Representative Product Type approach to CE marking

1 Introduction

This proposal is based on experience from Danish regulation and is intended for how CPR implementation can be carried out in a pragmatic way that is financially and operationally feasible even for smaller companies, while achieving a higher degree of comparability between product systems without compromising the relevance of the information at building level. The intention of this proposal is to meet Commission request for a simplification on product level without jeopardising the performance on building level.

The “Representative Product Type approach” described in detail below within the framework of Assessment and Verification Systems (AVS) 3 includes the following key steps:

1. Representative Product Types (RPTs) are defined for each representative element in a product system, equipped with standard glass and a standard spacer.
2. The essential characteristics for the Representative Product Types (RPTs) in specified reference sizes are determined by a Notified Body.
3. The manufacturer declares the values for the RPT from the Notified Body in the DoPC.
4. The values of the actual product are determined by the manufacturer and specified in the General Product Information (GPI).

1.1 The number of product combinations is infinite

Most manufacturers use product systems as a key concept both in production and in marketing. The different product systems often differ by material, design, and IGU construction (double/triple).
A product system could, for example, be: “windows and doors with triple glazing and constructed in timber with aluminium cladding”, while another could be “windows and doors with double glazing and constructed in timber with aluminium cladding”.

Within each product system, however, there will in theory be an infinite number of combinations, as elements may consist of a varying geometry, number of glass layers, glass thicknesses, glass types/functions, opening methods and functions.
In practice, a typical order will therefore contain almost as many variants as there are elements. Following the strictest interpretation, the product type definition results in a requirement to issue a DoPC for each individual element produced.

1.2 Declaration at element level is not the intention

Based on the feedback from the Commission we understand that the intention is that CE marking should be performed to an extent that ensures the declared values are representative at building level. Likewise, it is our understanding that the Commission is seeking a methodology that does not impose unnecessary financial, capacity, and resource demands on manufacturers.

This supports an approach based on declaring representative elements for each product system. At the same time, it reduces the risk of generating large volumes of data with only limited practical value, as the impact at building level is negligible.

1.3 Ability to compare different product systems

The main advantage of declaring key characteristics using representative elements is that it enables a very simple comparison of performance across different product systems. Performance cannot be “blurred” by geometry, glazing selection, or similar factors.
This will likely also be used in manufacturers’ marketing material, as it is difficult to imagine marketing material being tailored to each individual project.

To enable customers to make informed decisions, declarations on Representative Product Type are therefore an important tool.

This is supported by Article 22(5)

> *The manufacturer shall display to customers, in a visible manner,* ***before they are bound by a sales contract****, including in the case of distance selling,* ***the information which must be provided pursuant to this Regulation***

and Recital 54

> *users shall be able to make informed choices*

Comparability is considered a strong argument, contributing to a transparent market and enabling customers to make informed choices in due time.

1.4 Regulation and product development

In Denmark and several other countries, requirements (e.g. for U-values) are based on reference elements, such as an openable single-light element measuring 1.23 x 1.48 m.
Over the last 15 years, there is nothing to indicate that this has slowed down development — on the contrary, because the requirements have been clear to manufacturers.

At the same time, it has been easy for authorities to set future targets, as these targets are defined for the reference elements. In Denmark, timely and clear communication of such future targets by the authorities has enabled manufacturers to prepare for upcoming requirements, providing certainty for investments in the necessary product development.
In practice, this means that the stated future targets have often been achieved before the requirement entered into force.

A similar situation is seen for LCA data, where data are declared per m² at product system level according to EN 15804 and EN 17213, which also point towards the use of representative elements.
At present, no national product requirements have been set in this area, but experience from, among others, Denmark shows that when requirements are set at building level, this drives clear development work at product level. As for U-values, declaring at product-system level has resulted in an unambiguous basis for comparison.

