Dow Coating Materials

MAINCOTE™
Acrylic Resins based on AVANSE™ Technology raising water-borne performance
MAINCOTE™ Acrylic Resins based on AVANSE™ Technology raising water-borne performance

General industrial metal applications can be found in consumer goods, agricultural vehicles (ACE), or general machinery where the coating is factory applied. Total factory VOC emission level restrictions as well as environmental awareness are the main drivers for coating applicators to look for water-borne solutions to replace traditional solvent-borne systems. Corrosion resistance, adhesion to a wide range of treated and untreated surfaces as well as chemical resistance are important coating performance requirements. Typical dry film thicknesses are between 40–100μm. Early block will allow for fast stacking ability after coating application, therefore improving productivity on high speed production lines.

Low-VOC1) Metal Protection Next-generation MAINCOTE™ Resins for water-borne metal coatings, offer good corrosion resistance and gloss whilst meeting lower VOC targets compared to solvent-borne coatings. These features of are helping to raise the performance level of water-borne industrial coatings and expand their utility beyond traditional light-duty environments.

What can MAINCOTE™ water-borne binder based on AVANSE™ Technology deliver?

Low-VOC1) levels, < 100g/l typically, offering a better working environment:

- Excellent adhesion to various substrates, either treated or untreated.
- Fast hardness development for Direct-to-Metal applications.
- Good chemical resistance for topcoat applications.
- High gloss and gloss retention.
- Advanced UV protection.
- Corrosion and water resistance.
- Chemical and solvent resistance.
- Blister resistance.
- One component convenience.

ISO corrosion scale

1) VOC substances are not intentionally added and are not knowingly introduced from another raw material.
Technology Overview

MAINCOTE™ Acrylic Resins based on AVANSE™ Technology feature ambient self-crosslinking to help improve dirt pickup resistance, chemical/solvent resistance and overall durability.

In addition, novel polymer-pigment interaction in the wet phase produces a dried film structure that offers more uniform pigment distribution, improved barrier properties, and greater gloss potential.

**Figure 1.** SEM micrograph and illustration of acrylic latex coating formulated with conventional acrylic binder.

**Figure 2.** SEM micrograph and illustration of acrylic latex coating formulated with AVANSE™ Acrylic Binder.

Conventional Acrylic Resin

As illustrated in Figure 1, pigment-to-pigment agglomeration in the dried film of a conventional acrylic coating provides pathways for water and electrolyte migration, with adverse effects on barrier properties such as corrosion resistance. Pigment particles may also protrude from the film, with effects on surface roughness and gloss.

AVANSE™ Acrylic Resin

AVANSE™ Technology helps to solve the problem of pigment distribution in the wet and dry states by forming polymer-pigment composites. As illustrated in Figure 2, these polymer-pigment composites help to keep pigment and extender particles separated in the wet paint and provide a more optimal distribution of pigment in the dried film.

High Gloss and Gloss Retention

Figure 3. Gloss white coating formulated with AVANSE™ Technology demonstrates enhanced gloss retention when compared to a commercial solvent-borne polyurethane and a conventional acrylic in a two-year south 45° exposure study in eastern Pennsylvania.

Advanced Corrosion Protection

Figure 4. Coatings formulated with MAINCOTE™ Acrylic Resins based on AVANSE™ Technology offer enhanced corrosion resistance, as demonstrated above on blasted, hot-rolled steel panels protected by one coat of a direct-to-metal, high-gloss yellow coating at 75 µ DFT.

![Salt Spray Exposure (336 hours)](image)

**Applications**

MAINCOTE™ Acrylic Resins based on AVANSE™ Technology offer high-performance, low-VOC alternatives to solvent-based alkyds for general industrial finishing and light-duty maintenance and/or protective applications, as well as user-friendly alternatives to two-component coatings for medium-duty applications. They may be formulated into corrosion resistant primers, highly durable topcoats and high gloss direct-to-metal (DTM) finish coats.

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Source: Dow Coating Materials 2015
## Industrial metal coating – main product portfolio

<table>
<thead>
<tr>
<th>Technology</th>
<th>Product Name</th>
<th>Application</th>
<th>Description</th>
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<tbody>
<tr>
<td>Acrylic copolymer emulsion</td>
<td>MAINCOTE™ 1071</td>
<td>★ ★ ★</td>
<td>AVANSE™ based styrene acrylic resin for primer applications offering excellent adhesion to various substrates offering enhanced corrosion resistance.</td>
</tr>
<tr>
<td>Acrylic copolymer emulsion</td>
<td>UCAR™ Latex XZ 95034.00</td>
<td>★ ★ ★</td>
<td>Hydrophobic styrene acrylic resin for primer applications. Excellent for infrastructures segment.</td>
</tr>
<tr>
<td>Acrylic copolymer emulsion</td>
<td>MAINCOTE™ 1200</td>
<td>★</td>
<td>AVANSE™ based acrylic self-crosslinking resin, high and rapid adhesion on different substrates, good corrosion resistance, rapid hardness development, good chemical resistance, good gloss and UV retention, good dirt pick up resistance.</td>
</tr>
<tr>
<td>Acrylic copolymer emulsion</td>
<td>MAINCOTE™ 1100</td>
<td>★ ★ ★</td>
<td>AVANSE™ polymer for use in Industrial Maintenance and DIY, low VOC(^1) formulations. Excellent cost/performance balance by reducing the need for dispersants and rheology modifiers. High gloss potential, excellent corrosion resistance. Ambient self-crosslinking.</td>
</tr>
<tr>
<td>Acrylic polymer emulsion</td>
<td>MAINCOTE™ Protect</td>
<td>★ ★ ★</td>
<td>All acrylic resin for high gloss (&gt;80 at 60°) topcoat applications with good coating adhesion, rapid early block development, good gloss retention and good chemical resistance.</td>
</tr>
<tr>
<td>Acrylic polymer emulsion</td>
<td>MAINCOTE™ 100</td>
<td>★</td>
<td>Multi purposes binder with good cost/performances balance.</td>
</tr>
<tr>
<td>Acrylic copolymer emulsion</td>
<td>MAINCOTE™ HG-86ER</td>
<td>★ ★ ★</td>
<td>Good chemical resistance, improved adhesion on various metal substrates. Enhanced corrosion protection (salt-spray tests).</td>
</tr>
<tr>
<td>Functionalyzed Acrylic emulsion</td>
<td>MAINCOTE™ AE-58</td>
<td>★ ★ ★</td>
<td>Acrylic cross-linker for liquid epoxy dispersion for metal, concrete and flooring. Low VOC(^1), excellent solvent resistance, good exterior durability, long pot life (&gt;8H). Rapid dry film development.</td>
</tr>
</tbody>
</table>

\* Possible \* \* Recommended \* \* \* Highly recommended
Source: Dow Coating Materials 2015

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### Picture credits

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