TMAN-01.2 | APRIL 2026

TERRAIN

Terrain FUZE

DESIGN, SPECIFICATION AND INSTALLATION GUIDE

Part of the GENUIT GROUP

Polypipe Building Services

1 The Genuit Group

Here at Genuit Group, we are making the built environment more sustainable by helping create a more resilient planet, society and business. Sustainability is core to our commercial strategy, driving innovation in both how we run our business and products we create. We find solutions for the environmental challenges facing our infrastructure, our buildings and our communities, and deliver these at scale.

To find out more, visit **www.genuitgroup.com**

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At Polypipe Building Services, we harness our ingenuity and creativity to deliver class-leading solutions and product sustainability, with optimised whole-life costs, unrivalled technical support and on-the-ground assistance.

We understand the challenges today's projects face, including climate change, air quality and flooding, and in-industry regulations, skilled labour shortages and the lack of on-site storage facilities. From high-rise residential and commercial office projects to healthcare and leisure facilities, we develop systems that support you, that facilitate easier, more cost-effective ways to install.

Integral to our development process is providing innovative sustainable solutions that support safety, whether from the product itself or in the way it's installed. Our products are designed for a long life, use recycled content and are recyclable at end of life, enabling it to live on in the circular economy. We challenge ourselves on how we help solve on-site problems, whether lack of labour or on-site space, and look to develop solutions that benefit both the installing contractors and the occupants alike.

Polypipe Building Services, part of the Genuit Group. Helping construction build better.

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2 Introduction to FUZE

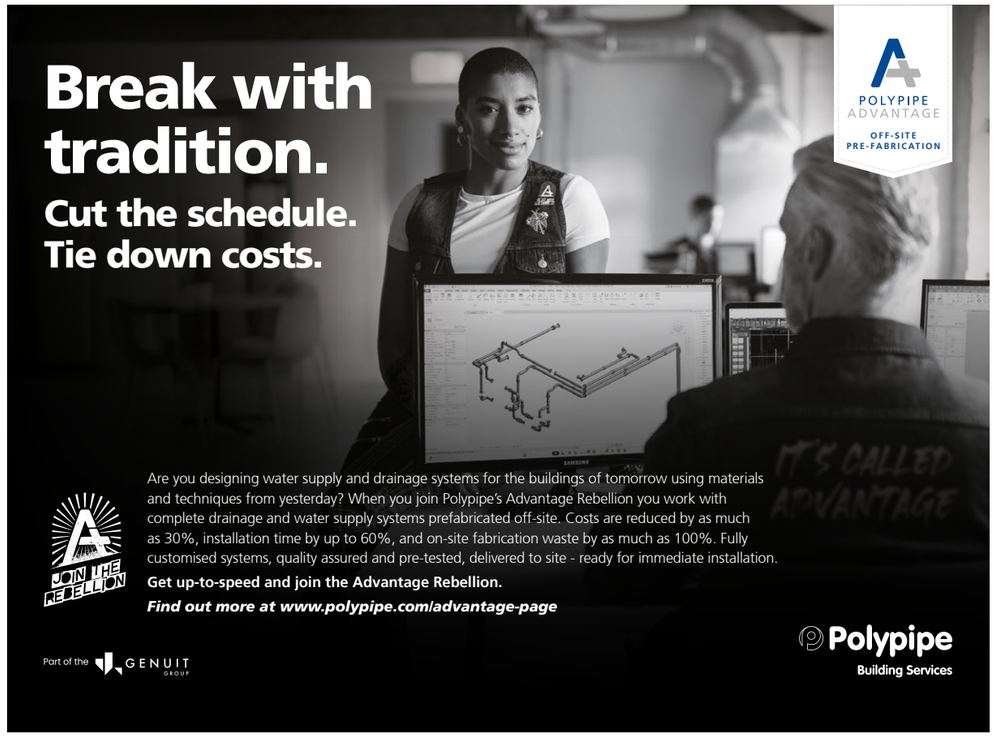
A modern high density polyethylene system with many advantages over cast iron and other traditional systems.

Terrain FUZE is a top-to-bottom solution for all above ground drainage and many chemical waste applications.

Terrain FUZE is manufactured using HDPE for superior performance and exceptional durability. HDPE is resilient to extreme temperatures enabling applications for hot water and within colder environments. For example, without mechanical load, FUZE is able to tolerate temperatures of up to 80°C – even up to 95°C for a maximum of two minutes – against the flow of hot water.

The lightweight nature of Terrain FUZE allows the product to be installed quickly and efficiently, giving direct, resource saving benefits to specifiers and installers.

For further information see contact details on the back cover of this brochure. Available through our Advantage Prefabrication.



2 Introduction to FUZE

Features and Benefits

TERRAIN HIGH DENSITY POLYETHYLENE HDPE: DENSITY 945 – 965 kg/m³

Polyethylene density varies between 945 – 965kg/m³. in accordance with ISO 1183/A. HDPE is a lighter material than water, offering direct benefits in handling, transportation and installation.

RESISTANCE TO COLD

Terrain FUZE pipes are resistant to freezing within the pipeline down to -40°C. When tested, the pipes simply expand with the ice and then return to their original dimensions without any damage.

FLEXIBILITY

Flexibility of a pipeline can be a major factor on certain building projects where concern must be given to the route of the pipeline through expansion joints or areas subject to vibrations.

RESISTANCE TO CHEMICALS

Terrain FUZE offers high resistance against chemical corrosion and is insoluble in most inorganic and organic solutions at 20˚C.

SCOPE OF USE

Ideal for use in hospitals, laboratories, schools, marine, oil rigs and chemical industrial drainage applications.

RESISTANCE TO IMPACT

Terrain FUZE ensures maximum strength against impact stresses and is unbreakable at room temperature. It still maintains a high impact resistance at temperatures as low as -40˚C.

NON-TOXIC

Terrain FUZE pipes are non-toxic, ensuring safe handling during installation. With no risk of contamination to the flow through the pipeline, HDPE is even suitable for use in the food or liquid transportation industries.

BEHAVIOUR IN FIRE

HDPE in open construction is a flammable material. However, the material has been installed throughout UK & Europe for over 40 years and poses no greater risk to fire spread than other similar systems when installed in accordance with local fire regulations.

PROTECTION AGAINST BLOCKAGES

Terrain FUZE has a low coefficent of friction enabling the continual flow of waste through the pipe, reducing the possibility of blockages along the pipeline.

JOINTING METHODS

Terrain FUZE allows for many welding methods of jointing including electrofusion, butt welding, compression, flange and push-fit.

THERMAL EXPANSION

Terrain FUZE has a coefficient of expansion of 0.2mm/m/ºC. The design of above ground drainage systems must be able to accomodate for this. As a general rule, an expansion rate of 10mm per linear metre for every 50˚C should be allowed.

WELDING TEMPERATURE

With a hot plate welding temperature of approximately 210˚C minimum, HDPE is a much safer and easier material to work with compared to metal. This enables processing of the material using simple tools and in a more energy efficient manner.

NON-CONDUCTIVE

HDPE like most plastics has an exceptional reputation as an insulator.

RESISTANCE TO ABRASION

HDPE offers a high level of abrasion resistance, making it an effective material within a commercial application.

CONDENSATE

Terrain FUZE is a good insulator and with the provision of lagging the formation of condensation is reduced.

RESISTANCE TO HOT WATER

Terrain FUZE offers substantial durability against the flow of hot water. A waste pipe with no mechanical load will tolerate temperatures of up to 80˚C and up to 95˚C is permissible for a maximum of two minutes.

EASY HANDLING

Lightweight and quick to install, construction teams choose Terrain FUZE for its ease-of-use as well as its outstanding performance properties.

3 Soil and Waste Drainage

A soil and waste system should be installed on a project to facilitate:

- Ease of access and maintenance to all parts of the system
- Flexible expansion of the system and integration with other pipe systems

Straight sections of horizontal pipe must be installed in perfect alignment with the pipe's axis and parallel to the wall. Vertical sections of the pipeline should be fixed in perfect alignment with the axis. Right angle bends must only be used to connect horizontal and vertical pipes and not within horizontal pipe networks.

Branches in the soil stack must be created using swept entry fittings when the branch is equal to the soil stack size. Eccentric reductions must be used, when the pipe diameter varies in the horizontal branch pipes, to ensure a centred connection of the pipes at the axis line. To minimise reductions in speed, sound and other negative effects variances in the direction of the horizontal and vertical pipe system must be kept to a minimum and use large radius bends. The stack vent should protrude by 2m above the roof structure where possible, and never less than 0.3m. Ventilating pipes to the outside air should finish at least 900mm above any opening into the building within 3m.

Access pipes should be installed in the following cases:

- At the beginning of the main manifolds in the waste system and at the base of every internal soil stack
- Access pipes should be installed every 15m for a linear stretch of pipe with a diameter equal to or less than 110mm and every 30m for larger diameter pipes
- Wherever two or more branches connect

Access pipes must be within easy reach throughout the system and must offer sufficient space for the use of utensils to clean the pipes.

The use of HDPE soil & waste pipe and fittings

The elements of the HDPE total pipe system offer direct benefits to the specifier and installer over more traditional materials. These benefits cover:

- Terrain FUZE HDPE is easier than more traditional materials to transport and handle safely due to its light weight
- Terrain FUZE HDPE is installed quicker and easier than more traditional materials, offering increased time and labour savings on-site
- Terrain FUZE HDPE is resistant to impact shock
- Due to its composition, HDPE is highly resistant to chemical attack and will not erode, ensuring a long life for the system
- Terrain FUZE HDPE offers system flexibility, where alterations can be made easily to a completed system
- A smooth inner surface of the pipe minimises the risk of build-up or scaling
- Terrain FUZE HDPE welded joints will not deteriorate over time as no other materials or solvents are used
- Terrain FUZE HDPE can be used in close proximity to electrical installations or systems as it is not conductive.
- Terrain FUZE HDPE offers a broad range of bespoke and fabricated items to be used in conjunction with the product ranges

Terrain FUZE HDPE offers a wide range of additional drains, traps and adaptors to be used with the standard catalogue of pipes and fittings, enabling HDPE products to be connected to other materials such as PVC, cast iron and cement pipes. This enables Terrain FUZE products to be used in an extensive range of applications, for example, in below ground applications when waste pipes with butt welded or electrofusion welded joints are utilised.

For all Terrain FUZE HDPE pipes and fittings, please see pages 30 - 65.

Table A: **Discharge units (DU) Values**

APPLIANCE	SYSTEM III DU l/s
Wash basin, bidet	0.3
Shower without plug	0.4
Shower with plug	1.3
Single urinal with cistern	0.4
Urinal with flushing valve	-
Slab urinal	0.2*
Bath	1.3
Kitchen sink	1.3
Dishwasher (household)	0.2
Washing machine up to 6kg	0.6
Washing machine up to 12Kg	1.2
WC with 4.0L cistern	**
WC with 6.0L cistern	1.2 to 1.7***
WC with 7.5L cistern	1.4 to 1.8***
WC with 9.0L cistern	1.6 to 2.0***
Floor gully DN 50	-
Floor gully DN 70	-
Floor gully DN 100	-

* Per person ** Not permitted - Not used or no data.
*** Depending upon type (valid for WC's with siphon flush cistern only)

Example: 10 storey building with:

2	WC	On each floor	2 x 1.5 = 3.0
4	WHB		4 x 0.3 = 1.2
2	Baths		2 x 1.3 = 2.6
2	Sinks		2 x 1.3 = 2.6
2	W/MC		2 x 0.6 = 1.2
			10.6 x 9 = 95.4 DU

Domestic Building Use K = 0.7

0.7 √95.4 .84 l/s

See Table C and D for capacities of pipes.

Table B: **Typical frequency factors (K)**

USAGE OF APPLIANCES	K
Intermittent use, e.g. in dwelling, guesthouse, office	0.5
Frequent use, e.g. in hospital, school, restaurant, hotel	0.7
Congested use, e.g. in toilets and/or showers open to public	1.0
Special use, e.g. laboratory	1.2

Frequency factor (K)

Typical frequency factors associated with different usage of appliances Table B.

Calculation of flowrate
Waste water flowrate (Qww)

Qww is the expected flowrate of waste water in a part or in the whole drainage system where only domestic sanitary appliances are connected to the system

Qww = K√∑DU where:

Qww	=	Waste water flowrate (L/s)
K	=	Frequency factor
∑DU	=	Sum of discharge units.

NB: Under no circumstances should pipe of a larger diameter be connected to pipe of a smaller diameter in the direction of flow.

3 Soil and Waste Drainage

Table C: **Stack with only Primary Vent**

STACK & STACK VENT	SYSTEM I, II, III, IV Q MAX (L/S)	
DN	Square # entries	Swept entries
60	0.5	0.7
70	1.5	2.0
80*	2.0	2.6
90*	2.7	3.5
100*	4.0	5.2
125	5.8	7.6
150	9.5	12.4
200	16.0	21.0

* Minimum size where WC's are connected in system II.
** Minimum size where WC's are connected in system I, III, IV. # Equal branch junctions that are more than 45° or has a centre line radius less than the internal pipe diameter.

Table D: **Stack with Secondary Venting**

STACK & STACK VENT	SECONDARY VENT	SYSTEM I, II, III, IV Q MAX (L/S)	
DN	DN	Square # entries	Swept entries
60	50	0.7	0.9
70	50	2.0	2.6
80*	50	2.6	3.4
90*	50	3.5	4.6
100*	50	5.6	7.3
125	70	7.6	10.0
150	80	12.4	18.3
200	100	21.0	27.3

* Minimum size where WC's are connected in system II.
** Minimum size where WC's are connected in system I, III, IV. # Equal branch junctions that are more than 45°, or has a centre line radius less than the internal pipe diameter.

For branch pipe sizing based on System III the following sizing charts should be used

APPLIANCE	DIA. DN	MIN. TRAP SEAL DEPTH (mm)	MAX. LENGTH (L) OF PIPE FROM TRAP OUTLET TO STACK (m)	PIPE GRADIENT	MAX. NO OF BENDS	MAX. DROP (H) (m)
Limitations for unventilated branch discharge pipes, system III						
Washbasin, bidet (30mm dia. trap)	30	75	1.7	2.2[1]	0	0
Washbasin, bidet (30mm dia. trap)	30	75	1.1	4.4[1]	0	0
Washbasin, bidet (30mm dia. trap)	30	75	0.7	8.7[1]	0	0
Washbasin, bidet (30mm dia. trap)	40	75	3.0	1.8 to 4.4	2	0
Shower, bath	40	50	No Limit[2]	1.8 to 9.0	No Limit	1.5
Bowl urinal	40	75	3.0[3]	1.8 to 9.0	No Limit[4]	1.5
Trough urinal	50	75	3.0[3]	1.8 to 9.0	No Limit[4]	1.5
Slab urinal[3]	60	50	3.0[3]	1.8 to 9.0	No Limit[4]	1.5
Kitchen sink (40mm dia. trap)	40	75	No Limit[2]	1.8 to 9.0	No Limit	1.5
Household dishwasher or washing machine	40	75	3.0	1.8 to 4.4	No Limit	1.5
WC with outlet up to 80mm[6]	75	50	No Limit	1.8 min	No Limit[4]	1.5
WC with outlet greater than 80mm[6]	100	50	No Limit	1.8 min	No Limit[4]	1.5
Food waste disposal[7]	40 min.	75[8]	3.0[3]	13.5 min	No Limit[4]	1.5
Sanitary towel disposal unit	40 min.	75[8]	3.0[3]	5.4 min	No Limit[4]	1.5
Floor drain	50	50	No Limit[3]	1.8 min	No Limit	1.5
Floor drain	50	50	No Limit[3]	1.8 min	No Limit	1.5
Floor drain	100	50	No Limit[3]	1.8 min	No Limit	1.5
4 basins	50	75	4.0	1.8 to 4.4	0	0
Bowl urinals[3]	50	75	No Limit[3]	1.8 to 1.9	No Limit[4]	1.5
Maximum of 8 WC's[6]	100	50	15.0	0.9 to 9.0	2	1.5
Up to 5 spray tap basins[9]	30 max	50	4.5[3]	1.8 to 4.4	No Limit[4]	0

1) Steeper gradient permitted if pipe is less than maximum permitted length.
2) If length is greater than 3m noisy discharge may result with an increased risk of blockage.
3) Should be as short as possible to limit problems with deposition.
4) Sharp throated bends should be avoided.
5) For slab urinal for up to 7 persons. Longer slabs to have more than one outlet.
6) Swept-entry branches serving WC's.
7) Includes small potato-peeling machines.
8) Tubular not bottle or resealing traps.
9) Spray tap basins shall have flush-grated wastes without plugs.

APPLIANCE	DIA. DN	MIN. TRAP SEAL DEPTH (mm)	MAX. LENGTH (L) OF PIPE FROM TRAP OUTLET TO STACK (m)	PIPE GRADIENT	MAX. NO OF BENDS	MAX. DROP (H) (m)
Limitations for ventilated branch discharge pipes, system III						
Washbasin, bidet (30mm dia. trap)	30	75	3.0	1.8 min	2	3.0
Washbasin, bidet (30mm dia. trap)	40	75	3.0	1.8 min	No Limit	0
Shower, bath	40	50	No Limit[2]	1.8 min	No Limit	No Limit
Bowl urinal	40	75	3.0[3]	1.8 min	No Limit[4]	3.0
Trough urinal	50	75	3.0[3]	1.8 min	No Limit[4]	3.0
Slab urinal[3]	60	50	3.0[3]	1.8 min	No Limit[4]	3.0
Kitchen sink (40mm dia. trap)	40	75	No Limit[2]	1.8 min	No Limit	No Limit
Household dishwasher or washing machine	40	75	No Limit[3]	1.8 min	No Limit	No Limit
WC with outlet up to 80mm[6] &[14]	75	50	No Limit	1.8 min	No Limit[4]	1.5
WC with outlet greater than 80mm[6] &[14]	100	50	No Limit	1.8 min	No Limit[4]	1.5
Food waste disposal[7]	40 min.	75[8]	3.0[3]	13.5 min	No Limit[4]	3.0
Sanitary towel disposal unit	40 min.	75[8]	3.0[3]	5.4 min	No Limit[4]	3.0
Bath drain, floor drain	50	50	No Limit[3]	1.8 min	No Limit	No Limit
Floor drain	70	50	No Limit[3]	1.8 min	No Limit	No Limit
Floor drain	100	50	No Limit[3]	1.8 min	No Limit	No Limit
5 basins[9]	50	75	7.0	1.8 to 4.4	[2]	0
10 basins[9] &[10]	50	75	10.0	1.8 to 1.9	No Limit	0
Bowl urinals[9] &[11]	50	70	No Limit[3]	1.8 min	No Limit[4]	No Limit
More than 8 WC's[6]	100	50	No Limit	0.9 min	No Limit	No Limit
Up to 5 spray tap basins[12]	30 max	50	No Limit[3]	1.8 to 4.4	No Limit[4]	0

1) For maximum distances from trap to vent (see Figure 8 of BS EN 1205-2:2000).
2) If length is greater than 3m noisy discharge may result with an increased risk of blockage.
3) Should be as short as possible to limit problems with deposition.
4) Sharp throated bends should be avoided.
5) For slab urinal for up to 7 persons. Longer slabs to have more than one outlet.
6) Swept-entry branches serving WC's.
7) Includes small potato-peeling machines.
8) Tubular not bottle or resealing traps.
9) See Figure 9 of BS EN 12056-2:2000).
10) Every basin shall be individually ventilated.
11) Any number.
12) Spray tap basins shall have flush-grated wastes without plugs.
13) The size of ventilating pipes to branches from appliances can be DN 25 but, if they are longer than 15m or contain more than five bends, a DN 30 pipe shall be used.
14) If the connection of the ventilating pipe is liable to blockage due to repeated splashing or submergence, it should be DN 50, up to 50mm above the spill-over of the appliance.

Ventilated discharge branches: Sizes and limitations upon the use of ventilated discharge branches are given in the tables above. Limitations given in the second table are simplifications, for further information see national and local regulations and practice.

Terrain Drainage Ventilation System

Terrain Soil & Waste products represent the industry benchmark for quality, installation, flexibility and product innovation, backed by the highest levels of customer service. Terrain Drainage includes the Terrain Pleura system, a unique alternative engineered ventilation solution for high-rise buildings.

- Unique products offering unrivalled installation options
- High quality finish
- Suitable for all types of commercial and residential high-rise buildings
- Extensive technical experience to support and advise on all aspects of design and installation
- Terrain P.A.P.A.® Valve accredited to BBA 18/5551

As you would expect from a market leader our products come with all relevant standards including:

Manufacturing Standards

BS EN 12380 A1 Air Admittance Valve (Pleura System)
Terrain FUZE HDPE: BS EN 1519/BBA, Certificate No. 07/4479

Quality Management Systems Standards

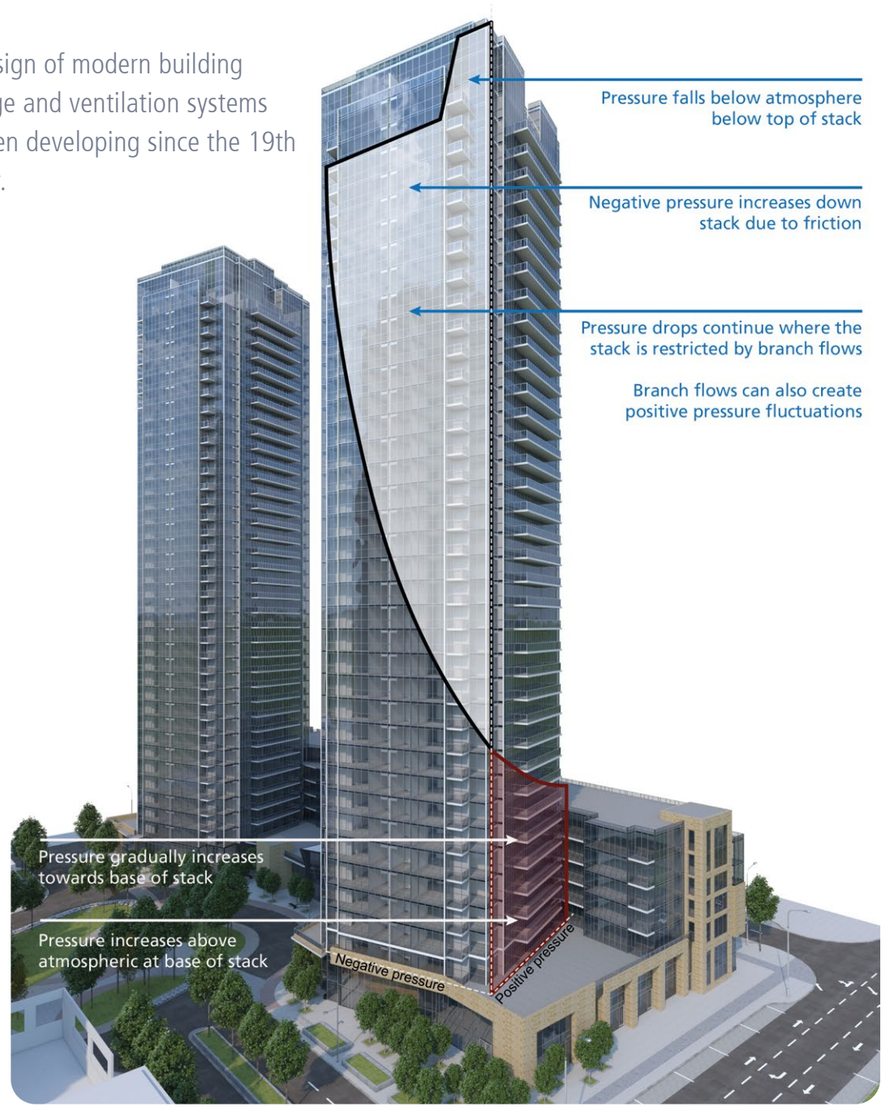
EN ISO 9001:2015 Management System
EN ISO14001:2015 Management System
OHMS ISO 45001:2018 Management System
PASS 99:2012 Integrated Management Registration
BES 6001 Responsible Sourcing of Products

BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE 18/5551

3 Soil and Waste Drainage

Ventilation Drainage Pipework Systems

The design of modern building drainage and ventilation systems has been developing since the 19th century.



A minimum of 50mm of water is all that protects the occupants of a building from potentially harmful sewer gases and 'particulates'. Therefore, a good design must consider the integrity of the trap seal and protect it from being lost. One way of doing this is to consider the air flow within the system, as this is the primary reason for trap seal breach. The flow of air within the drainage pipework system is equally as important as the flow of water in maintaining a safe and hygienic drainage system. This is because the flow of water creates both positive and negative air fluctuations which can compromise water trap seals and upset the equilibrium in the system. Installation of a secondary stack is traditionally the answer to help alleviate the pressure within the system, however, this modern method of drainage ventilation saves cost, time, floor space and is a more efficient solution.

Terrain Pleura Drainage Ventilation System

The smarter air pressure and drainage ventilation system for high-rise buildings.

Following several years of theoretical and practical research into both positive and negative transient pressure fluctuations in drainage systems, the Terrain Pleura system provides both an intelligent and integrated solution for balancing the transient air pressure within a drainage system.

Terrain Pleura drainage ventilation system; how it works:

Terrain Pleura regulators balance negative air pressure fluctuations whilst a positive pressure reduction device balances positive pressures. Together, they protect the water trap seal from damage by forming a highly effective alternative solution for maintaining transient air pressure within the drainage pipework system – whilst trapping foul air and introducing fresh air into the built environment.

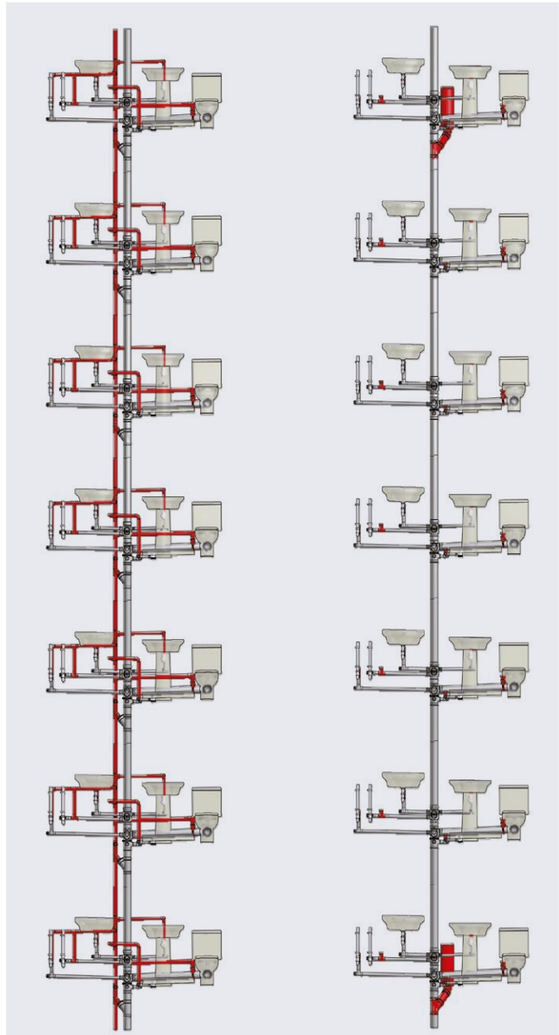
Terrain Pleura Drainage Ventilation System can be installed with all of our fabricated soil and waste drainage stacks.

To find out more…

CLICK HERE

For more information from the British Plastics Federation Pipes Groups on air admittance valves for domestic properties…

CLICK HERE



Conventional stack assembly

Stack assembly using Terrain and Pleura venting systems

TERRAIN PLEURA 50

The Terrain Pleura 50 air admittance valve provides ventilation to branch pipework. It is generally installed on the pipe behind the appliance trap water seal. The Terrain Pleura 50 opens and admits fresh air into the branch pipe when the negative (suction) pressure occurs from an appliance discharging into the pipework system. This equalises the transient air pressure within the pipework and protects the trap seal. When the flow stops and the internal transient air pressure in the pipework balances, the Terrain Pleura 50 closes by gravity and prevents foul air entering the built environment.

TERRAIN PLEURA 100

The Terrain Pleura 100 air admittance valve can be fitted on to the top of a foul or waste stack or at the end of long low gradient branch drains to provide ventilation. The Terrain Pleura 100 opens and admits fresh air under condition of reduced pressure in the discharge pipes and prevents trapped water seals being drawn. As the internal transient air pressure in the pipework balances, the Terrain Pleura 100 closes by gravity and prevents foul air entering the built environment.

TERRAIN P.A.P.A®

The Terrain P.A.P.A is a positive pressure reduction device, designed to mitigate the affects of positive air fluctuations in the drainage pipework system. As water descends down the drainage stack it creates a negative pressure; if that flow is interrupted or is approaching a change of direction, the negative pressure changes to a positive pressure and moves up the pipe. This low amplitude air wave typically travels at 320m/s, the speed of sound.

As the positive air fluctuation approaches the branch-off point for the Terrain P.A.P.A, the bladder within the unit reacts very quickly, within 0.2 seconds, and starts to expand; this creates a pressure differential at the branch-off point. The branch to the Terrain P.A.P.A then becomes the path of least resistance and the majority of the positive air pressure is absorbed within the unit.

As the transient air pressure within the pipework starts to equalise, the bladder slowly releases the small volume of air into the pipework system at only 12m/s, which will have no effect on the trap water seals.

Terrain P.A.P.A.® 9300.4

Terrain Pleura 100 9301.34

Terrain Pleura 50 9301.253

Base of Stack/Transition Areas

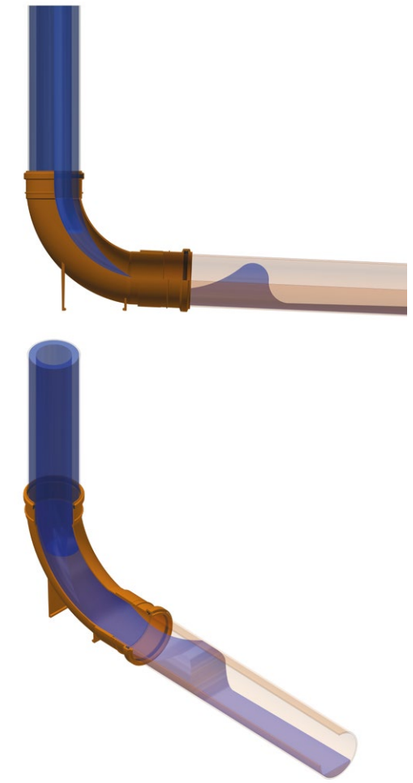
When foul air and water discharge down a drainage stack, it quickly changes direction into the collector drain or below-ground drainage system.

When this occurs the full cross sectional area of the pipe is filled with waste water causing a phenomenon known as the 'hydraulic jump'.

The distance at which the hydraulic jump occurs varies from immediately at the stack change of direction, up to 10 times the diameter of the stack downstream.

This is dependant upon

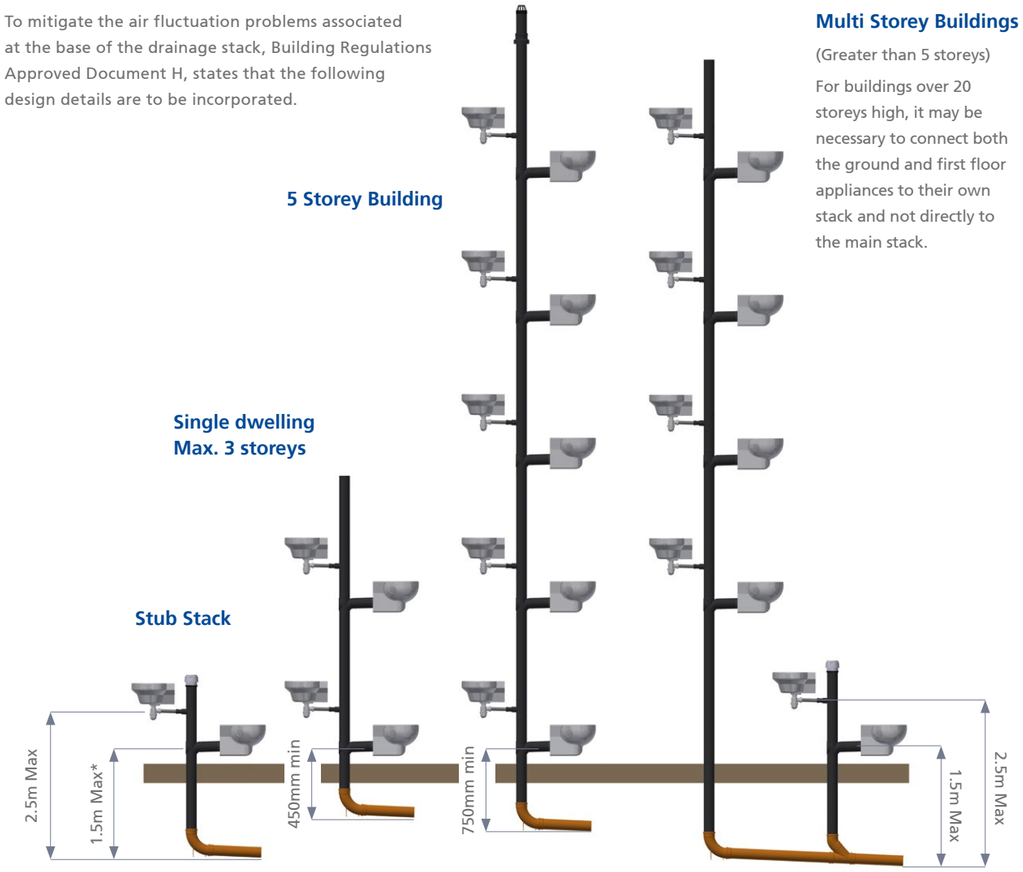
- Volume of discharge
- The entrance velocity
- Depth of water that may already exist within the horizontal drainage pipe
- Roughness co-efficient of the pipe
- Pipe diameter
- Pipe gradient
- Bend formation at the base of the stack



3 Soil and Waste Drainage

Base of Stack Requirements

To mitigate the air fluctuation problems associated at the base of the drainage stack, Building Regulations Approved Document H, states that the following design details are to be incorporated.

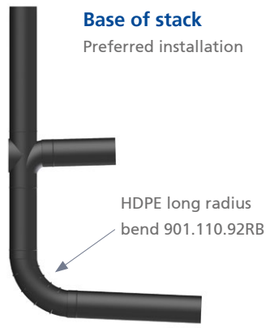


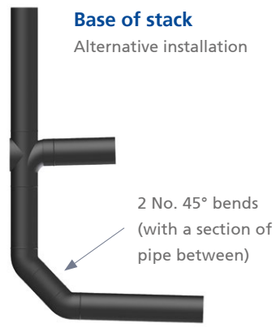
* BS EN 12056-2 states 1.5m from the invert of the pipe to the centre line of the branch.

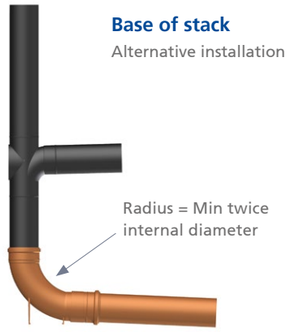
Multi Storey Buildings

(Greater than 5 storeys)

For buildings over 20 storeys high, it may be necessary to connect both the ground and first floor appliances to their own stack and not directly to the main stack.



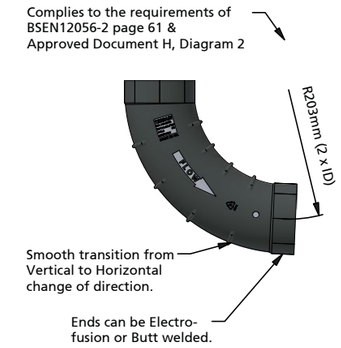


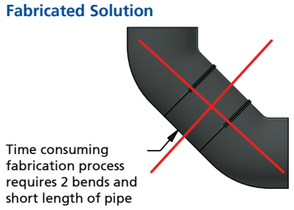


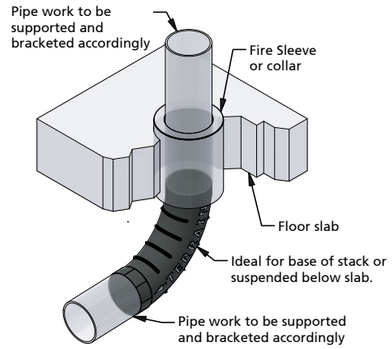
Long Radius Bend

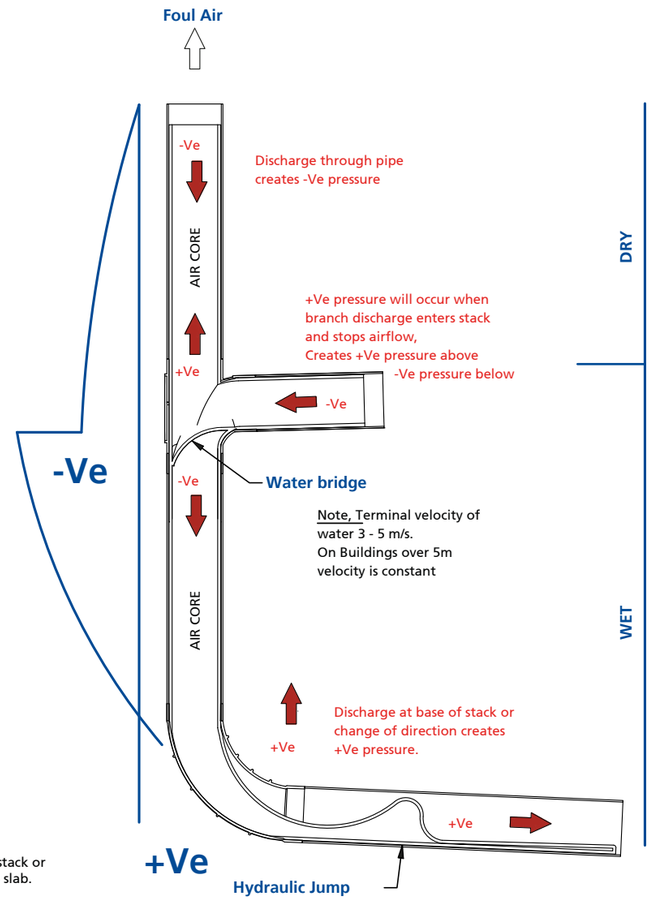
Key features

The 1 piece moulded long radius bend negates the need for a time consuming fabricated product, providing a more smooth and hydraulically profiled installation with 92.5~ fall built in over the existing solutions.







