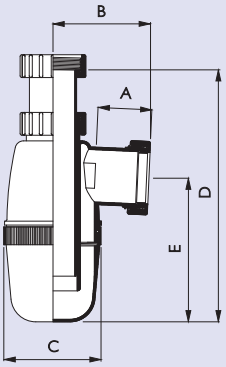
CODE	SIZE	SEAL DEPTH	A	B	C	D	E
WBT752	32	76	31	75	71	168	117

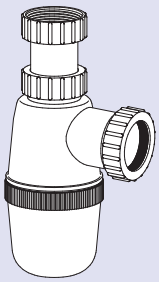




BOTTLE TRAP - TELESCOPIC

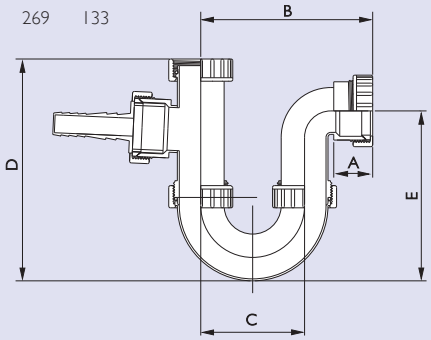
CODE	SIZE	SEAL DEPTH	A	B	C	D	E
WBT726	40	76	45	82	82	200 - 300	121

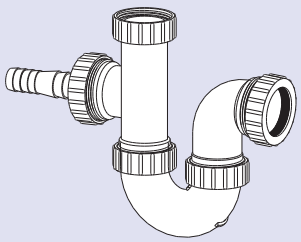




COMBINED SINK & WASHING MACHINE TRAP

CODE	SIZE	SEAL DEPTH	A	B	C	D	E
WWT566	40	76	31	163	73	269	133

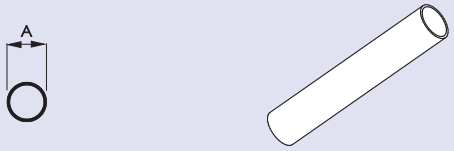




OVERFLOW SYSTEM
PUSH-FIT & SOLVENT WELD
21½mm (¾") PVC-C PIPE & FITTINGS

OVERFLOW PIPE - 3m LENGTHS

CODE	SIZE - A
W100	21.5mm



SNAP ON PIPE CLIP

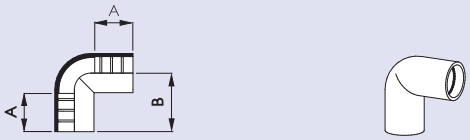
CODE	A
W190	23

STRAIGHT COUPLER

CODE	A	B
W120	25	2

KNUCKLE BEND - 90°

CODE	A	B
W130	25	38

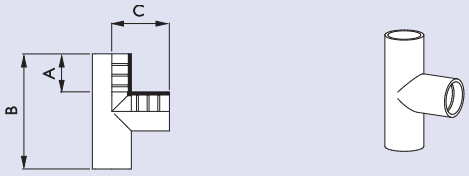


OBTUSE BEND - 135°

CODE	A	B
W140	25	26

TEE - 90°

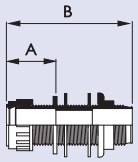
CODE	A	B	C
W110	25	76	38

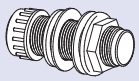


OVERFLOW SYSTEM
PUSH-FIT & SOLVENT WELD
21½mm (¾") PVC-C PIPE & FITTINGS

STRAIGHT COMPRESSION SOCKET TANK CONNECTOR

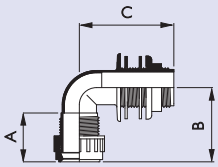
CODE	A	B
W150	32	83

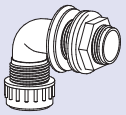




BENT COMPRESSION SOCKET TANK CONNECTOR

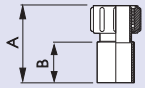
CODE	A	B	C
W170	32	49	63

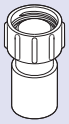




CAP & LINING

CODE	A	B
W180	53	28





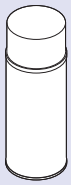
ANCILLARY ITEMS
LUBRICANT, SOLVENT CLEANER, SOLVENT CEMENT & FIRE SLEEVES

LUBRICANT - GEL

CODE	SIZE
B9333	0.5Kg
B9444	5Kg

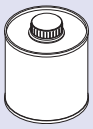
LUBRICANT - SPRAY

CODE	SIZE
B9555	400ml



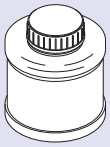
SOLVENT CLEANER

CODE	SIZE
B9031	250ml
B9032	500ml



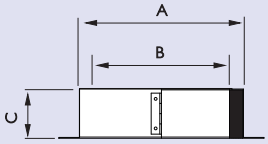
SOLVENT CEMENT

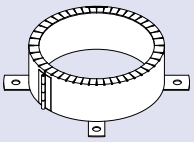
CODE	SIZE
B9020	125ml
B9021	250ml
B9022	500ml



FIRE PROTECTION SLEEVES

CODE	SIZE	A	B	C
BFS2	50	72	56	62
BFS4	110	132	112	48
BFS6	160	196	162	60





INDEX
TECHNICAL & DESIGN INFORMATION

DESIGN

FUNCTION

Soil & Waste Systems consist of extruded pipe sections, injection moulded fittings and traps to efficiently convey sanitary waste from all types of building.

The components in these systems enable the construction of Soil and Waste installations complying with the requirements of BS EN 12056-2:2000, and with the Building Regulations. Reference should be made to page 37 of this Product Guide.

There are complementary Brett Martin Underground Drain and Sewer systems to provide a complete solution for all drainage requirements.

AUTHORITY

Soil & Waste Systems will enable installers to satisfy the requirements of the following:

- The Building Regulations 2010, as amended
- Building (Scotland) Regulations 2004, as amended
- Building Regulations (Northern Ireland) 2012, as amended
- The Building Regulations 2010 (ROI), as amended

STANDARDS

Soil & Waste Systems are manufactured, as applicable, to the following British Standards:

BS EN 274	Waste fittings for sanitary appliances.
BS EN 1329	Plastics piping systems for soil and waste discharge within the building structure - Unplasticized poly (vinyl chloride) PVC-U.
BS EN 1566-1	Plastics piping systems for soil and waste discharge within the building structure - Chlorinated poly (vinyl chloride) PVC-C

All components are manufactured under a quality management system registered under BS EN ISO 9001:2015.

The air admittance valve is British Board of Agrément Approved, Certificate 90/2396.

COMPOSITION

Extruded pipe sections and injection moulded fittings are made from PVCu, PVC-C and polypropylene compounds complying with the material requirements of the relevant British standards. They contain the necessary processing additives, stabilisers and pigments to give products excellent appearance, durability and performance.

MATERIAL PROPERTIES

Material properties determine the correct selection of a system. The main materials used are PVCu, modified PVCu and polypropylene. Polyethylene is used in the manufacture of snap caps to retain the ring seals. Unplasticised polyvinyl chloride, PVCu, is a most versatile material: many processing methods can be used, it can be coloured, is light in weight, and has good chemical resistance, fire performance and weatherability. PVCu can be modified to increase its resistance to higher temperature discharges. Polypropylene has excellent chemical resistance and can tolerate higher temperatures.

