

# Focus on Cast Iron Rainwater Systems

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## HISTORY

During the Industrial Revolution the first mass-produced gutter and pipe system was made from cast iron. However, it was the Victorians who developed the design possibilities of cast iron rainwater systems and used them as decorative features to adorn the external elevations of buildings.

Prior to this period, gutters were fashioned from lead or timber and there are still original and restored examples on display today. Regional foundries were established which largely produced what became generic shapes and profiles, although there were certain profiles that were specific to particular areas such as Notts Ogee.

The original process for casting in iron was floor moulding using sand bonded with clay – commonly known as ‘green sand’. A pattern would be made from wood to mirror the required shape or profile, which was used to form the male and female sand moulds. Molten iron was then poured into the mould where it cooled over time until it had solidified.



An example of the cast iron process

The casting was then removed from the mould prior to painting with a bitumen-based paint. The fundamentals of this process are still employed today when replicating non-standard pipes, gutters, fittings and hopper heads.

As well as traditional casting methods, more recently the casting methods also include air and oil cooled metal dies into which molten metal is gravity fed. Whatever the process, today’s cast iron gutters and pipes are faithful reproductions of those from the 19th century and are generally interchangeable.

## TODAY’S MARKET

The popularity of cast iron has grown in recent years due to a greater trend towards conservation and sustainability by property managers and designers.

Cast iron is used mainly on the more traditional new build properties and extensively in the refurbishment market for domestic properties, churches, industrial and municipal buildings. Clearly, the popularity of cast iron rainwater goods in the United Kingdom is set to continue for many years to come.

## WHY USE CAST IRON

Cast iron is a popular choice for its traditional virtues of strength, reliability, versatility and sustainability. Cast iron rainwater goods are often manufactured from a mix of the following recycled materials; scrap iron, scrap steel pressings and scrap steel casting.

The resultant cast iron products are themselves 100 per cent recyclable at the end of the product’s life cycle.

## WHAT IS AVAILABLE?

There are thousands of existing profiles of cast iron gutter displayed on existing buildings and all of these can be replicated today using the traditional fabrication and sand-casting techniques. The current manufactured stock ranges where applicable conform to BS 460 include Half Round, Beaded Half Round, Victorian Ogee, Notts OG, G46 Moulded, Deep Half Round and Box. These profiles are available in a variety of sizes. Pipes are available in round, square and rectangular sections.



Beaded Half Round profile standard gutter



Deep Half Round profile gutter



G46 Moulded gutter



Plain Half Round profile gutter



Box profile gutter



OG gutter



Notts OG standard gutter

## PAINTED FINISH

They come either ready primed for subsequent painting on site prior to installation or are now widely available pre-painted with several manufacturers offering a range of British Standard colours or RAL options to suit end users, architects and installers, or to meet specific planning requirements.

Pre-painted products now offer the benefit of mechanised coating application for uniform thickness and superior finish quality, as well as allowing for more efficient installation by removing the time needed for manually applied paint to dry to a sufficient thickness.

If purchased in a primed finish for on-site painting, it is important to paint each component individually before installation, ensuring that all the non-visible areas are painted and protected and also ensure that the paint is fully dry (not just touch dry) prior to installation, otherwise the silicone sealant may react with the un-cured paint finish.

Powder coated finishes are becoming increasingly popular as they offer excellent hardness and abrasion/impact resistance, and exceptional gloss and colour retention. The coatings can be formulated for specific applications such as prolonged exposure to sunlight and the ability to survive in highly corrosive environments.

All painting should be carried out in accordance with the manufacturer's guidelines.

**MADE TO ORDER AND SPECIALS**

The sensitive restoration and maintenance of many of the United Kingdom’s cherished buildings is vital to the preservation of the country’s architectural heritage with cast iron rainwater products being a key feature in many of these old buildings.

Ornamental rainwater heads, radius gutters, bespoke pipework and special gutter profiles can all be matched using traditional sandcasting methods. An extensive range of designs is available to order from manufacturers who hold tooling for these items and specialist fabrication methods are also available for bespoke requirements. Manufacturers can offer specialist advice on project requirements and can be contacted via MGMA.



An example of the cast iron process

**INSTALLATION**

The gutters are normally supported by fascia brackets that are screwed to the timber fascia but some profiles can be directly fixed or larger profiles may also sit on a corbel stone or brick. There is also the option of fabricated rise and fall brackets and rafter brackets where no fascia board is available.

Pipes are fixed through eared socket connectors or by using ear belts/bands or holderbats (independent brackets). Use only the manufacturer’s recommended fixings to ensure they are capable of providing the required support and durability.

**JOINTING**

In the past, gutter joints were made using putty substances with bolts to hold the connection. Nowadays, low modulus silicone sealants are preferred for their adhesive and durability qualities. To ease installation, manufacturers have also developed dry-jointing systems for half-round profiles which consist of preformed rubber seals that are quick and easy to install, and have proven reliability. Always ensure that the manufacturer’s jointing recommendations are strictly followed.



An example of a holderbat

Traditionally, cast iron rainwater pipes were jointed with joint sockets cast on to the end of the pipe, either with cast on fixing ears/lugs or without, for fixing with independent brackets/ holderbats. Nowadays, some pipe systems are offered with loose pipe sockets which have a spigot at the base that can be just placed inside a plain end of the pipe.

Although pipe joints can be left unsealed and should not leak, the joint gap should be wedged with small lead wedges to ensure visual alignment and this also ensures the pipe does not rattle within the joint. However, experience over time has shown that in extreme winter conditions the joint gap can become filled with ice due to cyclical thaw then freezing.

MGMA recommends that all cast iron rainwater pipe joints are sealed to ensure this does not happen. Furthermore, tests have proved that rainwater pipes with fully sealed sockets are more efficient as they do not allow air to be dragged into the pipe at each unsealed joint effectively reducing the siphonic effect during peak flow.

### OTHER CAST IRON PIPE SYSTEMS

Often cast iron rainwater pipes to external elevations of a building utilise BS416 grade traditional pipe system, generally used for soil and vent pipes, known in the trade as LCC. This can be for various reasons, either because the rainwater pipe is connected to a combined rainwater and foul waste sewer, or that visually it needs to match adjacent cast iron soil and vent pipes. If cast iron pipes are specified for internal use, modern cast iron systems with rubber sealed bolted compression joints conforming to BS EN 877 should be used.

Currently there is much controversy regarding the various plastic 'cast iron look-alike' pipe and gutter systems that have entered the market, purporting to offer the same durability, feel or appearance as the genuine cast iron product at a lower cost. In spite of the latest technology and modern materials there is no plastic replica to cast iron that can remotely provide the durability, feel or appearance of cast iron. At first glance PVC might seem like an economical solution however, whole life cost comparisons prove that this is not the case.

PVC does not have the strength, rigidity, durability or colour fastness of metal rainwater systems. The 'cast iron look-alike' effect is created by applying a textured paint or co-extrusion layer to the PVC substrate which will in time fade, if not delaminate, and for that reason generally most of these products are only guaranteed for 10 years.

### WHERE IS IT AVAILABLE?

Cast iron is widely stocked at plumbing and building merchants across the UK, Ireland and Channel Islands and is also available to order online through a number of specialist suppliers. Details of manufacturers can be obtained by using the product matrix on the MGMA web site.

The matrix has been designed to help specifiers quickly find a suitable manufacturer for their project. Users can select from different material types, including cast iron, and there is also an option to select by product application namely, non-domestic, domestic, heritage, new build and refurbishment.



A cast iron drainpipe at Guernsey Market, St Peter Port, Guernsey

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