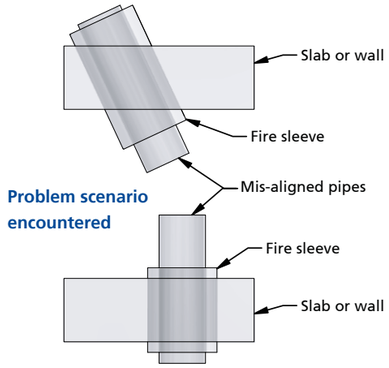


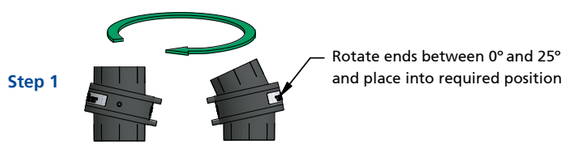
3 Soil and Waste Drainage

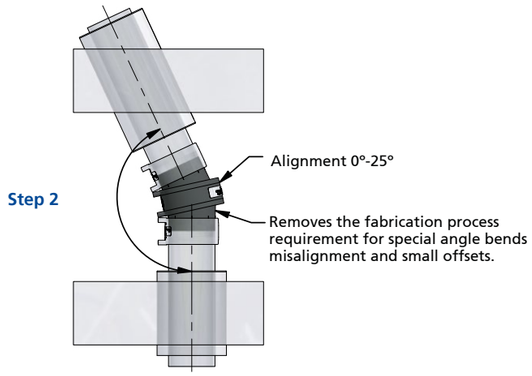
Variable Bend

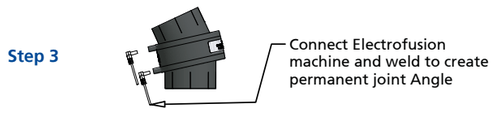
Key features

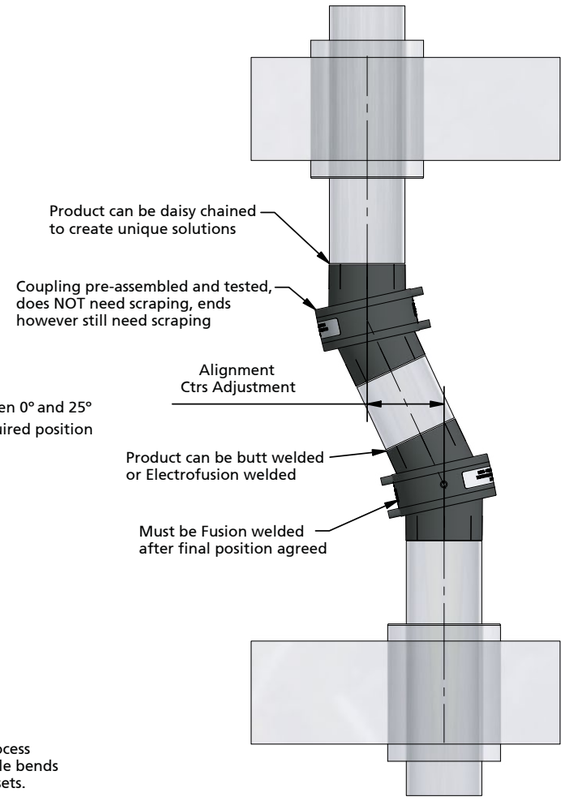
Three piece moulded and pre-assembled FUZE HDPE variable angle bend with a smooth internal transition, ideal for use with alignment issues and POD connectivity.











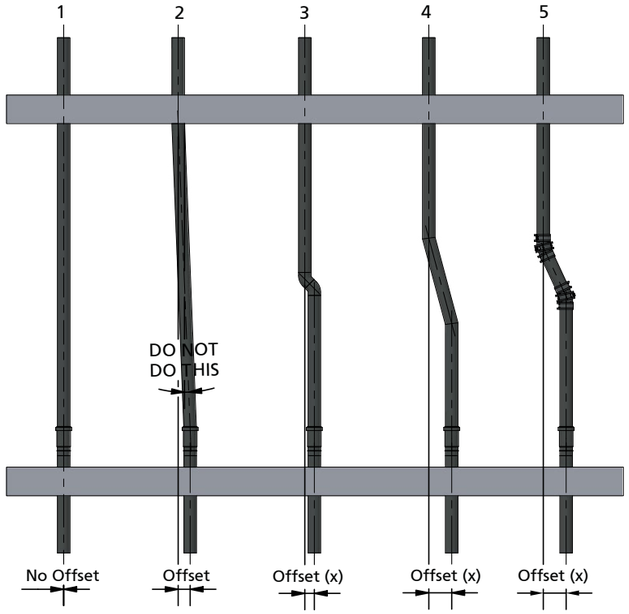
Smoother offset transition as apposed to 2 x 45 degree bends

Variable Bend

Slab floor alignment offsets (*assuming the pipework has no mechanical load, for guidance only).

Please ensure to anchor the pipe as per site instructions: 2017 - Technical Bulletin 8.

By adding any form of offset to pipework, this can cause air-borne noise. You will also need a bigger riser if you intend on using offsets. If offsets can be avoided in the wet portion of a discharge stack as per BS EN 12056-2 ND.3.5.4, we would recommend this.



Current option

OPTION 3		
Pipe OD	2 x 45° Bends MIN Offset (x)	2 x 45° Bends MAX Offset (x)
110mm	38mm	83mm

*MAX indicates bends not being cut back.
*MIN idicates bends being cut back and butt welded.

New option

OPTION 5		
Pipe OD	2 x 0-25° Variable Bends MIN Offset (x)	2 x 0-25° Variable Bends MAX Offset (x)
110mm	0mm	Unlimited with joining pipe length

2 x variable bend give a smoother transition across the offset.

Option 1. Ideal scenario. 0mm offset

Option 2. Slight misalignment. Not recommended in any scenario.

Option 3. If the offset is equal or larger than stated in the above table the, 2x 45° bends can be used to create an offset.

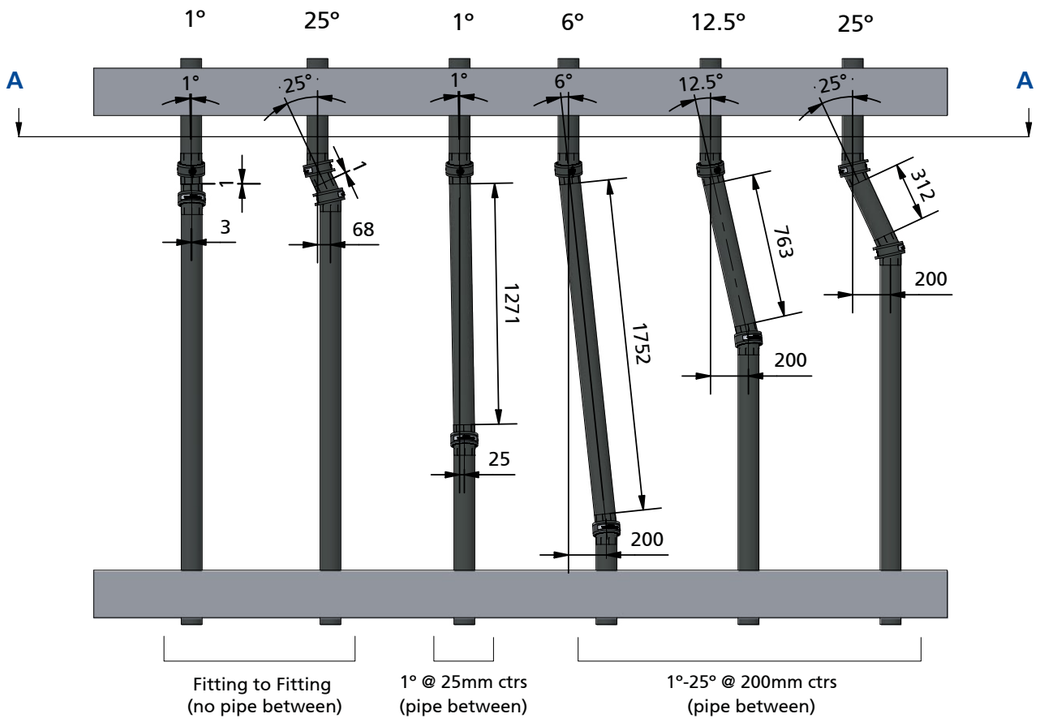
Option 4. If the offset is smaller (or larger) than stated in Table 3, by using our Polypipe Advantage service, we can also fabricate a slow angular offset using pipe lengths.

Option 5. Variable FUZE bend 2x set between 0° and 25°.

3 Soil and Waste Drainage

Variable Bend

Below are possible scenarios achievable with the new FUZE Variable bend, giving a smoother transition between pipes with a less acute angle but also variable dependent on distance available.



If this product is used in the horizontal plain ensure that all products fall in direction of Flow to prevent back flow and blockages.

Section shows the straight alignment achievable with this new product.

Section A-A

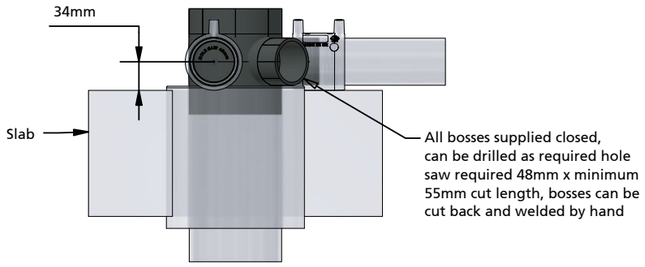
3 Soil and Waste Drainage

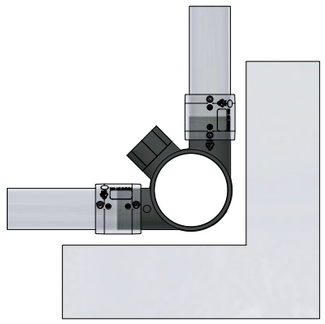
3-Way Boss Branch

Key features

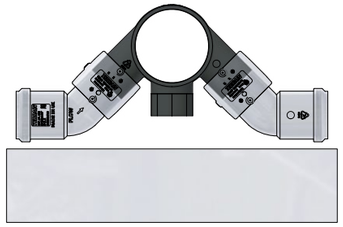
Can be used with 927.56B, or the NEW 927.56.90B & 927.56.135B to create the inlet directions required to solve a multitude of configurations, All outlets can be used simultaneously without crossflow.

Achieves low level installation to the slab

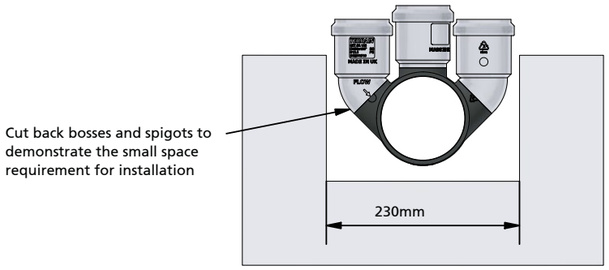




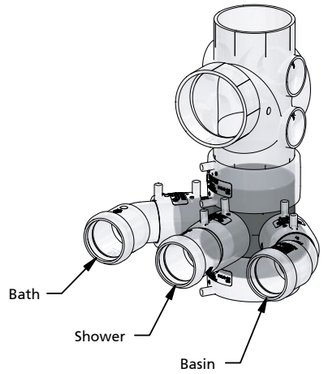
Corner configuration



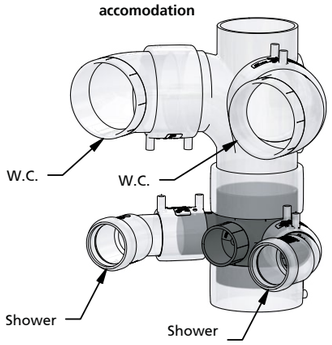
Straight configuration



Ability to run 3 appliances in the same direction close to wall



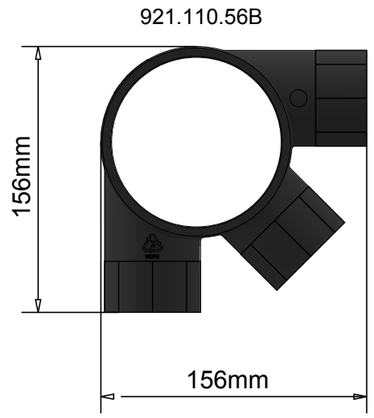
Back to back accomodation

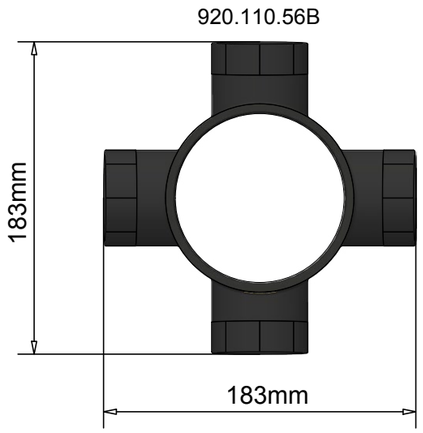


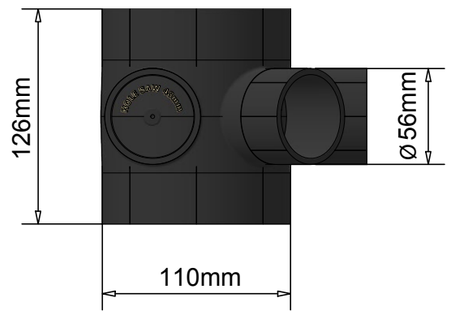
3-Way Boss Branch

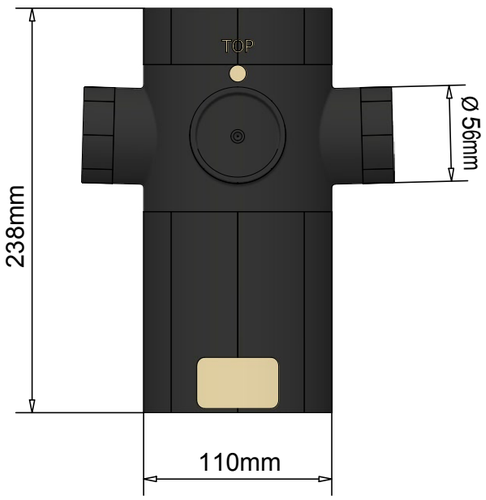
Dimensions

Dimension comparison of 110mm 3-way and 4-way boss branches









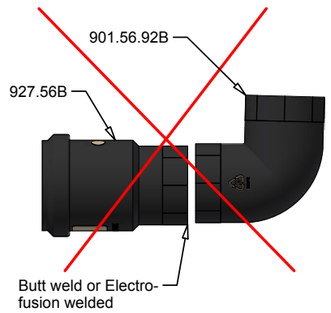
3 Soil and Waste Drainage

Ring Seal Adaptor Bends

Key features

The ring seal adaptors negate the need for a separate ring seal and bend, providing more compact installations over existing solutions, reducing the service area space required. Allowing for adaption to a multitude of materials (as shown). To adapt to smaller diameter use appropriate reducers i.e. 50mm-32mm (223.2.125) for PVC, 56mm-40mm (923.56.40B or 924.56.40B) for HDPE. Compatible with the following, all pipe ends should be chamfered and lubricated.

Single molded solution replaces fabricated route



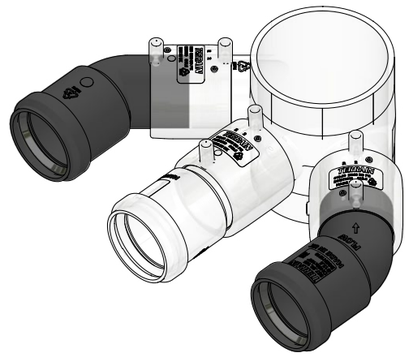
Alternative loose solution 2 parts requiring welding

Ring Seal Adaptor Bends

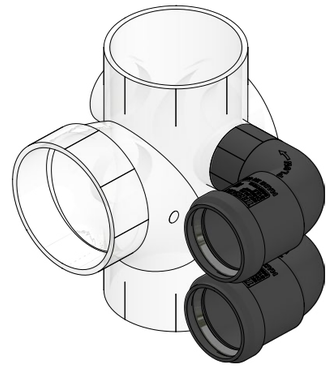
Dimensions

Below shows several ways in which the ring seal adaptor bends can be used, either by butt weld or electrofusion, providing multiple design options for various applications.

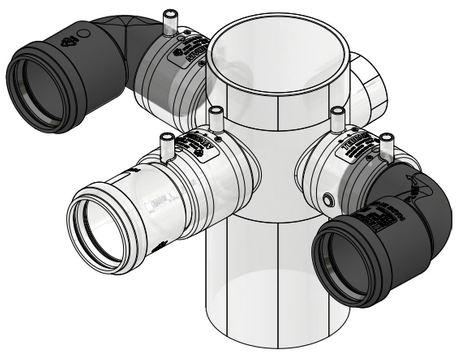
921.110.56B



904.110.925B



920.110.56B

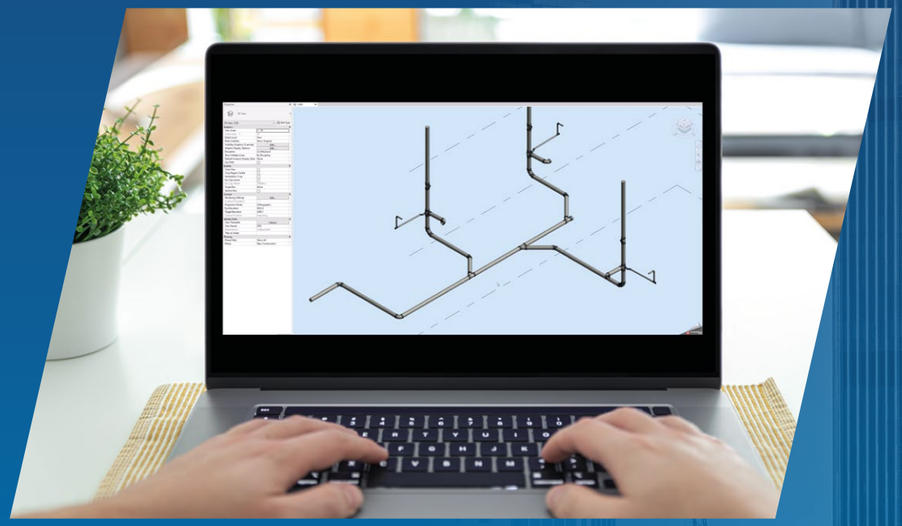


920.110.56B

Build better with **BIM**

100% accurate data-rich 3D models to give a better insight to how our products fit into the overall project.

The packaged files allow users to access the data for our systems, including Terrain FUZE HDPE pipes and fittings.



- ☑ **BIM Level 2 BSI accredited**
- ☑ **Highly accurate material estimates**
- ☑ **Improved project timelines and cost savings**
- ☑ **Visualise your project construction sequence and precisely schedule your installation**

CLICK HERE TO FIND OUT MORE

MECFLOW SUPPLY SYSTEMS

4 Pipes and Fittings

Terrain FUZE Stax

Terrain FUZE Stax is a variation of the Terrain FUZE HDPE drainage system family, this new range of 2-part fabricated stack configurations is designed to make installing the most common high-rise applications simpler and quicker.

Many large-scale drainage stack projects involve repeating very similar configurations of loose components across floors, significant time is spent on the same cutting and welding jobs.

Using data gathered by our Polypipe Advantage Service, we have produced a range of stacks that reflect the most common of these standard configurations to help reduce installation time needed on-site.

We have developed Terrain FUZE Stax as the perfect solution to sit between the current options of ordering loose Terrain FUZE components or using our Advantage service for more unique, complex projects.

Available from Polypipe Building Services stockists, the range covers three standard applications – kitchens, bathrooms, and utility rooms. Within these are a broad range of options including different top and bottom sections, stack diameters, vents and more to ensure maximum flexibility in meeting on site demands.

Terrain FUZE Stax can be obtained from distributors and integrate with loose Terrain FUZE components if needed. Where project requirements are too complex to be met efficiently through Terrain loose or FUZE Stax, the Polypipe Advantage service is on hand to offer bespoke design and fabrication.

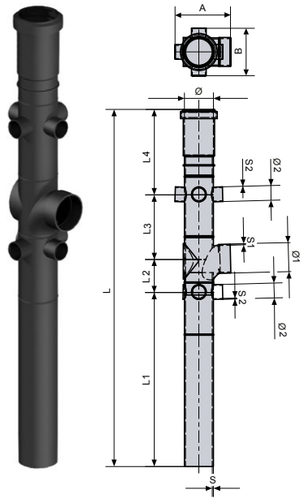
New Terrain FUZE Stax products available with new HDPE fittings added.

View on page 35.

4 Pipes and Fittings

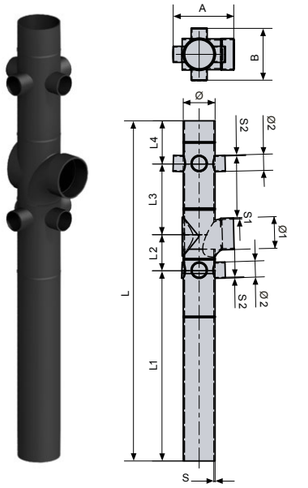
HDPE Stax

PRODUCT	HDPE BATHROOM SINGLE EXPANSION



CODE	Ø/$Ø_1$/$Ø_2$ mm	S/S_1/S_2 mm	L mm	L_1 mm	L_2 mm	L_3 mm	L_4 mm	A mm	B mm	WEIGHT Kg/m
9401.11011056B	110/110/56	4.3/4.3/3	1354	660	125	245	324	210	180	2.578
9401.16011056B	160/110/56	6.2/4.3/3	1358	660	125	250	323	243	241	5.16

Bottom section, use with an access section (9411)

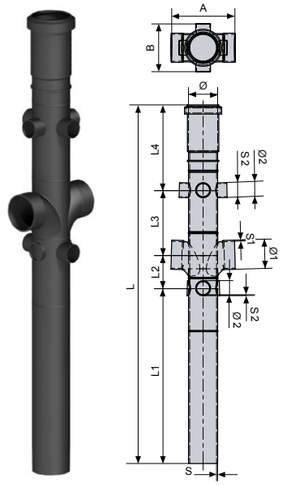


HDPE BATHROOM SINGLE LOCKED										
CODE	Ø/$Ø_1$/$Ø_2$ mm	S/S_1/S_2 mm	L mm	L_1 mm	L_2 mm	L_3 mm	L_4 mm	A mm	B mm	WEIGHT Kg/m
9402.11011056B	110/110/56	4.3/4.3/3	1177	660	125	245	147	210	180	2.37
9402.16011056B	160/110/56	6.2/4.3/3	1177	660	125	250	142	243	241	4.564

Bottom section, use with an access section (9411)

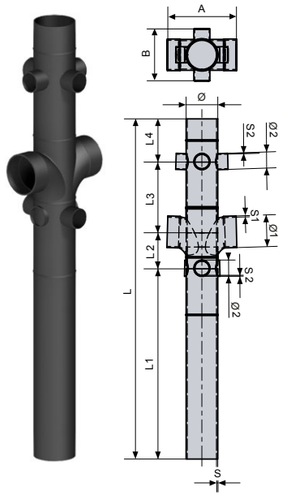
HDPE Stax

PRODUCT	HDPE BATHROOM DOUBLE EXPANSION



CODE	Ø/$Ø_1$/$Ø_2$ mm	S/S_1/S_2 mm	L mm	L_1 mm	L_2 mm	L_3 mm	L_4 mm	A mm	B mm	WEIGHT Kg/m
9403.11011056B	110/110/56	4.3/4.3/3	1354	660	125	245	324	240	180	3
9403.16011056B	160/110/56	6.2/4.3/3	1358	660	125	250	324	259	241	4.805

Bottom section, use with an access section (9411)

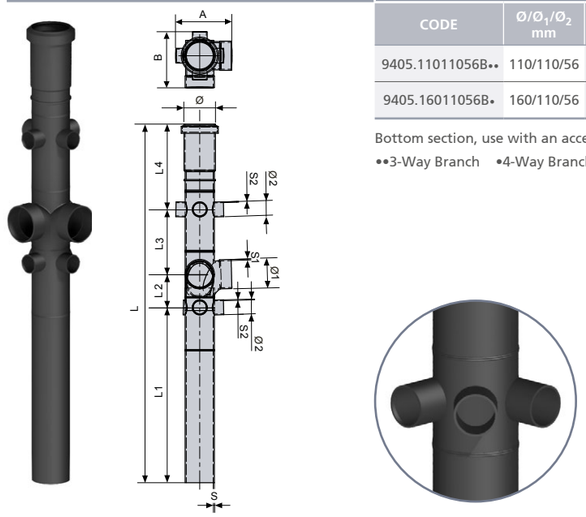


HDPE BATHROOM DOUBLE LOCKED										
CODE	Ø/$Ø_1$/$Ø_2$ mm	S/S_1/S_2 mm	L mm	L_1 mm	L_2 mm	L_3 mm	L_4 mm	A mm	B mm	WEIGHT Kg/m
9404.11011056B	110/110/56	4.3/4.3/3	1177	660	125	245	147	240	180	2.576
9404.16011056B	160/110/56	6.2/4.3/3	1177	660	125	250	142	262	241	4.565

Bottom section, use with an access section (9411)

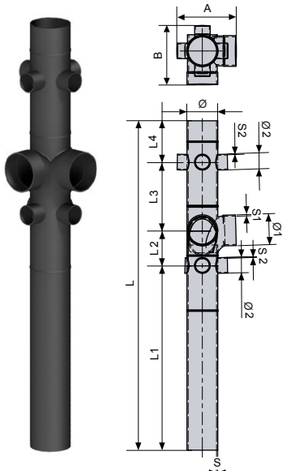
HDPE Stax

PRODUCT	HDPE BATHROOM CORNER EXPANSION



CODE	Ø/Ø$_1$/Ø$_2$ mm	S/S$_1$/S$_2$ mm	L mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	L$_4$ mm	A mm	B mm	WEIGHT Kg/m
9405.11011056B••	110/110/56	4.3/4.3/3	1354	660	125	247	312	190	190	2.340
9405.16011056B•	160/110/56	6.2/4.3/3	1358	660	125	250	323	259	243	4.791

Bottom section, use with an access section (9411)
••3-Way Branch •4-Way Branch

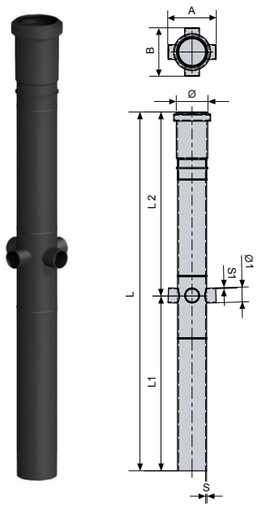


HDPE BATHROOM CORNER LOCKED										
CODE	Ø/Ø$_1$/Ø$_2$ mm	S/S$_1$/S$_2$ mm	L mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	L$_4$ mm	A mm	B mm	WEIGHT Kg/m
9406.11011056B	110/110/56	4.3/4.3/3	1177	660	125	245	147	210	210	2.574
9406.16011056B	160/110/56	6.2/4.3/3	1177	660	125	250	142	245	259	4.664

Bottom section, use with an access section (9411)

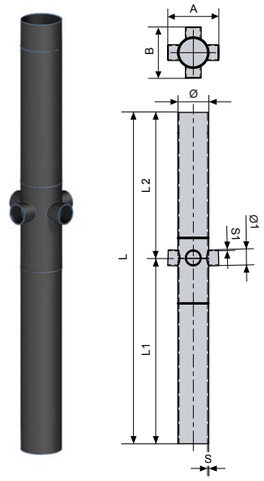
HDPE Stax

PRODUCT	HDPE KITCHEN EXPANSION



CODE	Ø/Ø$_1$ mm	S mm	S$_1$ mm	L mm	L$_1$ mm	L$_2$ mm	A mm	B mm	WEIGHT Kg/m
9407.7556B*	75/56	3.5	3	1025	572	453	93	125	0.907
9407.11056B•	110/56	4.3	3	1354	660	692	180	180	2.251
9407.110563B••	110/56	4.3/3	1352	660	692	170	170	2.082	2.251
9407.16056B•	160/56	6.2	3	1358	660	698	241	241	4.668

Bottom section, use with an access section (9411)
*Single Branch ••3-Way Branch •4-Way Branch



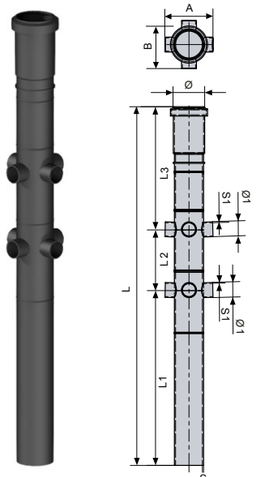
HDPE KITCHEN LOCKED									
CODE	Ø/Ø$_1$ mm	S mm	S$_1$ mm	L mm	L$_1$ mm	L$_2$ mm	A mm	B mm	WEIGHT Kg/m
9408.7556B*	75/56	3.5	3	859	572	287	78	118	0.677
9408.11056B•	110/56	4.3	3	1177	660	517	180	180	1.721
9408.110563B••	110/56	4.3/3	1117	660	517	155	155	1.762	1.721
9408.16056B•	160/56	6.2	3	1177	660	517	241	241	3.412

Bottom section, use with an access section (9411)
*Single Branch ••3-Way Branch •4-Way Branch

4 Pipes and Fittings

HDPE Stax

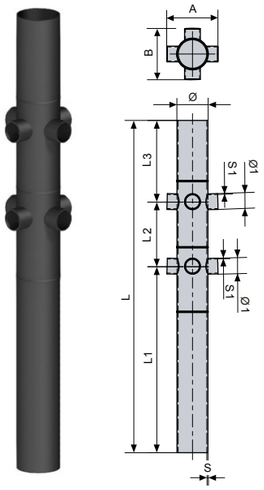
PRODUCT



HDPE UTILITY EXPANSION

CODE	Ø/Ø$_1$ mm	S mm	S$_1$ mm	L mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	A mm	B mm	WEIGHT Kg/m
9409.7556B*	75/56	3.5	3	1025	585	135	305	93	125	0.936
9409.11056B•	110/56	4.3	3	1354	660	229	463	180	180	2.377
9409.110563B••	110/56	4.3/3	1352	660	126	556	170	170	2.152	2.377
9409.16056B•	160/56	6.2	3	1358	660	125	573	241	241	5.417

Bottom section, use with an access section (9411)
*2x Single Branch ••2x 3-Way Branch •2x 4-Way Branch



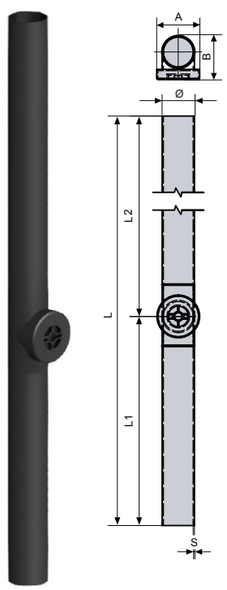
HDPE UTILITY LOCKED

CODE	Ø/Ø$_1$ mm	S mm	S1 mm	L mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	A mm	B mm	WEIGHT Kg/m
9410.7556B*	75/56	3.5	3	859	577	135	147	118	78	0.835
9410.11056B•	110/56	4.3	3	1177	660	229	288	180	180	1.955
9410.110563B••	110/56	4.3	3	1177	660	126	391	155	155	1.825
9410.16056B•	160/56	6.2	3	1177	660	125	392	241	241	4.033

Bottom section, use with an access section (9411)
*2x Single Branch ••2x 3-Way Branch •2x 4-Way Branch

HDPE Stax

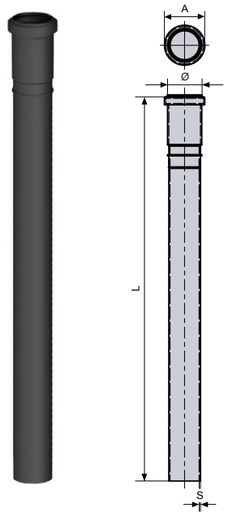
PRODUCT



HDPE ACCESS PIPE

CODE	Ø mm	S mm	L mm	L$_1$ mm	L$_2$ mm	A mm	B mm	WEIGHT Kg
9412.56B	56	3	2341	878	1463	82	108	1.246
9412.75B	75	3.5	2341	878	1463	85	126	1.865
9412.110B*	110	4.3	2023	648	1375	146	150	3.543
9412.160B	160	6.2	2023	648	1375	191	233	7.492

Top section, use with a bathroom, kitchen or utility section (9401-9408) or in a vent stack.



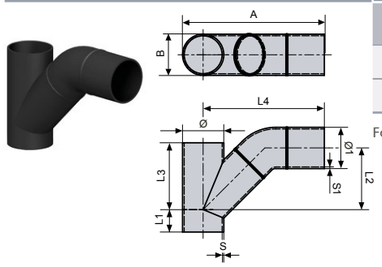
HDPE NO CONNECTION

CODE	Ø mm	S mm	L mm	A mm	WEIGHT Kg
9411.56B	56	3	1027	73	0.806
9411.75B	75	3.5	1025	93	1.119
9411.110B	110	4.3	1354	140	2.161
9411.160B	160	6.2	1358	192	4.558

4 Pipes and Fittings

HDPE Stax

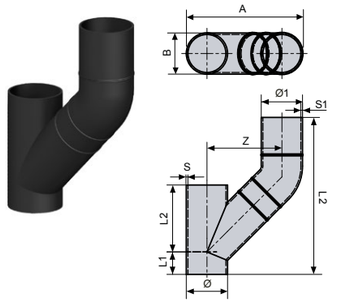
PRODUCT	HDPE VENT TERRAIN P.A.P.A. HORIZONTAL



CODE	Ø/Ø$_1$ mm	S mm	S$_1$ mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	L$_4$ mm	A mm	B mm	WEIGHT Kg/m
9413.110110B	110/110	4.3	4.3	60	165	178	323	379	112	0.755
9413.160110B	160/110	6.2	4.3	70	211	244	364	444	160	1.581

For connecting to Terrain P.A.P.A. valve (9300.4)

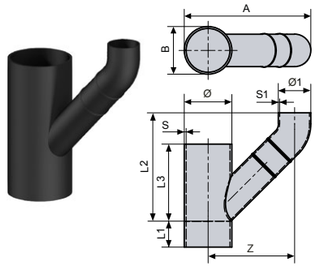
PRODUCT	HDPE VENT TERRAIN P.A.P.A.VERTICAL



CODE	Ø/Ø$_1$ mm	S mm	S$_1$ mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	A mm	B mm	Z mm	WEIGHT Kg/m
9414.110110B	110/110	4.3	4.3	60	178	419	312	113	200	0.755
9414.160110B	160/110	6.2	4.3	70	244	479	386	160	250	1.262

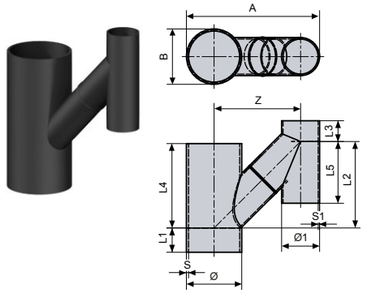
For connecting to Terrain P.A.P.A. valve (9300.4)

HDPE CROSS VENT TERMINATION



CODE	Ø/Ø$_1$ mm	S mm	S$_1$ mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	A mm	B mm	Z mm	WEIGHT Kg/m
9415.11056B	110/56	4.3	3	60	247	178	284	110	200	0.520
9415.11075B	110/75	4.3	3.5	60	251	178	294	110	200	0.580
9415.110110B	110/110	4.3	4.3	60	259	178	311	112	200	0.755
9415.160110B	160/110	6.2	4.3	70	309	244	385	160	250	1.543

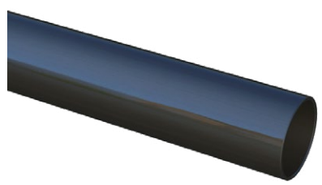
HDPE CROSS VENT



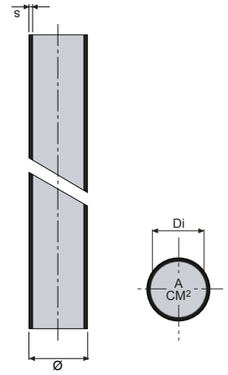
CODE	Ø/Ø$_1$ mm	S mm	S$_1$ mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	L$_4$ mm	L$_5$ mm	A mm	B mm	Z mm	WEIGHT Kg/m
9416.11056B	110/56	4.3	3	60	200	55	178	115	283	110	200	0.586
9416.11075B	110/75	4.3	3.5	60	200	51	178	136	293	110	200	0.652
9416.110110B	110/110	4.3	4.3	60	200	60	178	178	310	110	200	1.05
9416.160110B	160/110	6.2	4.3	70	250	60	244	178	385	160	250	1.785

Terrain FUZE HDPE Pipes

PRODUCT	HDPE PIPE (3m length)



CODE	Ø mm	Di mm	S mm	A cm2	PN	WEIGHT Kg/m
900.40.30B	40	34	3	9	8	0.37
900.50.30B	50	44	3	15.2	6.4	0.46
900.56.30B	56	50	3	19.6	5.7	0.53
900.75.30B	75	69	3	37.3	4.1	0.74
900.110.30B	110	101.4	4.3	80.7	4	1.45
900.160.30B	160	147.6	6.2	171.1	4	3.08

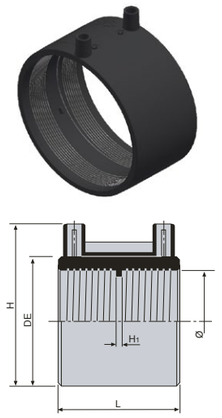


HDPE PIPE (5m length)

CODE	Ø mm	Di mm	S mm	A cm2	PN	WEIGHT Kg/m
900.40.50B	40	34	3	9	8	0.37
900.50.50B	50	44	3	15.2	6.4	0.46
900.56.50B	56	50	3	19.6	5.7	0.53
900.75.50B	75	69	3	37.3	4.1	0.74
900.110.50B	110	101.4	4.3	80.7	4	1.45
900.160.50B	160	147.6	6.2	171.1	4	3.08
900.200.50B	200	187.6	6.2	276.4	3.2	4.1
900.250.50B	250	234.4	7.8	431.5	3.2	6.1
900.315.50B	315	295.4	9.8	685.3	3.2	9.51

Terrain FUZE HDPE Fittings

PRODUCT	HDPE ELECTROFUSION COUPLINGS

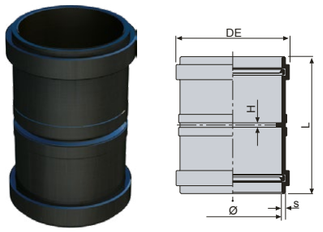


CODE	Ø mm	L mm	DE mm	H mm	H$_1$ mm	WEIGHT Kg
910.40B	40	62	54.5	72.6	2	0.075
910.50B	50	61.8	62.2	78	1.8	0.07
910.56B	56	61.8	68.2	84	1.8	0.077
910.75B	75	61.8	87.8	103.5	1.8	0.106
910.110B	110	61.8	176.5	191	1.8	0.283
910.160B	160	153	227.8	242.2	3	1.467
910.200B	200	153	278.5	292.6	3	1.909
910.250B	250	153	345.5	358.3	3	2.496
910.315B	315	153	350	365	3	2.61

4 Pipes and Fittings

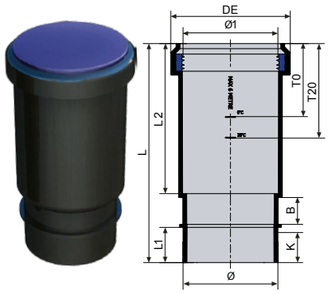
HDPE Fittings

PRODUCT



HDPE RING SEAL SOCKET

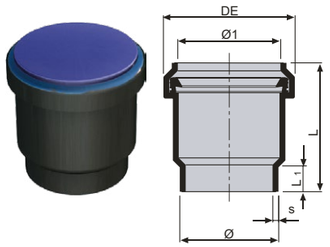
CODE	Ø mm	S mm	L mm	H mm	DE mm	WEIGHT Kg
910P.110B	110	4.3	176	6	130	0.43
910P.160B	160	6.7	230	6	185	1.24
910P.200B	200	6.7	270	6	226	1.815
910P.250B	250	8.3	300	7	284	5.14
910P.315B	315	10.4	320	9	354	7.33



