

Curtain walling and the Construction Products Regulations



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This paper describes the current position on the Construction Products Regulation as it will apply to curtain walling in the UK.

The Construction Products Regulation will apply to all curtain walling ranging from the largest bespoke projects to a simple screen on a stair well.

The Construction Products Regulation will have an impact on:

- Specialist contractors
- System suppliers
- Component suppliers

Architects and main contractors need to be aware of the changes inherent in the Construction Products Regulation.

Construction Products Regulation

The European Commission Construction Products Directive has been in existence since 1988. It entered into UK law as the Construction Products Regulations UK 1991 but the UK and Eire opted out of parts of the directive. While CE marking of construction products has been mandatory in most countries of the EU it has not been required in the UK.

The Construction Products Directive has become the Construction Products Regulation which was passed by the European Commission and published in the Official Journal on 4 April 2011 and it takes full effect in 2013. There is no possibility for countries to opt out of the Construction Products Regulation and CE marking will be required in the UK from 1 July 2013.

Curtain walling is a construction product and is covered by the harmonised European Standard EN 13830, as a result CE marking will apply to all curtain walling from 1 July 2013.

CE Marking

The CE mark may be applied to any construction product for which there is a harmonised Product Standard (hEN) or a European Technical Assessment Agreement (ETAG). A CE mark shows the performance of a construction product with regard to the essential requirements:

- Mechanical Resistance and Stability
- Safety in case of Fire
- Hygiene, Health and the Environment
- Safety in Use
- Protection against Noise
- Energy Economy and Heat Retention
- Sustainable use of natural resources

The responsibility for CE marking of a curtain wall lies with the specialist contractor but system and component suppliers will need to test their products.

EN 13830 Product Standard for Curtain walling

The current product standard is published as BS EN 13830:2003. This covers fire performance, weathertightness, wind loading, other applied loads, impact and thermal transmittance.

A revised product standard is being drafted with the aim to publish late in 2012. This has an extended scope that now includes durability in addition to the performance characteristics described in EN 13830:2003. The underlying test methods for air, water and wind testing remain unchanged. However, the revised product standard contains far more detailed requirements for the other aspects of performance.

The main changes to the standard that will impact in the UK are:

- A requirement to use Eurocodes for calculating loads and structural performance
- Requirements for testing fire stopping
- Assessment of U-value
- Assessment of flanking sound transmission
- Assessment of radiation properties

The revision to EN 13830 is currently available as a working draft. CWCT represent the UK on the drafting committee CEN TC33 WG6.

Implementation in the UK market

A CE mark must list all of the performance characteristics scheduled in the Harmonised Standard. However, performance levels or classes may be shown or 'NPD' may be used to signify that no performance has been determined. 'NPD' is not allowed for any performance characteristic that is either:

- mandatory in the harmonised standard
- required by National Regulations

A correlation between the performance requirements of the harmonised standard EN 13830 and the Building Regulations in different parts of the UK are given in Annex A

Performance characteristics always required

Considering the Building Regulations and product standard EN 13830 classes or levels of performance will always have to be stated for the following performance characteristics;

- Reaction to fire
- Fire propagation
- Resistance to windload (safety)
- Horizontal live load (Barrier load)
- Thermal transmittance
- Radiation properties
- Durability

Performance characteristics sometimes required

Considering the Building Regulations and product standard EN 13830 classes or levels of performance will sometimes have to be stated for the following performance characteristics.

- Resistance to fire
- Resistance to snow load
- Flanking sound transmission

Other performance characteristics

Considering the Building Regulations and product standard EN 13830 classes or levels of performance may not have to be stated for the following performance characteristics.

- Watertightness
- Resistance to self-weight
- Impact resistance
- Thermal shock resistance
- Direct air borne sound
- Air permeability

Note that putting 'No Performance Determined' against these performance characteristics may not be a good selling point for a curtain wall contractor. 'NPD' will not be allowed for some or all of these performance characteristics in all national markets within the EU and importers may declare classes or values for these characteristics. UK companies that export may have to declare classes or values in other markets and may also do so in the UK.

Responsibility for CE marking

The performance declared on the CE mark is the performance of the whole wall including framing members, infill, glazing, flashings and closures. Clearly the performance can only be determined by the company that is responsible for design and manufacture of the wall, the specialist contractor.

Clearly a company supplying a framing system but not supplying infill panels and glazing cannot determine the reaction to fire, resistance to horizontal load, thermal transmittance, radiation properties or durability of a whole curtain wall.

Implications for specialist contractors

Specialist contractors will, in nearly all cases except for fire resistance, be allowed to self attest the performance of a curtain wall. They will not require ISO 9000 or similar accreditation or supervision from any third party unless they undertake testing in their own test facilities.

Specialist contractors will be able to use test results from system and component suppliers when assessing performance of a wall; a process known as cascading initial type testing.

