



# Section 3

## Couplings – technical

**Ensign cast iron drainage 1st choice for bridges**

Ensign has the strength to complement the high-performance materials used in bridge construction:

- sympathetic expansion – co-efficient of linear expansion of cast iron is almost identical to that of concrete so, under any change of temperature, system will expand or contract with the structure
- non-combustible – in the event of traffic accidents, the system will not ignite even when subjected to exposure to burning fuels
- rigid and durable – will withstand even the most vigorous of rodding necessary to clear blockages caused by a build-up of rocksalt

# Coupling specification

## Above ground

50mm to 125mm two-piece couplings EC002 utilise two socket cap set screws and nuts (M8). 150mm to 300mm couplings utilise four socket cap set screws and nuts (M8), all driven by 6mm Allen key drive.

The couplings incorporate four iron nibs on each half-piece which provide electrical continuity satisfying the requirements of IEE regulations (*see page 49*).

The couplings are manufactured in ductile iron and incorporate an elastomer seal. The above ground couplings are coated in a red epoxy coating (*see page 83*).

Nitrile gaskets are available on request.

For 400-600 above ground and below ground  
(*see high performance couplings, pages 10 and 50*).

## Below ground

100, 150-300mm two-piece ductile iron couplings ED001 utilise stainless steel socket cap set screws and nuts (M8), are grey epoxy coated and do not feature the continuity nibs.

Alternatively a new push-fit coupling is available, ideal for fast pipe laying (*see page 53*).

					Accidental static water pressure (bar)	
System	Coupling	Material	Type	Diameter	Unrestrained	Restrained*
Ensign Soil	EC002	Ductile Iron	Mechanical	50mm to 100mm	Up to 1 bar	Up to 5 bar
Ensign Soil	EC002	Ductile Iron	Mechanical	125mm to 150mm	Up to 0.5 bar	Up to 5 bar
Ensign Soil	EC002	Ductile Iron	Mechanical	200mm to 300mm	Up to 0.3 bar	Up to 3 bar
Ensign Soil	EC002HP	S/Steel	Mechanical	100mm	>5 bar	>5 bar
Ensign EEZI-FIT	EZ001	Cast Iron	Push-fit	100mm	-	Up to 0.5 bar
Ensign Drain	ED001	Ductile Iron	Mechanical	100mm	Up to 1 bar	Up to 5 bar
Ensign Drain	ED001	Ductile Iron	Mechanical	150mm	Up to 0.5 bar	Up to 5 bar
Ensign Drain	ED001	Ductile Iron	Mechanical	200mm to 300mm	Up to 0.3 bar	Up to 3 bar
Ensign Drain	ED004	Cast Iron	Push-fit	100mm to 150mm	Up to 0.5 bar	Up to 5 bar

\*Bracketed to prevent movement

## Ensign/Timesaver connecting couplings

To connect Ensign to Timesaver drain systems use Timesaver transitional couplings which are coated in a black water base primer coating. (See table below identifying the coupling required).

Size dia.	Ensign pipe Dia.		Timesaver Pipe Dia. Drain TD00		Coupling required	Product Code
	Max.	Min.	Max.	Min.		
100	112	109	119	116	TD02	02466
150	162	158	173	170	TD02	02467