HDPE EXPANSION JOINT WITH CAP

CODE	Ø mm	S mm	DE mm	L mm	L_1 mm	L_2 mm	K mm	B mm	T_0 mm	T_{20} mm	WEIGHT Kg
911.40B	40	3	57	245	35	171	30	35	85	110	0.099
911.50B	50	3	67	245	35	171	30	35	85	110	0.122
911.56B	56	3	73	245	35	171	28	35	85	110	0.136
911.75B*	75	3	93	245	35	171	26	35	85	110	0.181
911.110B*	110	3.5	130	255	41	174	36	32	85	110	0.521
911.160B*	160	6.2	192	264	44	184	35	32	85	110	0.839
911.200B	200	6.2	228	350	80	265	75	-	85	110	1.85
911.250B°	250	7.8	280	440	183	252	178	-	85	110	3.38
911.315B°	315	9.8	350	480	183	345	178	-	85	110	6.1

° Without cap * For rigid support



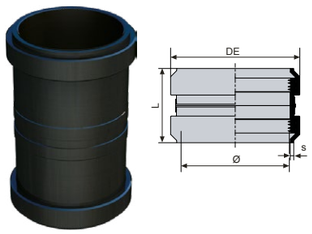
HDPE RING SEAL ADAPTOR WITH CAP

CODE	Ø/$Ø_1$ mm	S mm	DE mm	L mm	L_1 mm	WEIGHT Kg
927.40B	40	3	57	104	35	0.038
927.50B	50	3	67	104	35	0.053
927.56B*	56	3	73	104	35	0.059
927.75B	75	3	93	104	35	0.076
927.110B	110	3.5	130	112	31	0.203
927.160B**	160	6.2	192	184	85	0.785
927.200B	200	6.2	225	170	18	1.075
927.250B°	250	7.8	278	170	22	1.37
927.315B°	315	9.8	350	180	22	1.97

° Without cap * Can be used with PVC pipe ** For rigid support

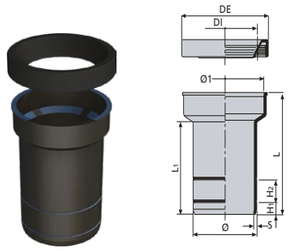
HDPE Fittings

PRODUCT



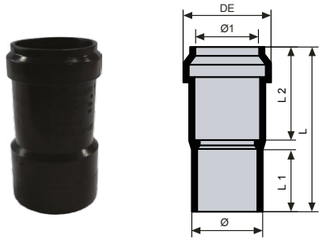
HDPE SLIDING CONNECTOR

CODE	Ø mm	S mm	L mm	DE mm	WEIGHT Kg
911S.110B	110	4.3	196	140	1
911S.160B	160	6.7	110	192	0.936
911S.200B	200	6.7	270	226	1.445
911S.250B	250	8.3	300	284	2.91
911S.315B	315	10.4	320	354	5.1



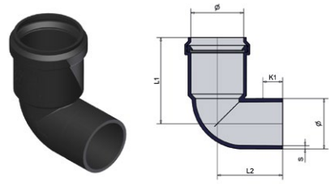
HDPE WC CONNECTOR FOR PVC WITH RING SEAL

CODE	Ø/$Ø_1$ mm	S mm	DI mm	DE mm	L mm	L_1 mm	WEIGHT Kg
925.110100B	110/100	4.3	102±5	140	166	130	0.39



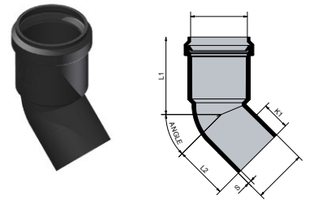
HDPE - PVC RING SEAL ADAPTOR

CODE	Ø/$Ø_1$ mm	S mm	DE mm	L mm	L_1 mm	L_2 mm	WEIGHT Kg
927.4036B	40/36	3	49	93	35	53	0.035
927.5036B	50/36	3	49	93	35	55	0.04
927.5043B	50/43	3	56	93	35	53	0.041
927.5636B	56/36	3	49	93	35	53	0.044
927.5643B	56/43	3	56	93	35	53	0.047



HDPE - PVC 90° RING SEAL ADAPTOR BEND

CODE	Ø/$Ø_1$ mm	S mm	L mm	K_1 mm	ANGLE (Deg)	WEIGHT Kg
927.56.90B	3.0	97	73	22	90	0.104



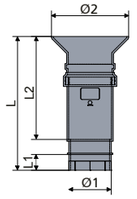
HDPE - PVC 45° RING SEAL ADAPTOR BEND

CODE	Ø/$Ø_1$ mm	S mm	L mm	K_1 mm	ANGLE (Deg)	WEIGHT Kg
927.56.135B	3.0	81	56	30	45	0.091

4 Pipes and Fittings

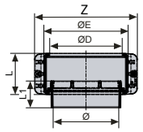
HDPE Fittings

HDPE ALIGNMENT FUNNEL



CODE	Ø2 mm	Ø1 mm	L mm	L1 mm	L2 mm	S mm
911E.100B	200	110	348	41	268	4.3

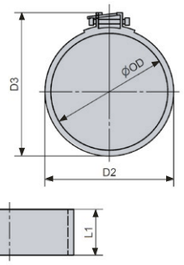
HDPE RIGID FIXING



CODE	Ø mm	DE mm	ID mm	L mm	L_1 mm	Z mm	WEIGHT Kg
990.110B•	110	144	123	70	45	173	0.281
990.4B*	110	144	123	70	45	173	0.281

• HDPE to HDPE * HDPE to PVC

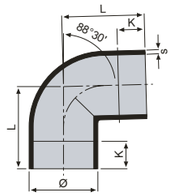
HDPE MECHANICAL COUPLING



CODE	Ø OD mm	OD TOLERANCE mm	L_1 mm	D_2 mm	D_3 mm	SCREW SIZE	HEX SOCKET ADAPTER mm	WEIGHT Kg
9110.90B*	90	89/92	65	101.4	145.4	M6 x 50	5	0.43
9110.110B*	110	109/112	65	121.4	165.4	M6 x 50	5	0.47
9110.160B*	160	159/162	65	171.4	215.4	M6 x 50	5	0.58
9110.90C•	90	85/90	65	101.4	145.4	M6 x 50	5	0.43
9110.110C•	114	110/114	65	125.4	169.4	M6 x 50	5	0.52
9110.160C•	165	160/165	65	176.4	220.4	M6 x 50	5	0.61

* HDPE to HDPE • HDPE to Cast Iron

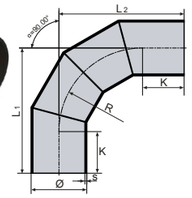
HDPE 92.5° (87.5°) BEND



CODE	Ø mm	S mm	L mm	K mm	WEIGHT Kg
901.40.92B	40	3	54.6	30	0.038
901.50.92B	50	3	59.5	30	0.053
901.56.92B	56	3	62.4	30	0.062
901.75.92B	75	3	71.7	30	0.09
901.110.92B	110	4.3	95	30	0.244
901.160.92B	160	6.2	118.3	30	0.651

HDPE Fittings

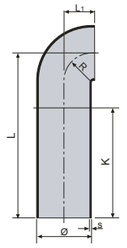
HDPE 90° RADIUS BEND



CODE	Ø mm	S mm	L_1 mm	L_2 mm	K mm	R mm	WEIGHT Kg
907.200.90B*	200	6.2	452	452	150	300	3.05
907.250.90B*	250	7.8	627	627	250	375	6.4
907.315.90B*	315	9.8	775	775	300	472.5	12

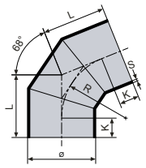
* Segmented

HDPE EXTENDED SPIGOT BEND



CODE	Ø/$Ø_1$ mm	S mm	DE mm	L mm	L_1 mm	R mm	K mm	WEIGHT Kg
902.56.90B	56	3	50	100	80	-	-	0.085
902.110.90B	110	4.3	-	300	60	60	220	0.5

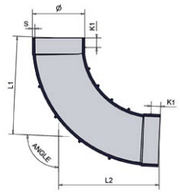
HDPE 112.5° (67.5°) BEND



CODE	Ø mm	S mm	L mm	K mm	R mm	WEIGHT Kg
901.110.112B*	110	4.3	125	50	142.5	0.34
901.160.112B*	160	6.2	161	70	167	0.91
901.200.112B*	200	6.2	183	80	188	1.30
901.250.112B*	250	7.8	196	80	204.5	2.19
901.315.112B*	315	9.8	295	139	295.5	5.2

* Segmented

HDPE LONG RADIUS BEND

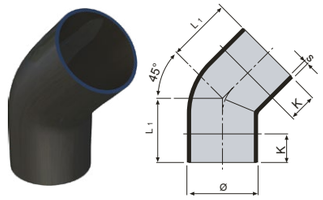


CODE	Ø/$Ø_1$ mm	S mm	L_1 mm	L_2 mm	K_1 mm	ANGLE (Deg)	WEIGHT Kg
901.110.92RB	110	4.3	208	213	20	92.5	0.539

4 Pipes and Fittings

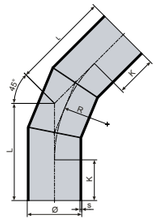
HDPE Fittings

HDPE 135° BEND



CODE	Ø mm	S mm	L_1 mm	K mm	WEIGHT Kg
901.40.135B	40	3	43.3	30	0.033
901.50.135B	50	3	45.4	30	0.043
901.56.135B	56	3	46.7	30	0.05
901.75.135B	75	3	50.6	30	0.074
901.110.135B	110	4.3	58.8	30	0.167
901.160.135B	160	6.2	73.3	30	0.453

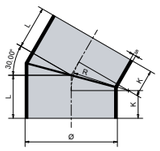
HDPE 135° WIDE RADIUS BEND



CODE	Ø mm	S mm	L mm	K mm	R mm	WEIGHT Kg
901.200.135B*	200	6.2	358	150	500	2.7
901.250.135B*	250	7.8	510	250	625	6
901.315.135B*	315	9.8	628	300	787.5	11.3

* Segmented

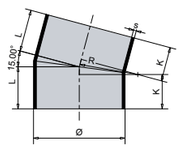
HDPE 150° (30°) BEND



CODE	Ø mm	S mm	L mm	K mm	R mm	WEIGHT Kg
901.110.150B*	110	4.3	50	35	57	0.15
901.160.150B*	160	6.2	64	42	80.5	0.38
901.200.150B*	200	6.2	113	86	101.5	0.86
901.250.150B*	250	7.8	117	83	125	1.39
901.315.150B*	315	9.8	128	85	160	2.41

* Segmented

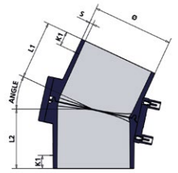
HDPE 165° (15°) BEND



CODE	Ø mm	S mm	L mm	K mm	R mm	WEIGHT Kg
901.110.165B*	110	4.3	43	35	59	0.13
901.160.165B*	160	6.2	50	39	79.5	0.30
901.200.165B*	200	6.2	92	79	97.5	0.70
901.250.165B*	250	7.8	99	82	126	1.18
901.315.165B*	315	9.8	104	84	154	1.97

* Segmented

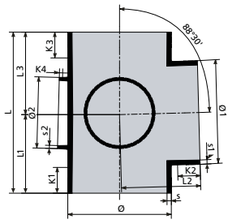
HDPE VARIABLE BEND



CODE	Ø/$Ø_1$ mm	S mm	L_1 mm	L_2 mm	K_1 mm	ANGLE (Deg)	WEIGHT Kg
907.110.025B	110	4.3	81	80	19	0 -25	0.617

HDPE Fittings

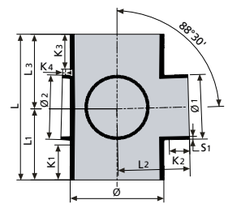
HDPE 90° BRANCH



CODE	Ø mm	$Ø_1$ mm	$Ø_2$ mm	S mm	S_1 mm	S_2 mm	L mm	L_1 mm	L_2 mm	L_3 mm	K_1 mm	K_2 mm	K_3 mm	K_4 mm	WEIGHT Kg
904.40.90B	40	160	110	3	6.2	4.3	110.2	55.6	60.6	54.6	30	35	40	5	0.06
904.50.90B	50	160	110	3	6.2	4.3	120.2	60.8	65.8	59.4	30	35	40	5	0.085
904.56.90B	56	160	110	3	6.2	4.3	126.3	63.9	68.8	62.4	30	35	40	5	0.105
904.75.90B	75	160	110	3	6.2	4.3	145.4	73.7	77.2	71.7	30	35	40	5	0.145
904.110.90B	110	160	110	4.3	6.2	4.3	210	102	91	108	30	35	40	5	0.365
904.160.90B	160	160	110	6.2	6.2	4.3	250	122	123	128	40	35	40	5	1.19
904.200.90B*	200	160	110	6.2	6.2	4.3	800	400	400	400	150	35	40	5	1.705
904.250.90B*	250	160	110	7.8	6.2	4.3	800	400	400	400	250	35	40	5	3.1
904.315.90B*	315	160	110	9.8	6.2	4.3	984	492	492	492	300	35	40	5	6.15

* Segmented

HDPE 90° REDUCING BRANCH



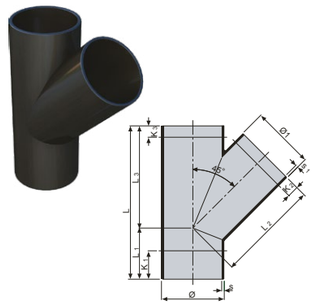
CODE	Ø/$Ø_1$ mm	S mm	S_1 mm	L mm	L_1 mm	L_2 mm	L_3 mm	K_1 mm	K_2 mm	K_3 mm	WEIGHT Kg
904.5040.90B	50/40	3	3	150	90	-	-	60	25	30	0.08
904.5650.90B	56/50	3	3	175	105	-	-	70	30	35	0.105
904.7540.90B*	75/40	3	3	210	105	107	105	75	60	75	0.18
904.7550.90B*	75/50	3	3	210	105	108	105	75	60	75	0.14
904.7556.90B	75/56	3	3	175	105	-	-	65	25	30	0.14
904.11040.90B	110/40	4.3	3	210	105	91	105	80	30	80	0.32
904.11050.90B	110/50	4.3	3	225	135	-	-	95	25	50	0.345
904.11056.90B	110/56	4.3	3	210	105	91	105	75	30	70	0.323
904.11075.90B	110/75	4.3	3	210	105	91	105	65	30	60	0.324
904.160110.90B	160/110	6.2	4.3	350	210	-	-	135	45	60	1.12
904.200110.90B*	200/110	6.2	4.3	450	225	434	225	150	150	150	2.1
904.200160.90B*	200/160	6.2	6.2	500	250	410	250	150	150	150	2.75
904.250110.90B*	250/110	7.8	4.3	650	325	463	325	250	150	250	4.3
904.250160.90B*	250/160	7.8	6.2	700	350	447	350	250	150	250	5
904.250200.90B*	250/200	7.8	6.2	750	375	425	375	250	150	250	5.4
904.315110.90B*	315/110	9.8	4.3	800	400	498	400	300	150	300	7.6
904.315160.90B*	315/160	9.8	6.2	820	410	486	410	300	150	300	8.2
904.315200.90B*	315/200	9.8	6.2	850	425	472	425	300	150	300	8.7
904.315250.90B*	315/250	9.8	7.8	900	450	446	450	300	250	300	9.1

* Welded

4 Pipes and Fittings

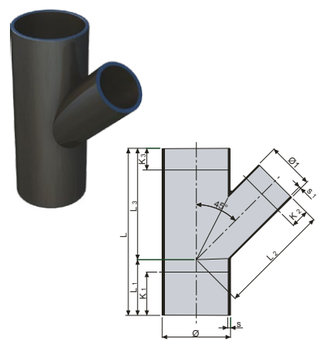
HDPE Fittings

PRODUCT	HDPE 135° Y BRANCH



CODE	Ø/Ø$_1$ mm	S/S$_1$ mm	L mm	L$_1$ mm	L$_2$/L$_3$ mm	K$_1$ mm	K$_2$ mm	K$_3$ mm	WEIGHT Kg
904.40.135B	40	3	135	45	90	25	30	30	0.07
904.50.135B	50	3	165	55	110	35	20	20	0.105
904.56.135B	56	3	180	60	120	40	25	25	0.13
904.75.135B	75	3	210	70	140	40	25	25	0.205
904.110.135B	110	4.3	270	90	180	55	20	20	0.53
904.160.135B	160	6.2	375	125	250	75	25	25	1.475
904.200.135B*	200*	6.2	540	180	360	85	10	10	2.811
904.250.135B*	250*	7.8	1045	448	597	250	250	250	8.5
904.315.135B*	315*	9.8	1153	435	718	300	300	300	15.1

* Segmented

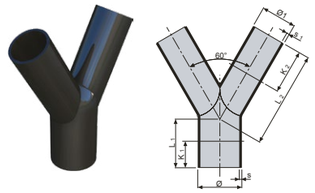


HDPE 135° REDUCING Y BRANCH											
CODE	Ø/Ø$_1$ mm	S mm	S$_1$ mm	L mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	K$_1$ mm	K$_2$ mm	K$_3$ mm	WEIGHT Kg
904.5040.135B	50/40	3	3	165	55	110	110	40	45	45	0.1
904.5650.135B	56/50	3	3	180	60	120	120	40	30	30	0.125
904.7540.135B*	75/40	3	3	210	68	158	142	70	70	70	0.19
904.7550.135B*	75/50	3	3	210	68	158	142	70	70	70	0.2
904.7556.135B	75/56	3	3	210	70	140	-	55	25	35	0.19
904.11040.135B*	110/40	4.3	3	240	59	183	181	70	70	70	0.38
904.11050.135B	110/50	4.3	3	270	90	180	-	95	50	55	0.44
904.11056.135B	110/56	4.3	3	270	90	180	-	90	40	45	0.455
904.11075.135B	110/75	4.3	3	270	90	180	-	75	30	35	0.47
904.16075.135B	165/75	6.2	3	315	65	253	250	80	75	80	1.03
904.160110.135B	160/110	6.2	4.3	314	70	246	244	65	65	65	1.25
904.20075.135B*	200/75	6.2	3	500	150	604	350	150	150	150	2.246
904.200110.135B*	200/110	6.2	4.3	540	170	587	370	150	150	150	2.4
904.200160.135B*	200/160	6.2	6.2	540	170	562	370	150	150	150	2.7
904.250110.135B*	250/110	7.8	4.3	700	225	622	475	250	150	250	4.4
904.250160.135B*	250/160	7.8	6.2	780	264	597	516	250	150	250	4.85
904.250200.135B*	250/200	7.8	6.2	800	275	577	525	250	150	250	5
904.315110.135B*	315/110	9.8	4.3	850	267	668.5	583	300	150	300	8.6
904.315160.135B*	315/160	9.8	6.2	850	267	643	583	300	150	300	9.15
904.315200.135B*	315/200	9.8	6.2	900	292	623	608	300	150	300	9.45
904.315250.135B*	315/250	9.8	7.8	1000	342	598	658	300	250	300	9.25

* Segmented

HDPE Fittings

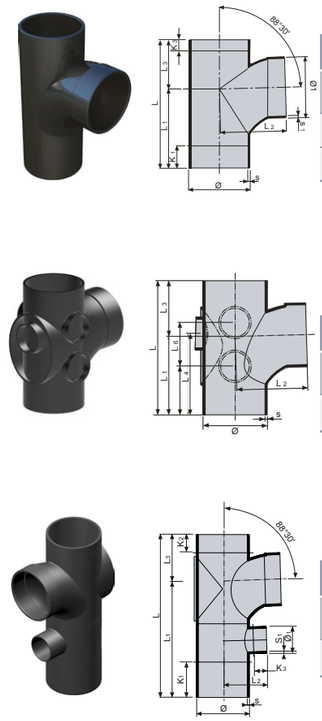
PRODUCT	HDPE 60° DOUBLE Y BRANCH



CODE	Ø/Ø$_1$ mm	S mm	S$_1$ mm	L mm	L$_1$ mm	K$_1$ mm	K$_2$ mm	WEIGHT Kg
906.5040.60B	50/40	3	3	55	110	40	50	0.093
906.110.60B	110/110	4.3	4.3	90	120	50	-	0.393

HDPE 135° DOUBLE REDUCING BRANCH												
CODE	Ø/Ø$_1$ mm	S mm	S$_1$ mm	L mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	L$_4$ mm	K$_1$ mm	K$_2$ mm	K$_3$ mm	WEIGHT Kg
906.11040.135B*	110/40	4.3	3	240	59	183	183	181	75	75	75	0.42
906.11050.135B*	110/50	4.3	3	238	60	183	190	178	75	75	75	0.43
906.110.135B	110/110	4.3	4.3	338	110	180	180	228	50	30	50	0.738

* Segmented



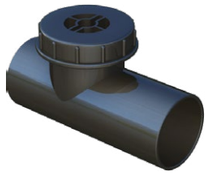
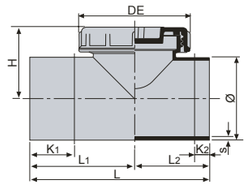
HDPE SWEPT BRANCH FITTING										
CODE	Ø/Ø$_1$ mm	S/S$_1$ mm	L mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	K$_1$ mm	K$_2$ mm	K$_3$ mm	WEIGHT Kg
904.56.92B	56	3	137	78	70.3	59	25	25	25	0.106
904.110.92B	110/110	4.3	230	140	120	90	90	40	20	0.415

HDPE 92.5° (87.5°) SWEPT ENTRY BOSSED BRANCH										
CODE	Ø mm	S mm	L mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	L$_4$ mm	L$_5$ mm	L$_6$ mm	WEIGHT Kg
904.110.925B	110	4.3	225	135.1	119.9	89.9	140	84	75	0.539

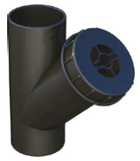
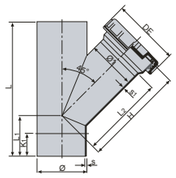
HDPE 88° SINGLE BOSS BRANCH											
CODE	Ø/Ø$_1$ mm	S mm	S$_1$ mm	L mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	K$_1$ mm	K$_2$ mm	K$_3$ mm	WEIGHT Kg
904.11090.12B	110/56	4.3	3	338	240	90	97	73	37	27	0.575

4 Pipes and Fittings

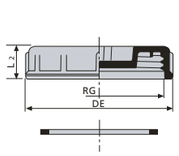
HDPE Fittings

PRODUCT	HDPE 90° ACCESS PIPE WITH SCREW CAP									
	CODE	Ø/Ø$_1$ mm	S mm	L mm	L$_1$ mm	L$_2$ mm	H mm	DE mm	K$_1$ mm	K$_2$ mm	WEIGHT Kg
	938.50.90B ▲	50	3	150	90	60	75	82	55	25	0.13
	938.56.90B ▲	56	3	175	105	70	84	82	65	30	0.195
	938.75.90B ▲	75	3	175	105	70	117	82	55	25	0.365
	938.110.90B ▲	110	4.3	240	140	100	94	146	65	20	0.62
	938.160.90B ▲	160	6.2	350	210	140	145	146	105	30	1.355
	938.200.90B*▲	200	6.2	500	250	250	200	192	150	150	2.73
	938.250.90B*▲	250	7.8	700	350	350	226	192	250	250	4.16
	938.315.90B*▲	315	9.8	820	410	410	259	192	300	300	7.97

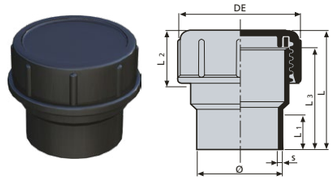
* Segmented ▲ Use Canvas style test bung

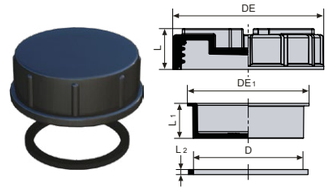
PRODUCT	HDPE 45° ACCESS PIPE WITH SCREW CAP									
	CODE	Ø/Ø$_1$ mm	S mm	S$_1$ mm	L mm	L$_1$ mm	L$_2$ mm	H mm	DE mm	K$_1$ mm	WEIGHT Kg
	938.110.135B	110/110	4.3	4.3	270	90	180	220	150	55	0.84
	938.160.135B	160/110	6.2	4.3	375	125	275	280	150	110	1.76

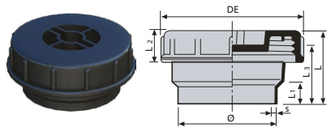
PRODUCT	HDPE SHORT END CAP WITH SEAL				
	CODE	Ø mm	RG mm	DE mm	L$_2$ mm	WEIGHT Kg
	9938.110B	110	132	149	33	0.215

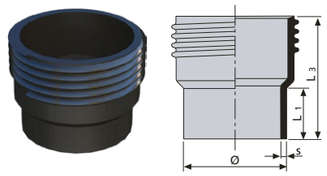


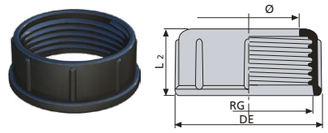
HDPE Fittings

PRODUCT	HDPE SCREWED END CAP							
	CODE	Ø mm	S mm	L mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	DE mm	WEIGHT Kg
	936.40B	40	3	75	30	34	66	60	0.075
	936.50B	50	3	75	30	33	66	70	0.08
	936.56B	56	3	77	30	34	66	80	0.12
	936.75B	75	3	103	30	45	87	109	0.28
	936.110B	110	4.3	106	30	65	89	144	0.5
	936.160B	160	4.3	95	35	48	1	191	0.814

	HDPE END CAP WITH SEAL						
	CODE	D mm	DE mm	DE$_1$ mm	L mm	L$_1$ mm	L$_2$ mm	WEIGHT Kg
	9936.56B	56	82	-	39	3.5	-	0.062
	9936.110B	110	149	120	41	34.5	5	0.314

	HDPE SHORT SCREWED CAP							
	CODE	Ø mm	S mm	L mm	L$_1$ mm	L$_2$ mm	DE mm	K mm	WEIGHT Kg
	935.110B	110	4.3	63	12	33	50	149	0.315

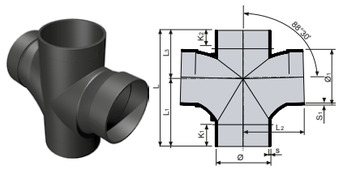
	HDPE THREADED UNION					
	CODE	Ø mm	S mm	L$_1$ mm	L$_2$ mm	WEIGHT Kg
	9122.50B	50	3	30	66	0.03
	9122.56B	56	3	30	66	0.025
	9122.75B	75	3	30	87	0.095
	9122.110B	110	4.3	30	89	0.17

	HDPE NUT					
	CODE	Ø mm	RG mm	DE mm	L$_2$ mm	WEIGHT Kg
	9120.50B	50	62	70	33	0.03
	9120.56B	56	71	80	34	0.05
	9120.75B	75	96	100	45	0.1
	9120.110B	110	132	144	65	0.20

4 Pipes and Fittings

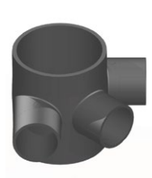
HDPE Fittings

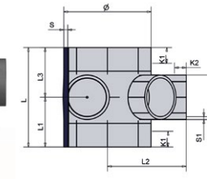
HDPE 88° DOUBLE BRANCH



CODE	Ø/Ø$_1$ mm	S mm	L mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	K$_1$ mm	K$_2$ mm	WEIGHT Kg
906.110.92B	110/110	4.3	231	134	120	97	43	37	0.553

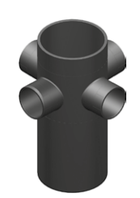
3 WAY BOSS BRANCH

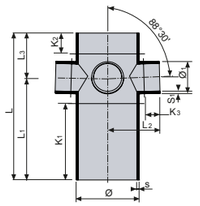




CODE	Ø/Ø$_1$ mm	S mm	S$_1$ mm	L mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	K$_1$ mm	K$_2$ mm	WEIGHT Kg
921.110.56B	110/56	4.3	3	126	63	100	63	20	15	0.308

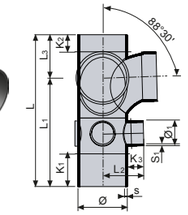
HDPE 4 WAY BRANCH





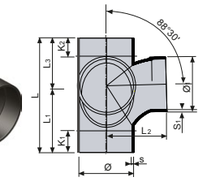
CODE	Ø/Ø$_1$ mm	S mm	S$_1$ mm	L mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	K$_1$ mm	K$_2$ mm	K$_3$ mm	WEIGHT Kg
920.110.56B	110/56	4.3	3	257	177	90	79	133	37	37	0.483
920.160.56B	160/56	6.2	3	146	73	120	73	15	15	15	0.699

HDPE 88° CORNER BOSS BRANCH



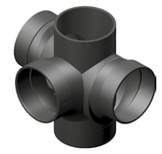
CODE	Ø/Ø$_1$ mm	S mm	S$_1$ mm	L mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	K$_1$ mm	K$_2$ mm	K$_3$ mm	WEIGHT Kg
906.11090.12B	110/56	4.3	3	338	240	90	97	73	37	27	0.71

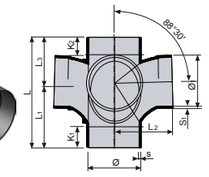
HDPE 88° CORNER BRANCH



CODE	Ø mm	S mm	L mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	K$_1$ mm	K$_2$ mm	WEIGHT Kg
906.11090.92B	110	4.4	231	134	120	97	43	37	0.479

HDPE 88° 3 WAY CORNER BRANCH

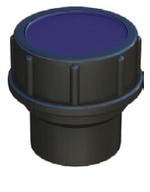


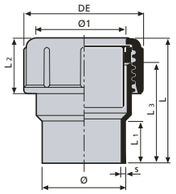


CODE	Ø mm	S mm	L mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	K$_1$ mm	K$_2$ mm	WEIGHT Kg
906.11093.92B	110	4.4	231	134	120	97	43	37	0.579

HDPE Fittings

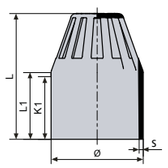
HDPE THREADED COUPLING





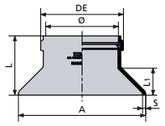
CODE	Ø/Ø$_1$ mm	S mm	L mm	L$_1$ mm	L$_2$ mm	L$_3$ mm	DE mm	WEIGHT Kg
912.40B	40	3	74	30	34	66	60	0.075
912.50B	50	3	76	30	33	66	70	0.08
912.56B	56	3	46	30	34	66	80	0.12
912.75B	75	3	106	30	45	87	109	0.25
912.110B	110	4.3	113	30	65	89	144	0.47

HDPE VENT COWL



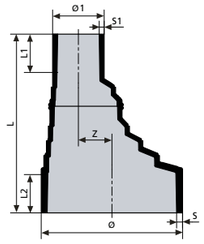
CODE	Ø mm	S mm	L mm	L$_1$ mm	K$_1$ mm	WEIGHT Kg
950.75B	75	3	118	68.5	63.5	0.074
950.110B	110	4.3	151	80	75	0.191
950.160B	160	6.2	192	100	95	0.528

HDPE WEATHERING APRON



CODE	Ø mm	DE mm	S mm	L mm	L$_1$ mm	A mm	WEIGHT Kg
931.110.200B	110	131	4.3	93.5	42.5	200	0.242

HDPE ECCENTRIC REDUCER



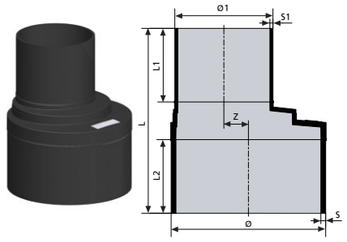
CODE	Ø/Ø$_1$ mm	S mm	S$_1$ mm	L mm	L$_1$ mm	L$_2$ mm	Z mm	WEIGHT Kg
923.5040B	50/40	3	3	80	35	35	-	0.035
923.5640B	56/40	3.5	3.5	120	64.59	31.05	-	0.064
923.5650B	56/50	3	3	108	35	60	-	0.064
923.7540B	75/40	3	3	80	37	35	-	0.055
923.7550B	75/50	3	3	80	37	35	-	0.05
923.7556B	75/56	3	3	80	37	35	-	0.05
923.11040B*	110/40	4.3	3	140	30	30	26	0.095
923.11050B*	110/50	4.3	3	132	30	30	22	0.125
923.11056B	110/56	4.3	3	80	37	35	-	0.1
923.11075B	110/75	4.3	3	80	37	35	-	0.105
923.160110B	160/110	6.2	4.3	80	37	35	-	0.23

* Segmented

4 Pipes and Fittings

HDPE Fittings

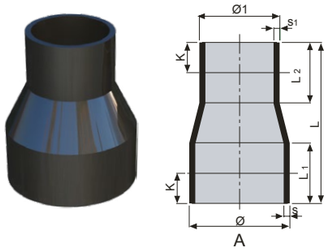
HDPE LONG ECCENTRIC REDUCER

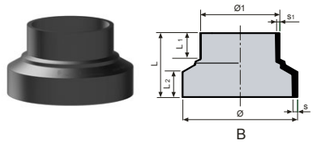


CODE	Ø/Ø1 mm	S mm	S1 mm	L mm	L1 mm	L2 mm	Z mm	WEIGHT Kg
923.160110LB	160/110	6.2	4.3	215	35	37	-	0.43
923.200110LB*	200/110	6.2	4.3	353.5	150	150	39	0.821
923.200160LB*	200/160	6.2	6.2	354	150	150	18	1.084
923.250200LB*	250/200	7.8	6.2	333.5	150	150	22	1.661
923.315200LB*	315/200	9.8	6.2	377	150	150	50	2.658
923.315250LB*	315/250	9.8	7.8	353	150	150	28	2.793

* Segmented

HDPE CONCENTRIC REDUCERS

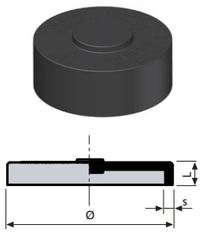




CODE	Ø/Ø1 mm	S mm	S1 mm	L mm	L1 mm	L2 mm	K mm	WEIGHT Kg
924.5040B▼	50/40	3	3	108	30	60	15	0.053
924.5650B▼	56/50	3	3	108	30	60	15	0.061
924.7540B▼	75/40	3	3	80	30	30	15	0.045
924.7550B▼	75/50	3	3	80	30	30	15	0.05
924.7556B▼	75/56	3	3	80	30	30	15	0.06
924.11040B▼	110/40	4.3	3	80	30	30	15	0.09
924.11050B▼	110/50	4.3	3	80	30	30	15	0.115
924.11056B•	110/56	4.3	3	80	30	30	15	0.095
924.11075B▼	110/75	4.3	3	80	30	30	15	0.125
924.160110B•	160/110	6.2	4.3	115	30	30	15	0.255
924.200160B▼	200/160	9.2	6.2	180	60	60	20	0.325

▼ A • B

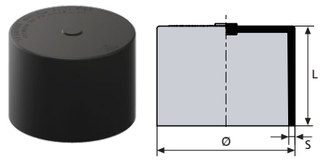
HDPE BLANK END



CODE	Ø mm	S mm	L mm	WEIGHT Kg
930.40B	40	3	15	0.009
930.50B	50	3	15	0.013
930.56B	56	3	15	0.016
930.75B	75	3	15	0.024
930.110B	110	4.3	15	0.061
930.160B	160	6.2	15	0.164
930.200B	200	6.2	110	0.56
930.250B	250	7.8	93	0.75
930.315B	315	9.2	117	1.42

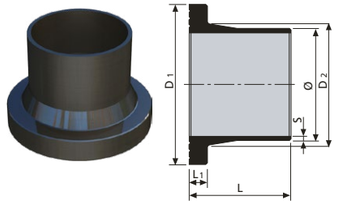
HDPE Fittings

HDPE LONG BLANK END



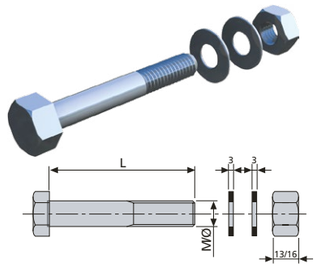
CODE	Ø mm	S mm	L1 mm	L2 mm	WEIGHT Kg
930.40LB	40	3	68.5	66	0.032
930.50LB	50	3	68.5	66	0.042
930.56LB	56	3	68.5	66	0.048
930.75LB	75	3	68.5	66	0.069
930.110LB	110	4.3	80	87	0.17
930.160LB	160	6.2	107	89	0.505

HDPE FLANGE ADAPTORS



CODE	Ø mm	S mm	D1 mm	D2 mm	L mm	L1 mm	WEIGHT Kg
980.50B	50	3	88	61	52	12	0.075
980.56B	56	3	94	72	90	12	0.115
980.75B	75	3	122	89	90	15	0.185
980.110B	110	4.3	158	120	100	18	0.335
980.160B	160	6.2	212	175	100	18	0.585
980.200B	200	6.2	268	232	100	20	0.92
980.250B	250	7.8	320	285	100	20	1.48
980.315B	315	9.8	370	236	100	20	1.72

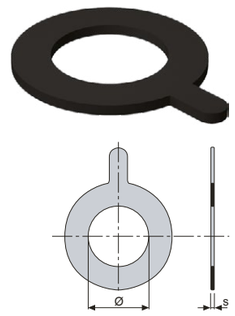
HDPE GALVANISED BOLT SET WITH WASHER FOR FLANGE



CODE	MØ mm	L mm	THREAD	FOR FLANGE mm	WEIGHT Kg
984.1650B	16	90	38	50-56	0.215
984.1663B	16	100	38	63-75	0.23
984.16110B	16	100	38	110-125-140	0.25
984.20160B	20	110	46	160	0.41
984.20250B	20	130	58	200-250-315	0.45

Material: Galvanised steel

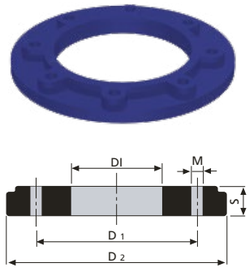
FLAT RUBBER SEAL FOR FLANGE



CODE	Ø mm	S mm	WEIGHT Kg
982.50B	50	3	0.02
982.56B	56	3	0.02
982.75B	75	3	0.03
982.110B	110	3	0.045
982.160B	160	3	0.07
982.200B	200	3	0.11
982.250B	250	3	0.14
982.315B	315	3	0.14

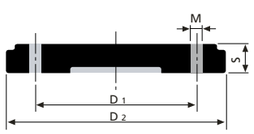
4 Pipes and Fittings

HDPE Fittings

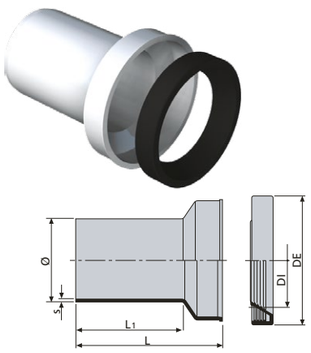
PRODUCT	PAINTED ALUMINIUM BACKING FLANGE							
	CODE	Ø mm	S mm	DI mm	D_1 mm	D_2 mm	M mm	HOLE No	WEIGHT Kg
	981.50B	50	20	62	120	150	18	4	0.625
	981.56B	56	20	64	123	159	18	4	0.71
	981.75B	75	21	93	148	185	18	4	0.885
	981.110B	110	22	128	182	220	19	8	1.05
	981.160B	160	25	179	240	285	22	8	1.84
	981.200B	200	26	235	295	337	22	8	2.325
	981.250B	250	30	285	350	396	22	12	3.78
	981.315B	315	30	340	400	444	22	12	3.945

