Soil & Waste
Design & installation
Now includes:
• PVCu
• dBlue
• HDPE
marley.co.uk
Marley Plumbing & Drainage offer a comprehensive range of soil and waste systems. Available with a variety of jointing methods, Marley products are manufactured to exacting UK and European standards and are designed for use on commercial projects as well as housing developments.

Product specification information
This guide contains design and installation information for Marley PVCu soil & waste, HDPE and dBlue acoustic drainage systems. Product specification information on these product ranges is available as a separate document. All documentation can be downloaded from marleypd.co.uk.

Production information
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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PVCu soil & waste systems

- 82, 110 and 160mm push-fit and solvent weld soil systems incorporating socketed and plain ended pipe
- 110mm WC connectors for all BS WC pans
- Available with solvent weld or push-fit joint
- 110mm WC manifold system allows range of toilets to be connected horizontally. Ideal for commercial applications.
- 50 and 82mm floor outlet components are available as separate components or as an all-in-one trapped floor outlet.
- Fire sleeves and pipe-wraps, providing up to 4 hours rating.
- 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.

Marley Akatherm HDPE

The Marley Akatherm HDPE drainage range is certified to BS EN 1519: 2000 (licence number KM 545620). An extension of the Marley soil & waste portfolio, the HDPE range 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 will also cope with temperature variations of -40°C to 100°C.

The combination of the excellent material properties of HDPE with homogenous welded joints provides greater installation flexibility with a wide range of jointing options.

Commercial applications

Marley dBlue acoustic system

The Marley dBlue acoustic system is a triple-layer drainage system designed for use where improved levels of soundproofing are required. Suitable for use in domestic applications as well as hospitals and hotels, where reduced noise levels are required. Used in conjunction with the acoustic pipe clips, the dBlue system is designed to reduce noise and acoustic vibrations to a level of 19dB at 4 l/s discharge rate. It is also lightweight, resistant to temperature change and is jointed using the push-fit ring seal method.

The dBlue system is available in 40mm, 50mm, 110mm and 160mm diameters. It is also compatible with the Marley PVCu soil and waste system for branch connections.

Solvent soil

The Marley PVCu soil range has been extended with the addition of nine 110mm solvent fittings, offering further options for the installer. The range includes the new 8-way soil manifold which offers the flexibility of 4 top and 4 side entries, allowing for multiple inlet connections. At just 70mm above the floor slab, the manifold sits neatly at finished floor level in most typical applications.
The Marley soil & waste range offers an extensive choice of standard fittings for commercial and domestic projects.

Pictured is a selection of key components within the range. Product specification information on the PVCu, HDPE drainage and dBlue acoustic soil ranges is available as a separate document. All documentation can be downloaded from marley.co.uk

Key components

Marley co-ex soil

110mm soil pipe with at least 30% recycled content

Marley 110mm soil pipe now combines the environmental benefits of using recycled material with the quality and aesthetic advantages of co-extrusion technology.

- BS EN 1329 certified
- Looks better, with higher gloss levels
- Has improved weathering performance
- Available in grey and black colour only
- Same list price as standard white pipe
- Colour matched to all standard 110mm Marley soil fittings

5 boss branch, 87½° push-fit sockets/spigot
The Marley range of five boss branches are designed to allow multiple waste pipe connections to be made to the discharge stack from different directions. Four different side entry combinations are possible together with a rear, if required.

Fire protection systems – Universal fire collar (UFC1) & fire sleeves
Fire sleeves and pipe wraps, providing up to 4 hours rating. The universal fire collar is designed to be surface mounted and is sufficient for 5 x 110mm pipe collars.

WC connectors
Connectors for all BS WC pans to accommodate a range of outlet sizes between 84 and 110mm. Available with solvent weld or push-fit joints.

Durgo air admittance valve
The Durgo valve is designed to reduce the number of roof penetrations. Suitable for use in sanitary pipework systems up to ten storeys high, the valve must be fitted in a vertical position above the flood level of the highest appliance connecting to the stack.

Manifold system
For use in sanitary pipework systems in schools, hospitals, public and commercial buildings, the manifold system allows ranges of toilets to be connected to a horizontal float above floor level and eliminates the need for specially fabricated fittings.

8-way collar boss
The collar boss offers the flexibility of 4 top and 4 side entries, allowing multiple inlet connections. Specifically designed to prevent cross-flow and to allow multiple low level bath or shower waste pipes to be connected to the stack above floor level.

Adjustable bends
Available in 82, 110 and 160mm and can be adjusted by cutting the fitting at the required angle and solvent welding the two sections together.

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<th>Code</th>
<th>Angle achieved</th>
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Solvent Soil range

PVCu Soil – Push-fit or solvent weld

The Marley range offers a secure method of jointing and includes the new eight-way collar boss for multiple connections to the stack, solvent socket bends, branches and access fittings. Ideally suited for commercial and small commercial applications.

8-way collar boss
The collar boss offers the flexibility of 4 top and 4 side entries, allowing multiple inlet connections. Specifically designed to prevent cross-flow and to allow multiple low level bath or shower waste pipes to be connected to the stack above floor level.

Adjustable bends
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Manifold system
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Sanitary pipework design

All sanitary pipework systems should be designed to satisfy the following regulations and standards where applicable.

- The Building Standards Technical Handbook (Scotland) 2010: Part M.
- The Building Regulations (Northern Ireland) 2000, Technical Handbook N.
- BS EN 12056: 2000, Parts 1 to 5.