# Electrical continuity

Ensign two-piece couplings EC002

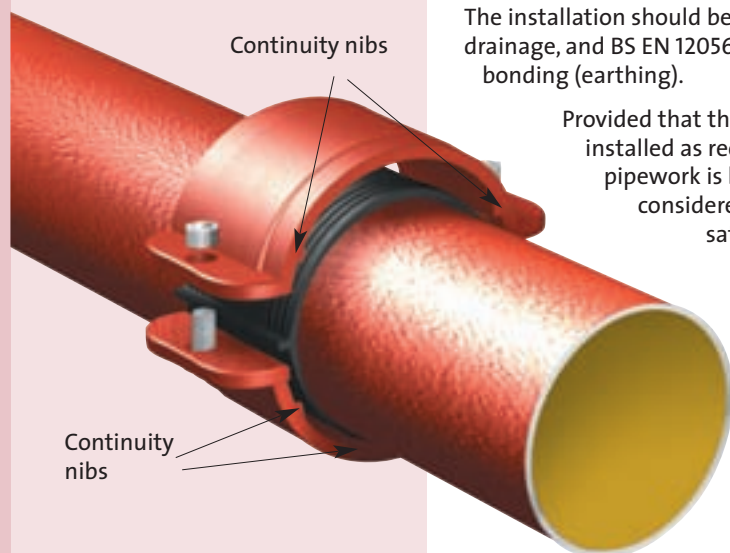
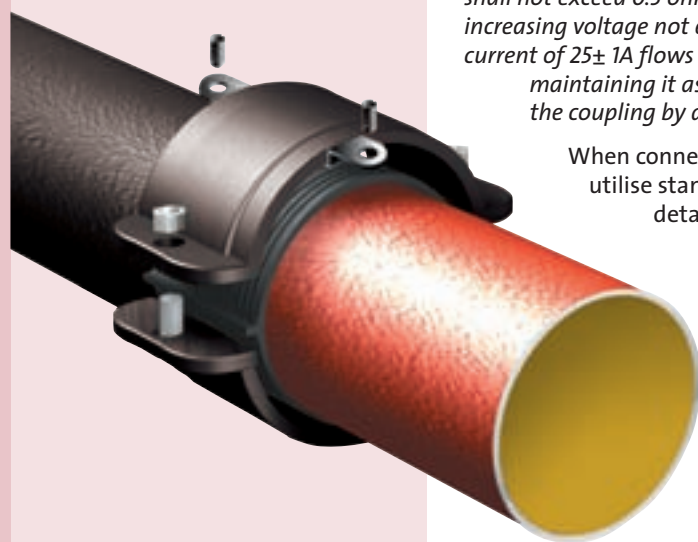


Fig. 1: Typical arrangement for providing continuity from Ensign to Timesaver Soil



The Ensign two-piece couplings are supplied with four iron nibs to each half-piece, providing electrical continuity (equipotential bonding) automatically when tightened to the recommended torque.

The installation should be tested in accordance with BS EN 12056-2 for gravity drainage, and BS EN 12056-3 for rainwater, and to IEE regulations on equipotential bonding (earthing).

Provided that the Ensign electrical continuity coupling is assembled and installed as recommended in our instructions (*see page 51*) and the pipework is bonded to the electrical earth or similar earth, it is considered that the Ensign electrical continuity coupling will satisfy the IEE regulations.

It is recommended that the installation is regularly checked for equipotential bonding (earthing) in case of accidental damage, unauthorised pipework, modifications etc.

If an Ensign electrical continuity installation is to be modified for any reason, electrical continuity couplings must be used and the installation re-tested for equipotential bonding (earthing).

The test for electrical continuity on-site should be in accordance with the requirements stipulated within BS EN 877.

*If provision is made for electrical continuity the electrical resistance of the coupling shall not exceed 0.3 ohms when tested in accordance with BS EN 877. Apply a steadily increasing voltage not exceeding 50V ac, 50 Hz, across the junction until a steady current of  $25 \pm 1$  A flows through the coupling. Allow the current to flow for 30 s, maintaining it as necessary by adjusting the voltage. Calculate the resistance of the coupling by dividing the observed voltage by the current.*

When connecting Ensign to Timesaver Soil or Drain, it will be necessary to utilise standard Timesaver coupling assemblies and continuity clips as detailed in following table.

