



HDPE drainage



marleypd.co.uk

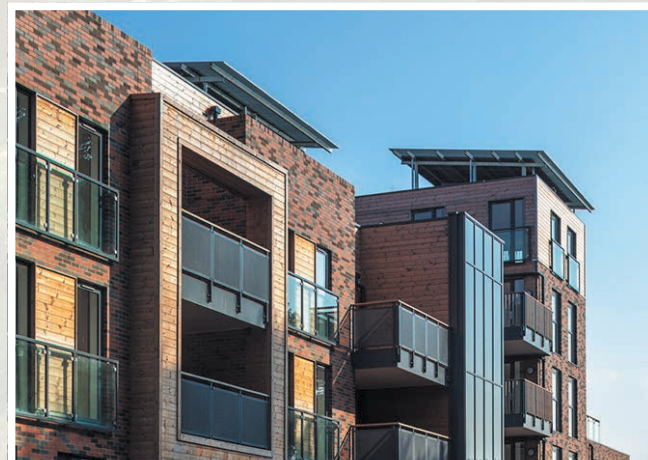
Innovation & Expertise

Marley HDPE

Marley HDPE is a drainage system which offers an alternative solution to cast iron. It is particularly suited for commercial applications or where a product with high impact or abrasion resistance is required, such as hospitals, hotels, schools, as well as residential buildings. HDPE is certified to BS EN 1519. HDPE will also cope with temperature variations of -40°C to 100°C making it ideal for external as well as internal installations.

This guide contains product specification details, design and installation information for The Marley HDPE range.

Information on the complete range of Marley Plumbing and Drainage system solutions is available to download from marleypd.co.uk or via the literature hotline 01622 852585.



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Marley soil & waste systems

Marley HDPE

The Marley HDPE drainage range is certified to BS EN 1519: 2000 (licence number KM 545820) An extension of the Marley soil & waste portfolio, the HDPE range offers an alternative solution to cast iron. The combination of the excellent material properties of HDPE with homogenous welded joints provides greater installation flexibility with a wide range of jointing options.



Key fitting: Akavent Aerator

The need for secondary venting in high-rise buildings can be eliminated with the Akavent aerator. An Akavent aerator fitting breaks the discharge fall on each floor and as a consequence the secondary vent pipe is not required as the pressure difference stays well within the limit of 3 mbar.

The unique shape of the fitting increases the capacity of the stack allowing the soil and waste flow from the higher floors to smoothly converge with the flow on the lower floor.

Marley acoustic system

An acoustic soil and waste range with a layered pipe providing quick, hygienic removal of sanitary waste water. The noise generated by the flow of water is dramatically reduced – making it perfect for multi-occupancy apartment blocks and high specification developments.



Marley PVC Soil

82, 110 and 160mm push-fit and solvent weld soil systems incorporating socketed and plain ended pipe
110 and 160mm pipe support components designed specifically to meet the needs of supporting horizontal or vertical suspended PVCu pipework.

82, 110 and 160mm pipes and fittings are also suitable for use as internal and external rainwater pipes to drain flat roofs and metal gutter systems on commercial and industrial buildings.
The range includes the 8-way soil manifold which offers the flexibility of 4 top and 4 side entries, allowing for multiple inlet connections.



Marley waste

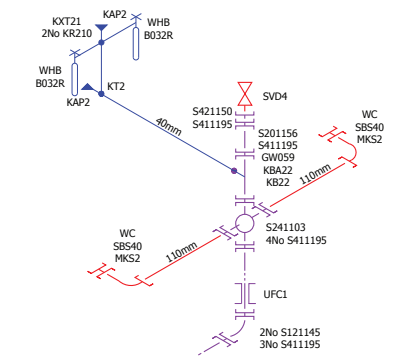
Multikwik					
Solvent waste		Push-fit waste	Overflow	Compression waste	Traps
PVCu	ABS	Polypropylene	PVCu	Polypropylene	Polypropylene
Suitable for internal and external applications.	Lightweight and cost effective for internal installation. Easy to cut joint and install.	For internal use, ideally suited to fast installation. Cost effective solution where systems are being installed or modified.	A complete range of pipework and fittings for overflow and boiler condensate applications.	Multi-fit compression socket, for internal use. Easy installation to similar sized new or existing plastic and copper pipework.	A range of traps, which enable quick & easy installation to any new or existing plastic or copper pipework.
Available in 32, 40 and 50 mm	Available in 32, 40 and 50 mm	Available in 32, 40 mm	Available in 21.5 mm	Available in 32, 40 mm	Available in 32, 40 and 50 mm
White & Black	White, Black & Grey	White, Black & Grey	White	White & Chrome	White & Chrome

ABS and polypropylene waste pipes and fittings are designed for internal use and should not be fitted externally as they will be subject to ultraviolet light degradation. If fitted externally it is recommended that they are protected by the application of a suitable paint or are boxed in.

Technical advisory service

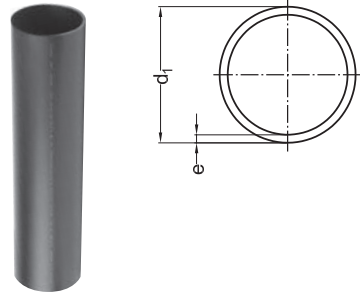
Technical Services offer a free advisory service, providing technical assistance regarding product and installation details. Those involved with the building industry may take advantage of design services provided by the company for customers who have made a commitment to use or specify Marley products.

Technical Hotline: 01622 852695



HDPE drainage

PIPE



PIPE LENGTH = 5 M

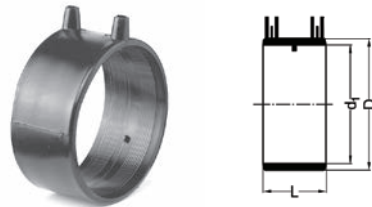
d ₁	Code	e	cm ²	Qty	d ₁	Code	e	cm ²	Qty
56	S 10 56 00	3.0	19.60	149	200	S 10 20 00	6.2	276.41	20
75	S 10 07 00	3.0	37.40	81	250	S 10 25 00	7.7	431.52	12
110	S 10 11 00	4.2	80.70	75	315	S 10 31 00	9.7	685.35	10
160	S 10 16 00	6.2	171.10	39					

cm² = cross sectional area of flow
Pipe = Tempered

PIPE LENGTH = 3M

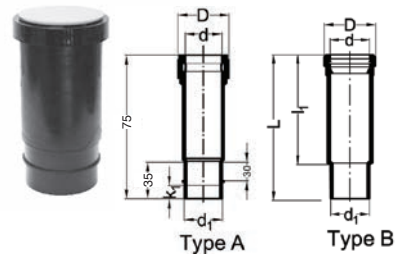
d ₁	Code	e	cm ²	Qty
110	S 10 11 03	4.2	80.70	48

ELECTROFUSION COUPLER



d ₁	Code	D	L	System	Qty	d ₁	Code	D	L	System	Qty
56	S 41 56 95	68	54	5A/80s	20	200	S 41 20 65	233	175	220V/420s	1
75	S 41 07 95	87	54	5A/80s	20	250	S 41 25 65	283	175	220V/420s	1
110	S 41 11 95	122	58	5A/80s	20	315	S 41 31 65	349	175	220V/420s	1
160	S 41 16 95	172	66	5A/80s	5						

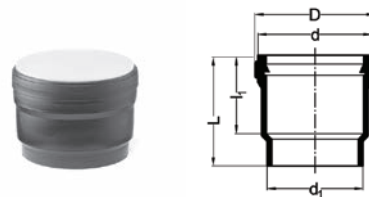
EXPANSION SOCKET



Type A						Type B								
d ₁	Code	D	d	L	Qty	d ₁	Code	D	d	L	I	Qty		
75	S 42 07 20	*	100	76	256	20	56	S 40 56 20	*	74	57	172	135	20
110	S 42 11 20	*	137	112	256	20	200	S 40 20 20	**	230	202	460	230	1
160	S 42 16 20	*	189	162	256	5	250	S 40 25 20	**	300	253	480	250	1
							315	S 40 31 20	**	370	319	510	270	1

Seals: SBR
* Includes protection plug
** Excludes protection plug
See page 26 for details on TYPE A / TYPE B

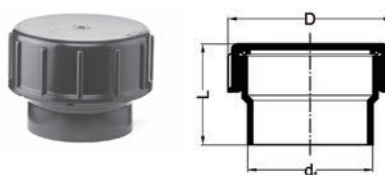
PLUG-IN SOCKET



d ₁	Code	D	d	L	I	Qty	d ₁	Code	D	d	L	I	Qty
56	S 42 56 50	72	57	89	54	20	110	S 42 11 50	131	111	111	69	20
75	S 42 07 50	96	76	109	69	20	160	S 42 16 50	190	162	147	105	10

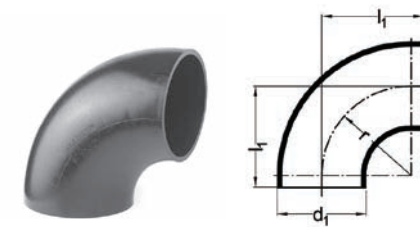
Electrofusible spigot ends
Seals: SBR
Includes protection plug

INSPECTION SCREW



d ₁	Code	D	L	Qty	d ₁	Code	D	L	Qty
56	S 66 56 40	81	74	20	110	S 66 11 40	145	106	10
75	S 66 07 40	111	106	20					