Specialist contractors will however be required to operate 'a factory production control system to control incoming materials and components, equipment, the production process and the product'.

The specialist contractor will also be required to 'document the various stages in the design of products, identify the checking procedure and those individuals responsible for all stages of design and keep a record of all checks, their results, and any corrective actions taken.' It follows that design should be undertaken by appropriately qualified individuals.

Records of the design and manufacturing process have to be retained for a period of 10 years.

Implication for system suppliers

Framing systems will have to be tested for wind safety as a minimum and U-Values will have to be calculated for framing systems. It is likely that specialist contractors will also require test results for watertightness, air permeability and impact. These are most economical if undertaken once by the system company, as initial type testing, and passed to specialist contractors.

System suppliers currently assist specialist contractors to a greater or lesser extent with structural and thermal calculations. There is likely to be greater demand for this support and system companies will have to ensure that calculation methods, charts, look-up tables and software comply with the requirements of EN 13830, EN 1990, EN 1999, EN 13947 and so on...

Enforcement of the Construction Products Regulations

In the UK the Construction Products Regulations will be enforced by Trading Standards Officers. This is a new area of activity for trading standards officers and it remains to be seen how they will enforce the regulations and how diligently.

Trading Standards Officers can ask to see all documentation connected with the design process or production process for a period of ten years following construction of a curtain wall.

The way forward

The Department of Communities and Local Government are currently consulting on detailed implementation of the construction products directive in the UK. CWCT have been identified as one of the bodies to be consulted on curtain walling.

CWCT will be holding meetings with system suppliers and specialist contractors to identify a workable approach to CE marking curtain walling and formulate a method of implementing it.

CWCT will lobby for clarification of some requirements in the Building Regulations and seek to develop standard details that reduce the need for testing of fire stopping and acoustic barriers.

EN 13830 allows for test results to be carried over to a wall of similar construction to reduce the need for testing. However, the rules for assessing similarity are unclear and capable of misuse. CWCT will work with the industry to develop a fair and uniform approach to assessing similarity and transferability of test results.

CWCT will work with specialist contractors and system companies to develop suitable training for designers, particularly in relation to the use of structural Eurocodes and assessment of thermal transmittance and radiation properties.

CWCT will work with its architect and contractor members to make the construction industry aware of how to specify and accept curtain walling in the context of CE marking.

The CWCT 'Standard for systemised building envelopes' is fully consistent with the requirements of EN 13830 but contains additional information of use in the UK. It will be maintained as non-contradictory complimentary information for curtain walling. It will remain the standard for ventilated rainscreen walls and non-standard forms of envelope construction.

On projects within the EU that are wholly privately funded the specifier may still ask for tests other than those in EN 13830 and may still ask for the CWCT dynamic water test using the aero-engine.

Annex A – Performance characteristics

| Characteristic | England and Wales | Scotland | NI | Standard | Comment |
|----------------------------------|--------------------------|------------------|------------------|-----------------|--|
| Reaction to fire | AD B | Section 2 | Booklet E | EN 13501-1 | Will always require CE marking |
| Fire resistance | AD B | Section 2 | Booklet E | EN 1364-3 | Only requires CE marking if performance required |
| Fire propagation | AD B | Section 2 | Booklet E | EN 1364-4 | Will always require CE marking |
| Watertightness | <i>AD C</i> | <i>Section C</i> | | EN 12154 | Not explicitly required in Building Regulations but may be CE marked |
| Resistance to own weight | AD A | Section 1 | | Threshold | Will always require CE marking |
| Wind load resistance | AD A | Section 1 | Booklet D | EN 13116 | Will always require CE marking for wind load safety |
| Resistance to snow load | AD A | Section 1 | Booklet D | EN 13830 | Will require CE marking for sloping portions of a wall |
| Impact resistance | | | | EN 14019 | Not explicitly required in Building Regulations but may be CE marked |
| Barrier load | AD K | <i>Section 4</i> | Booklet H | EN 1990 | Will always require CE marking although not explicitly required in Scotland |
| Seismic resistance | | | | | |
| Direct airborne sound resistance | | Section 5 | <i>Booklet G</i> | EN 717-1 | CE marking required for mixed development use in Scotland. NI regulations are not explicit. |
| Flanking sound transmission | AD F ₄ | Section 5 | <i>Booklet G</i> | EN 717-1 | Will always require CE marking in Scotland Will require CE marking in England and Wales for dwellings |
| Thermal transmittance | AD L | Section 6 | Booklet F | EN 13947 | Will always require CE marking |
| Air permeability | <i>AD L</i> | <i>Section 6</i> | <i>Booklet F</i> | EN 12152 | Not explicitly required in Building Regulations |
| Radiation properties | AD L | Section 6 | Booklet F | EN 410 | Will always require CE marking |
| Durability | | | | Threshold | |