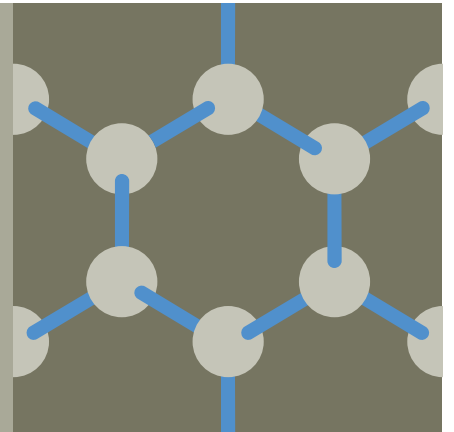




Core/shell VeoVa
Acrylic Polymers
for High Performance
Coatings



Veova™ Monomer 10

Veova 10 is the vinyl ester of Versatic™ acid 10, a highly branched carboxylic acid containing 10 carbon atoms.

Veova 10 is a monomer with a unique hydrophobic bulky structure and is used in the production of a broad range of high quality latex polymers. Veova 10 can be used as co-monomer with vinyl acetate, ethylene and various (meth)acrylates for the production of aqueous coating binders.

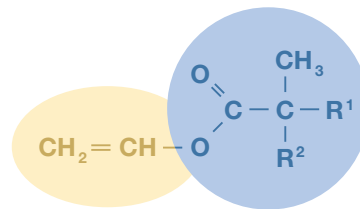
Structure and Properties:

Vinyl Ester:

Easily copolymerisable with various monomers such as vinyl acetate, ethylene, acrylates and methacrylates.

Versatic 10:

- Hydrophobic
- UV resistant
- Hydrolytically stable



Vinyl Ester of Versatic 10
R¹ + R² = 7 carbon atoms

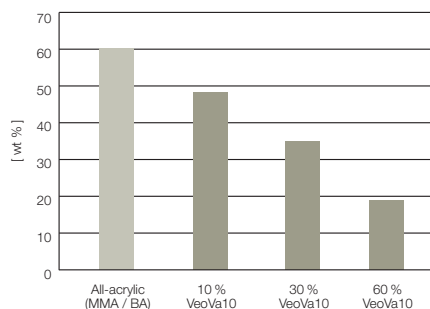
Veova™ / acrylic copolymers (Veocryls)

Veova monomers significantly upgrade some key performance properties of acrylic coating systems, such as adhesion, water resistance and chemical resistance.

Any incorporation of Veova 10 into an acrylic polymer leads to performance improvement. Properties further improve with increasing Veova content.

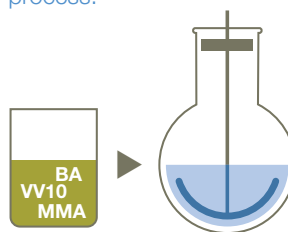
Veova improves the water resistance of Veova / acrylic copolymers.

Water absorption of Veova10 / MMA / BA polymer films

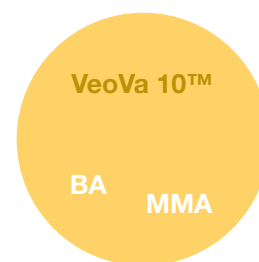


Veova monomers readily copolymerize in emulsion with acrylate and methacrylate monomers to yield latices especially suitable for high-performance coatings. The production of these Veova / acrylic latex types proceeds by free-radical emulsion polymerization of Veova and (meth)acrylate monomers at 80 – 85 °C following a semi-continuous process.

Conventional process:



180 min.
addition

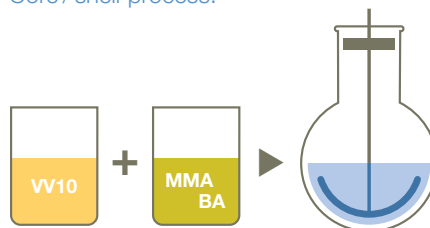


Uniform morphology

Core / shell technology

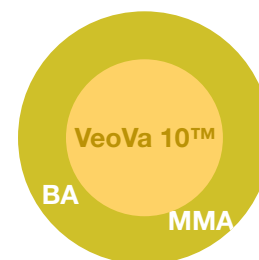
Alternatively, a two-stage process whereby first all Veova monomers are reacted followed by delayed addition of the rest of the acrylate monomers creating a core/shell morphology can be used. A small amount of a dimethacrylate (EGDMA) is reacted together with the Veova 10 to immobilize the core.

Core / shell process:



60 min.
addition

120 min.
addition



Core / shell morphology

This core / shell process is recommended for application such as dirt pick-up resistant coatings.

Polymer properties:

The monomer composition of the new core/shell Veocryl latex is almost the same as that of a conventional Veocryl latex. The core/shell latex particles consist of a soft core and a hard shell. The hard shell results in reduced tackiness and increased surface hardness, compared to the conventional latex. The MFFT is increased slightly.

Water resistance:

Core/shell latices do not contain hydrophobic VeoVa monomers in the shell. Nevertheless only a very slight increase in water sensitivity, as measured in the water absorption test, is observed. The core/shell latex still significantly outperforms an all-acrylic benchmark polymer.

