AVANSE™ MV-100 Resin

For Industrial Maintenance Coating Applications

Regional Product Availability

- North America

Description

AVANSE MV-100 Resin, one of the first products from the new AVANSE Technology platform, represents the latest technology in waterborne acrylic polymers for high performance and low VOC industrial maintenance coatings. It provides formulators with a single resin which can be formulated into corrosion-resistant primers, highly durable topcoats, and high gloss direct-to-metal (DTM) finish coats. The novel technology behind the AVANSE Resins product line leads to new standards in film gloss, durability, corrosion control, chemical and solvent resistance, and adhesion. One aspect of this new technology is the formation of latex-pigment composite particles, which gives more homogeneous pigment distribution and results in enhanced corrosion resistance. Also, combining a novel polymer composition and the ability to self-crosslink after film formation, AVANSE™ MV-100 Resin offers the ability to formulate high performance coatings with volatile organic content (VOC) at or below 100 g/L. The favorable colloidal stability of AVANSE MV-100 Resin accommodates a broad range of formulation types, providing the formulator with a versatile binder for a variety of applications. Formulation robustness, along with 50-51% weight solids, allows the formulator to produce coatings with volume solids above conventional waterborne binders.

Potential Applications

- Industrial Maintenance Finishes—for example, steel structures, tanks, bridges, piping
- Commercial Architectural Finishes for Metal—for example, metal buildings, beams, doors, ceilings
- Institutional Coatings
- DIY Metal Coatings
- Transportation—for example, railcars, shipping containers, truck chassis

Typical Properties

(These properties are typical but do not constitute specifications).	
Appearance	Milky-white fluid, free of visible impurities
Solid Content	50.00–51.00%
pH at Shipment	8.50–9.50
Viscosity Brookfield (mPa.s)	0–500 CPO
Brookfield LVT, spindle #1, 60 rpm, 25C	
Gel Particles on 150 microns	0–50 ppm
Gel Particles on 45 microns	0–100 ppm

Form No. 884-00360-1113-NAR-EN-CDP,
Rev. 0, April 2010

Key Features and Benefits

AVANSE™ MV-100 Resin provides coating formulators with greater options in their formulation of industrial maintenance and direct-to-metal coatings. Some of its key features are:

- Excellent corrosion resistance
- High gloss potential and excellent gloss retention
- Single acrylic resin that can be formulated for primer, midcoat, topcoat, or direct-to-metal applications. Provides a high performance system approach with a single resin
- Low coalescent demand, allowing compliance with stringent VOC regulations, formulations at 100 g/L or less provide excellent performance with the added benefit of freeze-thaw resistance
- Ambient self-crosslinking, providing excellent durability, dirt pickup resistance and solvent/chemical resistance
- Free of APEO-containing surfactants
- Excellent adhesion to various metal substrates (for example, steel, galvanized, aluminum) and other coatings (for example, alkyds)
- Expert technical service to help formulate and use AVANSE MV-100 Resin from the dedicated industrial finishes team at Dow

Technology Behind the Benefits

The benefits observed with coatings based on AVANSE MV-100 Resin are partly due to its unique role in the film formation process. With a conventional acrylic latex polymer, the final paint film rarely displays an optimum distribution of pigment and extender particles throughout the film. Both in the wet state and as the film is drying, pigment and extender particles can aggregate together and form larger agglomerates. Keeping the pigment particles separated in the wet state is really the function of dispersants and surfactants. Non-optimal dispersion leads to lower gloss and worse barrier properties than in an optimally dispersed system. AVANSE MV-100 Resin solves the problem of pigment distribution in the wet and dry states by actually forming latex-pigment composites, where the latex associates with the surface of the pigment particles. This phenomenon is depicted in Figure 1, which shows SEM micrographs of titanium dioxide particles dispersed in a conventional acrylic latex and in AVANSE™ MV-100 Resin. There is clearly a greater association of the AVANSE MV-100 Resin particles with the TiO_2 particles, such that the TiO_2 surface is partially covered with binder. The latex-pigment composites help to keep the pigment and extender particles separated in the wet paint and provide a more optimal distribution of pigment in the dry film, because the latex particles act as spacers between pigment particles. The result is higher gloss, better hiding, and improved barrier properties (For example, corrosion resistance). The formation of latex-pigment composites is not limited to titanium dioxide, but occurs with other mineral pigments as well. Figure 2 shows a similar situation for calcium carbonate dispersed in a conventional latex versus in AVANSE MV-100 Resin. The calcium carbonate surface appears to be completely covered by the AVANSE MV-100 Resin particles.

