Safety under fire

The CAB Aluminium in Building Conference 2018 *The Facade as Protection against Fire and Flanking Acoustics* takes place at the Jaguar Visitor Centre, Birmingham on Wednesday 16th May. CAB chief executive Justin Ratcliffe outlines the programme

Dame Judith Hackitt's interim report as part of the independent review of building regulations found that the whole system of fire safety regulation regarding complex and high-rise buildings was 'not fit for purpose', and left room for those who wanted to take shortcuts to do so. A programme of change is needed to safeguard our built environment.

The first theme for CAB's Aluminium in Building Conference 2018 at the Jaguar Visitor Centre, Birmingham looks at the issues facing our industry, particularly considering this on-going review of regulations. Our early confirmed speakers are:

Keynote Speaker: Merlyn Forrer, fire protection manager, Greater Manchester fire and rescue service who will set the scene with his first-hand experience of a variety of pertinent fire safety issues.

David Metcalfe, director, CWCT will focus on windows and curtain walling including such areas as:

- fire performance of facades – glazing systems
- fire performance of curtain wall and windows
- cavity barriers and fire stopping in curtain walling
- spandrel panels as used in curtain walling
- curtain walling testing.

Clive Everett, facades technical standards director, MD Insurance Services will speak on fire compliant facades – practical considerations.

He will consider several issues including:

- The warranty perspective
- Other façade elements requiring consideration
- Complying with BCA Guidance Note 18
- Defects we continue to see

Our second theme is flanking acoustics in curtain walling. As more curtain walling systems are used in high-rise living accommodation, how do you protect against flanking acoustics from one apartment to another? Can simple design changes make a big difference to performance? How do you test systems for their flanking acoustic performance and what impact does the installation have?

Our first speaker is: Nick Colan, acoustic consultant, Apex Acoustics whose presentation is entitled *Making sense of the Acoustic Performance of Flanking Paths for Curtain walling Systems*.

The presentation looks at how the different types of performance data provided for curtain walling systems are used to predict the sound insulation between spaces. It shows how the sound reduction index and the flanking level differences can be both used for the calculations. He will also describe common types of curtain walling and the associated flanking paths along with typical performances achieved and methods for improvement. A case study will demonstrate the contribution from flanking paths. ❐

Justin Ratcliffe

We will shortly be announcing further speakers. Please email julie.harley@c-a-b.org.uk for further details or go to www.c-a-b.org.uk to download booking forms.

Three focus points

CAB technical director Justin Furness reviews CAB's progress in promoting aluminium's sustainability credentials and highlights CAB's sustainability activity in 2018

CAB is involved in several activities and initiatives to demonstrate that aluminium is meeting the sustainability challenge and here we focus on three areas:

- end-of-life recycling rate
- circular economy
- responsible sourcing.

Justin Furness

End-of-life recycling rate

When a building is renovated or demolished, metal products are routinely collected and directed to recycling or to reuse. Currently more than 95% of metal products used in buildings are collected at end-of-life. A study performed on several demolition sites in Europe by the European Aluminium Association has demonstrated that more than 96% of the aluminium-content of these buildings was selectively collected and sent for recycling.

High economic value is the main driver for this systematic collection and recycling. In contrast to other materials, metals are recycled without loss of quality. The fact that metals do not degrade ensures that they can be recycled and used for the same application, with the same quality, again and again. Recycled metals and alloys have the same properties as the original material. Aluminium recycling provides energy savings of 95% compared to primary production.

Life Cycle Assessment (LCA) is a tool typically used to assess the environmental impacts of a product, process or activity throughout its life cycle; from the extraction of raw materials through to processing, transport, use, recycling and end-of-life. In LCA, two metrics are typically used for recycling: 'recycled content' and 'end-of-life recycling rate'.

Recycled content looks at how much recycled material is used in the production of a new product. The recycled content indicator is situated at the start of the supply chain – i.e. at the manufacturing stage of a product. This indicator makes sense for products containing materials for which the recycling industry is not profitable and mature. For such products and markets, the recycled content might be an adequate indicator to stimulate recycling by creating a market pull for these recycled materials. For metal products, however, the recycled content is not a relevant environmental metric, since it will artificially direct scrap towards specific products and will then interfere with a recycling market, which is limited by the availability of scrap. As a result, requesting high recycled content in specific metal products will be counter-productive, leading to a higher environmental impact of the metal recycling value chain.

As stated in the 2006 *Metals Declaration on Recycling Principles*, the end-of-life (EoL) recycling rate is the most appropriate metric to measure efficiency in collecting and recycling metal products at EoL. The EoL recycling rate compares the actual amount of metal coming from recycling with the amount of metal theoretically available from an EoL product. The EoL recycling rate is independent of a product's lifetime and market developments. By ensuring that metals are recycled, the EoL recycling rate is maximised.

So, if aluminium enjoys high EoL recycling rates, why does the recycled content in aluminium building products not always seem to reflect this? This is because recycled content is limited by scrap availability. The upper limit of what is recycled today is governed by what was produced in the past. The rapid growth in the use of aluminium over recent years, and the fact that aluminium building products typically have a service life of decades, means that there is a shortage of aluminium scrap coming from buildings. As there is insufficient recycled material to satisfy growing demand, virgin material must be introduced into the supply chain. Hence, the average recycled content in aluminium supply is still today relatively limited, usually between 30% and 50%. As a result, recycled content inadequately reflects the recyclability of aluminium building products.

