



MEMBRANE THICKNESS - ISSUES AND SOLUTIONS

The issue

Well-designed roof drainage is crucial to the long term performance of any building and this is particularly so when considering the issue of membrane thickness on insulated and un-insulated gutters. Guidelines issued by the Metal Gutters Manufacturers Association (MGMA), to specifiers advise them to seriously consider the thickness of pre-laminated membrane gutters. The MGMA recommends that all structural insulated and non-insulated gutters are manufactured from minimum thickness criteria of 1.2mm for both membrane and steel substrates.

When membrane lined gutters were first introduced, they were originally classified as a 'lick and stick' method which proved difficult in establishing leak points should a pin hole occur. Today most, if not all, are pre-laminated which minimises issues such as small scrapes, scuffs etc. The thickness of the membrane is critical at this point; the minimum thickness criterion for pre-laminated membrane thickness is 1.2mm. This specification thickness reduces the risk associated due to foot traffic and abrasion to the membrane during installation and on-going maintenance.

Contrary to MGMA guidelines, there are a number of manufacturers who supply gutters with membrane thicknesses as thin as 0.6mm so designers need to ask some pertinent questions before specification; what are the risks of using a thin membrane? What are the implications for the long term maintenance and service life of the gutter? What is the likely impact on the guarantee?

The solution

Structural membrane lined gutters have been used in the roofing and cladding industry for over 30 years, but it has only been in the last five to 10 years that the volume has overtaken traditional bolted gutter systems. This is due to a number of reasons, primarily the reduction in risk relating to water ingress at or about the gutter position. Issues such as siphonic design, eaves purlin gauge and tolerances, workmanship, drainage design and the lack of maintenance in terms of the cleaning of gutters to ensure all outlets are clear and allow free flow of rainwater have all contributed to the increase in the use of structural membrane lined gutters.

Membrane thicknesses as thin as 0.6mm are sometimes supplied to reduce cost; however a membrane thickness below the recommended 1.2mm is easily compromised by foot traffic, leading to corrosion and ultimately water ingress. Furthermore, 0.6mm thick membranes can prove difficult to install and weld. This thickness increases unacceptable risk, either in building use or during the welding process on site. Thinner membranes are more susceptible to damage and are not easily fixed; gaining access to the gutters to carry out repairs can end up making matters worse.



A 0.6mm thin membrane

Thickness of steel substrate must be considered when specifying membrane lined gutters. Whether single skin or insulated, the gutters should be adequately supported structurally to allow for foot traffic, snow loads etc., both pre and post construction. MGMA therefore recommends that a 1.2mm galvanised steel substrate should be specified as an absolute minimum for walkability, safety and serviceability.



Thin gauge steel and the deflection

Following on from the issue of self-supporting gutters, larger gutters will require additional structural support, in the form of continuous edge/side/base support, which will need to be considered during design for anything over 400mm sole / 1000mm girth, based on the aforementioned 1.2mm substrate / 1.2mm membrane, or 500mm / 1250mm girth for 1.5mm thick substrate.

Gutter installation and subsequent routine maintenance will involve working at height and therefore measures need to be put in place to prevent falls. The building owner or occupier has a legal obligation to protect people that go on their roof and should insist on a fall prevention only strategy – a restraint system.

Nowadays it is possible to deploy restraint themed life line safety systems that allow access to most of the roof area. Once the user is inside the wire perimeter system, by definition, he is classed as working in a safe environment, with no risk of a fall provided always that the roof is non-fragile. This is the safest horizontal life line design option and should be the default applied to roofs that can accommodate it; and of course, safety line installations need to be inspected and maintained annually. Working over fragile roof areas should always be avoided.

Generally, gutter guarantees vary from 10 years to 25 years, depending upon the manufacturing process and materials selected. In reality, the 0.6mm membrane will have a shorter service life and to include such a membrane into a building envelope with a 40 year non-membrane guarantee is not an appropriate way forward for the industry and is not something MGMA can endorse.

It is also important to note that guarantees will be nullified if a maintenance and inspection regime is not implemented and building owners need to be aware of the potential consequences associated with degradation; if a valid guarantee is not in place then repairs and disruption can be costly.

This article first appeared in RCi Magazine, February 2015

MGMA DISCLAIMER

Whilst the information contained in this document 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.

Information provided by the MGMA or contained within publications and articles which are made available in any form (mechanical, electronic, photocopying or otherwise) cannot be used or cited as a means of ensuring that a material, product, system or assembly is compliant with Building Regulations.