Another key feature of AVANSE™ MV-100 Resin is its ability to self-crosslink at ambient temperatures and still maintain true one-package stability. The functional groups present in the resin will crosslink via both oxidative and photolytic curing mechanisms. Formulations based on AVANSE MV-100 Resin will begin to crosslink as soon as they are applied, and may require about 2 to 4 weeks until some properties have reached their maximum performance level. The crosslinked film provides improved dirt pickup resistance, chemical and solvent resistance, and durability.

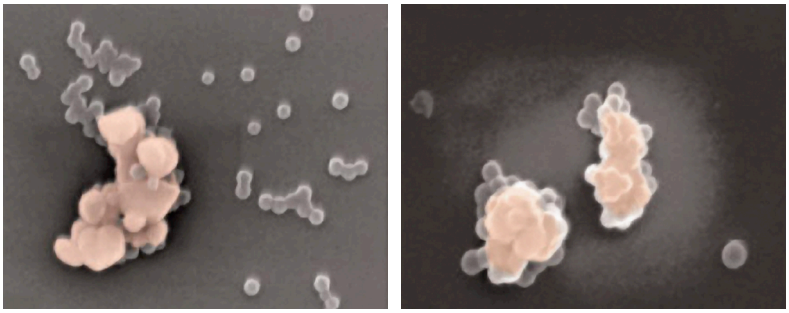

Figure 1: Left picture shows a SEM micrograph (50K magnification) of TiO_2 dispersed in a conventional acrylic latex polymer. Picture on right shows TiO_2 dispersed in AVANSE™ MV-100 Resin. The latex particles appear as the smaller, gray spheres, and TiO_2 appears as pink.

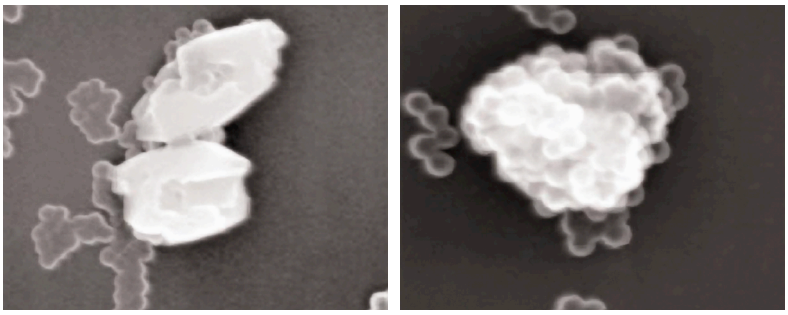

Figure 2: Left picture shows a SEM micrograph (50K magnification) of calcium carbonate dispersed in a Conventional acrylic latex polymer. Picture on right shows calcium carbonate dispersed in AVANSE MV-100 Resin. The latex particles appear as the smaller, grey spheres, and calcium carbonate appears as white.

Performance Data

The typical performance demonstrated by AVANSE MV-100 Resin in a gloss white DTM coating formulated at 100 g/L, such as formulations MV-100-1 and MV-100-2, is shown in the Tables and Figures below. Although Konig hardness is slightly lower, film hardness as measured by the pencil hardness test is similar to resins with higher Tg and higher VOC requirements such as MAINCOTE™ HG-54D Resin. Dirt pickup resistance is also comparable to harder resins after a short air cure, and actually exceeds that of conventional resins after self-crosslinking is allowed to occur, such as after exposure to UV light. Solvent resistance, as measured by MEK double rubs, also improves significantly after a short UV exposure. Gloss potential is high, and durability is also excellent, as demonstrated by the gloss retention after accelerated exposure to UV-A light (Figure 3). Figure 3 compares the gloss retention of AVANSE MV-100 Resin with a commercial waterborne acrylic paint based on a conventional resin and formulated at a higher VOC (200 to 250 g/L). Corrosion resistance of coatings based on AVANSE™ MV-100 Resin is excellent, as demonstrated by Figure 4, which compares it with a commercial waterborne acrylic DTM coating.