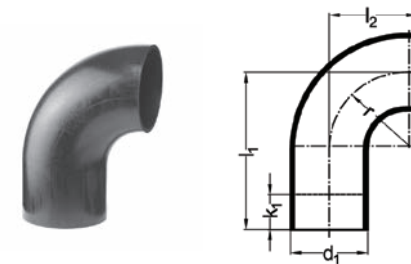
BEND 90° - SHORT



d ₁	Code	l ₁	r	Qty	d ₁	Code	l ₁	r	Qty
160	S 11 16 91	160	160	10	250	S 11 25 91	290	265	1
200	S 11 20 91	205	200	10	315	S 11 31 91	340	300	1

Butt-weld only

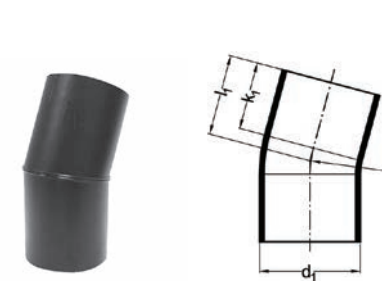
BEND 90° - LONG



d ₁	Code	l ₁	l ₂	r	k ₁	Qty	d ₁	Code	l ₁	l ₂	r	k ₁	Qty
56	S 11 56 92	120	59	56	55	20	110	S 11 11 92	180	113	110	60	20
75	S 11 07 92	140	78	75	60	25							

Electrofusible at one side

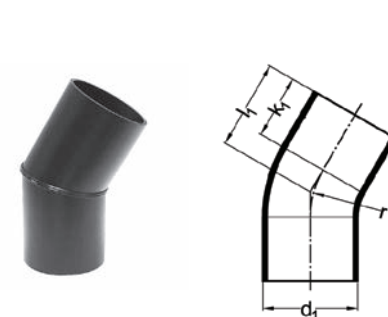
BEND 15°



d ₁	Code	l ₁	r	k ₁	Qty	d ₁	Code	l ₁	r	k ₁	Qty
110	S 18 11 15	125	165	65	1	250	S 18 25 15	225	375	135	1
160	S 18 16 15	175	240	100	1	315	S 18 31 15	250	473	175	1
200	S 18 20 15	200	300	125	1						

Fabricated

BEND 30°

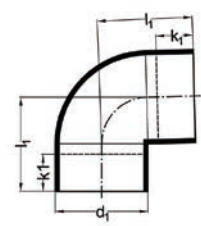


d ₁	Code	l ₁	r	k ₁	Qty	d ₁	Code	l ₁	r	k ₁	Qty
110	S 18 11 30	125	165	60	1	250	S 18 25 30	225	255	125	1
160	S 18 16 30	175	240	100	1	315	S 18 31 30	250	320	135	1
200	S 18 20 30	200	200	115	1						

Fabricated

HDPE drainage

ELBOW 88.5°

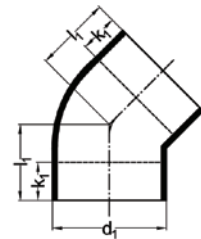


d ₁	Code	l ₁	k ₁	Qty
56	S 12 56 88	65	20	20
75	S 12 07 88	75	20	20
110	S 12 11 88	95	25	20
160	S 12 16 88	120	25	10

* Fabricated

d ₁	Code	l ₁	k ₁	Qty
200	S 12 20 88*	290	60	1
250	S 12 25 88*	350	60	1
315	S 12 31 88*	360	60	1

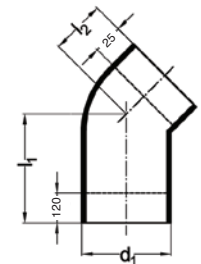
ELBOW 45° - SHORT



d ₁	Code	l ₁	k ₁	Qty
56	S 12 56 45	45	20	20
75	S 12 07 45	50	20	20
110	S 12 11 45	60	25	20
160	S 12 16 45	69	20	5

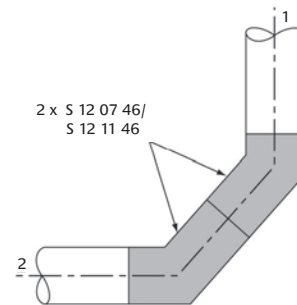
d ₁	Code	l ₁	k ₁	Qty
200	S 12 20 45	173	60	5
250	S 12 25 45	182	60	5
315	S 12 31 45	195	60	5

ELBOW 45° - LONG

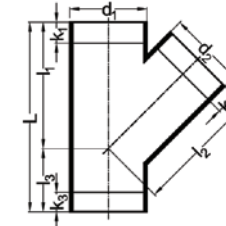


d ₁	Code	l ₁	l ₂	Qty
75	S 12 07 46	145	50	20
110	S 12 11 46	155	60	20

Elbows 45° with long spigot are applied for making the transition from stack to building drain acc. to EN 12056 (see drawing).
1 stack
2 building drain



BRANCH 45°

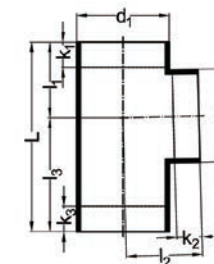


d ₁ , d ₂	Code	L	l ₁ /l ₂	l ₃	k ₁	k ₂	k ₃	Qty
56/56	S 30 56 56	180	120	60	25	25	40	20
75/56	S 30 07 56	210	140	70	35	25	55	20
75/75	S 30 07 07	210	140	70	25	25	40	20
110/56	S 30 11 56	270	180	90	45	40	90	10
110/75	S 30 11 07	270	180	90	35	30	75	10
110/110	S 30 11 11	270	180	90	20	20	55	15
160/56	S 30 16 56 *	375	250	125	120	115	65	5
160/75	S 30 16 07	375	250	125	120	115	65	5
160/110	S 30 16 11	375	250	125	50	40	45	5
160/160	S 30 16 16	375	250	125	10	15	25	5
200/75	S 30 20 07	540	360	180	95	160	175	1
200/110	S 30 20 11	540	360	180	65	140	150	1

d ₁ , d ₂	Code	L	l ₁ /l ₂	l ₃	k ₁	k ₂	k ₃	Qty
200/160	S 30 20 16	540	360	180	35	85	115	1
200/200	S 30 20 20	700	430	270	160	160	230	1
250/110	S 30 25 11 *	660	440	220	150	185	215	1
250/160	S 30 25 16 *	660	440	220	120	130	180	1
250/200	S 30 25 20 *	660	440	220	90	50	150	1
250/250	S 30 25 25 *	900	600	300	160	160	250	1
315/110	S 30 31 11 *	840	560	280	235	260	305	1
315/160	S 30 31 16 *	840	560	280	200	205	270	1
315/200	S 30 31 20 *	840	560	280	175	125	240	1
315/250	S 30 31 25 *	840	560	280	140	130	205	1
315/315	S 30 31 31 *	950	610	340	170	170	280	1

* Fabricated

BRANCH 88.5°



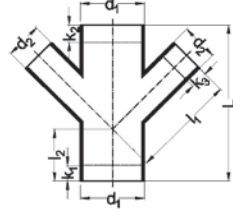
d ₁ , d ₂	Code	L	l ₁ /l ₂	l ₃	k ₁	k ₂	k ₃	Qty
56/56	S 20 56 56	175	70	105	30	30	65	20
75/56	S 20 07 56	175	70	105	30	25	65	20
75/75	S 20 07 07	175	70	105	25	25	55	20
110/56	S 20 11 56	225	90	135	45	25	90	10
110/75	S 20 11 07	225	90	135	35	25	85	10
110/110	S 20 11 11	225	90	135	20	20	65	15
160/56	S 20 16 56 *	350	140	210	75	30	145	5
160/75	S 20 16 07 *	350	140	210	80	45	150	5
160/110	S 20 16 11	350	140	210	60	45	135	5
160/160	S 20 16 16	350	140	210	30	35	105	5
200/75	S 20 20 07 *	360	180	180	90	60	90	1
200/110	S 20 20 11 *	360	180	180	70	60	70	1

d ₁ , d ₂	Code	L	l ₁ /l ₂	l ₃	k ₁	k ₂	k ₃	Qty
200/160	S 20 20 16 *	360	180	180	45	60	45	1
200/200	S 20 20 20 *	360	180	180	25	60	25	1
250/110	S 20 25 11 *	440	220	220	110	70	110	1
250/160	S 20 25 16 *	440	220	220	85	70	85	1
250/200	S 20 25 20 *	480	240	240	65	40	65	1
250/250	S 20 25 25 *	480	240	240	40	40	40	1
315/110	S 20 31 11 *	560	280	280	170	90	170	1
315/160	S 20 31 16 *	560	280	280	145	90	145	1
315/200	S 20 31 20 *	560	280	280	120	65	120	1
315/250	S 20 31 25 *	560	280	280	95	65	95	1
315/315	S 20 31 31 *	560	280	280	70	65	70	1

* Fabricated

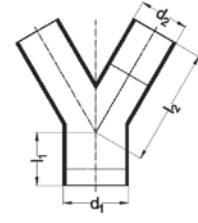
HDPE drainage

DOUBLE BRANCH 45°



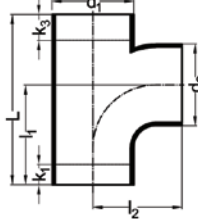
d ₁ /d ₂	Code	L	l ₁	l ₂	k ₁	k ₂	k ₃	Qty
110/110	S 36 11 11	270	180	100	65	20	20	10

