



Uniclass G5811 : L7312

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1h1

December 2010

PAM



Ensign EEZI-FIT
THE ADDED VALUE
PUSH-FIT RANGE

**Cast iron
above ground
sanitary drainage
system to BS EN 877**



10/10

For installation

A++

For specification

100%

Recyclable


SAINT-GOBAIN
PAM UK

EEZI-FIT

there's no
easier way
to add value



Ensign – the most comprehensive range on the market

Ensign offers individual cast iron drainage systems for above and below ground applications, and is the only system tested and kitemark approved to the product standard BS EN 877 in the UK.

EEZI-FIT – the next generation of cast iron systems

Now there's Ensign EEZI-FIT, a new push-fit range of socketed fittings and couplings in 100mm and 150mm diameter, designed for above ground gravity sanitary applications, that combines all the benefits of cast iron with the simplicity of push-fit assembly.

The EEZI-FIT fittings and couplings are compatible with all products within the existing Ensign range – improving even further the most versatile above ground system on the market.



**EEZI-FIT
earns top
marks from
installers**

**EEZI-FIT for
specifiers it's
the mark of
genius**

**EEZI-FIT for the
environment
and a brighter
future**

Push-fit assembly

All the benefits of cast iron with the advantages of push-fit assembly. The system utilises a new gasket design that makes jointing simple, and completed in seconds. Electrical continuity can be accommodated (see page 12).

Compatibility with Ensign

EEZI-FIT connects to standard Ensign double spigot pipe and is fully compatible with all Ensign plain-ended fittings. The installation of an Ensign mechanical joint positioned in the system can allow dismantling for future retro-fit (see page 15).

New connections to waste

The EEZI-FIT range includes many options to connect to waste pipes, providing even greater system flexibility – branches, single and double radius curves with four boss options, and short boss pipes with single option to three boss positions. A new manifold connector is available with 2 x 50mm waste connections with an extended spigot which avoids the need for a joint in the floor slab, to further ease installation.

Ease of installation

Ensign EEZI-FIT provides genuine opportunities for the installer to significantly reduce installation time – proven in a recent study endorsed by the BRE (British Research Establishment). EEZI-FIT proves significantly quicker to install than HDPE using fusion welded joints (see page 6).

Acoustic performance

EEZI-FIT has been tested to BS EN 14366 criteria and recorded acoustic levels even lower than Ensign, 4dB(A) at 2 l/s and 9dB(A) at 4 l/s. The acoustic difference between Ensign EEZI-FIT and standard HDPE plastic is very significant, and can only strengthen the case for using EEZI-FIT in flats/apartments where acoustic performance is so important (see page 5).

Applications

EEZI-FIT is intended for use for gravity above ground sanitary applications in accordance with BS EN 12056 (0.5 bar performance – kitemark approved).

Ideal for multi-floor applications

Ensign EEZI-FIT is the ideal system for projects with long vertical soil stacks, such as flats and apartments, hotels, office blocks etc; where the main stack will remain unchanged over time.



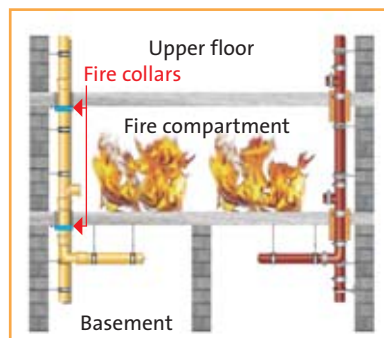
Why specify cast iron?

Fire safety

Many buildings are not protected enough against fire hazards. It means that fire can spread rapidly, can destroy buildings and property in a few hours and jeopardize the occupants' lives. When a fire breaks out, the first objective is to slow down its spread both horizontally and vertically. Drainage systems must be selected so that they resist the passage of fire and do not feed it.

Protection of people and property

For fire safety in a building, the major responsibility rests with the project manager who must meet building regulations Document B as a minimum. In properties at risk, like multi-storey buildings, materials with least flammability should be selected to mitigate this risk in particular to the building's occupants. The following two concepts are applied as regards fire safety: fire resistance and reaction to fire.



Fire resistance

The burning question

The Ensign cast iron drainage system answered the burning question through tests carried out by the MPA North-Rhine Westphalia laboratory in Germany. The tests were set up over three floors with the objective to examine the reaction to fire on a number of materials and to measure their ability to contain the fire within the compartment, preventing the spread of fire to another floor.

The test results highlighted (if exposed to fire):

- Serious limitations of fire collars for plastic systems:
 - Whilst the fire collars may comply to EN1366-3 - the standard does not include testing over 3 floors (see burning question video test available on CD)
 - Operate when exposed to heat – so likely to remain inactive in the compartment below the fire compartment
 - Can allow molten droplets of HDPE to pass through potentially spreading the fire downwards
- The plastic systems generated dense toxic smoke and sooty smog (the biggest killer in any fire)

FOCUS

Euroclasses		
A1	–	–
A2	s1	d0
A2	s1	d1
A2	s2	
	s3	
B	s1	d0
	s2	d1
	s3	
C	s1	d0
	s2	d1
	s3	
D	s1	d0
	s2	d1
	s3	
Classes other than E-d2 and F		

Sub-Class SMOKE production

- s1 : Low smoke production
- s2 : Medium smoke production
- s3 : High smoke production

FLAMING DROPLETS sub-classification

- d0 : No flaming droplets
- d1 : Flaming droplets that persist for less than 10 seconds
- d2 : Flaming droplets

Safety of cast iron

- Cast iron is not combustible
- Will not propagate fire unlike HDPE
- Does not require additional protection (Building Regulations approved Document B)
- Will not emit toxic smoke

Reaction to fire

Saint-Gobain PAM UK cast iron systems are among the safest materials on the market in terms of reaction to fire and all its drainage systems have been tested independently at Warrington Fire Research to the testing criteria stipulated.

