



FOCUS ON STANDARD ALUMINIUM RAINWATER SYSTEMS

INTRODUCTION

The MGMA has amongst its key objectives, a commitment to maintain and publicise recommendations for best product and installation guidance for metal gutter systems. With such a wide variety of products on offer, it is vital to understand their suitability for differing applications, whilst appreciating the all-important features to ensure they provide best value, functionality and durability in service expected of such premium products.

Over the last 50 years aluminium has established itself as one of the principal materials for the manufacture of metal gutter systems in the domestic, municipal and commercial sectors and, together with the added advantage of compatibility with architectural grade electrostatically applied powder paint finishes, enables manufacture of both bespoke and proprietary systems to offer unrivalled low maintenance, durable, and environmentally friendly products.

STANDARDS

Harmonisation of British and European standards required British standards for aluminium gutters to become obsolete in favour of European standards, which did not represent UK styles of aluminium gutters systems. MGMA has worked with the British Standards Institute to draft and launch BS 8530:2010 - the first new national standard to represent Traditional-Style Half Round, Beaded Half Round, Victorian Ogee and Moulded Ogee aluminium rainwater systems which replaced the obsolete BS 2997:1980.

MGMA continues to liaise with the British Standards Institute in the drafting of further national standards to represent the remaining types of UK aluminium gutter products.

MANUFACTURING PROCESSES

- Pressed formed sheet
- Extruding profiles
- Die casting
- Sand casting
- Sheet roll forming

With such diversity in manufacturing processes available, it is important to select the appropriate type and quality of product required. Some systems utilise a mixture of manufacturing process to make up a product range. For example, small components such as gutter outlets, corners, fascia brackets and pipe sockets can be made as an aluminium casting and the long components, such as pipes and gutters, can be made from extruded aluminium.

CORRECT SPECIFICATION

To ensure that the correct gutter system is specified for a particular application, the following factors should be taken into account:

Material grade: The quality of alloy should be of a high grade, (refer to BS 8530:2010) and corrosion resistant. For applications within five miles of the coastline the alloy should also be of 'Marine Grade'.

Factory applied colour coatings: If painted, the most popular paint system used is known as PPC (Polyester Powder Coating). This is an electrostatically applied architectural grade polyester powder coating to BS 6496. The coating process should be carried out in accordance with BS EN 12206-1:2004 as this application process will ensure appropriate paint thickness, exemplary uniform colour retention and coating adhesion which is guaranteed by most architectural paint manufacturers for a period of at least 25 years and, depending on the geographical location of the installation, should last considerably longer. Inferior non-architectural grade paints and application methods will result in early colour fading, chalking and delamination.



Box gutter and 72x72mm downpipe in textured black finish

On-site hand painting: Hand painting with conventional liquid paints directly to bare aluminium surfaces is not recommended, is time-consuming and therefore expensive and will not give the durability and colour fastness of architectural grade powder coating.

However, if this is the chosen option then the aluminium surfaces must be thoroughly degreased, an aluminium etch primer applied, then a further two coats of preferably a two-part polyurethane paint applied. All components must be individually painted prior to assembly (not after installation) and sufficient time allowed between coats to ensure the paint is fully cured prior to adding further coats. Installing components when the paint is not fully cured may result in a chemical reaction with the jointing sealant causing joint failure.

Over-painting PPC is an option if required in the future. The PPC surface will need to be rubbed down with a non-metallic fine abrasive such as a wire wool or wet and dry sheet then cleaned down with a mild solvent cleaner, prior to applying two coats of, preferably, a two-part polyurethane paint. However, it must be appreciated that this will not provide the colour fastness or durability of an architectural grade PPC coating.

Do ensure that products are ordered from a reputable manufacturer conforming to available British Standards and, where standards are not yet available, have independent test data to prove their products are fit for purpose. MGMA members are a model benchmark to provide such quality and service.



Box gutter and 72x72mm downpipe in RAL 7021 granite grey

NON-STANDARD REQUIREMENTS

As aluminium is such a versatile material to work with, most manufacturers offer to fabricate bespoke components or even complete systems. Listed below are the most commonly requested items:

True radii gutters: True radii gutters can be sand cast to simulate all profiles. Sand casting involves making a wooden pattern of the gutter profile to the given radius, from which the sand moulds are made. In view of the pattern cost, this method can be costly for small quantities.

Segmented radii gutters: Achieved by internally welding together pieces of gutter section cut to angles to a given radius. Dependent on the radius, the more segments introduced, the better the appearance. This method is less costly than sand casting and in general the segmentation is not noticeable on two storey buildings and above.

Due to building tolerances, it is recommended that radiused gutters are made in approximately one metre lengths, as this allows a small amount of tolerance at each joint, ensuring the gutters follow the radius of the building.

Site dimensions: As theoretical radius dimensions are often subject to extreme building tolerances, we recommend that a ridged one metre long radiused template be cut on site. The template should be offered up to the radiused fascia at one metre intervals to check that the fascia has been constructed to a uniform or near uniform radius. The template should then be sent to the manufacturer for use as a master template.

Bespoke hoppers: Individually designed hoppers can be either fabricated from sheet aluminium with a variety of decorative cast motifs and embellishments added to enhance the appearance, or can be individually cast, if required.

Rise and fall gutter angles: Any reasonable degree of angle can be fabricated. However, care must be taken in establishing accurate site dimensions and degrees of angle. Experience has proved that theoretical geometry may not be accurate; hence each angle should be site checked and location referenced.

Special adaptors: Adaptors between differing sizes and profiles of gutters, rainwater pipes or drain connections can be fabricated to the customer's requirement, subject to design criteria. Accurate dimensional details will be required.