SERVICE TEMPERATURE

PVCu has a softening point in excess of 70°C, and PVCu soil stacks can cope with short intermittent discharges with temperatures up to 90°C.

Modified unplasticised polyvinyl chloride, PVC-C, has a softening point above 90°C so, in addition to the normal properties of PVCu, it can also cope with higher temperature discharges over prolonged periods.

The higher softening point of polypropylene, above 140°C, means it can cope with high temperature discharges, such as boiling water, and it is the most appropriate material for the manufacture of traps.

UV LIGHT RESISTANCE

While polypropylene has good chemical resistance, resistance to UV light is poor. **Exterior applications require protection using paint or enclosures.** PVCu can be formulated to give excellent resistance to UV light, and so is suitable for exterior uses, requiring no additional protection.

FIRE PERFORMANCE

PVCu in almost all forms has superior fire performance to most plastic materials: this makes it a suitable choice for indoor applications as it will require no additional fire protection. Polypropylene has poor fire performance: interior applications require protection.

THERMAL EXPANSION

PVCu has a coefficient of expansion of approximately 0.06mm/m/°C. Consequently a 2m length of soil or waste pipe will expand by 2.4mm for a 20°C rise in temperature.

This expansion is taken into consideration in the design of systems and components, and must be accommodated when installing. A similar allowance should be made when installing polypropylene and PVC-C systems.

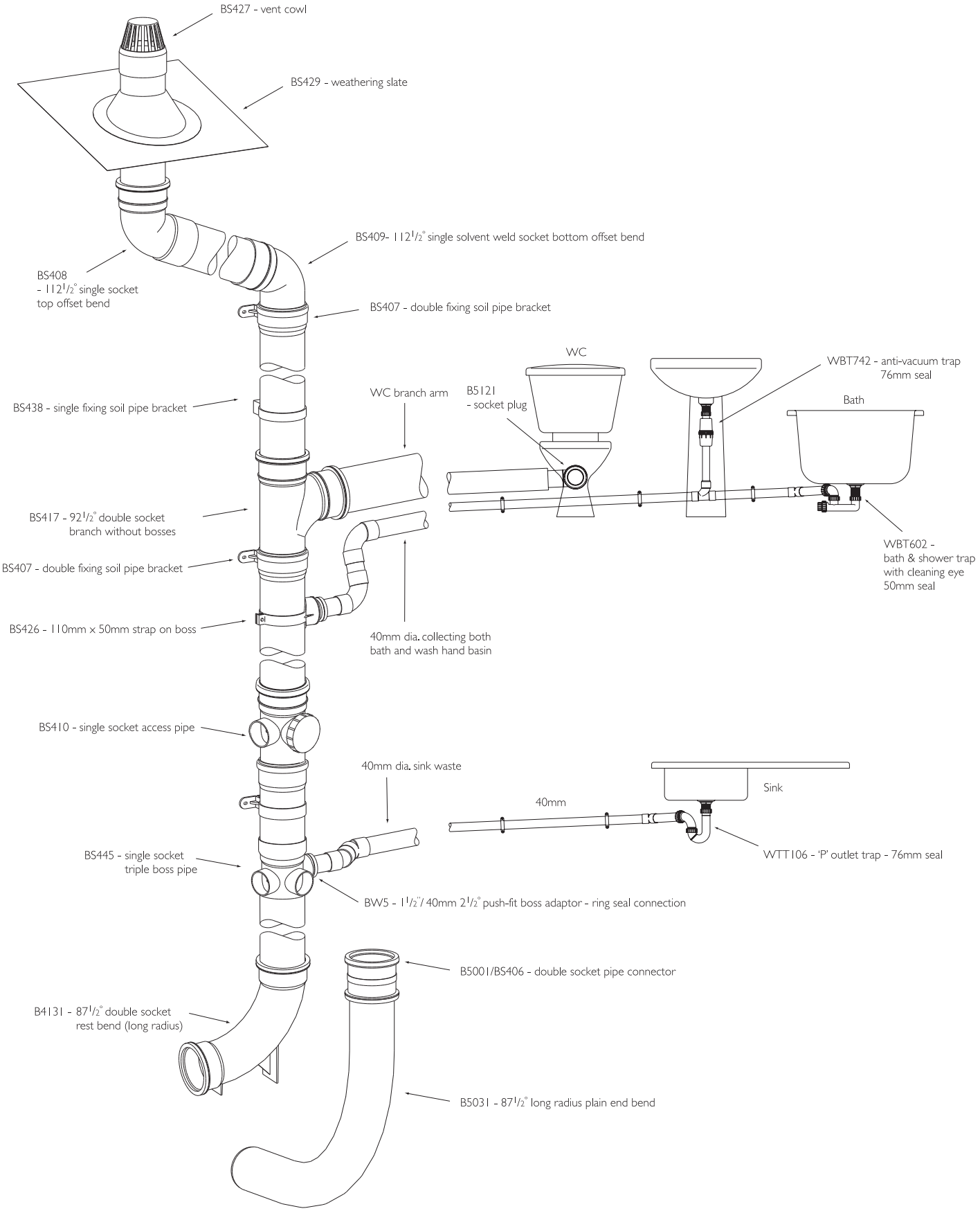
BIOLOGICAL AND CHEMICAL RESISTANCE

Polluted industrial atmospheres will not affect Soil & Waste Systems. PVC and polypropylene are rot and vermin proof and resistant to most commonly occurring chemicals, so it will not be affected by domestic effluents. Notable exceptions however are solvents, including those incorporated in most timber preservatives. Soil & Waste Systems should not be used for the disposal of industrial or chemical wastes.

TIMBER PRESERVATIVES

Before any component is fixed to a timber surface treated with wood preservative, the preservative must be dried thoroughly. The solvent content of wet preservatives can attack and embrittle plastic materials.

DESIGN
SOIL & WASTE INSTALLATIONS



BUILDING REGULATIONS

Soil and Waste installations must be designed to comply with the following:

- The Building Regulations 2010, Approved Document H, Section H1
- Building (Scotland) Regulations 2004, Technical Handbook (Domestic & Non-Domestic) Section 3: Environment
- Building Regulations (Northern Ireland) 2012, Technical Booklet N, Section 2
- Building Regulations 2010 (ROI), Part H, Section 1.2

Comprehensive guidance on the design of soil and waste systems is given in BS EN 12056:2000 Gravity Drainage Systems inside buildings. Following the recommendations of this Code is also deemed to satisfy the requirements of the above Building Regulations.

All information in this Technical Guideis based on the above documents, which should in any case be consulted for all installations.

All sanitary discharge system designs should be evolved by all professions involved in a building's construction. Positioning of appliances and associated pipework can have important implications both for the materials and time required for assembly. Extensive guidance is also provided in BS 6465-1:2006+A1:2009 Code of practice for the design of sanitary facilities and scales of provision of sanitary and associated appliances, and BS 6465-3:2006 Sanitary installations. Code of practice for the selection, installation and maintenance of sanitary and associated appliances.