Regular consultation is essential between Architects and Plumbing Engineers throughout the building design stage as the careful arrangement of kitchen and bathroom appliances will simplify the final sanitary pipework layout. This will help to ensure that an efficient sanitary pipework system is installed at minimum cost.

The design information provided in this catalogue is endorsed in the above publications and while every effort has been made to ensure accuracy, no responsibility can be accepted for errors or omissions. For detailed guidance please consult the relevant documents referred to above.

Methods of jointing

While the principal method of joining 82, 110 and 160mm PVCu pipes and fittings is push-fit, many components in the PCVu range are also available with sockets that allow for solvent weld jointing. This particular technique is widely used on smaller diameter waste and overflow pipework although expansion and copper adaptor couplings include a push-fit joint to allow for thermal movement.

As polypropylene cannot be solvent welded, the push-fit method of jointing is used throughout the system.

Marley dBlue is a push-fit acoustic drainage system.

Thermal movement

The coefficient of linear expansion for PVCu is 0.06mm/m°C. As a result a 3m length of pipe will increase in length by approximately 3.6mm when subjected to a 20°C temperature variation. Therefore, it is important to ensure that any movement is controlled and push-fit joints are installed to accommodate any expansion that may occur due to increases in ambient temperature or hot water discharges.

Sizing of soil stacks

It is recommended that the guidance given within BS EN 12056, part 2 be adopted when sizing soil stacks. Marley Technical Services Department offer design and installation advice, including the sizing of soil stacks, for customers who use or specify Marley Plumbing & Drainage products.

Stack capacity

The capacity of a soil stack can be increased by the installation of a secondary ventilated stack. The stacks. Marley Technical Services Department offer design and installation advice, including the sizing of soil stacks, for customers who use or specify Marley Plumbing & Drainage products.

Branches at the base of stacks

Branches at the base of stacks

For multi-storey systems up to five storeys high, minimum distance should be 740mm and for systems higher than five floors no connections are permissible at ground floor level. Where this occurs a separate stub stack should be provided to serve the ground floor or individual appliances should have their own separate connection to the building drain.

Materials and manufacture

Marley Plumbing & Drainage pipes and fittings for domestic sanitary pipework systems are manufactured from different plastics materials including PVCu, PVCc, ABS and Polypropylene.

The table right details the important dimensions and weights of each of the systems together with the relevant British and European Standard. All pipes are manufactured using a continuous extrusion process and fittings are produced by high-pressure injection moulding.

Chemical and temperature resistance

Most plastics used for sanitary pipework are highly resistant to those chemicals normally found in domestic waste water and sewerage systems. For applications where chemical discharges are likely to occur, the Marley Alkatherm HDPE drainage range may be more suitable.

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Generally the maximum working temperature of Marley PVCu, dBlue & HDPE soil and waste systems when subjected to continuous flow is 70°C and 75°C respectively. Higher intermittent discharges of up to 95°C may be accommodated by PVCu, dBlue & HDPE provided the period of discharge does not exceed one minute duration.

Alternatively, reference can be made to ISO publications TR10358 & TR7520 which provide comprehensive information on chemical and temperature resistance of plastics and rubber materials.

Bends at the base of stacks

Bends at the base of vertical stacks should be of long radius and have a minimum centre line radius of 200mm on a 110mm nominal size stack. Two 45° radius bends may also be used as an alternative to provide the change of direction and connection to the building drain. The same design principle should also be adopted where offsets occur in stacks of one or more storey height.

Where pipework is suspended in a ceiling void or car park, it is recommended that two 45° solvent weld bends are used with a short piece of pipe between to ensure the radius exceeds that required.

Dimensions and weights

<table>
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<tr>
<th>Pipe Material Standard</th>
<th>BS nominal size (mm)</th>
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Offsets in stacks

Offsets in the wet portion of a discharge stack should be avoided wherever possible but where they have to be fitted a large radius or two 45° bends should be used to create each change of direction. Offsets in tightly loaded stacks up to three storeys high do not require offset venting but on multi-storey buildings this may be necessary depending on the loading of the stack and the numbers of floors above the offset. The principles previously described for bends and branches at the base of a stack should also be applied.

Stub stacks

An unventilated stub stack terminated with an access fitting may be used to connect a group of ground floor appliances to the building drain provided the vertical drop to the invert level of the drain does not exceed 1.5m from a WC and 2.5m from a waste appliance. Where one or more stub stacks are connected to the same drain, the head of the run should be ventilated to atmosphere or air admittance valves fitted to each stub stack arrangement.

Branch pipe gradients

The gradient of a branch pipe should be uniform and adequate to drain the pipe and appliance efficiently. A minimum gradient of 15mm/metre should be adopted for 32, 40 and 50mm nominal size pipes but larger diameter 82, 110 and 160mm branch runs may be laid flatter at 9mm/metre fall where the discharge flow rate exceeds 2.5 litres/second.

Branch pipe lengths

The following information is taken from Table 8 of BS EN 12056: 2: 2000 and provides general guidance on the recommended lengths of unventilated branch pipes for a variety of sanitary appliances.

Prevention of cross-flow

Where small diameter branch waste pipes connect to a discharge stack they must be arranged to eliminate the risk of cross-flow from one branch to the other. A branch creates a no entry zone for opposing waste connections, which varies depending on the stack diameter. No connections should be made within the restricted zone although entry is permissible on the boundary centre line directly opposite or at right angles.