Manufactured to EN1092-1/04 PN10/16

PRODUCT	PAINTED ALUMINIUM BLANK FLANGE						
	CODE	Ø mm	S mm	D_1 mm	D_2 mm	M mm	HOLE No	WEIGHT Kg
	983.50B	50	20	120	150	18	4	0.76
	983.56B	56	20	123	159	18	4	0.865
	983.75B	75	21	148	185	18	4	1.305
	983.110B	110	22	176	220	19	8	1.7
	983.160B	160	25	240	285	22	8	2.945
	983.200B	200	26	295	337	22	8	4.485
	983.250B	250	30	350	396	22	12	7.495
	983.315B	315	30	400	444	22	12	9.345

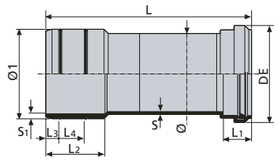


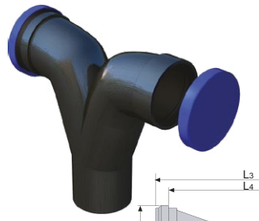
Manufactured to EN1092-1/04 PN10/16

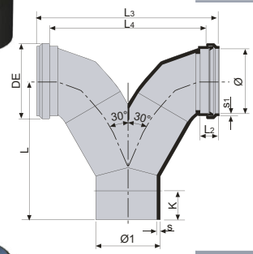
PRODUCT	HDPE WC PAN CONNECTOR - WHITE						
	CODE	Ø mm	S mm	L mm	L_1 mm	R mm	K mm	WEIGHT Kg
	925.110W	110	4.3	102±5	140	166	130	0.355

HDPE Fittings

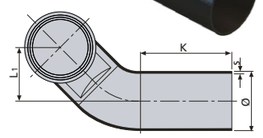
PRODUCT	HDPE STRAIGHT WC PAN CONNECTOR WITH SEAL AND CAP										
	CODE	Ø/$Ø_1$ mm	S mm	S_1 mm	DE mm	L mm	L_1 mm	L_2 mm	L_3 mm	L_4 mm	WEIGHT Kg
	999.90100.00B	90/100	3.5	5.5	109	232	31	70	15	28	0.332

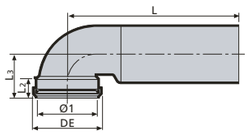


PRODUCT	HDPE DOUBLE WC PAN CONNECTOR WITH LIP SEALS AND CAPS											
	CODE	Ø/$Ø_1$ mm	S mm	S_1 mm	DE mm	L mm	L_2 mm	L_3 mm	L_4 mm	K mm	WEIGHT Kg
	929.110.90DB	110/110	4.3	4.3	130	205	37	285	240	50	0.816

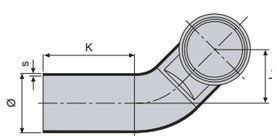


PRODUCT	HDPE WC BEND FOR HANGING PAN WITH 1-LIP SEAL AND CAP, LEFT									
	CODE	Ø/$Ø_1$ mm	S mm	DE mm	L mm	L_1 mm	L_2 mm	L_3 mm	K mm	WEIGHT Kg
	949.110LB	110/110	4.3	130	320	100	35	85	170	0.72
	949.11090LB	110/90	4.3	108	315	100	35	85	170	0.616





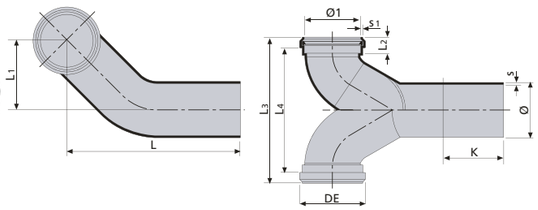
PRODUCT	HDPE WC BEND FOR HANGING PAN WITH 1-LIP SEAL AND CAP, RIGHT									
	CODE	Ø/$Ø_1$ mm	S mm	DE mm	L mm	L_1 mm	L_2 mm	L_3 mm	K mm	WEIGHT Kg
	949.110RB	110/110	4.3	130	320	100	35	85	170	0.72
	949.11090RB	110/90	4.3	108	315	100	35	85	170	0.616



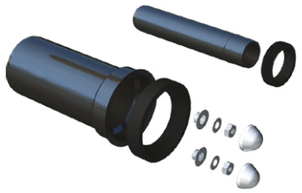
4 Pipes and Fittings

HDPE Fittings

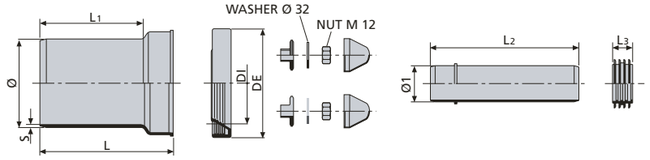
PRODUCT	HDPE WC PAN CONNECTORS

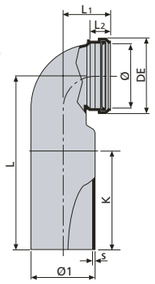


CODE	Ø/Ø1 mm	S mm	S1 mm	DE mm	L mm	L1 mm	L2 mm	L3 mm	L4 mm	K mm	WEIGHT Kg
949.110DB	110/110	4.3	3.5	108	335	100	-	285	-	120	1.02



HDPE WC CONNECTOR FOR HANGING PAN WITH SEAL AND WHITE COVERINGS									
CODE	Ø/Ø1 mm	S mm	DI mm	DE mm	L mm	L1 mm	L2 mm	L3 mm	WEIGHT Kg
925.11044B	110/45	4.3	102±5	132	166	129	199	24	0.53

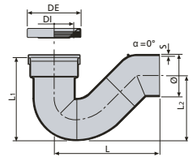




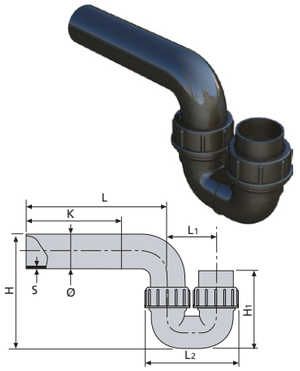
HDPE WC BEND HANGING PAN WITH SEAL AND CAP								
CODE	Ø/Ø1 mm	S mm	L mm	L1 mm	L2 mm	DE mm	K mm	WEIGHT Kg
999.110.90B	110/110	4.3	300	87	40	130	180	0.596

HDPE Fittings

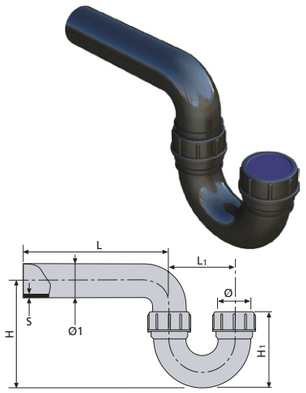
PRODUCT	HDPE TRAP WITH SEAL AND CAP



CODE	Ø mm	∮	S mm	DI mm	DE mm	L mm	L1 mm	L2 mm	WEIGHT Kg
9631.110.0B	110	0□	4.3	102±5	140	270	215	170	0.72



HDPE UNIVERSAL TRAP, VERTICAL INLET AND HORIZONTAL OUTLET									
CODE	Ø mm	S mm	L mm	L1 mm	L2 mm	H mm	H1 mm	K mm	WEIGHT Kg
931.110B	110	4.3	270	160	310	370	260	220	1.92

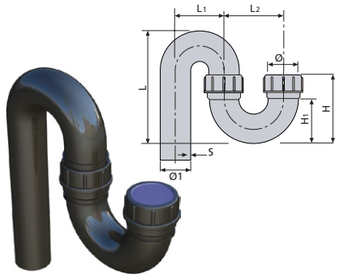


HDPE TRAP, VERTICAL INLET AND HORIZONTAL OUTLET							
CODE	Ø/Ø1 mm	S mm	L mm	L1 mm	H mm	H1 mm	WEIGHT Kg
931.4040B	40/40	3	150	80	140	110	0.22
931.4050B	40/50	3	180	80	160	110	0.31
931.4056B	40/56	3	210	80	155	110	0.31
931.5050B	50/50	3	180	100	170	110	0.31
931.5056B	50/56	3	210	100	165	110	0.31

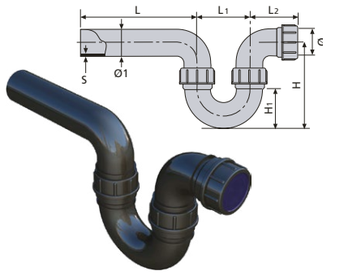
4 Pipes and Fittings

HDPE Fittings

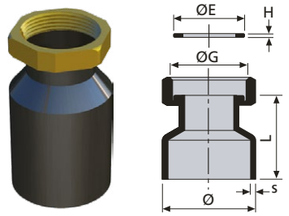
PRODUCT	HDPE TRAP, VERTICAL INLET AND OUTLET



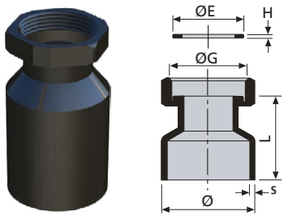
CODE	Ø/Ø1 mm	S mm	L mm	L1 mm	L2 mm	H mm	H1 mm	WEIGHT Kg
932.4040B	40/40	3	160	60	80	110	60	0.235
932.4050B	40/50	3	180	80	80	110	65	0.34
932.4056B	40/56	3	238	80	80	110	65	0.34
932.5050B	50/50	3	180	80	100	110	70	0.34
932.5056B	50/56	3	190	80	100	120	70	0.37



HDPE TRAP, HORIZONTAL INLET AND OUTLET								
CODE	Ø/Ø1 mm	S mm	L mm	L1 mm	L2 mm	H mm	H1 mm	WEIGHT Kg
945.4040B	40/40	3	150	80	90	140	40	0.31
945.4050B	40/50	3	180	80	90	160	65	0.37
945.5050B	50/50	3	180	100	90	170	70	0.42



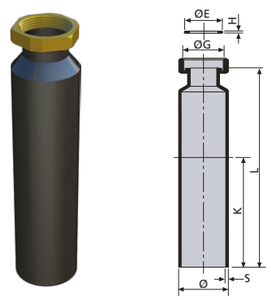
HDPE FITTING WITH NUT - BRASS								
CODE	Ø mm	ØG	S mm	L mm	ØE mm	H mm	NUT	WEIGHT Kg
918.40.125BN	40	1¼"	3	45	40	2	Brass	0.08
918.40.15BN	40	1½"	3	45	45	2	Brass	0.09
918.50.125BN	50	1¼"	3	45	40	2	Brass	0.08
918.50.15BN	50	1½"	3	45	45	2	Brass	0.09



HDPE FITTING WITH NUT - PLASTIC								
CODE	Ø mm	ØG	S mm	L mm	ØE mm	H mm	NUT	WEIGHT Kg
918.40.125PN	40	1¼"	3	45	40	2	Plastic	0.03
918.40.15PN	40	1½"	3	45	45	2	Plastic	0.03
918.50.125PN	50	1¼"	3	45	40	2	Plastic	0.03
918.50.15PN	50	1½"	3	45	45	2	Plastic	0.03

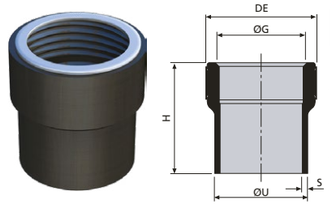
HDPE Fittings

PRODUCT	HDPE EXTENDED FITTING WITH NUT - BRASS



CODE	Ø mm	ØG mm	S mm	L mm	ØE mm	H mm	Nut mm	K mm	WEIGHT Kg
918.40.125EB	40	1¼"	3	195	40	2	Brass	110	0.13
918.40.15EBN	40	1½"	3	195	45	2	Brass	110	0.145
918.50.125EBN	50	1¼"	3	195	40	2	Brass	110	0.15
918.50.15EBN	50	1½"	3	195	45	2	Brass	110	0.155

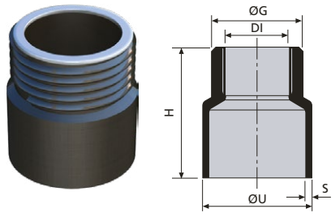
HDPE EXTENDED FITTING WITH NUT - PLASTIC									
CODE	Ø mm	ØG mm	S mm	L mm	ØE mm	H mm	Nut mm	K mm	WEIGHT Kg
918.40.125EPN	40	1¼"	3	195	40	2	Plastic	110	0.08
918.40.15EPN	40	1½"	3	195	45	2	Plastic	110	0.085
918.50.125EPN	50	1¼"	3	195	40	2	Plastic	110	0.1
918.50.15EPN	50	1½"	3	195	45	2	Plastic	110	0.095



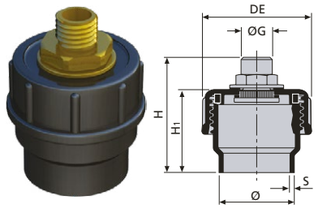
HDPE FEMALE IRON						
CODE	ØU mm	ØG mm	S mm	DE mm	H mm	WEIGHT Kg
916.40.05B	40	½"	3	40.5	55	0.065
916.40.075B	40	¾"	3	40.5	55	0.06
916.40.1B	40	1"	3	40.5	55	0.06
916.50.05B	50	½"	3	50	60	0.075
916.50.075B	50	¾"	3	50	60	0.075
916.50.1B	50	1"	3	50	60	0.075
916.50.125B	50	1¼"	3	50	60	0.07
916.50.15B	50	1½"	3	58.5	60	0.07
916.56.2B	56	2"	3	70	65	0.1
916.75.25B	75	2"½	3	89	70	0.135

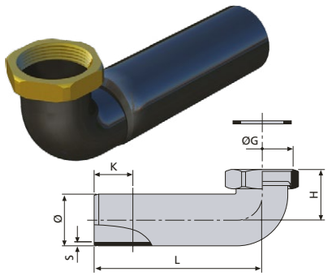
4 Pipes and Fittings

HDPE Fittings

PRODUCT	HDPE MALE IRON						
	CODE	ØU mm	ØG mm	S mm	DI mm	H mm	WEIGHT Kg
	917.50.125B	50	1¼"	3	29	60	0.055
	917.50.15B	50	1½"	3	29	60	0.065
	917.56.2B	56	2"	3	47	65	0.09
	917.75.25B	75	2"½	3	57	70	0.125

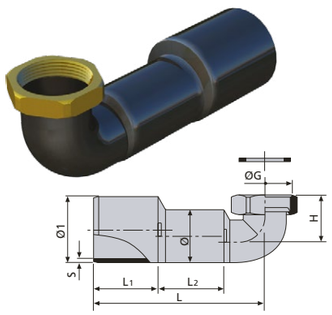
HDPE THREADED FITTING WITH BRASS NIPPLE							
CODE	Ø mm	ØG mm	S mm	DE mm	H mm	H_1 mm	WEIGHT Kg
936.40.05NB	40	½" x 15mm	3	60	81	74	0.18
936.40.075NB	40	¾" x 18mm	3	60	84	74	0.24
936.50.05NB	50	½" x 15mm	3	71	92	76	0.15
936.50.075NB	50	¾" x 18mm	3	71	95	76	0.185
936.50.1NB	50	1" x 22mm	3	71	95	76	0.245





HDPE BEND WITH NUT								
CODE	Ø mm	ØG mm	S mm	L mm	H mm	Nut mm	K mm	WEIGHT Kg
918.40.125.90BN*	40	1¼"	3	130	25	Brass	100	0.1
918.40.15.90BN*	40	1½"	3	130	30	Brass	100	0.105
918.40.15.90PN•	40	1½"	3	130	30	Plastic	100	0.04

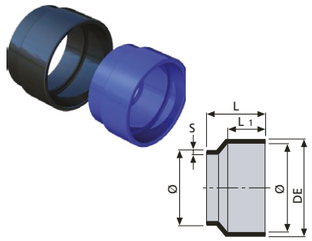
*Brass •Plastic



HDPE REDUCING BEND WITH NUT									
CODE	Ø mm	ØG mm	S mm	L mm	L_1 mm	H mm	Nut mm	K mm	WEIGHT Kg
918.4050.125.90BN*	40/50	1¼"	3	130	50	54	25	Brass	0.11
918.4050.15.90BN*	40/50	1½"	3	120	50	N.C.	30	Brass	0.12
918.4050.15.90PN•	40/50	1½"	3	120	50	N.C.	30	Plastic	0.055
918.4050.125.90PN•	40/50	1½"	3	130	50	54	25	Plastic	0.06

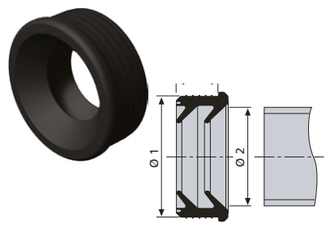
*Brass •Plastic

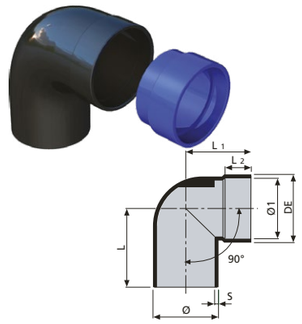
HDPE Fittings

PRODUCT	HDPE SLEEVE						
	CODE	Ø/$Ø_1$ mm	S mm	DE mm	L mm	L_1 mm	WEIGHT Kg
	917.4046B	40/46	3	52	30	20	0.015
	917.5046B	50/46	3	52	30	20	0.015
	917.5058B	50/58	3	64	38	20	0.02
	917.5646B	56/46	3	52	38	20	0.02
	917.5658B	56/58	3	64	38	20	0.025

HDPE GASKET				
CODE	$Ø_1$ mm	$Ø_2$ mm	L mm	WEIGHT Kg
917.4624.908B	46	24-46	22	0.01
917.4636.908B	46	36-40	22	0.01
917.5836.908B	58	36-40	22	0.2
917.5847.908B	58	47-50	22	0.3

For use with 917 HDPE Sleeve

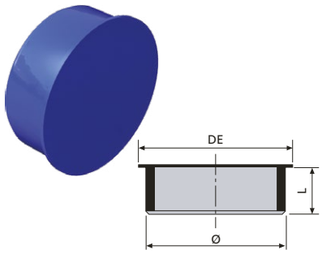


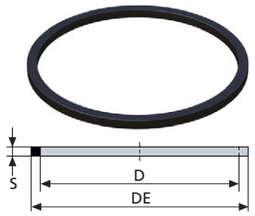


HDPE SPIGOT BEND WITH CAP							
CODE	Ø/$Ø_1$ mm	S mm	DE mm	L mm	L_1 mm	L_2 mm	WEIGHT Kg
917.4046.90B	40/46	3	52	60	51	22	0.055
917.5046.90B	50/46	3	52	62	51	22	0.06
917.5058.90B	50/58	3	64	68	55	24	0.07
917.5646.90B	56/46	3	52	64	60	22	0.07
917.5658.90B	56/58	3	64	65	60	22	0.075

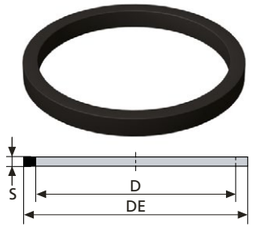
4 Pipes and Fittings

HDPE Fittings

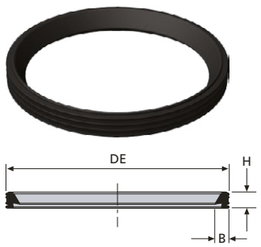
PRODUCT	HDPE PROTECTIVE CAP FOR SOCKET				
	CODE	Ø mm	DE mm	L mm	WEIGHT Kg
	9130.40B	40	48	30	0.01
	9130.50B	50	60	30	0.01
	9130.56B	56	62	25	0.01
	9130.75B	75	85	38	0.02
	9130.110B	110	123	39	0.04
	9130.160B	160	167	36	0.055
	9130.200B	200	220	50	0.13

	HDPE RING				
	CODE	D mm	DE mm	S mm	WEIGHT Kg
	9118.50B	50	58	3.5	0.003
	9118.56B	56	63	3.5	0.003
	9118.75B	75	84	4	0.007
	9118.110B	110	121	4	0.011

Suitable for 912 HDPE threaded coupling

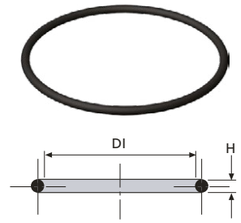
	HDPE RING SEAL				
	CODE	D mm	DE mm	S mm	WEIGHT Kg
	9119.50B	50	56	6	0.004
	9119.56B	56	61	6	0.004
	9119.75B	75	82	10	0.006
	9119.110B	110	121	10	0.008

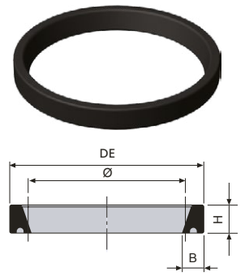
Suitable for 912 HDPE threaded coupling

	HDPE 1 LIP SEAL FOR SOCKETS					
	CODE	Ø mm	DE mm	H mm	B mm	WEIGHT Kg
	927.100.908B	100	114	9.3	8.2	0.02
	927.110.908B	110	123.9	8.9	7.9	0.02
	927.160.908B	160	179.8	11.5	10.2	0.045
	927.200.908B	200	223.7	12.8	11.2	0.045
	927.250.908B	250	282	19.5	1.6	0.5
	927.315.908B	315	350	20.5	17.15	0.055

Suitable for 927 HDPE ring seal adaptors

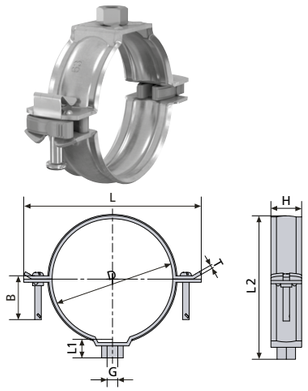
HDPE Spares

PRODUCT	HDPE O RING FOR SOCKETS				
	CODE	Ø mm	DI mm	H mm	WEIGHT Kg
	9116.40B	40	39+1	6	0.005
	9116.50B	50	49+1	6	0.005
	9116.75B	75	79+1	6	0.01
	9116.110B	110	109+1.5	7	0.015
	9116.160B	160	159+1.5	9	0.035

	HDPE SEAL FOR EXPANSION SOCKETS					
	CODE	Ø mm	H mm	B mm	DE mm	WEIGHT Kg
	911.40.908B	40	16	12	60	0.025
	911.50.908B	50	16	12	70	0.035
	911.56.908B	56	16	12	76	0.04
	911.75.908B	75	16	12.5	95.5	0.05
	911.110.908B	110	16	12.5	130.5	0.07
	911.160.908B	160	16	12.5	180.5	0.115
	911.200.908B	200	21.8	11.2	223.7	0.045

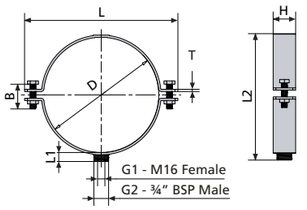
Suitable for 911 HDPE expansion joint

HDPE Anchors and Brackets

PRODUCT	M10 ANCHOR/GUIDE BRACKET								
	CODE	Ø mm	H mm	L mm	L_1 mm	L_2 mm	T mm	G mm	B mm	WEIGHT Kg
	9140.40B	40	28	84	11	55	2.5	M10 F	M6 x 30	5.5
	9140.50B	50	28	95	11	62	2.5	M10 F	M6 x 30	5.99
	9140.56B	56	28	101	11	70	2.5	M10 F	M6 x 30	7.93
	9140.75B	75	28	120	11	90	2.5	M10 F	M6 x 40	9.12
	9140.110B	110	28	162	17	131	2.5	M10 F	M6 x 40	7.09
	9140.160B	160	28	210	17	218	2.5	M10 F	M6 x 40	9.15
	9140.200B	200	40	272	20	224	4	M10 F	M10 x 50	10.8
	9140.250B	250	50	354	32	288	6	M10 F	M12 x 60	6.05
	9140.315B	315	50	423	32	353	6	M10 F	M12 x 60	7.33

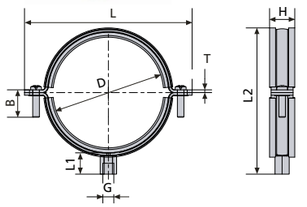
To use as an anchor point, remove spacer.
Material: Zinc plated steel.
If you need an anchor point, simply take out the recyclable spacer and tighten bolt to 2Nm torque MAX.
All brackets will produce an intermediate support bracket with use of the included recyclable spacer.

M16 BRACKET									
CODE	D mm	H mm	L mm	L_1 mm	L_2 mm	T mm	G mm	B mm	WEIGHT Kg
9149.200B	200	40	272	20	224	4	M16 F/ ¾" BSP M	M10 x 50	2.18
9149.250B	250	50	354	32	288	6	M16 F/ ¾" BSP M	M12 x 60	2
9149.315B	315	50	423	32	353	6	M16 F/ ¾" BSP M	M12 x 60	2.414



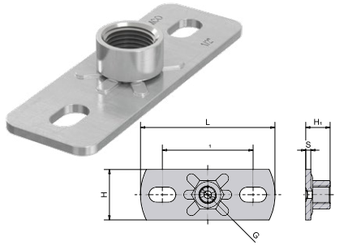
HDPE pipe anchoring shells not required.
Material: Zinc plated steel.

ACOUSTIC PIPE BRACKET								
CODE	D mm	H mm	L mm	L_1 mm	L_2 mm	T mm	G mm	B mm
9140.110R	110	23	153	20	134	2.5	M10 F	M6 x 25
9140.160R	160	30	220	20	200	2.5	M10 F	M6 x 25
9140.40R	40	24	90	20	78	2.5	M8/M10 F	M6 x 25
9140.50R	20	24	98	20	86	2.5	M8/M10 F	M6 x 25
9140.75R	75	24	126	20	114	2.5	M8/M10 F	M6 x 25
9140.110R	110	24	153	20	134	2.5	M8/M10 F	M6 x 25
9140.160R	160	30	220	20	200	2.5	M8/M10 F	M6 x 25

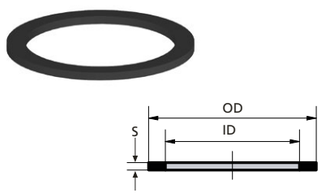


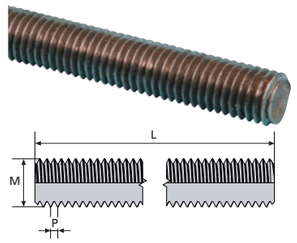
Material: Zinc plated steel.

HDPE Anchors and Brackets

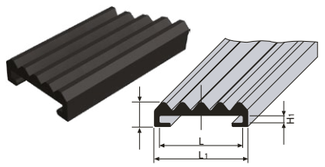
PRODUCT	MOUNTING PLATE							
	CODE	L mm	G mm	L_1 mm	H mm	H_1 mm	S mm	WEIGHT Kg
	9148.10B	120	½"	82	40	20	4	0.165
	9148.19B	120	¾"	84	40	22	4	0.185

RUBBER FLAT SEAL				
CODE	OD mm	ID mm	S mm	WEIGHT Kg
918.40.908B	38	30	2.4	0.002
918.40.918B	45	36	2	0.001





THREADED BAR				
CODE	D mm	L mm	P mm	WEIGHT Kg
9147B	10	1000	1.5	0.628
9149B	16	1000	2	1.608



ANTI VIBRATION RUBBER INSERT FOR CLIPS					
CODE	L mm	L_1 mm	H mm	H_1 mm	WEIGHT Kg
9105.30B	30	36	9	3	6.11

4 Pipes and Fittings

Terrain FUZE Electrofusion Welding Machine

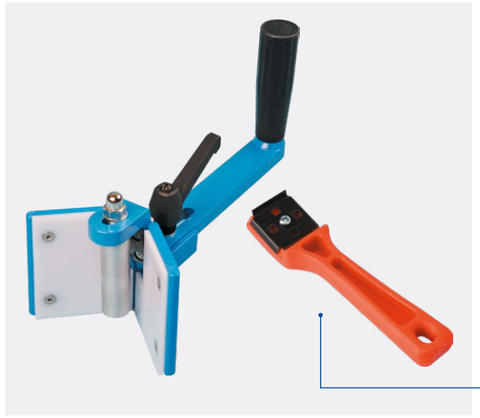
Supplied complete with yellow cable for pipe diameters up to and including 160mm and blue cables for pipe diameters greater than 160mm.

PART NUMBER	DESCRIPTION	PIPE DIAMETERS
9000.40315.110V	Terrain FUZE Electrofusion Welding Machines	40-315mm
AW00-2003	Yellow Replacement leads	40-160mm
AW00-2004	Blue Replacement leads	200-315mm
HDC464334	Yellow Universal Replacement Leads	40-160mm
HDC464335	Blue Universal Replacement Leads	200-315mm

General properties

- Supply voltage: 110V
- Pipe diameters: 40-315mm
- Supply current: 10A
- Supply power: 3500W
- Supply protection: Class 1 – earthed
- Weight: 15Kg
- Size: 410 x 350 x 200mm
- Protection level: IP65
- Operating temp.: -15°C to +45°C

Terrain FUZE Tooling



TERRAIN FUZE PIPE CUTTER		
CODE	DESCRIPTION	PIPE DIAMETERS
9500.663T	Pipe Cutter – Model T1	40 to 63mm
9500.50140T	Pipe Cutter – Model T2	50 to140mm
9500.100160T	Pipe Cutter – Model T3	100 to 160mm
9500.180315T	Pipe Cutter – Model T4	180 to 315mm

General properties

Model T1

- Weight: 0.6Kg
- Pipe diameters: 40-63mm

Model T2

- Weight: 1.4Kg
- Pipe diameters: 50-140mm

Model T3

- Weight: 1.6Kg
- Pipe diameters: 100-160mm

Model T4

- Weight: 7Kg
- Pipe diameters: 180-315mm

SPARE CUTTING WHEELS		
CODE	DESCRIPTION	PIPE DIAMETERS
9500.100160T	Spare Cutting Wheels	50 to 160mm

TERRAIN FUZE PIPE CHAMFER TOOL		
CODE	DESCRIPTION	PIPE DIAMETERS
9502.32160T	Pipe Chamfer Tool – Model 1	32 to 160mm
9502.40250T	Pipe Chamfer Tool – Model 2	40 to 125mm

General properties

Model 1

- Weight: 0.8Kg
- Pipe diameters: 32-160mm

Model 2

- Weight: 1.4Kg
- Pipe diameters: 450-250mm

HDPE Pipe Scraper

- Product code: 9507T

5 Chemical Resistance

The use of thermoplastic pipe systems within the commercial market is now widespread. Thermoplastics have replaced traditional materials such as steel, ductile iron and copper. Because of this diversity of use, it is essential that the most suitable plastic material is matched to its proposed application.

This section will provide a guide to compatible material selection. The information within this section has been collated from tests carried out by both national and international standards organisations (ISO/TR10358) as well as tests performed by independent test houses.

The tests were based on the use of pure chemicals. For mixed chemicals, we would advise that pilot tests should be undertaken in order to ascertain the resistance of the material under these circumstances.

PIPE JOINTS

Electrofusion joints are regarded as generally having the same chemical resistance as the material itself. However, the jointing process can leave a certain amount of residual stress within the joint.

SEALS AND SEAT MATERIALS

The working life of seals and seat materials is often different from that of the pipe system and greatly dependent on the working conditions involved.

Tables 5.01 and 8.02 outline their resistance.

SEAL AND SEAT MATERIAL	
MATERIAL TYPE	**RESISTANCE**
EDPM-Ethylene Propylene Rubber	Satisfactory resistance to most aggressive chemicals, not suitable for oils or fat
FPM-Fluorine Rubber	The most resistant of the elastomers to solvents
NBR-Nitrile Rubber	Not resistant to oxidising agents, but resists petrol and oils
PTFE-Polytetrafluoroethylene	Resists all the chemicals shown in tables

Table 5.01

TERMINOLOGY FOR CHEMICAL RESISTANCE TABLES	
SYMBOL/TERM	**DESCRIPTION**
✓	Resistant
O	Conditionally resistant
×	Not recommended
–	No test data available
Technical grade	Technically pure
Saturated	Media has reached its maximum absorption in water at ambient temperature, which is the point where there can be no further absorption
Aqueous	A solution below maximum absorption, expressed as a percentage (%) of saturation (concentration)
Suspension	Insoluble or partially soluble solid carried in an aqueous base normally prepared at ambient temperature
Commercial Proprietary Industrial	Self explanatory, grades of chemical named brands in general use

Table 5.02

Table of fluids* which can be conveyed through HDPE pipe and fittings with no internal pressure, mechanical stress and temperature up to 60°.

Terrain FUZE Stax is made from HDPE, please follow the column labeled PE.

CHEMICAL	CONCENTRATION	MATERIAL°C																		
		PVCu			ABS			PE			POLYPROPYLENE			EPDM			FPM			
		20	40	60	20	40	60	20	40	60	20	60	100	20	40	60	20	60	100	120
Acetaldehyde	40% aqueous solution	O	×	–	×	–	–	✓	✓	O	✓	O	O	✓	O	O	✓	O	–	–
Acetaldehyde	Technically pure	×	–	–	×	–	–	✓	O	–	O	×	–	✓	O	×	O	×	–	–
Acetic acid	50% Aqueous	✓	✓	O	×	–	–	✓	✓	✓	✓	✓	✓	✓	O	–	O	–	–	–
Acetic acid	Technically pure glacial	O	×	–	×	–	–	✓	✓	O	✓	✓	O	✓	O	–	×	–	–	–
Acetic acid anhydride	Technically pure	×	–	–	×	–	–	✓	O	–	✓	–	–	O	–	–	×	–	–	–
Acetic acid ethylester		×	–	–	×	–	–	✓	–	–	✓	–	–	✓	–	–	O	–	–	–
Acetic acid isobutyl ester	Technically pure	×	–	–	×	–	–	✓	–	–	✓	–	–	✓	–	–	×	–	–	–
Acetone	Up to 10% aqueous	×	–	–	O	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	O	×	–	–
Acetone	Technically pure	×	–	–	×	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	×	–	–	–
Acetonitrile	100%	×	–	–	×	–	–	O	–	–	O	–	–	O	–	–	×	–	–	–
Acetophenone	100%	×	–	–	×	–	–	O	–	–	O	–	–	✓	–	–	×	–	–	–
Acrylic acid methyl ester	Technically pure	×	–	–	×	–	–	O	–	–	×	–	–	O	–	–	–	–	–	–
Acrylicethyl	Technically pure	×	–	–	×	–	–	O	–	–	×	–	–	O	–	–	×	–	–	–
Acrylonitrile	Technically pure	×	–	–	×	–	–	✓	✓	✓	✓	–	–	✓	✓	O	O	×	–	–
Adipic acid	Saturated, aqueous	✓	✓	×	×	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Allyl alcohol	96%	O	×	–	×	–	–	✓	✓	✓	✓	O	–	✓	✓	O	O	–	–	–
Ammonia	Gaseous technically pure	✓	✓	✓	×	–	–	✓	✓	✓	✓	✓	–	✓	–	–	✓	–	–	–
Ammonium acetate	Aqueous, all	✓	✓	O	O	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–
Ammoniumpersulphate		✓	✓	O	–	–	–	✓	–	–	O	–	–	✓	–	–	✓	–	–	–
Ammonum salts, aqueous inorganic	Saturated	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Amyl acetate	Technically pure	×	–	–	×	–	–	✓	✓	✓	O	×	–	O	–	–	×	–	–	–
Amyl alcohol	Technically pure	✓	✓	O	×	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	O	–	–	–
Aniline	Technically pure	×	–	–	×	–	–	✓	O	–	✓	O	–	✓	✓	✓	O	O	–	–
Antimony trichloride	90% Aqueous	✓	✓	–	×	–	–	✓	✓	✓	✓	✓	–	✓	–	–	✓	–	–	–
Aqua regia	Mixing ratio	✓	O	–	×	–	–	×	–	–	×	–	–	×	–	–	O	–	–	–
Arsenic acid	80% Aqueous	✓	✓	O	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	–
Barium salts, aqueous inorganic	Saturated	✓	✓	✓	✓	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	–
Beer	Usual commercial	✓	–	–	✓	–	–	✓	–	–	✓	–	–	–	–	–	✓	–	–	–
Benzaldehyde	Saturated, aqueous	×	–	–	×	–	–	✓	✓	O	✓	–	–	✓	✓	O	✓	✓	–	–
Benzene	Technically pure	×	–	–	×	–	–	O	O	–	O	–	–	×	–	–	✓	–	–	–
Benzene sulfonic acid	Technically pure	✓	–	–	–	–	–	✓	✓	O	✓	O	–	✓	✓	O	✓	–	–	–

KEY: – NO DATA × NOT RECOMMENDED O CONDITIONALLY RESISTANT ✓ RESISTANT

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5 Chemical Resistance

Table of fluids* which can be conveyed through HDPE pipe and fittings with no internal pressure, mechanical stress and temperature up to 60°.

Terrain FUZE Stax is made from HDPE, please follow the column labeled PE.

CHEMICAL	CONCENTRATION	MATERIAL°C																		
		PVCu			ABS			PE			POLYPROPYLENE			EPDM			FPM			
		20	40	60	20	40	60	20	40	60	20	60	100	20	40	60	20	60	100	120
Benzine (Gasoline)	Free of lead and aromatic compounds	✓	✓	–	×	–	–	✓	✓	–	O	–	–	×	–	–	✓	–	–	–
Benzoic acid	Aqueous, all	✓	✓	O	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	O	–
Benzyl alcohol	Technically pure	O	–	–	×	–	–	✓	✓	O	✓	O	–	✓	✓	O	✓	–	–	–
Beryllium salts, aqueous, inorganic		✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Borax	Aqueous, all	✓	✓	O	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–
Boric acid	Aqueous, all	✓	✓	O	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
Bromine water	Saturated, aqueous	✓	–	–	×	–	–	×	–	–	×	–	–	×	–	–	✓	–	–	–
Butadiene	Technically pure	✓	–	–	×	–	–	O	–	–	O	–	–	×	–	–	✓	–	–	–
Butane	Technically pure	✓	–	–	✓	–	–	✓	–	–	✓	–	–	×	–	–	✓	–	–	–
Butanediol	10% Aqueous	✓	O	–	×	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Butanol	Technically pure	✓	✓	O	×	–	–	✓	✓	✓	✓	O	–	✓	✓	✓	✓	×	–	–
Butyl acetate	Technically pure	×	–	–	×	–	–	✓	–	–	O	–	–	✓	×	–	O	–	–	–
Butyl phenol p-tertiary	Technically pure	O	×	–	×	–	–	O	–	–	✓	–	–	×	–	–	O	–	–	–
Butylene glycol	Technically pure	✓	✓	O	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	O	–	–
Butylene liquid	Technically pure	✓	–	–	–	–	–	×	–	–	×	–	–	O	–	–	✓	–	–	–
Butyric acid	Technically pure	✓	–	–	×	–	–	✓	–	–	✓	–	–	O	–	–	O	–	–	–
Caesium salts, aqueous inorganic	<Saturated acid	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Cadmium salts, aqueous inorganic	<Saturated acid	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Calcium acetate	Saturated	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Calcium hydroxide	Saturated aqueous	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	–
Calcium lactate	Saturated	✓	✓	–	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Calcium salts, aqueous, inorganic	Saturated acid	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Carbon dioxide	Technically pure, anhydrous	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Carbon tetrachloride	Technically pure	×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	✓	–	–	–
Carbonic acid		✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Caro's acid		✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–	–
Caustic potash solution (potassium hydroxide)	50% Aqueous	✓	✓	O	–	–	–	✓	✓	✓	✓	O	–	✓	✓	✓	×	–	–	–
caustic soda solution	50% Aqueous	✓	✓	✓	–	–	–	✓	✓	✓	✓	O	–	✓	✓	✓	×	–	–	–
Chloric acid	10% Aqueous	✓	✓	O	×	–	–	✓	✓	–	×	–	–	✓	✓	✓	✓	✓	–	–
Chloric acid	20% Aqueous	✓	✓	O	×	–	–	O	–	–	×	–	–	O	O	–	✓	✓	–	–
Chlorine	Moist, 97% gaseous	×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	✓	–	–	–

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Table of fluids* which can be conveyed through HDPE pipe and fittings with no internal pressure, mechanical stress and temperature up to 60°.