UNDERGROUND DRAINAGE

It is necessary to dispose of the waste collected by Soil & Waste Systems in an efficiently designed underground drainage system. Complete Brett Martin Underground systems are available for this application, in diameters from 110mm to 400mm, and are detailed in the Brett Martin Underground Product Guide.

PERFORMANCE CRITERIA.

In order to satisfy National and Local Regulations, a well designed and installed sanitary waste system will satisfy the following basic criteria:

1. Be of sufficient capacity, with appropriate pipe sizes and gradients, to convey foul water to a suitable drainage system for disposal.

2. Have minimal risk of blockage or leakage and be provided with access for inspection and cleaning.

3. Prevent foul air from entering the building under normal working conditions, through provision of water seal traps.

4. Be ventilated to maintain water seal integrity.

5. Be fixed securely to cope with structure and environmental conditions and changes.

WASTE TRAPS

Every appliance which discharges into a soil and waste system must be fitted with a water-sealed trap which will prevent foul air from within the system entering the building. Under test and working conditions, traps should retain a minimum water seal of 25mm. All traps must be removable, or fitted with a cleaning eye to give access for clearing blockages.

For each appliance there is a minimum trap size and seal depth which must be used. These are given in the following table:

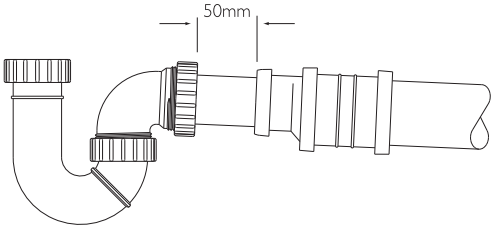
TYPICAL MINIMUM TRAP SIZES AND SEAL DEPTHS

Appliance	Trap Size (mm)	Seal Depth (mm)
Wash basin	32	75
Bidet	32	75
* Sink	40	75
* Bath	40	50
* Shower	40	50
Urinal (bowl)	40	75
WC Pan (min. size)	75	50

* The appliances indicated, when situated on a ground floor and discharging directly to an external gully, may have the seal depth reduced to a minimum of not less than 38mm.

In BS EN 12056-2:2000 Sanitary Pipework Layout Calculation, there is a recommended trap water seal depth of not less than 38mm. However in some areas a 19mm seal is found to be acceptable and, to suit customer requirements, traps WBT604 and WBT608 - illustrated on page 27 and page 28 - are offered. Clarification on the suitability of these shallow traps should be sought from the relevant local Building Control department. Another alternative is the 50mm seal trap, WBT602 which is illustrated on page 27.

The waste pipe connected to a trap must not be of a smaller diameter than the trap outlet. Where the waste pipe is larger than the trap outlet, the outlet should be extended by 50mm before the connection to the larger size pipe.



APPLIANCE DISCHARGE VOLUMES

The size of pipe required in any system is dependent on the volume of waste which is to be conveyed, which in turn is determined by the type, grouping and number of appliances. The Discharge Unit Method gives a method of determining the size of stacks and branch pipes where a large number of appliances are in use. This method is comparable to that detailed in BS EN 12056-2:2000 sanitary pipework layout and calculations.

A numerical value is given to each type of appliance: the table below gives typical values. On the basis of this information and the flow capacities of vertical and branch pipes, correct pipe diameters can be selected or their adequacy confirmed.

DISCHARGE RATES OF APPLIANCES

Appliance	Frequency of use minutes	Discharge Units
WC (7 l)	20 10 5	10 15 20
Wash basin	20 10 5	1 3 6
Spray tap basin	Add 0.6 l/s per spray	
Bath (domestic) (commercial)	75 30	7 18
Shower	Add 0.11 l/s per shower	
Automatic washing machine	250	4
Sink	20 10 5	6 14 27
Urinal (commercial per person)	5 20	27 0.3

PIPE SIZING

VERTICAL PIPE CAPACITY

Each diameter of pipe fixed vertically in a soil stack can convey a given number of discharge units. Alternatively this can be expressed as a flow capacity in litres per second, as is illustrated in the table opposite.

VERTICAL PIPE CAPACITY

Pipe size mm (Nominal Dia.)	Flow capacity litres/second	Flow capacity Discharge units
50	1.2	*10
65	2.1	*60
75	3.4	200
90	5.3	350
100	7.2	750
125	13.3	2500
150	21.7	5500

* WC's should not be connected to vertical pipes of 50mm and 65mm diameter.

BRANCH PIPE CAPACITY

The flow capacities of branch discharge pipes differ from those of vertical pipes, since this capacity is reduced by the pipe gradient. Gradients for waste pipes must not be below 22mm/m (1.25°).
The diameter of a branch pipe must not be less than that of the appliance trap outlet to which it is connected.

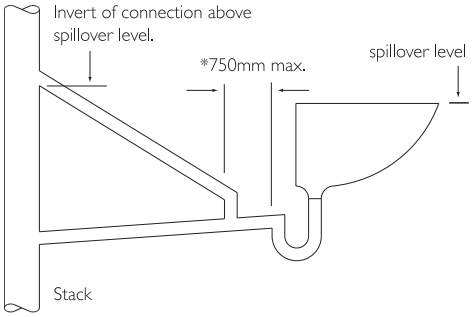
The table below illustrates the flow capacities of various unvented branch pipe sizes for different pipe gradients.

BRANCH PIPE CAPACITY

Pipe size mm	Gradient		
	0.5° 9mm/m	1.25° 22mm/m	2.5° 45mm/m
	Flow capacity - discharge units		
32	-	1	1
40	-	2	8
50	-	10	26
110	230	430	1050

Where the conditions of the above table are not satisfied, the branch pipe must be ventilated, usually with a 25mm pipe connected not more than *750mm from the trap: the principle is illustrated in the diagram on the following page.

*300mm max NI only



*300mm max NI only

Note that a 32mm ventilating pipe must be used where pipe length will be in excess of 5m, or when it contains more than five bends. Alternatively anti-vacuum traps, WBT742 and WBT746 illustrated on page 29 can be used.

The branch ventilating pipe must terminate as illustrated in the diagram on page 41, or be connected to a ventilating stack which is similarly terminated.

SINGLE STACK SYSTEMS

Most sanitary waste disposal requirements, for buildings up to twenty storeys high, can be satisfied using a single ventilated effluent-conveying soil stack, as opposed to having two parallel stacks, one for waste conveyance and a second to provide ventilation to the first.

One soil stack may be used for buildings up to five storeys high: the ground floors of buildings between five and ten storeys high, and the lower two storeys of buildings between ten and twenty storeys high should have their own soil stacks.

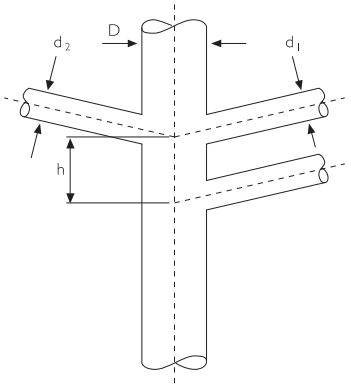
External stacks are not permitted where building height exceeds three storeys. Those sections of stack in which effluent flows should not have any offsets, and pipe diameter must not decrease in the direction of flow.

