Views from the aluminium window profiles industry on quality and compliance issues

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1. Actual situation in EU
EU and national legislation closely related

- Product data are 90% based on CEN
- CEN rules are progressing continuously
- Design rules, thermal and structural are introduced and operational through product standards
- Local legislation is converting to a clear usage of the EU directives and regulations
Today: Outer skin takes an active part of the building physics

Important efforts are made to enhance the thermal insulation level to a maximum.

![Graph showing thermal insulation improvement from 1960 to 2000 till now.](image)
Spectacular evolution in the technical specifications...

1960-1980: Basic requirements for the outer skin (mainly stability, watertightness)

1980-2000: increasing demands on acoustic and thermal requirements

2000- YTD: Review of all specifications and extension of the criteria in the usage phase
Introduction of Eurocodes
Enhanced introduction of criteria on airtightness, thermal insulation
2. Synthesis of challenges
   (in context of this presentation)
OBJECTIVE 1:
Reliable U-values

Hundreds of profiles with different U-value

Glazing features

Each window: Specific U-value

Whole building: Average U-value

Challenges...
- Keep it simple
- Stimulate innovation
- ...
Synthesis of challenges
(in context of this presentation)

OBJECTIVE 2:
Good quality of windows

- High quality profiles
- Correct assembly of windows
- Correct installation on site
3. Quality labels
Supporting quality labels and markings
Example of quality awareness and support
4. Declaration of performances
what’s the warranty /accuracy level?
Building process: a compilation of industrial processes

Material

Forming, shaping,...

System

Constructors

Installers
Existing tools nowadays

• Availability of all parameters from tender to execution through modern ICT: U-value for each element and as total value at project level in renovation and new projects

• Thermal properties, structural and air and water tightness are known, through testing and CE declarations

• Ongoing evolution in advanced calculation of window parameters and their performances
Example of installation details and quantification of the result – good/bad installation

![Diagram of installation details](image)

- **Good execution**
- **Bad execution**

![Bar chart](image)

- $\Psi_e [W/(mK)]$
- Top (resp with and without anchorage)
- Lateral
- Sill detail

Values:

- Top: 0.065, 0.083, 0.062, 0.078, 0.016, 0.040
- Lateral: 0.134, 0.133, 0.203, 0.133
- Sill detail: 0.219, 0.203, 0.268
5. Proposal for a value adding approach on quality control
Practice and proposal

• Continuous effort on improvement of products through innovation with stimuli from authorities as this will reduce the use of non performant outdated solutions

• Usage of ICT such as in BIM with a platform where data on performances can be exchanged, but no new database system has to be set up

• Determine levels of control on the basis of type and size of the project

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<th>Large projects</th>
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• Use stimulation and not sanctioning as a tool

• Train the certification and control authorities on the job by the industry to make a modern approach possible
Functioning of the control scheme and quality check
6. Conclusions

1. The industry supports a value adding quality control system
2. The usage of existing schemes and technology is possible
3. An intensive, but two sided approach whereby control and certification on one side and industry on the other hand work together, is absolutely necessary
4. Convergence to a unique system such as the BIM platform and avoiding any supplementary system or costs that cannot be covered by the economy of EU
Thank you for your attention!

Ir. Cyriel Clauwaert