FATAL FLAW OF REGULATION

When it comes to building safety, how fire reacts in the real world is all that matters.

The Grenfell Tower tragedy in London has once again put fire safety in the spotlight.

For years Knauf Insulation has supported organisations such as Fire Safe Europe as well as many national campaigns to fight for better building fire safety regulation.

But building fires continue to devastate lives across the world with the Grenfell disaster in the UK in June 2017, the latest in a terrible legacy of tragedy.

In 2012, 19 people including 13 children were killed in a fire that swept through a Qatar shopping mall. A year later, 242 were killed in a nightclub fire in Brazil. In 2014, 32 pensioners died in a blaze in a Canadian care home.

In the United Arab Emirates (UAE), there have been five fires in towers over a height of 34 storeys since New Year's Eve 2015 when a blaze engulfed a 63-storey hotel.

Incredibly, in August 2017, fire swept up one of the world's largest residential buildings, the Torch Tower in the UAE emirate of Dubai, for the second time in two years.

"These terrible incidents and the shocking tragedy of the London Grenfell disaster reinforces our conviction at Knauf Insulation that the right solution for the right application is vital to create a safe and sustainable built environment," says Siân Hughes, Knauf Insulation's Director of External Affairs.

"However, to make such an environment a reality it is essential that the entire building chain is driven by robust regulation. And that means designing the risk of fire out of buildings from the start."

This approach, encouraged by Knauf Insulation and its building fire safety network, is gathering momentum.

In the UAE, a new building code introduced in 2017 means that any insulation in a façade must be non-combustible on any building higher than 15 metres as well as in other public buildings such as malls, theme parks, schools and hospitals. In the Czech Republic and Slovakia, only non-combustible — or materials with limited combustibility — can be used on facades in high-rise buildings. Serbia now requires the installation of non-combustible materials in the facades of all public buildings regardless of height.

Such regulation is highly prescriptive defined by a specific approach to achieve a very specific aim. But what about countries such as the UK where fire regulations are based on lab performance and where extensive testing on products, kits and systems establish how a combination of materials are expected to perform in a fire?

We put real performance at the heart of everything we do because it is the reality by which all buildings will be judged in the future. That is why we invest heavily in research and development, both in testing facilities and ground-breaking 'real world' projects, to understand how our solutions will perform when it comes to thermal and acoustic performance.

But the question has to be asked: has real performance testing reached its limit when it comes to using it as a basis for building fire safety regulation?

"No matter how sophisticated the technology and no matter how extensive the scale or range of modelling research, it is impossible for a test facility to assess the endless factors that could impact how a high risk large building will react in the event of a fire in the real world," says Siân.

It is an opinion shared by Phil Barry, Managing Director of CWB Fire Safety Consultants in the UK and a member of the Institution of Fire Engineers.

He says: *"Fire tests that are recommended in the UK do not ensure that all aspects of modern building construction are scrutinised and the test methods are not appropriate for modern high-rise building situations."*

Issues such as poor installation workmanship, unexpected environmental factors, unpredictable occupant behaviour or simply the impact of ageing that chips away at buildings through constant modification could all further increase fire risk.

"Another major issue that appears to be often over-looked is the fact that building codes around the world permit the use of unprotected areas — i.e. windows — in external walls, with the size and number permitted dependant on the proximity of neighbouring buildings to reduce the risk of fire spread between buildings by radiated heat," Phil says.

"We must design this risk out of these buildings and that means only permitting non-combustible materials in these buildings from the start."

"So we have many situations around the world where buildings have combustible outer walls with unprotected areas which may result in rapidly spreading fire across buildings and into them from the outside."

But at the heart of the debate is the emphasis placed on fire tests. *"For high-rise buildings or for any other building where evacuation is slow or difficult in the event of a fire — such as schools, hospitals or care homes — building fire safety cannot be left to regulation based on results from test facilities because the real-life risks are too high,"* says Siân.

"We must design this risk out of buildings and that means only permitting non-combustible materials in them from the start."

Because when it comes to building safety, how fire reacts in the real world is all that matters.

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FIRE REACTION VS FIRE RESISTANCE

What is the difference between fire reaction and fire resistance?

Reaction to fire describes the combustibility of a material — whether it will burn or not — and fire resistance describes how building elements are expected to behave in the event of a fire.

How is fire reaction defined?

There is a clear definition of a product's reaction to fire and it comes from seven levels of combustibility based on tests for the EN13501-1 European Standard. These 'Euroclasses' start at A1 (non-combustible and doesn't burn) and A2 (limited combustibility) and go down to B, C, D, E and F.

Does that mean the protection offered by non-combustible materials varies?