Safety

The Euroclass classification ranges from A1 to F, with A1 and A2 being reserved for products that are not, or only slightly, combustible. The indices s and d refer respectively to smoke emission and the production of burning droplets. For both of these criteria the Saint-Gobain PAM UK Ensign and EEZI-FIT ranges achieved the highest possible scores: s1, d0.

Scope

The CE marking for cast iron wastewater systems is based on the harmonised standard EN 877, which applies to a system including pipes, fittings, couplings and accessories – and is used to test all of the components of the ranges. The cast iron material alone is classified A1 in the Euroclass classification of reaction to fire, without prior tests.

The classification obtained by Saint-Gobain PAM UK covers complete ranges – pipes, fittings, couplings and accessories, components of a wastewater pipe system – A2-s1, d0 the highest permitted under BS EN 877. Original classification from Warrington was A1.

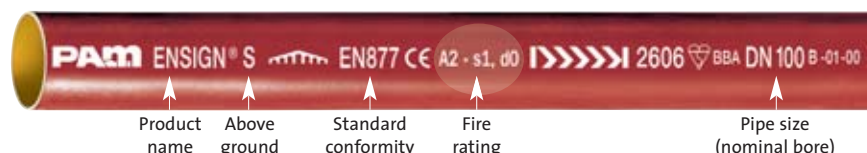
Note - Will be re-classified A1 in 2011 in line with amended BS EN 877 Standard.

Product marking

Ensign above ground pipes for use with EEZI-FIT



Example: EEZI-FIT fittings



Product name

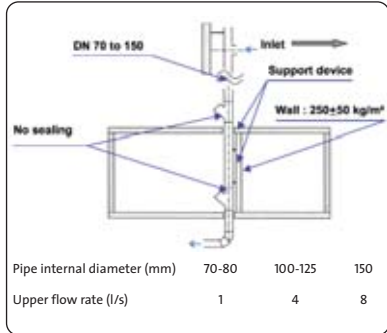
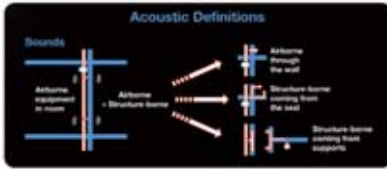
Above ground

Standard conformity

Fire rating

Pipe size (nominal bore)

Why specify cast iron?



BS EN 14366:2004 Test Criteria



EF048 with acoustic dampener



Acoustic performance

The evacuation of waste, soil and rainwater generates structure-borne and airborne sound between rooms and usually occurs as the result of a mixed flow, when the pipe is filled with water and air. In such circumstances a pipe will radiate noise outwards and transfer it to any lightweight ceilings, cupboards and similar areas wherever it makes contact.

Relevant regulations

BS 8233:1999 – code of practice for governing acoustics within buildings

- Suggests acoustic levels by building type, ie. office, library, bedroom, etc
- Provides details of acoustic insulation and their estimated insulation value

BS EN 14366:2004

A new standard introduced to provide manufacturers of all drainage materials with a simple testing criteria (see BS EN 14366:2004 diagram). The results recorded should be comparable and allow the specifier to make a more informed choice.

Ensign was the first UK drainage system to be tested to this new European Standard, carried out on the complete range of Ensign bracketry providing independently assessed results. EEZI-FIT has also been tested.

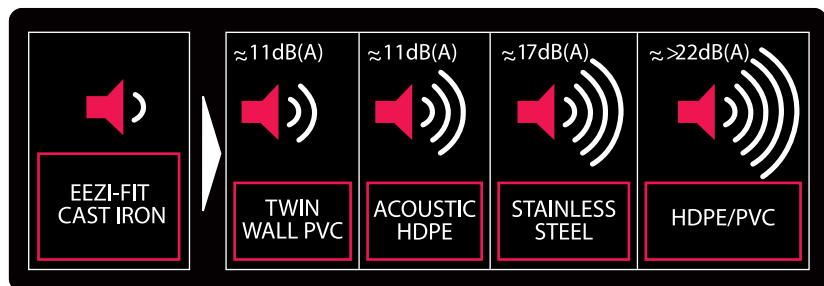
Conclusions of tests

All brackets within the Ensign range meet the requirements of BS 8233. For exceptionally low levels of acoustic performance, the standard ductile iron bracket fitted with a new acoustic dampener should be used (see table below).

Wastewater systems Ensign and EEZI-FIT – (100mm diameter) wall density 220kg/m²						
Flow rate l/s	AIRBORNE SOUND dB(A)			STRUCTURE BORNE dB(A)		
	2.0	4.0	8.0	2.0	4.0	8.0
Ensign pipework fitted with two iron brackets EF048	45	48	54	27	32	34
Ensign fitted with two acoustic brackets EF048AD	45	47	54	5	11	19
EEZI-FIT system fitted with two iron brackets EF048	45	48	51	23	28	36
EEZI-FIT system fitted with two acoustic brackets EF048AD	45	48	51	4	9	17

Please note: when comparing Ensign and EEZI-FIT to alternative systems – ensure you are comparing the same flow rate, and number of brackets used in the tests (eg. two). For vertical stacks, Ensign often requires only one bracket per three metres, therefore acoustic performance will be even better in this instance.

Ensign EEZI-FIT compared to other systems



EEZI-FIT acoustic performance, when using the ductile iron brackets fitted with acoustic dampeners, is far superior to any system on the market.

The low level of acoustic noise generated by Ensign EEZI-FIT using the acoustic brackets prove there should be no requirement for insulation wrapping when passing through habitable rooms.