Terrain FUZE Stax is made from HDPE, please follow the column labeled PE.

CHEMICAL	CONCENTRATION	MATERIAL°C																		
		PVCu			ABS			PE			POLYPROPYLENE			EPDM			FPM			
		20	40	60	20	40	60	20	40	60	20	60	100	20	40	60	20	60	100	120
Chlorine	Liquid, technically pure, as double pipe system	×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	O	–	–	–
Chlorine	Anhydrous, technically pure, as double pipe system	×	–	–	×	–	–	O	O	–	×	–	–	O	–	–	✓	–	–	–
Chlorine water	Saturated	✓	✓	O	O	–	–	O	O	–	O	–	–	O	–	–	✓	–	–	–
Chloroacetic acid, mono	50% Aqueous	✓	✓	–	×	–	–	✓	✓	O	✓	O	–	O	–	–	×	–	–	–
Chloroacetic acid, mono	Technically pure	✓	✓	O	×	–	–	✓	✓	O	✓	O	–	O	–	–	×	–	–	–
Chlorobenzene	Technically pure	×	–	–	×	–	–	O	–	–	O	–	–	×	–	–	×	–	–	–
Chloroethanol	Technically pure	×	–	–	×	–	–	✓	✓	✓	✓	✓	–	O	–	–	×	–	–	–
Chlorosulphonic acid	Technically pure	O	–	–	×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	–
Chromic acid	Aqueous, all	O	O	–	×	–	–	O	–	–	O	–	–	–	–	–	✓	O	–	–
Chromic acid + water + sulphuric acid	50g 15g 35g	✓	✓	O	×	–	–	×	–	–	×	–	–	O	O	–	✓	–	–	–
Chromium (II) - salts, aqueous, inorganic	<Saturated acid	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Compressed air, containing oil		×	–	–	×	–	–	✓	✓	–	O	–	–	×	–	–	✓	–	–	–
Copper salts, aqueous inorganic	<Saturated acid	✓	✓	O	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	–	✓	✓	–	–
Cresol	Cold saturated aqueous	O	–	–	×	–	–	✓	✓	O	✓	–	–	O	–	–	✓	–	–	–
Crotonic aldehyde	Technically pure	×	–	–	×	–	–	✓	–	–	✓	–	–	✓	–	–	✓	–	–	–
Cyclohexane	Technically pure	×	–	–	×	–	–	✓	✓	✓	✓	–	–	×	–	–	✓	–	–	–
Cyclohexanol	Technically pure	✓	✓	✓	×	–	–	✓	✓	✓	✓	O	–	×	–	–	✓	–	–	–
Cyclohexanone	Technically pure	×	–	–	×	–	–	✓	O	O	✓	O	–	O	–	–	×	–	–	–
Dextrine	Usual commercial	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓	✓	–	–
Disobutyl ketone	Technically pure	×	–	–	×	–	–	✓	O	–	✓	–	–	O	O	–	×	–	–	–
Dibrombenzene	<Saturated acid	×	–	–	×	–	–	O	–	–	O	–	–	O	–	–	✓	–	–	–
Dibutyl ether	Technically pure	×	–	–	×	–	–	O	–	–	O	–	–	×	–	–	✓	–	–	–
Dibutyl phthalate	Technically pure	×	–	–	×	–	–	✓	O	O	✓	O	–	O	–	–	O	–	–	–
Dichloroacetic acid	50% Aqueous	✓	✓	O	×	–	–	✓	✓	O	✓	O	–	✓	✓	✓	O	×	–	–
Dichloroacetic acid	Technically pure	✓	✓	O	×	–	–	✓	✓	O	✓	O	–	✓	✓	✓	O	–	–	–
Dichloroacetic acid methyl ester	Technically pure	×	–	–	×	–	–	✓	✓	✓	✓	✓	–	✓	✓	O	×	–	–	–
Dichlorobenzene	Technically pure	×	–	–	×	–	–	O	–	–	O	–	–	O	–	–	✓	–	–	–
Dichloroethylene	Technically pure	×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	O	–	–	–
Diesel oil		✓	✓	–	×	–	–	×	–	–	✓	–	–	×	–	–	✓	–	–	–

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CHEMICAL	CONCENTRATION	MATERIAL°C																		
		PVCu			ABS			PE			POLYPROPYLENE			EPDM			FPM			
		20	40	60	20	40	60	20	40	60	20	60	100	20	40	60	20	60	100	120
Diethyl ether		×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	–
Diethylamine	Technically pure	–	–	–	×	–	–	✓	–	–	✓	–	–	O	–	–	×	–	–	–
Dimethyl formamide	Technically pure	×	–	–	×	–	–	✓	✓	O	✓	✓	–	O	–	–	×	–	–	–
Dimethylamine	Technically pure	×	–	–	×	–	–	✓	–	–	×	–	–	O	–	–	×	–	–	–
Dioxane	Technically pure	×	–	–	×	–	–	✓	✓	✓	O	O	–	O	–	–	×	–	–	–
Ethanolamine	Technically pure	×	–	–	×	–	–	✓	–	–	✓	–	–	✓	–	–	O	–	–	–
Ethyl alcohol (Ethnause)	Technically pure 96%	✓	✓	O	×	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	O	–	–
Ethyl benzene	Technically pure	×	–	–	×	–	–	O	–	–	O	–	–	×	–	–	✓	–	–	–
Ethyl chloride (G)	Technically pure	×	–	–	×	–	–	O	–	–	O	–	–	×	–	–	O	–	–	–
Ethyl ether	Technically pure	×	–	–	×	–	–	✓	–	–	O	–	–	×	–	–	×	–	–	–
Ethylene diamine	Technically pure	O	–	–	×	–	–	✓	✓	✓	✓	✓	–	✓	–	–	O	×	–	–
Ethylene glycol	<50%	✓	✓	✓	O	O	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Ethylene glycol	Technically pure	✓	✓	✓	×	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Ethylenediamine -tetraacetic acid (EDTA)		–	–	–	–	–	–	✓	–	–	✓	–	–	✓	–	–	–	–	–	–
Fluorine	Technically pure	×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	–
Fluorosilic acid	32% Aqueous	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	–	–	O	–	–	–
Formaldehyde	40% Aqueous	✓	✓	–	–	–	–	✓	✓	✓	✓	–	–	✓	✓	✓	✓	✓	–	–
Formamide	Technically pure	×	–	–	×	–	–	✓	✓	✓	✓	✓	–	✓	–	–	O	–	–	–
Formic acid	≥25%	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	–	–	–	–
Formic acid	Up to 50% aqueous	✓	✓	O	O	–	–	✓	✓	✓	✓	O	–	✓	✓	O	✓	O	–	–
Formic acid	Technically pure	✓	O	×	×	–	–	✓	✓	✓	✓	×	–	✓	✓	O	✓	–	–	–
Frigen 12 (freon 12)	Technically pure	✓	–	–	×	–	–	×	–	–	×	–	–	O	–	–	O	–	–	–
Fuel oil		✓	✓	–	×	–	–	✓	–	–	O	–	–	×	–	–	✓	–	–	–
Furfuryl alcohol	Technically pure	×	–	–	×	–	–	✓	✓	✓	✓	O	–	O	–	–	×	–	–	–
Gelatin	Aqueous, all	✓	✓	–	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	–	✓	–	–	–
Glucose	Aqueous, all	✓	✓	O	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	–
Glycerol	Technically pure	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	✓	✓	O	O	✓	O	–	–
Glycin	10% Aqueous	✓	✓	–	✓	✓	–	✓	✓	–	✓	–	–	–	–	–	✓	–	–	–
Glycolic acid	37% Aqueous	✓	–	–	–	–	–	✓	✓	✓	✓	–	–	–	–	–	✓	–	–	–
Heptane	Technically pure	✓	✓	–	×	–	–	✓	✓	–	O	–	–	×	–	–	✓	–	–	–

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Table of fluids* which can be conveyed through HDPE pipe and fittings with no internal pressure, mechanical stress and temperature up to 60°.

Terrain FUZE Stax is made from HDPE, please follow the column labeled PE.

CHEMICAL	CONCENTRATION	MATERIAL°C																		
		PVCu			ABS			PE			POLYPROPYLENE			EPDM			FPM			
		20	40	60	20	40	60	20	40	60	20	60	100	20	40	60	20	60	100	120
Hexane	Technically pure	✓	✓	–	×	–	–	✓	✓	–	O	–	–	×	–	–	✓	–	–	–
Hydrazine hydrate	Aqueous	✓	–	–	×	–	–	✓	✓	✓	✓	✓	–	✓	–	–	O	–	–	–
Hydrochloric acid	Up to 30% aqueous	✓	✓	O	–	–	–	✓	✓	✓	✓	O	–	✓	✓	O	✓	O	–	–
Hydrochloric acid	38% Aqueous	✓	✓	O	×	–	–	✓	✓	–	O	–	–	✓	O	–	✓	O	–	–
Hydrocyanic acid	Technically pure	✓	✓	O	×	–	–	✓	✓	✓	✓	✓	–	✓	O	–	✓	–	–	–
Hydrofluoric acid	40%	✓	O	O	×	–	–	✓	✓	O	✓	✓	–	×	–	–	✓	O	–	–
Hydrogen	Technically pure	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	–	✓	✓	✓	–
Hydrogen chloride	Technically pure gaseous	✓	✓	O	×	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Hydrogen peroxide	30% Aqueous	✓	–	–	×	–	–	✓	–	–	✓	–	–	O	–	–	✓	–	–	–
Hydrogen peroxide	90% Aqueous	✓	–	–	×	–	–	O	–	–	–	–	–	×	–	–	O	–	–	–
Hydrogen sulphide	Saturated aqueous	✓	✓	O	–	–	–	✓	✓	✓	✓	✓	–	✓	×	–	✓	✓	–	–
Hydrogen sulphide	Technically pure	✓	✓	✓	–	–	–	✓	✓	O	✓	✓	–	✓	×	–	✓	O	–	–
Hydrquinone	30%	✓	✓	–	–	–	–	✓	✓	✓	✓	✓	–	✓	–	–	–	–	–	–
Lodine-potassium iodide solution (Lugol's solution)		✓	–	–	×	–	–	✓	–	–	✓	–	–	✓	–	–	✓	–	–	–
Iron salts, aqueous inorganic	≥Saturated acid	✓	✓	✓	✓	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	✓	–
Isooctane	Technically pure	✓	–	–	×	–	–	✓	–	–	✓	–	–	–	–	–	✓	–	–	–
Isopropyl alcohol (ESC)	Technically pure	✓	✓	O	–	–	–	✓	✓	O	✓	O	–	✓	✓	–	✓	–	–	–
Isopropyl ether	Technically pure	×	–	–	×	–	–	O	–	–	O	–	–	O	–	–	×	–	–	–
Lactic acid	10% Aqueous	✓	O	×	✓	O	×	✓	✓	✓	✓	✓	–	✓	✓	O	✓	O	–	–
Lead acetate	Aqueous saturated	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Lead salts, aqueous, inorganic	≥Saturated acid	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Linsead oil	Technically pure	✓	✓	O	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–
Lithium salts, aqueous, inorganic	≥Saturated acid	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Magnesium salts, aqueous inorganic	≥Saturated acid	✓	✓	O	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
Maleic acid	Cold saturated aqueous	✓	✓	O	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Mercury	Pure	✓	✓	✓	✓	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Mercury salts	≥Saturated acid	✓	✓	O	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Methane (natural gas)	Technically pure	✓	–	–	✓	–	–	✓	–	–	✓	–	–	–	–	–	✓	–	–	–
Methanol	All	✓	✓	O	×	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	O	O	–	–
Methyl acetate	Technically pure	×	–	–	×	–	–	✓	–	–	✓	–	–	✓	–	–	×	–	–	–

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5 Chemical Resistance

Table of fluids* which can be conveyed through HDPE pipe and fittings with no internal pressure, mechanical stress and temperature up to 60°.

Terrain FUZE Stax is made from HDPE, please follow the column labeled PE.

CHEMICAL	CONCENTRATION	MATERIAL°C																		
		PVCu			ABS			PE			POLYPROPYLENE			EPDM			FPM			
		20	40	60	20	40	60	20	40	60	20	60	100	20	40	60	20	60	100	120
Methyl amine	32% Aqueous	O	–	–	×	–	–	✓	–	–	✓	–	–	✓	–	–	×	–	–	–
Methyl bromide	Technically pure	×	–	–	×	–	–	O	–	–	×	–	–	×	–	–	O	–	–	–
Methyl ethyl ketone	Technically pure	×	–	–	×	–	–	✓	–	–	✓	–	–	✓	–	–	×	–	–	–
Methyl isobutyl ketone		×	–	–	×	–	–	✓	–	–	✓	–	–	✓	–	–	×	–	–	–
Methyl methacrylate		×	–	–	×	–	–	✓	–	–	✓	–	–	✓	–	–	×	–	–	–
Methyl phenyl(acetophenon)		×	–	–	×	–	–	✓	–	–	✓	–	–	✓	–	–	×	–	–	–
Milk		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	✓	–	–	–
Mineral water		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mixed acids - nitric 15% - hydrofluoric 15% - sulphuric 18%	3 parts 1 part 2 parts	✓	–	–	×	–	–	O	–	–	×	–	–	×	–	–	✓	–	–	–
Mixed acids - sulphuric - nitric - water	10% 20% 70%	✓	✓	✓	×	–	–	✓	–	–	×	–	–	×	–	–	✓	✓	–	–
Mixed acids - sulphuric - nitric - water	50% 33% 17%	✓	O	–	×	–	–	×	–	–	×	–	–	×	–	–	✓	–	–	–
Mixed acids - sulphuric - nitric - water	50% 31% 19%	✓	–	–	×	–	–	×	–	–	×	–	–	×	–	–	✓	–	–	–
Mixed acids - sulphuric - phosphoric - water	30% 60% 10%	✓	✓	–	×	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
N, N-Dimethylaniline	Technically pure	×	–	–	×	–	–	✓	–	–	✓	–	–	✓	–	–	–	–	–	–
N, methylpyrrolidon		×	–	–	×	–	–	✓	–	–	✓	–	–	✓	–	–	O	–	–	–
Naphthalene	Technically pure	×	–	–	–	–	–	✓	–	–	✓	–	–	×	–	–	✓	–	–	–
Nickel salts, aqueous in organic	≥Saturated acid	✓	✓	O	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Nitrating acid - sulphuric acid - nitric acid - water	65% 20% 15%	✓	O	–	–	–	–	×	–	–	×	–	–	×	–	–	✓	–	–	–
Nitric acid	6.3% Aqueous	✓	✓	✓	–	–	–	✓	✓	✓	✓	O	–	✓	O	–	✓	✓	–	–
Nitric acid	≥25%	✓	✓	✓	×	–	–	✓	✓	O	✓	–	–	✓	–	–	✓	–	–	–
Nitric acid	65% Aqueous	O	O	×	×	–	–	O	×	–	×	–	–	×	–	–	✓	×	–	–
Nitric acid	85%	×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	✓	–	–	–
Nitric acid	100%	×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	–

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Table of fluids* which can be conveyed through HDPE pipe and fittings with no internal pressure, mechanical stress and temperature up to 60°.

Terrain FUZE Stax is made from HDPE, please follow the column labeled PE.

CHEMICAL	CONCENTRATION	MATERIAL°C																		
		PVCu			ABS			PE			POLYPROPYLENE			EPDM			FPM			
		20	40	60	20	40	60	20	40	60	20	60	100	20	40	60	20	60	100	120
Nitrobenzene	Technically pure	×	–	–	×	–	–	✓	–	–	✓	–	–	O	–	–	✓	–	–	–
Nitrotoluene (o-, m-, p-)	Technically pure	×	–	–	×	–	–	✓	O	–	O	–	–	×	–	–	O	–	–	–
Nitrous acid		✓	✓	–	×	–	–	✓	–	–	×	–	–	✓	–	–	✓	–	–	–
Nitrous gases (nitric oxide)	Diluted, moist, anhydrous	✓	–	–	×	–	–	O	–	–	O	–	–	O	–	–	✓	–	–	–
Oleic	Technically pure	✓	✓	✓	×	–	–	✓	✓	O	✓	O	–	×	–	–	✓	×	–	–
Oleum	10% SO3	×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	–
Olive oil		✓	✓	✓	×	–	–	✓	✓	O	✓	✓	–	×	–	–	✓	✓	–	–
Oxygen	Technically pure	✓	✓	✓	–	–	–	✓	✓	O	✓	O	–	✓	✓	✓	✓	✓	✓	✓
Ozone	Up to 2%, in air	✓	–	–	×	–	–	O	–	–	O	–	–	O	–	–	✓	–	–	–
Ozone	Cold saturated, aqueous	✓	–	–	×	–	–	O	–	–	O	–	–	×	–	–	✓	–	–	–
Palm oil, palm nut oil		✓	–	–	–	–	–	✓	–	–	✓	–	–	×	–	–	✓	–	–	–
Paraffin emulsions	Usual commercial, aqueous	✓	–	–	–	–	–	✓	–	–	✓	–	–	×	–	–	✓	–	–	–
Parraffin oil		✓	–	–	O	–	–	✓	–	–	✓	–	–	×	–	–	✓	–	–	–
Perchlorid acid	10% Aqueous	✓	–	–	–	–	–	✓	–	–	✓	–	–	✓	–	–	✓	–	–	–
Perchlorid acid	70% Aqueous	✓	–	–	×	–	–	–	–	–	×	–	–	×	–	–	✓	–	–	–
Perchloroethylene (tetrachlorethylene)	Technically pure	×	–	–	–	–	–	O	–	–	O	–	–	×	–	–	✓	✓	–	–
Phenol	Up to10% aqueous	✓	O	–	×	–	–	✓	✓	O	✓	✓	–	✓	✓	O	✓	✓	–	–
Phenol	Up to 90% aqueous	O	–	–	×	–	–	✓	✓	O	✓	✓	–	×	–	–	✓	×	–	–
Phosgene	Gaseous technically pure	✓	O	O	×	–	–	O	–	–	O	–	–	✓	–	–	✓	O	–	–
Phosgene	Liquid, technically pure	×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	✓	–	–	–
Phosphoric acid	85% Aqueous	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	O	✓	✓	O	–
Phosphoric acid	Up to 95%	✓	✓	–	×	–	–	✓	✓	–	✓	✓	–	O	–	–	✓	O	–	–
Phosphorous chlorides - trichloride - pentachloride - oxichloride	Technically pure	×	–	–	×	–	–	×	–	–	×	–	–	–	–	–	×	–	–	–
Photographic developer	Usual commercial	✓	✓	O	✓	✓	O	✓	✓	O	✓	–	–	✓	✓	–	✓	–	–	–
Photographic emulsions		✓	✓	–	✓	✓	–	✓	✓	–	✓	–	–	✓	✓	–	✓	–	–	–
Photographic fixer	Usual commercial	✓	✓	O	✓	✓	O	✓	✓	–	✓	–	–	✓	✓	–	✓	–	–	–
Phthalic acid	Saturated, aqueous	✓	O	×	×	–	–	✓	✓	✓	✓	✓	–	✓	O	–	×	–	–	–
Potassium hydroxide	50%	✓	✓	✓	–	–	–	✓	✓	✓	✓	O	–	✓	✓	✓	×	–	–	–

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5 Chemical Resistance

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CHEMICAL	CONCENTRATION	MATERIAL°C																		
		PVCu			ABS			PE			POLYPROPYLENE			EPDM			FPM			
		20	40	60	20	40	60	20	40	60	20	60	100	20	40	60	20	60	100	120
Potassium aluminium salts, (alum), aqueous, inorganic	≤Saturated acid	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	–	–	–	–
Potassium persulphate (potassium peroxidisulfate)	All, aqueous	✓	✓	O	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	–	✓	✓	–	–
Potassium hypochlorite		✓	O	–	–	–	–	O	–	–	O	–	–	✓	–	–	O	–	–	–
Propane	Technically pure, gaseous	✓	✓	–	–	–	–	O	–	–	✓	–	–	–	–	–	✓	–	–	–
Propane	Technically pure, liquid	✓	✓	–	–	–	–	✓	–	–	✓	–	–	–	–	–	✓	–	–	–
Propanol, n- and iso-	Technically pure	✓	O	O	–	–	–	✓	✓	O	✓	O	–	✓	✓	O	✓	–	–	–
Propionic acid	50% Aqueous	✓	✓	O	×	–	–	✓	✓	✓	✓	✓	–	✓	✓	–	O	–	–	–
Propionic acid	Technically pure	✓	O	–	×	–	–	✓	O	O	✓	O	–	✓	O	–	✓	✓	–	–
Propylene glycol	<50%	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	–	✓	O	–	–
Propylene glycol	Technically pure	✓	✓	✓	✓	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Pyridine	Technically pure	×	–	–	×	–	–	✓	O	O	O	O	–	O	–	–	×	–	–	–
Salicylic acid	Saturated	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	–	–	–
Sea water		✓	✓	O	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
Silicic acid		✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	–	–	–
Silicone oil		✓	O	×	✓	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Silver salts, aqueous, inorganic	≤Saturated acid	✓	✓	✓	✓	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Sodium chlorite	Diluted, aqueous	✓	–	–	–	–	–	O	–	–	O	–	–	O	–	–	✓	–	–	–
Sodium hyprochlorite	12.5% Active chlorine, aqueous	✓	✓	–	×	–	–	O	O	–	O	–	–	✓	✓	–	O	–	–	–
Sodium persulphate	Cold saturated, aqueous	✓	✓	O	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	–	✓	✓	–	–
Sodium salts, aqueous, inorganic	≤Saturated acid	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Stannous chloride	Cold saturated, aqueous	✓	O	O	✓	✓	–	✓	✓	✓	✓	✓	–	✓	O	×	✓	✓	–	–
Starch solution	Aqueous all	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Styrene		×	–	–	×	–	–	–	–	–	–	–	–	–	–	–	✓	–	–	–
Succinic acid	Aqueous ,all	✓	✓	✓	✓	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Sulfuryl chloride	Technically pure	×	–	–	×	–	–	×	–	–	×	–	–	–	–	–	✓	–	–	–
Sulphur dioxide	Technically pure, liquid	×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	O	–	–	–
Sulphur dioxide	All, moist	✓	✓	O	×	–	–	✓	✓	✓	✓	✓	–	✓	O	×	✓	×	–	–
Sulphuric acid	Saturated aqueous	✓	✓	O	–	–	–	✓	✓	✓	✓	✓	–	✓	×	–	✓	O	–	–
Sulphuric acid	Up to 80% aqueous	✓	✓	✓	×	–	–	✓	✓	O	✓	O	–	O	O	×	✓	O	–	–
Sulphuric acid	Up to 96% aqueous	✓	✓	O	×	–	–	×	–	–	×	–	–	×	–	–	✓	✓	–	–

KEY: – NO DATA × NOT RECOMMENDED O CONDITIONALLY RESISTANT ✓ RESISTANT

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Table of fluids* which can be conveyed through HDPE pipe and fittings with no internal pressure, mechanical stress and temperature up to 60°.

Terrain FUZE Stax is made from HDPE, please follow the column labeled PE.

CHEMICAL	CONCENTRATION	MATERIAL°C																		
		PVCu			ABS			PE			POLYPROPYLENE			EPDM			FPM			
		20	40	60	20	40	60	20	40	60	20	60	100	20	40	60	20	60	100	120
Sulphuric acid	98%	✓	O	–	×	–	–	×	–	–	×	–	–	×	–	–	O	–	–	–
Tannic acid	Aqueous all	✓	–	–	–	–	–	✓	✓	✓	✓	✓	–	–	–	–	✓	–	–	–
Tetrachlorethylene (perchloroethylene)		×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	✓	–	–	–
Tetrachloroethane	Technically pure	×	–	–	×	–	–	O	–	–	O	–	–	×	–	–	O	–	–	–
Tetraethylene lead	Technically pure	✓	–	–	×	–	–	✓	–	–	✓	–	–	O	–	–	✓	–	–	–
Tetrahydrofurane	Technically pure	×	–	–	×	–	–	O	–	–	O	–	–	O	–	–	×	–	–	–
Tin salts, aqueous, inorganic	≤Saturated acid	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Toluene	Technically pure	×	–	–	×	–	–	O	–	–	O	–	–	×	–	–	✓	–	–	–
Trichloromethane	100%	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	–	–	–
Trichloroacetic acid	50% Aqueous	✓	O	–	×	–	–	✓	✓	✓	✓	O	–	O	–	–	×	–	–	–
Trichloroacetic acid	Technically pure	O	–	–	×	–	–	✓	O	×	✓	O	–	O	–	–	×	–	–	–
Trichloroethane	Technically pure	×	–	–	×	–	–	O	–	–	O	–	–	×	–	–	✓	–	–	–
Trichloroethylene	Technically pure	×	–	–	×	–	–	×	–	–	O	–	–	×	–	–	✓	–	–	–
Triethylamine	Technically pure	×	–	–	×	–	–	✓	–	–	✓	–	–	×	–	–	×	–	–	–
Trifluoroacetic acid	Up to 50%	×	–	–	×	–	–	✓	–	–	✓	–	–	O	–	–	×	–	–	–
Turpentine oil	Technically pure	✓	O	–	×	–	–	O	O	–	×	–	–	×	–	–	✓	✓	–	–
Urea	Up to 30% aqueous	✓	✓	O	✓	✓	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Urine		✓	✓	O	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–
Vinyl acetate	Technically pure	×	–	–	×	–	–	✓	✓	–	✓	O	–	✓	–	–	×	–	–	–
Vinyl chloride	Technically pure	×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	✓	–	–	–
Waste gases, containing alkaline		✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	×	–
Waste gases, containing hydrochloric acid	All	✓	✓	✓	–	–	–	✓	✓	✓	✓	O	–	✓	✓	✓	✓	✓	✓	–
Waste gases, containing hydrogen fluoride	Traces	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	–	O	O	O	✓	✓	–	–
Waste gases, containing nitrous gases	Traces	✓	✓	✓	–	–	–	✓	O	O	O	O	–	✓	O	O	✓	✓	O	–
Waste gases, containing sulphur dioxide	Traces	O	✓	–	–	–	–	✓	✓	–	✓	–	–	✓	✓	✓	✓	✓	✓	–
Water, drinking, chlorinated	≤0.1ppm Chlorine	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O	✓	✓	✓	–
Water - distilled - deionised		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O	✓	✓	✓	✓
Xylene	Technically pure	×	–	–	×	–	–	×	–	–	×	–	–	×	–	–	✓	×	–	–
Zinc salts, aqueous, inorganic	≤Saturated acid	✓	✓	✓	✓	–	–	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓	–	–

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6 Polypipe Advantage

From design and planning to ordering, delivery, technical support and customer service, Polypipe Advantage provides everything you need to plan your project.

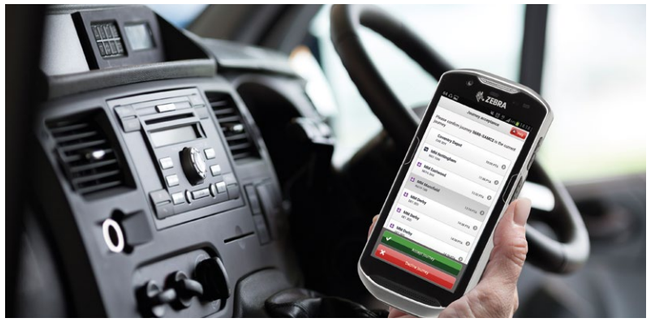
You'll have access to our team of dedicated Project Managers, who will work with you to create an exact delivery schedule. This means your Terrain FUZE HDPE product reaches site exactly at the point you need it, ensuring that it can be installed straight away, with no need for storage. Simply remove the components and follow the instructions.

SUSTAINABILITY

While our streamlined approach to fabrication can make your projects more efficient, it also offers wide-reaching sustainability benefits. Because we deliver precisely what you need, and nothing more, there are no spare parts or unnecessary extras to dispose of. We've invested heavily into sophisticated technology, ensuring our pipes are of the highest quality.

ASSESSMENT, ESTIMATION AND DESIGN

Every good project begins with a thorough plan. The Polypipe Advantage team is on hand from the outset, to appraise your enquiry to identify any unique project requirements before creating a draft estimate. The Polypipe Advantage team will produce detailed CAD drawings for approval, all designs are compliant to as-drawn dimensions. This means you save vital planning time and won't have to compromise with inappropriate or over-engineered solutions.

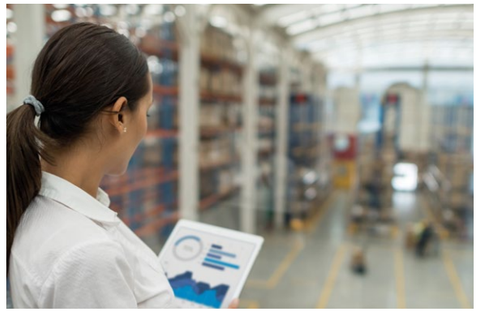


DISPATCH AND DELIVERY

We know that time and scheduling are critical for any project, so we ensure your system is delivered how and when you need it – while keeping you updated along the way. Our team of logistics experts work with your project timelines to ensure each element of your unique system arrives to site as scheduled, removing the need for on-site storage; leaving you to focus on installation.

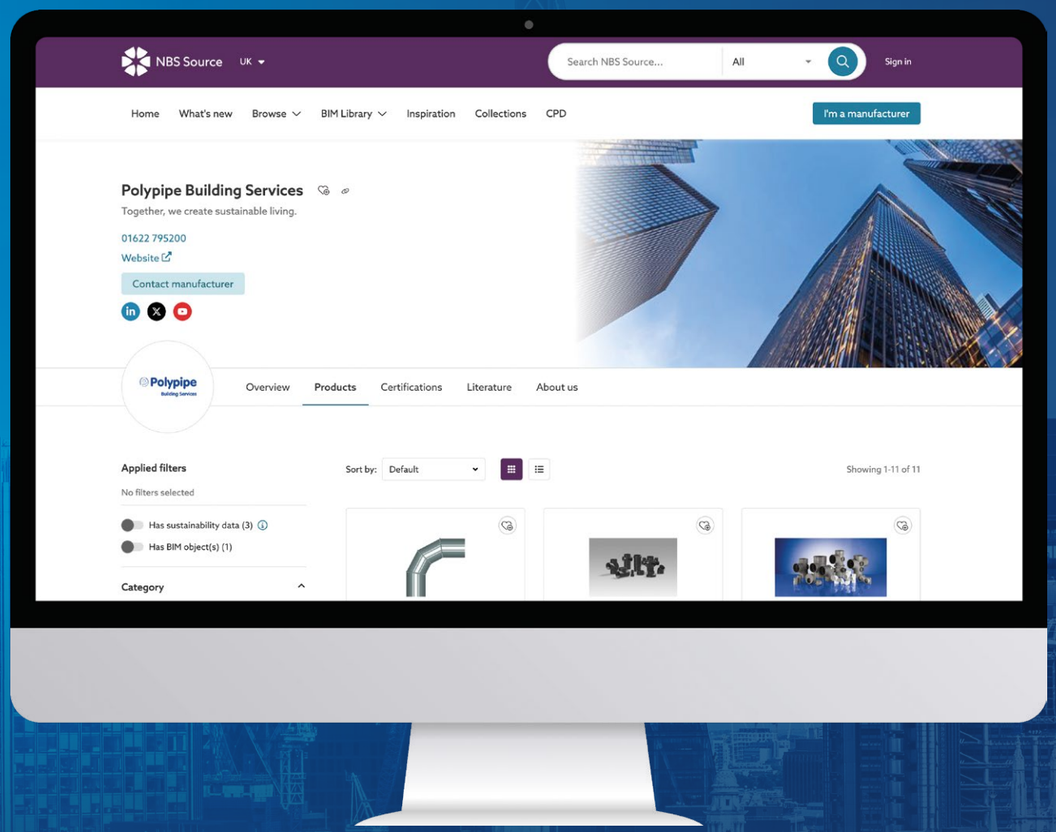
ORDERING AND FABRICATION

Once you've reviewed the design and it's finalised, our state-of-the-art fabrication and testing facility will create your system under factory-controlled conditions, ensuring only the highest quality and peace of mind for first-fix testing.

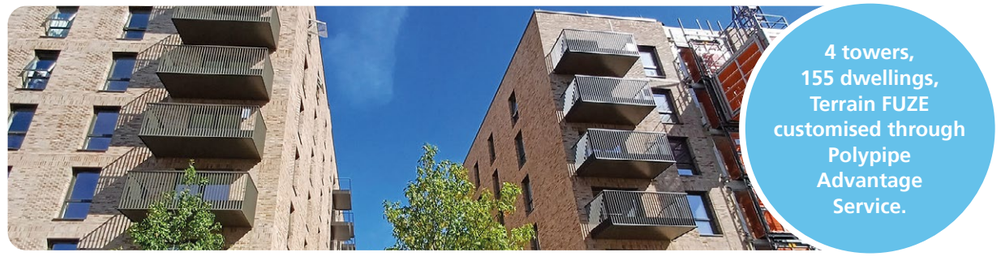


MERCHANT INTEGRATION

You can purchase fabricated systems from our approved Merchants, who will be happy to take your order, arrange the details with the Polypipe Advantage team – and deliver it in time for your next job.



A clear focus on customer requirements delivers ideal drainage solution for film factory development.



Eastman Village (formerly Harrow View East) is an ambitious, multi-phased project built on the old Kodak factory site in Harrow. The project will deliver a complete new urban neighbourhood of over 2,000 homes together with workspace, retail and leisure facilities.

The new homes include 40% affordable housing and a new healthcare facility. Polypipe Building Services (PBS) is currently providing drainage systems for 155 dwellings, across 4 towers – working with M&E Contractor, Millharbour on behalf of Barratt London.

Custom drainage system clicked perfectly with project on former Kodak site.

Eastman Village is a highly specified and carefully designed project which incorporates many community amenities within a development that delivers exceptional accommodation. The building layout is therefore quite complex, requiring a considered approach to how the M&E elements deliver all of the facilities. The drainage system brief was therefore challenging in that the bathrooms were highly specified, but the build schedule was also very ambitious.

The Client decided to use a prefabricated approach to the installation so as to hit project deadlines, with a highly customised system that would fit the bathroom design specification.

Following an initial analysis, Millharbour worked closely with technical staff at Polypipe Building Services and the Advantage Team to create a totally bespoke solution. It was decided that Terrain FUZE would be the ideal system for the project. Terrain FUZE is made of HDPE and incorporates an extensive range of fittings, and is therefore highly adaptable and customisable. Terrain FUZE is also lightweight and highly resistant to impact and abrasion, it's therefore the perfect system for the high-level pipework in the basement. This meant that a single system could be used seamlessly for the whole building, making it possible to develop a tailored solution that could be installed rapidly.

The Advantage Design Team created a design that combined butt-welds and expansion joints which meant that the complex stack design could be installed with just a single electrofusion coupling on the ground floor - to connect the stacks to the high-level pipework in the basement. Ideally, the customer wanted the stacks to use a minimal number of electrofusion couplings. Therefore, each stack section had a ring seal at the top into which the next section could be push-connected from the floor above, negating the need for electrofusion couplings between floors. All of which makes for rapid installation.

Robert Bruce, Technical Sales Manager for Polypipe Building Services in London said:

"Millharbour were looking for a system which enabled a highly efficient installation, minimising the need for plant and maximising the productivity of the install team. But at the same time, it had to be carefully configured to work with the design of the apartments. And so, we needed to design a bespoke system that minimised the number of on-site connections - with an emphasis on push-fit rather than electrofusion couplings.

"The high-level elements in the basement required careful on-site fabrication by skilled installers. A fast, efficient and straightforward install up the building was going to be vital to keep to the schedule – without having to deploy large amounts of manpower.

"Prefabrication and careful design really helped deliver the customisation and streamlined installation that the project demanded. The guys could just drop each floor section of stack down into the expansion joint below.

"And being so lightweight, Terrain FUZE is also very manpower-efficient compared to conventional systems. One person can carry an entire stack section compared to cast-iron which would require a team in itself."

CASE STUDY

Project
Eastman Village

Client
Millharbour on behalf of Barratt London. Masterplan designed by Pollard Thomas Edwards architects.

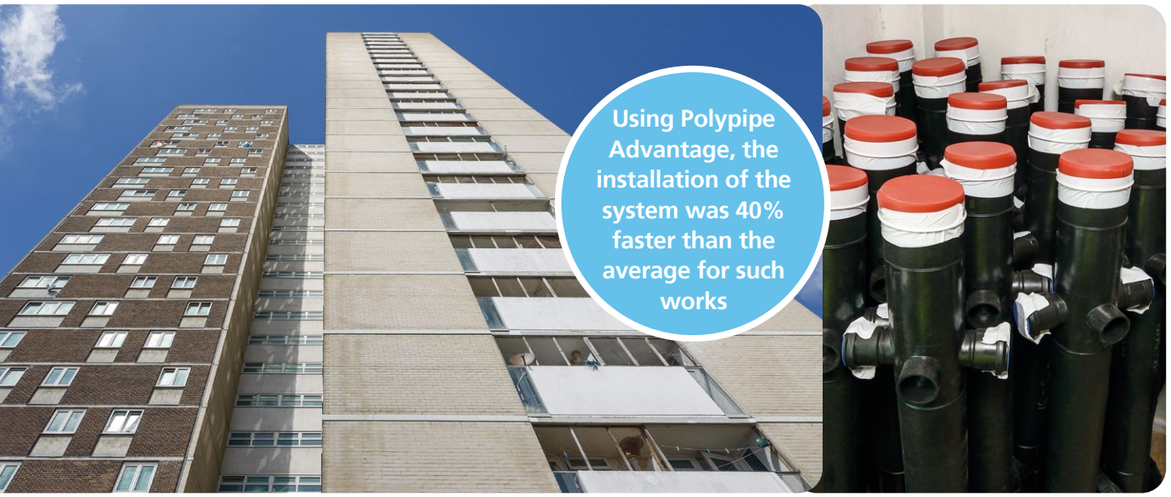
Application
Drainage - soil and waste.

Products
Full fabrication – drainage stacks. Terrain FUZE and Advantage Off-site Pre-fabrication Service.

6 Polypipe Advantage

Millbrook Tower stands tall following replacement of rainwater drainage stacks

One of the tallest buildings in Southampton has had a complete drainage solution designed and installed without the temporary re-homing of any residents.



Using Polypipe Advantage, the installation of the system was 40% faster than the average for such works

Formerly the tallest building in Southampton, the Millbrook Tower stands at 240 feet. Built over 50 years ago, the building had a cast iron drainage system installed that had started to rust and fail, causing excessive leaking in the 144 flats in the development. Southampton City Council (SCC) who wanted a complete holistic approach to the design, manufacture and installation of the replacement drainage system, approached Polypipe. In January 2016, eight members of the Direct Labour Organisation (DLO) department of SCC came to Polypipe's Centre of Excellence in Aylesford for training to gain a better understanding of the specification, assembly and installation of plastic fabricated drainage stacks.

Working with SCC, as experts in providing intelligently engineered solutions for the movement of water and air around tall buildings, Polypipe assessed the failing drainage stacks in Millbrook Tower, and designed a new high-density polyethylene system. Terrain FUZE was installed due to a number of its key benefits over other more traditional materials.