Form No. 884-00360-1113-NAR-EN-CDP,
Rev. 0, April 2010

Table 1. Typical Performance of AVANSE™ MV-100 in an 18 PVC Gloss White DTM Formulation

Gloss (20°/ 60°)	67/84
Heat Age Stability	Pass 10 days at 60 °C
Freeze-Thaw Stability	Pass 3 cycles
Roller Stability	Pass 10 days
Hardness	
Pencil	2B
Konig	13 sec
Dirt pickup resistance (initial/final Y-reflectance)[1)]	
1 week air cure	0.89
1 week UV-A exposure	0.99
MEK double rubs (3 mils DFT)	
1 week air cure	50
1 week UV-A exposure	300
Adhesion to cold rolled steel (% remaining)	
Dry	100
Wet	100
Humidity resistance (Cleveland condensation cabinet, 2 weeks)	No blistering/slight dulling

1) Dirt pickup resistance (DPUR) is measured by an accelerated method employing a simulated dirt slurry (brown iron oxide) applied to the paint surface for a prescribed time, then washing with water and wiping with cheesecloth. The ratio of initial to final Y-reflectance is used as a measure of DPUR. As a reference, MAINCOTE HG-54D Resin gives a ratio of 0.91 after a 1 week air cure.

Gloss Retention

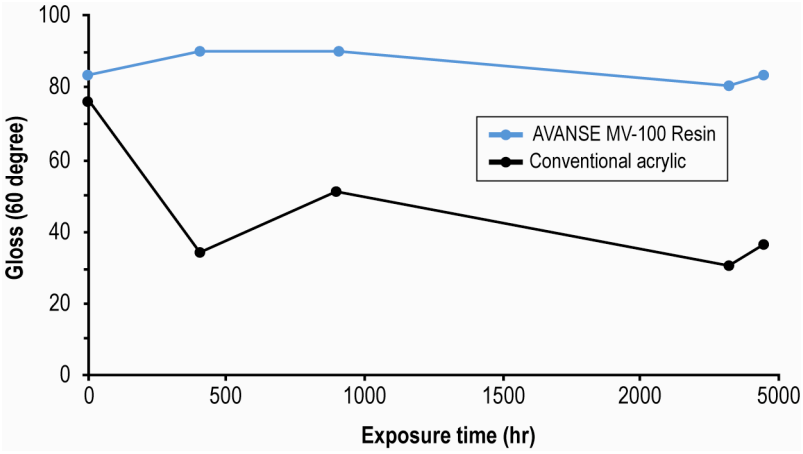

Figure 3: Comparison of gloss retention of UV-A exposure for a gloss white DTM formulation based on AVANSE MV-100 Resin and a commercial gloss white DTM based on a conventional VOC resin (200–250 g/L).

Form No. 884-00360-1113-NAR-EN-CDP,
Rev. 0, April 2010

Corrosion Performance–Salt Fog Exposure Test

Commercial DTM Paint | AVANSE™ MV-100 Paint

Figure 4: Salt spray resistance at approximately 5 weeks of a gloss white DTM formulation based on AVANSE MV-100 Resin and a commercial gloss white DTM based on a conventional VOC resin (200–250 g/L). Paints were applied at 3 mil DFT on hot rolled steel (SSPC SP-5) and dried 1 week prior to exposure according to ASTM B-117.

Formulating Guidelines

In addition to the resin, the other ingredients in a coating formulation and/or their level of usage can play a significant role in the performance of the coating. The choice of paint ingredients can impact the protective, aesthetic, and application properties of a coating, and thus should be evaluated carefully. The following guidelines serve as a starting point to help in maximizing the performance of coatings based on AVANSE MV-100 Resin. Formulations should be fully tested prior to commercialization.