Ensign to Timesaver soil			
Dia. mm	Coupling	Product Code	Cont. Clip
50	GT01	03798	00692
70-75	GT12	02783	00692
100	GT01	03802	00692
150	GT01	03805	00694

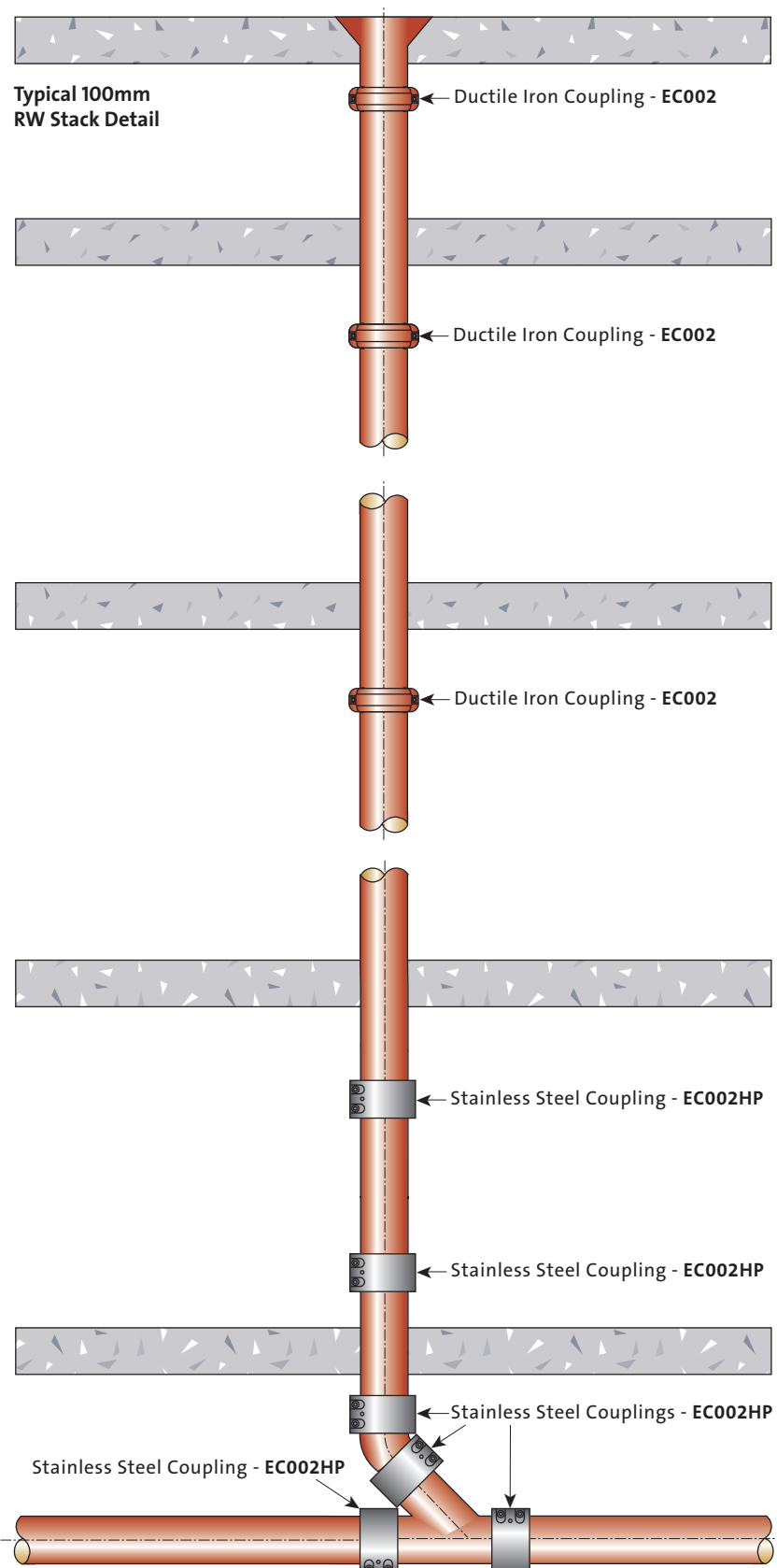
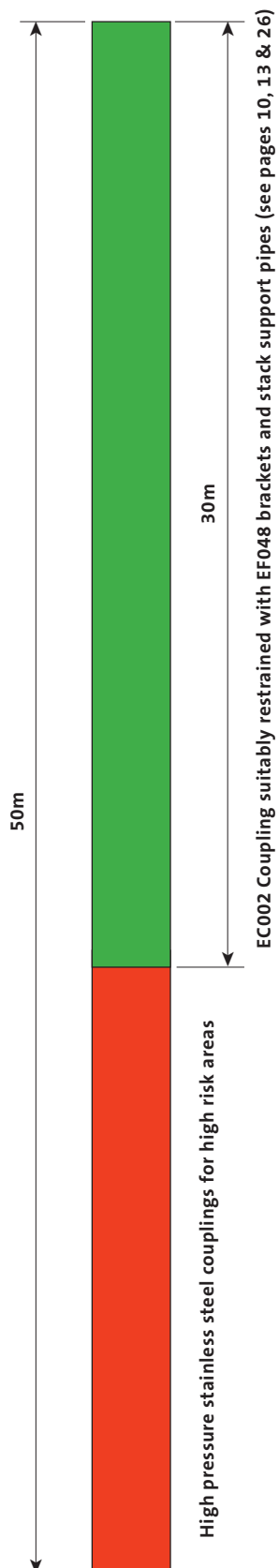
Ensign to Timesaver drain			
Dia. mm	Coupling	Product Code	Cont. Clip
100	TD02	02466	00694
150	TD02	02467	00694