Design

The Marley Collar Boss was specifically designed to overcome installation problems imposed by the 200mm restricted zone and to allow multiple low level bath or shower waste pipes to be connected to the stack above floor level. Cross-flow is prevented as the circular annular chamber protects the small diameter waste connections from the WC discharge allowing waste water to flow freely and merge below the critical zone. Different combinations of 110mm branches can be used with the collar boss to accommodate various WC positions which may be up to 3 metres from the vertical stack.
Combined branch waste
A combined branch waste is often used to connect a bath and/or shower and basin to the discharge stack as this allows waste pipework to be neatly concealed in a low level duct. Where the technique is adopted a 45° entry tee must be used to ensure the basin discharge is swept in the direction of flow towards the stack. The minimum distance between the bath or shower and basin connection should not be less than 500mm and it is recommended that an anti-syphon bottle trap is fitted to the basin or a vent provided to protect the appliance from self-syphonage.

It is recommended that the distance of the combined waste does not exceed 3 metres, however, experience has shown that longer runs using 40 or 50mm pipework has proved successful provided adequate fall can be obtained to ensure self-cleaning velocity is maintained.

Waste traps
Generally appliances such as sinks, baths and showers do not suffer from self-syphonage as the trap seal is replenished at the end of the discharge due to the flat bottom design of the appliance. Tubular traps are recommended for such appliances as they ensure unrestricted discharge and reduce the risk of blockage and prevent the accumulation of sediment.

- Compression jointed polypropylene traps can be taken apart to remove a blockage or gain access to the waste system
- Range includes P-traps, S-traps, bottle traps, bath & shower traps and different configurations for washing machines, dishwashers, 1½ or 2 bowl sinks
- White with multiple seal depths

Sizes: 32, 40 and 50mm

● White with multiple seal depths

Design

**Waste traps**

The Multikwik anti-vac bottle trap, B032V / B040V, was specially developed to prevent self-syphonage from basins, which can occur particularly where the waste pipe drops vertically from the appliance before falling at an even gradient to the discharge stack. The trap also eliminates the need for a secondary vent pipe where basins are located further than the recommended 3m maximum from the stack. Non-mechanical, the trap operates as air is drawn in through a by-pass tube to eliminate any syphonic action and ensure the trap seal is maintained. The P1940 low level shallow trap has a 19mm water seal and is supplied to satisfy customer demand. It is recommended its use is restricted to ground floors and showers that discharge directly to an external trapped gully. It should not be fitted to a bath or shower where the waste pipe is connected to a gully. The trap also eliminates the need for a secondary vent pipe where basins are located above floor level and eliminate the need for specially fabricated fittings.

**WC manifold system**

Developed for use in sanitary pipework systems in schools, hospitals, public and commercial buildings, the manifold system allows ranges of toilets to be connected to a horizontal float above floor level and eliminate the need for specially fabricated fittings. The components are suitable for installation in a duct, or for fitting on the surface of the wall directly behind the pan. Where the manifold is fitted directly behind the range of toilets, the minimum distance between the end of the WC spigot and the face of the wall is 150mm. To facilitate varying angles and gradients the 110 x 90mm manifold branch has a radial socket to match both options of adjustable WC bend. When the selected bend is cut to the appropriate line and solvent welded into the socket on the manifold branch a uniform fall is obtained between each toilet on the horizontal float.

To accommodate different dimensions between the WC spigot and horizontal float, the adjustable spigot bend SM43W may be trimmed by up to 35mm or the extension pipe SM45W can be used with the pan connector SM44W and SA323W cap & seal. The WC socket on both the SM42W and SM44W must be trimmed to suit the length of pan spigot before the SA323W is fitted.
Durgo air admittance valve

The Durgo valve is designed to reduce the number of ventilating pipes and subsequent roof penetrations in domestic, commercial and public buildings. Suitable for use in sanitary pipework systems up to ten storeys high, the valve must be fitted in a vertical position above the flood level of the highest appliance connecting to the stack. Valves should be installed within the building in a ventilated duct or roof space where there is no risk of freezing and must be accessible for inspection and testing.

The 50, 82 and 110mm size valves have been assessed by the British Board of Agrément and awarded Certificate No.06/4325 which permits their use in accordance with the Building Regulations. A copy of the full certificate is available and provides comprehensive information on their use and installation.

When installed the valve will remain closed unless the system is subject to negative pressure whereby the diaphragm will lift and allow air to be drawn in to eliminate syphonic action. Positive pressure ensures the valve closes and prevents foul air escaping from the system. Each valve is supplied boxed with a polyethylene insulation cover that should remain in position after installation, as this will protect the valve against freezing, particularly when installed in a roof space.

To ventilate the underground drainage system and to minimise the effects of back pressure should a blockage occur, the branch or main drain serving a stack or stacks fitted with Durgo valves may require conventional venting at a point upstream of the stack connection.

For up to and including four dwellings, 1, 2, or 3 storeys in height, additional drain venting is not required. Where a drain serves more than four such dwellings equipped with the valve, the drain should be vented according to the following rules:

5 to 10 such dwellings – conventional ventilation to be provided at the head of the system.

11 to 20 such dwellings – conventional ventilation to be provided at the mid-point and at the head of the system.

For multi-storey domestic dwellings (other than those referred to previously) and non-domestic buildings, conventional drain venting should be provided if more than one such building, each equipped with the valves, is connected to a common drain which itself is not vented by means of a ventilating stack or a discharge stack not fitted with a valve.

Stacks should not be fitted with valves when the connecting drain is subject to periodic surcharging or is fitted with an intercepting trap. An open vent must be provided and this also applies to stacks that discharge to a cesspool or septic tank.

