

INPUT TO 30th SEPTEMBER ECODESIGN CONSULTATION FORUM ON WINDOW PRODUCTS

Introduction

European Aluminium would like to remind that the main bottleneck hindering the market uptake of high performance window products is the too low renovation rate in Europe, currently only about 1% per year.

► **The priority of EU Institutions should therefore remain to increase the renovation rates of the EU building stock. Whether an energy labelling measure for windows would serve this purpose has not been demonstrated.**

European Aluminium would also like to highlight that the market structure of windows is very different from the market structure encountered for household appliances.

► **90% of windows sold in the EU are NOT standard products purchased in point-of-sales, but are products made to measure for specific projects and installed by professionals.**

► **This allows optimising products based on site-specific aspects.**

This is already the case for new buildings and major renovations, for which the Energy Performance of Buildings Directive requires a holistic optimisation of the complete buildings, including their windows.

► **New buildings in all market sectors, and renovations in the non-residential sector, are already covered by existing EU and national legislation dealing with Energy efficiency.**

However, for small scale residential renovation projects, a holistic optimisation of the whole building may not always occur, so that personalised advice to consumers could be improved thanks to an “installer label” taking into account site-specific window sizes, façade orientations, climate conditions and adaptive elements such as solar shading devices.

► **For these reasons, European Aluminium cannot support an energy labelling measure for window products unless an “installer label” taking into account site-specific windows sizes, façade orientations, climate conditions and adaptive elements would be the core of the very first Commission Delegated Regulation on the topic and unless its scope would be limited to the residential renovation sector only.**

The animation¹ below explains why choosing windows requires personalised advice, which an installer label would stimulate.



¹ www.youtube.com | Channel: 'EUROPEAN ALUMINIUM' | 'Why choosing your windows requires personalised advice'

Consultation questions

The question about the installer label (consultation number 9) that will be addressed during the Consultation Forum on 30 September is the most important in European Aluminium's opinion.

Unfortunately, the present European Commission proposal and eight out of nine questions to be discussed during the Consultation Forum, are focused on a generic EU wide energy label. Such label could make sense for standard products produced before knowing their final destination, but this only occurs in less than 10% of the cases across Europe.

European Aluminium however answered these eight questions as well, keeping in mind that, to guide consumers properly, labels should allow them choosing the products that fit best to their particular situation. To do so:

- ▶ **Heating and cooling energy performances should be shown separately.**
- ▶ **Both heating and cooling energy performances should be differentiated by climate.**
- ▶ **Two separate EU maps for heating & cooling should be displayed.**
- ▶ **Within each climate condition, energy classes should not be rescaled to such an extent that consumers would be misled about which performance (i.e. heating or cooling) matters the most.**
- ▶ **The performance of windows with adaptive elements activated should be shown on labels.**
- ▶ **Leaving energy classes A & B empty is not acceptable since it prejudices the results of the ongoing co-decision procedure for the revision of the Energy Labelling Directive.**

European Aluminium's more detailed answers can be found in the following pages.

Conclusion

Should an energy labelling measure be decided for windows or not, taking **climate conditions, orientations** and **window sizes** into account is a must, since it means:

- ▶ **Better payback for consumers: choosing the products that fit best to his/her building without buying elements that will not provide tangible benefits**
- ▶ **No superfluous elements and thereby less material use**
- ▶ **Better renovation rates, as consequence of the better payback.**

The energy saving potential will better be tapped if the right window products are used at the right place, rather than windows designed based on average conditions.

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Consultation 1. "Technical scope"

Regarding the scope of the EU energy label for windows, which alternative is preferred?

1. the scope is all windows within the scope of standard EN 14351-1
2. the scope is all windows within the scope of standard EN 14351-1, with the exception of roof windows

European Aluminium does not have a position on whether roof windows should be excluded or not, but proposes other exclusions.

If limited to a "generic EU wide label" and in absence of an "installer label" European Aluminium would oppose to any window energy labelling regulation.