DOUBLE BRANCH 60°



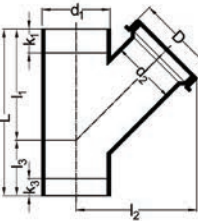
d ₁ /d ₂	Code	l ₁	l ₂	Qty
110/110	S 37 11 11	90	102	5

BRANCH 88.5° – SWEEP ENTRY



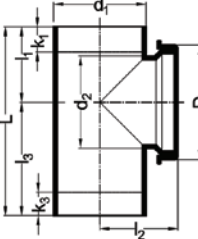
d ₁ /d ₂	Code	L	l ₁	l ₂	k ₁	k ₂	Qty
110/110	S 25 11 11	230	140	120	90	20	15

BRANCH 45° – CLEAN OUT



d ₁ /d ₂	Code	D	L	l ₁	l ₂	l ₃	k ₁	k ₂	Qty
110/110	S 33 11 00	140	270	180	195	90	20	55	1
160/110	S 33 16 00	140	375	250	220	125	45	45	1

BRANCH 90° – CLEAN OUT

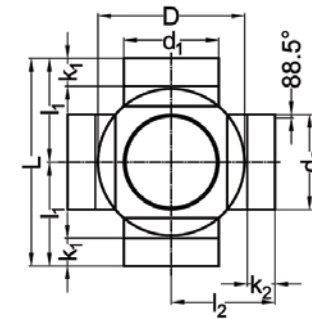


d ₁ /d ₂	Code	D	L	l ₁	l ₂	l ₃	k ₁	k ₂	Qty
56/56	S 23 56 00	83	175	70	100	105	30	65	1
75/75	S 23 07 00	91	175	70	100	105	25	55	1
110/110	S 23 11 20	140	225	90	115	135	20	65	1
160/110	S 23 16 00	140	350	140	140	210	60	135	1
200/110	S 23 20 00	140	360	180	160	180	90	90	1
250/110	S 23 25 00	140	440	220	185	220	110	110	1
315/110	S 23 31 00	140	560	280	220	280	170	170	1

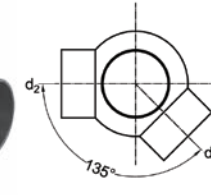
BALL BRANCHES

d ₁ /d ₂	1 DOUBLE 90°		2 DOUBLE 135°		3 DOUBLE 180°		4 TRIPLE 90°		5 TRIPLE 135°		6 FOURFOLD 90°		L	l ₁	l ₂	D	k ₁	k ₂	Qty
	Code	Code	Code	Code	Code	Code	Code	Code	Code	Code									
110/56	S 24 11 15	S 24 11 25	S 24 11 35	S 34 11 15	S 34 11 25	S 44 11 15							240	120	130	170	30	20	1
110/75	S 24 11 17	S 24 11 27	S 24 11 37	S 34 11 17	S 34 11 27	S 44 11 17							240	120	130	170	30	20	1
110/110	S 24 11 01	S 24 11 02	S 24 11 03	S 34 11 01	S 34 11 02	S 44 11 01							240	120	110	170	30	30	1

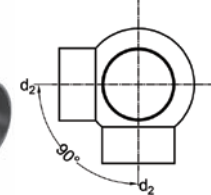
GENERAL DIMENSIONS



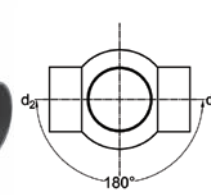
1 DOUBLE BALL BRANCH 88.5° FABRICATED – 90°



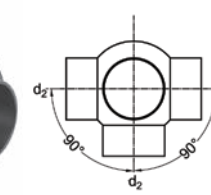
2 DOUBLE BALL BRANCH 88.5° FABRICATED – 135°



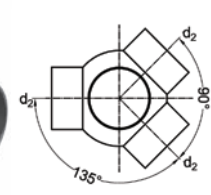
3 DOUBLE BALL BRANCH 88.5° FABRICATED – 180°



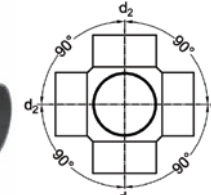
4 TRIPLE BALL BRANCH 88.5° FABRICATED – 90°



5 TRIPLE BALL BRANCH 88.5° FABRICATED – 135°

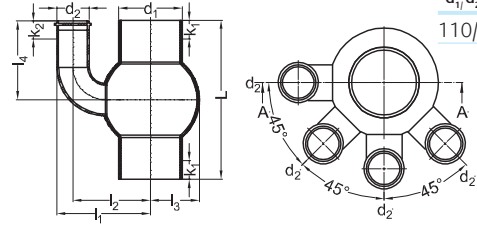


6 FOURFOLD BALL BRANCH 88.5° FABRICATED – 90°



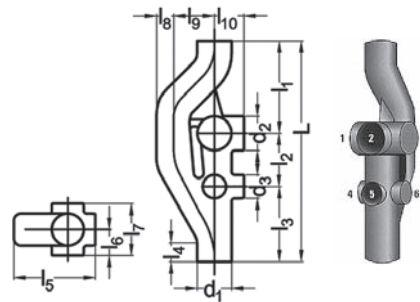
HDPE drainage

FOUR WAY SOIL MANIFOLD



d ₁ /d ₂	Code	L	L ₁	L ₂	L ₃	L ₄	k ₁	k ₂	Qty
110/56	S 44 11 56	275	162	134	85	136	30	70	1

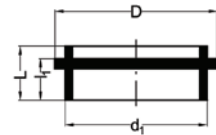
AERATOR AKAVENT



d ₁	Code	L	l ₁	l ₂	l ₃	l ₄	l ₅	l ₆	l ₇	l ₈	l ₉	l ₁₀	Qty
110	S 60 11 07 *	750	320	170	260	275	90	180	55	130	90		1
160	S 60 16 07 *	715	320	160	235	310	100	200	75	125	110		1

* 1/2/3 = max. Ø 110 mm – 4/5/6 = max. Ø 75 mm
Butt-weld only

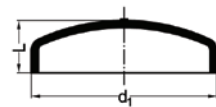
END CAP – FLAT



d ₁	Code	D	L	l ₁	Qty
56	S 67 56 07	64	16	12	20
75	S 67 07 07	85	21	16	20
110	S 67 11 07	120	19	19	20

Butt-weld only

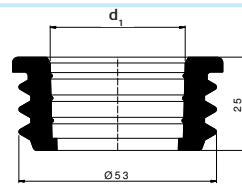
END CAP – DOMED



d ₁	Code	L	Qty
160	S 67 16 09	45	1
200	S 67 20 09	55	1
250	S 67 25 09	30	1
315	S 67 31 09	30	1

Butt-weld only

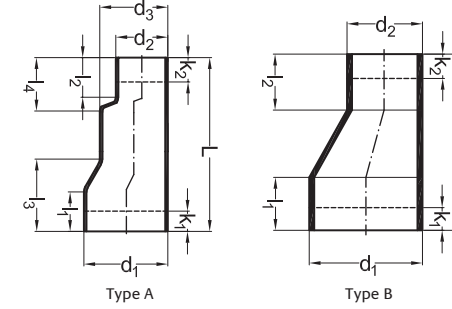
56MM BOSS ADAPTER



d ₁	Code	Qty
32	S 00 56 32	
40	S 00 56 40	

Material: TPE

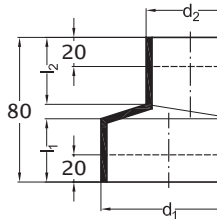
REDUCER ECCENTRIC – LONG



d ₁	Code	L	l ₁	l ₂	l ₃	l ₄	d ₃	k ₁	k ₂	Qty
200/110	S 14 20 11 *	335	95	36	165	55	160	75	20	1
200/160	S 14 20 16 **	260	95	95				75	75	1
250/200	S 14 25 20 **	290	105	95				85	75	1
315/200	S 14 31 20 *	580	115	95	235	190	250	95	75	1
315/250	S 14 31 25 **	340	115	105				75	85	1

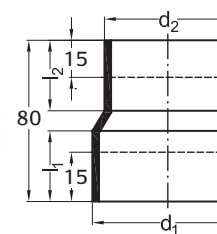
* type A
** type B

REDUCER ECCENTRIC – SHORT



d ₁ /d ₂	Code	l ₁	l ₂	Qty	d ₁ /d ₂	Code	l ₁	l ₂	Qty
75/56	S 16 07 56	35	37	20	110/75	S 16 11 07	31	36	20
110/40	S 16 11 04	31	34	10	160/110	S 16 16 11	28	36	5
110/56	S 16 11 56	31	35	10					

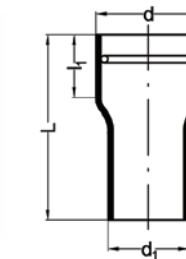
REDUCER CONCENTRIC



d ₁	Code	l ₁	l ₂	Qty	d ₁	Code	l ₁	l ₂	Qty
75/56	S 15 07 56	30	30	20	200/160	S 15 20 16*	50	40	20
110/40	S 15 11 04	30	30	20	250/160	S 15 25 16*	60	40	20
110/56	S 15 11 56	30	30	20	250/200	S 15 25 20*	60	50	20
110/75	S 15 11 07	30	30	20	315/200	S 15 31 20*	90	80	20
160/110	S 15 16 11	35	30	1	315/250	S 15 31 25*	90	90	20

