

Bringing clarity to regulatory changes

Whitepaper, October 2023

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Introduction

The regulatory system can be a source of frequent misunderstanding and confusion, with many across the industry having a lack of understanding around materials and recent changes to building regulations. This has led to a confidence crisis industrywide with the effect of updated building regulations and their impact. In short, what do these changes mean for products? It is crucial for companies to uphold integrity and ensure they do not exploit this confusion by providing inaccurate information about the impact of these changes on products.

The purpose of this document is not to showcase specific products and their attributes but to provide clear information on what the new legislation means for structural components and responsibilities of those that use them. Our primary purpose is to outline the changes to legislation and who this impacts, the types of products this impacts and how they comply. It is aimed at those who want to understand which products are now compliant under the legislation and also where the responsibility will fall when specified incorrectly.



Building Regulations

Overview and Explanation

The Building Regulations are a set of standards for the design and construction of all buildings. They ensure that buildings are designed and built to be safe for people who are in or around them. These regulations are supported by a series of Approved Documents that provide detailed practical guidance on different aspects of a building's design and construction. This includes structural integrity, fire protection, accessibility, energy performance, acoustic performance, protection against falls, electrical and gas safety. There are also standards for drains, ventilation, protection against the ingress of water and protection against contamination including methane and radon gas.

New Approved Document L 2021 (15th June 2022)

Purpose

The new Part L (Conservation of Fuel and Power) requirements of the Building Regulations aims to reduce carbon emissions in new homes and non-residential buildings by 75%-80% (compared to 2013 standards) in response to climate change. These regulations form a series of Approved Documents that provide guidance on different aspects of a building's design and construction.

The built environment currently contributes approximately 40% of UK greenhouse gases with around 17% of this coming from new and existing homes¹. Improving the energy performance of buildings will not only reduce greenhouse gas emissions but also reduce the cost of energy in occupation.

It is anticipated that changes to Part L of the Building Regulations (2025) will have the following effects:

- More stringent requirements for building services such as mandatory space for hot water storage, solar PV or heat pump technology and the phasing out of combi boilers.
- Significant improvements to building fabric (including insulation), thermal bridging and airtightness.
- Increased documentation of evidence of compliance on site – photographic evidence required for all plots.

¹ Heat and Buildings Strategy, HM Government (2021), p.29

New Approved Document B (December 2022)

Purpose

The tragic fire at the Grenfell Tower site on 14th June 2017 led the Government to undertake a root and branch review of the Fire Regulations (Approved Document B).

Following this careful review, The Building (Amendment) Regulations 2018 were introduced on 21 December 2018, which introduced a ban on the use of combustible materials in external walls for all buildings. This applies to any building work (as defined in regulation 3) carried out in or on a building in scope of the ban (as defined in regulation 7(4)).

Fire Resistance and Reaction to Fire

The distinction between fire resistance and reaction to fire can be a source of confusion. Regulation 7(2) of the Building Regulations specifically focuses on "reaction to fire," which refers to how a material behaves when subjected to fire. This regulation considers three key factors: the material's contribution to flame propagation, the amount of smoke generated by the material during a fire, and the material's production of flaming droplets and particles.

In addition to the regulations governing reaction to fire, there are also rules concerning the "fire resistance" of structures. This is the duration a structure can withstand a fire and is also known as the "REI" rating. The duration in minutes is provided in relation to a structural system's ability to resist the following aspects related to fire. It can be rated against one or more of these functions:

- **R = Load-bearing** – continue to support the required load
- **E = Integrity** – prevent the passage of gas / vapours through the structure
- **I = Thermal insulation** – prevent the passage of heat through the system



What are the key changes and what do they mean for:

Masonry Products

Thermal Performance

Whilst the Part L requirements for hot water storage and the potential changes to boiler types are significant, it is the introduction of new minimum building fabric requirements, which may have a knock-on effect for masonry products.

