



## **FORMULATING YOUR VISION WITH OUR EXPERTISE**

**Celanese Emulsions  
Product Overview  
Guide for the Americas**

# 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.

At Celanese, 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 process technology and competitive cost structures.

- Celanese seeks to be first choice solution provider. We help our customers address problems and accelerate product development and 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 varied capabilities and expertise.

## Our two core business areas are:

- Materials Solutions: Specialty thermoplastics, cellulose derivatives and food ingredients
- Acetyl Chain: acetic acid, vinyl acetate monomer, other acetyl derivatives, such as solvents, plasticizers, maleic acid esters, polymer dispersions for paints & coatings, adhesives and specialty fibers and EVA polymers for different applications

## Celanese emulsion polymers business

- Partnering with our customers to fulfill industry and consumer needs
- Global expertise in a wide array of applications
- Manufacturer of both high-pressure (VAE) and conventional (atmospheric) emulsions

Celanese Emulsion Polymers is one of the largest and most experienced suppliers of emulsion technology for waterborne coatings in the world. We have manufacturing plants and technical support in all major regions of the globe and are ready to help you add value to each of your coating products. We have been an active leader in European paints and coatings for decades, and we have gained deep understanding of the markets, products, applications and issues affecting our industry today.

## Innovation and expertise

Our goal is to help our customers drive innovation into their products by assisting them with their product development. Celanese is closely watching market and industry trends, as well as regulatory requirements, to be at the forefront of emulsions technology. Celanese is ready to help you meet your requirements for high-quality waterborne coatings.



### Understanding customer and industry needs

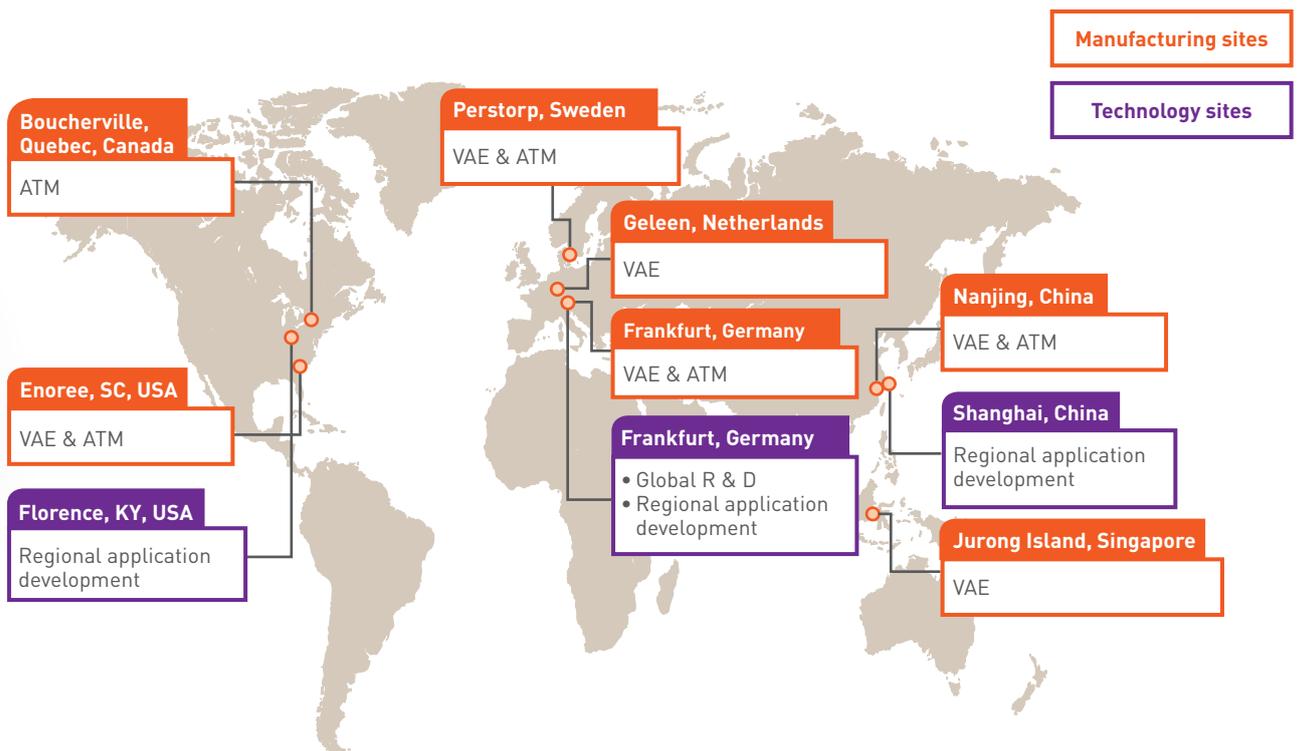
The Celanese technical team consistently strives to meet the needs of our customers, including their formulated coating products. We are constantly updating our laboratory with modern equipment to aid in designing and adapting our products to meet real-world application profiles and enable product testing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

