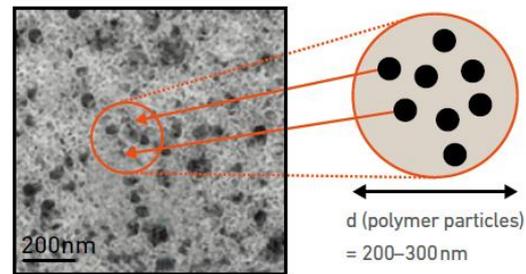


VAE Inclusion Technology : A universal binder for both interior & exterior applications



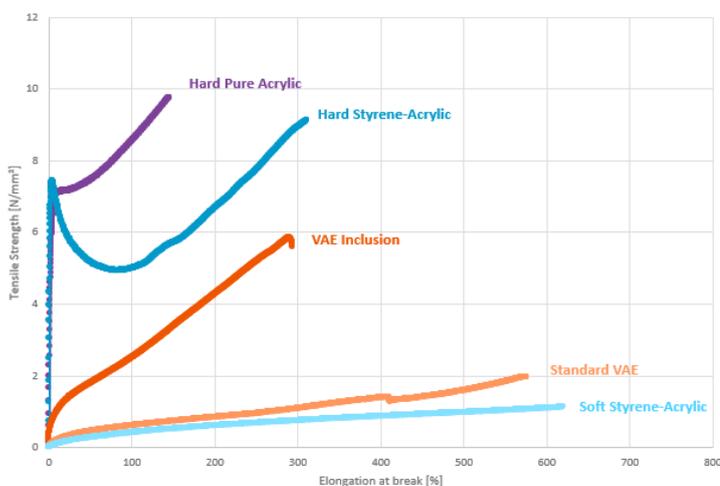
TEM picture: Polymer film showing evenly distributed domains of the hard polymer, which are significantly smaller than the size of the emulsion particles.

Introduction to Mowilith®LDM 1869 and VAE Inclusion Technology

Mowilith®LDM 1869 is a versatile Vinyl Acetate Ethylene (VAE) based binder designed for both interior and exterior coatings. It is characterized by a low minimum film-forming temperature (MFFT) below 5°C and a transition temperature (T_g) of approximately 13°C. This binder excels in pigment binding, hiding power, and durability, making it suitable for a wide range of applications including exterior paints & plasters, but also interior mat to satin paints.

A key innovation in Mowilith®LDM 1869 is the incorporation of Inclusion Technology, which embeds hard acrylic polymer domains within the VAE polymer matrix. This hybrid structure synergistically combines the advantageous properties of both VAE and acrylic binders, resulting in improved mechanical properties, enhanced dirt pick-up resistance, and optimized water absorption behavior.

Mechanical and Film Properties



The mechanical behavior of VAE Inclusion Technology exhibits an intermediate profile between traditional hard and soft binders, delivering optimized film toughness. This balance enables coatings to achieve excellent blocking resistance—surpassing standard VAE, soft styrene-acrylic (S/A), and Veova binders—while maintaining flexibility and durability.

In interior applications, such as matt and satin paints, Mowilith®LDM 1869 demonstrates wet scrub resistance comparable to soft S/A and Veova binders, with class I wet scrub resistance achieved in satin finishes. Notably, the hiding power of Mowilith®LDM 1869 significantly exceeds that of conventional S/A binders, allowing for enhanced opacity and coverage.

Durability, Weathering, and Dirt Pick-Up Resistance

Long-term outdoor weathering tests over five years confirm the excellent durability of coatings formulated with VAE Inclusion Technology. Dirt pick-up resistance, measured as delta L, matches or exceeds that of conventional acrylics, S/A, and Veova binders, while standard VAE binders lag behind. This improvement is attributed to the hard acrylic domains introduced via Inclusion Technology, which reduce surface soiling to levels comparable with pure acrylic emulsions.

Color retention, quantified by delta E, is outstanding in both plasters and façade paints, with VAE Inclusion Technology performing on par with or better than Veova and pure acrylic binders, and significantly outperforming styrene-acrylic systems. This includes superior stability in deep shade paints and UV-sensitive pigments, ensuring long-lasting aesthetic quality.

Water Resistance and Formulation Flexibility

Water uptake values across VAE Inclusion Technology, pure acrylic, and other binders are similar, indicating good inherent water resistance. However, the Inclusion Technology binder exhibits higher permeability to liquid water due to its hydrophilic nature but compensates with enhanced vapor diffusion. This characteristic allows moisture to escape from coatings, reducing the risk of blistering or degradation.

Water resistance, often expressed as the W-value, can be further optimized by incorporating silicone additives, enabling formulators to tailor performance for specific environmental conditions. Additionally, the low MFFT of VAE Inclusion Technology facilitates low or no coalescing agent use, supporting low volatile organic compound (VOC) formulations and enabling cost-effective, environmentally friendly coatings.

The technology also supports high PVC formulations with reduced titanium dioxide (TiO₂) content without sacrificing hiding power, offering significant cost savings in production.

Fire Performance and Safety

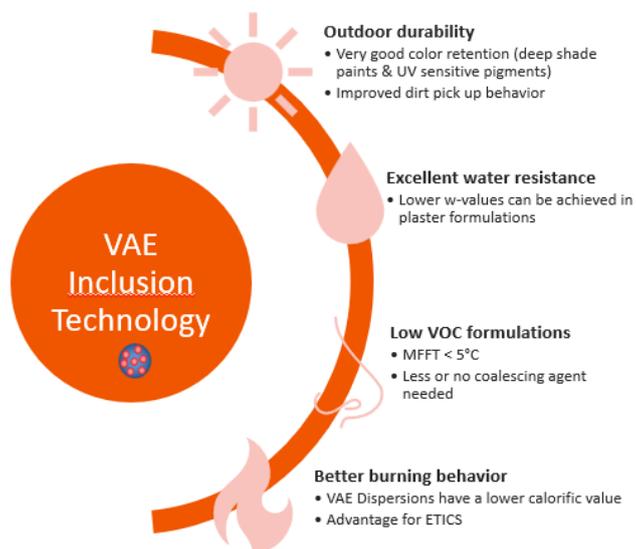


A notable advantage of VAE binders, including Mowilith®LDM 1869 with Inclusion Technology, is their lower calorific value compared to pure acrylic and styrene-acrylic binders. This translates into superior fire resistance, particularly in external thermal insulation composite systems (ETICS).

In fire testing according to DIN 4102-1 (Brandchacht test), VAE Inclusion Technology meets building material class B1 requirements, demonstrating a residual flame length greater than 15 cm and smoke gas temperatures below 200°C. Furthermore, it achieves fire class B s1 d0 in the SBI test (EN 13823), outperforming pure acrylic binders. These results highlight the binder's suitability for applications demanding stringent fire safety standards.

Summary

Mowilith®LDM 1869, enhanced by VAE Inclusion Technology, represents a state-of-the-art binder solution for interior and exterior coatings. It offers a unique combination of low MFFT, excellent mechanical properties, superior hiding power, and outstanding durability. The technology's improved dirt pick-up resistance and color retention extend the lifespan and aesthetic appeal of coatings, while its fire performance meets rigorous safety standards. Its formulation flexibility allows for low VOC, cost-effective, and environmentally conscious products, making it a compelling choice for modern coating applications.



Technical data	Mowilith®LDM 1869
Polymer	VAE/Acrylic
Particle morphology	Inclusion
Solid Contents [%]	52 – 54
MFFT [°C]	2
T _g [°C]	13
Viscosity [mPa.s]	500 – 2500
pH	4,0 – 6,0
Particle size [nm]	100 - 500