FOCUS

Comments from the installer

"On projects with long vertical runs within a riser, a large saving could be made using the EEZI-FIT system."

"The strength of the pipe and the system of jointing makes it ideal for situations that go up many floors, and may have access problems after installation."

Potential time-saving on system testing:

"Being push-fit, the joints are very much fit and forget – providing time saving opportunities on testing – an area where installers historically may have allowed extended time with cast iron for nipping of mechanical coupling bolts."

Ensure all hidden costs are allowed for:

"Being a plumbing installer we are experienced in all materials and one real bone of contention are the hidden costs associated with other materials. With cast iron there aren't any hidden costs"

- No cost of special tool hire
- No fire collars
- No additional brackets
- No special insulation

With cast iron you simply install the systems – with no extras – and simple tools.

"These extras bite! and to the installer can mean the difference between making or losing money on the installation."

Mark Myers – PJ Myers Ltd

Why specify cast iron?

EEZI-FIT – fast and simple to install

To understand the speed and ease of installation capability of EEZI-FIT Saint-Gobain PAM UK wanted endorsement from:

- a respected independent body recognised for its quality research
– commissioned BRE Watford
- a respected plumbing installer, experienced in all materials
– commissioned PJ Myers Ltd

The objective of the study was to demonstrate whether the installation of the new EEZI-FIT pipework system is intrinsically faster than the installation of other systems, leading to potential savings of time and subsequently cost.

Laboratory study

Installation

Vertical section 9 metres

All systems would be supported by brackets mounted on pre-assembled rail systems, to ensure overall system assembly times were in the main influenced by assembly of joints and cutting of pipes.

Identical waste pipe systems were installed in the laboratory – the vertical section comprised three floors with the ground floor section in 150mm diameter and the first and second floor sections in 100mm diameter. Each floor was fitted with a provision for WC and basin wastes.

Materials observed in the study

Cast iron	Push-fit jointed system (EEZI-FIT)
HDPE	Assembled using fusion welded couplings
Stainless steel	Push-fit jointed system

Findings	Vertical section
Ensign EEZI-FIT	52 mins
HDPE	98 mins

EEZI-FIT was comparable with stainless steel.

Points of note from the study

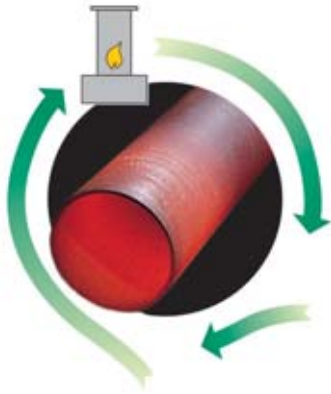
For vertical soil and waste stacks

- The Ensign EEZI-FIT cast iron system was significantly quicker to install than the HDPE fusion welded system
- The ease and speed of installation of the EEZI-FIT system can potentially bridge the material cost gap with HDPE. Therefore you get the safest, quietest, strongest, longest lasting, most sustainable solution at a competitive cost
- The Ensign EEZI-FIT cast iron system was just as fast to install as stainless steel for vertical soil stacks
- Both HDPE and stainless steel require specialist installation tools that incur a hire cost – which over a number of weeks can amount to a significant additional cost and must be allowed for when comparing materials



Why specify cast iron?

Cast iron – the sustainable choice



100% recyclable indefinitely without losing any of its properties.

Cast iron is made from 97% recycled raw materials and so saves natural resources. Unlike HDPE and other plastics, once used on site cast iron is 100% recyclable, is not degradable through use and the recycling process, allowing it to be reformed as a drainage system.

Saint-Gobain PAM UK pipe systems can be recycled without any deterioration of their properties, so they can be reused for exactly the same purpose. In other words, a pipe can be recycled as a pipe.

Owing to the stability of their mechanical properties, it is currently considered that the service life of Saint-Gobain PAM UK cast iron pipe systems is twice that of alternative products made of plastic materials.

Resistance to thermal expansion

For cast iron, the bracketing system is designed to only carry the weight of the pipe and its contents - simplifying the designers task. Plastic pipes expand considerably due to temperature changes. Their bracketing system must be designed and adapted accordingly as it can affect the stability of the pipe system and its performance in the future.

Thermal expansion of cast iron and other materials for 10m and a temperature rise of 50°C.

Thermal expansion coefficient		
0,0104 mm/°C.m	⇒ 5,2 mm	Cast iron
0,07 mm/°C.m	⇒ 35 mm	PVC
0,150 mm/°C.m	⇒ 75 mm	PP
0,02 mm/°C.m	⇒ 100 mm	HDPE
		7 times more
		14 times more
		19 times more

Strength/resistance to damage

Cast iron's tensile strength is eight times greater than PVC.

Cast Iron - 200mpa PVC - 50mpa

Long life

The soil discharge stack should be designed and specified to last the lifetime of the building (50 years) cast iron drainage systems are proven to provide this level of service life. Unlike plastic and HDPE, cast iron is not affected by thermal ageing.

- Its mechanical strength remains stable
- Its thermal expansion is very low
- Cast iron pipe systems are not liable to creep at operating temperatures

Quality Assurance BS EN ISO 9001:2000 – Registered No: FM12908

The Ensign system is manufactured under the BS EN ISO 9001: 2000 Quality Assurance Scheme. Continual checks made throughout the year by the BSI inspectorate, ensure that the set standards are maintained.

Product certification BS EN 877:1999 Kitemark KM51733

Ensign is the only cast iron system to be tested and awarded kitemark approval to the product standard in the UK.

Ensign EEZI-FIT has been included in kitemark certificate KM51733 for sanitary gravity applications and 0.5 bar (accidental static water pressure) performance.