Bath/Shower

Low level ‘p’ trap

Indicative row of 20 dwellings 3 storeys high (maximum) fitted with Durgo valves

Fire protection

The Building Regulations 1991 (as amended) require that a building shall be sub-divided into compartments where necessary to inhibit the spread of fire. Plastic pipework is permitted to penetrate separating walls, compartment walls and floors provided the appropriate measures are taken to prevent the spread of fire in accordance with Part 8 of the Approved Document (2010).

To comply with this, pipes must be enclosed within a fire resistant enclosure which extends from floor to ceiling within each storey. The enclosure must have a class 0” internal surface and have each side formed by a separating wall, external wall or by casing. Any casing must have a minimum ½ hour fire resistance and penetrations of the duct must be limited to 1600mm vertical and 1100mm horizontal.

Where longer periods of fire resistance are required, Marley fire collars or pipe wraps can be fitted to provide a fire rating of up to 4 hours depending on the actual construction detail. Tests carried out at the Warrington Fire Research Centre in accordance with BS 476: Part 20: 1987 verified the integrity of each construction detail shown opposite in respect of fire spread.

In addition to the above, tests carried out at FRIDO on a variety of typical sanitary pipework arrangements proved that it was possible to achieve up to 1 hour fire rating through a compartment floor without a fire collar or pipe wrap where the stack was terminated by an air admittance valve. Various other arrangements were also tested and achieved a minimum of 2 hours integrity. The test work and technical evaluation was independently assessed by the British Board of Agrément who issued an Agrément Certificate. Copies of the original certificate and the detail sheets are available from Marley Plumbing & Drainage.

The construction illustrated below achieved a ½ hour fire resistance rating without the need for a fire resistance enclosure. The enclosure is necessary to achieve a 2 hour rating.

Fire protection

Marley Fire Protection Products provide up to 4 hours resistance. Suitable for use with all Marley plastic drainage systems

The construction illustrated below achieved a ½ hour fire resistance rating without the need for a fire resistance enclosure. The enclosure is necessary to achieve a 2 hour rating.

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### Jointing techniques

The ring seal has been successfully employed as the principal method of jointing large diameter PVCu pipes and fittings since their introduction over thirty years ago. This particular technique has proved extremely reliable as the joint can accommodate thermal movement that will occur as a result of temperature variations. An expansion gap of between 5-10mm should be allowed within each ring seal socket as each full length of pipe is installed and fixed using socket and barrel pipe clips.

Solvent weld jointing is also widely used and many components in the range are available with this facility to provide an effective alternative. By selecting these fittings a solvent weld system can be installed, however, ring seal joints must be incorporated to control thermal movement.

While the most popular method of jointing larger size PVCu pipes and fittings is by ring seal, with small diameter waste pipework the principal choice is usually solvent weld. Where this technique is used expansion couplings must be introduced where pipe lengths exceed 2 metres or between fixed points. The same principle should also be adopted when the polypropylene push-fit waste system is installed.

It should be noted that polypropylene cannot be solvent welded and together with the ABS waste system must not be fitted externally unless painted to protect it from ultra-violet degradation.

### Pipe support

Experience has proved that an efficient and reliable PVCu sanitary pipework system depends considerably on the attention that is placed on the correct provision of pipe support brackets. This is particularly important in multi-storey buildings where care must be taken to ensure clips are positioned to control thermal movement at each floor level.

Plastic coated metal socket clips are designed to fit ring seal sockets and act as anchor brackets. These are used in conjunction with PVCu intermediate pipe clips, control expansion and contraction and maintain the vertical alignment of the stack.

Two piece socket clips SC41/61 may be adapted to suit the appropriate pipe size by using a section of barrel clip collar SC621 to provide the necessary spacer sleeve. The table opposite indicates the maximum recommended support centres of different size plastic pipe systems.

### Installation data

#### Solvent soil stack installation

The addition of the SE409 ring seal adaptor allows for thermal movement required in a solvent soil installation.

#### Push-fit soil stack installation

The addition of the SE409 ring seal adaptor allows for thermal movement required in a solvent soil installation.

<table>
<thead>
<tr>
<th>Pipe material</th>
<th>BS Nominal pipe size</th>
<th>Horizontal support (m)</th>
<th>Vertical support (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVCu</td>
<td>21.5</td>
<td>0.50</td>
<td>1.20</td>
</tr>
<tr>
<td>Polypropylene</td>
<td>32</td>
<td>0.50</td>
<td>1.20</td>
</tr>
<tr>
<td>40</td>
<td>0.50</td>
<td>1.20</td>
<td></td>
</tr>
<tr>
<td>PVCu</td>
<td>32</td>
<td>0.50</td>
<td>1.20</td>
</tr>
<tr>
<td>ABS</td>
<td>40</td>
<td>0.50</td>
<td>1.20</td>
</tr>
<tr>
<td>50</td>
<td>0.60</td>
<td>1.20</td>
<td></td>
</tr>
<tr>
<td>PVCu</td>
<td>82</td>
<td>1.00</td>
<td>2.00</td>
</tr>
<tr>
<td>110</td>
<td>1.00</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>160</td>
<td>1.20</td>
<td>2.00</td>
<td></td>
</tr>
</tbody>
</table>
Installation data

Marley dBlue
Marley dBlue is a push-fit system and is installed in the same way as PVCu soil pipe. The only minor difference is type of clips used, which are integral to the effectiveness of the system.

Drill holes applicable for the diameter of the fixing. Fix a rawlbolt into the wall and insert the pipe clip, rotating it clockwise until it is flush with the wall and secure.

