Celanese
The chemistry inside innovation™

CELANESE DISPERSIONS FOR PAINTS & COATINGS

PRODUCT PORTFOLIO EUROPE

About Celanese

Formulating your vision with our expertise

The company

We are a global technology and specialty materials company based in Dallas, Texas, operating in key geographic locations worldwide.

We are continuously working on innovation and process improvement and are always looking for exciting new opportunities. In all the industries we serve, our products hold leading positions worldwide. We are offering an advanced product portfolio complemented by large global production capacity, operating efficiencies, proprietary production technology and competitive cost structures.

- Celanese is a real solution provider. We help our customers address problems and accelerate product development or deliver new solutions for their customers.
- Celanese is a company of world-class chemists, material and polymer scientists, engineers, operators and professionals across the globe.
- Celanese is represented by diverse backgrounds and cultures with diverse capabilities and expertise.
- Celanese is closely watching market and industry trends, as well as regulatory requirements, to be at the forefront of innovation. Celanese is ready to help you meet your requirements for high-quality waterborne coatings.

Our two business segments

- Acetyl Chain: acetic acid, vinyl acetate monomer, other acetyl derivatives, EVA polymers, emulsions polymers, redispersible polymer powders and specialty additives & Acetate Tow: cellulose derivatives
- Engineered Materials: specialty thermoplastics and food ingredients

Celanese Emulsion Polymers business

- Partnering with our customers to fulfill real industry and consumer needs
- Global expertise in its wide array of applications
- Manufacturer of both high-pressure (VAE) and conventional (atmospheric, ATM) dispersions

Celanese Emulsion Polymers is one of the largest and most experienced suppliers of dispersion technology for waterborne coatings in the world. We have been an active leader in paints and coatings for decades, and we have gained deep understanding of the markets, products, applications and issues affecting our industry today.

Thanks to the acquisition of the ELOTEX® redispersible polymer powder products, Celanese has extended its product portfolio for the building & construction industry.

Understanding customer and industry needs

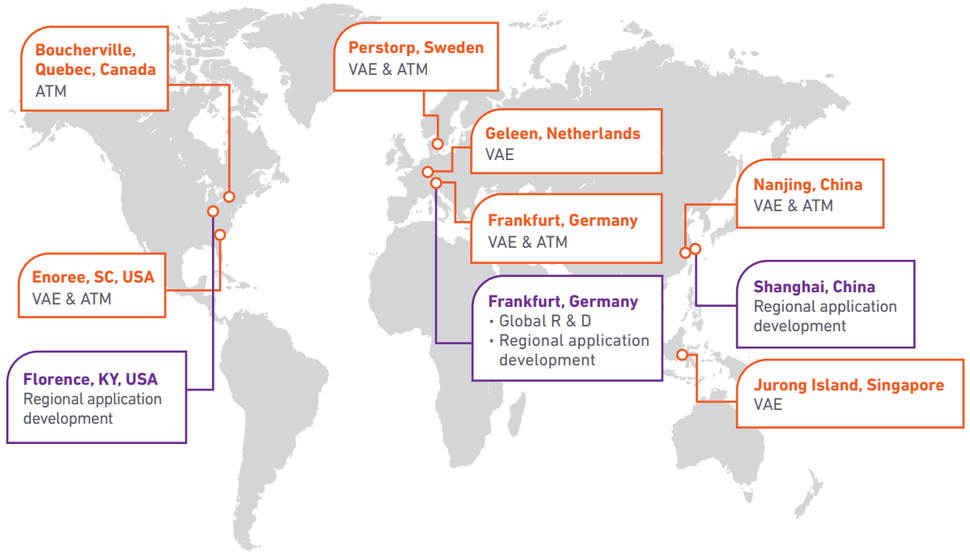
The Celanese technical team consistently strives to meet the needs of our customers, including their formulated coating products. We are constantly updating our laboratory with modern equipment to aid us in designing and adapting our products to meet real-world application profiles to enable product testing according the latest standards and norms.

Advanced technology for a sustainable future

Celanese offers high-performance dispersions for the entire coatings market. These water-based dispersions do not contain solvents, or plasticizers. This leads to lower emissions, lower odor and a lower environmental impact, making them the right binder choice for the next generation of high-performance coatings.

Global reach

The global research and development center for Celanese dispersions (Frankfurt Technology Center) is located in Germany. The center closely cooperates with the other Celanese regional application development centers in Florence, USA and in Shanghai, China. These regional facilities enable us to rapidly develop new products and to assist customers in the region with their development projects. We have manufacturing plants and technical support in all major regions.



VAE = High-pressure, vinyl acetate/ethylene
ATM = Conventional (atmospheric)

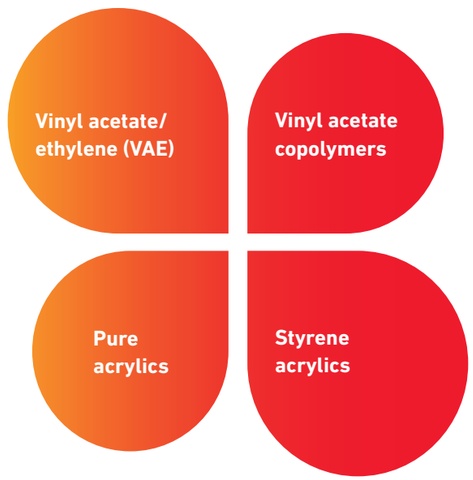
Dispersions for every coating

The Celanese Emulsion Polymers business offers one of the broadest and most comprehensive portfolios of water-borne dispersions in the world. Though VAE-based systems are our specialty, we are also experts in pure acrylic, styrene acrylic and VAM copolymers.