In case a labelling scheme would be put in place, a more appropriate question regarding the technical scope would be the **exclusion of products which have NOT been examined during the preparatory study, i.e. large sized windows.**

The scope should exclude large sized windows (door height windows, big sized sliding windows, folding windows etc), i.e. the products targeted by the large reference size (1,48m x 2,18m) from standard EN 14351-1. These products have not been examined at all during the preparatory study and this without robust justification and without sensitivity analysis.

As all mathematical formulas provided in the preparatory study are exclusively based on small sized windows (1,23m x 1,48m), the scope should be limited to products for which this small reference size is representative.

Consultation 2. "Application scope"

Regarding the scope of application, which alternative is preferred?

1. the application scope should be limited to the residential sector only
2. the application scope should not be limited, thus covering non-residential applications as well

European Aluminium's preferred answer is "1. the application scope should be limited to the residential sector only", but the scope should be limited further.

The scope of any possible future regulatory measure should be limited to **small scale residential replacement market**.

European Aluminium absolutely does not need an energy label, neither for new buildings, nor for renovation in the non-residential sector. The introductory text to the above question in the EC explanatory

memorandum contains the detailed justification why the most appropriate scope is “**replacement windows in the residential sector**”. European Aluminium fully supports this justification.

The application scope should however be narrowed down to “**small scale replacement**” market as, even in the residential window replacement sector, projects may fall under the definition of “major renovations”, for which the Energy Performance of Buildings Directive requires a holistic optimisation of the complete buildings (including their windows) that is always preferential to a component-by-component approach presenting the risk of sub-optimisation.

Assuming the scope would be limited to “small scale replacement windows in the residential sector”, European Aluminium could only support an energy labelling regulation on window products if an “installer label” taking into account site-specific windows sizes, façade orientations, climate conditions and adaptive elements would be the core of the regulation. Detailed justification can be found in answer to “Consultation 9”, in the last pages of this document.

Furthermore, the application scope of the generic EU wide energy label should be restricted to standard windows sold in point-of-sales without installation (do-it-yourself outlets) representing 10% of the market.

Consultation 3.

Which alternative is preferred: heating and cooling performance shown separately or combined?

1. heating and cooling performance should be shown separately;
2. heating and cooling performance should be combined into a single value.

European Aluminium’s preferred answer is “1. heating and cooling performance should be shown separately” but this answer alone does not solve European Aluminiums’ concerns.

Preamble:

Before answering the above question, European Aluminium **would first like to state its full disagreement with the statement² that the only equation required to reflect the cooling performance would be the one of the $g_{w,eff}$ independently of the climate condition considered.**

As demonstrated in several parts of the study, there is a huge difference in energy use for cooling between Northern, Central and Southern European climates. For example Table 28 in Task 7 shows a factor 20 between the energy used for cooling in Northern and Southern Europe.

The political decision to apply separate cooling energy classes for all three climate conditions with the toughest classification in Northern Europe where cooling is also the least relevant, leads to completely

² Explanatory memorandum, page 18

biased conclusions on the equation to use. Reducing the cooling energy performance to the $g_{w,eff}$ equation will make consumers in Helsinki believe that cooling performance is as important for them as for consumers leaving in Athens!

European Aluminium would like to stress that the present definition of climate zones, combined with the re-scaling of energy classes within each climate zone, with too few classes (A & B classes empty) and the “orientation-averaged” approach, have the effect to promote windows with a lower U-value than necessary in several cases. This will lead consumers to more material-intensive and more expensive products, a situation that will negatively influence the renovation rates and be counter-productive.

European Aluminium is opposed to the European Commission proposal to have A & B classes empty for all energy-related products. This should depend on the energy-related product under examination and should not apply to products with limited improvement potential. In this respect, the preparatory study on window products clearly indicates³ that “the U_w -value, which may be considered as one of the main criteria in regard to energy consumption in the use phase, for current state of the art products is as low as 0.7 to 0.9 W/m²K compared to 5.8 W/m²K some decades ago. It is estimated, that further improvements may result in even lower U_w -values, but the necessary design changes are estimated to result in un-proportional additional costs – compared to the cost of other measures to improve the total energy consumption of buildings”.