BS EN 14366:2004

Ensign and EEZI-FIT have been tested to the criteria laid down in BS EN 14366:2004. Laboratory measurement of noise from waste water installations at the IBP laboratory in Stuttgart. A number of test reports are available.

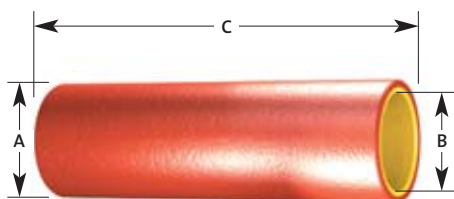
Environmental commitment

Environment Standard BS EN ISO 14001:2004

Saint-Gobain PAM UK manufacturing sites including Sinclair, at Telford, have been awarded the 'Manufacturing to Environmental Standards' accreditation BS EN ISO 14001:2004 which was developed to help manufacturers maintain and improve their management of environmental responsibilities and assist them in ensuring compliance with environmental laws and regulations.

Saint-Gobain PAM UK operates Integrated Pollution and Preventative Control (IPPC) regulations and have implemented comprehensive environmental management systems throughout the manufacturing sites.

Pipes • double spigot

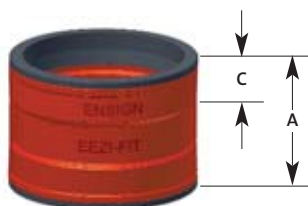


Ensign Pipe – EP000

Product Code	Dia	A Max O/dia	B Min I/dia	Min Section	C Metre Lengths Available	Nominal Wt/kg
156563	100	112	97.5	3	3	24.3
156827	150	162	146.25	3.5	3	40.9

Pipes are coated internally with a two part epoxy and externally with a red protective coating.

Couplings



EEZI-FIT Coupling – EZ001

Product Code	Dia	A	C	Nominal Wt/kg
208191	100	85	40	1.3
216312	150	114	55	2.4

Electrical continuity can be accommodated.

Clips available in bags of 30. Product code 223541 (see page 12).



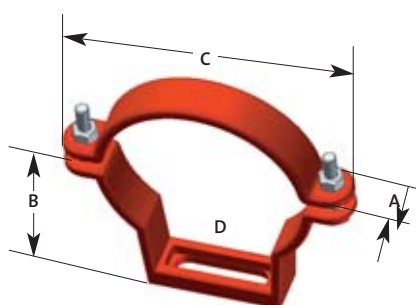
Ensign Two-piece Ductile Iron Coupling – EC002

Ductile iron coupling with built-in electrical continuity

Product Code	Dia	A	B	C	Nominal Wt/kg
156634	100	170	137	58	0.8
156888	150	217	183	80	1.7

To be installed in positions where the ability to dismantle the sanitary system would be beneficial, ie. next to an access pipe (see page 15).

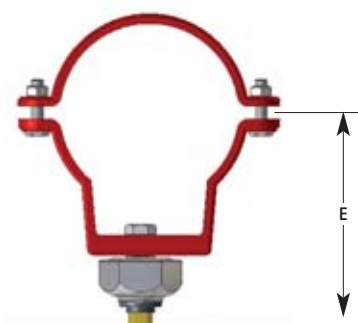
Brackets



Ensign Ductile Iron Bracket – EF048

Product Code	Dia	A	B	C	Nominal Wt/kg
156646	100	27	90	166	0.6
156898	150	30	115	214	0.8

Elongated slot at fixing point (D) to ease fixing.



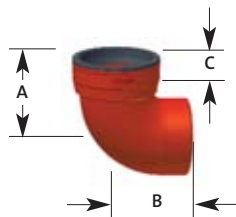
Ensign Ductile Iron Bracket – EF048AD (fitted with acoustic dampener)

Product Code	Dia	E	Nominal Wt/kg
199883	100	138	0.7
199884	150	163	0.9

For installations requiring high level of acoustic performance.

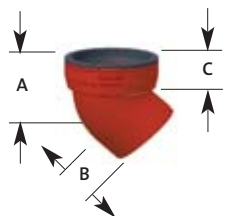
Tested to BS EN 14366: 2004 (see page 5).

Bends • short radius



88° EEZI-FIT Bend – EZ002

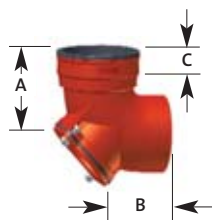
Product Code	Dia	A	B	C	Nominal Wt/kg
208192	100	112	108	40	2.3
216313	150	154	145	50	5.0



45° EEZI-FIT Bend – EZ002

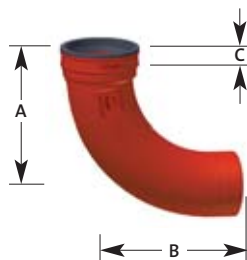
Product Code	Dia	A	B	C	Nominal Wt/kg
208193	100	73	69	40	1.9
216319	150	102	94	50	3.8

Bends • short door back • long radius



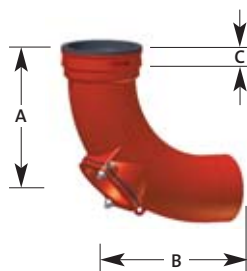
88° EEZI-FIT Bend • Short Radius Door Back – EZ005

Product Code	Dia	A	B	C	Nominal Wt/kg
208194	100	112	108	40	3.4
216315	150	154	145	50	5.7



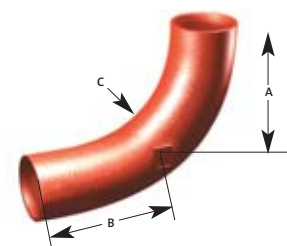
88° EEZI - FIT Bend • Long Radius – EZ02L