Celanese is not only a leading producer of vinyl-based dispersions worldwide, but also a leading global producer of VAM (vinyl acetate monomer) and acetic acid. The backward integration offers security of supply for this essential raw material.

Whether you are developing an environmentally friendly interior or a tough exterior architectural paint, or formulating an industrial coating for wood or metal, we have the right dispersion for your needs.

Mowilith® dispersions represent the premium class for quality and performance for the European paint and coatings market. The Mowilith® portfolio continues to grow, allowing you to expand your product offerings and capitalize on the major trends in the industry including low-emission paints.



Mowilith® – Supreme solutions for your coatings challenges

Coatings application areas

Interior
- Paints and plasters

Exterior
- Masonry
- Plasters
- ETICS
- Elastomeric wall coatings (EWC)

Gloss paints, lacquers and varnishes
- Gloss paints
- Wood stains
- Trim paints

Construction
- Fillers, putties, primers
- Roof coatings
- Flexible sealings and ceramic tile adhesives
- Water proofing

Industrial applications
- Joinery, furniture and parquet coatings
- Plastic and metal coatings
- Fiber cement coatings
- Fire retardant paints

Mowilith® LDM 7728 – for optimized deep shade masonry paints

Nowadays there is a mega trend to sustainability therefore paint films are required to have an improved outdoor durability. Also, more and more customer like to have the color matches their own personal taste.

Therefore, a binder with improved outdoor durability and color retention is required.

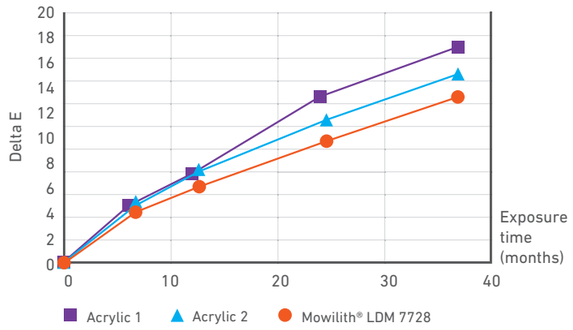
Through a systematical study over several years, Celanese was able to develop a new generation of acrylic emulsions with the Color Retention Technology.

The newly developed Mowilith® LDM 7728 with optimized color retention allows the formulation of premium masonry paints, especially deep shades.
It offers excellent durability through UV and color resistance but also good water resistance and good weathering abilities overall. The Color Retention Technology is the best on the market regarding durability of deep shade masonry paints. Mowilith® LDM 7728 provides excellent adhesion on mineral surfaces and aged wall paints.

Low color retention

High color retention

3 years outdoor weathering in a deep shade masonry paint

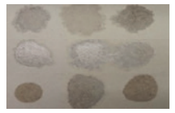
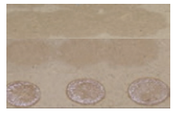


Mowilith® LDM 1734 – VAE penetration primer

VAE's historically have not widely been used as binder for deep penetration primers for surfaces such as hard and soft wood, gypsum and cement. Thanks to a new innovative production method it is now possible to produce a penetration primer grade with a small particle size and a very narrow particle size distribution, which ensures an effective penetration of the primer into a variety of surfaces.

Key properties for a good penetration primer are (dust) binding power, penetration in different surfaces, water resistance and adhesion power. Mowilith® LDM 1734 provides a unique property profile and offers an excellent performance as binder for deep penetration primers.

Universal penetration primer for various substrates

Gypsum plaster		LDM 1734	✓
		St Ac I	✓
		St Ac II	✓
Gypsum plaster board		LDM 1734	✓
		St Ac I	✓
		St Ac II	✓
Sanded gypsum plaster		LDM 1734	✓
		St Ac I	✗
		St Ac II	✓
Press wood fiber board		LDM 1734	✓
		St Ac I	✓
		St Ac II	✗

Technical advantages and formulation tools

Coalescent free formulation for low VOC interior paints

All around the world, the paint and coatings industry is under pressure to reduce VOC emissions. Although most interior decorative paints are already water-based, many formulations based on traditional polymers still contain solvents and coalescing agents which can affect the indoor air quality of the painted rooms.

The use of VAE dispersions with MFFT 0°C enables the formulation of paints without any solvents and coalescing agents. Detectable emissions after 28 days are far below the A+ TVOC limit of 1000 µg/m³, which is required by the French "Décret". Even after just seven days, the TVOC emissions are far below the requirements of some non-mandatory labels (e.g. TÜV-Süd).

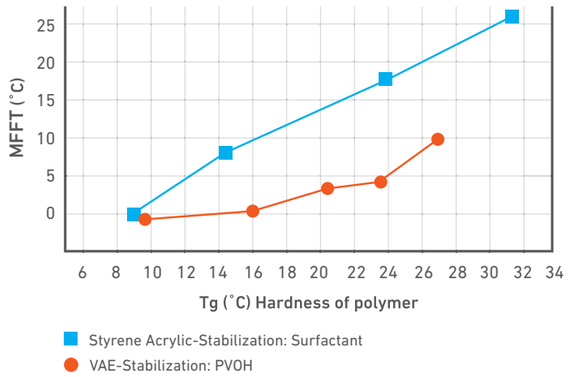
Beside the impact on the indoor air quality, interior paints also must fulfill application properties in order to meet the expectations of the end consumers. The most important application properties are wet scrub resistance, hiding power and block resistance.