Put the pipe or fitting inside the pipe clip under socket and connect the two parts of the open pipe clip with a drill.

Marley dBlue boss connections
Marley boss connectors are available in white, black & grey. The blue colour variant is not only a different colour, but it is a different size, which should be used to connect to dBlue metric waste pipe only.

Please note that this applies to the boss connections on all Marley dBlue fittings, including the collar boss, branches and boss pipe. For integrity, all boss adaptors must be solvent welded into boss upstands.

To connect a Marley dBlue soil stack to Marley dBlue waste pipe, use the SA421BL (40mm) or SA422BL (50mm).

To connect a Marley dBlue soil stack to Marley ABS & PVCc waste systems use the SA411 (32mm), SA421 (40mm) or SA422 (50mm) in white, black or grey.

Marley pipe support system
The Marley pipe support range was developed to meet the specific requirements of PVCu suspended sanitary pipework and drainage systems. Manufactured in zinc electro plated mild steel for internal use, the versatile range of components can be assembled to provide a robust, lightweight system suitable for most applications. The system also provides suitable control of expansion and contraction.

The arrangements of brackets and channel supports have been extensively tested and the assembly techniques used have been successfully employed on many domestic and commercial installations.

Single support
Recommended for waste or larger diameter pipework fixed within 500mm of the floor soffit.

Double support
Developed for use with larger diameter pipework fixed within 1.0m of the floor soffit.

Pipe brackets
The 110mm two piece pipe brackets are designed to fit round the ring seal socket of a pipe or fitting. Where intermediate support brackets are located, the SC621 PVC barrel clip collar is used as a spacer sleeve between the pipe and bracket.

Angle and side bracing
Angle braces should be provided at 6m centres to prevent linear and thermal movement. Side bracing may also be necessary on long runs where there are no side connections to eliminate lateral movement.

Vertical pipes
The transition between vertical and horizontal pipework should be achieved using two 45° bends or a single 87½° long radius bend with a support bracket positioned as close as possible.

Branch connections
All branch connections into horizontal pipework should be made at 45° to ensure the discharge is swept in the direction of flow.

Structural fixings
It is recommended that 6mm rawlbolt or similar proprietary fixings are used to secure base plate and angle cleats to the structure.
Boss branches

The Marley range of five boss branches are designed to allow multiple waste pipe connections to be made to the discharge stack from different directions. Four different side entry combinations are possible together with a rear if required. Staggered waste pipe connections, directly opposite are not permitted as cross-flow could occur.

Compatibility

Boss pipes, boss connectors and strap-on bosses fitted with multi-fit "T" ring seals are suitable for use with PVCc or ABS waste systems to BS EN 1566 or BS EN 1451-1, polypropylene to BS EN 1451-1 and metric size copper to BS EN 16090.

Un-perforated boss upstands on boss pipes, branches and reducers may be drilled to accept 32, 40 and 50mm boss connectors SA411, S4421 and S4420 using a 51mm diameter hole saw. Knuckle bends KBK25 and KBK35 may also be used as 90° boss connectors for 40 and 50mm PVCc or ABS waste pipework.

Horizontal connections

The SWS4135 boss pipe is recommended for use in horizontal situations where connections to 110mm diameter pipe is made at 45°. This fitting has a 50mm solvent weld socket to accept PVCc or ABS waste pipes.

Installation data

Boss pipe connections

Four different types of fitting are available to provide alternative methods of connecting small diameter waste pipes to 82, 110 and 160mm vertical discharge stacks.

Single boss pipes.

Available with ring seal or solvent weld sockets for push-fit or solvent weld joining, single boss pipes allow 32, 40 and 50mm waste pipe connections to be made at 87½° direct to the vertical stack.

Multiple entry boss pipes.

Supplied in ring seal or solvent weld options, all have 90° boss upstands moulded on each fitting with one inlet port open. Connection is made using the appropriate size Marley boss connector to suit 32, 40 or 50mm waste pipes.

Patch bosses.

Suitable for solvent weld joining to new and existing 82mm diameter PVCu discharge stacks to accept 32, 40 and 50mm size PVCc or ABS waste pipework.

WC connections

Two different types of connectors are available to allow connection to vitreous china or stainless steel WC pans, slop hoppers and other similar sanitary equipment. Manufactured in PVC and ethylene vinyl acetate) to accommodate a range of outlet sizes between 84 and 110mm sanitary pipework or underground drainage. The 90° ST40W, ST41W and S410W connectors are supplied complete with flexible seal and retaining cap. Where the S410W or ST41W pan connectors are used, the WC socket must be trimmed to suit the length of pan spigot before the S410W is solvent welded in position. Ground floor toilets often have their own connection to the building drain to eliminate pipework and ducting. Where this occurs both types of connector are suitable for push-fit or solvent weld joining to the 110mm PVC drain.
**Installation data**

**WC manifold system**

Up to six WCs can be connected to a soil stack using the WC manifold system and a single branch connection. By using a double branch connection, an additional six WCs can be connected. The table below details the angles of the manifolds for this installation.

