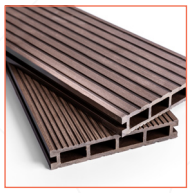
IMERYS

ImerBuild™ for PVC construction applications

Imerys' **ImerBuild™** is a portfolio of engineered mineral-based solutions designed to enhance the performance of rigid and foamed PVC.

ImerBuild®

Imerys presents a unique portfolio of engineered mineral solutions designed to improve performance in both rigid and foamed PVC compounds for construction applications.



Harnessing the intrinsic properties and unique morphology of our minerals, ImerBuild solutions are proven to positively influence PVC applications by:

- Reducing material expansion and shrinkage
- Increasing stiffness and impact strength
- Improving gloss and surface finish
- Lowering the overall cost and environmental footprint of the finished product

Imerys has a network of 9 technology centers worldwide, as well as a dedicated team of over 300 scientists working at its technology and application lab who can help customers improve their existing formulations or develop new product solutions for global challenges.

Recommended product applications

Product	Mineral	Applications	Features
ImerBuild C100	Carbonate	- Rigid PVC siding - Fence & window profile - Foamed PVC Sheet - Trim - Profiles & sign boards	Fine, blocky minerals impart stiffness to PVC while **improving impact** with higher loading levels compared to coarser materials. Higher mineral loading levels **contribute to lower composite cost** and environmental impact
ImerBuild W100 & W200	Wollastonite	- Foamed PVC Decking - Foamed PVC Siding - Foamed Louvers for Shutters - Other Foamed PVC profiles	Acicular minerals provide **increased stiffness** and **reduced expansion and contraction** of foamed PVC for elimination of sagging, lower cost and improved aesthetics
ImerBuild K100 & K200	Kaolin	- Foamed PVC trim boards and sheets - Rigid PVC profiles	**Domestically sourced,** fine, platy minerals enable **reduction of TiO_2** for lower raw materials costs and environmental impact
ImerBuild P100	PCC	- Window profiles - Foamed PVC trim boards and sheets	Uniform ultrafine particle size and chemical purity significantly improve impact properties, **surface finish and gloss**

ImerBuild for improved dimensional stability & stiffness

ImerBuild W100 and W200 are wollastonite-based grades which provide excellent reinforcing properties, thermal stability, reduced CLTE and dimensional stability. These products are designed for use in lightweight rigid foamed PVC composites, used in the production of decking, railings, shutters, trim and other foamed PVC composite materials.

Reinforcement

Increased stiffness and reduced sagging

Lower CLTE

Better dimensional stability (less expansion/ contraction during temperature changes)

Performance (W100 & W200)

The acicular morphology and high aspect ratio of **ImerBuild W100** and **W200 improve flexural modulus** in foamed PVC parts to prevent sagging, particularly in hot regions. Improved stiffness eliminates the need to use metal inserts in long foamed PVC parts and allows for greater spacing of deck footings, for example, translating to lower installation costs. Fig.1 shows that the flexural modulus increases with Increasing mineral loading.

ImerBuild wollastonites **lower coefficient of linear thermal expansion (CLTE**) resulting from temperature changes, particularly important for outdoor applications. Lower CLTE allows for the production of longer board lengths with smaller installed gaps and eliminates the need for slot holes and complex connectors in siding and decking. Fig.2 presents CLTE of foamed PVC as a function of mineral loading, which is inversely proportional to the mineral loading.

Fig.1 Flexural/modulus of foamed PVC as a function of mineral loading

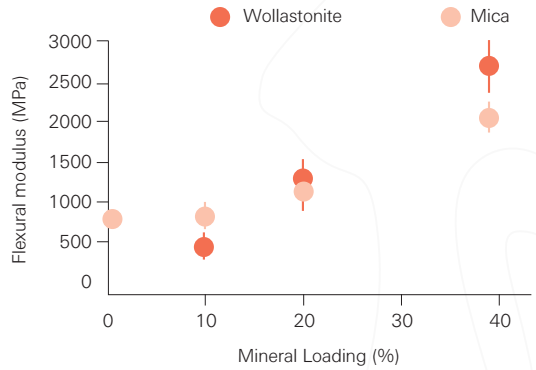
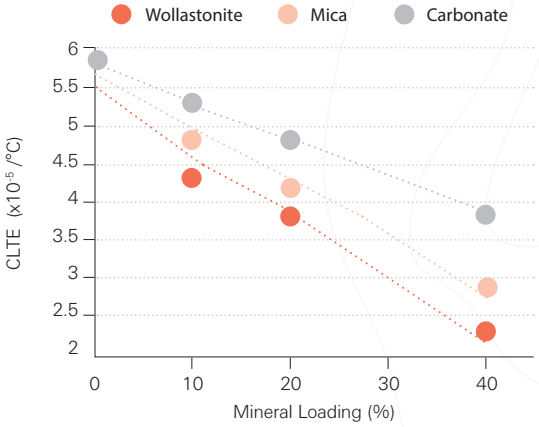


