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Highly-Insulating Window and Facade Systems (www.hwff.info)

HWFF

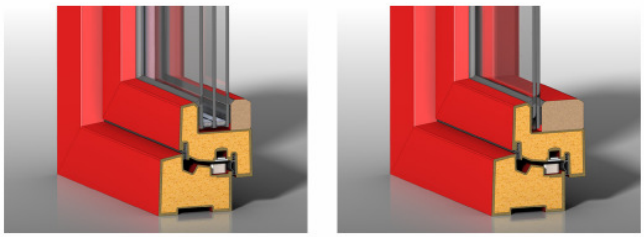
Funded by the Bundesministerium für Wirtschaft und Technologie
by resolution of the German Federal Parliament

Project Description

- development and optimization of highly-insulating window and facade systems with slim frames and profiles
- consideration of window and frame as a single thermal and structural unit
- focus on standard windows for new buildings and renovation
- integration of new, highly-efficient glazing systems such as vacuum insulation glass (VIG)

Window Profile TT 90 - R

A thermally optimized window profile has been developed using a new kind of production technology. The core of the profile is a PU foam which makes for the excellent insulating properties of the **TT 90 - R**. This core is cased in a thin covering of dimensionally stable, weather-resistant plastic which safeguards the **TT 90 – R's** mechanical properties and design potential.



*Design study of the **TT 90 - R** with triple glazing (left) and vacuum insulation glass (right)*

The simple and cost-efficient manufacture and assembly of the windows is made possible by the adhesive technology used. Gluing the glazing and the frame also improves the static properties.

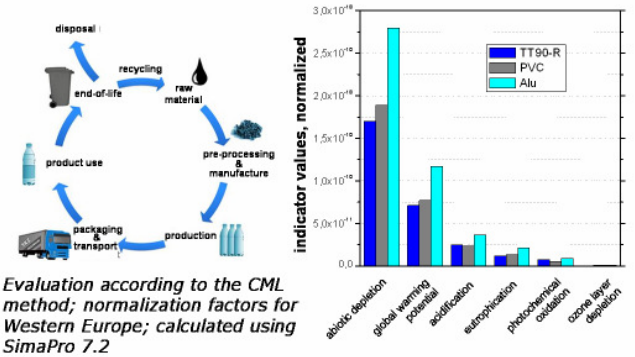
The sample windows produced well meet the customary industrial standards:

air permeability (EN 1026): class 4
water-tightness (EN 1027): class A9
resistance to wind load (EN 12211): class 3C

Concepts for integrating **TT 90 - R** production technology into existing profile fabrication systems have been drawn up and are available from BBG.

TT 90 – R's Life Cycle Assessment

Life cycle assessment in accordance with DIN EN-ISO 14044 shows that the **TT 90 - R** has clear advantages over aluminium profiles and some advantage over PVC profiles (even though the **TT 90 – R's** potential recycling capacity has not yet been evaluated).



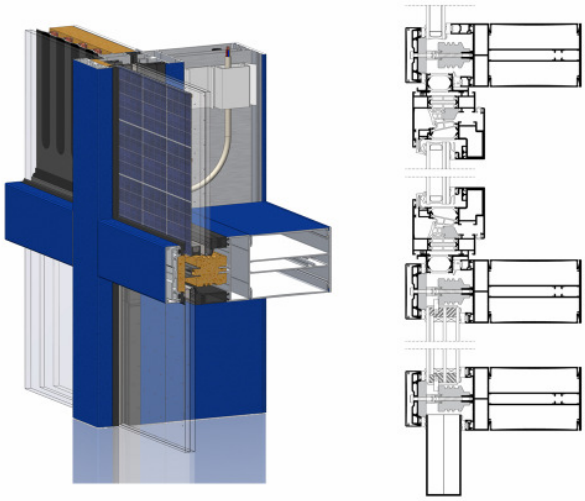
Evaluation according to the CML method; normalization factors for Western Europe; calculated using SimaPro 7.2

Facade System 280 AF

A thermally optimized facade system has been developed. The Active Facade 280 AF not only achieves excellent insulation values, but also has improved features to accommodate cable ducts and functional facade elements such as PV modules and facade collectors. A new type of spacer ensures visual uniformity of the glass front even when elements with different system thicknesses are applied.

Due to their reliable aluminium design, the profiles satisfy even the highest static demands. Specially-developed pressure plates and isolators ensure excellent insulating values and also enable rapid, sufficient dehumidification.

Moving-part windows in reliable aluminium design with conventional or vacuum insulation glass can be applied as well as static elements.



*Design study of the Active Facade **280 AF** with different elements – triple glazing, vacuum insulation glass, PV vacuum insulation glass and solar-thermal facade collector (left); facade design with moving-part aluminium window element and a combination of vacuum insulation glass and insulation glass (right)*

Characteristic Values

The **TT 90 - R** has clear advantages over conventional, passive-house-suitable window profiles:

Excellent insulating value at 90mm thickness (1.23m x 1.48m):
U_w = 0.77 W/(m²K) with triple glazing U_g = 0.7 W/(m²K)
U_w = 0.68 W/(m²K) with VIG U_g = 0.5 W/(m²K)

The **280 AF** has the following characteristic values (1.1m x 1.2m with influence of screws) :

U_f = 0.79 W/(m²K) at 48mm
U_{cw} = 0.87 W/(m²K) with triple glazing U_g = 0.7 W/(m²K)

Projektpartner und Kontakte

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