The new FEES (Fabric Energy Efficiency Standard) requirements, which remain in Part L, will be integral to the Future Homes Standard 2025. The FEES will set the performance levels for the building fabric and can be achieved in one of two ways;

- Improve the airtightness of the fabric through installation of better fitting and more thermally efficient doors and windows.
- Increase the thickness of insulation within the cavity wall.

Improvements to airtightness do not affect the design of masonry products, however the increase of insulation thickness would inevitably increase the cavity width. Increased cavity widths will require the redesign of some common products found in all cavity walls such as wall ties, lintels and masonry support systems. Other products such as cavity trays and fire barriers and any other items dimensionally designed around current cavity widths may also be impacted.

Initial estimates suggest external cavity walls may move from 150mm wide cavities up to around 250mm wide cavities. Party walls are expected to move from around 100mm wide to 200mm wide.

The changes to Parts F and O are not expected to affect masonry products.

Fire

From a Leviat perspective, the ban on combustible materials has had minimal impact on masonry products. As a manufacturer of primarily stainless steel components for the construction industry, stainless steel is already designated "Reaction to fire class A1" according to Decision 94/611/EC implementing Article 20 of 89/106/EEC.

Additionally, components supplied by Leviat which are not manufactured using stainless steel e.g. isolation gaskets, thermal breaks and some fixing components are included in a list of exemptions under *The Building (Amendment) Regulations 2018*.

Leviat did however endeavour to adopt best practice where possible and selected materials that performed both structurally and met the required standard e.g. the Ancon Thermal Break for use with masonry support brackets, which is designated A2_s1-d0 to BS EN 13501-1:2007+A1:2009 (limited combustibility, lowest production of smoke and zero production of flaming droplets / particles).

Structural Thermal Breaks

Thermal Performance

The most recent changes to Part L and the changes that are anticipated in 2025 do not have a direct impact on concrete reinforcement products. Balcony connectors and other elements which pass through the external building envelope, creating a thermal bridge, are addressed in Part L as shown in the below extracts. These aspects of the Building Regulations have not changed recently.

Section 4:

Limiting heat gains and losses

4.9 a. The insulation should be reasonably continuous across newly built elements.

b. Thermal bridging, including at the party wall, should be reasonably limited.

4.11 Thermal bridging should be addressed in the design and construction of a building by either of the following means.

a. Using construction joint details calculated by a person with suitable expertise and experience, which can then be used in the building primary energy rate and building emission rate calculations. Construction joint details should be calculated using both of the following.

i. The guidance set out in the Building Research Establishment's BR 497.

ii. A process flow sequence that has been provided to the building control body indicating the way in which the detail should be constructed.

4.12 To calculate linear thermal transmittances and temperature factors in support of the approaches in paragraph 4.11a, follow the guidance in the Building Research Establishment's BR 497. Specified construction details should achieve a temperature factor that is no worse than the performance set out in the Building Research Establishment's Information Paper 1/06.

The key aspect from Part L with which balcony connectors need to comply is the calculated Temperature Factor in accordance with the BRE's Information Paper 1/06. This parameter is dependent on the surrounding building envelope as well as the Levia product. An independent specialist analysed typical examples of the (S)STC and (S)STS balcony connectors in 'typical' building envelopes to demonstrate that in the analysed scenarios the products achieved the required Temperature Factors for a wide range of building types.

Type of building	Critical temperature factor for avoiding mould growth in buildings, f_{CRai}	Ancon STC when used with a typical insulated render wall $f_{Rai} = 0.790$	Ancon SSTC when used with a typical insulated render wall $f_{Rai} = 0.860$
Dwellings; residential buildings; schools	0.75	✓	✓
Swimming pools (including a dwelling with an indoor swimming pool)	0.90	✗	✗

Type of building	Critical temperature factor for limiting the risk of surface condensation, f_{CRsi}	Ancon STC when used with a typical insulated render wall $f_{Rai} = 0.790$	Ancon SSTC when used with a typical insulated render wall $f_{Rai} = 0.860$
Storage buildings	0.30	✓	✓
Offices, retail premises	0.50	✓	✓
Sports halls, kitchens, canteens; buildings heated with un-flued gas heaters	0.80	✗	✓
Buildings with high humidity: eg. swimming pools, laundries, breweries	0.90	✗	✗



For a building to comply with Part L there are many further requirements. The presence of balcony connectors and their properties need to be considered in these full building assessments, for which the assessor will need to know the point thermal transmittance associated with each of the thermal bridges. So, although these aspects are important the full building compliance is dependent on these values in the context of the whole building.