Chamber emission tests

Excellent wet scrub resistance

VAE dispersions show a unique feature called "hydroplastification". Due the hydrophilic nature of VAE polymers, water acts as a coalescing agent (softening the polymer) during the film formation. As a result, VAE dispersions show a substantially higher Tg, at the same MFFT compared to competitive chemistries (e.g. S/A).

Hydroplastification effect with VAE copolymers

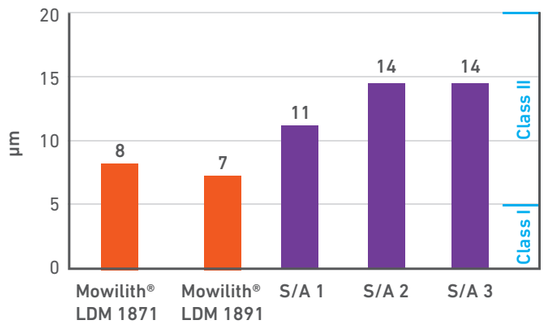


Glossary

MFFT = Minimum Film Forming Temperature
PVC = Pigment Volume Concentration
S/A = Styrene-Acrylic
Tg = Glass Transition Temperature
TiO_2 = Titanium Dioxide
TVOC = Total Volatile Organic Compound
VAE = Vinyl Acetate Ethylene
VOC = Volatile Organic Compound

This substantially higher Tg of VAE dispersions, develops a much better surface hardness compared to soft S/A dispersions, resulting in much better wet scrub resistance.

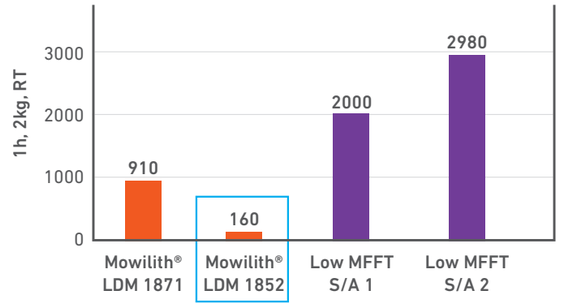
Wet scrub resistance



Better blocking resistance for satin paints

The major challenge in low emission water-based satin paints is to achieve a high level of blocking resistance. With the application of the Core-Shell Technology to VAE dispersions, Celanese created a heterogeneous VAE dispersion with the introduction of a hard VAE polymer phase into a low MFFT VAE polymer phase. As a result, the gap between MFFT and Tg is increased even more, resulting in increased block resistance, while maintaining the excellent gloss behavior of VAE dispersions in general.

Blocking



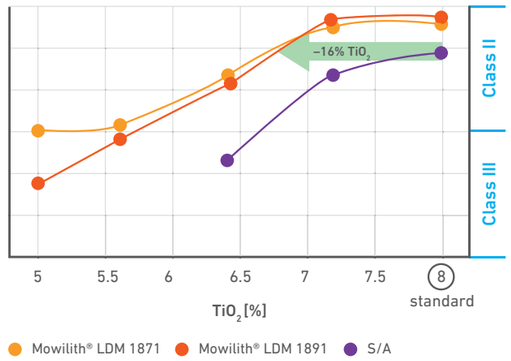
Increased hiding power in paints above critical PVC

VAE dispersions also have a positive impact on the hiding power of high PVC interior paints where the polymer acts as spacer between pigments and fillers. By using VAE dispersions, paint manufacturers are able to reduce the use of titanium dioxide, which has a direct positive impact on the paint formulation costs.

In paints above critical PVC, VAEs offer a better hiding power than S/A over the full spreading rate range.

For example, in a S/A based matt formulation containing 8% of TiO_2, it is possible to reduce the amount of TiO_2 to 6.7% by replacing the S/A binder by VAE, while keeping the same hiding power. Thus, VAE technology allows to save up to 16% of TiO_2 in the formulation.

Cost reduction due to better hiding power with VAE dispersions



VAEs:
State of the art

Color retention

Beside excellent wet scrub, blocking and hiding power, VAE dispersions demonstrate excellent color retention over time for the entire range of shades which is important to prevent interior paints from fading.

Especially with light sensitive pigments, VAE dispersions are showing better results compared to S/A.

How to formulate VAEs

VAE dispersions differentiate from styrene-acrylic dispersions through various aspects such as monomer content, hydrophilicity, stabilization, particle size, which result in different thickener responses, application properties, odor, etc. Therefore, the adaptation of the paint formulation profile is crucial.

Choose the right thickener(s) package

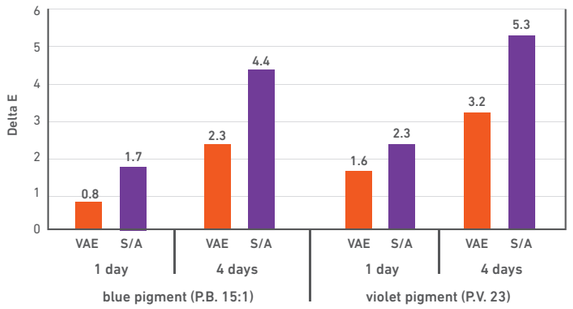
To achieve optimum rheological and application properties, Celanese recommends the use of a cellulosic thickener in combination with polyurethane- or acrylic thickeners. Guide formulations and thickener recommendations for the relevant VAE dispersions are available upon request.