### Advanced technology for a sustainable future

Celanese offers high-performance emulsions for the architectural coatings market. These water-based emulsions do not contain solvents or other hazardous ingredients. The ease of use combined with lower emissions and low odor makes them the right binder choice for the next generation of high-performance coatings.

### Global reach

The global research and development center for Celanese emulsions (Frankfurt Technology Center) is located in Germany. The center closely cooperates with the other Celanese regional application development centers located in Florence, USA, and in Shanghai, Asia. These regional facilities enable us to rapidly develop new products and to assist regional customers with their development projects. We have manufacturing plants and technical support in all major regions of the world. In 2016, an additional VAE production unit on Jurong Island, Singapore went live to support the growing demand for ecologically-friendly dispersions in the South East Asia region, including Australia, India and New Zealand.



VAE = high-pressure, vinyl acetate/ethylene  
 ATM = conventional (atmospheric)

## Celanese supports the American paint industry

Celanese supports the North, Central and South American paint industries by providing high-performance emulsions and technical expertise to coatings manufacturers. We constantly monitor and evaluate the market drivers and regulatory trends that affect the coatings industry in order to provide innovative solutions to our customers.

Celanese has two emulsions manufacturing facilities in North America to support your requirements. As one of the world's leading suppliers of vinyl-based technologies, Celanese is backward integrated to VAM and acetic acid to provide the security of supply to our customers.

For the formulator, we provide technical expertise, starting point formulations and emulsions that are tailored to meet all their needs, from VOC regulations to application characteristics and paint performance properties. For the paint marketer, we help support low-odor and low-VOC claims, as well as high-performance attributes such as scrub resistance and block resistance.

## Broad product range to meet your needs

Celanese offers a diverse portfolio of products, including our EcoVAE® line of vinyl acetate/ethylene emulsions, our Avicor® line of vinyl acrylic and 100% acrylic emulsions and our Celanese CLX ultra-low VOC coalescent.

Celanese has decades of experience in VAE emulsions designed for low-odor, low-VOC interior decorative paints and has translated this in the form of EcoVAE® emulsions designed for the North and Latin American industries. EcoVAE® emulsions must meet a stringent criteria including:

- Ability to formulate low-VOC coatings
- Very low odor
- APE-free
- A low residual monomer level (<1000 ppm)

These emulsions address the formulation and regulatory concerns, as well as offering distinct competitive marketing advantages, such as low odor, good touch-up and scrub resistance. These emulsions can also enable you to meet third party certifications such as Master Painters Institute specifications.

Ask us about our products and how they fit your sales and marketing goals.

## Our brands

### Avicor® and EcoVAE® Emulsions for Architectural Coatings

Celanese offers a broad range of emulsions for use in the architectural paint and coatings industry, including the EcoVAE® brand of vinyl acetate/ethylene polymers and the Avicor® brand of emulsions.

Celanese Emulsion Polymers has been at the forefront of technology that has enabled environmental breakthroughs for the coatings industry. Our company developed the first non-solvent binder technology for low-VOC paints decades ago. Today, EcoVAE® brand emulsions are enabling low-VOC paints that meet increasingly stringent VOC legislation, while meeting consumer requirements for high-performance use.