Fire

In December 2018, a new Regulation was introduced: Regulation 7(2) and associated with that, Regulations 7(3) and 7(4). This regulation deals with materials and workmanship, focusing on the structural performance and integrity of buildings. It specifies certain standards, requirements, or tests that concrete reinforcement products must meet to ensure their suitability for use in a construction project.

The new regulation says:

Regulation 7

- (2) *Subject to paragraph (3), building work shall be carried out so that materials which become part of an external wall, or specified attachment of a relevant building are of European Classification A2-s1,d0 or Class A1, classified in accordance with BS EN 13501-1:2007+A1:2009 entitled "Fire classification of construction products and building elements. Classification using test data from reaction to fire tests".*
- (3) *Paragraph lists exemptions to paragraph (2) including*
- (a) *cavity trays when used between two leaves of masonry;*
 - (i) *thermal break materials where the inclusion of the materials is necessary to meet the thermal bridging requirements of Part L of schedule 1*
- (4) *In this regulation –*
- (a) *a "relevant building" means a building with a storey ... at least 18 metres above ground level and which –*
 - (i) *contains one or more dwellings;*
 - (ii) *contains an institution; or*
 - (iii) *contains a room for residential purposes*

Prior to the adoption of Regulation 7, the requirement was for any insulation product, filler material etc. used in the construction of an external wall to be of limited combustibility. According to Appendix A, a material of limited combustibility is defined as class A2-s3,d2 or better. Such materials do not necessarily have to be tested, and other means of evaluation are permitted. By way of comparison, testing of materials is mandatory to demonstrate that they meet European classification A2-s1,d0, or Class A1, under Regulation 7 requirements.

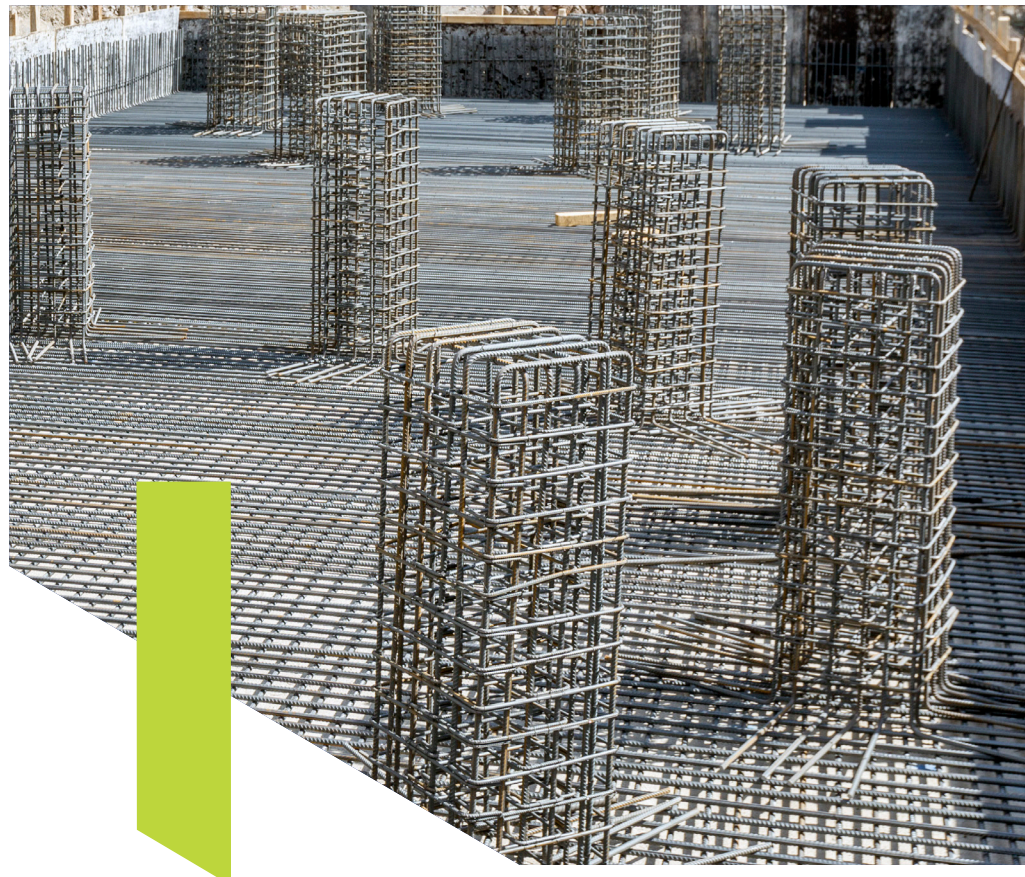
It is important to note that Regulation 7(3) lists items that are part of an external wall and do not have to comply with Regulation 7(2) such as cavity trays and thermal break pads. However, being mindful of the significant shift in requirements regarding combustibility of materials within an external wall, Leviat decided to apply the higher threshold to the thermal break pad used in (S) STS and (S)STC balcony connectors. There are some components of Leviat products that are combustible and that