Product Code	Dia	A	B	C	Nominal Wt/kg
215953	100	243	233	40	4.5



88° EEZI - FIT Bend • Long Radius Door Back – EZ05L

Product Code	Dia	A	B	C	Nominal Wt/kg
215952	100	243	233	40	5.6

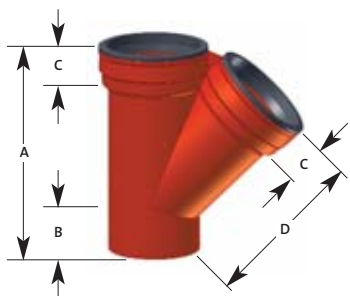


88° Ensign Bend • Medium – EF02M

Product Code	Dia	A	B	C	Nominal Wt/kg
191550	150	274	274	150	10.1

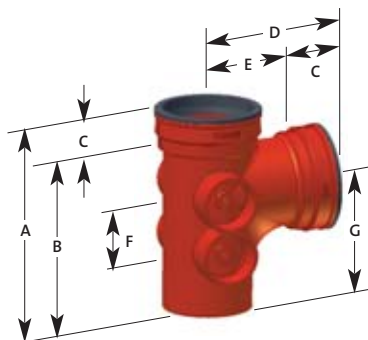
Use with EEZI-FIT coupling. If access required, use EF05L code 192357.

Branches • single equal



45° EEZI-FIT Branch – EZ006

Product Code	Dia	A	B	C	D	Nominal Wt/kg
208196	100x100	250	67	40	183	4.1
216320	150x100	270	56	40	227	6.5
216341	150x150	351	91	53	259	8.9

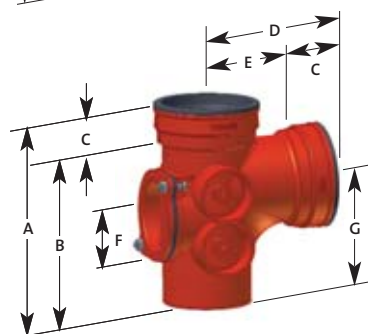


88° Single EEZI-FIT Branch (with 4 boss options) – EZ06R

Product Code	Dia	A	B	C	D	E	F	G	Nominal Wt/kg
208195	100x100	250	210	40	145	105	68	148	5.6
216342	150x100	290	237	53	175	122	68	191	7.0

To make boss connections (see page 14).

Rubber grommets to connect to 54mm OD copper or 56mm OD UPVC waste are supplied separately in bags of 10. Product code 208205



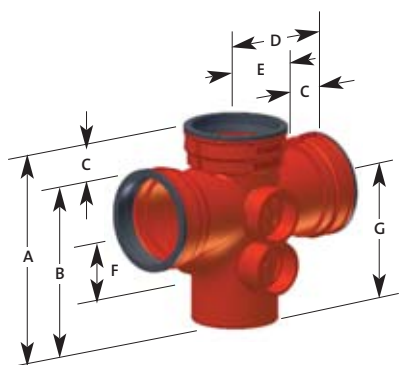
88° EEZI-FIT Branch with Access (with 4 boss options) – EZ07R

Product Code	Dia	A	B	C	D	E	F	G	Nominal Wt/kg
208197	100x100	250	210	40	145	105	68	148	6.7
216314	150x100	290	237	53	175	122	68	191	9.5

To make boss connections (see page 14).

Rubber grommets to connect to 54mm OD copper or 56mm OD UPVC waste are supplied separately in bags of 10. Product code 208205

Branches • double



88° EEZI-FIT Double Branch (with 4 boss options) – EZ010R

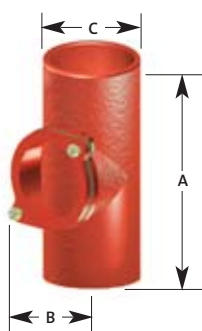
Product Code	Dia	A	B	C	D	E	F	G	Nominal Wt/kg
208198	100x100	250	210	40	145	105	68	148	6.0

If 45° double branch is required, use ENSIGN EF010 code 191509 with EEZI-FIT couplings.

To make boss connections (see page 14).

Rubber grommets to connect to 54mm OD copper or 56mm OD UPVC waste are supplied separately in bags of 10. Product code 208205

Pipes • access



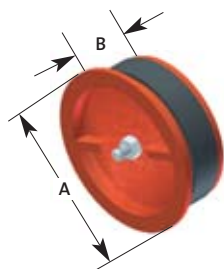
Ensign Round Door – EF014

Product Code	Dia	A	B	C	Nominal Wt/kg
03029	100	250	80	116	3.1
191519	150	280	110	170	6.2

Use with EEZI-FIT coupling.

Alternatively use with mechanical joint at points where dismantling may be required (see page 15).

Expansion plugs



Ensign Expansion Plug – EF074

Product Code	Dia	A	B	Nominal Wt/kg
191583	100	110	42	0.7
191584	150	156	42	1.5

When using expansion plug in EEZI-FIT socket, remove rubber gasket from socket.