Lighter in weight than cast iron, Terrain FUZE can feature longer pipe runs, so less jointing is required. As the system is jointed using electrofusion welding, where the weld area is as strong as the host material, the system integrity is increased and consequently the risk of leaks in the development is dramatically reduced.

As the system is jointed using electrofusion welding, where the weld area is as strong as the host material, the system integrity is increased and consequently the risk of leaks in the development is dramatically reduced. Due to the inherent material characteristics, Terrain FUZE lends itself to fabrication. Utilising the unique Advantage Service, the system was fabricated to exact specification and delivered to the site, where Southampton's DLO were able to complete the installation work across the 144 properties 40% faster than the average for such works. This meant that the residents of Millbrook Tower were able to remain in their properties, a key consideration when designing the drainage stacks of the building.

CASE STUDY

Project
Millbrook Tower, Southampton

Client
Southampton City Council

Application
Live Stack Replacement

Products
Terrain Fuze

Fast order turnaround of prefabricated drainage stacks helps installation team hit project deadlines

Alperton Bus Depot is a mixed-use new development which includes commercial space aimed at supporting start-ups alongside 461 new homes, of which 40 percent will be affordable in the London Borough of Brent.

More than 4,000 Terrain FUZE Stax were delivered in stages to site in collaboration with their nearest Wolseley branch.

The former Metroline bus garage is being transformed into three blocks, one of which is 27-storey, linked at the ground and first floors for community use and industrial floorspace. The development is due to be completed mid 2025.

Tight project turnarounds need a versatile solution.Mechanical & electrical contractor I-MEX (M&E) Ltd was looking for a drainage stack solution which was both good quality and quick to install within a six-month project deadline.

Other challenges for the installation team included the fact that the development sits on the corner of a busy dual carriageway meaning limited space on site for deliveries and cranes. This meant a delivery schedule which staggered product delivery to tie into work on each level was essential.

Robert Bruce, Polypipe Building Services Technical Sales Manager for London, said:

"We met with I-MEX (M&E) Ltd on October 6th and the order was placed for Block A of the building by the end of October.

The essential aspect for them was the fast turnaround to keep up with the build schedule. This made Terrain FUZE Stax ideal, as products are kept in stock with our distributors for projects like this. This is supported by flexible delivery options, so the products for different phases of work can be delivered at intervals, for example, so many floors worth at a time."

Versatility was also important, and I-MEX (M&E) Ltd liked that Stax offers two four-way bosses on the same stack and can be used in multiple situations. The fact that they come in two parts means logistically moving them around site is easier and the pieces are more versatile compared to traditional three metre long pieces of fabrication which I-MEX (M&E) Ltd have previously used."

Minimising time-consuming repetitive work
Terrain FUZE Stax helps reduce installation times because typically large-scale drainage stack projects involve repeating similar configurations of loose components across floors. This means significant time is spent on repetitive cutting and welding jobs. The Terrain FUZE Stax range removes a lot of this time-consuming work by offering prefabricated products in the most common configurations covering kitchens, bathrooms, and utility rooms.

Robert adds: "I-MEX (M&E) Ltd installed Stax so quickly at a level per day that we've adjusted their delivery schedule. Our Advantage team was also able to support in adapting the Stax being used in the bathrooms, so they have a ring seal already fitted on one of the outlets as requested by Telford Homes.

"We also gave their installation team complete peace of mind by visiting site and producing an installation report for them to present to Telford Homes. This proves the installation has been carried out correctly, which was something they really valued us being able to do for them."

CASE STUDY

Project
Drainage stacks installation at Alperton Bus Garage development, Greater London

Client
I-MEX (M&E) Ltd on behalf of Telford Homes

Application
New building drainage stacks installation

Products
Terrain FUZE

7 Storage & Handling

Good Site Practice

GOOD SITE PRACTICE

- Pipes should not be thrown, dropped or dragged along hard surfaces
- In case of mechanical handling, use protective slings and padded supports. Metal chains and hooks should not make contact with the pipe

ON-SITE STORAGE

- Stack pipe lengths
  - on a flat base
  - on level ground
  - or on 75mm x 75mm timber at 1m centres (Fig. 1)
- Provide side support with 75mm wide battens at 1m centres (Fig. 1)
- Maximum stack should not exceed 1.5m high
- Ideally, stacks should contain one diameter pipe size only. Where this is not possible, stack largest diameter pipes at base of stack. Small pipes may be nested inside larger pipes
- If stored in the open for long periods or exposed to strong sunlight, cover the stack with opaque sheeting
- Store fittings under cover. Do not remove from cartons or packaging until required

STORAGE IN HOT CLIMATES

- Ultra-violet light can affect pipes and fittings: pipe colour may change and rubber seals may be degraded
- Store accordingly:
  - store all materials in well-ventilated, shady conditions
  - do NOT expose to direct sunlight
  - keep fittings in original packaging until required for use
- Maximum stack (hot conditions): six layers high

SITE SAFETY

- The relevant regulations detailed in the Health & Safety at Work Act 1974, Construction Design and Management Regulations 2015, must be adhered to on-site
- MSDS data sheets are available on request

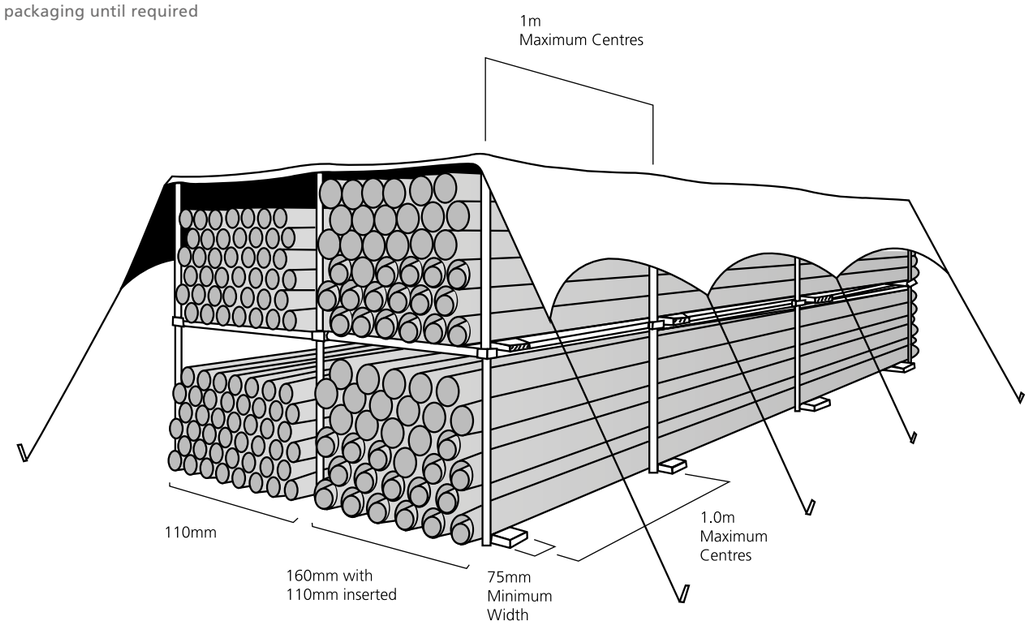


Fig. 1 Pipe stacking

Disposal

POLYPIPE ADVANTAGE SERVICE

Supplying fabricated drainage stacks and water supply systems means less packaging is needed for the pipes and fittings. When customers choose to use our Polypipe Advantage Service, they are dramatically reducing the amount of cardboard and plastic packaging reaching their sites.

PACKAGE RECYCLING

At Polypipe Building Services we aim to re-use and recycle as much of our packaging as possible. We encourage all customers to return both metal and wood stillages and plastic totes as these can be re-used multiple times.

Whilst we try to limit the amount of packaging used when delivering to our sites, we do have to ensure products are safeguarded against damage and arrive in the best condition. We therefore use, where appropriate, cardboard and plastic packaging which can be recycled.

Polypipe Building Services accepts the following packaging to be returned to for recycling;

- Shrink wrap
- Banding
- Cardboard
- Paper labels
- White plastic wrapping

PRODUCT RECYCLING

We can provide a service for all end caps and pipe cut-offs to be returned to Polypipe Building Services, where they will be recycled. Please speak with your Sales representative for further information.

Products can also be recycled via waste recycling centres. Please check with your local recycling centre for accepted materials.

8 Jointing Methods

Terrain FUZE offers workable and effective solutions to a wide range of project constraints through the availability of a number of jointing methods. Each connection is categorised according to its varying properties, with the different classifications assembled as follows:

REMOVABLE

Connections which can be disconnected after assembly.

NON-REMOVABLE

Connections which cannot be disconnected after assembly.

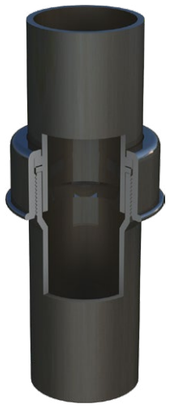
TENSION-RESISTANT

Connections which cannot be disconnected by tensional forces.

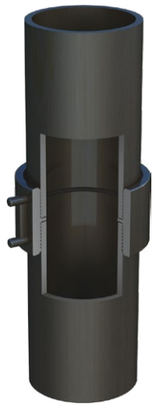
NON-TENSION-RESISTANT

Connections which can be disconnected by tensional forces.

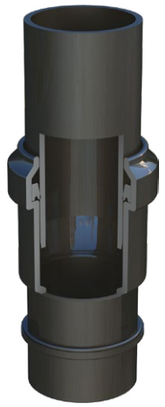
Butt weld



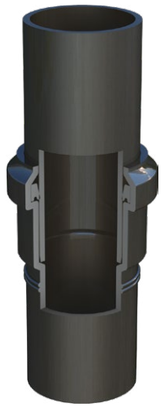
Screw-threaded coupling



Electrofusion coupling



Expansion socket



Ring-seal socket

Flange joint

Mechanical

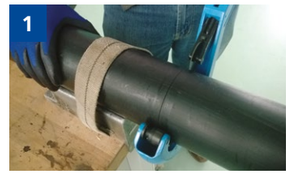
Rigid fixing

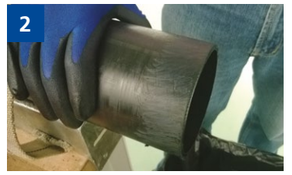
Electrofusion Welding

1. Cut the pipe or fitting using the appropriate pipe cutter or saw. Make sure the end of the pipe or fitting is square and clean.
2. Scrape the oxidation layer from the spigot of the pipe or fitting to at least the insertion depth of the coupling using the appropriate pipe scraper. Ensure that the spigot ends and the couplers are kept clean and free from dirt, water and grease.
3. Insert into the centre stop of the coupling. Mark the spigots using a wax pencil.
4. Unpack your Polypipe Terrain FUZE electrofusion welding machine and ensure you have the correct leads attached.
5. Ensuring that the pipe work is supported correctly, attach the leads to the coupling and push the start/stop button. This will begin the electrofusion welding process.
6. There will be two visual indications showing that the weld has been completed successfully. The first will be on the screen showing that the welding is 100% complete. The second will be a visual indication on the coupling, as shown below.

COOLING DOWN

Once the weld sequence has successfully completed, leave the welded coupling to cool down for the time indicated on the label. Do not disturb the coupling during the cooling period. Cooling time should be extended in ambient temperatures above 25°C, or when welding in strong direct sunlight.

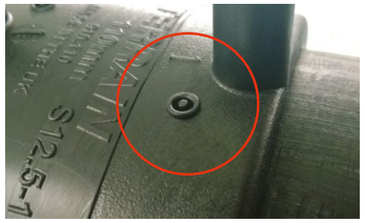




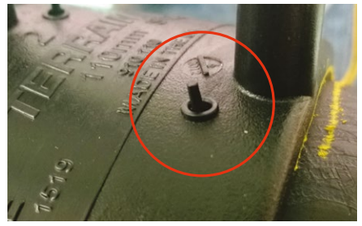
8 Jointing Methods

Electrofusion Welding

The before and after.



Before

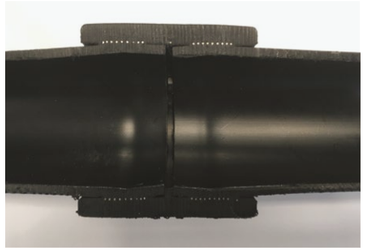


After

Examples of electrofusion welded joints which have been made correctly and incorrectly:

EXAMPLE OF A GOOD ELECTROFUSION WELD JOINT

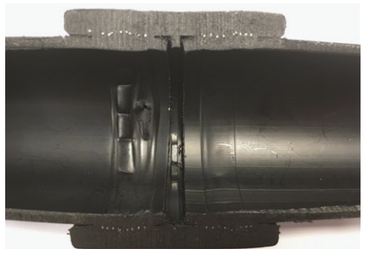
You can see that the pipe surface has been scraped and the fitting has been welded once. The pipe and coupling surfaces have welded together to make a good joint.

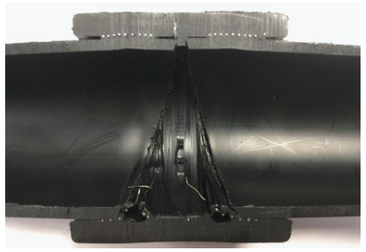


EXAMPLES OF INCORRECTLY PREPARED ELECTROFUSION WELD JOINTS

This shows where the coupling was welded twice without the coupling being left to cool down after the first weld. This has resulted in the pipe becoming distorted due to the excess heat.

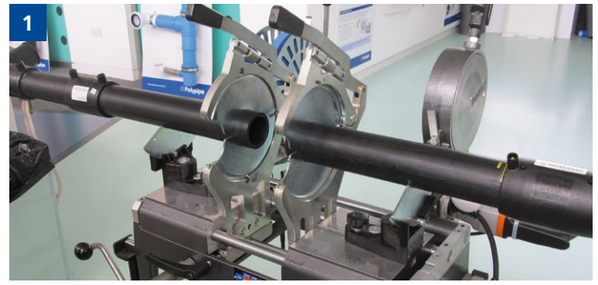
In the joint to the right the pipe has not been cut square and you can also see that the pipe surface has not been scraped. This joint is likely to leak.

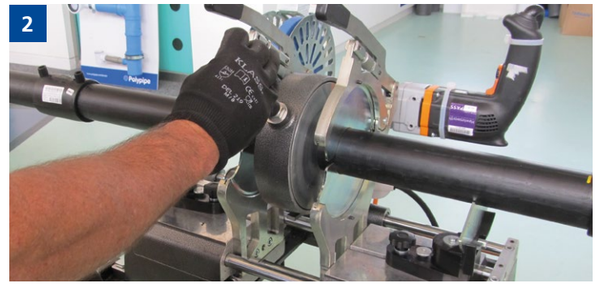


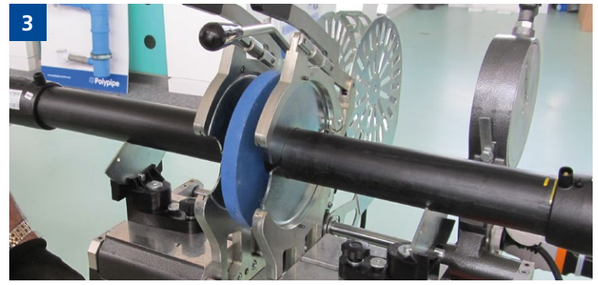


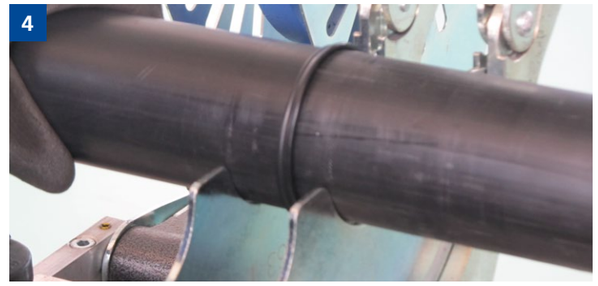
Butt Welding

1. Prepare pipe ends and insert into butt welding machine.
2. Use the planing tool to ensure that the pipe ends are square and free of any burr's.
3. Press the pipe/fitting ends lightly against the hot plate melting the pipe ends until a small bead is visible around both ends.
4. Remove hot plate and press the ends together with the necessary pressure (as advised by welding machine) and lock the clamps in place until the weld cools.









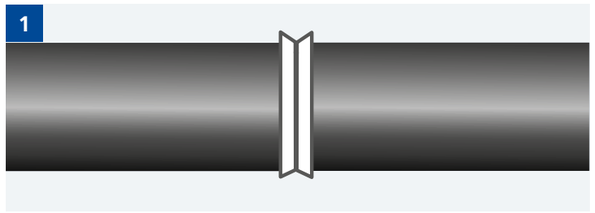
8 Jointing Methods

Butt Welding

Examples of butt welded joints which have been made correctly and incorrectly. These can be easily identified with a visual inspection:

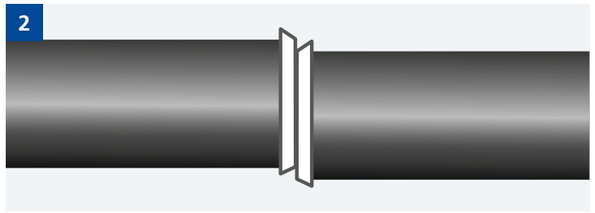
EXAMPLE OF A GOOD BUTT WELD JOINT

1. Two equal size beads continuing all the way around the pipe on both sides of the joint.

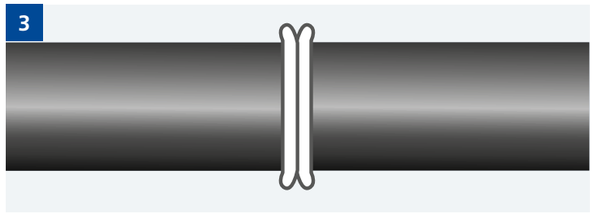


EXAMPLES OF INCORRECT BUTT WELD JOINTS

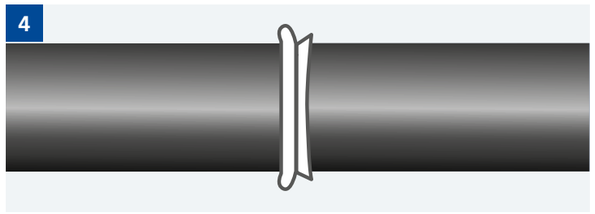
2. The pipes have been misaligned during the welding process.



3. Too much pressure has been exerted during the welding process when the pipe ends are on the hot plate. No pressure should be applied at this stage



4. The two pipe ends have not heated evenly on the hotplate. Possibly one of the pipe ends was not cut/planed square.



Note: A good rule of thumb is that the welded beads should be approx. the thickness of the pipe diameter.

Ring Seal

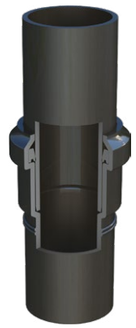
Available in sizes 40 – 315mm

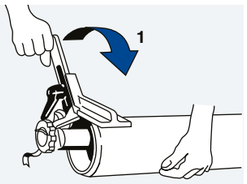
CONNECTION PROPERTIES:

- Removable
- Non-tension-resistant

Use

Ring-seal sockets facilitate the assembly of pre-fabricated sections.



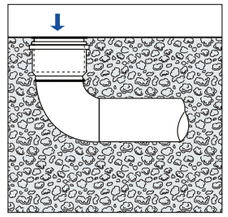


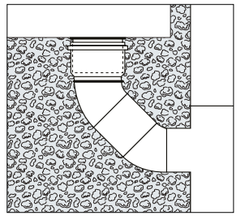
The pipe should be chamfered to approximately 15° and lubricated with suitable Polypipe product. Do not use oil or grease which can damage the rubber seal.

Assembly

The ring-seal socket is suitable for use on both horizontal and vertical applications with the small dimensions providing a space-saving advantage. Assembly instructions are also available for ring-seal sockets, with the insertion depth corresponding for the same diameters. Ring seal sockets are also provided with a cap to prevent dirt entering the pipe on-site. The pipe must be fully inserted into the socket as it is not intended to act as an expansion socket.

A flush fit is obtained by chamfering the pipe end to approximately 15° and lubricating it with silicone oil. To avoid damage to the rubber seal, do not use oil or grease.





Protection Cap.

Expansion

Available in sizes 40 – 315mm

CONNECTION PROPERTIES:

- Removable
- Non-tension-resistant

Use

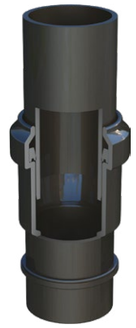
Expansion sockets must be provided on horizontal runs and vertical stacks running from floor to floor and for rainwater pipes both inside and outside the building.

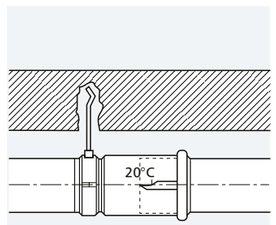
Installation

Expansion sockets are suitable for use in both vertical and horizontal applications with the depth of the sleeve enabling the assembly of up to 6 metre length stacks and collector pipelines. The design of the seal allows for pipe movement during expansion and contraction, ensuring that the connection remains water tight even under substantial hydraulic load.

To ensure easy assembly of the sleeve, the following conditions must be observed:

- Chamfer the inserted pipe end to approximately 15°.
- Lubricate the pipe end with a suitable Terrain product.
  Note: do not use oil or grease which can compromise the rubber seal.
- Observe the indications on the outer surface of the expansion socket for insertion depth.
- There are two markings, one for installation at 0°C and the other at 20°C, which are marked at 85mm and 110mm respectively from the seal end.





Horizontal assembly (e.g. at an ambient temperature of 20°C).

8 Jointing Methods

Flanged Joints

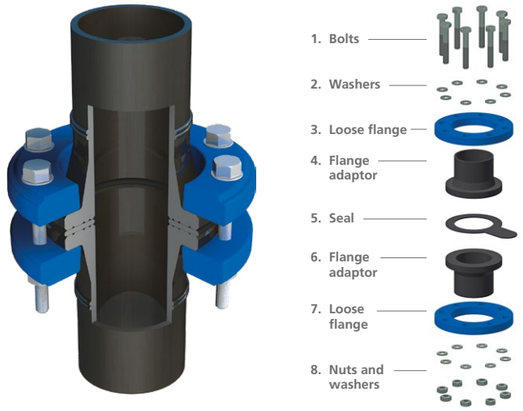
Available in sizes 50 – 315mm

CONNECTION PROPERTIES:

- Removable
- Tension-resistant

Use

The backing flanges are made of a special, painted aluminium alloy and have standard dimensions to suit EN1092-1/04 PN10/16 manufacturing standard/PN rating. These are most commonly used to create a removable connection in industrial plants. By using a blank flange, it is possible to create an inspection access opening for large diameter pipes (200, 250 and 315mm).



Mechanical

Available in sizes 90 – 160mm

CONNECTION PROPERTIES:

- Removable
- Non-tension-resistant

Use

Mechanical couplings are used in retrofit and live stack scenarios. They can be used when removing or replacing products in wet sections.

Available in two types:

- For connecting HDPE to HDPE stacks
- For connecting HDPE to existing Cast Iron stacks

Rigid Fixing

Available in size 110mm

CONNECTION PROPERTIES:

- Removable
- Tension-resistant

Use

Allows for the provision of thermal expansion of HDPE whilst retaining a rigid fixing.

Available in two types:

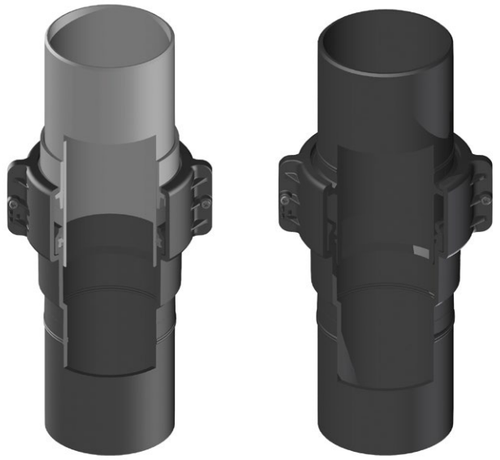
- For connecting HDPE to HDPE
- For adapting PVC to HDPE

Patented design, patent no. 1703849.8

Use

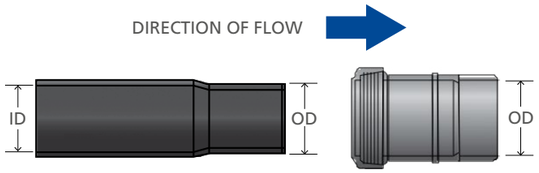
The rigid fixing allows the provision of thermal expansion with tension-resistant limits to prevent the part from coming apart. The two patented shells are screwed and clamp around the top of the ring seal adaptor and a connected lip on the adjoining pipe spigot to create a moveable seal. This

comes in two variants:- one for connecting an HDPE pipe spigot into an HDPE Ring seal and one for connecting a PVC pipe spigot into an HDPE Ring seal. Should the connection need to be removed, the shells can be unscrewed, and the pipe spigot pulled out.



9 Adapting to other materials

Adapting from one material to another can sometimes require a number of different fittings. Terrain FUZE offers a wide range of solutions that can adapt our system with other materials, with specific products for adapting in direction of flow.



MATERIAL	OD SIZE 1¼"	1½"	2"	3"	4"	6"
PVC-c	36mm	43mm	56mm	82mm	110mm	160mm
PP	35mm	41mm	54mm			
HDPE	40mm	50mm	56mm	75mm	110mm	160mm
Terrain Q	40mm		50mm		110mm	160mm
Iron	42mm	47.8mm	60mm			
Copper	35mm	42mm	54mm		108mm	
Clay					100mm	
Vulcathene		48mm	60mm	89mm	114mm	
Cast Iron					112mm	
Ridgidrain					118mm	176mm
Chrome	32mm					

MATERIAL	ID SIZE 1¼"	1½"	2"	3"	4"	6"
PVC-c	32mm	39mm	52mm	76mm	104mm	154mm
PP	31mm	37mm	50mm			
HDPE	34mm	44mm	49.5mm	69mm	101mm	148mm
Terrain Q	36mm		46mm		104mm	153mm
Iron	32mm	38mm	51mm			
Copper	32mm	39mm	51mm		104mm	
Clay					76mm	
Vulcathene		38mm	51mm	75mm	102mm	
Cast Iron					98mm	
Ridgidrain					100mm	150mm
Chrome	28mm					

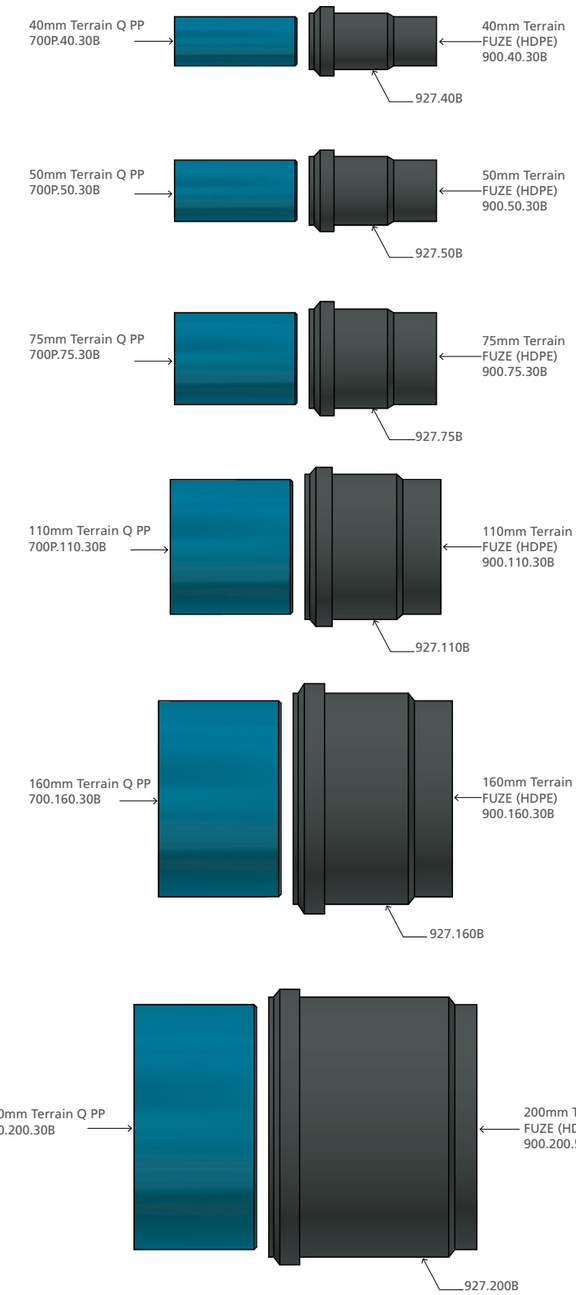
Note: Pipes to be chamfered and lubricated when being used with ring seal, use 9136250L Silicone grease.

References: 1. Terrain Soil and Waste Product Installation guide. 2. BSEN12056 Gravity drainage systems inside buildings. Sanitary pipework, layout and calculation. For more information please call our Technical Team on 01622 795200

The table below shows a range of five adaptors available and you can use this table to find the adaptor to suit your requirements.

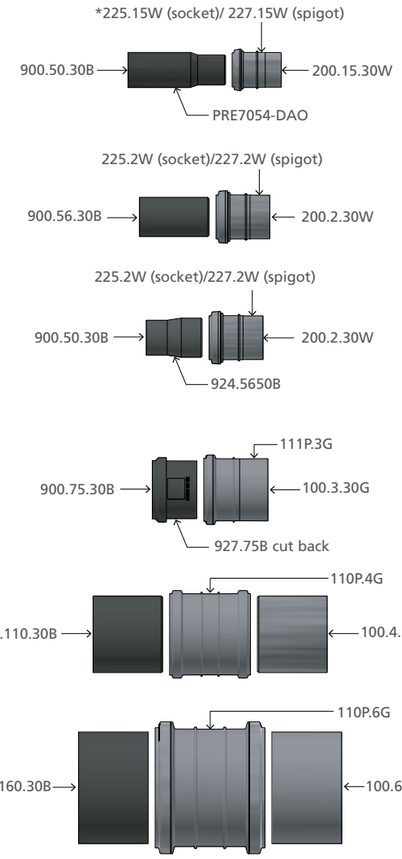
PART NUMBER	TERRAIN FUZE SIZE	COMPATIBILE WITH PVC (200 SERIES)	PP (300 SERIES)	ABS (600 SERIES)	COPPER (GENERIC)
927.4036B	40mm	32mm	32mm	32mm	35mm
927.5036B	50mm	32mm	32mm	32mm	35mm
927.5043B	50mm	40mm	40mm	40mm	42mm
927.5636B	56mm	32mm	32mm	32mm	35mm
927.5643B	56mm	40mm	40mm	40mm	42mm
And as you have always been able to do…					
927.56B	56mm	50mm	Not available in this range	50mm	54mm

Terrain (PP) – Terrain FUZE (HDPE)

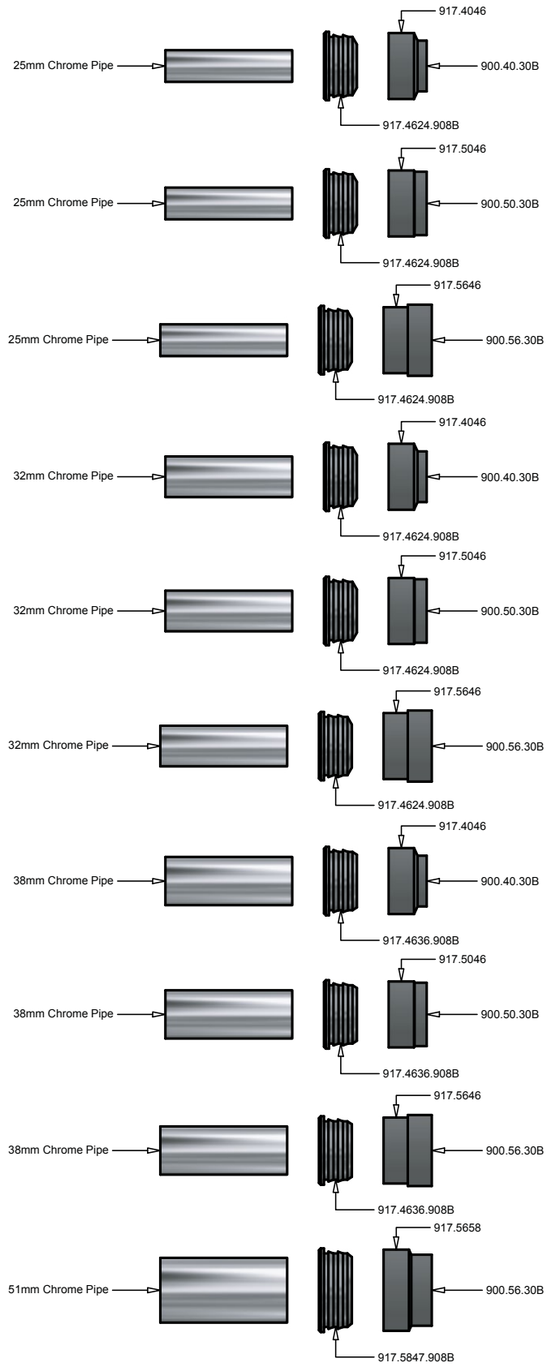


9 Adapting to other materials

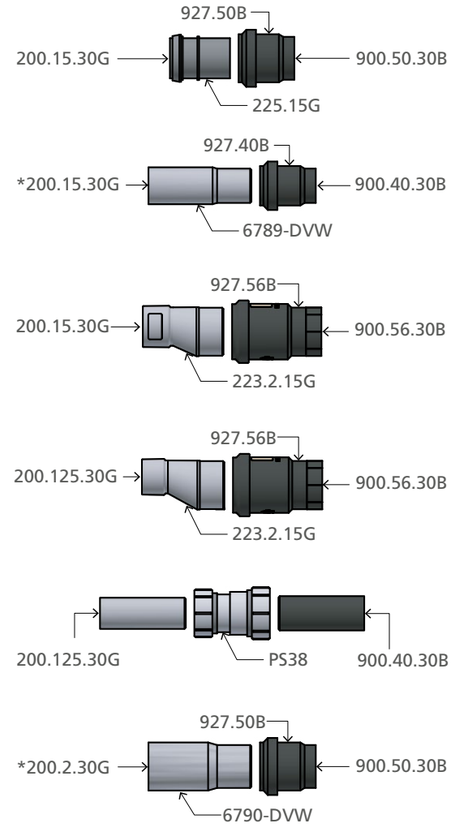
FUZE (HDPE) – PVC-c



Chrome - FUZE (HDPE)



PVC-c - FUZE (HDPE)



*Note: This will cause a reduction in bore in the direction of flow.

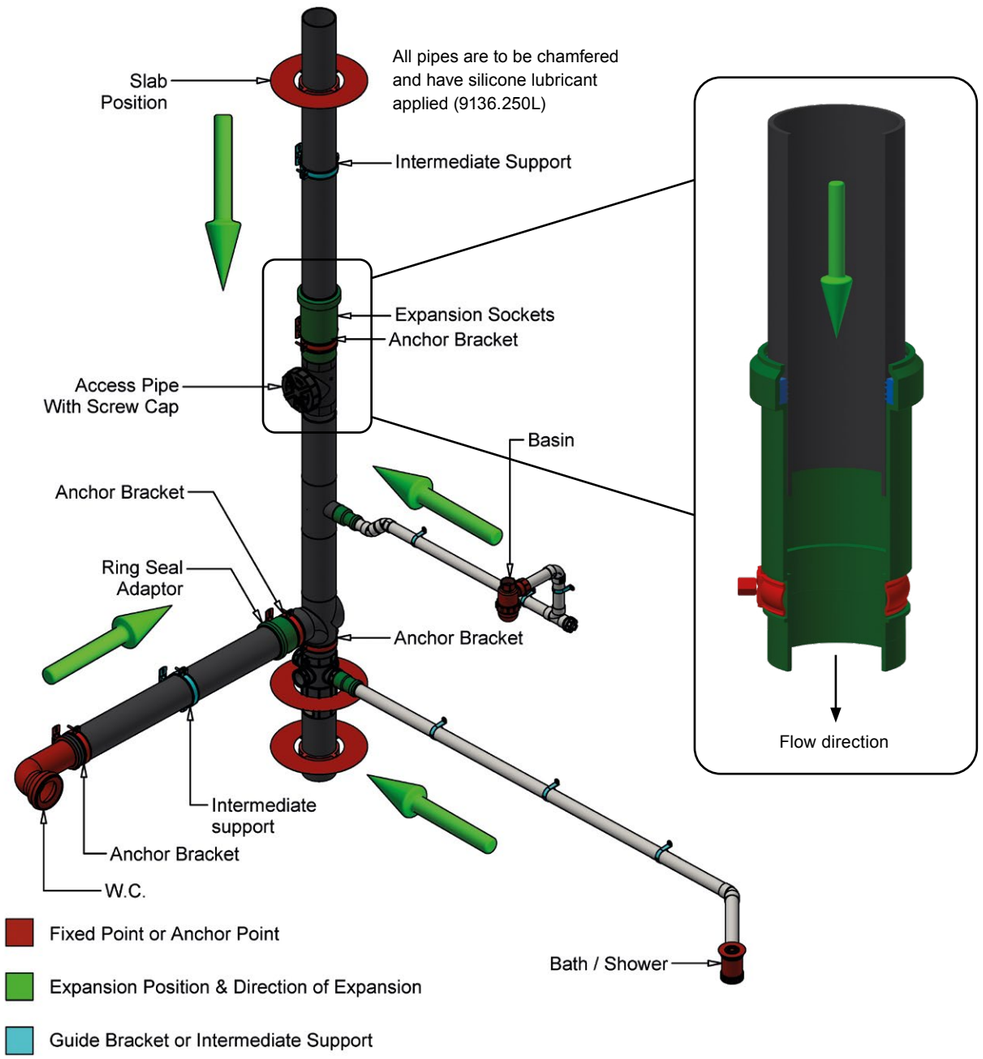
10 Installation

HDPE Thermal Expansion

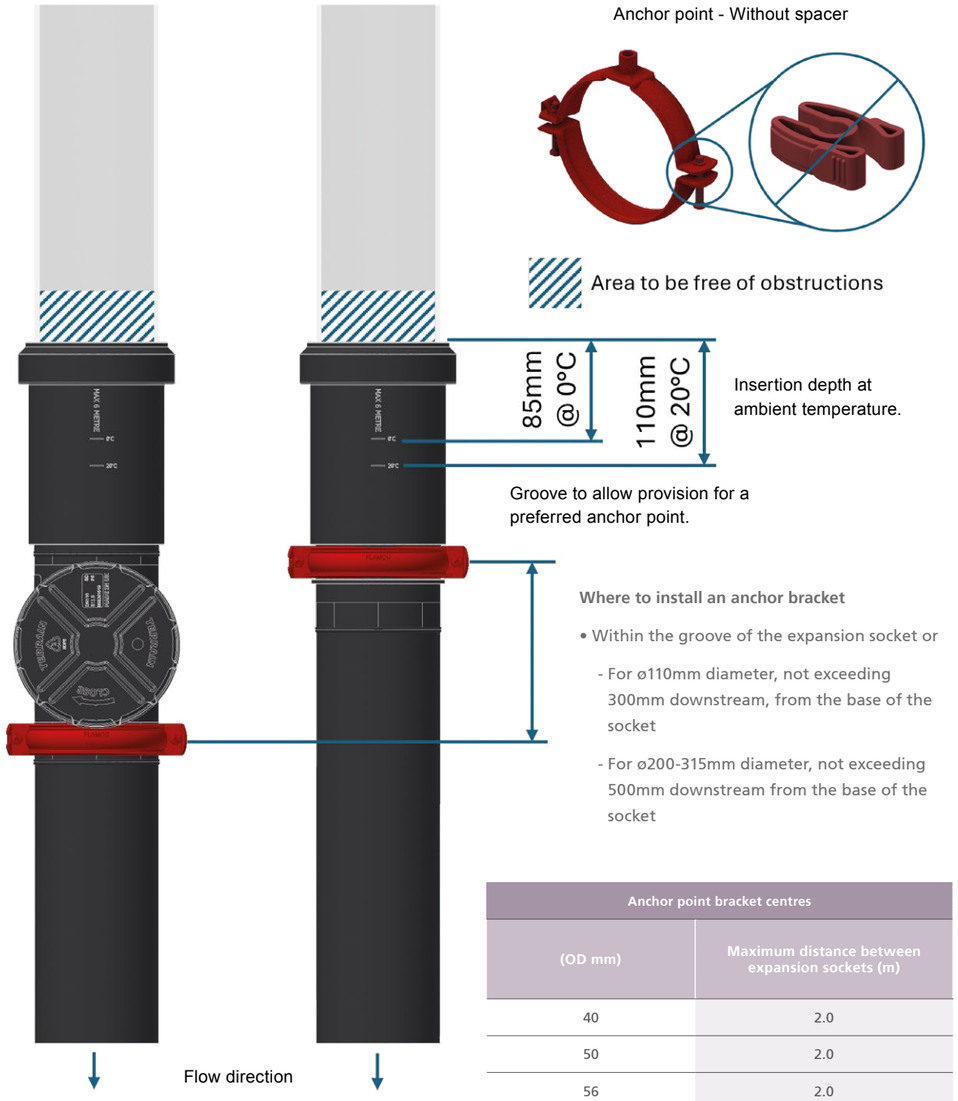
Terrain FUZE HDPE pipe work systems expand and contract with changes in temperature, both ambient temperature and from the temperature of the waste discharge through the pipework. This guide describes the principles of thermal movement allowance and provides advice covering assembly and jointing techniques.