### Today, you can choose the following polymer types in the Avicor® line of emulsions:

- Vinyl acrylic
- 100% pure acrylic
- Specialty vinyl acetate/versatate emulsions

Avicor® polymers enable formulators to meet durability and high-scrub requirements in both conventional and low-VOC paints. They can be used in both interior and exterior architectural coatings, where durability and washability are critical requirements.

EcoVAE® vinyl acetate/ethylene emulsions are specifically designed for the formulation of low-odor, low-VOC architectural coatings.

### Characteristics of paints formulated with EcoVAE® emulsions:

- Low-odor
- Low-emission/low-VOC
- Eco-friendly
- Excellent scrub resistance
- Good touch-up
- Able to meet green certifications

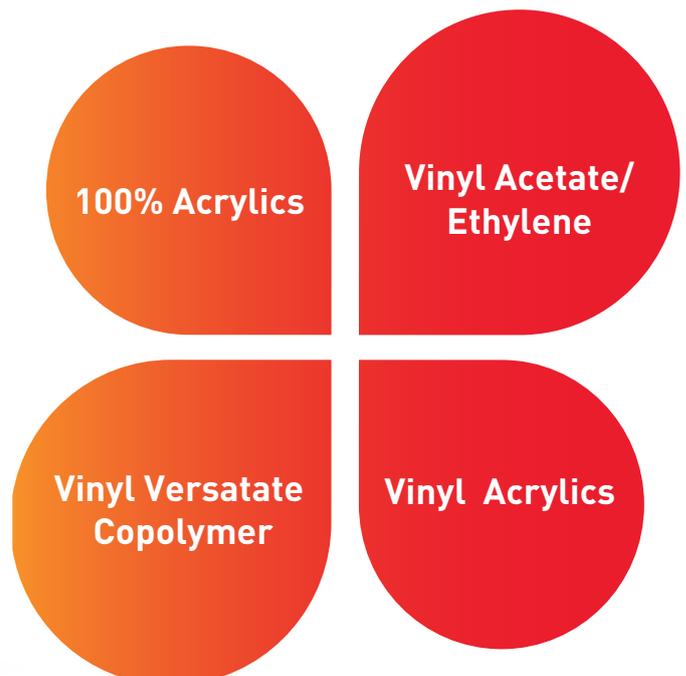
### EcoVAE® emulsions meet the following criteria:

- Low-VOC
- APE-free
- Vinyl acetate/ethylene (VAE)-based

### Applications:

- Interior Wall and Trim Paints
- Exterior Paints
- Bonding Primers
- Wood Stains and Sealers
- Peelable Coatings
- Low VOC

### Technologies:



# CELANESE EMULSION POLYMERS BINDER TECHNOLOGY SOLUTIONS

## Emulsions Portfolio

Product	Polymer Type	Stabilization	APE-Free	Solids Content	MFFT (°C)	Tg (°C)	pH	Typical Particle Size (nm)	Viscosity (cps)
ECOVAE® 401	VAE	E/C	Yes	55%	0	13	5.0	225	100 - 650
ECOVAE® 405	VAE	E/C	Yes	55%	0	13	5.0	225	125 - 650
AVICOR® 325	Vinyl Acrylic	S	No	55%	10	19	5.0	300	700 - 1450
AVICOR® 384	Vinyl Acrylic	S	Yes	55%	11	19	5.0	200	< 850
AVICOR® 7305	Vinyl Acrylic	E/C	Yes	55%	13	20	5.0	285	500 - 1500
AVICOR® 7480	Vinyl Acrylic	E	Yes	55%	8	18	5.0	275	< 300
AVICOR® 7448	Vinyl Acrylic	E/C	No	55%	13	20	5.0	300	300 - 1000
AVICOR® 601	100% Acrylic	S	Yes	47%	0	-14/+32	8.5	115	< 300
AVICOR® 633	100% Acrylic	E	Yes	50%	10	20	8.5	150	100 - 500
AVICOR® 2550	100% Acrylic	E	No	50%	17	20	8.7	150	50 - 300
AVICOR® 6408	100% Acrylic	E	No	45%	34	52	8.2	80	< 1500
AVICOR® 2456	Vinyl Versatate Copolymer	E	No	50%	11	19	6	175	50 - 400