<table>
<thead>
<tr>
<th>Number of WCs</th>
<th>Angle of Manifold Branch</th>
</tr>
</thead>
<tbody>
<tr>
<td>WC 1</td>
<td>60°</td>
</tr>
<tr>
<td>WC 2</td>
<td>55°</td>
</tr>
<tr>
<td>WC 3</td>
<td>50°</td>
</tr>
<tr>
<td>WC 4</td>
<td>45°</td>
</tr>
<tr>
<td>WC 5</td>
<td>40°</td>
</tr>
<tr>
<td>WC 6</td>
<td>35°</td>
</tr>
</tbody>
</table>

**Dimensions (T) based on 230mm centre outlet WC pans and SM43W adjustable spigot bends cut to the angles shown.**

1. Select the adjustable bend angle required from the above diagram according to the WC position. Cut the bend with a hack saw, removing the unwanted portion.
2. File away any rough edges from the face of the fitting and wipe clean the bend and branch, with a dry cloth. Before painting, the bend and branch should be checked for position and alignment, both parts being marked to ensure accurate assembly.
3. Apply a uniform coat of Marley solvent cement, to the short branch radial socket and to the external surface of the bend body.
4. Assemble the branch immediately, insuring that the marked lines on the fitting coincide. Do not twist the two parts of the branch during this operation, but maintain steady pressure until the spigot of the bend comes to rest against the internal surface of the branch socket. Quickly wipe off any surplus solvent cement from the inside and outside of the completed joint and hold in position for approximately 15 seconds.
5. Trim the WC socket to suit the toilet pan spigot length and remove any swarf with a file. Place the seal in the socket, apply a uniform coat of solvent cement about 75mm wide to the outside of the socket and inside the retaining cap. Push onto the socket and wipe off any surplus solvent cement.

**Site Work**

**Inspection and testing**

Inspection and testing should be carried out in accordance with BS 12056: 2000 and Building Regulations noting especially the details given in respect of air testing and the fact that smoke testing of plastics pipework should be avoided as the materials can be adversely affected.

**Air test**

The installation should be capable of withstanding an air test of positive pressure of at least 3kPa water gauge for at least 3 minutes. During this time every trap should maintain a water seal of at least 25mm.

**Handling**

PVC-U pipes are strong, though lightweight and therefore very easily handled. However, reasonable care should be exercised while handling, particularly in extremely cold conditions. Pipes should preferably be loaded and unloaded by hand but if mechanical handling is used, protected slings are recommended.

**Maintenance**

Provided that the system is designed and installed correctly, no maintenance will be required.

**Storage**

Pipes should be stacked on a reasonably flat, level surface on timber battens not less than 75mm wide spaced at a maximum of 1.5m centres. Side support should also be provided at intervals of not more than 1.5m.

Different size pipes should be stacked separately. However, where this is not possible, larger diameter pipes should be placed at the bottom. Spigot and socket pipes should be stacked separately. However, where this is not possible, larger diameter pipes should be stacked with sockets at alternate ends protruding to ensure pipes are evenly supported along their length.

Pipes should not be stacked more than 7 high and when stored in the open for long periods, or exposed to strong sunlight, they should be covered with an opaque sheet. Fittings supplied in cardboard boxes or polythene bags should be stored covered and kept packed until required. Solvent cement should be stored in a cool place out of direct sunlight and away from any heat source.

**Packing, storage and transportation specific to Marley DBlue**

In order to facilitate transport and storage, all the fittings are packed in cardboard boxes. Pipes are packed in bundles on pallets. Marley DBlue pipes and fittings must not be transported unpacked (in bulk) along with other construction materials to prevent damage during transportation. The pipes must be transported in a horizontal position.

During unloading they must be protected against damage, particularly at temperatures below freezing.

Never throw, drag or bend pipes and fittings when unloading them.

Pipes should be stored horizontally on even surfaces up to 1.5m high. All products should be protected against sunlight. Their outdoor storage time should not exceed 12 months.

**Safety**

The relevant regulations are outlined in the Health and Safety At Work Act 1974 and The Construction (Design and Management) Regulations 1994 and should be followed. Hazard sheets, dealing with the correct storage, use, and any hazards of working with solvent cement, silicone lubricant and fire protection products are available from Marley Plumbing & Drainage.
HDPE jointing methods

Electrofusion

Electrofusion, the most simple and rapid jointing technique, is mainly used on construction sites for a highly efficient method of assembly for pipes, fittings and prefabricated sections.

Electrofusion couplers

The PE range includes couplers in the diameters 40 to 315 mm. 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. One welding indicator on each welding surface for checking both welding connections.
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 315 mm for better visibility.

Electrofusion control box

The Akafusion control box CB315 can not only weld Akatherm electrofusion couplers in the diameter range 40 to 160 mm but also the diameters 200, 250 and 315 mm. The new techniques applied in the design ensure an efficient and reliable control box.

Multiple welding

The CB315 is capable of welding several electrofusion couplers simultaneously in the same time that is needed for producing one electrofusion weld. The combined diameters of the couplers to be joined should not exceed 200 mm. For example in the case of a 45° tee, both the diameters 75 mm and the branch 50 mm can be welded at once.

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. 0.2 mm 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.

6. **Prevent joint movement during welding**

7. **Prevent misalignment**

8. **Prevent coupler from sliding down when installed vertical**

9. **Prevent load on vertical pipesystem**

10. **Don’t weld coupler twice**

**Butt-welding**

Butt-welding is a very economical and reliable jointing technique for making welded joints, requiring only butt-welding equipment. All Akatherm pipes and fittings can be joined by this welding method. Fittings for which a k-dimension is shown in the table 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 affected 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 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.

**Fitting types**

- All Akatherm pipes and fittings can be joined by this welding method.
- Butt-welding is extremely suitable for prefabricating pipe sections and for making special fittings.

**Electrofusion**

- Electrofusion, the most simple and rapid jointing technique, is mainly used on construction sites for a highly efficient method of assembly for pipes, fittings and prefabricated sections.
- Electrofusion couplers are extremely suitable for applications in waste water and rainwater drainage.