Coalescents

Because corrosion resistance is very dependent on the quality of film formation, the selection of a coalescent package suitable for the intended application is necessary. AVANSE MV-100 Resin requires approximately 8% on polymer solids of a slow-evaporating coalescent or coalescent/plasticizer blend to insure good film formation under marginal drying conditions. Some suitable slow-evaporating coalescents and plasticizers include Texanol™, DOWANOL™ DPnB, DOWANOL PPh, Kodaflex™ TXIB, Santicizer™ 160, Merrol™ 4221 and Dibutylphthalate. A particularly effective package is 4% of either Texanol or DOWANOL DPnB in combination with 4% Kodaflex TXIB.

In some cases, replacement of some of the slow-evaporating coalescent or plasticizer with a higher level of a fastevaporating coalescent can maintain good film formation and improve freeze-thaw resistance. In such a case, the partly water-miscible coalescent DOWANOL DPM has been shown to be very effective for this purpose. A combination of 4% Texanol or DOWANOL DPnB with 9% DOWANOL™ DPM yields good film formation, maintains VOC levels below 100 g/L, and provides at least three cycles of freeze-thaw resistance.

Freeze-Thaw Protection

Without the use of co-solvents to aid in freeze-thaw resistance, a typical white DTM formulation may pass one freeze-thaw cycle. The use of a co-solvent such as ethylene glycol or propylene glycol may extend this to 3 or more cycles. Depending on the level of volatile coalescent present, a typical gloss white DTM formulation can accept about 13–18 lbs/100 gallons of a cosolvent and still maintain a VOC level below 100 g/L. For example, using 8% DOWANOL™ DPnB in an 18 PVC white formula similar to MV-100-1 allows about 13 lbs of propylene glycol to be added and still be at 100 g/L total VOC. This paint passes three freeze-thaw cycles. However, co-solvents such as the glycols are slow-evaporating and can cause water sensitivity in the fresh film.For improved early water resistance, do not use glycol solvents such as propylene or ethylene glycol. Another method to achieve freeze-thaw resistance with AVANSE™ MV-100 Resin is with the use of faster-evaporating, partially water-miscible coalescents. DOWANOL DPM, for example, has been found to contribute to both film formation and freeze-thaw resistance with this binder, as described in the section above. An example of a coating with 3 or more freeze-thaw cycles using this method is given in formulation MV-100-2, which contains 4% Texanol and 9% DOWANOL DPM.

Titanium Dioxide

Several grades of titanium dioxide, both dry and slurry, have been evaluated and found to give good results with AVANSE MV-100 Resin. A highly durable grade, such as Ti-Pure™ R-706 or Tiona™ RCL-696, is recommended for the best gloss and durability in topcoats and DTMs. For white and grey primers, a less durable grade such as Ti-Pure R-900 can be used. Some slurry grades can also be used without sacrificing corrosion resistance. Ti-Pure R-746 has been evaluated with good results.

Dispersants

Because AVANSE MV-100 Resin interacts closely with the pigment and extender and forms latex-pigment composite particles, it is not surprising that the choice of dispersant is critical. Copolymer dispersants such as TAMOL™ 165A and TAMOL 681, or the low VOC alternative TAMOL 2001 dispersant, at 1–2% on pigment (solids/solids), are recommended as a starting point. Surfynol™ CT-111 is also recommended as a co-dispersant with TAMOL 2001 Dispersant. In general, polyacrylic acid and polymethacrylic acid dispersants are not good choices, as they normally reduce corrosion resistance with conventional binders and can also inhibit composite particle formation with AVANSE MV-100 Resin. High levels of dispersant should also be avoided, as it can inhibit composite particle formation as well as increase water sensitivity and lower corrosion resistance.

Thickeners

Nonionic urethane thickeners such as ACRYSOL™ RM-8W, ACRYSOL RM-12W, and ACRYSOL RM-2020NPR Rheology Modifiers are key to formulating a high-quality, corrosion-resistant coating. The use of cellulosic or alkali-soluble thickeners significantly degrades the water and corrosion resistance.

The expected method of application is an important parameter to consider when selecting rheology control agents. Brushing formulations require higher viscosity under high shear conditions for best brush drag. On the other hand, lower high shear viscosity is desired for ease of atomization during spraying. The viscosity range suitable for brushing is 1.5–2.0 poise, while 0.5 poise is characteristic of a paint with good atomization.