Adjust pH for optimal stabilization

Based on their chemistry, VAE dispersions have a pH in the acidic range, typically between 4 and 6. Thus, VAEs differ from typical pH values of S/A which lie between 8 and 9.

Celanese recommends to adjust the pH of the final VAE paint formulation between 8.0 to maximum 8.5.

Color fading high PVC interior paints
Artificial weathering - Pigment stability (Sun test)



What our customers like about VAEs

High solid range from 53% to 58% (lower storage capacity needed, lower transportation cost, lower carbon foot print)

- Low VOC paint formulations possible without coalescent
- Longer open time
- Pigment binding properties
- Blocking resistance of heterogenous VAE
- Better over-lapping properties
- Stable and versatile

Mowilith® LDM 1829	Is a dispersion based on VAE/vinyl ester copolymer that facilitates the formulation of low-emission biocide free interior paints. The binder shows good compatibility with water glass, which allows the required stability under alkaline conditions at high pH.
Mowilith® LDM 1852	Is the first heterogeneous VAE dispersion especially developed for low-emission satin paints. The binder offers optimized gloss and improved blocking for high binder containing paints in the medium PVC range.
Mowilith® LDM 1871	Is the first-choice binder for low-emission interior matt and satin paints. Paints formulated with Mowilith® LDM 1871 offer excellent wet scrub resistance and hiding power. Due to the optimized shear stability, this versatile binder can also be formulated into low-emission plasters and textured coatings.
Mowilith® LDM 1880	Is a cellulose ether stabilized VAE dispersion particularly suited for thixotropic paints. This versatile binder is ideal for low emission interior matt to satin paints, plasters, textured coatings and deep shade paints.
Mowilith® LDM 1891	Is an extra-high solid VAE dispersion based on a pure emulsifier stabilization. Mowilith® LDM 1891 offers interesting cost performance ratio.

Formulating your low emission paints with our expertise

As we spend around 90% of our time indoors, consumers demand healthy, easy to apply and esthetically beautiful decorative paints with a long-lasting appearance. Celanese offers the technology and formulating assistance that can help you create paints that will delight consumers. We can assist you in your environmental, performance and cost goals in flat and semi-gloss paints, plasters and textured coatings, deep shade paints, specialty primers and more.

Celanese VAE dispersions are the premium class for low-emission, environmentally friendly paints. Our acrylic dispersions offer good block resistance and wet adhesion for satin paints. Our styrene acrylic dispersions are ideal for conventional paints containing coalescing agents and for primers. Use our vinyl ester polymers in conventional paints and deep shade paints.

Technology at your service

With Celanese technology, you can address virtually any type of interior paint functionality you can imagine. We can help you with challenges regarding color, workability, blocking, penetration, adhesion and many other challenges you face. Our technical assistance teams are experienced in putting our technology to work for optimized performance and addressing your formulating issues.

Chemical Base	Product	Specifications							Features/Benefits	Suggested applications							Product
	Mowilith®	Stabilization*	Solids content (%)	MFFT approx. (°C)	Tg approx (°C)	pH	Particle size approx. (µm)	Brookfield viscosity (mPa·s)		Interio paints; low emission	Satin paints; low emission	Plasters & textured coatings; low emission	Paints containing coalescent agents	Dispersion silicat paints	Primers	Easy-to-clean	Mowilith®
VAE/Vinyl ester	NEW LDM 1829	E/C	50	0	-10	5.5	0.1 – 0.55	100 – 1500	Good compatibility with water-glass for low emission biocide free interior paints					••			LDM 1829
VAE	LDM 1734	E	34	0	1	5.0	0.09	10 – 100	Good penetration properties						••		LDM 1734
	LDM 1852	E/PVOH	50	4	19	4.5	0.18	500 – 1900	Optimized gloss and blocking; first "heterogeneous" VAE-dispersion	•	••						LDM 1852
	LDM 1871	E/PVOH	53	0	12	4.5	0.10 – 0.45	1000 – 4000	Good pigment binding power, workability and shear stability, very versatile; excellent for low emission paints	••	••	••					LDM 1871
	LDM 1880	E/C	55	0	13	5.0	0.10 – 0.60	1000 – 3000	For thixotropic paints with improved wet scrub	••	••	••					LDM 1880
	LDM 1881	E/C	60	1	12	4.5	0.15 – 0.40	3000 – 6000	Particularly suited for thixotropic paints	••	•	••					LDM 1881
	LDM 1891	E	58	0	13	5.0	0.10 – 0.45	200 – 1600	Extra-high solid VAE with pure emulsifier stabilization	••	•						LDM 1891
Vinyl ester	LDM 2454	E	50	11	20	6.0	0.15	50 – 350	Improved pigment binding power; very versatile				••				LDM 2454
Styrene acrylic	LDM 6119	E	50	1	3	8.0	0.13	1000 – 4000	Good compatibility with water-glass	•	•	•		••	•		LDM 6119
	LDM 6159	E	48	0	3	8.5	0.15	2000 – 7000	Good barrier protection against, e.g. nicotine and wood ingredients						••		LDM 6159
	LDM 7601	E	34	0	-4	8.0	0.06	10 – 60	Good penetration properties						••		LDM 7601
	LDM 7669	E	34	2	9	6.5	0.06	10 – 90	Good penetration properties; very versatile, compatible with water-glass, ammonia-free						••		LDM 7669
Acrylic	LDM 7412	E	46	1	-7/45	8.5	0.12	50 – 150	Low emission, easy to clean	••	••					••	LDM 7412
	LDM 7451	E	47	7	13/65	8.5	0.10	2500 – 6500	Good block and chemical resistance, high performance trim paint				••			•	LDM 7451
	LDM 7459	E	47	0	-5/65	8.5	0.10	2500 – 6500	Good block and chemical resistance, high performance trim paint for low emission paints		••					•	LDM 7459
	LDM 7749	E	48	2	8	8.5	0.12	2000 – 6000	Low emission acrylic interior paints	••	••						LDM 7749
	NEW ECO 9500	E	46	1	6	7.5	0.12	100 – 1500	Universal acrylic binder with good water resistance and 31% biobased carbon based on total carbon content	••	••	••					ECO 9500