Coming back to the Consultation 3, **European Aluminium does not support combining heating and cooling performances into a single value**, because consumers need to be able to look at the energy performance that is the most relevant for them, but by summing up heating and cooling energy performances, it is decided for them “a priori” that both aspects are relevant for them and prevent them to have a clear information on the separate heating and cooling energy performances. Several cases where consumers would lose useful information by combining performances are listed below:

- ▶ Consumers located in Northern Europe for which cooling performance is of almost no relevance (e.g. very few consumers have a cooling system consuming energy in Sweden)
- ▶ Consumers located in central Europe equipped with a heating system but not having a cooling system and therefore no associated energy consumption.
- ▶ Consumers located in Southern Europe for which heating performance is of lower relevance (e.g. in Cyprus a permanent residence usually is not equipped with unnecessary equipment).
- ▶ Consumers looking for windows for houses they do not occupy all-year-round, e.g. summer/winter cottages.
- ▶ Buildings fitted with external shading devices that will be conserved, leading to irrelevant cooling performance values that consumers should be allowed to disregard.

³ Task 4, page 92

Consultation 4.

In case the energy performance is expressed as a 'bare' window, the performance of the window with adaptive elements activated, should be shown (if appropriate).

1. yes, add the performance of the adaptive window;
2. no need for the performance of the adaptive window.

European Aluminium answer is “1. yes, add the performance of the adaptive window”.

Apart from the fact that several windows are placed on the market with incorporated shading systems that allow building user controlling solar gains, the preparatory study shows that during both heating and particularly during the cooling period, the products which have been studied by the consultants without shading systems (followed by letter 'a') and with shading systems (followed by letter 'b') perform with a significant difference.

Especially if someone calculates the heating ($P_{E,H,W}$) and cooling ($P_{E,C,W}$) energy performance of the different products using ABC and XYZ factors from table 34 of task report 7, it can be understood that the usage of shading systems should be mandatory particularly in the Southern climate condition as it can reduce by c.a. 50% cooling demands and in Central climate condition as it can secure that with the proper operation of the shading device, the occupant of the residence will almost avoid reaching uncomfortable temperatures.

As stated in the preparatory study⁴, The IEA Technology Roadmap, lists exterior shades among the 'low cost solutions' for curtailing energy consumption for cooling. In new buildings, says the report, 'exterior shading, proper orientation and dynamic solar control should become standard features globally in new buildings and can also be applied to existing buildings'.

Consultation 5.

In case the energy performance is expressed as a combined value, a 'summer comfort' indicator should be added.

1. yes, add a summer comfort indicator.
 - a. based on g_w (no adaptive elements considered, just g of glazing and frame fraction);
 - b. based on $g_{w,eff}$ (adaptive elements is considered, need to define Z value);
 - c. based on $kWh/(m^2*yr)$, for South climate only, without adaptive elements;
 - d. based on $kWh/(m^2*yr)$, for South climate only, with adaptive elements;
2. no need for a summer comfort indicator.

⁴ Task 2, page 23

Not being supportive of a combined value, European Aluminium does not consider this question as relevant.

Consultation 6.

In case the energy performance is expressed as a combined value, a 'winter comfort' indicator should be added.

1. yes, add a winter comfort indicator (based on heating performance in kWh/(m²*yr).
2. no need for a winter comfort indicator.

Not being supportive of a combined value, European Aluminium does not consider this question as relevant.

Consultation 7.

The following additional performance parameters should be included in the EU energy label in the following way.

1. Thermal transmittance (U_w of window, in W/(m²*K))
 - a. yes, mandatory
 - b. optional
 - c. do not include on label.

European Aluminium's has no position on this question, but in case U_w would be included, ΔR of shutters should also be included.

European Aluminium's feeling is that a reference to the Declaration of Performance (DoP) number would be sufficient and that duplication of the declared values on the energy label would not really help consumers. It should also be reminded that the Commission Delegated Regulation (EU) No 157/2014 allows and sets the rules for making a Declarations of Performances of construction products available on websites.

Should the Commission decide to show this performance parameter in the EU energy label, the improvement of the thermal transmittance thanks to shading devices (ΔR) should also be included.

2. Solar heat gain coefficient (g value of window, dimensionless) for static window without adaptive elements:
 - a. yes, mandatory
 - b. optional
 - c. do not include on label.

