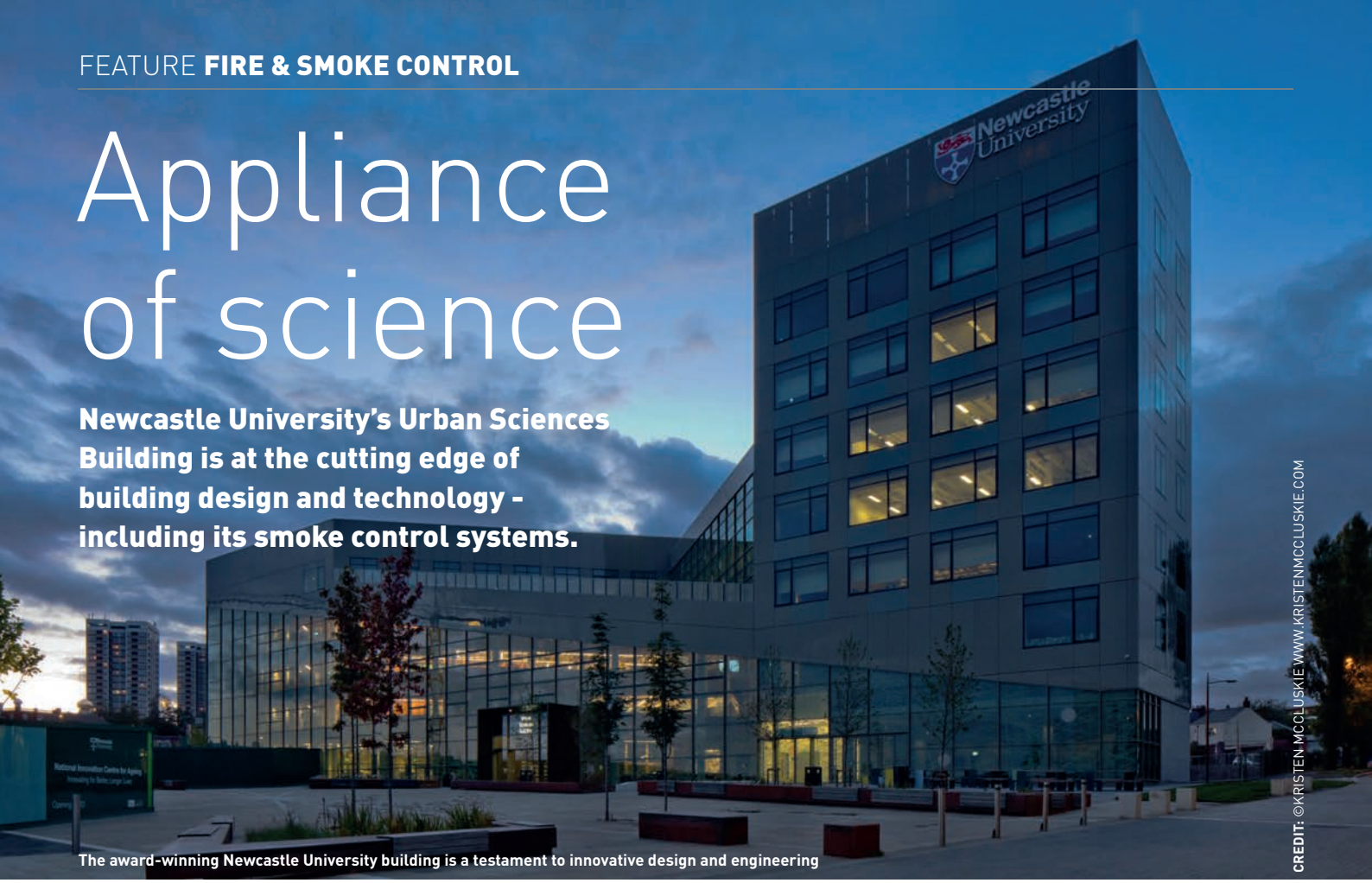
# Appliance of science

**Newcastle University's Urban Sciences Building is at the cutting edge of building design and technology - including its smoke control systems.**




The award-winning Newcastle University building is a testament to innovative design and engineering

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**Newcastle University's multi-award winning Urban Sciences Building (USB) is testament to a combination of advanced engineering, innovative design and energy efficient construction, which are being used for the benefit of the building's occupants, as much as they are for the environment.**

Designed by architects, Hawkins Brown, the 12,800m$^2$ USB is the first structure to be completed on the 9.7 hectare Newcastle Helix development. The building incorporates a range of innovative technologies and sustainable design features including rainwater harvesting and a bio-dome, which uses waste CO2 heat and water from the building to grow food for the university's restaurant.