The advice and guidance is based on typical situations only. For further information contact the Terrain Technical Services Department. Terrain FUZE HDPE offers substantial durability against the flow of hot water. A waste pipe with no mechanical load will tolerate temperatures of up to 80°C and up to 95°C is permissible for a maximum of two minutes.

Thermal movement MUST always be accounted for in both locked and expansion systems (explained in the following pages).



Expansion System Bracketing



Where to install an anchor bracket

- Within the groove of the expansion socket or
  - For ø110mm diameter, not exceeding 300mm downstream, from the base of the socket
  - For ø200-315mm diameter, not exceeding 500mm downstream from the base of the socket

Where to install an expansion coupling

- Every floor, or between two fixed points (e.g. slab) greater than 2m, but not exceeding 6m
- At changes of direction or branch runs greater than 1.2m in length

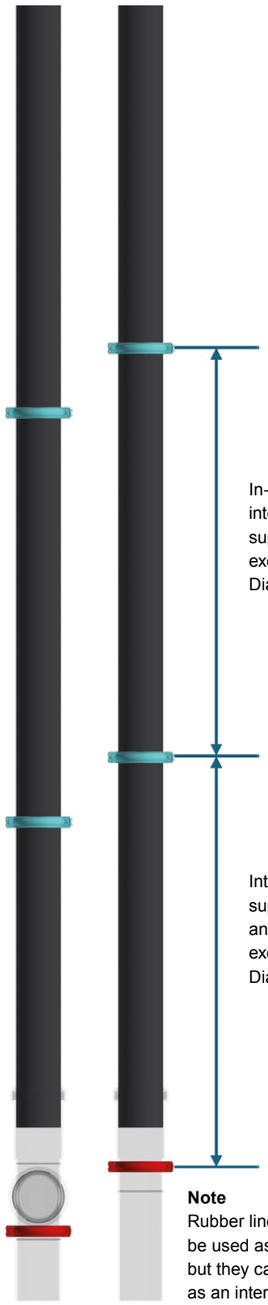
Anchor point bracket centres	
(OD mm)	Maximum distance between expansion sockets (m)
40	2.0
50	2.0
56	2.0
75	5.0*
110	5.0*
160	5.0*
200	5.0*
250	5.0*
315	5.0*

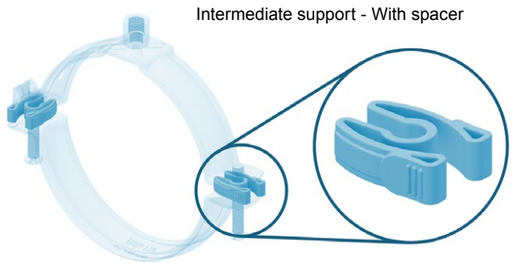
* General rule

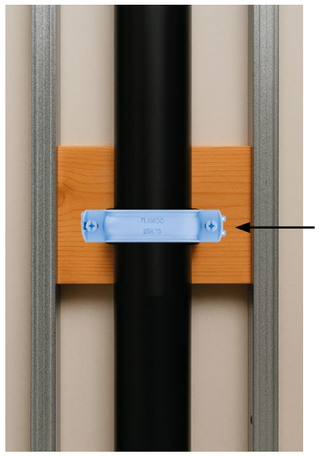
Expansion System Bracketing

Where to install an intermediate support bracket

• Every floor, or between expansion couplings, at recurring distances not exceeding 1.2m







Note
Rubber lined brackets can be used as anchor points, but they cannot to be used as an intermediate support.

Intermediate support bracket centres	
(OD mm)	Intermediate support centres (mm)
40	400
50	500
56	560
75	750
110	1100
160	1600
200	2000
250	2500
315	3150

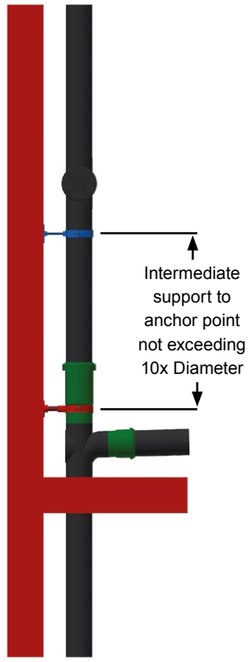
Vertical Expansion Systems

Where to install an expansion coupling

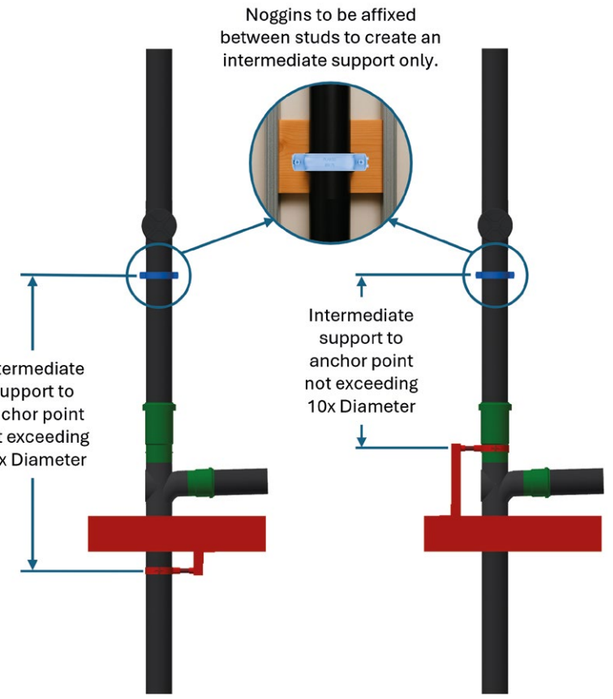
• Every floor, or between two fixed points (e.g. slab) greater than 2m, but not exceeding 6m
• At changes of direction or branch runs greater than 1.2m in length

Without a structural wall
Fix using posts or sofit anchor for the fixed points, and intermediate at the mid-point using a noggin to support the bracket. May need to review the location of the expansion joint with this method of installation.

3. Anchored to wall



1. Anchored below slab **2. Anchored above slab**



With a structural wall
Fix onto the wall behind / side of it. With this arrangement the Expansion can be fitted preferably low to middle of the height of the room.

High Level Bracketing

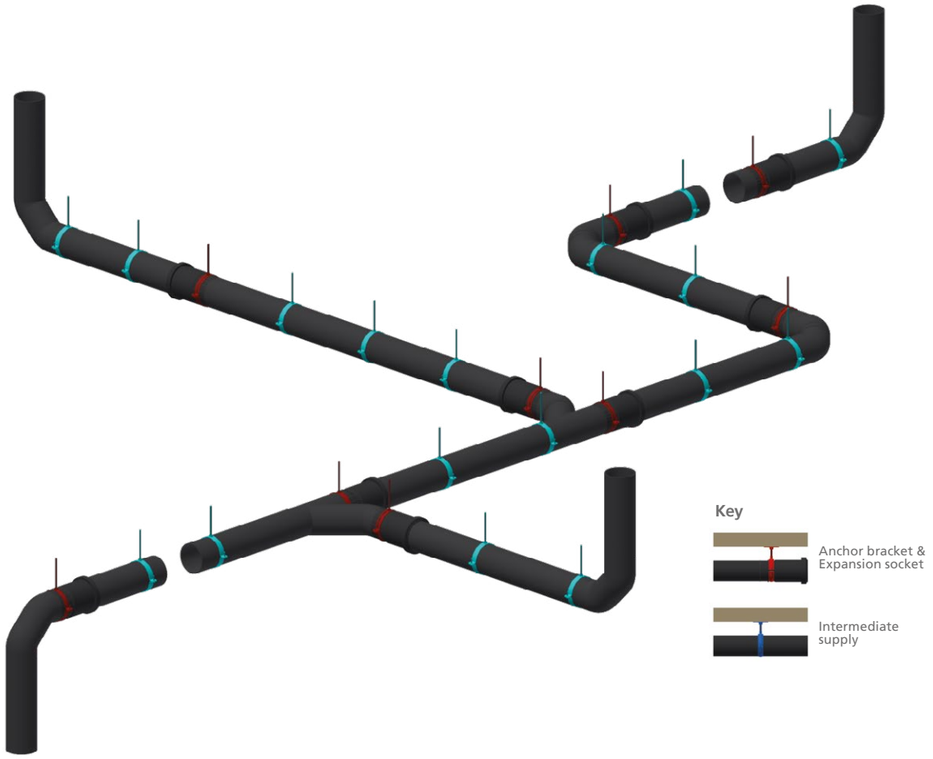
Bracketing for Expansion systems

Remember!

Where to install an expansion coupling
- Every floor, or between two fixed points (e.g. slab) greater than 2m, but not exceeding 6m
- At changes of direction or branch runs greater than 1.2m in length

Where to install an anchor bracket
- Within the groove of the expansion socket or
  - For ø110mm diameter, not exceeding 300mm downstream, from the base of the socket
  - For ø200-315mm diameter, not exceeding 500mm downstream from the base of the socket

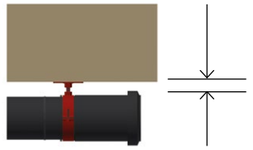
Where to install an intermediate support bracket
- Every floor, or between expansion couplings, at recurring distances not exceeding 1.2m



Important! Thermal movement MUST always be accounted for in both locked and expansion systems.

Bracketing for Expansion Systems Anchor Points Only

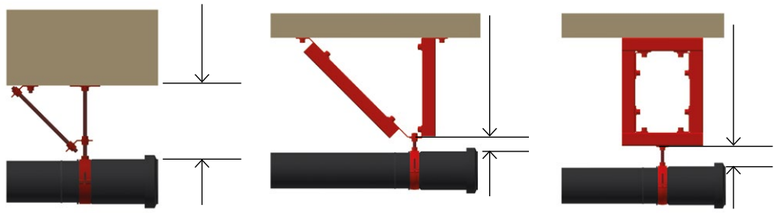
Slab to back of pipe up to 100mm



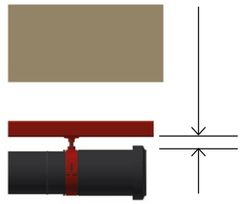
Stud information
ø40-160mm Up to 100mm @ M10
ø200-315mm Up to 100mm @ M16

Slab to back of pipe between 100mm - 500mm

Stud information
ø40-160mm 100mm-500mm @ M10
ø200-315mm 100mm-500mm @ M16

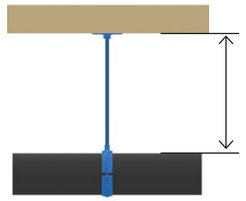


Greater than 500mm



Stud information
ø40-160mm Up to 100mm @ M10
ø200-315mm Up to 100mm @ M16

Bracketing for Expansion Systems Intermediate Supports Only

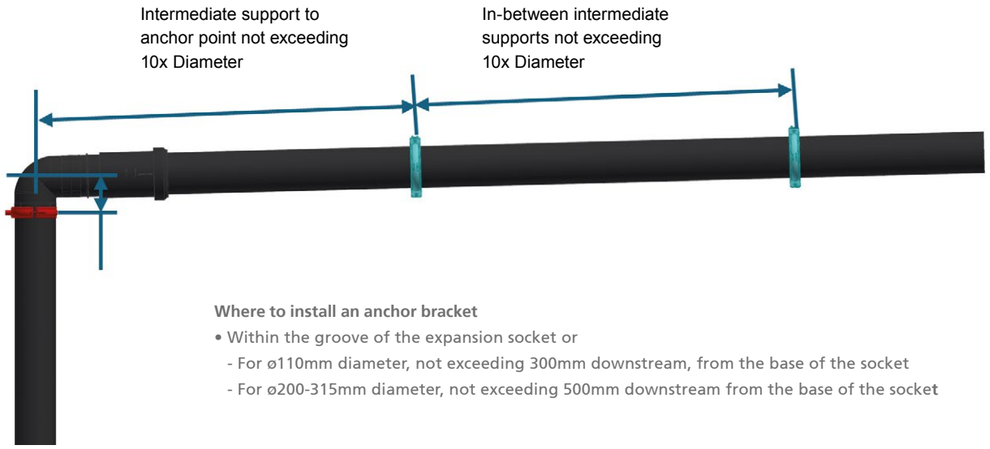


Stud information
ø40-160mm - Up to 500mm @ M10
ø200-315mm - Up to 500mm @ M16

10 Installation

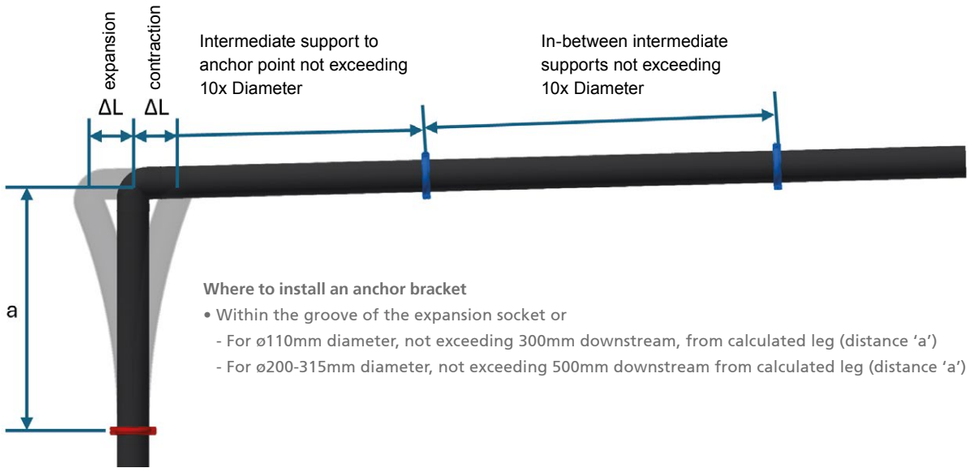
At Changes of Direction

1. Using an expansion coupler (Preferred)



Where to install an anchor bracket
- Within the groove of the expansion socket or
  - For ø110mm diameter, not exceeding 300mm downstream, from the base of the socket
  - For ø200-315mm diameter, not exceeding 500mm downstream from the base of the socket

2. Not using an expansion coupling (Alternative) - Deflection Legs



Where to install an anchor bracket
- Within the groove of the expansion socket or
  - For ø110mm diameter, not exceeding 300mm downstream, from calculated leg (distance 'a')
  - For ø200-315mm diameter, not exceeding 500mm downstream from calculated leg (distance 'a')

Step 1: Calculate the change in length

$\Delta L = \alpha \times L \times \Delta T$

Where:

ΔL = Expansion (mm) or contraction (-mm)

α = Co-efficient of linear expansion (mm/m/°C). For Terrain FUZE α = 0.2

L = Total length of the pipe between anchor points (m)

ΔT = Temperature difference (°C)

NB. For waste discharges ΔT should always be calculated from 0°C, so if the temperature of the water in the pipe is to be 60°C, then ΔT is 60°C.

Step 2: Determine the length of the deflection leg

$a = 10 \times \sqrt{(\Delta L \times Ø)}$

Where:

a = Deflection leg length (distance to first bracket)

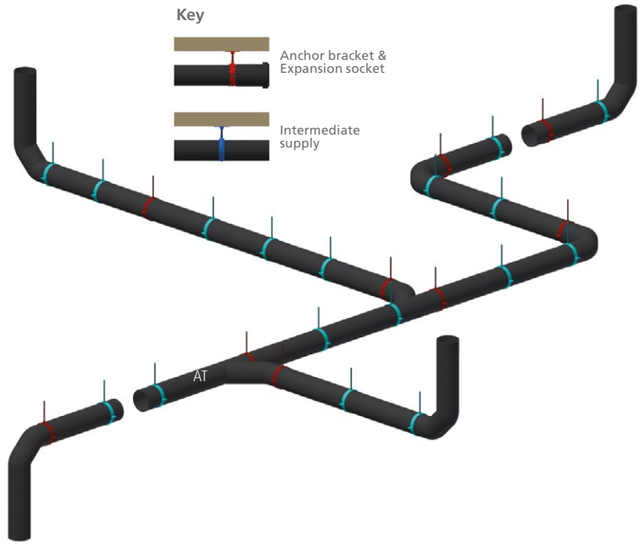
ΔL = Expansion (mm) or contraction (-mm) from Step 1 above

Ø = Total length of the pipe between anchor points (m)

ΔT = Pipe outside diameter (mm)

High Level bracketing

Bracketing for Locked systems



Remember!

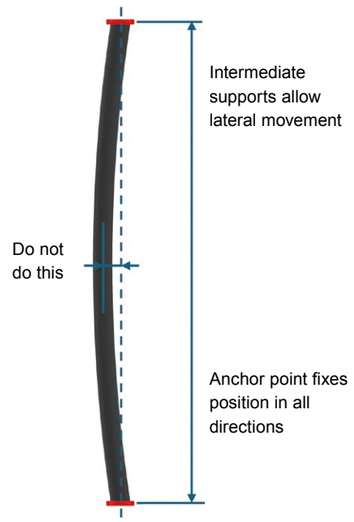
Where to install an expansion coupling
- Every floor, or between two fixed points (e.g. slab) greater than 2m, but not exceeding 6m
- At changes of direction or branch runs greater than 1.2m in length

Where to install an intermediate support bracket
- Every floor, or between expansion couplings, at recurring distances not exceeding 1.2m

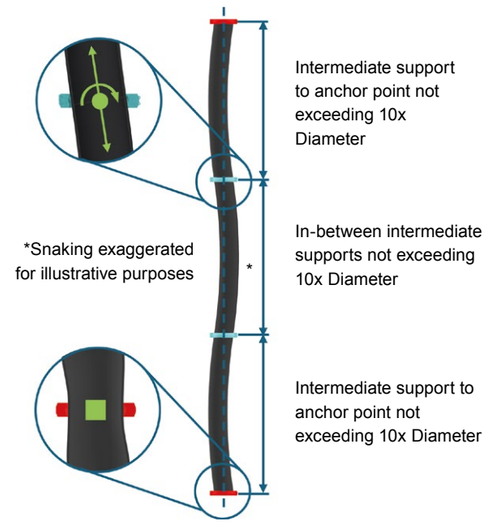
Where to install an anchor bracket
- Within the groove of the expansion socket or
  - For ø110mm diameter, not exceeding 300mm downstream, from the base of the socket
  - For ø200-315mm diameter, not exceeding 500mm downstream from the base of the socket

Important! Pipe will still expand and contract into itself in a locked system. Even in a locked system, thermal movement needs to be accounted for.

Problem



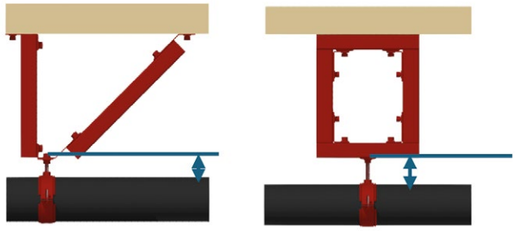
Solution



10 Installation

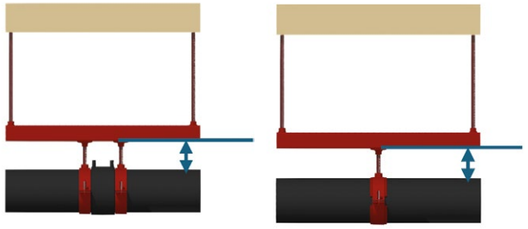
Bracketing for Locked Systems Anchor Points Only

Not Using a rail system

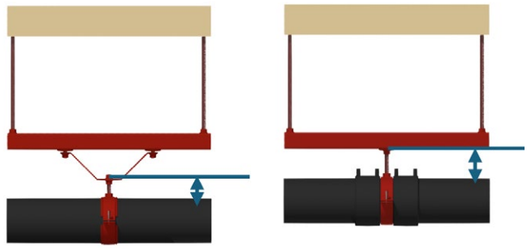


Stud information
⌀40-160mm Up to 100mm @ M10
⌀200-315mm Up to 100mm @ M16

Using a rail system

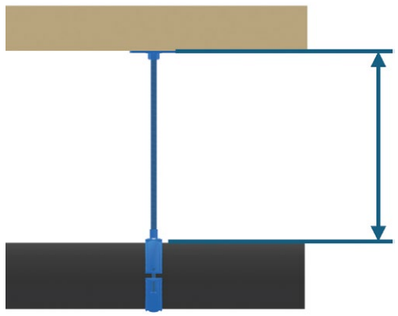


Stud information
⌀40-160mm Up to 100mm @ M10
⌀200-315mm Up to 100mm @ M16



Stud information
⌀40-160mm Up to 100mm @ M10
⌀200-315mm Up to 100mm @ M16

Bracketing for Locked Systems Intermediate Supports Only



Stud information
⌀40-160mm - Up to 500mm @ M10
⌀200-315mm - Up to 500mm @ M16

Where

ΔL = expansion (mm) OR contraction (-mm)

α = co-efficient of linear expansion (mm/m/°C) Terrain FUZE HDPE, 0.2

L = Total length of the pipe between anchor points (m)

ΔT = Temperature difference (°C)

NB. For waste discharges ΔT should always be calculated from 0°C, so if the temperature of the water in the pipe is to be 60°C, then ΔT is 60°C.

Example 1 - Typical vertical stack

Example 1 - Typical vertical stack A 10 storey foul drainage stack will collect and convey domestic waste (assumed temperature 60°C) and connect directly to drain. Each storey is 3m high.

$\Delta L = \alpha L \Delta T$

$\Delta L = \frac{0.2 \times 3.0 \times 60}{}$ = 36mm thermal movement per floor

Example 2 - Typical suspended pipe run

A 20 metre, high-level lateral run has been designed in an open car park area. The maximum length between anchor points should be 6m. The assumed temperature of the waste fluid is 50°C.

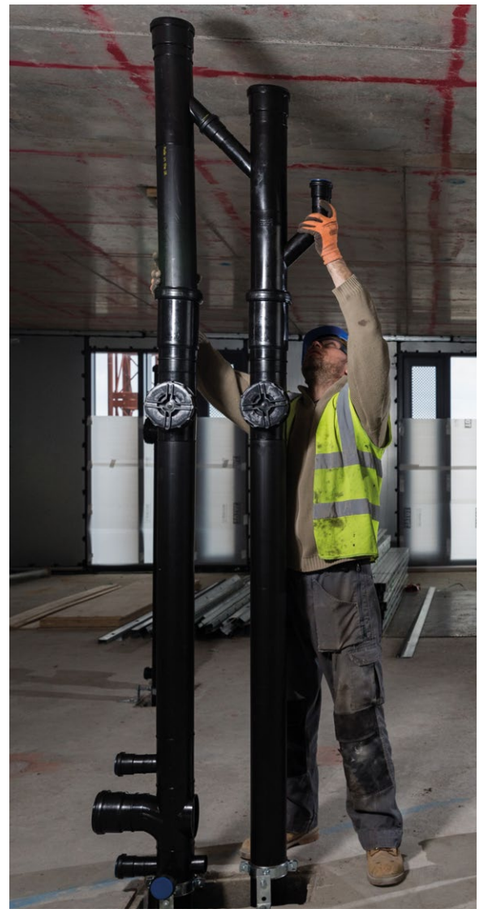
$\Delta L = \alpha L \Delta T$

$\Delta L = \frac{0.2 \times 6.0 \times 50}{}$ = 60mm thermal movement between anchor points

CALCULATING THERMAL MOVEMENT

Terrain FUZE HDPE has a coefficient of expansion of 0.2 (mm/m/°C), the design and installation of above ground drainage systems must be able to accommodate for this. Calculate the thermal movement on straight lengths between anchors using:

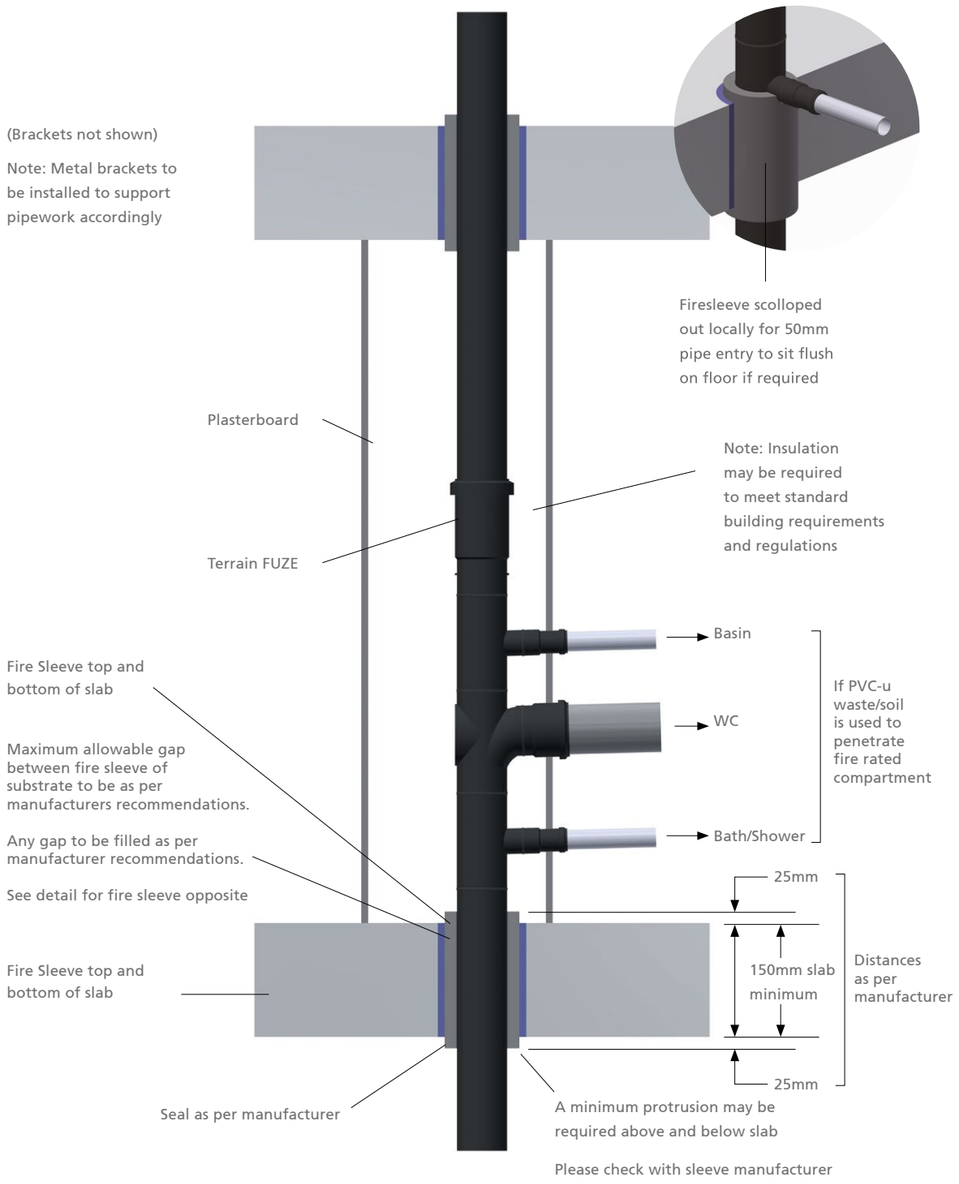
$\Delta L = \alpha L \Delta T$



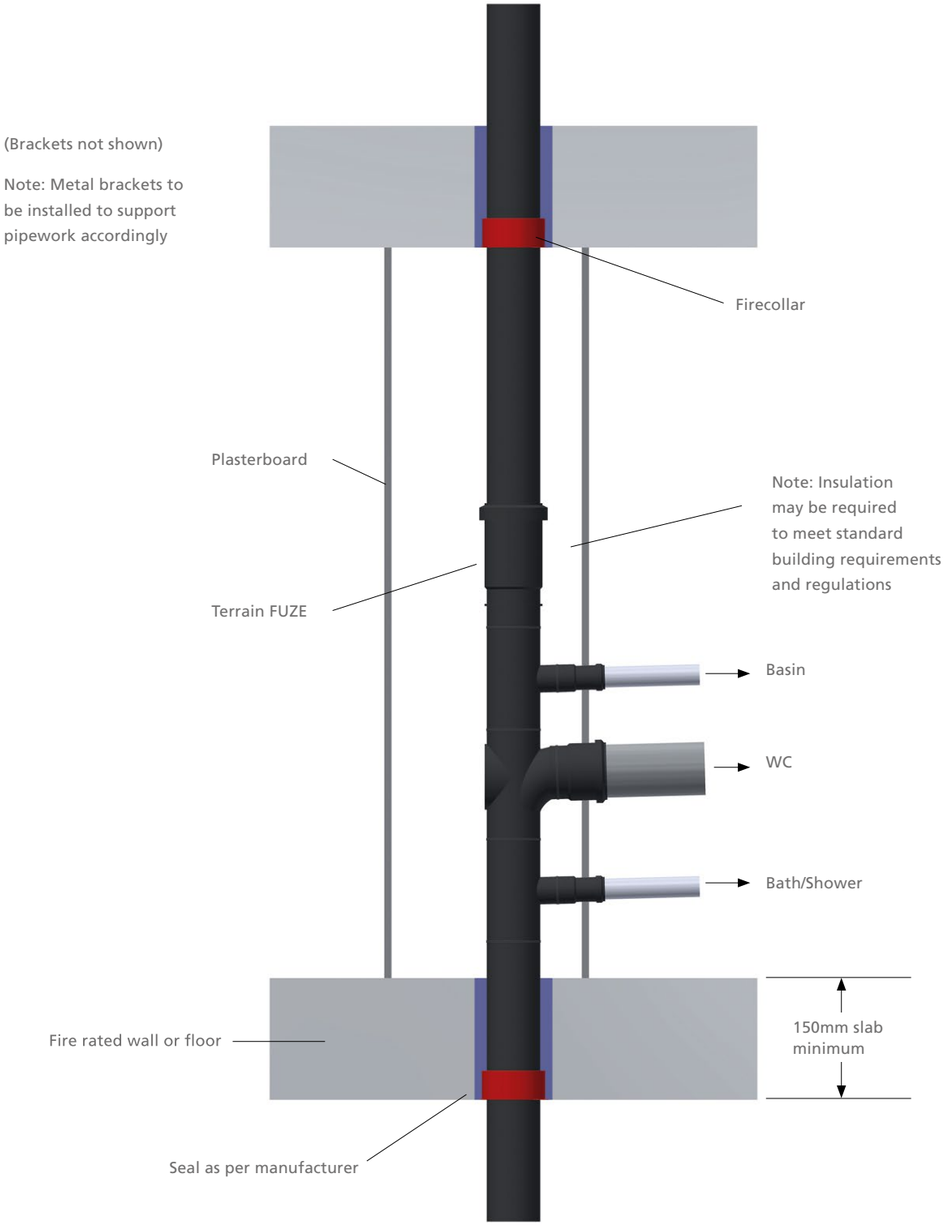
(OD mm)	Weight full of water (Kg/m)	Weight empty (Kg/m)	Thrust force assuming no mechanical load (Kg)
40	1.278	0.370	10
50	1.986	0.460	12
56	2.493	0.530	20
75	4.479	0.740	30
110	9.525	1.450	40
160	20.19	3.080	70
200	31.741	4.100	100
250	49.252	6.100	150
315	78.045	9.510	220

11 Fire Compartmentation

The HDPE FUZE system is considered as combustible for the purposes of compliance to UK Building Regulation B. With this in mind, where HDPE FUZE pipes of nominal diameter ≥ø40mm pass through a fire compartment floor or wall, the penetration must be protected with a suitable passive fire protection product.



These diagrams are indicative of a typical install. Please contact a passive fire protection product supplier for proper installation instructions.



NG.3 Testing

Terrain FUZE should be tested in accordance with guidelines stated within BS EN 12056-2 (Annex NG.3.1) which lays out the following:

NG.3.1 AIR TEST

NOTE Normally this test is carried out to confirm that all pipes and fittings are airtight. It should be completed in one operation but for large multi-storey systems testing in sections may be necessary.

NG.3.1.1 PREPARATION

The water seals of sanitary appliances should be fully charged and test plugs or bags inserted into the open ends of the pipework to be tested. To ensure that there is a satisfactory air seal at the base of the stack, or at the lowest plug or bag in the stack if only a section of the pipework is to be tested, a small quantity of water sufficient to cover the plug or bag can be allowed to enter the system.

One of the remaining test plugs should be fitted with a tee piece, with a cock on each branch, and one branch being connected by means of a flexible tube to a manometer. Alternatively, a flexible tube from a tee piece fitted with cocks on its other two branches can be passed through the water seal of a sanitary appliance. Any water trapped in this tube should be removed and then a manometer can be connected to one of the branches.

NG.3.1.2 APPLICATION

Air is pumped into the system through the other branch of the tee piece until a pressure equal to 38 mm water gauge is obtained. The air inlet cock is then closed and pressure in the system should remain constant for a period of not less than 3 min.

NG.3.1.3 LEAK LOCATION

NOTE Defects revealed by an air test may be located by the methods given in NG.3.1.3.1, NG.3.1.3.2 and NG.3.1.3.3.

NG.3.1.3.1 SMOKE

A smoke producing machine may be used which will introduce smoke under any pressure into the defective pipework. Leakage may be observed as the smoke escapes. Smoke cartridges containing special chemicals should be used with caution, taking care that the ignited cartridge is not in direct contact with the pipework and that the products of combustion do not have a harmful effect upon the materials used for the discharge pipe system. Smoke testing of plastics pipework should be avoided due to naphtha having a detrimental effect, particularly on ABS, PVC-U and MUPVC. Rubber jointing components can also be adversely affected.

NG.3.1.3.2 SOAP SOLUTION

With the pipework subject to an internal pressure using the smoke machine method as described in NG.3.1.3.1, a soap solution can be applied to the pipes and joints. Leakage can be detected by the formation of bubbles.

NG.3.1.3.3 WATER TEST

There is no justification for a water test to be applied to the whole of the plumbing system. The part of the system mainly at risk is that below the lowest sanitary appliance, and this may be tested by inserting a test plug in the lower end of the pipe and filling the pipe with water up to the flood level of the lowest sanitary appliance, provided that the static head does not exceed 6m.

*For accurate readings, please ensure equipment is regularly checked.

Air pressure test to comply with BS EN 12056-2 for testing a stack with connections

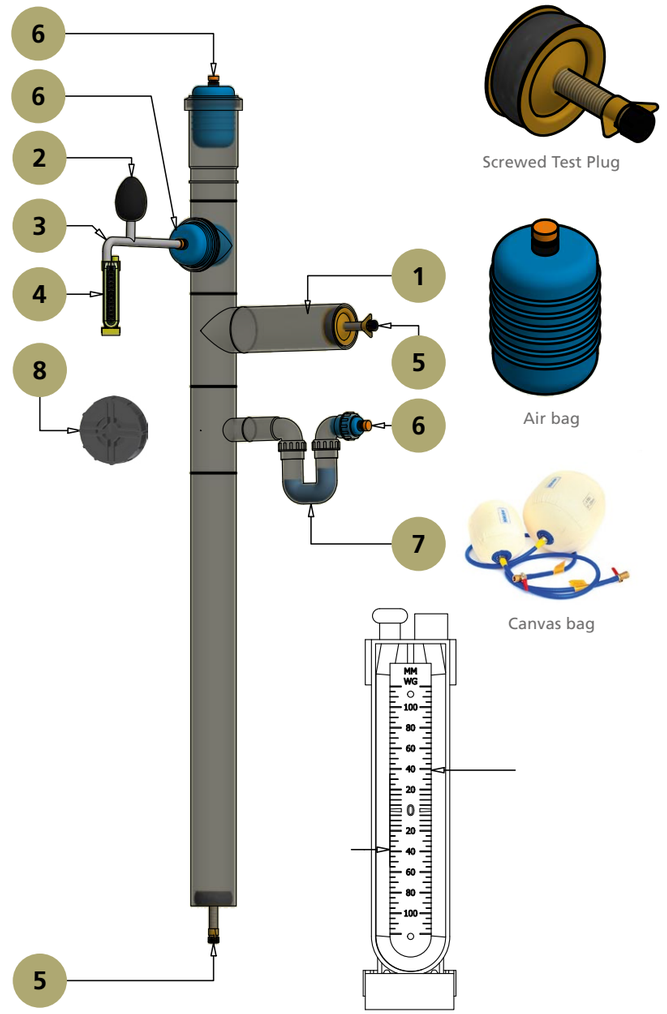
SCREWED TEST PLUG

- Blank or open
- For use in pipe ends
- Manufactured and supplied by others

AIR BAG

- Blank
- For use in access pipe/ expansion socket/pipe ends
- Manufactured and supplied by others

Traps must be filled with water to ensure there is positive pressure within the system to seal the waste inlet.



Screwed Test Plug

Air bag

Canvas bag

KEY	
NO.	PART
1	Pipework to test
2	Bellow
3	Hose
4	U-Gauge (should read 38mm)
5	Screwed Test Plug
6	Air Bag
7	Trap (must be filled with water)
8	Screwed Cap (for access door)

Note: Blue temporary caps are not to be used for air pressure testing, only black threaded caps are to be used.
Further information is available on technical bulletin:2016 - PT06 - Air pressure test to comply with BS EN 12056-2 - Version 6

12 System Testing and Maintenance

System Maintenance

NG.4.1 GENERAL

Discharge pipe systems should be kept in a clean and sound condition in order to maintain maximum efficiency. This is facilitated by designing in accordance with the recommendations in this national annex. The following points should be noted:

- When access covers, caps and clearing eyes are removed, damaged packing, ring seals, washers and loose fittings should be renewed before replacement.
- Care should be taken in the use of chemical descaling agents, which are often of a corrosive nature and materials employed in the pipe system should be clearly identified before treatment to ensure that the internal surfaces are not subject to damaging chemical attack.
- Caution is necessary when employing the methods of clearing obstructions which involve the use of air or water at high pressures.
- Hand operated rods for removing blockages in discharge pipes should be capable of passing through the system without damaging the internal surfaces of pipes and fittings.
- Mechanised rodding equipment should only be used by properly trained operators and the pipework to be cleared should be thoroughly examined in advance to enable selection of the appropriate cleaning attachments.
- In renewing paintwork care should be taken to preserve any distinguishing colours which may have been used for identification purposes. Reference should be made to BS 1710.