Assemble the transitional coupling as detailed in the typical arrangement shown in Fig. 1.

# Installation

## high performance

### Typical installation for high performance stainless steel couplings (EC002HP)



**NOTE:** If access is required at lower level - telephone Technical Helpline: 01952 262529.



# Jointing method

**Couplings are supplied pre-assembled.**

**1.** Slacken bolts on coupling to fullest extent, removing the bolt(s) from one side to ease assembly and remove rubber gasket.



**2.** Place the rubber gasket over the end of the pipe or fitting, ensuring the central register is abutted against the spigot edge.



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



**4.** Loosely assemble the coupling around the gasket.



**5.** Check alignment of assembly before tightening the bolts. Coupling bolts on all sizes are M8 and require special Allen socket adaptor (6mm) EF102, together with a ratchet spanner EF100.



*Note: Bolts should be tightened until a suitable resistance is achieved if using a torque wrench minimum setting 20Nm.*

## Tools

	Product Code
<b>A</b> – Ensign EC Lube (1 litre bottle) <b>EC0931</b> For use with all push-fit connections	<b>00553</b>
<b>B</b> – 1/2" Square-drive <b>EF100</b> Ratchet Spanner (use with C and E) For use with nuts on fixing brackets and on access door fittings and also with new two-piece coupling	<b>00915</b>
<b>C</b> – 13mm A/F 1/2" Square-drive <b>EF101</b> Deep Socket (use with ratchet B) For use with nuts on fixing brackets and on access door fittings	<b>00916</b>
<b>D</b> – 13mm A/F 'T' Box Spanner <b>EF098</b> For use with nuts on fixing brackets and on access door fittings	<b>00914</b>
<b>E</b> – 6mm Allen Socket Adaptor (use with ratchet B) <b>EF102</b> For use with bolts on all ductile iron couplings	<b>04028</b>