Also, 4,000 digital sensors and embedded computing technology make it one of the UK's most monitored high performance buildings.

Cladding and glazing systems specialist, Dane Architectural Systems, was involved from the early stages of the project and used Schueco FW 60 + SG, with AWS 114 ventilators, including TipTronic concealed actuators.

A key role for SE Controls was to ensure these vents could be linked to the BMS for managed day-to-day ventilation,

As the automatic opening vents (AOVs) have specific zone requirements and operate in banks of 3 for normal ventilation needs, SE Controls designed the operation of the smoke control system to maintain the functionality and flexibility of the TipTronic control, while integrating with the system and providing effective smoke ventilation to the building in the event of a fire.

SE Controls developed the new OS2 TipTronic SHEVTEC controller, enabling it to provide effective smoke and heat exhaust ventilation (SHEV) to the building. Following the production of a detailed design, SE Controls installed more than 40 of the new controllers in the building.

Andrea Hayward, SE Controls senior key account manager on the project, says: "The Urban Sciences Building is a technological and sustainability tour de force which reflects the advanced research activities undertaken at the university."

Much of the development work undertaken by SE Controls was driven by the company's strict adherence to the various legislation and codes of practice that are necessary within the highly regulated smoke control and fire safety environment.

Will Perkins, SE Controls Group managing director explains: "Smoke ventilation systems such as those used at USB are becoming increasingly complex and perform multiple functions including integral delivery of a building's environmental performance, which in this case is provided in part through the building's automated façade for environmental ventilation."

Key among the product standards are the Construction Product Regulations (CPR), which covers compliance through CE marking, in particular the BS EN12101 suit of standards and BS7346-8 Code of practice for planning, design, installation, commissioning and maintenance.

Within BS EN12101, there are a number of individual parts that focus on specific products including BS EN12101-2 for natural smoke vents and BS EN12101-10 power supplies for smoke control systems. However, a level of diligence is required relating to the components and testing.

For example, actuators and window systems must be tested together as a single product and not as individual components to ensure compliance. Designers should reference the need to evidence Declarations of Performance (DOPs) at tender stage to ensure that what will be installed satisfies these strict safety requirements.

"The EN12101 series is the European standard that covers components of smoke control systems and compliance is mandatory under Construction Product Regulations, importantly to attestation level 1, which requires third party accreditation through a qualified Notified Body," continues Perkins.

SE Controls is also a member of the Smoke Control Association which has drafted guidance which underpins the need to use competent designers, installers and products in order to ensure safe and well designed systems are delivered.

The SCA has also introduced a competent installer scheme, which is now a pre-requisite of membership of the SCA.

Perkins says: "James Brokenshire's report, prepared following Dame Judith Hackitt's' review of building regulations and fire safety, refers to a 'golden thread' which runs through all projects."

Perkins believes that doing things right should not involve

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**The building incorporates a range of innovative renewable technologies, along with numerous sensors and embedded computer technology - making it one of the most monitored high-performance buildings in the UK**

a cost premium. "If competent companies with proven track records of delivery are engaged early in the process to understand the design intent – and are allowed to help steer the project team through the regulatory and performance maze, then the client will ultimately end up with what they wanted."

He adds that by conforming to regulations, clients know that their building and its safety systems are documented, compliant and have planned preventative maintenance in place.

**"The USB is a technological and sustainability tour de force which reflects the advanced research taking place at the University"**

Perkins says: "There is no room for 'cutting corners' after completion in areas such as maintenance and ignorance can lead to catastrophic and potentially life threatening outcomes. BS 7346 Part 8 provides a good reference of how to go about this effectively and in a planned manner.

With greater focus on delivery of safety in buildings, Newcastle University's USB offers a perfect example of Brokenshire's principle of the golden thread' with its vision and innovative design being delivered by specialists to an exceptionally high standard.