*Butt-weld only

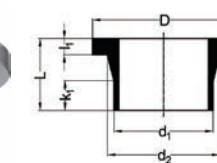
CONTRACTION SLEEVE



d ₁	Code	L	l ₁	d _x	Qty	d ₁	Code	L	l ₁	d _x	Qty
50/70	S 55 05 03	210	65	57-64	5	75/90	S 55 07 01	210	75	80-84	5
56/75	S 55 56 01	210	70	62-69	5	110/125	S 55 11 02	210	100	102-111	5

Seal: NBR

STUB FLANGE

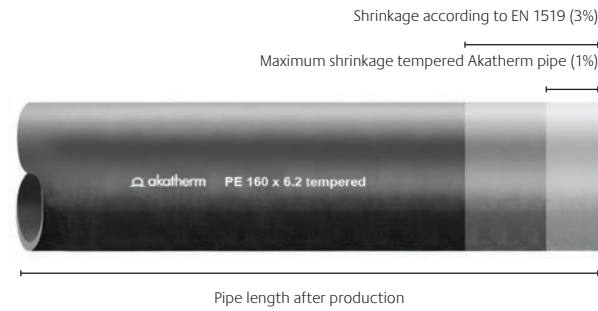


d ₁	Code	d ₁	D	L	l ₁	k ₁	Qty	d ₁	Code	d ₁	D	L	l ₁	k ₁	Qty
56	S 47 56 02 *	70	102	60	14	15	5	200	S 47 20 02 *	232	268	100	18	40	1
75	S 47 07 02 *	89	120	50	16	15	5	250	S 47 25 02 *	285	320	100	20	40	1
110	S 47 11 02	125	158	80	18	30	5	315	S 47 31 02 *	335	370	100	20	40	1
160	S 47 16 02	175	210	80	18	30	1								

* Butt-weld only

Tempered Pipe

Marley HDPE pipe is tempered. This pipe is produced according to the standards EN 1519 and ISO 8770 and has undergone a heat treatment after extrusion. The result is less shrinkage when cooled down from high operational temperature. This gives less stress on joints resulting in a longer life for the pipe system.



Linear expansion

Marley HDPE material has a linear expansion coefficient of 0.13-0.19 mm/mK. We calculate with an expansion of 0.2mm per meter pipe for every °C temperature difference. The total length variation can be calculated as follows:

$$\Delta l = L \times \lambda \times \Delta t$$

Δl = length change in mm
 L = total length of pipe
 λ = linear expansion coefficient
 Δt = temperature difference in °C

Example:

10 metres of pipe with a maximum temperature of 60°C and a minimum temperature of -20°C. This results in an expansion of:

$$\Delta l = 10 \times 0,2 \times 80 = 160 \text{ mm}$$

Length changes can be accommodated by the expansion socket which can take up the expansion and contraction of a 5 meter length of pipe for temperatures between -20°C and 70°C.

Electrofusion

Marley HDPE products can be welded by electrofusion unless stated differently in the product table. This is the preferred method of on-site jointing.

Butt welding and k-dimension

Marley HDPE products can be welded using this jointing method. Fittings can be shortened by up to the k-dimension (indicated in the product specification section page, 6-15), still allowing butt-welding on a standard butt-welding machine.

Abbreviations

Abbreviation	
D	External dimension fitting part
d1, d2 ...	External dimension fitting/pipe
e	Wall thickness
k1,k2 ...	Maximum length for shortening fittings
L	Total length fitting
l1,l2 ...	Lengths of part of fitting
TPE	Thermoplastic Elastomer
SBR	Styrol butadiene rubber
NBR	Acrylnitril-butadiene rubber
EDPM	Ethylene propylene copolymer
HDPE	High density poethylene

Testing the system

The system should be inspected for any possible leaks in accordance with BS EN 12056. Air should be pumped into the system through a branch of a tee piece until a pressure equal to 38mm water gauge is achieved. The inlet valve should then be closed and the system should maintain the pressure for a minimum of three minutes.

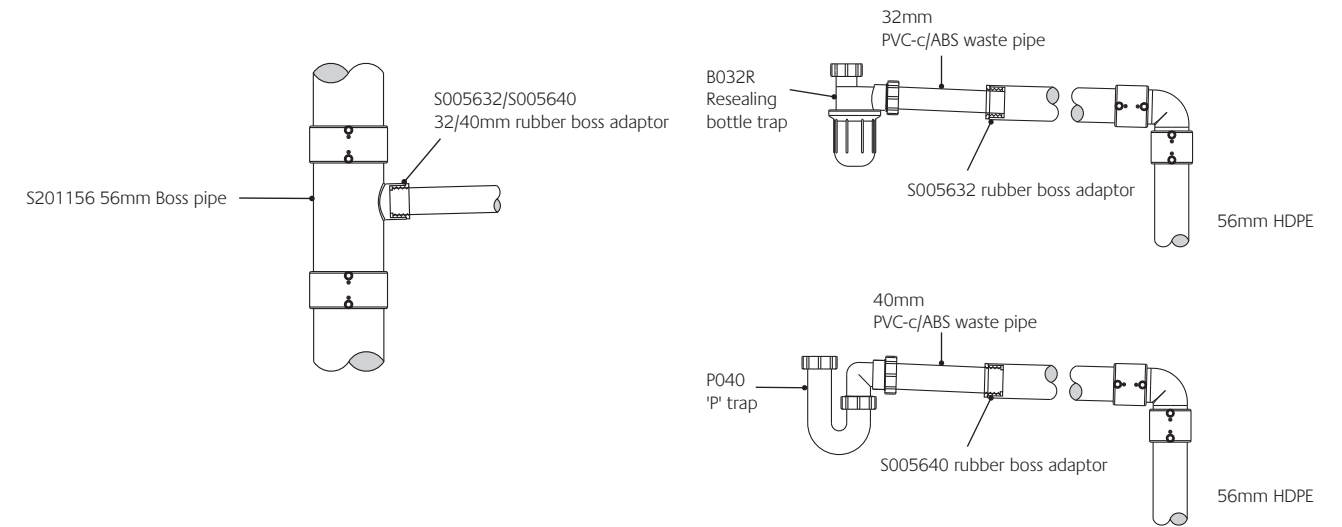
Chemical resistance

For all chemical resistance enquiries please contact our technical support team on 01622 852695.

The Marley HDPE range can be connected to PVC-c or ABS materials, allowing for easy waste pipe connection to the discharge stack.

Soil stack:

Connection from a 56mm boss pipe to a 32mm or 40mm pipe, using a 56mm rubber boss adaptor.

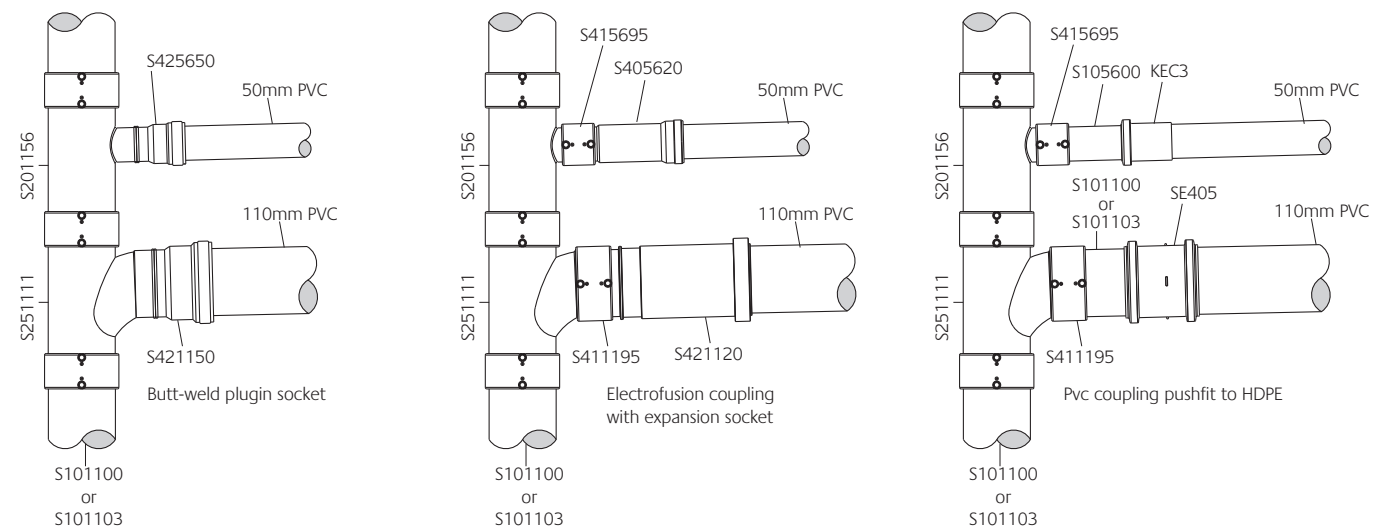


Bottle traps:

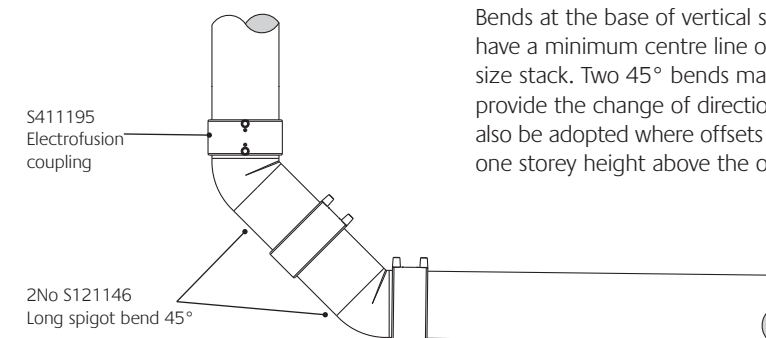
32mm and 40mm rubber boss pipe connections to bottle traps.