Boss pipes



EEZI-FIT Single Boss 1 x 50mm Waste Connection – EZ090

Product Code	Dia	A	B	Nominal Wt/kg
208199	100	158	82	2.1

Supplied with rubber grommets to connect to 54mm OD copper or 56mm OD UPVC waste. For connections to 38/32 waste (see page 14).
150mm boss pipe – Use standard Ensign EF090



EEZI-FIT Double Boss 2 x 50mm Opposed Waste Connection – EZ091

Product Code	Dia	A	B	Nominal Wt/kg
208200	100	158	82	2.3

Supplied with rubber grommets to connect to 54mm OD copper or 56mm OD UPVC waste. For connections to 38/32 waste (see page 14).
150mm boss pipe – Use standard Ensign EF091



EEZI-FIT Double Boss 2 x 50mm at 90° Waste Connection – EZ092

Product Code	Dia	A	B	Nominal Wt/kg
208201	100	158	82	2.3

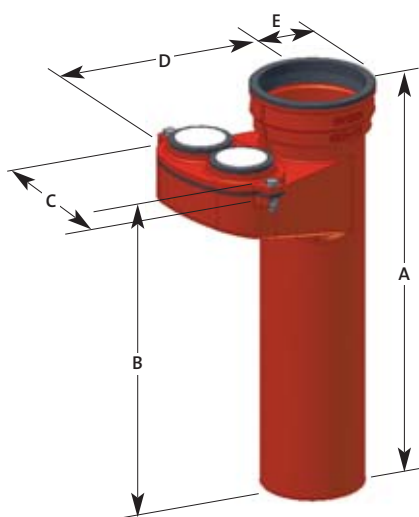
Supplied with rubber grommets to connect to 54mm OD copper or 56mm OD UPVC waste. For connections to 38/32 waste (see page 14).



EEZI-FIT Triple Boss 3 x 50mm Waste Connection – EZ093

Product Code	Dia	A	B	Nominal Wt/kg
208202	100	158	82	2.5

Supplied with rubber grommets to connect to 54mm OD copper or 56mm OD UPVC waste. For connections to 38/32 waste (see page 14).



EEZI-FIT Manifold Connector – EZ094

Product Code	Dia	A	B	C	D	E	Nominal Wt/kg
208203	100	410	345	195	170	66	6.6

Supplied with rubber grommets to connect to 54mm OD copper or 56mm OD UPVC waste (see typical installation page 15).

Ensign couplings performance

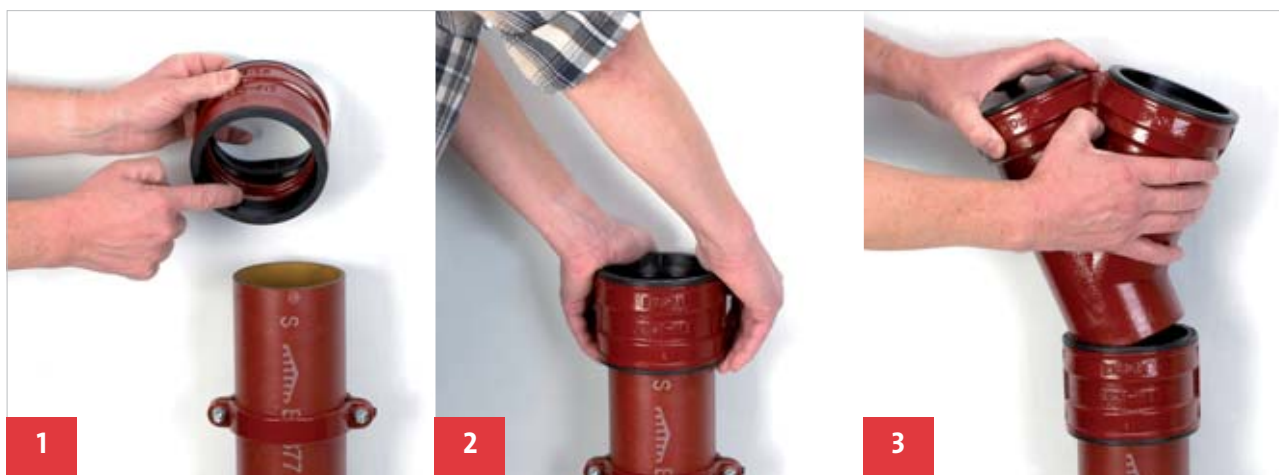
Coupling	Material	Type	Diameter	Accidental static water pressure (bar)
				Restrained
EZ001	Cast iron	Push-fit	100mm/150mm	Up to 0.5 bar
EC002	Ductile	Mechanical	100mm/150mm	Up to 5 bar

Note:

Ensign EEZI-FIT is designed to meet gravity 0.5 bar performance to BS EN 877 although has been successfully tested to higher pressures in excess of 1 bar.



Jointing method of new Ensign EEZI-FIT



1. Apply a small amount of jointing lubricant on the lip of the rubber gaskets and the end of the pipe/fitting to ease insertion.

2. Push joint over the end of pipe, ensuring the central register is abutted against the spigot edge evenly.

3. Push the second pipe or fitting into the gasket again ensuring that the spigot is abutted against the central register.

NOTE: It is advisable to use a mechanical coupling EC002 at strategic points (i.e. access pipe) to simplify retro-fit opportunity in the future.

When jointing to pipe which has been cut, please remove any metal burrs (chamfering is not necessary). Saint-Gobain PAM UK recommend the use of its own jointing lubricant that ensures a safe, secure joint (available in 0.5kg tubs product code 199037). The use of a silicon based lubricant is also recommended which can provide more flexibility after joint is completed for modification.



Electrical continuity

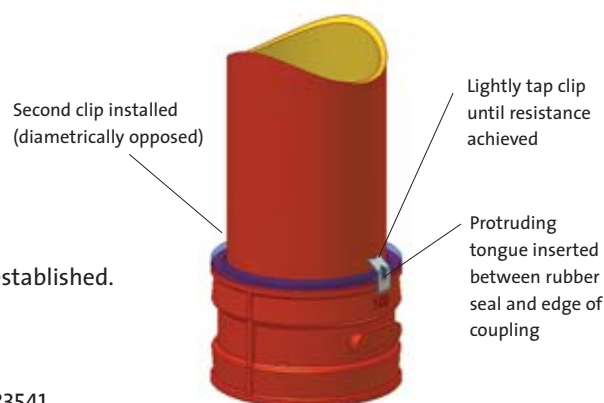
In situations where equipotential bonding (earthing) has been specified electrical continuity clips can be fitted to the Ensign EEZI-FIT system, with two continuity clips per joint diametrically opposed.