**Multiple welding**

- Multiple welding is available on the CB315 control box.
- The CB315 is capable of welding several electrofusion couplers simultaneously in the same time that is needed for producing one electrofusion weld.

**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. 0.2 mm 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.

6. **Prevent joint movement during welding**

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  - 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 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.

**Fitting types**

- All Akatherm pipes and fittings can be joined by this welding method.
- Butt-welding is extremely suitable for prefabricating pipe sections and for making special fittings.
HDPE jointing methods

Welding process
The butt welding of Akatherm 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 dirty or touch 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.

Obtaining correct heating depth
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.

In this table the welding parameters can be found for Akatherm 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.
HDPE jointing methods

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 be approximately 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.

Butt-weld with even welding beads (acceptable)

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)

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".

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)

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

Plug in socket:
The pipe needs to be inserted into the plug in socket using the full insertion depth.

A plug-in joint is not to be used to accommodate the expansion and contraction of a pipe system.

Chamfer pipe end

The pipe-end needs to be chamfered under an angle of 15°. To get an even cut and chamfer a chamfering tool should be used.

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

An expansion socket counteracts the variation in length caused by the thermal expansion and shrinkage of the pipe.

Depending on the ambient temperature the insertion depth varies. The right insertion depth for both 0°C and 20°C is indicated on the expansion socket.

Chamfer pipe end

The pipe-end needs to be chamfered under an angle of 15°. To get an even cut and chamfer a chamfering tool should be used.

Make joint

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

Flange joint

The flanged joint is a detachable joint not that common in soil and waste systems. It is the ideal jointing method to connect the system onto flanged equipment and to install valves. The joint can be made by the following steps:

- Mount backing ring over pipe or fitting
- Weld stub flange to fitting or pipe
- Apply seal
- Mount bolts, nuts and washers and tighten nuts with the bolt torque mentioned in the next table.

<table>
<thead>
<tr>
<th>d (mm)</th>
<th>Bolt torque (Nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>50</td>
<td>30</td>
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<tr>
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<td>250</td>
<td>80</td>
</tr>
<tr>
<td>315</td>
<td>100</td>
</tr>
</tbody>
</table>

Bolt torque for non-pressure applications.

Contraction sleeve

A simple transition to other materials than HDPE can be made using the contraction sleeve. The sleeve provides a non-pull-tight connection and is installed as follows:

- Mark insertion depth on the connecting pipe.
- Connect contraction sleeve to HDPE pipe or fitting using electrofusion or butt fusion.
- Mount the O-ring in the middle of the insertion zone.
- Heat up the contraction sleeve evenly with a torch or an industrial heater. Diameters above 125 mm are best heated up using a second heat source.

Tempered Pipe

The Marley Akatherm HDPE pipe is tempered. This pipe is produced according to the standards EN 1519 and ISO 8770 but 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

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

\[ \Delta l = L \times \lambda \times \Delta t \]

- \( \Delta l \) = length change in mm
- \( L \) = total length of pipe
- \( \lambda \) = linear expansion coefficient
- \( \Delta t \) = temperature difference in °C

Example:

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

\[ \Delta l = 10 \times 0.2 \times 80 = 160 \text{ mm} \]

Electrofusion

The Marley Akatherm 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

All Marley Akatherm products can be welded using this jointing method. Fittings can be shortened by up to the k-dimension (indicated in the specification guide), still allowing butt-welding on a standard butt-welding machine.

HDPE installation

Tempered Pipe

Anchor point bracket

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

Contraction sleeve

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.

Linear expansion

Electrofusion coupler either side of support bracket

Support bracket fixed to building structure - brackets must be of sufficient strength to resist forces generated by thermal movement of PE pipes.

Anchor bracket with 2 electrofusion couplers Art. nr. 41xx95

Anchor bracket with expansion socket

Support bracket fixed to building structure - brackets to be of sufficient strength to resist forces caused by the internal resistance of the expansion socket and thermal movement of PE pipework.

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.

Temp error from pipe manufacture and use of expansion socket.

Guide bracket
Bracket distance
The bracket distances for Akatherm PE 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.

HDPE installation

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

Bracket distances horizontal installation with expansion sockets and support trays

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.

Bracket distances horizontal installation with expansion sockets

Bracket distances vertical installation with expansion sockets
### HDPE expansion socket insertion depths