BRANCH CONNECTION SPACING

Building Regulations and BS EN 12056:2000 place dimensional restrictions on the vertical spacing of branch pipe connections to single stack soil and ventilating systems, and on the lowest connection height.

These restrictions can be summarised as follows:

1. Branches of any diameter should not be positioned opposite each other such that effluent could discharge across between them, or potentially cause blockages. Waste branches may be connected in opposing directions if there is an adequate vertical spacing.



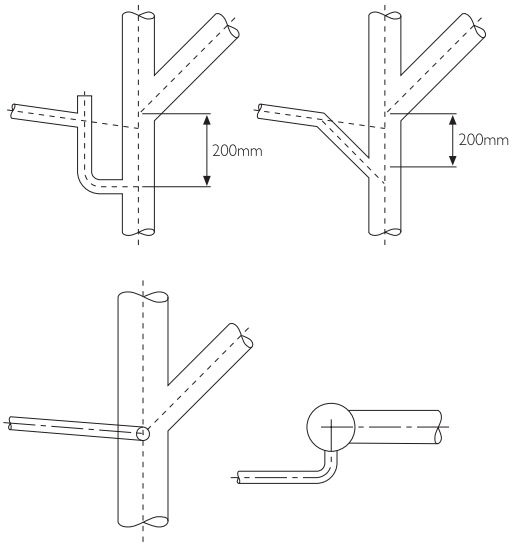
Directly opposed or opposed & offset branches.

D - 110mm, 160mm
h - 110mm, 250mm

d_1 & d_2 < 63mm:
eg 32, 40 or 50mm.

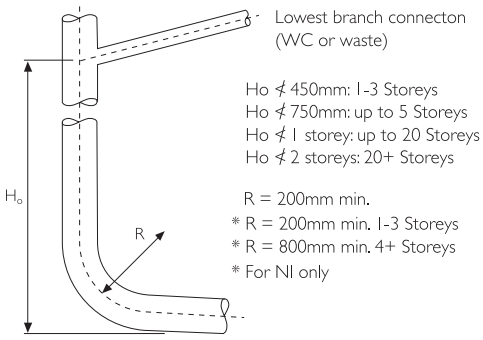
Opposed branches serving WC's can be connected to a stack at the same level using a double branch fitting, in which the branch pipes are angled or swept into the main stack.

2. No other connection should be made less than 200mm lower than an opposing WC branch connection: a 50mm parallel branch connection can prevent this situation, or the connection can be at the same level if perpendicular to the WC connection.



A facility to make several waste connections at the same level, while avoiding cross flow conditions, is provided by the waste inlet manifold. This fitting accepts waste connections close to the WC branch connection, but discharges into the main stack below the 200mm restricted area.

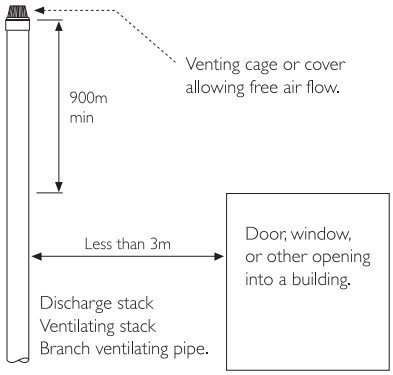
3. The distance between the lowest connection to the stack and the foot of the stack is dependent on the building height and should be as indicated in the diagram below.



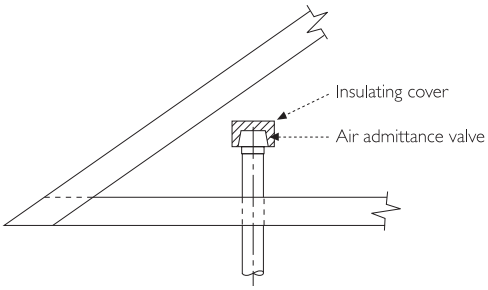
VENTILATION

Ventilation of a soil and waste system is necessary to prevent water seals in traps being broken due to negative pressure or pressure fluctuations within the system. Broken seals permit foul air and smells to escape from the system, contaminating the air in and around the building. There are two ways of ventilating a soil stack: either externally to the atmosphere, or internally to a non-inhabited space within a building.

The termination of an externally vented system must comply with the dimensional requirements illustrated in the following diagram.

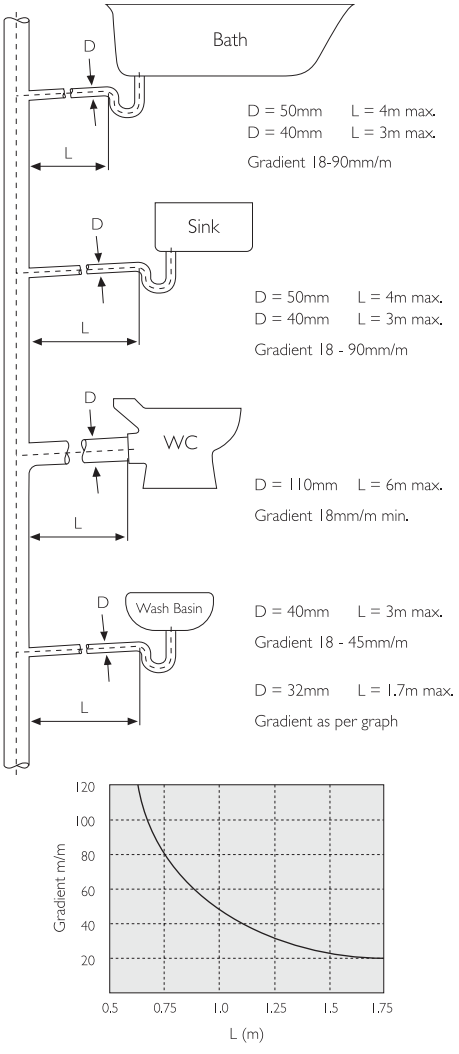


Where an internal method of ventilation is approved, the stack is terminated, e.g. in the roofspace, using an air admittance valve.

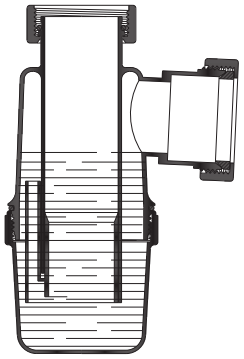


Air admittance valves are detailed on page 43.

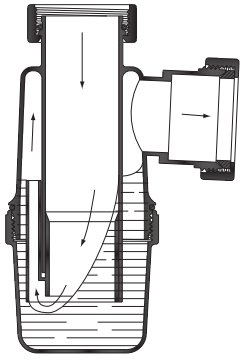
Individual branch pipes require separate ventilation if their length and slope exceed those illustrated in the diagram below.



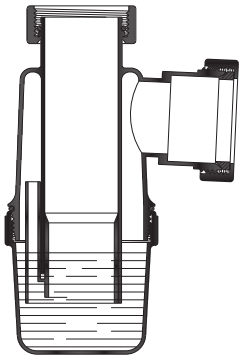
In circumstances where maximum lengths of branch pipes exceed those permitted by Building Regulations or local Bye Laws, then the branch pipe should be ventilated using a branch ventilation pipe or an anti-vacuum trap. The diagrams below illustrates typical arrangements.



