



## REFURBISHMENT OF INTERNAL METAL GUTTERS

### INTRODUCTION

In most industrial buildings with internal gutters, those gutters are fabricated from galvanised steel with bolted joints. However, all building products have a life expectancy and in older installations, corrosion of the gutter steel substrate and leakage at the bolted gutter joints can occur.

The Metal Gutter Manufacturers Association (MGMA) advises that there are a variety of methods to deal with the deterioration of internal metal gutters. However, it is important to fully consider the advantages and disadvantages of each method and not just opt for the cheapest solution, which may end up being a liability to both the customer and the installer.



*Fig 1 Metal gutter suffering corrosion and joint leakage*

### Liquid applied methods

Where the gutter surface has not deteriorated, and the only issue is joint leakage, one approach is to cover the joint using a liquid applied sealant with individual strand fibre reinforcement mixed in. This is a fairly low cost solution, but to be effective the preparation and execution of the works has to be very carefully undertaken.

The gutter has to be completely clean, grease and debris free, so that the compound can adhere well to the gutter. Great care must be taken when applying the material around bolt heads to avoid pin prick holes, through which water can leak. Badly applied sealant of this type can peel off after a fairly short period of time, leading to a renewal of leakage into the building. In most cases this is not considered a permanent repair.

A more sophisticated approach is to line the gutter with a liquid applied sealant together with a separate fibre reinforcement mat. Usually this will involve multiple layers of reinforcement and sealant, and will often be applied as a total lining rather than locally across joints. This approach can be very successful, though again it must be noted that preparation, workmanship, and weather conditions during installation can have a significant impact on the effectiveness of the final product. Care must be taken to ensure that the surfaces are clean and dry before the lining takes place, and that outlets are protected against sealant running into them and fouling the rainwater pipes.



*Fig 2 Liquid applied lining material delaminating from the gutter*

### Membrane methods

Well specified membrane-lined gutters are probably the best solution for most internal gutters. There are a number of membrane lining systems which can be used to address joint leakage and surface deterioration. Some are supplied as seamless liners which can be the full length of the gutter with no joints; others are supplied as fold-in discrete sections, bonded to a metal substrate, with joints at centres along the gutters.

With seamless liners, care has to be taken to ensure thermal movement of the liner can be restrained; most thermoplastics have a coefficient of thermal expansion far in excess of the steelwork of the building, so unless this is considered thoroughly, problems can occur with movement and dislocation of push-in outlets.

Fold out gutter liners bonded to a metal substrate can be more costly, but cause fewer problems with thermal performance, as the metal substrate controls the expansion of the membrane material. However, it is important to note that the MGMA recommends a minimum thickness criterion of 1.2mm for a membrane-lined gutter. There are however, many more joints in this type of system, so care has to be taken in the installation of the product, which is more dependent on weather.

Installing sleeve outlets in any lining system reduces the capacity of the system, as the new outlets will be smaller. This may lead to a situation where day to day leaks are prevented at the expense of significant overflows in heavy rain. Gutters must be checked to ensure that their design capacity after the installation of the liner is adequate; if not, additional outlets may have to be added to achieve this. It is likely that the installer of the liner would be held liable for any flood damage which occurred after installation, so this needs to be checked.



*Fig 3 Gravity (left) and siphonic (right) outlets restricted by installed liners*

One area where this is particularly important is where the building has siphonic outlets. Any liner which protrudes down into a siphonic outlet should not be used without taking advice from the original manufacturer of the siphonic system or an independent expert. Lining into siphonic outlets can reduce capacity by as much as 80 per cent which can have a disastrous effect of the ability of the roof to drain.

Sometimes lining systems, either liquid-applied or membrane, are dressed up to the underside of, or even onto, the roof sheets to increase the effective gutter depth. This can be a dangerous method to adopt, as if there are any faults at all in the roof sheets, water will flow down the liner tray, build up in the void between the new liner and the existing gutter liner, and thus leak into the building.



*Fig 4 Water trapped below side slope of lining system extended onto roof sheets*

There are a wide variety of methods of dealing with the deterioration of internal metal gutters; however it is important to fully examine all the issues, compare the advantages and disadvantages of each method and not just opt for the cheapest solution, which may end up being a liability to both the customer and the installer.

Metal guttering systems are designed and manufactured to give many years of reliable service and detailed advice is available from individual MGMA member companies at [www.mgma.co.uk](http://www.mgma.co.uk)

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