A suitable viscosity range for airless spray is 95–105 Kreb Units to minimize sagging tendencies. For brushing, formulate to lower values of approximately 85 KU so that brush marks flow out.

ACRYSOL™ RM-8W and ACRYSOL RM-12W rheology modifiers are recommended for paints designed for spray application. ACRYSOL RM-12W is excellent for spray application where flow/sag balance is critical. ACRYSOL RM-2020NPR rheology modifier is more suitable for brush or roller application. Having a paint that provides optimum viscosity for both brush and spray application is difficult and having a viscosity of 90 Kreb Units/1.0 poise (low shear/high shear viscosity) is a compromise. To attain this rheology profile, it would be necessary to use both thickeners.

Defoamers

Foam control is a major concern in waterborne paint formulation design. Defoamers are needed to eliminate foam during manufacture and film application. The choice of defoamer type and level will depend primarily on the formulation and mode of application. Deeptone formulations for airless spray application, which use pre-dispersed colorants, will require the most effective defoamer package. Brushing formulations prepared with in-house, factory-dispersed dry pigments are typically easier to effectively defoam.

A good start in choosing the right defoamer package is to have a silicone-based defoamer in the grind followed by a non-silicone in the letdown. Effectiveness of the defoamer can be screened by the shaker test, but the best candidates should be checked by actual application. Drawdowns should be made to check for surface defects and impact on gloss. Defoamer persistence should be checked by oven aging and retesting the defoaming capabilities.

Our testing has shown Drewplus™ L-493 to be an effective defoamer for the grind stage, and Tego Foamex™ 1488 to be a good choice for the letdown. Tego Airex™ 902W at 0.5–1.0% by weight as supplied on total formulation has been found to assist in reduction of microfoam during airless spray application.

Flash Rust Inhibitors

In waterborne paints for steel, the water phase should contain flash rust inhibitors since rapid rusting (flash rust) can occur as the paint is drying. The recommended additive is sodium nitrite, which is effective at low use levels, such as 1–2 lbs (solid) per 100 gallons. Addition in a diluted form (15% aqueous solution) is recommended to prevent stability problems and grit formation. Other inhibitors are available that can be used, such as ammonium benzoate.

Reactive Pigments

Reactive or inhibitive pigments are often used in primer formulations to increase the corrosion resistance. The type and level of these pigments can also have a strong effect on the paint stability, and so these pigments should be thoroughly evaluated. We recommend either Heucophos™ ZMP or ZCPP or Halox™ SZP-391 for use in primers at a level of approximately 50 lbs/100 gallons. Lower levels of reactive pigment are sometimes used in DTM finish coats, but can have a negative impact on gloss levels.

Extender Pigments

The choice of extender pigment can play an important role in barrier properties. In our primer formulation work, we have found a talc, such as Lo Micron™ 2610 Talc, to yield the best corrosion resistance. In general, higher PVC leads to a more porous coating and lower corrosion resistance. For this reason, we recommend primers to be formulated at approximately 25–30% PVC. When preparing low gloss coatings, flatting with silica flatting aids is generally preferable to increasing PVC with an extender because of the lower impact on barrier properties.

Colorants

Good choices for coloring formulations based on AVANSE™ MV-100 Resin are the UCD™ E-Line or Q-Line colorants from Dow. They provide color fastness and full color ranges. The UCD E-Line of colorants is suitable for in-plant tinting of industrial paints, and the Q-Line is suitable for volumetric dispensing and in-store tinting. Colorant selection, like most additive choices, should be done carefully for waterborne maintenance coatings, since pre-dispersed colorants can negatively impact corrosion resistance due to the high level of surfactants or additives used to disperse and stabilize the colored pigments. The low VOC UCD E-line colorants are unique in that they are not surfactant-based, and thus have a minimum impact on rheology modifiers.