Full water seal-trap under normal conditions.



Negative pressure creates a syphon effect which is broken when air flows through the by-pass tube.



Discharge terminates, pressure differential disappears, and trap is resealed by water.

In the case of large numbers of ventilating pipes being required, or if their length is considerable, then a separate ventilating stack, at least 32mm diameter, should be considered.

In addition to the length and slope limitations placed on unvented branch pipes, there is also a maximum number of appliances which can be connected to one branch. The table below details the maximum number of appliances that can be connected to unvented branch pipes.

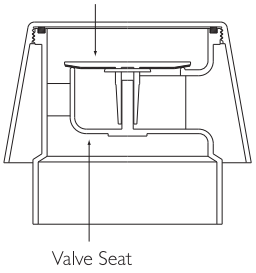
UNVENTED BRANCH PIPES - APPLIANCE CAPACITY

Appliance	Maximum number that can be connected
WC	8
Urinal: bowl	5
Urinal: stall	6
Washbasin	4

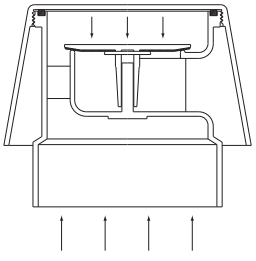
AIR ADMITTANCE VALVES

Air admittance valves are designed to decrease the number of external roof and wall surface penetrations required to accomodate soil and ventilating stacks without reducing the effectiveness or performance of the system. They also reduce the quantity of components required to complete a system.

The valve contains a diaphragm which under light spring pressure is normally held closed, containing foul air within the system. When there is a discharge from an appliance, a negative air pressure is produced in the system. This pressure causes the diaphragm in the valve to lift from its seat, allowing air to be drawn into the system: this intake and the rapid equalisation of air pressure prevents foul air escaping and prevents the water seals in traps from being broken.

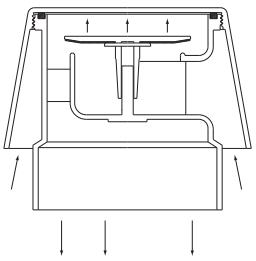


No discharges in system, valve in normally closed position.



Positive pressure in system. Pressure forces diaphragm seal on to seat; foul air cannot escape.

Positive pressure in system.



Negative pressure in system, lifts diaphragm seal from seat, draws air into pipework.

Negative pressure in system.

Air admittance valves are packaged in formed polystyrene boxes, the tops of which should be fitted to the valve top after installation, providing insulation for the valve when in use.

Air admittance valves can be fitted to sanitary pipe work systems of buildings up to ten storeys high. An air admittance valve must be installed in a vertical position above the flood level of the highest appliance connected to any soil stack. It should be situated in a non-habitable area of the building, e.g. the roof space, where it will be easily accessible and there is reduced risk of freezing.

The underground drain or branch drain which serves a stack or stacks to which air admittance valves are fitted may require additional ventilation at a position further up stream from the stack connection. This will minimise the effects of excessive back pressure if a blockage should occur in a drain. In determining the requirement for additional ventilation to the underground drainage system the following rules can be used for general guidance.

1. Up to and including four domestic dwellings up to three storeys high, additional drain ventilation is not necessary.

2. Where an underground drain serves more than four such dwellings which have soil systems fitted with an air admittance valve, the drain must be vented as follows:

   a. In the case of five to ten such dwellings, additional conventional ventilation must be provided at the head of the underground drainage system.

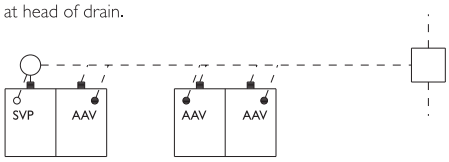
   b. In the case of eleven to twenty such dwellings, additional conventional ventilation must be provided at the head and midpoint of the underground drainage system.

All multi-storey dwellings require additional venting of their underground drainage system if more than one such building, equipped with air admittance valves, is connected to a common drain not ventilated by conventional means.

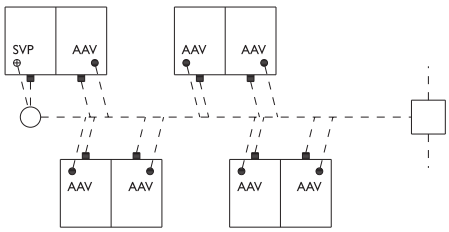
These principles are illustrated in the diagrams:

Inspection Chamber
Manhole
Air Admittance Valve
Soil and Venting Pipe
Gully

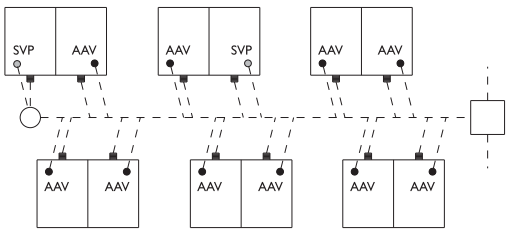
1-4 Dwellings
Maximum 2 storeys high: additional open venting at head of drain.



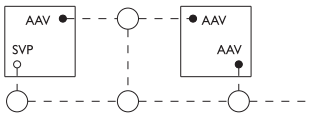
5-10 Dwellings
Maximum 2 storeys high: conventional ventilating stack at head of drain.



11-20 Dwellings
Maximum 3 storeys high: conventional ventilating stack at mid-point and head of drain.

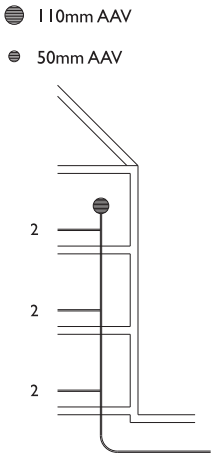


More than one multi-storey domestic or non-domestic building, each having a maximum of 2 stacks, and connected to the same drain: conventional ventilation at head of drain.

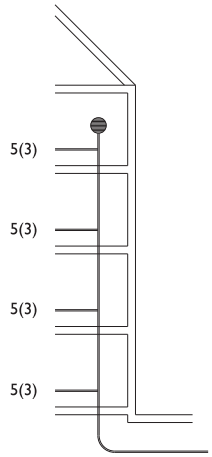


Appliance group = one WC and one Wash Basin

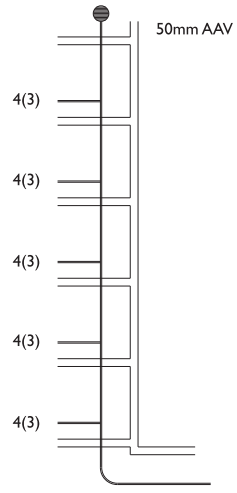
110mm AAV
50mm AAV



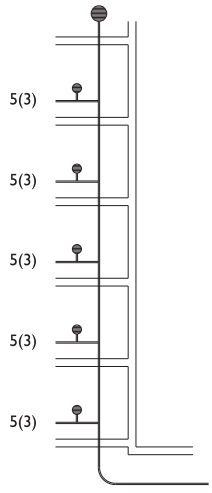
1-3 Storeys
Maximum 2 appliance groups per storey



1-4 Storeys
Maximum 5 appliance groups per storey, 3 if use frequency ≥ 5 mins.