NG.4.2.DEPOSITS DUE TO MISUSE OF THE DISCHARGE SYSTEM

Completely or partial blockages due to large objects or compacted masses, such as toilet paper and sanitary towels, can usually be loosened by rodding. All such material should be removed from the system at the nearest access point.

NG.4.3 PERIODIC INSPECTION

In addition to general maintenance work, periodic inspections and tests may be advisable to ascertain if there is any misuse or negligence. All defects should be fixed.

13 Approvals

Terrain FUZE, HDPE Soil and Waste

Terrain FUZE is made to the manufacturing standards stated below. These standards set out the dimensional, physical and mechanical characteristics that each individual product shall conform to.

PIPES AND ELECTROFUSION COUPLINGS

Pipes and Electrofusion Couplings are manufactured in accordance with BS EN 1519 Standard, Kitemark certificate KM 729217, and is covered by the British Board of Agrément (BBA), certificate 07/4479.

FITTINGS

Fittings are also covered by the British Board of Agreement (BBA), certificate 07/4479.

P.A.P.A. AND AAV

Terrain P.A.P.A.® - BBA - Certificate No. 18/5551

Terrain Air Admittance Valves - BS EN 12380/ Kitemark KM 554663

Polypipe Quality Assurance

Our Terrain products are accredited to the following Management Systems:

BS EN ISO 9001 - Quality Management System

BS EN ISO 14001 - Environmental Management System

BS ISO 45001 - Occupational Health & Safety Management System

PAS 99 - Integrated Management Registration

BES 6001 - Responsible Sourcing of Product

BS 8541 - BIM Objects

FURTHER INFORMATION AND ASSISTANCE

Terrain products are backed by a comprehensive technical advisory service, available to provide advice and design guidance on all aspects of above and below ground drainage.

Technical services include:

- On-site advice and problem solving.
- Terrain Drainage Stacks are designed and fabricated through our Polypipe Advantage Service. Any items ordered through this service have a 21-day lead time.

For more information, please see page 70.

For prompt assistance, please contact the Polypipe Advantage team: **Tel: 01622 795200**

Email: **buildingservices.technical@polypipe.com**

www.polypipe.com/commercial-building-services

14 Support

As the industry moves forward, we're here right by its side. Terrain FUZE is proof of our commitment to making things simple for our customers, an innovative plastic drainage system that's designed for the future.

Our website also provides useful information to keep you up to date with news and innovations as they happen, including how Terrain FUZE can further enhance your project.

To find out more visit:
polypipe.com/this-is-our-terrain/terrain-fuze

Polypipe Building Services

Investing in our business and our people enables us to bring more expertise, more support and more innovation to our customers, helping them to create safe and sustainable commercial buildings, whether newbuild or refurbishment projects.

BUILDING SERVICES SPECIALISM

Having made significant investment in expanding our portfolio to include not only our trusted and well-established Terrain drainage systems, but also MecFlow, our water supply system, we're committed to working with our customers to provide the best building services solutions for their project. From schools, hospitals and tall buildings to shopping centres, local authorities and commercial and industrial developments, we provide drainage and water supply solutions that help our customers create safe and sustainable services within buildings.

SERVICE AND SUPPORT

Recognising the challenges the construction industry faces, we continuously research and develop products and services that enable us to support our customers more – from working with Engineers to design the best solutions for complex projects to helping Contractors overcome labour shortage issues, a lack of on-site storage and on-site waste management. We develop services to support our customers so that together, we can achieve more.

POLYPIPE ADVANTAGE SERVICE

The Polypipe Advantage service has been specially developed to complement our products and services offering. The Polypipe Advantage team is with you every step of your project, from initial design and project planning, through
to manufacture and delivery. By creating fabricated Terrain drainage and MecFlow, we're able to provide our customers quick and more efficient installations on-site. For more information on how the Polypipe Advantage service could benefit your next project, email: **mecflow@polypipe.com**.

SUPPORTING PRODUCTS AND LITERATURE

With both drainage and water supply systems in its portfolio, Polypipe Building Services has a number of solutions for your next project. More information on these systems can be found at:
polypipe.com/commerical-building-services

TAKING YOUR PROJECT FURTHER

As part of the Genuit Group, we have a number of complementary water and climate management systems available to maximise the comfort and efficiency of your commercial building:

Nuaire Ventilation Systems
Our Nuaire brand has been at the forefront of packaged Air Handling Units (AHUs) for over 20 years, designing and manufacturing market leading ranges. Explore the full range of Nuaire ventilation systems at **www.nuaire.co.uk**.

Polypipe Underfloor Heating
Underfloor heating systems are increasingly popular and are rapidly becoming the heat source of choice for commercial and multioccupancy residential developments. For more information on our range of Underfloor Heating Systems, controls and manifolds visit: **www.polypipeUFH.com**.

Polypipe: Inspiring Green Urbanisation
To help address the pressures that urbanisation and climate change place on our built environment, we've developed a new generation of technologies that sustain and optimise urban green assets through extended and fully integrated water management solutions. Systems that make space for water, alleviate flooding and capture, store and reuse rainwater, whilst enabling and inspiring Green Urbanisation.
www.polypipe.com/civils/gi

MECFLOW SUPPLY SYSTEMS	TERRAIN	nuaire	Polypipe Underfloor Heating	Polypipe Civils & Green Urbanisation
polypipebuildingservices.com/products/mecflow-supply-systems/	polypipebuildingservices.com/products/terrain-drainage/	nuaire.co.uk	polypipeUFH.com	polypipecivils.com

15 Terms and Conditions

1.INTERPRETATION

The following definitions and rules of interpretation apply in these Conditions.

1.Definitions:

1.Business Day: a day other than a Saturday, Sunday or public holiday in England, when banks in London are open for business.

2. Conditions: these terms and conditions as amended from time to time in accordance with 19.8.

3. Contract: the contract between the Supplier and the Customer for the supply of Goods or Services or Goods and Services in accordance with these Conditions.

4. Control: has the meaning given in section 1124 of the Corporation Tax Act 2010, and the expression change of control shall be interpreted accordingly.

5. Customer: the person or firm who purchases the Goods or Services or Goods and Services from the Supplier.

6.Deliverables: the deliverables set out in the Order produced by the Supplier for the Customer.

7. Goods: the goods (or any part of them) set out in the Order.

8. Goods Specification: any specification for the Goods, including any relevant plans or drawings, issued by the Supplier from time to time.

9. Intellectual Property Rights: patents, utility models, rights to inventions, copyright and neighbouring and related rights, moral rights, trade marks and service marks, business names and domain names, rights in get-up and trade dress, goodwill and the right to sue for passing off or unfair competition, rights in designs, rights in computer software, database rights, rights to use, and protect the confidentiality of, confidential information (including know-how and trade secrets), and all other intellectual property rights, in each case whether registered or unregistered and including all applications and rights to apply for and be granted, renewals or extensions of, and rights to claim priority from, such rights and all similar or equivalent rights or forms of protection which subsist or will subsist now or in the future in any part of the world.

10. Order: the Customer's order for the supply of Goods or Services or Goods and Services.

11. Polypipe Group of Companies: any subsidiary of Polypipe Limited, or any subsidiary of any subsidiary of Polypipe Limited.

12. Services: the services, including the Deliverables, supplied by the Supplier to the Customer as set out in the Service Specification.

13. Service Specification: the description or specification for the Services provided in writing by the Supplier to the Customer.

14. Supplier: Polypipe Limited trading as Polypipe Building Services registered in England and Wales with company number 01099323.

2. Interpretation:

a. A person includes a natural person, corporate or unincorporated body (whether or not having separate legal personality).

b. A reference to a party includes its personal representatives, successors and permitted assigns.

c. A reference to legislation or a legislative provision is a reference to it as amended or re-enacted. A reference to legislation or a legislative provision includes all subordinate legislation made under that legislation or legislative provision.

d. Any words following the terms including, include, in particular, for example or any similar expression shall be interpreted as illustrative and shall not limit the sense of the words preceding those terms.

e. A reference to writing or written excludes fax but not email.

2. BASIS OF CONTRACT

1. Unless otherwise specifically agreed in writing by the Supplier, these Conditions shall apply to the provision of all Goods and/or Services to the Customer.

2. The Order constitutes an offer by the Customer to purchase Goods or Services or Goods and Services in accordance with these Conditions.

3. If a quotation has been provided the quotation shall not constitute an offer and shall only be valid for the period of time stated on the quotation or, in the absence of any stated validity period, shall be valid for a period of 28 days from the quotation date.

4. The Order shall only be deemed to be accepted on the sooner of:

a. the Supplier communicating a formal acceptance of the Order; or

b. the Supplier despatching any Goods forming part, or all, of the Order; or

c. the Supplier commencing any Services forming part, or all, of the Order; at which point and on which date the Contract shall come into existence (Commencement Date). For the avoidance of all doubt, the Supplier shall be under no obligation to accept any Order.

5. Once an Order has been accepted, and the Contract formed, the Customer shall not be entitled to amend or cancel the Order without the prior written consent of the Supplier. If such consent is granted the Customer shall be liable to the Supplier for the Supplier's costs incurred as a direct result of any such amendment or cancellation.

6. Any samples, drawings, descriptive matter or advertising issued by the Supplier and any descriptions of the Goods or illustrations or descriptions of the Services contained in the Supplier's catalogues or brochures are issued or published for the sole purpose of giving an approximate idea of the Goods and Services described in them. They shall not form part of the Contract nor have any contractual force.

7. These Conditions apply to the Contract to the exclusion of any other terms that the Customer seeks to impose or incorporate, in any form, or which are implied by law, trade custom, practice or course of dealing.

8. The Customer waives any right it might otherwise have to rely on any term endorsed upon, delivered with or contained in any documents of the Customer that is inconsistent with these Conditions.

3. GOODS

1. The Goods are described in the Goods Specification.

2. To the extent that any of the Goods are to be manufactured in accordance with a specification supplied by the Customer, the Customer shall indemnify the Supplier against all liabilities, costs, expenses, damages and losses (including any direct, indirect or consequential losses, loss of profit, loss of reputation and all interest, penalties and legal costs (calculated on a full indemnity basis) and all other professional costs and expenses) suffered or incurred by the Supplier arising out of or in connection with any claim made against the Supplier for actual or alleged infringement of a third party's Intellectual Property Rights arising out of or in connection with the Supplier's use of the Goods Specification. This 3.2 shall survive termination of the Contract.

3. The Supplier reserves the right to amend the Goods Specification:

a. Without notice to the Customer if the amendments to do not result in any reduction in functionality of the Goods, or that in the reasonable opinion of the Supplier is non-material;

b. By giving the Customer not less than 2 weeks' notice if the amendments are material in nature, or will result in any reduction in functionality of the Goods; or

c. On written notice to the Customer if required by any applicable statutory or regulatory requirement.

4. DELIVERY OF GOODS

1. The Supplier shall ensure that:

a. each delivery of the Goods is accompanied by a delivery note which shows the date of the Order, all relevant Customer and Supplier reference numbers, the type and quantity of the Goods (including the code number of the Goods, where applicable), special storage instructions (if any) and, if the Order is being delivered by instalments, the outstanding balance of Goods remaining to be delivered; and

b. if the Supplier requires the Customer to return any packaging materials to the Supplier, that fact is clearly stated on the delivery note. The Customer shall make any such packaging materials available for collection at such times as the Supplier shall reasonably request. Returns of packaging materials shall be at the Supplier's expense.

2.Delivery of the Goods shall be completed as per the Order or, in the absence of any specific delivery terms in the Order, shall be completed EXW Incoterms®2020.

3.Delivery of the Goods shall be completed on the completion of unloading, or where appropriate, loading of the Goods at the Delivery Location.

4. Any dates quoted for delivery of the Goods are approximate only, and the time of delivery is not of the essence. The Supplier shall not be liable for any delay in delivery of the Goods that is caused by a Force Majeure Event or the Customer's failure to provide the Supplier with adequate delivery instructions or any other instructions that are relevant to the supply of the Goods.

5. If the Supplier fails to deliver the Goods, its liability shall be limited to the costs and expenses incurred by the Customer in obtaining replacement goods of similar description and quality in the cheapest market available, less the price of the Goods. The Supplier shall have no liability for any failure to deliver the Goods to the extent that such failure is caused by a Force Majeure Event or the Customer's failure to provide the Supplier with adequate delivery instructions or any other instructions that are relevant to the supply of the Goods.

6.If the Customer fails to take, or accept, delivery of the Goods within three Business Days of the Supplier notifying the Customer that the Goods are ready, then except where such failure or delay is caused by a Force Majeure Event or by the Supplier's failure to comply with its obligations under the Contract in respect of the Goods:

a. delivery of the Goods shall be deemed to have been completed at 9.00 am on the third Business Day following the day on which the Supplier notified the Customer that the Goods were ready; and

b. the Supplier shall store the Goods until actual delivery takes place, and charge the Customer for all related costs and expenses (including insurance).

7. If ten Business Days after the day on which the Supplier notified the Customer that the Goods were ready for delivery the Customer has not taken, or accepted, actual delivery of them, the Supplier may resell or otherwise dispose of part or all of the Goods and, after deducting reasonable storage and selling costs, account to the Customer for any excess over the price of the Goods or charge the Customer for any shortfall below the price of the Goods.

8. Once delivery has been completed in accordance with the Contract the Supplier shall, save for as detailed elsewhere in these Conditions, have no obligation to accept any returns of any Goods delivered. Should the Customer wish to return any Goods, without cause, acceptance of any such returns shall be at the Supplier's sole discretion and shall be subject to:

a. a restocking fee, on a per item basis, determined by the Supplier at the time. The restocking fee shall not amount to more than 25% (excluding VAT) of the total price of the Goods returned; and

b. a charge equalling the value of any depreciation in the returned Goods attributable to any damage, or wear and tear, caused to the Goods whilst at the Customer's risk.

9. The Supplier may deliver the Goods by instalments, which shall be invoiced and paid for separately. Each instalment shall constitute a separate contract. Any delay in delivery or defect in an instalment shall not entitle the Customer to cancel any other instalment.

5. DELIVERY INSPECTIONS

1.The Customer shall have no claim for loss, shortages or damage on delivery which are or would be apparent on inspection unless the Customer:

a.unpacks and inspects the Goods as soon as reasonably practicable following receipt;

b.notifies the Supplier of any loss, shortages or damage (otherwise than by a qualified signature on the delivery note) within 3 Business Days of the date of delivery; and

c.demonstrates to the satisfaction of the Supplier that such loss, shortages or damage occurred prior to delivery.

2.The Customer shall have no rights in respect of loss, shortages or damage unless the Supplier is given a reasonable opportunity to inspect the Goods in question and investigate any complaint before any use of or alteration to or interference with the Goods.

3.On a valid complaint made in accordance with this clause 5 the Customer shall be entitled:

a. in the case of notified shortages, to receive within a reasonable time thereafter a delivery of Goods equivalent to the shortfall; or

b. in the case of defects, at the Supplier's discretion, to:

i. repairs to the affected Goods; or

ii. replacements of the affected Goods;

iii. a credit for the price of the affected Goods and the Supplier shall have no further liability whatsoever in respect of any such complaint.

4. If a complaint of loss, shortages or damage on delivery is not made to the Supplier in accordance with this Clause 5 within 3 Business Days of the date of delivery, then the Goods shall be deemed to be delivered complete and undamaged in accordance with the Contract.

6. EXPORT TERMS

1. If any Goods are to be delivered outside the United Kingdom the provisions of this clause shall apply and the transport of Goods outside the United Kingdom will be governed by the relevant Incoterms agreed by the parties.

2. Unless otherwise agreed between the parties, the full Order value shall be secured by an irrevocable letter of credit satisfactory to the Supplier, established by the Customer in favour of the Supplier immediately upon the acceptance of an Order as outlined in clause 2.4, and confirmed by a bank acceptable to the Supplier. The letter of credit shall be for the full value of the relevant Order (together with any tax or duty payable) payable to the Supplier and shall be valid for not less than three months. The Supplier shall be entitled to payment within the time-scale agreed between the parties in writing on presentation of the relevant Contract documentation to the Supplier's nominated bank.

3. Unless otherwise agreed in the Order, or in writing between the parties, the Customer shall be responsible for complying with any legislation or regulations governing the importation of the Goods into the country of destination and for the payment of any applicable duties, or the application, and payment for, any required licences.

7. QUALITY OF GOODS

1. Where specifically stated in the Goods Specification, the Goods shall come with the Supplier's standard warranty, a copy of which is available on request.

2. Save for where specifically detailed in these Conditions, all other warranties, whether express, or implied, are hereby excluded to the furthest extent possible in law.

3. Without prejudice to clause 7.1, the Supplier warrants that on delivery, and for a period of 6 months from the date of delivery (Warranty Period), the Goods shall:

a. conform in all material respects with the Goods Specification;

b. be free from material defects in design, material and workmanship; and

c. be of satisfactory quality (within the meaning of the Sale of Goods Act 1979.

4. Subject to 7.5, if:

a. the Customer gives notice in writing to the Supplier during the Warranty Period, and within a reasonable time of discovery, that some or all of the Goods do not comply with the warranty set out in 7.1;

b. the Supplier is given a reasonable opportunity of examining such Goods; and

c. the Customer (if asked to do so by the Supplier) returns such Goods to the Supplier's place of business at the Supplier's cost, the Supplier shall, at its option, repair or replace the defective Goods, or refund the price of the defective Goods in full. This shall be the Customer's sole remedy for any breach of the warranty set out in clause 7.1.

5. The Supplier shall not be liable for the Goods' failure to comply with the warranty set out in 7.1 if:

a. the Customer makes any further use of such Goods after giving a notice in accordance with 7.4;

b. the defect arises because the Customer failed to follow the Supplier's oral or written instructions as to the storage, commissioning, installation, use or maintenance of the Goods or (if there are none) good trade practice regarding the same;

c. the defect arises as a result of the Supplier following any drawing, design or specification supplied by the Customer;

d. the Customer alters or repairs such Goods without the written consent of the Supplier;

e. the defect arises as a result of fair wear and tear, wilful damage, negligence, or abnormal working conditions; or

f. the Goods differ from the Goods Specification as a result of changes made to ensure they comply with applicable statutory or regulatory requirements.

6.Except as provided in this 7, the Supplier shall have no liability to the Customer in respect of the Goods' failure to comply with the warranty set out in 7.1.

7. These Conditions shall apply to any repaired or replacement Goods supplied by the Supplier.

8. TITLE AND RISK

1. The risk in the Goods shall pass to the Customer on completion of delivery.

2. Title to the Goods shall not pass to the Customer until the earlier of:

a. the Supplier receiving payment in full (in cash or cleared funds) for the Goods in which case title to the Goods shall pass at the time of payment; and

b. the Customer resells the Goods, in which case title to the Goods shall pass to the Customer at the time specified in 8.4.

3. Until title to the Goods has passed to the Customer, the Customer shall:

a. store the Goods separately from all other goods held by the Customer so that they remain readily identifiable as the Supplier's property;

b. not remove, deface or obscure any identifying mark or packaging on or relating to the Goods;

c. maintain the Goods in satisfactory condition and keep them insured against all risks for their full price on the Supplier's behalf from the date of delivery;

d. notify the Supplier immediately if it becomes subject to any of the events listed in 15.1(b) to 15.1(d); and

e. give the Supplier such information as the Supplier may reasonably require from time to time relating to:

i. the Goods; and

ii. the ongoing financial position of the Customer.

4. Subject to 8.5, the Customer may resell or use the Goods in the ordinary course of its business (but not otherwise) before the Supplier receives payment for the Goods. However, if the Customer resells the Goods before that time:

a. it does so as principal and not as the Supplier's agent; and

b. title to the Goods shall pass from the Supplier to the Customer immediately before the time at which resale by the Customer occurs.

5. At any time before title to the Goods passes to the Customer, the Supplier may:

a. by notice in writing, terminate the Customer's right under 8.4 to resell the Goods or use them in the ordinary course of its business; and

b. require the Customer to deliver up all Goods in its possession that have not been resold, or irrevocably incorporated into another product and if the Customer fails to do so promptly, enter any premises of the Customer or of any third party where the Goods are stored in order to recover them.

9. SUPPLY OF SERVICES

1. The Supplier shall supply the Services to the Customer in accordance with the Service Specification in all material respects.

2. The Supplier shall use reasonable endeavours to meet any performance dates for the Services specified in the Order, or as agreed between the parties from time to time, but any such dates shall be estimates only and time shall not be of the essence for the performance of the Services.

3. Where, pursuant to the Services, the Supplier makes recommendations to the Customer, such recommendations will be based on the information available to the Supplier's representatives as at the time any such recommendation is provided, and shall be given to the best of the Supplier's knowledge of the matter in question. Save for where the recommendation explicitly falls within the scope Services being provided, or the Goods being supplied, any such recommendations are for guidance only and the Supplier shall have no liability to the Customer arising from the Customer following such recommendations without first having consulted a relevant expert in the matter in question.

4. Where any aspect of the Services involves the Supplier undertaking visits to any premises under the control of the Customer for the purposes of undertaking a pre-assessment of such premises the Customer shall inform the Supplier of all material information relating to the premises that may impact the pre-assessment being undertaken including, but not limited to, ground conditions, location of utilities, any hazards (whether physical or otherwise), and any plans to change the premises in the near future. Without prejudice to the generality of clause 10.2, the Supplier shall have no liability to the Customer if any such information is not provided, or if any information provided is not thorough or accurate.

5. The Supplier reserves the right to amend the Service Specification if necessary to comply with any applicable law or regulatory requirement, or if the amendment will not materially affect the nature or quality of the Services, and the Supplier shall notify the Customer in any such event.

6. The Supplier warrants to the Customer that the Services will be provided using reasonable care and skill.

10. CUSTOMER'S OBLIGATIONS

1.The Customer shall:

a. ensure that the terms of the Order and any information it provides in either or both the Service Specification and the Goods Specification are complete and accurate;

b. be wholly responsible for ensuring that any measurements, information, schematics, documentation, or specifications provided to the Supplier are accurate and warrants and represents that the Supplier shall be entitled to rely on anything provided to it by the Customer without further interrogation;

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c. co-operate with the Supplier in all matters relating to the Services;

d. provide the Supplier, its employees, agents, consultants and subcontractors, with access to the Customer's premises, office accommodation and other facilities as reasonably required by the Supplier to provide the Services;

e. provide the Supplier with such information and materials as the Supplier may reasonably require in order to supply the Services, and ensure that such information is complete and accurate in all material respects;

f. prepare the Customer's premises for the supply of the Services;

g. notify the Supplier, in advance, prior to the delivery of any Services, if any of the Services being delivered relate to a 'High Risk Building' as defined in the Building Safety Act 2022. Should any of the Services being provided relate to a 'High Risk Building', and the Customer has failed to notify the Supplier in accordance with this clause, the Supplier shall have no liability to the Customer, in any form, for any failure for the Services, or any resulting Goods supplied, being in compliance with the requirements of the Building Safety Act 2022;

h. ensure that all relevant Customer personnel are aware of the Supplier's activities under the Contract, including, but not limited to:

i. any deliveries of Goods; and

ii. the performance of any Services.

i. pro-actively inform the Supplier of any information regarding the site where the Services are to be provided that may be relevant to the Services including, but not limited to, site conditions, ground conditions, utilities on or in the vicinity of the site, and any potential hazards on or in the vicinity of the site;

j. ensure the site where the Goods are to be delivered and/or the Services performed is suitable for such delivery and/or performance for the entire period in which the Supplier may be on site;

k. obtain and maintain all necessary licences, permissions and consents which may be required for the Services before the date on which the Services are to start;

l. comply with all applicable laws, including health and safety laws;

m. keep all materials, equipment, documents and other property of the Supplier (Supplier Materials) at the Customer's premises in safe custody at its own risk, maintain the Supplier Materials in good condition until returned to the Supplier, and not dispose of or use the Supplier Materials other than in accordance with the Supplier's written instructions or authorisation; and

n. comply with any additional obligations as set out in the Service Specification or the Goods Specification or both.

2. If the Supplier's performance of any of its obligations under the Contract is prevented or delayed by any act or omission by the Customer or failure by the Customer to perform any relevant obligation (Customer Default):

a. without limiting or affecting any other right or remedy available to it, the Supplier shall have the right, without liability to the Customer, to suspend performance of the Services until after the Customer remedies the Customer Default, and to rely on the Customer Default to relieve it from the performance of any of its obligations in each case to the extent the Customer Default prevents or delays the Supplier's performance of any of its obligations;

b. the Supplier shall not be liable for any and all costs or losses sustained or incurred by the Customer arising directly or indirectly from the Supplier's failure or delay to perform any of its obligations as set out in this 10.2; and

c. the Customer shall reimburse the Supplier on written demand for any costs or losses sustained or incurred by the Supplier arising directly or indirectly from the Customer Default.

11. CHARGES AND PAYMENT

1. The price for Goods:

a. shall be the price set out in the Order or, if no price is quoted, the price set out in the Supplier's published price list as at the date of delivery; and

b. shall, unless otherwise outlined in the Order, be exclusive of all costs and charges of packaging, insurance, transport of the Goods, which shall be invoiced to the Customer.

2. Unless otherwise agreed in the Order, or between the parties in writing, the charges for Services shall be calculated on a time and materials basis:

a. the charges shall be calculated in accordance with the Supplier's rates, as set out in any quotation provided by the Supplier;

b. if working to a day rate, the Supplier's daily fee rates for each individual person are calculated on the basis of an eight-hour day from 9.00 am to 5.00 pm worked on Business Days;

c. the Supplier shall be entitled to charge an overtime rate of 50% of the daily fee rate on a pro rata basis for each part day or for any time worked by individuals whom it engages on the Services outside the hours referred to in 11.2(b); and

d. the Supplier shall be entitled to charge the Customer for any expenses reasonably incurred by the individuals whom the Supplier engages in connection with the Services including travelling expenses, hotel costs, subsistence and any associated expenses, and for the cost of services provided by third parties and required by the Supplier for the performance of the Services, and for the cost of any materials.

3. The Supplier reserves the right to increase the price of the Goods, by giving notice to the Customer at any time before delivery, to reflect any increase in the cost of the Goods to the Supplier that is due to:

a. any factor beyond the control of the Supplier (including foreign exchange fluctuations, increases in taxes and duties, and increases in labour, materials and other manufacturing costs);

b. any request by the Customer to change the delivery date(s), quantities or types of Goods ordered, or the Goods Specification; or

c. any delay caused by any instructions of the Customer in respect of the Goods or failure of the Customer to give the Supplier adequate or accurate information or instructions in respect of the Goods.

4. In respect of Goods, the Supplier shall invoice the Customer on or at any time after completion of delivery. In respect of Services, the Supplier shall invoice the Customer as outlined in the Order or, in the absence of any specific detail on the Order, on completion of the Services.

5. The Supplier reserves the right to complete credit checks as against the Customer and, by entering into the Contract, the Customer consents to the Supplier undertaking such credit checks.

6. The Supplier shall be entitled, at its discretion, to require the Customer to pay for any Goods, or Services, in full, or in part, prior to the delivery of the Goods, or the commencement of any of the Services.

7. Without prejudice, and subject to, clause 11.6, the Customer shall pay each invoice submitted by the Supplier:

a. within 30 days of the date of the invoice or in accordance with any credit terms agreed by the Supplier and confirmed in writing to the Customer; and

b. in full and in cleared funds to a bank account nominated in writing by the Supplier, and time for payment shall be of the essence of the Contract.

8. All amounts payable by the Customer under the Contract are exclusive of amounts in respect of value added tax chargeable from time to time (VAT). Where any taxable supply for VAT purposes is made under the Contract by the Supplier to the Customer, the Customer shall, on receipt of a valid VAT invoice from the Supplier, pay to the Supplier such additional amounts in respect of VAT as are chargeable on the supply of the Services or Goods or both, as applicable, at the same time as payment is due for the supply of the Services or Goods.

9. If the Customer fails to make a payment due to the Supplier under the Contract by the due date, then, without limiting the Supplier's remedies under 15:

a. The Supplier shall be entitled, without liability to the Customer, to suspend delivery of all Goods not yet delivered to the Customer; or

b. The Supplier shall be entitled, without liability to the Customer, to suspend performance of any Services not yet performed; and

c. the Customer shall pay interest on the overdue sum from the due date until payment of the overdue sum, whether before or after judgment. Interest under this 11.9 will accrue each day at 6% a year above the Bank of England's base rate from time to time, but at 6% a year for any period when that base rate is below 0%.

10. All amounts due under the Contract shall be paid in full without any set-off, counterclaim, deduction or withholding (other than any deduction or withholding of tax as required by law).

12. INTELLECTUAL PROPERTY RIGHTS

1. All Intellectual Property Rights in or arising out of or in connection with the Services (other than Intellectual Property Rights in any materials provided by the Customer) shall be owned by the Supplier.

2. Save for as explicitly stated, nothing in the Contract shall serve to assign, transfer, or licence any Intellectual Property Rights owned by the Supplier, or any Polypipe Group Company.

3. The Supplier grants to the Customer, or shall procure the direct grant to the Customer of, a fully paid-up, worldwide, non-exclusive, royalty-free licence during the term of the Contract to copy the Deliverables (excluding materials provided by the Customer) for the purpose of receiving and using the Services and the Deliverables in its business.

4. The Customer shall not sub-license, assign or otherwise transfer the rights granted by 12.3 without the Supplier's written consent.

5. The Customer grants the Supplier a fully paid-up, non-exclusive, royalty-free non-transferable licence to copy and modify any materials provided by the Customer to the Supplier for the term of the Contract for the purpose of providing the Services to the Customer.

13. DATA PROTECTION

1. The following definitions apply in this 13:

a. Controller, Processor, Data Subject, Personal Data, Personal Data Breach, processing and appropriate technical and organisational measures: as defined in the Data Protection Legislation.

b. Data Protection Legislation: all applicable data protection and privacy legislation in force from time to time in the UK including the UK GDPR, the Data Protection Act 2018 (and regulations made thereunder) and the Privacy and Electronic Communications Regulations 2003 (SI 2003/2426) and the guidance and codes of practice issued by the Information Commissioner or other relevant regulatory authority and applicable to a party.

2. Both parties will comply with all applicable requirements of the Data Protection Legislation. This 13 is in addition to, and does not relieve, remove or replace, a party's obligations or rights under the Data Protection Legislation.

3. Where the Supplier is acting as a Processor on behalf of the Customer, and without prejudice to the generality of 13.2, the Customer will ensure that it has all necessary appropriate consents and notices in place to enable lawful transfer of the Personal Data to the Supplier and/or lawful collection of the Personal Data by the Supplier on behalf of the Customer for the duration and purposes of the Contract.

14. LIMITATION OF LIABILITY

1. References to liability in this 14 include every kind of liability arising under or in connection with the Contract including liability in contract, tort (including negligence), misrepresentation, restitution or otherwise.

2. Nothing in the Contract limits any liability which cannot legally be limited, including liability for:

a. death or personal injury caused by negligence;

b. fraud or fraudulent misrepresentation;

c. breach of the terms implied by section 12 of the Sale of Goods Act 1979 or section 2 of the Supply of Goods and Services Act 1982 (title and quiet possession); and

d. defective products under the Consumer Protection Act 1987.

3. Subject to 14.2, the Supplier's total liability to the Customer shall not exceed the value of the Contract.

4. The Supplier shall, in no circumstances, be liable to the Customer for any of the following types of losses:

a.loss of profits;

b.loss of revenue;

c.loss of sales or business;

d.loss of agreements or contracts;

e.loss of anticipated savings;

f.loss of use or corruption of software, data or information;

g.loss of or damage to goodwill; and

h.indirect or consequential loss.

5.The Supplier has given commitments as to compliance of the Goods and Services with relevant specifications in 7 and 9. In view of these commitments, the terms implied by sections 13 to 15 of the Sale of Goods Act 1979 and sections 3, 4 and 5 of the Supply of Goods and Services Act 1982 are, to the fullest extent permitted by law, excluded from the Contract.

6.This 14 shall survive termination of the Contract.

15. TERMINATION

1.Without affecting any other right or remedy available to it, either party may terminate the Contract with immediate effect by giving written notice to the other party if:

a.the other party commits a material breach of any term of the Contract and (if such breach is remediable) fails to remedy that breach within a period of 30 days after being notified in writing to do so;

b.the other party takes any step or action in connection with its entering administration, provisional liquidation or any composition or arrangement with its creditors (other than in relation to a solvent restructuring), obtaining a moratorium, being wound up (whether voluntarily or by order of the court, unless for the purpose of a solvent restructuring), having a receiver appointed to any of its assets or ceasing to carry on business or, if the step or action is taken in another jurisdiction, in connection with any analogous procedure in the relevant jurisdiction;

c.the other party suspends, or threatens to suspend, or ceases or threatens to cease to carry on all or a substantial part of its business; or

d.the other party's financial position deteriorates so far as to reasonably justify the opinion that its ability to give effect to the terms of the Contract is in jeopardy.

2.Without affecting any other right or remedy available to it, the Supplier may terminate the Contract with immediate effect by giving written notice to the Customer if:

a.the Customer fails to pay any amount due under the Contract on the due date for payment; or

b. there is a change of control of the Customer.

3. Without affecting any other right or remedy available to it, the Supplier may suspend the supply of Services or all further deliveries of Goods under the Contract or any other contract between the Customer and the Supplier if the Customer fails to pay any amount due under the Contract on the due date for payment, the Customer becomes subject to any of the events listed in 15.1(b) to 15.1(d), or the Supplier reasonably believes that the Customer is about to become subject to any of them.

16. CONSEQUENCES OF TERMINATION

1. On termination of the Contract:

a. the Customer shall immediately pay to the Supplier all of the Supplier's outstanding unpaid invoices and interest and, in respect of Goods and Services supplied but for which no invoice has been submitted, the Supplier shall submit an invoice, which shall be payable by the Customer immediately on receipt;

b. the Customer shall return all of the Supplier Materials and any Deliverables or Goods which have not been fully paid for. If the Customer fails to do so, then the Supplier may enter the Customer's premises and take possession of them. Until they have been returned, the Customer shall be solely responsible for their safe keeping and will not use them for any purpose not connected with this Contract.

2. Termination or expiry of the Contract shall not affect any rights, remedies, obligations and liabilities of the parties that have accrued up to the date of termination or expiry, including the right to claim damages in respect of any breach of the Contract which existed at or before the date of termination or expiry.

3. Any provision of the Contract that expressly or by implication is intended to have effect after termination or expiry shall continue in full force and effect.

17. CONFIDENTIALITY

1. Each party undertakes that it shall not at any time during the Contract, and for a period of two years after termination or expiry of the Contract, disclose to any person any confidential information concerning the business, assets, affairs, customers, clients or suppliers of the other party or of any member of the group of companies to which the other party belongs, except as permitted by 17.2.

2.Each party may disclose the other party's confidential information:

a. to its employees, officers, representatives, contractors or subcontracts or advisers who need to know such information for the purposes of exercising the party's rights or carrying out its obligations under or in connection with the Contract. Each party shall ensure that its employees, officers, representatives or advisers to whom it discloses the other party's confidential information comply with this 17; and

b. as may be required by law, a court of competent jurisdiction or any governmental or regulatory authority.

3. No party shall use any other party's confidential information for any purpose other than to exercise its rights and perform its obligations under or in connection with the Contract.

18. FORCE MAJEURE

Neither party shall be in breach of the Contract or otherwise liable for any failure or delay in the performance of its obligations if such delay or failure results from events, circumstances or causes beyond its reasonable control (a Force Majeure Event). The time for performance of such obligations shall be extended accordingly. If the period of delay or non-performance continues for 8 weeks, the party not affected may terminate the Contract by giving 7 days' written notice to the affected party.

19. GENERAL

1. Assignment and other dealings

a. The Supplier may at any time, on written notice to the Customer, assign, mortgage, charge, subcontract, delegate, declare a trust over or deal in any other manner with any or all of its rights and obligations under the Contract to any member of the Polypipe Group of Companies.

b. The Customer shall not assign, transfer, mortgage, charge, subcontract, delegate, declare a trust over or deal in any other manner with any of its rights and obligations under the Contract.

2. Notices.

a. Any notice given to a party under or in connection with the Contract shall be in writing and shall be delivered by hand or by pre-paid first-class post or other next working day delivery service at its registered office (if a company) or its principal place of business (in any other case).

b. Any notice shall be deemed to have been received:

i. if delivered by hand, at the time the notice is left at the proper address; or

ii. if sent by pre-paid first-class post or other next working day delivery service, at 9.00 am on the second Business Day after posting.

3. Severance. If any provision or part-provision of the Contract is or becomes invalid, illegal or unenforceable, it shall be deemed deleted, but that shall not affect the validity and enforceability of the rest of the Contract. If any provision or part provision of the Contract is deemed deleted under this 19.3 the parties shall negotiate in good faith to agree a replacement provision that, to the greatest extent possible, achieves the commercial result of the original provision.

4. Waiver.

a. Except as set out in 2.8, a waiver of any right or remedy is only effective if given in writing and shall not be deemed a waiver of any subsequent right or remedy.

b. A delay or failure to exercise, or the single or partial exercise of, any right or remedy shall not waive that or any other right or remedy, nor shall it prevent or restrict the further exercise of that or any other right or remedy.

5. No partnership or agency. Nothing in the Contract is intended to, or shall be deemed to, establish any partnership or joint venture between the parties, constitute either party the agent of the other, or authorise either party to make or enter into any commitments for or on behalf of the other party.

6. Entire agreement.

a. The Contract constitutes the entire agreement between the parties.

b. Each party acknowledges that in entering into the Contract it does not rely on any statement, representation, assurance or warranty (whether made innocently or negligently) that is not set out in the Contract. Each party agrees that it shall have no claim for innocent or negligent misrepresentation or negligent misstatement based on any statement in the Contract.

7. Third party rights.

a. The Contract does not give rise to any rights under the Contracts (Rights of Third Parties) Act 1999 to enforce any term of the Contract.

b. The rights of the parties to rescind or vary the Contract are not subject to the consent of any other person.

c. Except as set out in clause 19.1(a), the Contract is personal as between the Supplier and the Customer and shall not apply to any supplies made to the Customer by any other member of the Polypipe Group of Companies, with any such supplies being subject to their own contract.

8. Variation. Except as set out in these Conditions, no variation of the Contract shall be effective unless it is agreed in writing and signed by the parties (or their authorised representatives).

9. Governing law. The Contract and any dispute or claim (including non-contractual disputes or claims) arising out of or in connection with it or its subject matter or formation shall be governed by and construed in accordance with the law of England and Wales.

10. Jurisdiction. Each party irrevocably agrees that the courts of England and Wales shall have exclusive jurisdiction to settle any dispute or claim (including non-contractual disputes or claims) arising out of or in connection with the Contract or its subject matter or formation.

TERRAIN

Terrain FUZE

DESIGN, SPECIFICATION
AND INSTALLATION GUIDE

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