Special gutter outlets: Standard gutter outlets can be modified to the customer's requirements subject to design criteria. However, it should be noted that this may be detrimental to the flow performance of that outlet.

Gutter assemblies: Non-standard gutter profiles can be made from sheet aluminium.
Special pipe/gutter brackets: Special support bracketry for use in conjunction with standard or bespoke products is available to order, subject to design criteria.

Lightning conductor links: If gutters are to be bonded to a lightning conductor system, positive electrical continuity bridge across all gutter joints will be necessary. Gutter sealant acts as an insulator between joint union and gutter, hence electrical continuity through the gutter system cannot be guaranteed. Universal electrical continuity link assemblies conforming to BS 6651:1985 are normally available as standard or on request. Gutters drilled and riveted on site with 4.8mm mill finish rivets give electrical continuity.

To determine if lightning links are required, it is recommended that a specialist lightning protection consultant or installer is consulted.

GUTTER SUPPORT METHODS

Fixing methods will depend on the type of gutter system and the background to which it is to be fixed.

Most standard proprietary gutter systems predominantly for domestic and small commercial buildings will have compatible brackets that should conform to EN 1462:2004 in terms of weight loading and corrosion resistance.

Traditional styles of gutters conforming to BS 8530: 2010 are fixed with standard fascia, rafter or rise and fall brackets, the latter being fixed into masonry. Below are examples of typical BS 8530:2010 fixing methods adopted, which are available to suite most profiles and sizes of gutters.

Modern style proprietary gutter systems tend to be fixed with concealed gutter brackets giving the gutter a sleek minimalistic appearance or even direct fixed through the vertical rear of the gutter eliminating the brackets altogether.



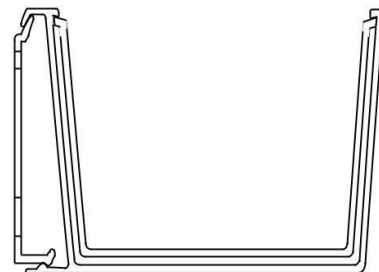
Standard fascia bracket



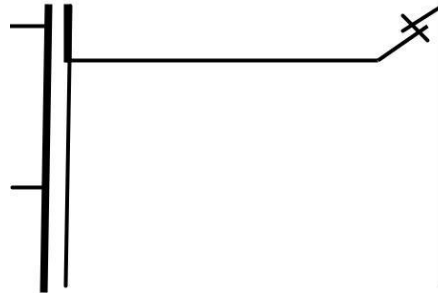
Rafter arm brackets



Rise and fall bracket



Concealed bracket

*Direct fixing**External fascia bracket*

GOOD INSTALLATION PRACTICE

Install gutters level, or to a fall of 1:600. Check levels using a water level (a long transparent flexible tube filled with water) or other appropriate device. Set gutter height to prevent possible overshoot, in particular with narrow gutters draining high steep sloping roofs. Gutters installed too high may be damaged by high velocity impact of sliding snow. In areas of heavy snowfall snowboards should be considered, especially above pedestrian areas.

*Half round gutter and 63mm Ø downpipe*

As aluminium gutters do not flex, check the straightness of fascia boards prior to fixing. If required, shim out the brackets to achieve true linear alignment. Misaligned bracketry will result in gutter joint fatigue and eventual joint failure.

Use standard metal work tools to cut or drill aluminium gutters. Angle grinders are not recommended. On polyester powder coated parts, once cut, debar and touch up with compatible paint.

Aluminium will thermally expand and contract and therefore it is vital that all joints to gutters and pipes have a minimum 3mm expansion gap. Some gutter systems are designed to absorb thermal movement, so ensure that the manufacturer's recommendations are followed.

All fixings must be either austenitic stainless steel or a compatible alloy to be compatible and avoid electrolytic corrosion. Under no circumstance should zinc coated steel screws or bolts be used.

Aluminium gutter systems are not recommended to be installed in conjunction with a copper roof as the copper oxide 'run off' will quickly corrode any uncoated surfaces of aluminium. All other metal roofing materials are compatible, but should not come into direct contact with uncoated aluminium.

Ensure joint area is dry and clean. Protect joints against frost damage if freezing conditions are anticipated during sealant curing period of approximately four to six hours. **Only use sealant recommended by the manufacturer; use of other sealants may result in early joint failure. Do not use sealants that are out of date.**

Leaf guards

Leaf guard meshes are a popular ancillary item and are generally available to fit all gutter profiles.

Testing

If testing is required and is practical to carry out, plug off outlets, fill gutter to 80 percent full and after a five-minute period, check for leaks. Discharging flood test water into rainwater pipes will show up any leaks in rainwater pipes. Any joints that fail should be taken apart, all sealant cleaned off, then re-sealed and re-tested.

ENVIRONMENTAL

All MGMA members place great emphasis on ensuring that all manufacturing processes are environmentally responsible. This extends to packaging as well as raw material handling and process controls.

Aluminium is 100 per cent infinitely recyclable, without losing any of its characteristics. The majority of aluminium smelting plants worldwide are now hydro electro powered, reducing SO₂ and CO₂ emissions. Thirty per cent of aluminium used today is from recycled material, which only requires five per cent of the energy used in production of the primary aluminium.

The polyester powder coating process also now recycles all the overspray PPC powder and there are no harmful emissions from the application of powder paint.

MGMA DISCLAIMER

Whilst the information contained in this bulletin is believed to be correct at the time of publication, the Metal Gutter Manufacturers Association Limited and its member companies cannot be held responsible for any errors or inaccuracies and, in particular, the specification for any application must be checked with the individual manufacturer concerned for a given installation.

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