1-5 Storeys
Maximum 4 appliance groups per storey, 3 if use frequency ≥ 5 mins.



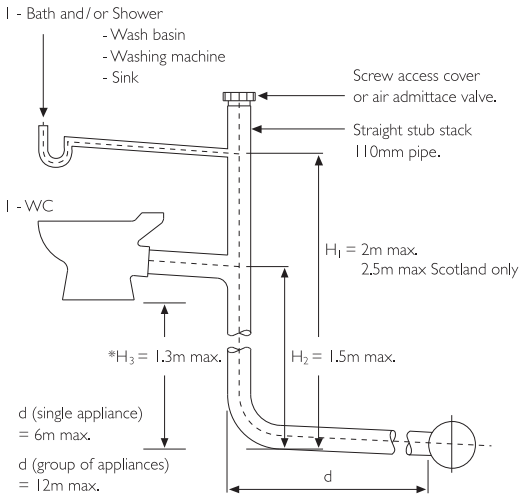
1-5 Storeys
Maximum 4 appliance groups per storey, 3 if use frequency ≥ 5 mins.

STUB STACKS

Where a group of appliances or a WC on a ground floor is connected directly to an underground drain, a stub stack of 110mm diameter pipe can be used.

Ventilation is necessary if the distance from the highest appliance connection from the stack to the invert of the drain is in excess of *2m, or if the distance from the crown of the WC connection to the invert of the drain is in excess of 1.5m.

*2.5m max Scotland only



*H_3 applies to England and Wales only

GULLIES

Ground floor washing appliances, producing waste water only, may discharge into a gully: waste pipes from these appliances must terminate between the top of the gully water seal and the level of the gully grid. Several appliances may discharge to the same gully.

WASTE SYSTEM CONNECTIONS

BOSS FITTINGS

Various fittings in the Brett Martin Soil range have integrally moulded bosses which facilitate connection of waste systems - bossed pipes and branches, bossed access pipes, and strap on bosses. The use of these connections is outlined in the installation section on pages 48-49.

WASTE INLET MANIFOLD

The waste inlet manifold allows up to four appliances to be connected to the soil stack within the 200mm restricted area around the WC connection. The manifold also enables bath and shower connections to be made above floor level where suitable.

WC CONNECTIONS

Connection to most WC units with outlet diameters 82-110mm is effected using the range of adaptors detailed on pages 11-12. They provide sealed socketed fitting to the pan outlet spigot, and multiple sealing in the bore of 110mm pipe and fittings.

UNDERGROUND SYSTEM CONNECTIONS

A soil stack may be connected at ground level to an underground drainage system of PVCu, cast iron or earthenware material. A range of adaptors and couplers is available for these connections, as illustrated in the installation drawings on page 50.

CLEANING ACCESS

By definition, traps must be removable for cleaning or be fitted with a rodding eye for cleaning access. Where any other section of the system is not accessible for cleaning with the trap removed, suitably positioned rodding eyes should be fitted.

FIRE STOPPING

Where services penetrate separating walls, compartment walls, floors, cavity barriers or protecting elements of a building, there is an obvious potential for fire spread: protection against spread can be provided in several ways.

Requirements for penetrations by any diameter of pipe can be satisfied if it is fitted with a proprietary fire seal device of proven performance, or for any diameter up to 160mm, if it is sleeved for at least 1m on each side of the penetrated element with a non-combustible material. A proprietary fire-stopping material of proven fire resistance can also be used. In the case of internal 160mm PVCu soil stack pipes and 110mm PVCu branch pipes, the pipes must be housed in an enclosure details, of which are provided in Building Regulations.

In all cases the appropriate fire protection method used should be agreed with the Local Authority.

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HANDLING

Soil & Waste Systems are light in weight and therefore easy to handle. As with all other quality materials, the components should be handled with due care at all times to avoid damage and preserve appearance, particularly in low temperatures.

STORAGE

All components should be stored under conditions which will prevent damage and preserve appearance. Pipes and fittings should be kept in a cool dry store, with lengths of pipe stacked horizontally on a smooth level and continuous base to avoid distortion. Extra care should be taken when stacking socketed pipes so that adjoining sockets do not exert undue pressure on each other. Stacks should not be more than 1.2m high to prevent overloading and damage to bottom layers in the stack. Where pipe and fittings are stored outdoors, cover securely with an opaque waterproof cover to avoid exposure to the elements.

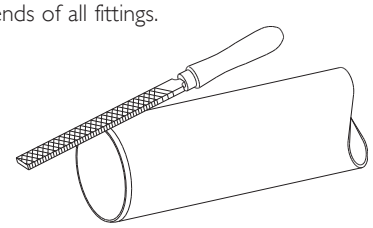
CUTTING

Pipes can be cut with a hand saw having 6-8 teeth per cm, held at a shallow angle and sawing with slow steady strokes. A file should be used to remove any swarf and a chamfer should be made around the full circumference of the pipe.

PUSH-FIT JOINTING

To ensure watertight jointing the following procedure should be followed:

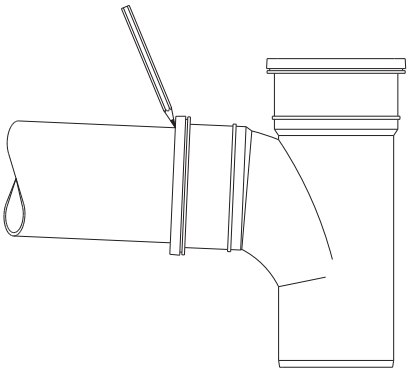
1. Pipe ends must be cut square. Chamfer the end to about half the wall thickness and at an angle of about 15° using a file or rasp. Remove all swarf. Chamfers are moulded on spigot ends of all fittings.



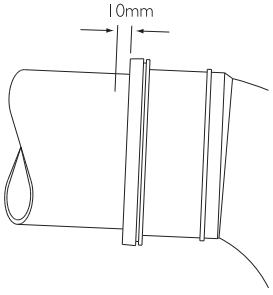
2. Check all seals, sockets on pipes and fittings, and pipe ends are clean for a distance equivalent to socket depths.

3. Apply Brett Martin lubricant around the pipe end or spigot end of fittings - not around the ring seals.

4. Align components and push the pipe end or fitting spigot fully into the ring seal socket; mark the pipe or fitting spigot at the socket face.



5. Withdraw the pipe or spigot until the mark is 10mm away from the socket face: this creates a thermal movement allowance within the socket.