are used within the external wall build-up – for which the dispensation permitted by Regulation 7(3) is applicable (e.g Plastic casing of thermal insulation for Halfen HIT balcony connector).

Leviat's Structural Thermal Breaks

Ancon (S)STS and (S)STC balcony connectors do not have a fire resistance rating. In order to provide for fire resistance, the building designer would need to consider the fire resistance system separately. It would be typical for an Ancon (S)STS or Ancon (S)STC bracket to be encapsulated in a proprietary fire protection casing. Should compartmentation be required, fire resistance rated board should be installed continuously between Ancon (S)STS or Ancon (S)STC brackets along the perimeter of the slab-wall interface.

On the other hand, a linear system such as the Halfen HIT balcony connector has a fire resistance rating of REI 120 as standard.



Future Homes Standard 2025

Purpose

The Future Homes Standard [FHS] was announced in the Government's spring statement 2019 and is scheduled to come into effect in 2025. This will follow up on the 2021 Building Regulations changes. The 2021 changes were introduced to provide an 'interim uplift' to build up the required skills and supply chain in preparation for the FHS, which is due to be codified into the Building Regulations in 2025. The Future Homes Standard will complement the Building Regulations to ensure new homes will produce 75%-80% less carbon than homes delivered to current regulations.



Future Buildings Standard 2025

Purpose

The Future Buildings Standard (FBS) proposes changes to Part L and Part F of the Building Regulations which cover fuel and power conservation and ventilation in new non-domestic properties. Following the FHS, the Future Buildings Standard is a broader initiative and has put the spotlight on decarbonising all non-domestic buildings across a range of sectors from offices to hotels and warehouses. The government introduced an 'interim uplift' in standards from 15 June 2022 with new non-domestic buildings to deliver CO₂ savings of 27% compared to current standards, through a combination of low carbon heating and increased fabric standards. These reforms will lay the groundwork for the forthcoming implementation of the Future Buildings Standard which will come into force in 2025 with more stringent demands.



Product Certification

CE and UKCA Marking

Following the UK's decision to leave the European Union, it has become necessary to adopt a route to certification for products previously covered by harmonised European standards and their associated CE marking certification process. Previously any product covered by a harmonised European standard had to carry a CE (Conformité Européenne) mark and this was deemed to be proof that the product met the standards required by European law. The CE Certification scheme:

- Showed that the manufacturer had checked that these products met EU safety, health or environmental requirements
- Was an indicator of a product's compliance with EU legislation
- Allowed the free movement of products within the European market.