Alternative connectors:

Alternative connections from HDPE to PVC-u and PVC-c.



Bends at the base of stacks



Bends at the base of vertical stacks should be of long radius and have a minimum centre line of 200mm on a 100mm nominal size stack. Two 45° bends may also be used as an alternative to provide the change of direction. The same design principle should also be adopted where offsets occur in stacks that have more than one storey height above the offset.

Electrofusion



Electrofusion, the most simple and rapid jointing technique, for a highly efficient method of assembly for pipes, fittings and prefabricated sections.

Electrofusion couplers

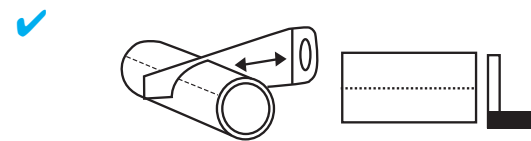
The HDPE range includes couplers in a range of core diameters up to 315mm. The couplers are extremely suitable for applications in waste water and rainwater drainage, with the following features:

1. Injection moulded with excellent dimensional accuracy and stability.
2. Welding indicators on each welding surface for visual identification to show that the coupler has been welded.
3. Centre stops easy to remove, in order to use the coupler as a slide-over coupler.
4. Resistance wires fixed to the surface for an optimal heat transfer and therefore a high quality welding connection.
5. Yellow edge surrounding the welding indicators of the diameters 200, 250 and 315mm are provided for better visibility.

Correct Jointing procedure

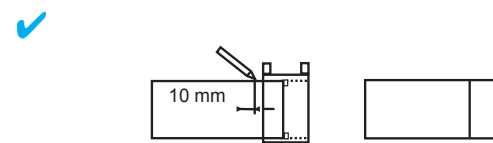
1. Cut the pipe square

The pipe ends must be cut square to ensure that the heating element in the coupler is completely covered by the pipe or fitting.



2. Mark insertion depth + 10 mm

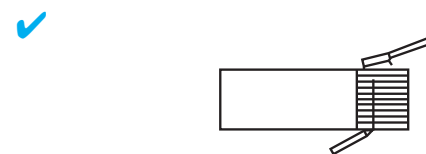
This is to ensure that across the full welding zone the oxidised layer will be removed.



3. Scrape pipe and mark insertion depth again

The outer surface of the pipe (approx. 0.2mm deep) must be scraped for the full distance that will be covered by the coupler to remove any surface 'oxidation'.

The insertion depth should be marked again to safeguard full insertion.



4. Clean coupler

Before assembling the pipes into the coupler ensure that all surfaces are clean and dry.



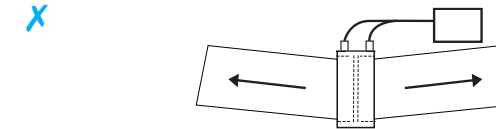
5. Insert pipe and/or fitting up to pipe stop

Ensure that the pipe is pushed as straight as possible into the fitting.

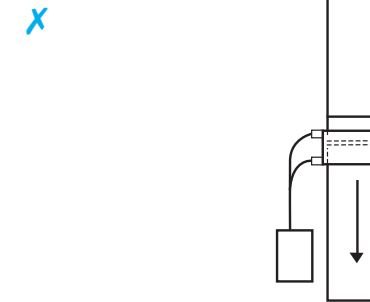


Incorrect Jointing procedure

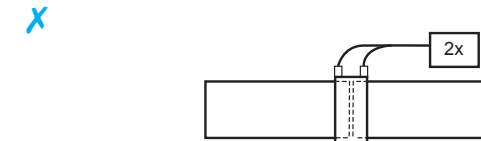
1. Prevent misalignment



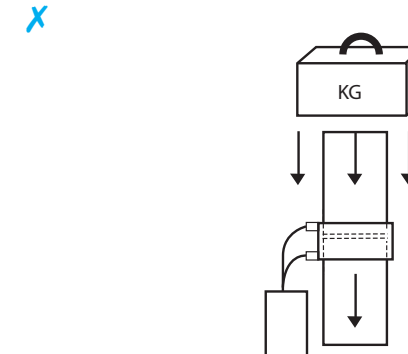
2. Prevent coupler from sliding down when installed vertical



3. Don't weld coupler twice



4. Prevent load on vertical pipesystem



After connecting the cables of the control box the welding process can commence by pushing the start button. The control box adapts the welding time to the ambient temperature. When it is colder than 20°C the welding time is extended and when the ambient temperature exceeds 20°C the welding time is shortened. For welding times and cooling down time see table below.

The joint assembly should not be disturbed during the fusion cycle and for the specified cooling time afterwards.

dimension d ₁	system	weld time	cooling time
mm		sec	min
40-160	Constant current 5A	80	20
200-315	Constant voltage 220V	420	30

Butt-welding



Butt-welding is a very economical and reliable jointing technique for making welded joints, requiring only butt-welding equipment. All pipes and fittings can be joined by this welding method. Fittings for which a k-dimension is shown in the product section, (page 6-15), can be shortened by not more than this amount. Butt-welding is extremely suitable for prefabricating pipe sections and for making special fittings.

Preparations

The following guidelines are of importance when making a proper butt-weld:

- Establish a work space where the jointing can be done without being effected by major weather conditions.
- Check the equipment functions properly. Welding equipment used on site deserves special attention.
- The fittings and or pipes need to be aligned in the welding machine. Mis-alignment can be up to 10% of the wall thickness.
- Clean the heating element before each jointing operation with a lint-free cloth and suitable cleaner (see instructions supplied with the welding machine).
- Cut the pipe and/or fitting with a pipe cutter to make the end square.
- Make sure that once the pipe and/or fitting ends have been machined, they do not get dirty. Do not touch them with your hands. The surface needs to be clear of oil, grease and dirt.
- Put the pipe parts into the welding machine to facilitate a firm hold during the jointing process.
- A digital thermometer can be used to check the temperature of the heating plate. The temperature should be checked at several points around the plate and should be between 200°C and 220°C. Maximum deviation between points is given in the table.

Used surface of heating element for welding diameter (d ₁)	Δ' max
d ₁ = 40-160	8°C
d ₁ = 200-315	10°C

Maximum temperature variation heating element

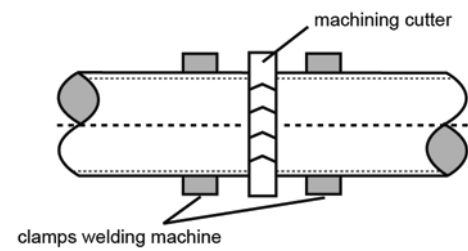
Welding process

The butt-welding of Marley HDPE operates according to the following steps:

Machining the surface

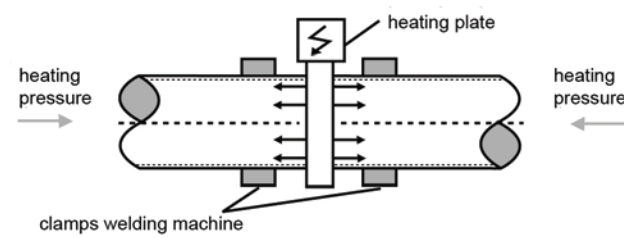
Both sides should be machined until they run parallel. When the machining is finished, open the carriages (the plastic shavings must be continuous and uniform in both sides to weld). Take off the milling cutter.

Verify the alignment between the machined surfaces. Remove the plastic shaving. Do not touch or get any dirt on the machined surfaces.



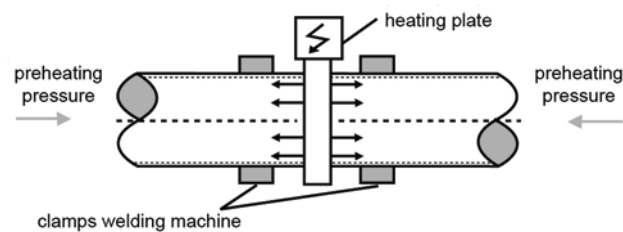
Heating up with less pressure

HDPE is a good insulator, therefore at this stage it is necessary that the correct heating depth of the pipe ends is obtained. Only a small amount of pressure 0.01 N/mm² is required to maintain the contact of the pipe ends with the heating element. The heat will gradually spread through the pipe/fitting end. The size of the bead will increase a little. The time and pressure needed for this phase can be found in the table on the next page.



Preheating under pressure

Press the two ends to be jointed gradually on to the heating element until a bead is created. The size of the bead is a good indication that the appropriate pressure and time is used. For pressure and bead size see the table on the next page.



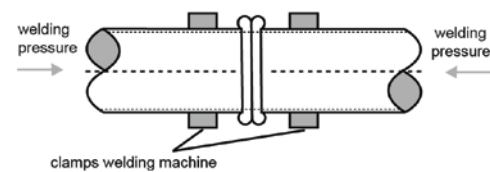
Change over

Remove the heating element from the jointing areas and immediately make those areas touch each other. Do not push the pipe ends abruptly onto each other.