SOLVENT CEMENT JOINTING

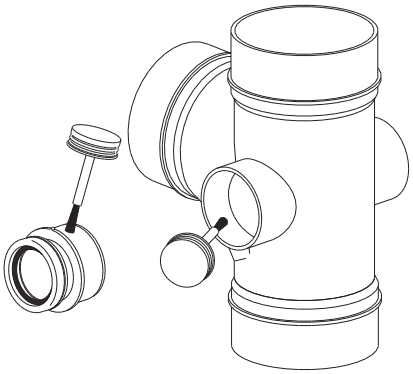
To ensure a permanent solvent cement join, the following procedure should be followed:

1. When a solvent joint involves a pipe, the pipe end must be cut square and all burrs removed.

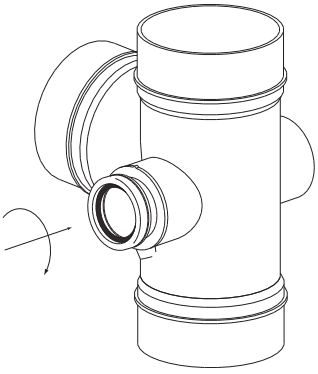
2. Clean both surfaces to be joined, making sure they are free from dirt, grease and water.

3. With a clean brush apply Brett Martin solvent cleaner.

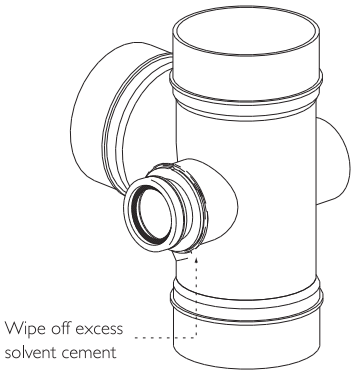
4. Again with a clean brush apply Brett Martin solvent cement to both surfaces to be joined: apply the brush along the surface, not around it.



5. Immediately insert the coated pipe end or fitting spigot into the coated fitting socket, using a slight twisting motion to ensure correct spread of adhesive and removal of air bubbles. If cemented surfaces are left unjoined for longer than 90 seconds, bonding will not be totally effective.



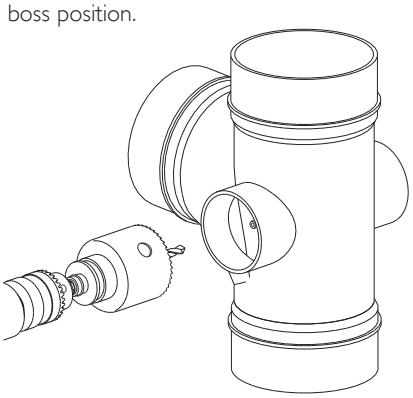
6. Hold the joint still for 30 seconds for initial bonding to take place; wipe off excess solvent cement: leave for a further 2 hours to gain strength: do not test for at least 24 hours.



BOSS CONNECTIONS

When making a connection to a fitting incorporating a boss, the following procedure should be followed:

1. Locate the point of an appropriate size drill bit in the central locator moulded at each boss position.



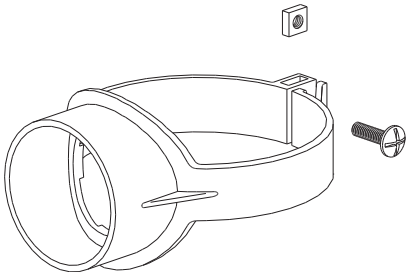
2. Drill out the fitting wall in the centre of the boss and remove swarf.

3. Select the boss adaptor appropriate to the boss size and the size of the branch connection being made, and push-fit or solvent weld in position using the procedure for solvent welding outlined above.

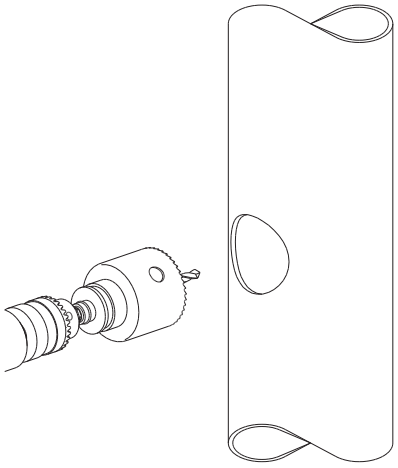
INSTALLATION

STRAP-ON-BOSS CONNECTION

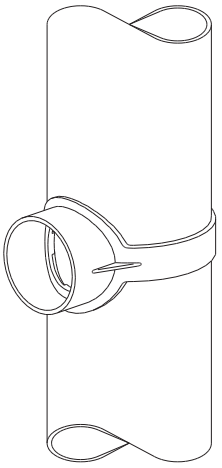
The strap-on-boss permits connection of a discharge pipe up to 50mm diameter to a soil stack at any time after the stack has been erected. The fitting procedure is fairly simple



1. At the desired position on the downpipe drill a hole to accomodate the rear locating flange of the boss.



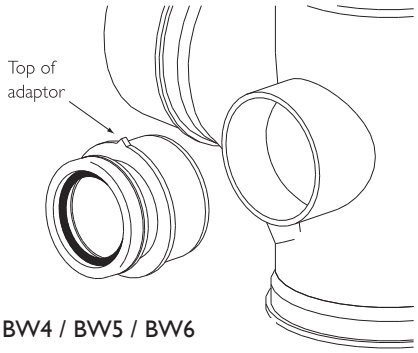
2. Apply solvent cement to the edge of the hole and around the flange: locate the straps around the pipe with the flange located in the drilled hole, and hold for two minutes for initial bonding to take place.



3. Remove excess cement and fit the nut and bolt to the rear of the straps. When the join is thoroughly dry fit the boss adaptor appropriate for the diameter of discharge pipe to be accomodated.

BOSS ADAPTOR SELECTION

When the branch connection is of a push-fit type, select adaptor BW1, BW2, or BW3 for 32mm, 40mm and 50mm diameters respectively, and insert into the boss using the same technique as for any other push-fit connection. When the branch connection is of a solvent weld type, select adaptor BW4, BW5, or BW6 for 32mm, 40mm and 50mm diameters respectively, and solvent weld into the boss. These adaptors have an inbuilt fall of 2.5°. To ensure correct fitting there is a mark on each adaptor which should always be at the top.

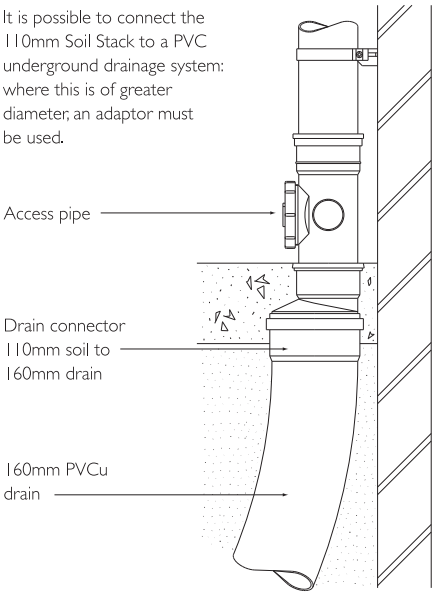


BW4 / BW5 / BW6

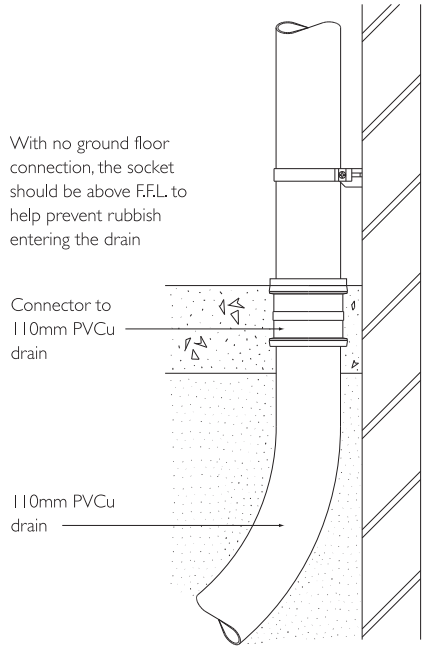
Alternatively **BW7**, **BW8** or **BW9** provide a solvent weld connection for the incoming waste pipe.