As the UK diverges from EU legislation, the UK Government has introduced the UKCA mark. Various dates have been tabled for its mandatory introduction and a recent postponement gives the latest date of introduction for construction products as 1st July 2025.

In the case of UK manufacturers, this will require different marking and approvals for placing on the UK market (UKCA) and for countries within the Eurozone (CE).

Impact on Masonry Products

These changes to the certification of products will have a direct impact on any product that falls under the scope of a harmonised European standard. This is not limited to just the paperwork as any product carrying a CE mark must be tested by a certified European "notified body" and any product placed on the UK market must be tested at a UK "approved body".

It may therefore be necessary to either re-test products at a facility in the intended sale geography with the appropriate qualification or arrange for a transfer of responsibility between a notified body and an approved body (underwriting).

This affects products such as masonry support systems, wall ties and lintels. Leviat has already carried out the required review and the correct paperwork is in place for both the European economic area and the UK.

Impact on Concrete Reinforcement Products

The topic of UKCA marking for construction products is complex, and the repeated extensions of the deadline highlight its intricacies and challenges.

In relation to concrete reinforcement products, before considering the introduction of UKCA and UKNI marking, it is worth considering CE marking itself. The CE Mark is only applicable to products covered by a harmonised standard (or a European Technical Assessment – relating to products which may not be covered by a harmonised standard). Unfortunately, as yet, there is no such 'harmonised' standard for reinforcing steel. BS EN 10090 is not a harmonised standard. Many ancillary products for reinforced concrete (which may or may not incorporate reinforcement steel) are not covered by harmonised standards either. A further complication is that the requirements/standards vary from country to country. A European Technical Assessment (ETA), for example, which can be developed based on EN standards will need to be amended for specific country requirements, therefore it is not directly applicable across the whole of Europe.

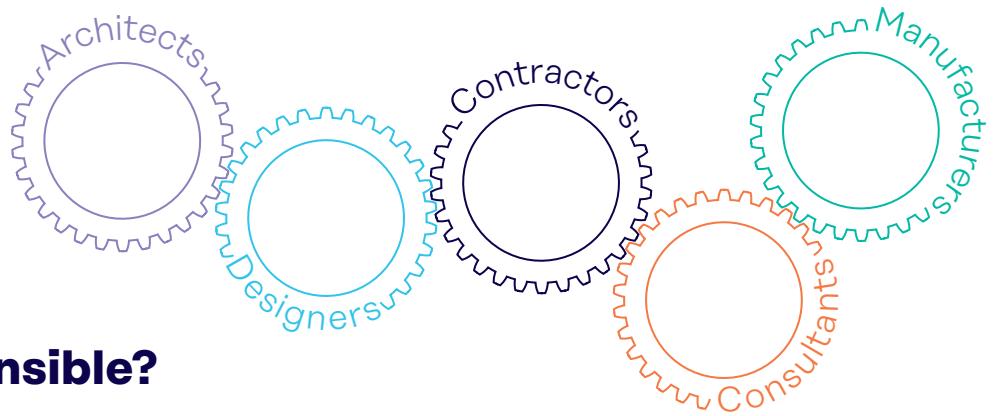
The CARES scheme is a voluntary approvals scheme that covers this gap to some extent in



the UK market. The CARES Steel for the Reinforcement of Concrete (SRC) scheme provides independent assurance of the consistency of product quality and, critically, gives the market a product that is traceable across the whole supply chain, ensuring that steel reinforcement products are effectively tested, certified, marketed and traced. CARES has a system of certification to provide user confidence via a Technical Approval Procedure which addresses the ancillary products for reinforced concrete such as couplers, punching shear reinforcement and continuity systems.