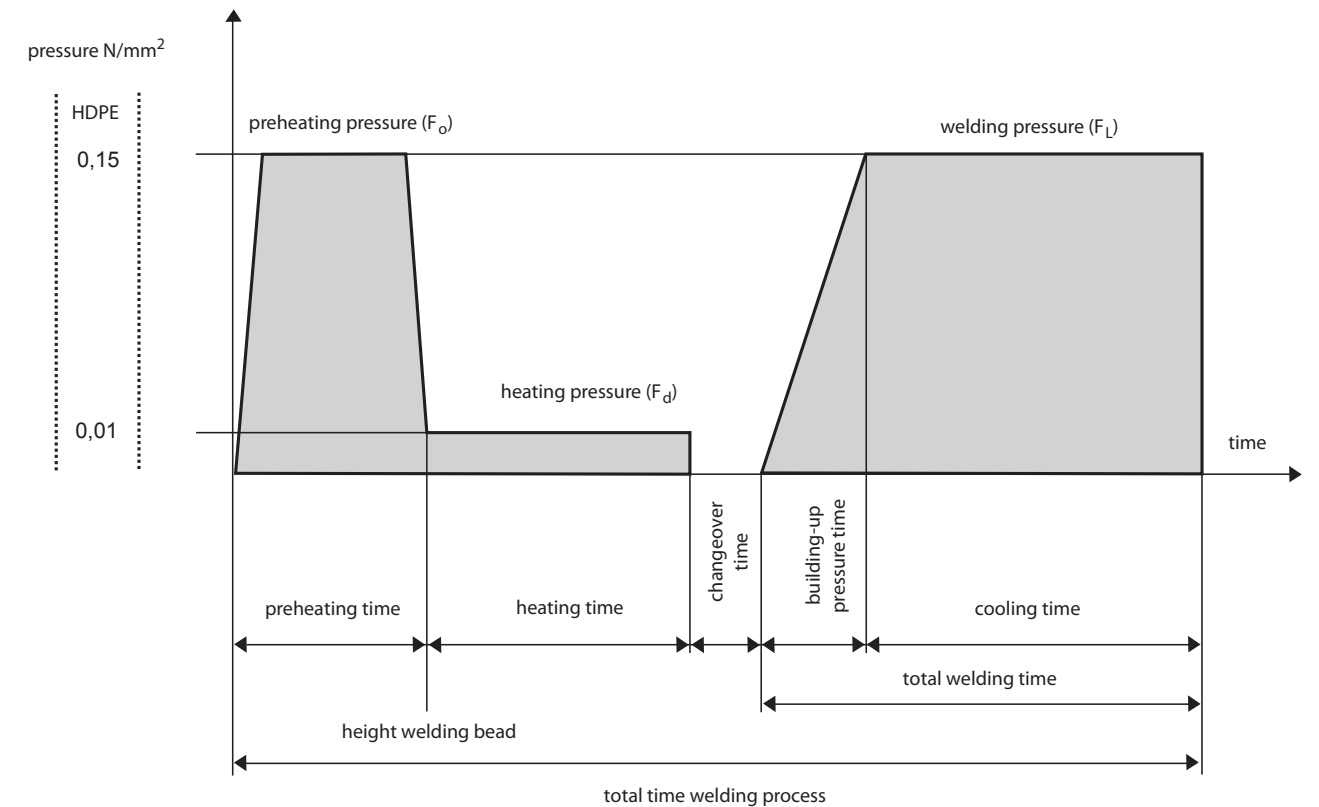
The removal of the heating element needs to be done quickly to prevent the pipe ends from cooling down. The times for changing over can be found in the table on the next page.

Welding and cooling

After the jointing areas have made contact they should be joined with a gradual increase in pressure up to the specified value. Keep the specified welding pressure at a constant level during the cooling period. Do not cool artificially.



The welded components can be removed from the machine when 50% of the cooling period has elapsed, providing that this is done carefully, with no load or strain being placed on the joint. The joint must then be left undisturbed for the remainder of the cooling period.



Diameter d _i mm	Wall thickness e mm	Preheating pressure / welding pressure (0,15 N/mm ²) F ₀ /F _L N	Heating pressure (0,01 N/mm ²) F _d N	Height welding bead mm	Heating time sec	Changeover time sec	Building-up pressure time sec	Cooling time min
*40	3.0	55	4	0.2	29	4	4	4
*50	3.0	70	5	0.5	30	4	4	4
56	3.0	75	5	0.5	30	4	4	4
*63	3.0	85	6	0.5	31	4	4	4
75	3.0	105	7	0.5	32	5	5	4
*90	3.5	145	10	0.5	35	5	5	4
110	4.2	210	14	0.5	42	5	5	6
*125	4.8	275	18	1.0	48	5	5	6
*125	3.9	225	15	0.5	39	5	5	5
160	6.2	450	30	1.0	62	6	6	9
110	3.4	175	12	0.5	35	5	5	4
160	4.9	370	25	1.0	49	5	5	7
200	6.2	570	38	1.0	62	6	6	9
250	7.8	900	60	1.5	77	6	6	11
315	9.7	1400	93	1.5	77	6	6	11
200	7.7	700	47	1.5	77	6	6	11
250	9.6	1090	73	1.5	97	7	7	13
315	12.1	1730	115	2.0	121	6	8	16

Marley HDPE – Welding parameters

*Please note these sizes are made to order and require a 28 day lead time.

In this table the welding parameters can be found for Marley HDPE. The exact regulation of the welding machine depends on its mechanical resistance. The tables provided with the machine are to be used for regulating the machine.

Evaluating the butt-weld joint

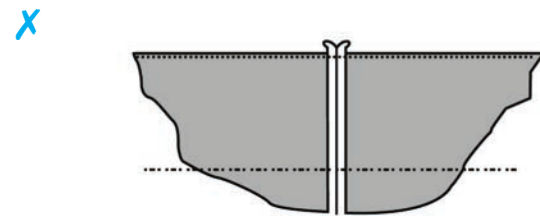
The butt-weld can be evaluated using destructive and non destructive evaluation methods. For these evaluations special equipment has to be used. Butt-welds can easily be judged by a visual inspection making this the recommended method for a first evaluation.

The shape of the welding bead is an indication for the proper operation of the welding process. Both welding beads should have the same shape and size. The width of the welding bead should approximately be 0.5 x the height. Differences between the beads can be caused by the difference in HDPE material used in the welded components. Despite the differences in welding bead the butt can be of sufficient strength.

In the next illustration a good weld is shown with a uniform welding bead. At a visual inspection this would be classified as an "acceptable" weld.

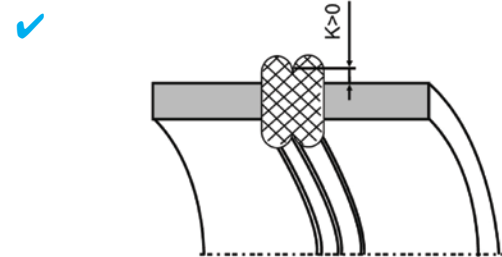
When there is either insufficient heating up or too low welding pressure there are hardly any beads. In cases like this thick walled pipes often form shrinking cavities. The weld must be classified as "not acceptable".

Butt-weld (not acceptable)

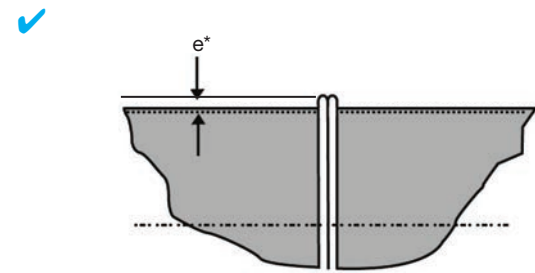


In the next illustration a cross-section of a regular, round fusion bead, free of notches or sagging is shown. Special attention should be paid to the fact that the collar value 'K' is greater than 0.

Cross section of a good butt-weld

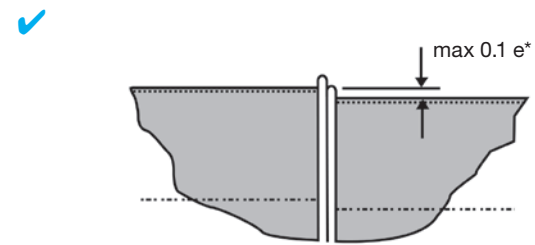


Butt-weld with even welding beads (acceptable)



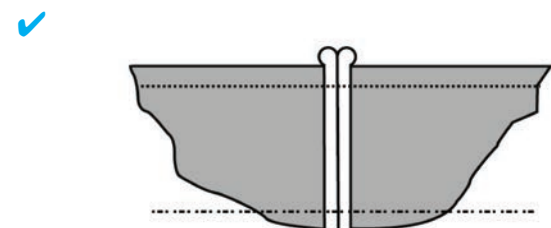
Mis-alignment between fittings and pipe can occur for several reasons. Oval pipe ends or irregular necking of the pipe can cause an incomplete fit. If this is less than 10% of the wall thickness the weld can still be classified as "acceptable" (see next illustration).

Butt-weld with mis-alignment of pipe (acceptable)



The next illustration shows a joint with beads that are too big. The uniformity indicates a good joint preparation. Heat supply and jointing pressure settings, however, are too high. A purely visual assessment would still classify the weld as "acceptable".