European Aluminium's as no position on this question (see comments on consultation number 7.1)

3. Solar heat gain coefficient ($g_{w,eff}$ value of window, dimensionless) for window with adaptive elements activated:
 - a. yes, mandatory
 - b. optional
 - c. do not include on label.

European Aluminium's as no position on this question (see comments on consultation number 7.1)

4. Sound insulation (dB):
 - a. yes, mandatory
 - b. optional
 - c. do not include on label.

European Aluminium's could live with answers "b. optional" and "c. do not include on label".

It should first be underlined that this is not an energy-related characteristic, as contrary to energy using products which produce noise, windows are operating as noise barriers against external sounds.

The acoustic insulation is not a universal requirement from all consumers, it primarily depends on their external environment: e.g. it is important along highways, airports and in main urban streets, but much less in suburbs and on the country side. We should avoid imposing extra testing and measurement to all products and to all manufacturers, which would automatically increase their compliance costs.

The provision of acoustic performance should therefore remain a voluntary declaration and preferably under the Declaration of Performance and CE marking made under the Construction Products Regulation.

5. Daylight potential (dimensionless):

- a. yes, mandatory
- b. optional
- c. do not include on label.

European Aluminium's answer is "Yes" it should be mandatory, because it is:

- ▶ one of the key function of windows.
- ▶ energy-related, allowing consumer identifying whether a product reduces artificial lighting demands.
- ▶ presently missing from hEN14351-1 and is not expected to be taken into account during the revision that is taking place nowadays by CEN/TC 33.

Consultation 8.

An EU map should /should not be shown on the EU Energy Label for Windows:

- 1. yes, show an EU map indicating reference zones (two maps for 'separate heating/cooling' or single map if 'combined performance').
- 2. yes, a map should be shown, but different to the ones presented in this Working Document
- 3. do not show an EU map at all.

European Aluminium's answer is "1. yes, show an EU map indicating reference zones (two maps for 'separate heating/cooling')."

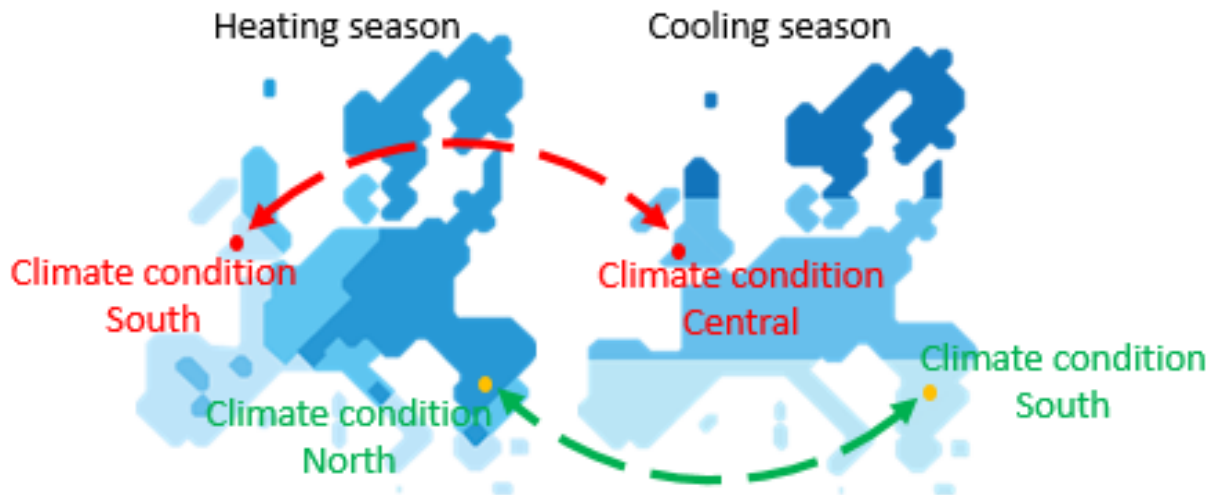
It must be noted that:

- ▶ the heating performance chiefly depends on external temperatures.
- ▶ the cooling performance chiefly depends on the solar irradiation.

As shown on the following two maps that are enclosed on the explanatory memorandum, several European regions are falling under a different zone for the two performances.