Fitting instructions – after the joint has been completed

1. Locate clips by inserting the protruding tongue in between the edge of the coupling and the rubber seal.
2. Lightly tap each clip (in line with the pipe/fitting) until resistance is established.

The electrical continuity clips are supplied separately in bags of 30. Product code 208462 (100mm only).

New clip now available to suit both 100 & 150mm range. Product code 223541 Testing should be carried out in accordance with BS6087 Amendment 2.



Pipe support brackets

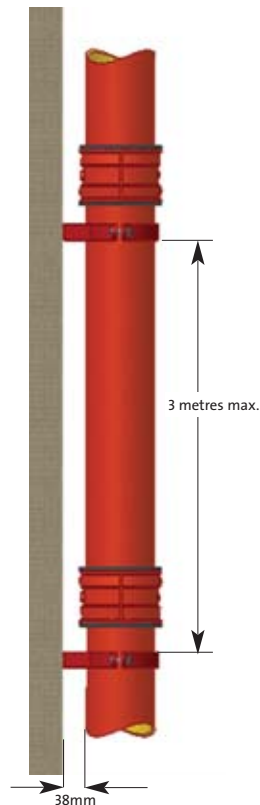
The unique, all-purpose, lightweight, ductile iron bracket incorporates an elongated slot at the fixing point. This allows both vertical and lateral adjustment without dismantling the pipe system.



For vertical waste or stacks, it is recommended that a load-bearing bracket be fitted to each floor level, to carry the weight of the pipe and its contents. This is of particular importance on multi-storey applications.

These brackets should be tightened as the stack is built up, so that each floor height is self-supporting and undue pressure is not imposed upon the base of the stack.

Where rainwater and soil stacks are located at standard distances from wall or column (see table below), one bracket EF048 per length of pipe will be adequate within 600mm of the joint.



Ensign pipe diameters 100, 150

Stand distances from back of pipe wall face 38mm

Additional brackets may be required where fittings are installed within the vertical stack, at the discretion of the designer.

EEZI-FIT acoustic performance, when using the ductile iron brackets fitted with acoustic dampeners, is far superior to any system on the market.

Connections to other systems

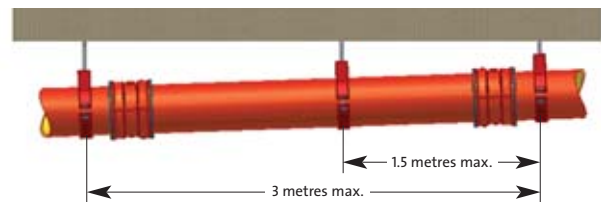
Other materials can be connected to the Ensign EEZI-FIT sockets and couplings, if their dimensions conform to the following table.

Ensign Nom.Dia	Min OD	Max OD
100mm	109	112
150mm	158	162

Support for horizontal pipework

The distance between pipe supports should not exceed three metres, as advised in BS EN 12056-2 Code of Practice for Sanitary Pipework.

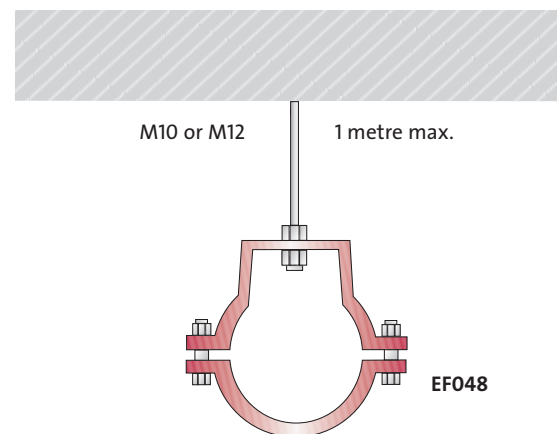
However, to ease installation it is recommended that suspended Ensign pipework should have two bracket supports per three metre length.



Positioning of brackets as follows:

One bracket maximum of 300mm from joint.
Second bracket positioned approximately centre of 3m length pipe, or as further guidance, 1.5m approximately from first bracket (see diagram).

Typical support arrangement for horizontal pipework



The low level of acoustic noise generated by Ensign EEZI-FIT using the acoustic brackets prove there is no requirement for insulation wrapping when used in habitable rooms.

Connections to boss pipes/new manifold connector



Boss pipes and manifold are supplied with rubber grommets for connection to 54mm OD copper and 56mm OD UPVC waste.

To connect to 38/32mm waste simply use a reducer as shown (supplied by waste manufacturers).

Making boss connections to radius branches – connections to waste

1. Simply determine which boss connection is to be used. If possible drill hole before installation.
2. Using a 51mm hole saw – cut a hole at the bottom of the boss centrally using the dimple provided. Ensure casting is held firm before drilling.
3. De-burr cut ends and make good with appropriate Ensign touch-up paint.
4. Fit rubber grommet (product code 208205) in bags of 10 supplied separately.
5. Apply small amount of lubricant to grommet.
6. Insert waste pipe – and push-home until fully located.