High-performance applications:

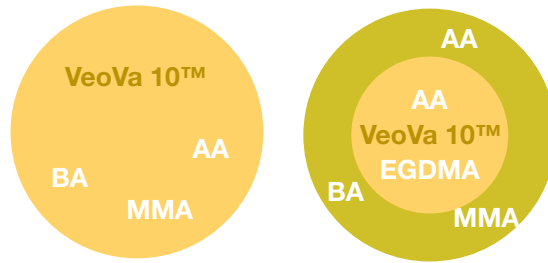
Core/shell Veocryls can be used for high performance coatings for use on a variety of substrates such as wood, metal and concrete. Examples include wood stains, gloss paints, exterior masonry paints, roof tile coatings and anti-corrosion coatings.

High resistance to dirt pick-up:

Architectural coatings with low resistance to dirt pick-up, result in discoloration of the coating by airborne pollutants.

Panels coated with a white exterior paint were exposed at different locations for up to 6 months. The paints based on core/shell Veocryls are visibly and measurably (colour change Delta E) superior in dirt pick-up resistance, even in tropical climates.

Core/shell Veocryls provide a much better resistance to dirt pick-up than conventional Veocryls with similar monomer composition. They perform significantly better than all-acrylics.



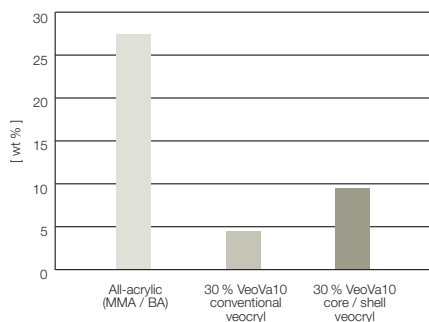
Typical Properties*			
Property	Unit	Conventional Veocryl	Core / shell Veocryl
MFFT	°C	27	35
T _g	°C	35	51
Koenig Hardness	sec.	86	117

* VeoVa10 / MMA / BA / AA (Weight ratio = 30 / 49 / 20 / 1)

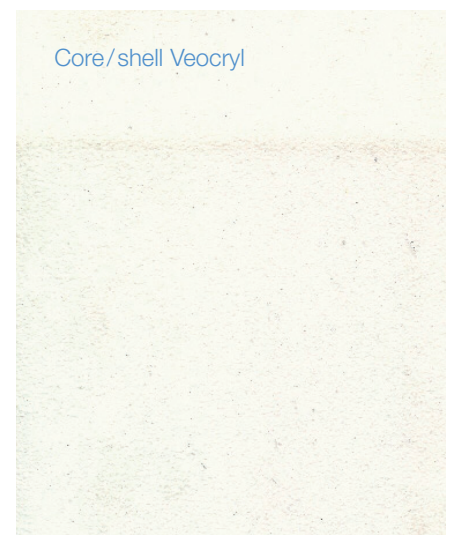
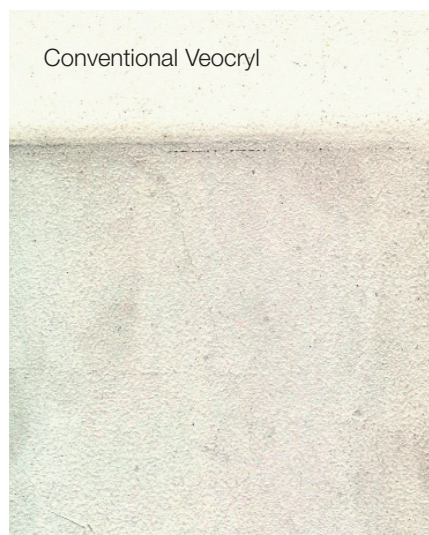
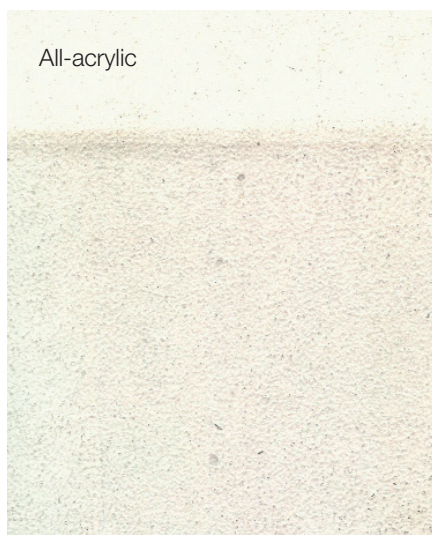
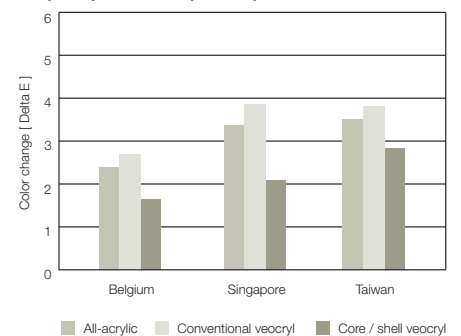
Core/shell Veocryls have excellent water resistance and exhibit higher surface hardness compared to conventional Veocryls.

Core/shell Veocryls consistently were the best performing polymers amongst the different systems tested.

Water absorption of VeoVa10 / MMA / BA polymer films



Dirt pick-up of 40% PVC paints exposed for 3 months



Coated panels exposed 6 months in Singapore

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