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For the “generic EU wide label”, which in European Aluminium’s opinion only fits to less than 10% of sales across the EU, in line with European Aluminium answer to “Consultation 3.”, two separate maps would provide to best transparency for consumers.

For the “installer label”, a web-based software would pick the right climatic data for heating and cooling, based on the identification of the location (e.g. post code) where the house is located. No map would need to be shown on such label.

Consultation 9.

The Commission Services should develop a (web-based) tool to generate 'installer labels':

1. yes, develop this tool;
2. no, don't develop this tool.

European Aluminium’s answer is “1. yes, develop this tool”!

As explained in the introduction, this tool corresponds to the dominant market structure in the EU.

It is definitely important to allow manufacturers and retailers who operate locally to suggest the most energy efficient AND cost effective solutions based on location, sizes and orientations by using the so called ‘installer label’.

The animation that has been prepared by European Aluminium ([click here to see it](#)) describes the importance of these parameters.

An installer label would allow considering the following site specific elements for each project:

- Type of windows: by integrating all different window types that may enter into a specific renovation project, consumers would receive a single heating energy performance and a single cooling energy performance calculation/rating for all products and will not have to look at individual energy labels for each window type.
- Size of windows: by varying the frame fraction AND, when relevant, using equations fit for big sized windows.
- Picking the right climatic data for heating and cooling (i.e. one task less for consumers): this could in first approximation be based on the three climate conditions respectively defined for heating and cooling, but may also evolve towards much more precise data (e.g. accurate heating and cooling degree days based on postal codes).
- **Orientations of windows:** by reference to orientation-specific A & B parameters for heating and X & Y parameters for cooling. This would allow to reflect the very different solar irradiations that are faced in the four different orientations. Solar gains during:
 - ▶ Heating season can be up to 4 times higher in South orientation than in North and 2 times higher than in East & West.
 - ▶ Cooling season, solar gains are about twice higher in East, South & West than for the North orientation.

In term of windows energy performance and cost optimisation, optimising products per orientation delivers the best cost/performance ratio (see also the two examples further below)!

- Use of adaptive elements, by reference to parameters C for heating and Z for cooling performance by orientation. This would also allow to take existing adaptive elements into account, e.g. existing external shading devices that will be conserved.

The two simple examples below demonstrate the benefits of an installer label:

EXAMPLE 1

Let's take a simplified house with 4 facades, having four equally sized windows of 1,23 m x 1,48 m, each of them facing a different orientation (N, E, S, W). Assuming this house is located in the southern climate condition, that both heating & cooling performance are relevant (full year occupation), and that adaptive elements (shutters) are used.

Starting from an offer including four identical windows of $U_w=0.8$ & $g_{gl}=0.60$ (403€⁵), offering a performance of -87 for heating and 63 for cooling (kWh/m²-year), the installer label formulae/web tool would show that

⁵ Task 2, Table 17, Street prices

- Switching to a cheaper alternative for the southern window of $U_w=1,7$ & $g_{gl}=0,65$ (255€), provides a similar performance of -87 for heating and 64 for cooling (kWh/m²-year)

EXAMPLE 2

Let's take the same house than in Example 1, but now assume that this house is located in the central climate condition, that both heating & cooling performance are relevant (full year occupation), and that adaptive elements (shutters) are used.

Starting from an offer including four identical windows of $U_w=0.8$ & $g=0.60$ (403€⁶), offering a performance of -41 for heating and 7 for cooling (kWh/m²-year), the installer label formulae/web tool would show that

- Switching to a cheaper alternative for the southern window of $U_w=1,55$ & $g_{gl}=0,75$ (300-350€⁷), provides a similar performance of -40 for heating and 7 for cooling (kWh/m²-year)

Installer labels would be very easy to control by market surveillance authorities, if they are generated by a web-based tool. Based on the example of the web-based tool the European Commission is using for its stakeholders consultations, a reference number could be generated each time an installer label would be generated. This reference number could then be used by market surveillance authorities to verify that the information given to consumers is authentic.

⁶ Task 2, Table 17, Street prices

⁷ Estimated range based on present prices in the UK