*E = Emulsifier, C = Cellulose derivatives, PVOH = Polyvinyl alcohol

• Recommended •• Highly recommended

Formulating your durable coatings with our expertise

Pure acrylic dispersions are known for their outstanding versatility, durability and UV resistance on a variety of substrates including minerals, woods and metals. For architectural coatings, Celanese offers a broad product portfolio of high-quality acrylic dispersions for masonry paints and concrete protection paints.

Mowilith® LDM 7717	Combines good hardness and low water uptake, which translates into excellent weathering behavior.
Mowilith® LDM 7718	Especially for tinted paints and marble chip plasters, Celanese has developed the new acrylic dispersion Mowilith® LDM 7718, which provides excellent color retention in combination with organic pigments and very low blanching under wet conditions in transparent formulations.
Mowilith® LDM 7719 **Mowilith® LDM 7714**	The softer Mowilith® LDM 7719 and the harder Mowilith® LDM 7714 enable formulators to select the right hardness for their specific requirements. Both dispersions contain the same adhesion promoter technology to achieve excellent adhesion on critical substrates, such as old alkyd paints or metal which makes them especially suitable for house, wood and concrete protection paints.
Mowilith® LDM 7713	Is the best option for wood protection paints. It was especially developed for its wet adhesion properties on old alkyd paints.
Mowilith® LDM 7759 **Mowilith® LDM 7719**	Are acrylics with lower Tg and MFFT. They offer higher elasticity, good adhesion and a low MFFT of 0 °C. This is an advantage for wood and crack bridging coatings and enables the manufacturer to formulate coalescent-free, low-emission paints.
Mowilith® LDM 7709	Is the first choice for solvent-free masonry paints, plasters and silicate paints. It offers excellent outdoor weathering behavior in coalescent free formulations.
Mowilith® LDM 7728	When outdoor durability is the #1 criteria, Celanese offers the newly developed Mowilith® LDM 7728, with best in class color retention properties, especially in deep shade masonry paints and excellent adhesion on mineral surfaces and aged wall paints.
Mowilith® LDM 1734	Reducing complexity and raw materials is today one of our priorities. The newly launched Mowilith® LDM 1734 is the first VAE penetration primer and is compatible with various substrates like gypsum, concrete, wood, brick, old coat, etc.

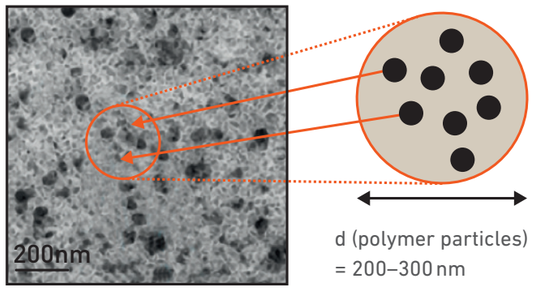
Brilliant exterior paints with patented VAE Inclusion Technology

Think VAE Inclusion Technology

The patented VAE Inclusion Technology allows the introduction of hard acrylic domains into a VAE polymer matrix without increasing the MFFT. This results in a combination of the best of both monomer systems, (including excellent durability), and color retention – especially in combination with organic pigments. Mowilith® LDM 1869 represents the next generation of VAE-based dispersions designed for exterior paints and plasters.

The VAE Inclusion Technology also offers excellent fire-retardant characteristics. This is especially important for External Thermal Insulation Composite System (ETICS), which must meet the requirements for the classification B1 according DIN 4102 (German Brandschacht Test) or the Euroclass B classification, according to the European SBI test DIN EN 13501. The low MFFT of approx. +3 °C allows for a reduction in solvent and plasticizer content, which represents the next ecologically friendly trend for low VOC exterior paints.

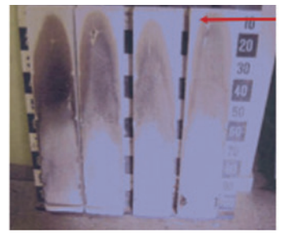
VAE Inlclusion Technology



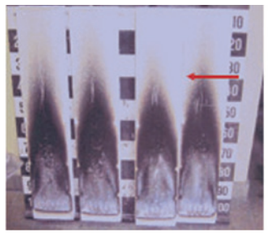
TEM picture: Polymer film showing evenly distributed domains of the hard polymer, which are significantly smaller than the size of the emulsion particles.

Brandschacht test results

Pure acrylic



VAE Inclusion



At least 15 cm residual length is needed the test for class B1.