Butt-weld with big welding beads (acceptable)



* For the value of 'e' please refer to the table on page 21

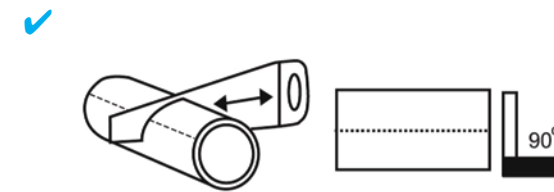
Plug-in joint



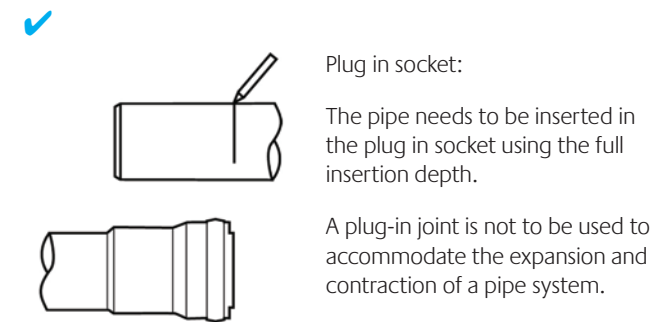
A plug-in joint is an easy to make, detachable and non pull-tight jointing method.

Jointing process:

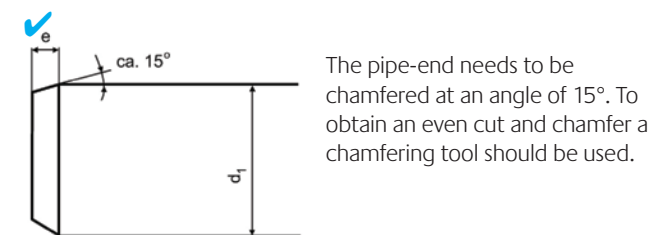
Cut pipe square and remove burr



Mark insertion depth



Chamfer pipe end



Make joint

Lubricate the pipe end and insert the pipe up to the marked insertion depth.

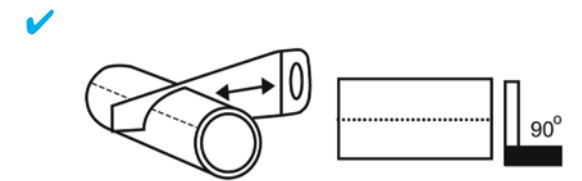
Expansion joint



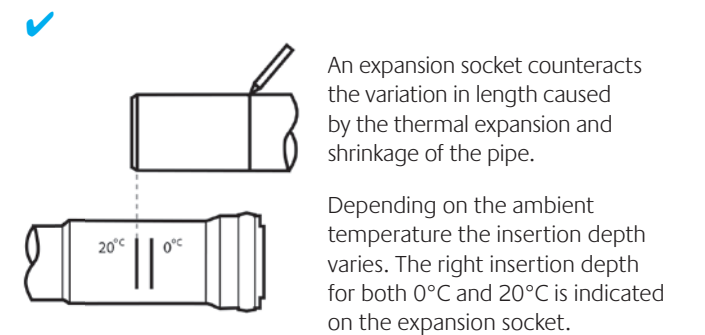
Expansion sockets can absorb length changes of pipes with a maximum length of 5 m.

Jointing process:

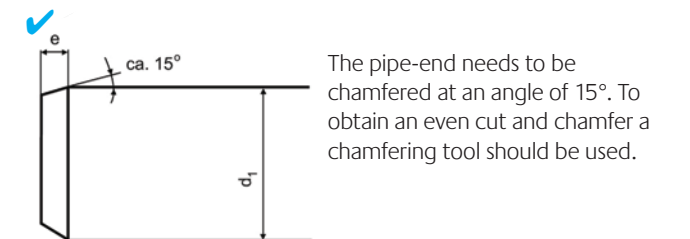
Cut pipe square and remove burr



Mark insertion depth



Chamfer pipe end



Make joint

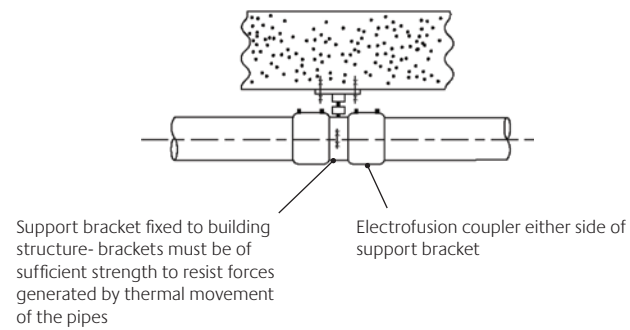
Lubricate the pipe end and insert the pipe up to the marked insertion depth.

Bracketing system

For the installation of Marley HDPE pipe systems several bracketing systems can be used:

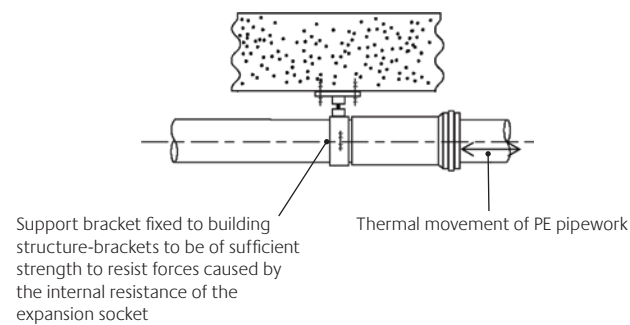
Anchor point bracket

This method of bracketing is used for rigid installations. The expansion forces are transferred to the building structure.



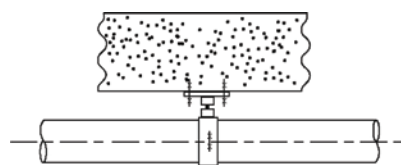
Anchor bracket with expansion socket

This method of installation is used for flexible installations where the expansion force is not transferred to the building structure. Only the force caused by the internal resistance of the expansion socket is transferred.



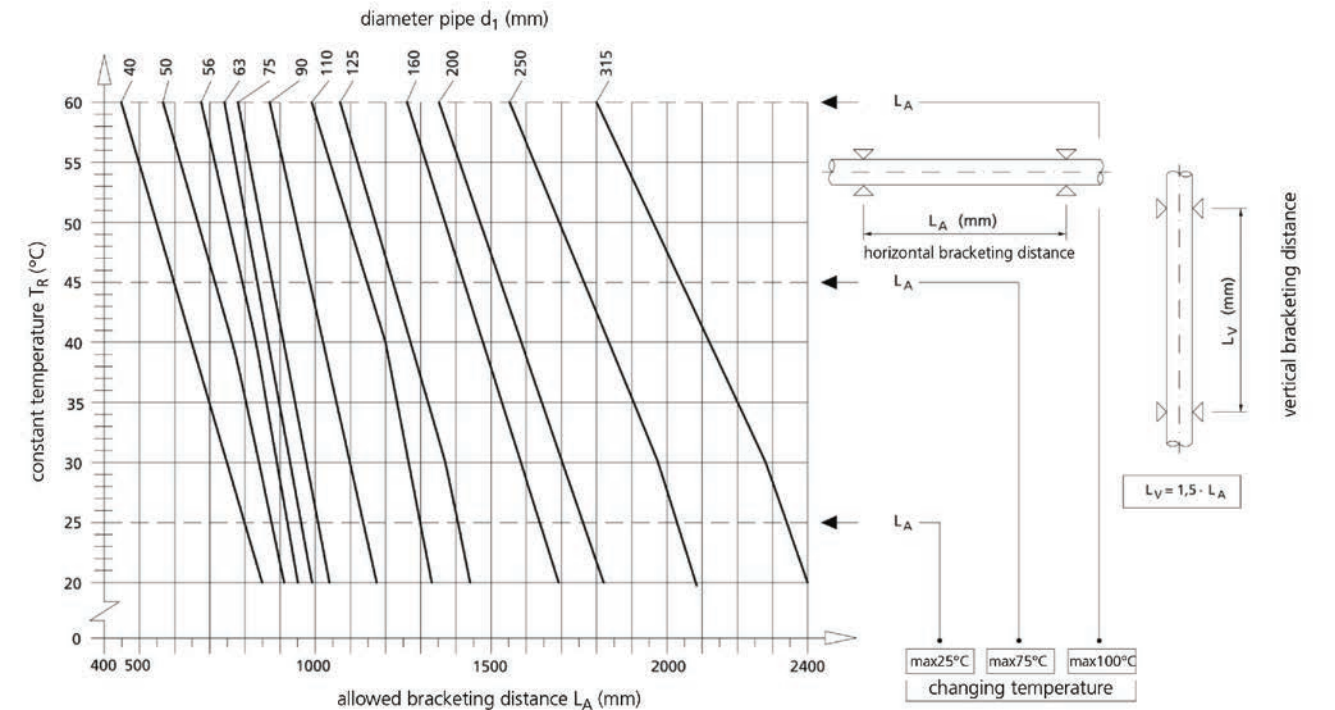
Guide bracket

The guide bracket is used to support the pipe and to prevent the pipe from buckling sideways when in a rigid installation. The pipe can freely move in the bracket.



Bracket distance

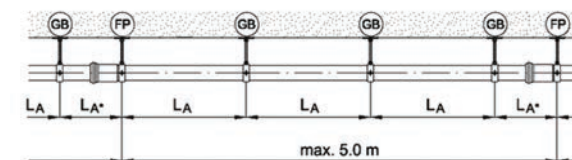
The bracket distances for Marley HDPE pipes are largely dependent on the working temperature of the pipe system. Also the filling rate of the pipe plays a role. A fully filled pipe has a different bracket distance.