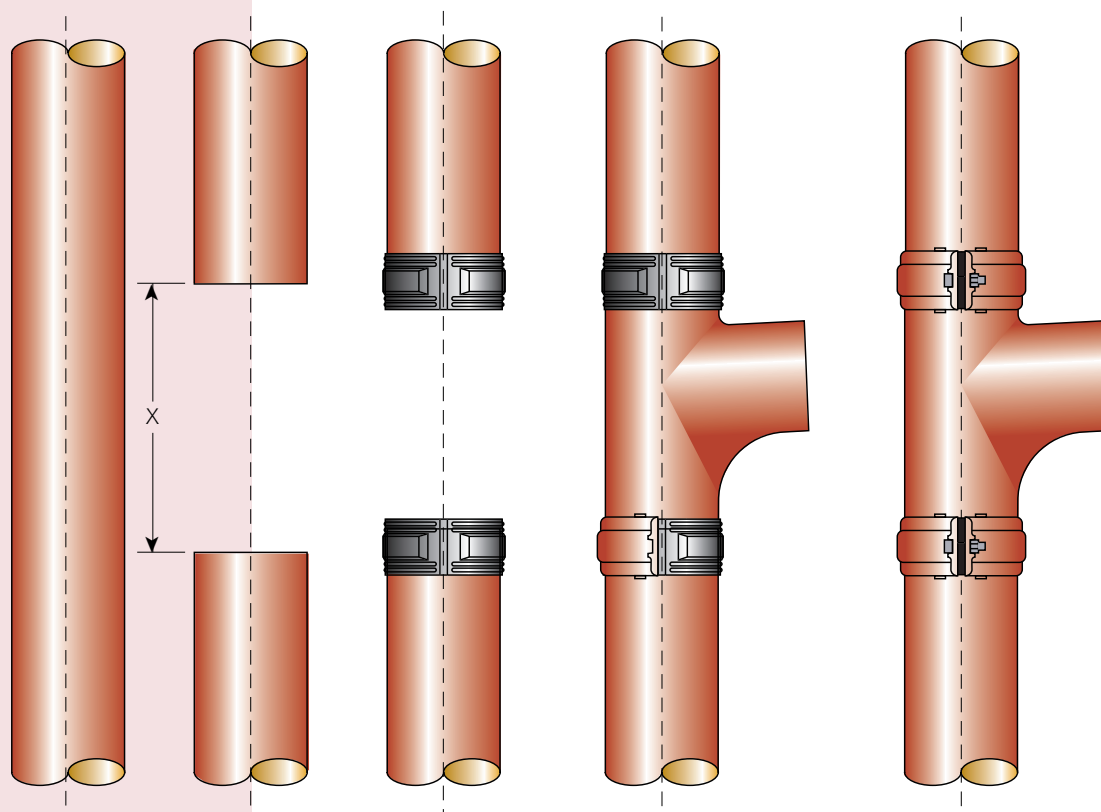
# Installation modifications

## Modifications to an existing Ensign installation

### Typical example

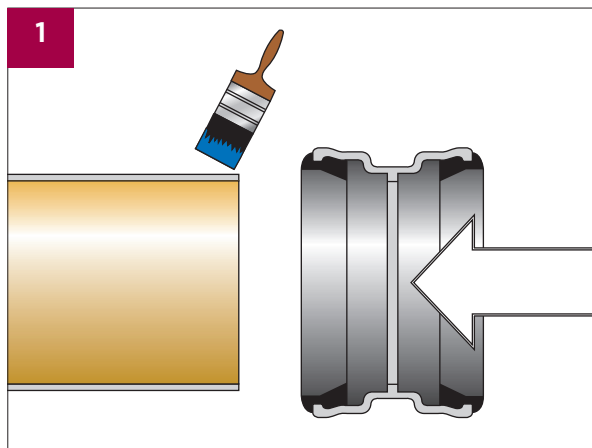
1. Measure length of branch, adding a further 15mm in total to allow for coupling's central register top and bottom.
2. Make sure existing pipework is adequately supported from above.
3. Mark pipe position for cutting.
4. Cut pipe using powered disc cutter or wheel cutter.
5. Coat cut ends with appropriate touch-up (epoxy coating).
6. Lubricate cut spigot end of pipe and the coupling gasket with Ensign EC Lube or similar.
7. Push the rubber gaskets onto the spigot cut ends top and bottom, ensuring the central registers are abutted against each spigot edge.
8. Position fitting in the stack within each rubber gasket abutting against the central registers.
9. Loosely assemble the coupling around each gasket.
10. Check alignment of assembly before tightening the bolts, to recommended level (minimum 20Nm).
11. Test new stack for successful joints.