SBI test results

	Fire growth rate [W/s]	Total heat release [MJ]	Smoke growth rate [m^2/s^2]	Total smoke production [m^2]	Class [1]
VAE Inclusion	113.2	2.5	10.9	45.2	B s1 d0
Pure acrylic	157.7	5.3	4.7	60.7	C s2 d0

[1] Classification according DIN EN 13501-1

Surface protection

Exterior coatings must durably protect the surface while providing an esthetically beautiful finish. Celanese offers a wide range of dispersions based on several polymer chemistries to provide the best solution for different exterior coatings, including masonry paints, silicate paints, plasters or wood coatings. Our product portfolio includes standard binder technologies for exterior coatings such as pure acrylic, styrene acrylic, vinyl ester and VAE dispersions. In addition Celanese has developed innovative dispersions by combining and improving the advantages of different chemistries and technologies such as nano-hybrid technology and VAE inclusion technology to reach the next level of performance. Learn more about our VAE Inclusion Technology product on page 15.

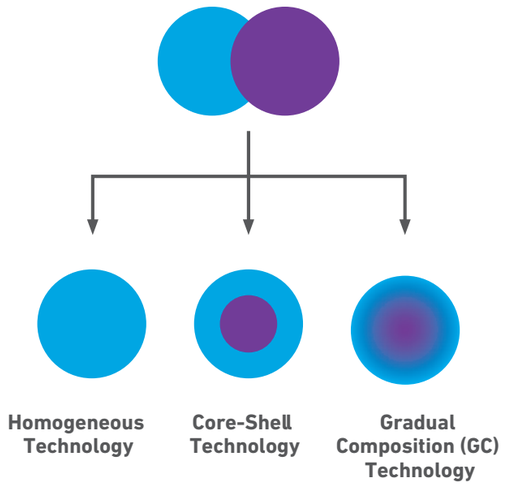
Chemical Base	Product	Specifications							Features/Benefits	Suggested applications									Product
	Mowilith®	Stabilization*	Solids content (%)	MFFT approx. (°C)	Tg approx. (°C)	pH	Particle size approx. (µm)	Brookfield viscosity (mPa·s)		Masonry paints; low emission	Masonry paints; containing coalescent agents	Elastomeric wall coatings	Dispersion silicate paints & plasters	Deep shade paints	Plasters & textured coatings	ETICS	Primers	Marble chip plasters	Mowilith®
VAE	LDM 1734	E	34	0	1	5.0	0.09	10 – 100	Good penetration properties								••		LDM 1734
	LDM 1871	E/PVOH	53	0	12	4.5	0.10 – 0.45	1000 – 4000	Versatile dispersion for exterior coating	•	•			••	•	•	•	•	LDM 1871
VAE inclusion	LDM 1869	E/PVOH	53	1	13	5.0	0.1 – 0.5	500 – 2500	Excellent binder for exterior coatings like masonry paints and plasters with optimized balance regarding liquid water & water vapor penetration	••	••			••	••	••	•		LDM 1869
VAE/VC/A	LDM 1265	E/C	52	5	10	5.5	0.2 – 1.3	1500 – 3000	Saponification resistance; water-glass compatible		••		••	••	••	••	•		LDM 1265
Vinyl ester	LDM 2454	E	50	11	20	6.0	0.15	50 – 350	Improved dirt pick-up; optimized colour retention; very versatile; acrylic containing		••			••	••	••	•		LDM 2454
Styrene acrylic	LDM 6119	E	50	1	3	8.0	0.13	1000 – 4000	Improved dirt pick-up; water-glass compatible; good water resistance	••	••	•	••		••		•		LDM 6119
	LDM 7601	E	34	0	-4	8.0	0.06	10 – 60	Good penetration properties								••		LDM 7601
	LDM 7669	E	34	2	9	6.5	0.06	10 – 90	Good penetration properties; water-glass compatible, ammonia free								••		LDM 7669
	LDM 7671	E	50	0	-6	8.0	0.17	4000 – 9000	Suitable for elastomeric wall coatings; good dirt pick-up	•		••	•				••		LDM 7671
Acrylic	LDM 7709	E	46	2	7	6.5	0.12	20 – 200	Acrylic dispersion for low emission coatings; water-glass compatible; optimized dirt pick-up	••	•		••	••	••	••	•	•	LDM 7709
	LDM 7714	E	50	14	21	8.5	0.12	500 – 3500	Optimized dirt pick-up; low water up-take; improved wet adhesion		••		•	••	••	•	•		LDM 7714
	LDM 7717	E	46	18	23	8.5	0.12	200 – 600	Optimized dirt pick-up; low water up-take		••			••	••	••	•		LDM 7717
	LDM 7718	E	48	8	19	8.5	0.12	1000 – 5000	Fulfills high demands regarding bleaching, good water resistance		••			••	•	••		••	LDM 7718
	LDM 7719	E	50	1	9	8.5	0.12	3000 – 7000	Acrylic dispersion with improved wet adhesion and optimized elasticity; particularly on wood	•	••			••			•		LDM 7719
	LDM 7728	E	47	16	22	8.5	0.12	300 – 3000	Optimized color retention with a wide variarity of pigments		••			••	•				LDM 7728
	NEW LDM 7759	E	48	1	7	8.0	0.15	100 – 1000	Acrylic dispersion for low emission coatings with excellent compatibility with water-glass and good color stability	••			••	••	••	••	•		LDM 7759
	LDM 7978	E	60	0	-30	6.0	0.40	100 – 3000	High elasticity and good crack bridging			••				••			LDM 7978
	NEW ECO 9500	E	46	1	6	7.5	0.12	100 – 1500	Universal acrylic binder with good water resistance and 31% biobased carbon based on total carbon content	••				••	••	••			ECO 9500
Nano hybrid	Nano 9451	E	45	18	28	8.5	0.12	10 – 100	For special exterior paints; extreme low dirt pick-up	For technical advice, please contact our Application Technology Service.									Nano 9451

*E = Emulsifier, C = Cellulose derivatives, PVOH = Polyvinyl alcohol

• Recommended •• Highly recommended

High-performance acrylics technologies

Acrylic dispersions have excellent versatility, resistance and durability on various substrates including minerals, woods and metals. Due to the increasing requirements of VOC regulations and Eco-labels, water-based Mowilith® acrylic dispersions are perfect alternatives for solvent based binders.



