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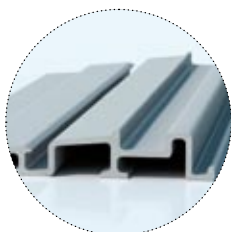
Lifetime energy efficiency

Exel Composites for windows and doors

exel 
COMPOSITES



WINDOW FRAMES



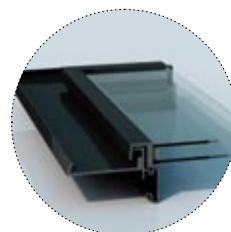
SLIDING DOORS



DOOR FRAMES



DOOR SILLS



**SKYLIGHTS AND
DOME LIGHTS**

Current and proposed legislation demands higher energy performance for new homes, public & commercial properties. Similar formats are being introduced for refurbishment of older properties.

Changes in Global climates and the drive to reduce world dependence on fossil fuels for energy generation have created worldwide initiatives to improve the insulation values of buildings, especially homes and public places such as schools, hospitals and offices.

Many Western Governments have created specific legislation to ensure new buildings have far greater ability to retain habitable temperatures at reduced levels of energy consumption. Similar legislation is underway for refurbishment of existing properties. Control

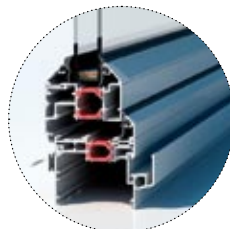
of heat loss and heat gain through windows and doors is critical in any building. Traditional materials: aluminium, PVC and timber, at best only fulfil some of these key requirements: thermally efficient, durable, robust, economically viable and low maintenance.

Exel Composites' pultruded composite profiles provide the superior solution to match all the energy saving criterion. Window linings, thresholds, sills, door frames, door profiles and door skins, are currently used or soon to be launched into this critical and highly demanding market.

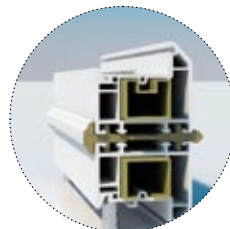


THERMAL EFFICIENCY

- The make-up of Exel Composites' profiles is mainly glass fibre.
- Glass-fibre is an excellent insulating material – it does not conduct heat or cold, thus ensuring thermal efficiency of the composite.
- Exel Composite profiles do not require the "thermal breaks" necessary with aluminium windows.
- Coefficient of thermal expansion is similar to glass



**ALU THERMALLY
BROKEN PROFILE**



**PVC WINDOW
STIFFENER**



**STEEL DOORS AND
DOOR EDGES**

DIMENSIONALLY STABLE

- Exel Composites show no brittleness at low temperature and remain unchanged at high temperatures.
- Exel Composites have expansion/contraction rate of 1/6 of PVC and 1/3 of aluminium, making it an ideal alternative to aluminium, PVC and timber.
- Extra low thermal movement, stable at all temperatures, high or low.
- Resistant to water, unaffected by sustained saturation or moisture.

LASTING PERFORMANCE

- Does not rust, rot or warp.

- A strong, self reinforced structural composite, performs extremely well in all demanding environments.
- Can be painted with a range of readily available paint systems.
- Low embodied energy, far lower than steel, aluminium or PVC.
- Composite profiles are recyclable.

CONTEMPORARY STYLE

- Aesthetic appeal – slimmer profiles for windows allow greater glass area and less intrusive sight lines.
- Compatible – Composite windows and doors profile designs accommodate standard locks, handles, hinges and accessories.

Legislation for higher energy performance

Current legislation in Germany (EnEV 2009), the UK (Code for Sustainable Homes – Level 6) and similar moves throughout the world, drive the change to high efficiency windows for new and refurbished properties.

New legislation for lower energy consumption limits the U value for windows (glazing and frames, combined) to a maximum of 0.80 W/m²/K, with Solar Heat Gain Coefficients around 50%.

Exel Composite pultruded profile is the ideal material for achieving and exceeding these performance levels for windows. The low U value of Exel Composite profiles reduces the demands for higher specification and high cost double and triple glazed units, providing economic, durable and future-proof solutions.

Typical material properties for windows and doors

Property	Unit	Composite	PVC	Aluminium	Steel	Wood
Thermal conductivity λ	W/m ² K	0.3	0.2	160–250	45–55	0.11–0.16
Linear thermal expansion α	10 E-6/°K	10	60	24	12	4
Density ρ	g/cm ³	1.8	1.4	2.7	7.85	0.4–0.7
Elastic modulus E	GPa	23	3	70	210	9–13
Tensile strength σ	MPa	240	50	240	250	50–100

NOTE: Composites offer wide ranges of mechanical performances, the values in the table are those of the E23 structural laminate according to EN 13706.

Composite profiles have many functions

Composite profiles are regularly used to replace and out-perform traditional materials due their mechanical and weight-saving properties however they are also used together with traditional materials to enhance and improve performance.

Used together with:

PVC

- As a strength element
- Replacing steel stiffener for more insulation
- As a coextruded thermo-plastic strength member

Aluminium

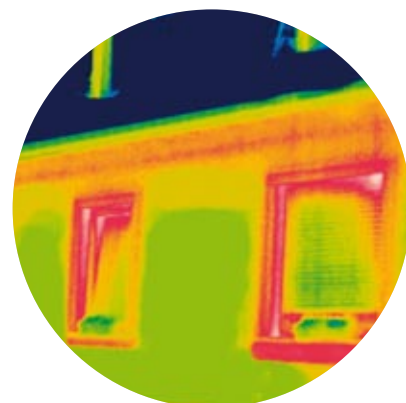
- As thermal barrier with high mechanical performance and functionality
- As part of a profile or special profile

Wood

- On outside face of soft-wood windows (US)
- Replacing some high rot/high maintenance parts (eg sill)



SLIMMER PROFILES FOR WINDOWS
ALLOW GREATER GLASS AREA.



THE NEW LEGISLATION FOR LOWER ENERGY
CONSUMPTION LIMITS THE U-VALUE FOR WINDOWS.



COMPOSITES CAN BE USED TOGETHER WITH
TRADITIONAL MATERIALS TO IMPROVE THE
PERFORMANCE.

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Certification