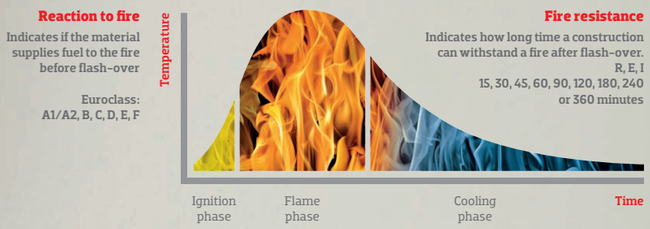
Yes. Tests for A1 and A2 products are designed to show a product is non-combustible, while for the other classes the tests are all about degrees of combustibility. You will know what the Euroclass reaction rating is because it is included on a product's CE Mark. This is a marking demonstrating compliance with the European Construction Product Regulation (CPR) and testing according to the European Standards.

Knauf Insulation products are A1 and A2?

We offer a wide range of A1 and A2 fire-safe insulation solutions for all building applications from Rock Mineral Wool slabs, Glass Mineral Wool rolls and slabs, to Heraklith boards. These products have exceptional fire reaction and fire resistance.

What about fire resistance?

Fire protection classifications are normally reported in terms of a period of fire resistance, for example 30, 60 or 90 minutes. These classifications relate to what is known as the integrity, thermal insulation and load-bearing capacity of building elements. Simply, this means how elements — either in combination or individually — stop a fire spreading, how they restrict temperature rise and how the elements' loadbearing capacity is maintained. The ideal approach would be to have excellent fire reaction materials combined through intelligent system design to give excellent fire resistance in a building element.



NEW FAÇADE REGULATION IN SERBIA

New regulation has been introduced in Serbia that requires the installation of non-combustible materials in the facades of all public buildings regardless of height.

Since 2012, Knauf Insulation and the National Association for Fire Protection (NUZOP) have been campaigning to generate greater awareness of how easily fire can spread through building façades featuring combustible materials as well as highlighting the dangers of toxic gases.

The campaign was given added momentum by nation-wide renovation programmes designed to make public buildings — particularly schools and hospitals — more energy efficient. At the heart of these works it was vital that fire safety was made a priority.

The new law marks a major step forward for Serbia and covers public renovation projects as well as new public buildings and a range of other building types. The previous regulation on facade material use dated back to 1984 and was only for buildings above 22 metres.

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UAE CODE PUTS SAFETY FIRST

New building codes in the United Arab Emirates (UAE) have placed strong emphasis on fire safety following dramatic blazes in high profile buildings in Dubai, Abu Dhabi, Sharjah and Ajman.

Knauf Insulation has consistently campaigned for non-combustible facades in UAE buildings and in 2016 new regulations were introduced in a 780-page Building Code.

Now any insulation in a building façade must be non-combustible on any building higher than 15 metres as well as in public buildings such as malls, theme parks, school and hospitals.

Secondly, everyone in the supply chain — from manufacturers and contractors to specifiers and clients — is responsible for ensuring all cladding system elements have been tested and certified in line with the new fire safety regulations.

Finally, any HVAC elements that contain combustible elements must be encased in non-combustible material.

"The building ambition of the UAE has been extraordinary. In just 40 years the country has created iconic skylines out of desert sand," said David Adams, Managing Director Knauf Exeed. *"Now the authorities have created a serious and comprehensive code that reflects the scale of this ambition."*

LEADING THE CHARGE FOR BETTER FIRE SAFETY

Knauf Insulation is a founding member of, and presides over, Fire Safe Europe (FSEU), an organisation dedicated to improving fire safety in European buildings. FSEU aims to create awareness among policy makers about building fire safety; publicly share expertise from fire-fighters, fire experts, associations and product manufacturers; create a platform for the sharing of ideas about fire safety; advocate for regulation that reflects real performance in a fire and build a network that can make Europe fire safe.

TIMBER-FRAME SUCCESS IN SLOVAKIA

In Slovakia our public affairs team supported national partners to help drive through a technical norm that allows timber-frame buildings to be constructed to a height of up to five storeys. The new regulation replaces codes that previously only allowed timber frame construction up to a height of two storeys. A key condition of the new regulation is that these buildings must be fire-safe — our Mineral Wool offers the ideal solution for the frame to be filled with incombustible material.

FIGHTING FIRE IN HVAC SYSTEMS

Fire safety is the greatest challenge facing any public building and that is why our Technical Solutions division offers fire resistant HVAC solutions that are customised to meet the strictest regulation.

Preventing fire spreading room to room through a building via HVAC systems is a key consideration of specifiers and it is vital that these systems not only block fire but also offer the highest fire resistance.

Our specialists are expert in the wide range of HVAC fire regulations that differ considerably from country to country and — whether an HVAC system uses circular, rectangular or pipe connections — we have effective fire-resistant solutions that can be tailored to fit and meet all standard requirements.

Building on this success we continue to work to develop new HVAC insulation solutions. For example, we recently launched our HVAC Fire-teK system in Switzerland and Finland following certification that met the country's highest fire standards. We are also developing specialist solutions for ships that, unsurprisingly, have to meet some of the toughest fire resistant classifications in the world.

At Technical Solutions, we are also committed to environmental care. All HVAC systems feature our revolutionary ECOSE Technology, which is a binder mainly derived from rapidly renewable materials and with no added formaldehyde. It is also certified Indoor Air Comfort Gold by Eurofins in line with demanding Indoor Air Quality emissions regulation.