Homogeneous Technology

Mowilith® acrylic dispersions with homogeneous particle morphology enable the formulation of high-performance coatings with long-term durability. Through monomer composition and functionality (wet adhesion and crosslinking), polymer dispersions can be optimized for gloss paints, lacquers and varnishes.

Mowilith® LDM 7774 and Mowilith® LDM 7714 enable the formulation of universal and high-performance coatings for use on various substrates.

Mowilith® LDM 7749 is the perfect binder for low emission wood stains. The binder is showing excellent elasticity on wood while providing at the same time very good resistance to water.

Advanced polymerisation technologies

For special applications, a compromise must be found between low VOC formulation (flexibility) and low blocking (hardness). Therefore advanced polymerization technologies enable the combination of opposing mechanical properties into one binder, optimizing the balance between soft polymer phase (formulation without coalescent agent, low Tg) and hard polymer phase (low blocking, high Tg).

Core-Shell Technology

Mowilith® acrylic dispersions based on Core-Shell Technology contain two different copolymers with two different Tg values. The soft phase (low Tg) enables the film formation at lower temperatures with reduced demand for coalescing agents, and the hard phase (high Tg) improves film hardness and block resistance.

Mowilith® LDM 7451 offers excellent block and chemical resistance, and is particularly suited for low VOC gloss and trim paints.

Mowilith® LDM 7416 is the perfect binder for wood stain, while providing early block resistance and good hailstone resistance.

At low MFFT Mowilith® LDM 7459 offers optimized block and chemical resistance. It's the ideal binder for low emission gloss and trim paints. Furthermore Mowilith® LDM 7459 can be used for high quality interior paints where chemical resistance is a required feature.

Gradual Composition (GC) Technology

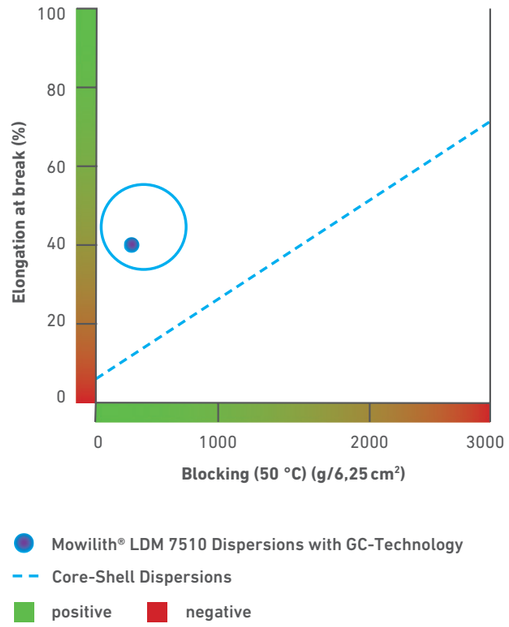
Mowilith® LDM 7510 is designed with the new Gradual Composition (GC) Technology. In contrast with Core-Shell Technology, where there are two different polymers with two different Tg's the GC-Technology products contain a broad range of copolymers with different glass transition temperatures (Tg).

Mowilith® LDM 7510 represents the next generation of acrylic dispersions designed as binders for gloss paints, varnishes and trim paints. This new low MFFT acrylic dispersion offers an excellent balance between high block resistance and elasticity. The combination makes the product suitable for low-emission gloss paints and coatings for decorative applications in the professional and DIY segment.

Key advantages

- High gloss
- MFFT = 0 °C
- Styrene-free
- Excellent elasticity and high block-resistant
- Excellent chemical and solvent resistance with great wet adhesion (self-cross-linking)
- Good outdoor durability – results are in line with expectations thus far

Optimized balance between blocking resistance and elasticity



Perfect for application and environmental performance

The demand for waterborne, ecologically friendly gloss paints, lacquers and varnishes has significantly increased in recent years. Due to the increasingly stringent VOC regulations and standards for Eco-labels, there has been a concentrated effort to formulate away from solvent-based binders, the benchmark for decades. Water-based Mowilith® acrylic dispersions are good alternatives for solvent-based binders to reduce the VOC content while retaining the performance properties required in these products.