Tools Required:

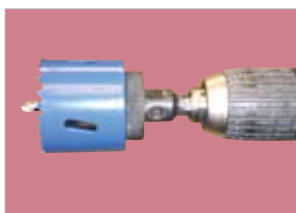
- A 51mm hole saw – product code 208206
- Arbour – product code 192327
- 1/4" pilot drill – product code 192328

Touch-up Paint: red epoxy

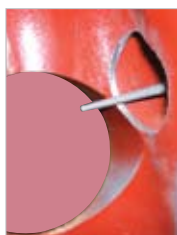
- Two part touch-up spray paint – product code 216317



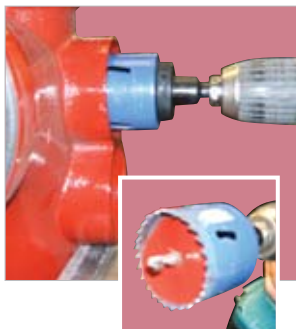
Boss cutting instructions



1. Firstly decide on which boss or bosses are to be used. If possible cut these out before installation of the branch. Fit the drill, arbour and hold cutter (51mm) as shown.



3. Use a file to remove any sharp burrs around the cut edge, and touch up with a two part epoxy repair kit or similar to bring back the protection to the original specification.

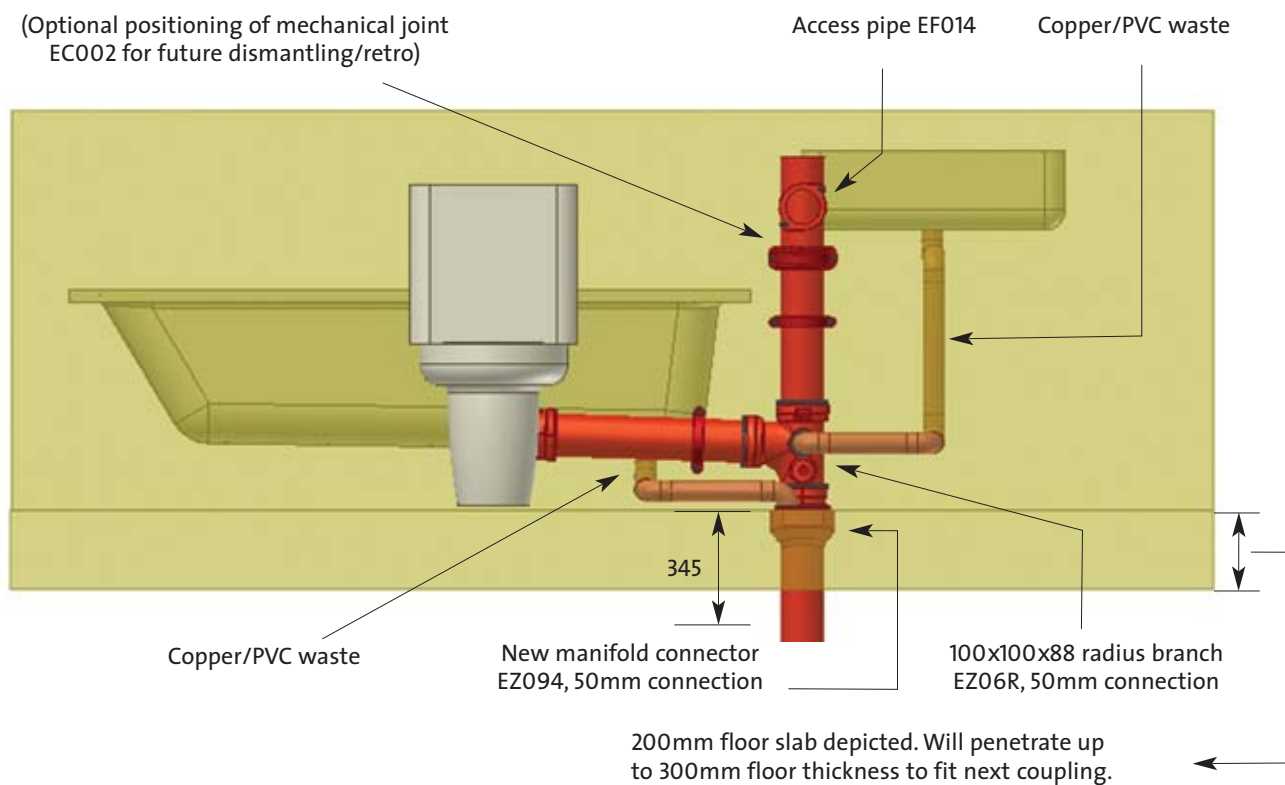


2. Set the drill on fast speed, and drill a pilot hole locating the drill in the dimple provided. When this drill breaks through, set the drill to a slow speed and continue to cut the hole with the hole saw. Ensure that the drill is cutting square to the boss and only apply moderate even pressure on the drill. When the drill breaks through, the waste metal will remain in the hole saw.



4. Fit the rubber grommet into the boss, apply lubricant (code 199037) to the inside of the grommet and to the outside of the waste pipe, rotate the waste pipe and push firmly until fully located.

Typical installation of new manifold



Coating specification

Pipes

Externally – acrylic, anti-corrosive primer coating, red-brown colour, average dry thickness of 40 microns. Internally – two-part epoxy coating, ochre colour, with an average thickness of 130 microns.

Fittings/brackets/couplings

Shall be protected internally with a red powder epoxy resin electrostatically applied to an average thickness of 150 microns. Externally coated to an average thickness of 70 microns.



EEZI-FIT in-situ



1. Lytham Quays - apartments 2. United House Four Courts - Flats (New 150mm diameter) 3. Jupiter Apartments by Redrow
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An installation accreditation scheme, designed to give peace of mind and confidence to water utilities and contractors in the knowledge that the ductile iron pipeline that they have purchased will be installed effectively and in its optimum condition.

Ensign™

Cast iron above and below ground drainage system BSI kitemark approved to BS EN 877. Used for soil and waste, rainwater, suspended, buried and bridge drainage applications, providing lifetime service for commercial and public buildings.

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A new range of cast iron push-fit fittings and couplings in 100 and 150mm diameter, kitemarked to BS EN 877 for gravity sanitary installations.

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