Bracket distances for vertical and horizontal PE pipe systems with standard filling

Horizontal installation with expansion sockets

The bracket directly in front of the expansion socket has a shorter bracket distance (L_{A^*}). This makes a better guidance into the expansion socket possible (see image). The bracketing distances for this application can be found in table below. The maximum distance between 2 expansion sockets is 5 m.

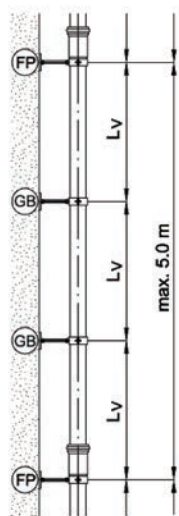


d_i	L_A	L_{A^*}
75	0.8 m	0.4 m
*90	0.9 m	0.5 m
110	1.1 m	0.6 m
*125	1.3 m	0.7 m
160	1.6 m	0.8 m
200	2.0 m	1.0 m
250	2.0 m	1.0 m
315	2.0 m	1.0 m

Bracket distances horizontal installation with expansion sockets
*Please note these sizes are made to order and require a 28 day lead time.

Bracket distance

Vertical installation: to the wall



For the vertical installation the bracketing distance is in general 1,5 times the distance of the horizontal bracketing. There is no separate bracketing distance for immediately in front of the expansion socket because there is no sagging of the pipe and the insertion is always in line.

Vertical installation

GB = guide bracket FP = fixed point
LV = vertical support distance

d±	LV
*50	1.0 m
56	1.0 m
*63	1.0 m
75	1.2 m
*90	1.4 m
110	1.7 m
*125	1.9 m
160	2.4 m
200	3.0 m
250	3.0 m
315	3.0 m

Bracket distances vertical installation with expansion sockets

*Please note these sizes are made to order and require a 28 day lead time.

HDPE expansion socket insertion depth

HDPE Expansion Details				Type A	Type B
Diameter	Total Length	Min. Insertion Depth @ 20°C	Max. Expansion	(No White Retaining Ring)	(With White Retaining Ring)
*40mm	132mm	76mm	56mm		Type B
*50mm	132mm	76mm	56mm		Type B
56mm	132mm	76mm	56mm		Type B
*63mm	132mm	76mm	56mm		Type B
*75mm	-	On Fitting	On Fitting	Type A	
*90mm	-	On Fitting	On Fitting	Type A	
110mm	-	On Fitting	On Fitting	Type A	
125mm	-	On Fitting	On Fitting	Type A	
160mm	-	On Fitting	On Fitting	Type A	
200mm	230mm	120mm	110mm	Type A	
250mm	250mm	125mm	125mm	Type A	
315mm	270mm	126mm	144mm	Type A	

*Please note these sizes are made to order and require a 28 day lead time.

Fittings

The fittings and electrofusion couplers need to be stored in a dry place. To prevent oxidation and contamination, it is recommended to leave the fittings in their original packaging as long as possible.

Pipes

The high impact strength of Marley HDPE provides some protection against damage but care should be taken at all stages of handling, transportation and storage.

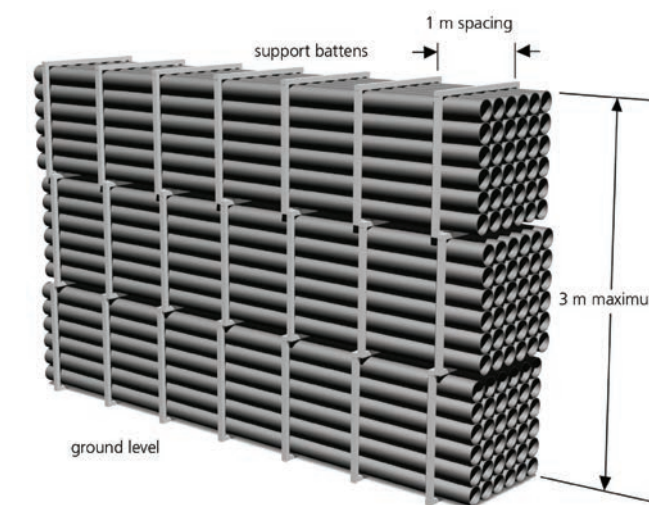
Pipe must be transported by a suitable vehicle and properly loaded and unloaded, e.g. wherever possible moved by hand or mechanical lifting equipment. It must not be dragged across the ground. The storage should be flat, level and free from sharp stones.

Bundles

Bundled packs of pipe should be stored on clear, level ground with the battens supported from the outside by timber or concrete blocks. For safety, bundled packs should not be stacked more than three high.

Smaller pipes may be nested inside larger pipes. Side bracing should be provided to prevent stack collapse.

Similar precautions should be taken with fittings and these should be kept packaged until required for use.

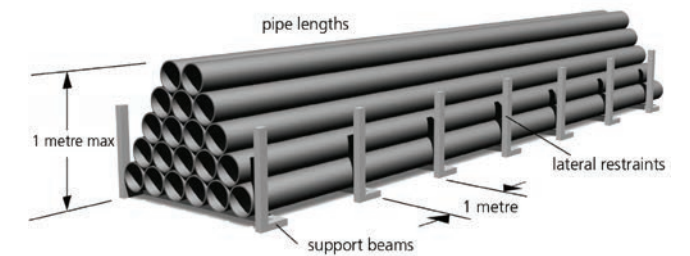


Storage of bundles

Lengths

Pipe lengths stored individually should be stacked in a pyramid not more than one metre high, with the bottom layer fully restrained by wedges. Where possible, the bottom layer of pipes should be laid on timber battens at one-metre centres. On site, pipes may be laid out individually in strings (where appropriate, protective barriers should be placed with adequate warning signs and lamps).

Storage of loose pipes



Tools

Tools need to be protected against moisture.

Health and safety at work act and COSHH regulations

Attention is drawn to the requirement in the UK of this act and to the 1988 Control of Substances Hazardous to Health (COSHH) Regulations. Marley cannot accept responsibility for accidents arising from the misuse of its products because of bad installation or incorrect application.

Handling of HDPE has no detrimental health impact. It is recommended, however, that HDPE is not ingested or dust inhaled.

Personal Protective Equipment (PPE)

When welding HDPE, molten material is formed, which can cause burns to skin. Appropriated PPE should be worn.

Physical contact

HDPE is not considered to be a skin irritant. Where HDPE dust is generated by cutting or machining pipe or fittings, powder particles of HDPE dust may cause eye irritation by abrasion.

Behaviour in Fire

HDPE is a flammable material. It has, however, been installed throughout Europe for over 35 years and presents no greater risk of fire propagation than similar plastic based systems when installed in accordance with local regulations. Marley offer a range of firecollars suitable for HDPE. Please speak to our Technical Department on 01622 852695 for further information.

Standards

British & European Standards

BS EN 1519-1: 2000

Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure – polyethylene.

BS EN ISO 9001: 2008

Quality systems. Model for Quality Assurance in Design, Development, Production, Installation and Servicing.

BS EN ISO 14001: 2004

Environmental management systems. Requirements with guidance for use.

Accreditations



NOTE:

Marley Plumbing & Drainage products are manufactured to a constant high standard. The Company will not therefore accept responsibility for failure of any installation which includes components not supplied by us.

Customer attention is drawn to the Company's official Terms and Conditions of Sale. Goods are supplied strictly in accordance with these terms and conditions, copies of which are freely available on request and on marleypd.co.uk. Product illustrations may vary slightly depending on the type and size. Product images are for illustrative purposes only. Qty, refers to the pack quantity. Products can be purchased individually e & o e.

Marley system solutions



Marley PVCu Soil

Standard PVCu soil systems to BS EN 1329: 2000. Ideal for domestic and commercial applications, including branch connections to other materials. Available in 82mm, 110mm and 160mm, ring seal and solvent weld jointing variants.



Marley waste systems

A wide range of PVC-u, ABS and polypropylene waste ranges from 32mm to 50mm and in a variety of colours. Available in solvent weld and push fit jointing.



Marley acoustic

An acoustic soil and waste range with a layered pipe providing quick, hygienic removal of sanitary waste water. The noise generated by the flow of water is dramatically reduced – making it perfect for multi-occupancy apartment blocks and high specification developments.



Marley rainwater

Five gutter profiles and three downpipe options provide a rainwater solution for any application. Advanced Life⁴ technology on four of the key profiles, coupled with the benefits of the Easyclip and notching capability combine to make the Marley rainwater range the most comprehensive available.



Marley underground systems

The Marley Plumbing & Drainage range of underground systems include the solid wall range, predominately for round the house drainage and Quantum structured wall range for sewer and highway drainage applications.



Alutec

Alutec offer modern and traditional aluminium rainwater profiles, providing solutions for any type of building. Aluminium has high visual appeal and durability, lasting for 50 years or more. The product portfolio includes Evolve; easy to install, low cost gutter systems in four profiles. The rainwater ranges are complemented by aluminium soffit and fascia systems and roof & floor outlets.



marleypd.co.uk

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Email: marketing@marleypd.com

To place an order

For delivery to **England & Wales**

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Fax: 01622 851111

For delivery to **Scotland**

Email: orders.uddingston@marleypd.co.uk

Fax: 01698 810307

For all estimate requests

Email: estimates@marleypd.co.uk

For Technical advice please call

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