Chemical Base	Product	Specifications							Features/Benefits	Suggested applications					Product
	Mowilith®	Stabilization*	Solids content (%)	MFFT approx. (°C)	Tg approx. (°C)	pH	Particle size approx. (µm)	Brookfield viscosity (mPa·s)		Gloss/Trim paints	Weather protection wood paints	Weather protection wood stains	Corrosion protection	Stain-blocking coating	Mowilith®
Vinyl ester maleinate	DM 2 H	PVOH	51	0	-	4.5	0.3 – 2.0	1300 – 2700	Good weathering resistance; good low temperature elasticity		••				DM 2 H
VAE inclusion	LDM 1869	E/PVOH	53	1	13	5.0	0.1 – 0.5	500 – 2500	Good weather resistance & improved dirt pick-up		••				LDM 1869
Styrene acrylic	LDM 6159	E	48	0	3	8.5	0.15	2000 – 7000	Good barrier protection against, e.g. nicotine and wood ingredients					••	LDM 6159
Acrylic	LDM 7416	E	50	1	3/90	8.5	0.12	1000 – 4000	Good block resistance; good hailstone resistance	•		••	•		LDM 7416
	LDM 7451	E	47	7	13/65	8.5	0.10	2500 – 6500	Good block and chemical resistance; particularly suited for gloss paints	••		•	•		LDM 7451
	LDM 7459	E	47	0	-5/65	8.5	0.10	2500 – 6500	Low emission paints trim paints with good block and chemical resistance	••		•			LDM 7459
	LDM 7510	E	48	0	-	8.5	0.11	500 – 6000	Optimized balance of block resistance and elasticity for low emission paints	••		•			LDM 7510
	LDM 7713	E	50	12	17	8.5	0.12	1500 – 4500	Excellent adhesion on alkyd	•	••	••			LDM 7713
	LDM 7714	E	50	14	21	8.5	0.12	500 – 3500	Improved wet adhesion	•	•	••			LDM 7714
	LDM 7717	E	46	18	23	8.5	0.12	200 – 600	Standard dispersion for universal use	•	•	•			LDM 7717
	LDM 7719	E	50	1	9	8.5	0.12	3000 – 7000	Acrylic dispersion with improved wet adhesion and optimized elasticity, particularly on wood		••				LDM 7719
	LDM 7724	E	46	9	20	8.5	0.10	500 – 5000	Good wetting; good levelling	•	•	••			LDM 7724
	LDM 7749	E	48	2	8	8.5	0.12	2000 – 6000	High elasticity; good water resistance for solvent-free wood stain			••			LDM 7749
	LDM 7774	E	46	13	25	8.5	0.11	100 – 700	Good wet adhesion, very versatile binder	••	•	•			LDM 7774

*E = Emulsifier, PVOH = Polyvinyl alcohol

• Recommended •• Highly recommended

Tailored solutions

In the industrial coatings segment customers often have a stringent set of criteria that a product should provide. Next to coating properties, such as durability, color fastness, etc, processing properties such as the applicability and drying speed are of critical importance to guarantee a high efficiency (low cost in use) in the industrial environment.

As industrial coatings are designed for a specific application and manufacturing environment, Celanese technical experts are ready to work with you to match our technology with your customers' performance and processing needs. For industrial coatings, various application techniques are used.

Chemical Base	Product	Specifications								Features/Benefits	Suggested applications														Product
	Mowilith®	Stabilization*	Solids content (%)	MFFT approx. (°C)	Tg approx. (°C)	pH	Particle size approx. (µm)	Brookfield viscosity (mPa·s)	Compatibility with cement		Ceramic tile adhesives	Flexible sealing	Corrosion protection	Fillers/putties	Primers	Furniture varnishes	Parquet varnishes	Joinery coating	Elastomeric roof coating	Plastic coating	Metal coating	Roof tile coating	Fibre cement coating	Intumescent coating	Mowilith®
Construction																									
VAE	LDM 1734	E	34	0	1	5.0	0.09	10 – 100	Yes	Excellent penetration properties					••										LDM 1734
Styrene acrylic	LDM 6119	E	50	1	3	8.0	0.13	1000 – 4000	Yes	Good flexibility; improved water resistance	•	••		••	••				••						LDM 6119
	LDM 6482	E	57	0	-7	8.0	0.20	1000 – 4000	Yes	Good compatibility with bitumen		••		•	•										LDM 6482
	LDM 6636	E	50	13	20	8.5	0.15	50 – 300	No	Particularly suited for tile adhesives	••														LDM 6636
	LDM 7651	E	50	0	-10	8.5	0.14	3000 – 6000	No	Good compatibility with light weight fillers				••	•				•						LDM 7651
	LDM 7601	E	34	0	-4	8.0	0.06	10 – 60	No	Good penetration properties					••										LDM 7601
	LDM 7669	E	34	2	9	6.5	0.06	10 – 90	No	Good penetration properties, especially water-glass compatible, ammonia-free					••										LDM 7669
	LDM 7671	E	50	0	-6	8.0	0.17	4000 – 9000	Yes	Good flexibility; improved water resistance									••						LDM 7671
Fire retardant coating																									
Vinyl ester	LDM 2301	E/C	50	13	26	4.0	0.1 – 0.5	1000 – 3000	-	Optimized for fire protection paints														••	LDM 2301
Industrial																									
Acrylic	LDM 7411	E	50	1	-10/50	8.5	0.10	1000 – 4000	-	Improved block resistance and wet adhesion			••					•			•		•		LDM 7411
	LDM 7416	E	50	1	3/90	8.5	0.12	1000 – 4000	-	Optimized block resistance; good hailstone resistance			••					••		•	•		••		LDM 7416
	LDM 7461	E	46	24	30/98	7.5	0.12	500 – 2500	-	Optimized chemical resistance and hardness						••	••			•	•				LDM 7461
	LDM 7722	E	47	15	21	7.8	0.16	20 – 80	-	Good efflorescence protection												••	•		LDM 7722
	LDM 7991	E	46	-	98	8.5	0.11	200 – 800	-	Very high block and scratch resistance										•					LDM 7991

*E = Emulsifier, C = Cellulose derivatives

• Recommended •• Highly recommended

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EMULSION POLYMERS

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