



## NEW STANDARDS FOR METAL RAINWATER IN A CHANGING CLIMATE



*BSi's new standard for the design and manufacture of metal gutters focuses on the strength and structural capability of rainwater products. It's an important standard that reflects climate change and the increasing demands of wind and rain on our built environment. Mike Meegan, Development Engineer (NPD) of Alumasc Rainwater, explains overleaf the significance to industrial, commercial and residential projects.*

Our climate is becoming warmer, wetter and windier. Following a succession of record breaking average yearly temperatures, 2015 was the hottest since records began, and 2016 was even hotter. Arctic ice is melting at the fastest seen. A recent article in The Times highlights how the Alps may lose 70% of snow by the end of the century due to global warming.

Extreme weather is now an all-year-round probability in the UK, ranging from flash floods one day to heat waves the next. Average wind speeds are rising faster than predicted and February's Storm Doris brought damaging winds and heavy rain to many parts of the country.

Climate change is one of the key drivers for improving roof drainage and water management, from rain to drain. Developing new standards, regulations and testing methods to ensure products and solutions align to the worst-case scenarios of climate models is essential.

Rainwater systems are integral to protecting our buildings and channelling water from roof to ground. So gutters, outlets and downpipes must demonstrate in-situ strength and structural capability when handling increasing volumes of rainfall and wind loadings.

The new, recently published BSi standard is: BS 9101:2017 - *Steel and Aluminium rainwater systems. Specification*. It specifies the requirements for the design and manufacture of metal gutters on industrial, commercial and residential buildings. This includes the materials, tolerances, mechanical properties and surface conditions, coatings, laminated surfaces, jointing methods and fixings for rainwater systems, including fittings and accessories for assembly or support.

BS 9101:2017 puts particular emphasis on the design strength of the metal gutter. This is determined by loading capabilities in the form of downward rain, wind uplift and snow. Products to this standard require either Finite Element Analysis (FEA) or physical testing to ensure they meet the new standard. FEA is a computer based method of analysing the behaviour of engineering structures and components under certain conditions. It is an advanced engineering tool that is used in design and to augment or replace experimental testing.



### **Evolving standards**

Before BS 9101:2017, standards such as BS 8530:2010 were developed to establish the requirements of traditional cast systems. However, the standard for pressed and extruded gutters was still open to interpretation.

The industry had referenced BS 612 for pressed gutters, covering 'Eaves gutters and rainwater down-pipes of metal sheet', as it was the only standard that came close. In 2005 this was updated and defined as 'Eaves gutters with bead stiffened fronts and rainwater pipes with seamed joints made of metal sheet'. A beaded stiffened front is defined as a rolled section rather than a pressed sheet. As such, pressed sheet gutters are covered under the new standard BS 9101:2017.

With regards to extruded gutters, the industry used to reference BS 1474 - *Specification for wrought aluminium and aluminium alloys for general engineering purposes: bars, extruded round tubes and sections*. This standard was withdrawn in 1987 and replaced by EN Standards, which apply to the material and not in-situ structural strength. As a result, the new BS 9101:2017 is far more comprehensive and detailed to meet specific metal sheet and extruded gutters, and has been developed to cover gutters that are excluded from BS 8530.

### **Working in partnership**

Setting new British Standards is a time consuming and detailed process. The BSi depends on expert advice from leading UK manufacturers with regards to design parameters, loadings and specifications. Associations like the Metal Gutter Manufacturers Association (MGMA) work in partnership with BSi to review current standards for rainwater products, and advise on new developments and technologies for the benefit of the industry. Developing new standards also helps eliminate bad practices among manufacturers producing inferior or unsafe products.

### **Improving specifications and compliance**

The new BS 9101:2017 standard raises the bar for metal rainwater specifications and will prove invaluable to metal gutter manufacturers. But often new standards are complex and the implications on project designs aren't always clear.

Many architects, specifiers, design engineers or installers may not be aware of the latest developments or the significance to their projects.

It is important that rainwater manufacturers offer the relevant support and technical advice to their specifier and installer customers so that metal rainwater gutters are correctly specified across all projects. Climate change isn't a debatable possibility and compliance isn't just a tick in the box: it is a must. It is essential for the protection of our buildings at a time when the demands put upon them are increasing that they benefit from the best solutions.

The new British Standard BS 9101:2017 is available from <http://shop.bsigroup.com/>

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