Typical example

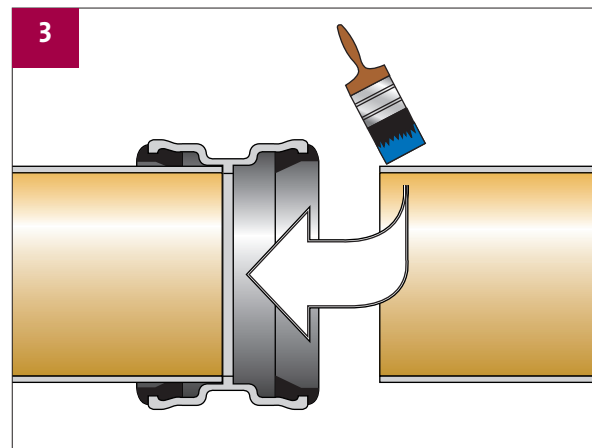


$$X = \text{fitting} + 15\text{mm}$$

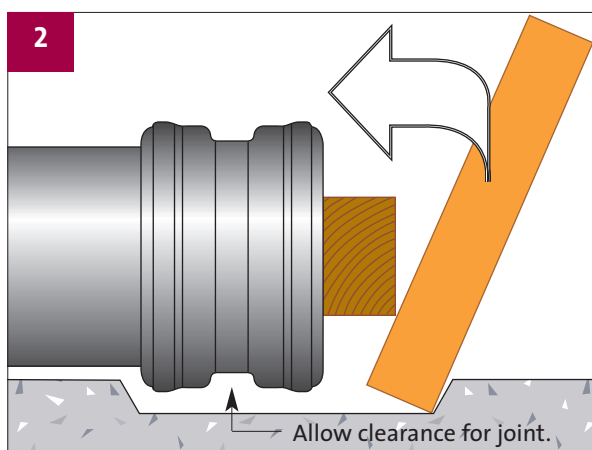
# Installation PFJ drain coupling



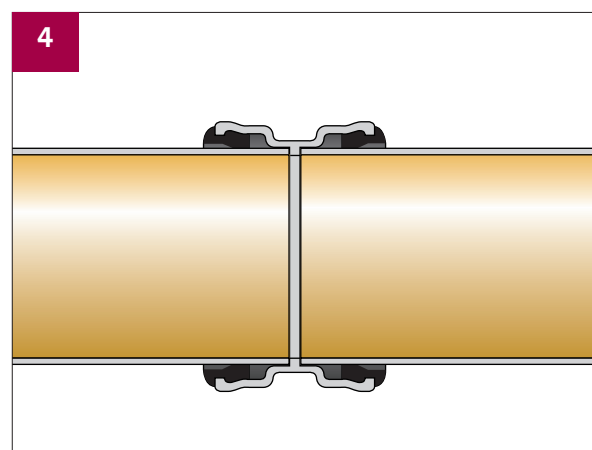
**1.** Apply lubricant (ie. silicone) to spigot end of drain pipe (remove any burrs etc. if previously cut).