Some products combine parts which are covered by harmonised standards and parts which are not, such as the Ancon Steel to Concrete ((S) STC) Insulated Balcony Connector. This two-part product combines a steel fabricated bracket and a cast-in anchorage system. The steel bracket complies with all UKCA and CE requirements and is certified accordingly to EN 1993 (EC3) for design and to EN 1090 for manufacturing. However, there is no harmonised standard covering the cast-in anchorage component, therefore it is not certified and does not carry the CE mark or UKCA mark.

Within the Leviat range of reinforced concrete products there are some without CE marking and some with CE marking (where European Technical Assessments have been completed). For those products on the UK market, some have CARES approval and some do not.



Who is Responsible?

The design and construction of buildings is a joint responsibility across the entire supply chain from architects and designers to contractor, consultants and manufacturers. By working together, we can improve the quality of a building and ensure they perform as designed with respect to fire, thermal and acoustic requirements.

In response to the Grenfell Tower tragedy, The Building Safety Act 2022 brought safety to the forefront of the industry. At its heart is the legal obligation for all individuals and organisations to be competent to ensure compliance with the Building Regulations in both design and construction.

Dame Judith Hackitt's Golden Thread

In her report, 'Building a Safer Future: Independent Review of Building Regulations and Fire Safety', Dame Judith Hackitt proposed the adoption of a golden thread of information to preserve a property's original design intent. The golden thread essentially provides a digital audit trail of information, which is passed along the supply chain, in order to provide transparency and accountability throughout the life of a building. It is proposed that keeping a permanent digital record of the material composition of a building's fabric, for example, will ensure regulatory fire safety and energy performance is maintained in the event of structural alterations. It also acts to ensure that what has been built is 'as designed'.

The Government has made a commitment to implement Hackitt's golden thread recommendations as part of a more stringent building regulatory regime.

The Importance of Early Involvement

It is incumbent on all parties to have a role in ensuring that buildings perform as designed. A manufacturer may only be involved in a very narrow aspect of an overall building, but if they can engage with designers, specifiers and contractors from the outset then they can make sure that whatever product is provided will be compatible and fit for purpose with the rest of their scheme.

Engagement and communication throughout the supply chain at the earliest stages of a project will lead to effective collaboration and a reduction in project risk. This will optimise a building's design, improve buildability and create opportunities for innovation.

Installation and Competency

Installation also plays an important part in the performance of a product. In the first instance manufacturers must ensure the product is designed and developed to be as easy to install as possible. When a product is overly complex, the risk of failure will be multiplied. Users need to know how products will fit together. Installation instructions and layout drawings are also important for the installer as they show a best practice step-by-step guide. Furthermore, it is important to accurately label products so that when they arrive on site, they can be easily referenced and identified by contractors as to the different sizes and product types.

In short, it's about ensuring the design of the product is as simple as possible, and then having the relevant aids for the installer once the products are on site to make sure that the product is installed properly. Manufacturers should not be in a situation where they need to be on site to guide somebody, it should be as simple as possible for the user to install.

A product should be selected based on a standard detail from a manufacturer and then a competent installer needs to be able to demonstrate they have installed the solution based on that standard detail. This becomes an audit trail and demonstration of compliance with building regulations.



Summary

The construction industry is characterised by its constant evolution, with new advancements and practices emerging regularly. In order to thrive in this dynamic environment, it is crucial for all those involved in the construction of buildings to embrace and adapt to these changes. Regulations governing the industry also undergo frequent modifications, reflecting the need to address emerging challenges and ensure compliance with evolving standards. It is anticipated that legislation, especially concerning thermal performance, will become increasingly stringent in the future.

As a critical part of the supply chain, Leviat remains actively engaged in monitoring and participating in regulatory changes. We maintain a continuous feedback loop, integrating insights from our research and development activities as well as training initiatives.

This document will be periodically reviewed to incorporate any further alterations to legislation, allowing us to stay at the forefront of industry requirements and deliver the highest standards of quality and compliance.





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