E=Emulsifier

C=Protective Colloid

S=Surfactant Stabilized

Product	VOC	Product Type	Specific Gravity	Boiling Point (°C)	Acid Value	Appearance	Water Content	Odor
Celanese® CLX	~0% (GC Method)	Coalescent	0.966	380	Max. 0.10 mg/ KOH/g	Clear liquid	Max. 0.10% (w/w)	Very slight



Features/Benefits	Product
A versatile, workhorse emulsion for low- to zero-VOC DIY and contractor paints that addresses both regulatory compliance and performance issues. Paints formulated with EcoVAE® 401 offer low odor, good scrub resistance and excellent touch-up characteristics. Low-to near zero-VOC capable.	<b>ECOVAE® 401</b>
A high-performance emulsion for DIY and contractor paints, offering exceptional scrub resistance, low odor and enhanced touch-up characteristics. Low- to near zero-VOC capable.	<b>ECOVAE® 405</b>
A vinyl acrylic designed for use in both interior and exterior paints. Offers excellent flexibility for use on aged masonry, primed wood, etc. High tensile strength makes it an ideal binder choice for use in peelable coatings	<b>AVICOR® 325</b>
A small particle size APE-free vinyl acrylic designed for use in both interior and exterior paints. Offers excellent flexibility for use on aged masonry, primed wood, etc. Excellent scrub and stain resistance. Compatibility with other polymers and coalescents.	<b>AVICOR® 384</b>
An APE-free vinyl acrylic emulsion designed for quality interior coatings across a wide range of sheens. Paint properties include excellent film build and gloss development as well as good flow and leveling.	<b>AVICOR® 7305</b>
A high molecular weight vinyl acrylic emulsion, which exhibits efficient pigment binding over a range of PVC, resulting in enhanced scrub resistance, good hiding and superb gloss.	<b>AVICOR® 7480</b>
Small particle size, vinyl acrylic emulsion producing low porosity paint films for excellent stain removal and sealing characteristics. Use in both interior and exterior formulas.	<b>AVICOR® 7448</b>
Self-crosslinking, premium acrylic emulsion designed for excellent performance in ultra-low VOC flat and non-flat formulations. Excellent adhesion to various substrates and capable of being used in bonding primers. Can be used to blend with Celanese vinyl-based resin systems.	<b>AVICOR® 601</b>
An APE-free emulsion suitable for interior and exterior formulations with superior scrub and stain resistance, excellent dry and wet adhesion to alkyd substrates. It is an excellent modifying resin for VAEs and vinyl acrylics.	<b>AVICOR® 633</b>
High-performance acrylic latex designed for versatility across a wide range of interior and exterior paints. Excellent wet and dry adhesion and good resistance to UV degradation from exterior exposure.	<b>AVICOR® 2550</b>
Extremely small particle size leads to a tougher polymer film resulting in excellent water and alkali resistance. The all acrylic backbone provides increased resistance to UV degradation from exterior exposure. Blend with alkyds to create wood coatings or concrete sealers.	<b>AVICOR® 6408</b>
This terpolymer is ideal for masonry exterior surfaces because it offers excellent alkali and efflorescence resistance. It is also commonly used in intumescent coatings.	<b>AVICOR® 2456</b>



Features	Product
Ultra-low VOC coalescent that enables formulators to meet lowered VOC-limits. Coating formulators can replace conventional coalescents with CLX without having to switch to lower Tg binders, maintaining many desirable application and paint performance characteristics.	<b>Celanese® CLX</b>





## **EMULSION POLYMERS**

[celanese.com/emulsion-polymers](http://celanese.com/emulsion-polymers)

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