Fig.2 CLTE of foamed PVC as a function of mineral loading



ImerBuild for TiO_2 replacement in foamed PVC

ImerBuild K100 and K200 are kaolin-based solutions for the partial replacement of titanium dioxide (TiO_2) in foamed PVC composites. This solution offers improved UV resistance and weathering performance.

TiO_2 reduction

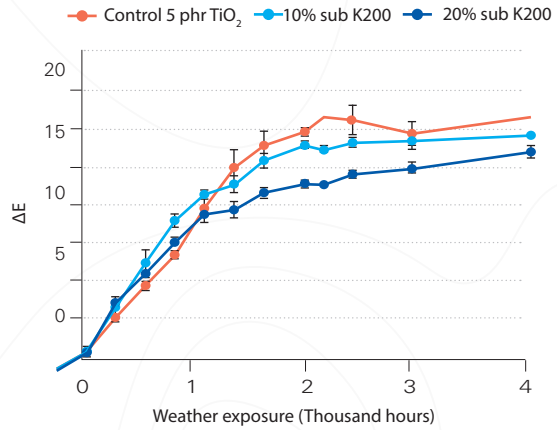
Reduced composite costs Less reliance on imported TiO_2

Performance (K100 & K200)

The Based on premium high-whiteness ore, the engineered morphology and particle size of ImerBuild K100 and K200 solutions enable **partial replacement of TiO_2** in outdoor rigid and foamed PVC building applications such as trimboard, fencing and more.

Fig. 3 shows partial replacement of up to 20% TiO_2 with ImerBuild K200. As demonstrated, ΔE color change of samples is less than that of the control sample after 1,500 hours of accelerated weathering exposure (modified ASTM G-154).

Fig. 3 ΔE Color difference compared to the original color as a function of weathering exposure hours.



ImerBuild for impact and processing

ImerBuild C100 ultrafine surface-treated GCC is the premier solution for achieving improved impact strength, increased throughput and superior gloss in rigid PVC composites such as siding and fence boards.

PVC mixing

Flexibility to optimize fusion at lower temperatures and Increased mineral loading

Processing

Improved handling due to increased bulk density and increased processing throughput

Application enhancement

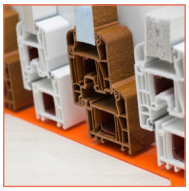
Improved impact strength and enhanced gloss

Performance (C100)

ImerBuild C100 is a fine GCC with a surface treatment specifically optimized for its particle size distribution. This surface-treated, submicron product with a highly engineered particle size distribution enhances product handling and improves the incorporation of the mineral with the PVC melt. Improved homogenization with the melt lends to more control for a consistently fused PVC profile. The ultrafine particle distribution **allows formulators to decrease levels of higher cost additives** such as impact modifiers while maintaining impact strength.

ImerBuild for enhanced surface finish

ImerBuild P100 is a premium quality PCC based solution for achieving improved impact strength and gloss in rigid and foamed PVC composites such as trim boards, sheets and window profiles.



Surface treated

Easy dispersion in PVC resin

Better impact resistance

Less impact modifier requirements and Lower costs

Improved surface finish

Enhanced gloss

Performance (P100)

ImerBuild P100 combines a uniform, narrow particle size distribution and high degree of chemical purity. The ability to control these attributes **significantly improves surface finish, gloss, and impact properties of rigid PVC**, due to better energy dissipation provided by PCC particles in the nanometer region, enhanced dispersion of the modifier and improved gelation.

For more information:
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