2 Proposed definition of product systems

Under AVS 3, the Notified Body has, among other tasks, the following responsibility:

> *confirmation that the product type and the product category were correctly determined*

In this context, it would be appropriate to apply the same methodology for defining product systems that is already used by manufacturers and customers:

- Material combination (inside/outside)
- Design, primarily the height of the frame/sash construction

This approach supports Recital 43.

> *manufacturers should be prohibited from creating ever new product types where the products in question are, in view of the crucial characteristics, identical*

while ensuring that each product system is clearly defined.

Involving the Notified Body in this would ensure a professionally sound and credible determination.

3 Proposed Representative Product Type (RPT) for essential characteristics

While the current, widely accepted **Range of direct application** for most characteristics can be carried over into the new standards, for certain characteristics there will be a need to define representative elements — specifically the following:

- Thermal performance
- Acoustic performance
- Emissions to indoor air
- Environmental Sustainability

For **the reference size of RPT**, the following is proposed:

- Single window (openable)
  - 1,23 x 1,48
- Double window (one openable one fixed)
  - 1,48 x 2,18
- Door height window / door
  - 1,23 x 2,18
- Sliding door (2-leaf)
  - 3,00 x 2,18
- Folding door (3-leaf)
  - 3,00 x 2,18

For all of the above, the declaration is based on the product system's standard glazing and standard spacer (defined by the manufacturer according to the rules given in the harmonised technical specification). It could be distinguished between different number of glass layers (e.g. double, e.g. 4 – 16 – 4 or triple glazing, e.g. 4 – 12 – 4 – 12 – 4).
The component input values (e.g. U_f-values and Ψ-values) are based on the representative element.

4 The values of actual product are provided in the General Product Information

In a building's design process, the properties and performance of the individual construction products are used by architects and planners to evaluate the performance of the building.

In connection with a quotation and/or an order and/or delivery note the manufacturer can provide the products' actual values in the quotation or order documentation, which will then also form part of the General Product Information.

As a check, the values of the actual product can be calculated based on the declared characteristics, with deviations assessed as negligible at building level.

5 Significance at building level

An assessment performed for a single-family house in Denmark showed deviations of approximately 3% for primary energy use and 3.5% for net energy demand when comparing calculations based on reference sizes with calculations based on actual values. This indicates that the declared values remain representative at building level.

There are also studies from other countries like France concluding similar results.

6 Summary

The deviations that arise when calculations are based on representative elements are not considered significant, and the declared values provide a good expression of the performance of the various product systems.

NB's confirmation that the product type and the product category were correctly determined

Because NB involvement under AVS 3 in confirming the product type would in practice be an unsolvable task if it had to be done at element level, it is possible to envisage that the NB confirms a matrix of essential characteristics established by the manufacturer for the product system using Representative Product Types.

This would largely be based on the practice used so far with range of direct application given in the harmonised technical specification, supplemented by the additions described in this document.

The NB's confirmation would thus consist of a Representative Product Type description, supplemented by a list of characteristics, their test methods and their field of application.

7 Concluding remark

CE marking of made-to-measure products — here windows and doors — based on representative product types rather than declaration at element level is considered a complete, pragmatic and usable approach.

Because the number of real variants in practice is almost infinite, a strict interpretation would lead to disproportionate costs and data volumes with no meaningful effect at building level.

A representative approach, on the other hand, will ensure sufficient accuracy at building level, create a clear and comparable basis between product systems and support a more transparent market where customers can make informed choices early in the sales and design process.

Experience from both U-value regulation and LCA declarations shows that representative elements can function as a robust and development-enabling steering principle.

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About EuroWindoor AISBL – EuroWindoor AISBL was founded as an international non-profit Association, in order to represent the interests of the European window, door and facade (curtain walling) sector. Our 20 national associations speak for European window, door and facade manufacturers that are in direct contact with consumers, and thereby having large insights on consumers' demands and expectations. We are at the forefront interacting with dealers, installers and consumers buying windows and doors, and the companies behind the associations cover selling all over Europe.

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