Environmental Product Declarations (EPD) have been developed as a standardised way of communicating the environmental impact of a product, determined using LCA techniques. In Europe, the rules for presenting EPD for construction products are set out in EN 15804.

EN 15804 describes the life stages of a construction

product by means of different 'modules', with *Module A* covering the product and construction process stages, *Module B* the use stage, *Module C* the EoL stage and *Module D* the reuse, recovery and recycling potentials.

As *Module A* reflects only the environmental benefits related to the recycled content in the materials used to manufacture the product, it makes sense to use *Module D* to reflect the additional environmental benefits resulting from recycling of the metal product at EoL. *Module D* reports the additional environmental benefits resulting from EoL recycling, deducting the recycling benefits already considered at the production stage, avoiding any double counting. For example, with a high EoL recycling rate of 90%, a product made of 1kg of metal with 40% recycled content will comprise 0.4kg of recycled metal at the production stage and will report additionally the benefits of 0.5kg of recycled metal produced at the EoL stage (i.e. 90% - 40% = 50%). *Module D* is used by the metal industry to reflect the recycling aspects of metal products on a full life cycle perspective.

An important aspect of CAB's activity is to promote and defend the use of *Modules C* and *D* in EPD. We sit on B/558, the UK mirror committee to CEN/TC 350, the European committee that manages EN 15804 and other important standards related to sustainability in construction. While this activity may not at first sight appear to be at the sharp end of day-to-day activity for our members, we recognise the increasing importance of EPD and their likely future use in building sustainability assessment schemes such as BREEAM and LEED, as well as in providing sustainability data for building information modelling and their possible uptake in regulations such as CE marking and building regulations. It is vital that such initiatives properly consider whole life issues and that metals are not essentially discriminated against by ignoring or discounting EoL.

Through our membership of FAECF (the European Federation of National Window & Curtain Walling Manufacturers' Associations), we are a member of the European alliance, Metals for Buildings. This alliance is at the forefront of promoting the sustainability credentials of metals and in promoting the use of *Module D*.

Circular economy

As the population of the world surpasses seven billion and continues to rise, the earth's finite resources must be shared out between a lot more people. The concept of the circular economy has arisen from consideration of material flows and the need to maintain access to those materials and resources for future use. For a circular materials flow, there is a need to maintain, refurbish, reuse and recycle products at end-of-life, feeding the components and materials back into the lifecycle of the original product. With their durable nature, reusability and excellent recyclability, metals lend themselves to the circular economy.

While consideration of the circular economy has tended to focus on products such as fast-moving consumer goods and short-lived electronic goods, policy makers are seeking to address the circular economy in construction, where the time between manufacture and end-of-life can be relatively long.

For example, the European Commission has adopted an ambitious new circular economy package to help European businesses and consumers to make the transition to a stronger and more circular economy, where resources are used in a more sustainable way. The proposed actions will contribute to 'closing the loop' of product lifecycles through greater recycling and re-use, bringing benefits for both the environment and the economy. The plans aim to extract the maximum value and use from all raw materials, products and waste, fostering energy savings and reducing greenhouse gas emissions. A monitoring framework for ten indicators has been established that should help citizens and policy makers see what works and where more action is needed.

By weight, construction and demolition waste is the single biggest waste stream in the EU. While most member states have reported that they already recover over 70% of their waste, the target set for the EU by 2020, this 'recovery' target includes backfilling, which does not keep the value of the materials in the economy and is therefore not conducive to a circular economy.

While high economic value is the main driver for systematic collection and recycling of aluminium building products at end-of-life, with more than 95% of aluminium products used in buildings collected, there is considerable current interest in developing a closed loop recycling scheme for aluminium building products in the UK. Such a closed loop scheme should allow for closer control of the composition of the recycled material, with a high-quality window profile recycled into another high-quality profile.

Responsible sourcing

Responsible sourcing of construction products should involve managing a product from the point at which materials are mined or harvested, through manufacture, processing, use and end-of-life. This requires management of the supply chain and product stewardship considering social, economic and environmental factors. Responsible sourcing is assessed as part of building sustainability assessment schemes such as BREEAM and LEED.

There are now standards developed specifically for the aluminium value chain – the *Aluminium Stewardship Initiative* (ASI) and *Performance and Chain of Custody Standards*.

ASI's standards are applicable to all stages of aluminium production, specifically: bauxite mining, alumina refining, primary aluminium production, semi-fabrication (rolling, extrusion, forging and casting), material conversion, and refining and re-melting of scrap, as well as material stewardship criteria relevant to downstream users. CAB was part of the ASI standards committee leading up to the launch of the standards in December 2017. Existing ASI members in the 'production and transformation' and 'industrial users' categories are committed to achieving certification against the ASI Performance Standard by the end of 2019.

CAB is also a member of the BSI committee SDS/3/6 – Chain of custody, which is responsible for UK input into ISO/PC 308, currently working on a standard concerning general terminology, concepts, requirements and guidance related to chain of custody. ❐

For more information on CAB's sustainability contact justin.furness@c-a-b.org.uk or visit www.c-a-b.org