**HDPE Expansion Details**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Total Length</th>
<th>Min. Insertion Depth @ 20°C</th>
<th>Max. Expansion</th>
<th>Type A (No White Retaining Ring)</th>
<th>Type B (With White Retaining Ring)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40mm</td>
<td>132mm</td>
<td>76mm</td>
<td>56mm</td>
<td>Type B</td>
<td>Type B</td>
</tr>
<tr>
<td>50mm</td>
<td>132mm</td>
<td>76mm</td>
<td>56mm</td>
<td>Type B</td>
<td>Type B</td>
</tr>
<tr>
<td>56mm</td>
<td>132mm</td>
<td>76mm</td>
<td>56mm</td>
<td>Type B</td>
<td>Type B</td>
</tr>
<tr>
<td>63mm</td>
<td>132mm</td>
<td>76mm</td>
<td>56mm</td>
<td>Type B</td>
<td>Type B</td>
</tr>
<tr>
<td>75mm</td>
<td>–</td>
<td>On Fitting</td>
<td>126mm</td>
<td>Type A</td>
<td>Type A</td>
</tr>
<tr>
<td>90mm</td>
<td>–</td>
<td>On Fitting</td>
<td>126mm</td>
<td>Type A</td>
<td>Type A</td>
</tr>
<tr>
<td>110mm</td>
<td>–</td>
<td>On Fitting</td>
<td>126mm</td>
<td>Type A</td>
<td>Type A</td>
</tr>
<tr>
<td>125mm</td>
<td>–</td>
<td>On Fitting</td>
<td>126mm</td>
<td>Type A</td>
<td>Type A</td>
</tr>
<tr>
<td>160mm</td>
<td>–</td>
<td>On Fitting</td>
<td>126mm</td>
<td>Type A</td>
<td>Type A</td>
</tr>
<tr>
<td>200mm</td>
<td>230mm</td>
<td>120mm</td>
<td>110mm</td>
<td>Type A</td>
<td>Type A</td>
</tr>
<tr>
<td>250mm</td>
<td>250mm</td>
<td>125mm</td>
<td>125mm</td>
<td>Type A</td>
<td>Type A</td>
</tr>
<tr>
<td>315mm</td>
<td>270mm</td>
<td>126mm</td>
<td>144mm</td>
<td>Type A</td>
<td>Type A</td>
</tr>
</tbody>
</table>

* Insertion depth and expansion details indicated on fitting

### HDPE handling and storage

**Fittings**

The fittings and electrofusion couplers need to be stored at 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 Akatherm 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. whenever 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 loose pipes**

To prevent oxidation and contamination it is recommended to leave the fittings in their original packaging as long as possible.

**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, modern 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 of machining pipe of 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 Unicollar firecollars are suitable for use with Akatherm HDPE (up to 200mm) and these should be installed in accordance with the instructions provided.

**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).
BS EN 1329-1: 2000
Specification for thermoplastics waste pipe and fittings.

BS 5255: 1989
Specification for thermoplastics waste pipe and fittings.

BS EN 1455-1: 2000
Plastics piping systems for soil and waste (low and high temperature) within the building structure – ABS.

BS EN 1329-1: 2014
Specification for thermoplastics waste pipe and fittings.

BS EN 14680: 2006
Specification for adhesives for non-pressure thermoplastics pipe systems.

BS EN 681-1: 1996
Elastomeric seals. Material requirements for pipe joint seals used in water and drainage applications. Part 1 vulcanised rubber.

BS EN ISO 9001: 2008

BS EN ISO 14001: 2004
Environmental management systems. Requirements with guidance for use.

BS EN 1451-1: 2000
Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure – polypropylene.

BS EN 1519-1: 2000
Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure – polyethylene.

BS EN 1455-1: 2000
Plastics piping systems for soil and waste (low and high temperature) within the building structure – polyethylene.

BS EN 1566-1: 2000
Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure – ABS.

BS EN 1566-1: 2014
Plastics piping systems for soil and ventilating pipes, fittings and accessories.

BS EN 1329-1: 2014
Specification for PVCu soil and ventilating pipes, fittings and accessories.

British & European Standards

Accreditations

Certification

Certificate No. 0646325
BS EN 1329-1: 2000
BS EN 1329-1: 2014
BS EN 1519-1: 2000
BS EN 1519-1: 2014
BS EN ISO 9001: 2008
BS EN ISO 9001: 2004
BS EN ISO 14001: 2004

Marley system solutions

Marley HDPE
Marley Akatherm 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 will also cope with temperature variations of -40°C to 100°C making it ideal for external as well as internal installations.

Marley DBlue
An acoustic soil and waste range with a triple 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 underground systems
The Marley Plumbing & Drainage range of underground systems include the solid wall range, predominately for central heating installations. A tamperproof de-mounting tool. Equator has been designed to meet the requirements of BS 7291: Parts 1 & 3, Class S. The complete Equator system is backed by a 30-year guarantee.

Marley Equator
Equator is ideal for hot & cold water or central heating installations. A tamperproof fitting with a unique grip release mechanism ensuring that the system can only be disassembled through the use of a special de-mounting tool. Equator has been designed to meet the requirements of BS 7291: Parts 1 & 3, Class S. The complete Equator system is backed by a 30-year guarantee.

Marley rainwater
Five gutter profiles and three downpipe options provide a rainwater solution for any application. Advanced Life® 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 sustainable drainage
The Waterloc250 cell is ideal for use in either an underground infiltration or attenuation system. 96% of the cell volume is available to store water, minimising the extent of excavation required for the installation. The range includes Flowloc, a vortex control device, which controls the rate at which water is discharged to a surface water drain or water course.

Marley waste systems
A wide range of PVCu, ABS and polypropylene waste ranges from 32mm to 50mm and in a variety of colours. Available with polypropylene solvent weld and push fit joining.

Marley Equator
Equator is ideal for hot & cold water or central heating installations. A tamperproof fitting with a unique grip release mechanism ensuring that the system can only be disassembled through the use of a special de-mounting tool. Equator has been designed to meet the requirements of BS 7291: Parts 1 & 3, Class S. The complete Equator system is backed by a 30-year guarantee.

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 Evoke; 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.

Multikwik
The Multikwik brand is known and trusted by plumbers for its sanitary frames, cisterns, traps, compression waste systems and market leading range of pan connectors. Complementing the Marley range it provides an excellent solution to modern bathroom design with a wide choice of product options.

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marley.co.uk

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email: marketing@marleypd.com

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Fax: 01622 851111
For delivery to Scotland
Email: orders.uddingston@marleypd.co.uk
Fax: 01698 810307

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