CONNECTION TO UNDERGROUND DRAINAGE

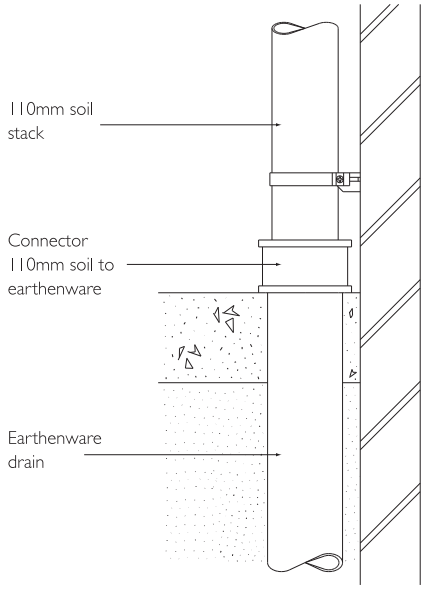
Connection to PVCu drain socket.



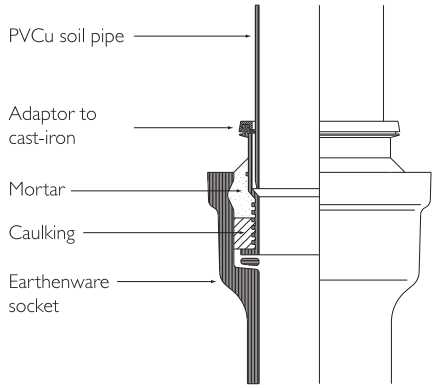
Connection to PVCu drain spigot.



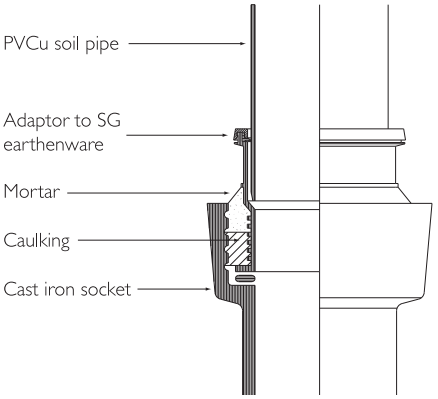
Connection to thin-wall earthenware sleeve.



Connection to cast iron drain socket.



Connection to earthenware socket.



PROVISION FOR THERMAL MOVEMENT

All plastic soil and waste systems move with changes in temperature. It is vital to accomodate this movement when making push-fit joints. An expansion allowance is also necessary in solvent weld systems. As installation of a system progresses, a continuous check should be made to ensure that the expansion allowance has not been lost.

PIPE SUPPORT

All soil and waste pipes must be securely fixed, but not so rigidly as to prevent thermal movements. Distances between pipe supports are determined by pipe material, diameter and gradient.

Material	Size	Spacings	
		Vertical	Low Gradient
PVCu	110 160	2.0 2.0	1.0 1.2
PVC-C	32 40 50	1.2 1.2 1.2	0.5 0.5 0.6
PP	32 40 50	1.2 1.2 1.2	0.5 0.5 0.6

Two types of bracket are available for 110mm pipe: BS407 has two side fixing holes: BS438 has three centrally positioned holes, and is especially suitable where only narrow surfaces are available for fixing.

PIPE ROUTING

The flow through discharge pipework is most efficient where, in branch pipes in particular, the pipe routing is as straight as possible, and bends where necessary are of generous radius to assist smooth effluent flow. Minimum bend centre line radii for components are given in the various British Standards.

OVERFLOW DISCHARGE

Overflows can discharge into soil stacks or branches, in which case the discharge must be through a trap. This allows appliance overflow to be detected, and prompt maintenance carried out.

Where the discharge is not into the soil system, it must be designed such that there is no potential for damage to the building fabric from water.

TESTING

FINAL INSPECTON

On completion, the sanitary discharge system should be meticulously inspected to ensure that requirements of relevant codes of practice have been adhered to. No cement droppings, rubble or other objects should be left inside the system and no jointing material should intrude into the bore. When fully inspected, the system can be pressure tested.

AIR TEST

The pipes, fittings and joints should be capable of withstanding an air test of positive pressure of at least 38mm water gauge for at least 3 minutes. During this time every trap in the system should maintain a water seal of at least 25mm. Chemicals released by smoke test cartridges adversely affect plastics materials, particularly PVCu, making this method unsuitable.

MAINTENANCE

Provided that the system has been designed and installed correctly, mimimal maintenance will be required. Security of retaining clips, brackets and joints of exposed sections of systems should be inspected on at least an annual basis and any faults rectified to ensure correct functioning is not impaired.

Blockages, provided not due to poor design, may occur through misuse. Blockages can be cleared using flexible or roller type rods. The equipment used by drain and pipe cleaning contractors is generally suitable.

SAFETY

Hazard data sheets dealing with Brett Martin solvent cleaner, solvent cement and lubricants are available on request.

APPENDIX

REFERENCES

BS 6465-1:2006+A1:2009: Code of practice for the design of sanitary facilities and scales of provision of sanitary and associated appliances.

BS 6465-3:2006: Sanitary installations. Code of practice for the selection, installation and maintenance of sanitary and associated appliances.

BS EN 274:2002: Waste Fittings for Sanitary Appliances. Requirements

BS EN 1329:2014: Plastics piping systems for soil and waste discharge within the building structure - Unplasticized poly (vinyl chloride) PVC-U.

BS EN 1566:2012: Plastics piping systems for soil and waste discharge within the building structure - Chlorinated poly (vinyl chloride) PVC-C.

BS EN ISO 9001:2015: Quality Management Systems Requirements.

BS EN 752:2008: Drain and sewer systems outside buildings.

**The Building Regulations 2010,
Approved Document H, Section H1**

**Building (Scotland) Regulations 2004, Technical Handbook (Domestic & Non-Domestic)
Section 3: Environment**

**Building Regulations (Northern Ireland) 2012,
Technical Booklet N, Section 2**

Building Regulations 2010, Part H, Section 1.2 (ROI)

BS EN 12056:2000 Gravity Drainage Systems inside Buildings.

BS EN 1401:2009: Plastic piping systems for non-pressure underground drainage and sewerage.

BS EN 681 Elastomeric Seals. Material requirements for pipe joint seals used in water and drainage applications. Vulcanised rubber.

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