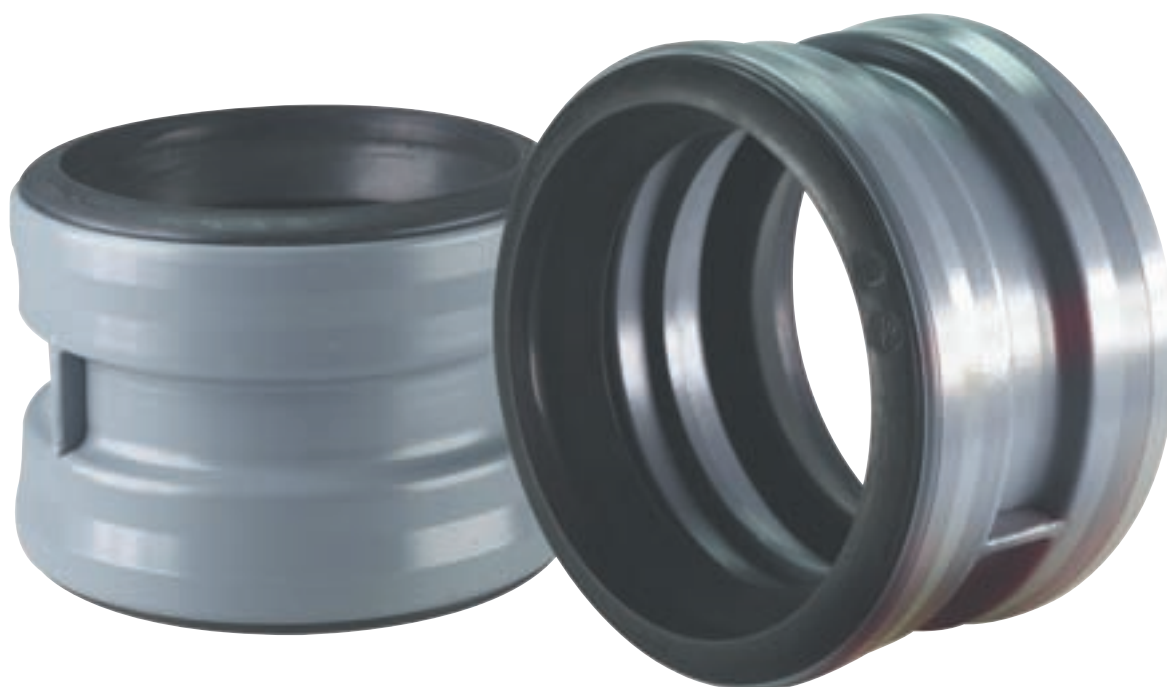
**3.** Apply lubricant to second pipe align with coupling and push pipe until abuts to central register.



**2.** Place in position and apply force easing coupling into end of pipe until abuts to the central register.



**4.** Completed joint.



# Ensign EEZI-FIT jointing method



**1.** Apply a small amount of jointing lubricant on the lip of the rubber gaskets with a brush, both ends to ease insertion of pipe/fittings.

**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.

When jointing to pipe which has been cut, please remove any sharp edges (chamfering is not necessary). Saint-Gobain Pipelines recommend the use of its own jointing lubricant available in 0.5kg tubs. Product Code of the lubricant: 199037. (Please read health and safety instructions when using this product).



## Ensign couplings performance

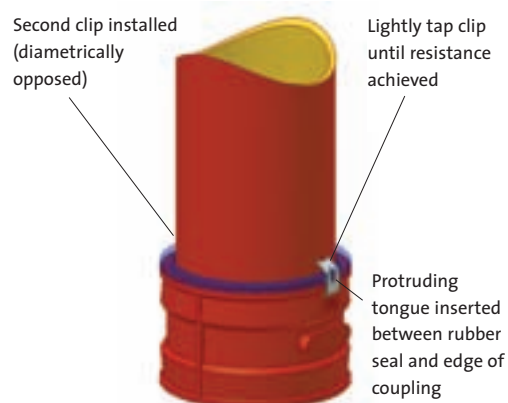


Coupling	Material	Type	Diameter	Accidental static water pressure (bar)
				Restrained
EZ001	Cast iron	Push-fit	100mm	Up to 0.5 bar

### Note:

**Ensign EEZI-FIT is designed to meet gravity 0.5 bar performance BS EN 877 although has been successfully tested to 2 bar.**

## Ensign 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.

Testing should be carried out in accordance with BS 6087 Amendment 2.