High Gloss White DTM/Topcoat

MV-100-1

Ingredients	Pounds	Gallons
Grind		
Water	50.00	5.99
TAMOL 2001	7.86	0.89
Surfynol CT-111	2.00	0.25
Drewplus L-493	1.00	0.13
Ammonia (28%)	2.00	0.27
Ti-Pure R-706	220.00	6.59
Grind Subtotal	**282.86**	**14.11**
Letdown		
AVANSE MV-100	530.00	61.21
Water	132.00	15.81
Ammonia (15%)	7.00	0.89
Add grind from above		
Propylene Glycol	18.50	2.14
DOWANOL DPnB	10.79	1.41
Kodaflex TXIB	10.79	1.37
Ammonium Benzoate (10%)	23.00	2.71
ACRYSOL RM-8W	3.00	0.35
Totals	**1017.94**	**100.00**
PVC	18.0%	—
Volume Solids	38.4%	—
Weight Solids	49.5%	—
Density (lb/gal)	10.17	—
VOC (g/L)	97.0	—
pH	9.1	—
Viscosity (KU)	89.0	—

High Gloss White DTM/Topcoat

MV-100-2

Ingredients	Pounds	Gallons
Grind		
Water	50.00	5.99
TAMOL 2001	7.86	0.89
Surfynol CT-111	2.00	0.25
Drewplus L-493	1.00	0.13
Ammonia (28%)	2.00	0.27
Ti-Pure R-706	220.00	6.59
Grind Subtotal	**282.86**	**14.11**
Letdown		
AVANSE MV-100	540.00	62.41
Water	146.00	17.46
Ammonia (15%)	3.50	0.45
Add grind from above		
Texanol	11.00	1.39
DOWANOL DPM	24.00	3.02
Sodium Nitrite (15%)	9.00	0.99
Ammonia (15%)	3.50	0.45
Adjust to pH 9.0–9.5		
ACRYSOL RM-8W	3.00	0.35
Totals	**1022.86**	**100.64**
PVC	17.7%	—
Volume Solids	37.8%	—
Weight Solids	49.2%	—
Density (lb/gal)	10.16	—
VOC (g/L)	98.0	—
pH	9.0	—
Viscosity (KU)	100.0	—
Gloss (20°/60°)	67/84	—

High Gloss Deep Tint Base

MV-100-3

Ingredients	Pounds	Gallons
AVANSE™ MV-100	730.50	84.42
Water	60.00	7.19
Ammonia (15%)	7.00	0.89
Tego Foamex 1488	1.00	0.12
DOWANOL DPM	17.50	2.20
DOWANOL DPnB	14.87	1.95
Kodaflex TXIB	14.87	1.89
Sodium Nitrite (15%)	9.00	0.99
ACRYSOL RM-8W	3.00	0.35
Totals	**857.75**	**100.00**
Volume Solids	42.6%	—
Weight Solids	44.5%	—
Density (lb/gal)	8.58	—
VOC (g/L)	100.0	—
pH	9.0	—
Viscosity (KU)	100.0	—

Note: Tinting of deep tint base formulation MV-100-3 has been evaluated with UCD Eline colorants at 10 oz/gallon. Minimal decreases in viscosity were observed. Colorants tested include UCD 5150E (phthalo green), UCD 7949E (organic red), UCD 4830E (phthalo blue), and UCD 5696E (organic yellow).

Gloss Medium White Tint Base, MV-100-4

Ingredients	Pounds	Gallons
Grind		
Water	50.00	5.99
TAMOL 2001	3.42	0.39
Surfynol CT-111	2.00	0.25
Ammonia (28%)	2.00	0.27
Drewplus L-493	1.00	0.13
Ti-Pure R-706	96.00	2.88
Grind Subtotal	**154.42**	**9.90**
Letdown		
AVANSE MV-100	565.00	65.30
Water	146.00	17.49
Ammonia (15%)	7.00	0.89
Add grind from above		
DOWANOL DPM	18.00	2.26
DOWANOL DPnB	10.50	1.38
Kodaflex TXIB	10.50	1.33
Sodium Nitrite (15%)	9.00	0.99
ACRYSOL RM-8W	4.00	0.46
Totals	**924.42**	**100.00**
PVC	8.2%	—
Volume Solids	36.3%	—
Weight Solids	42.8%	—
Density (lb/gal)	9.24	—
VOC (g/L)	99.0	—
pH	9.2	—
Viscosity (KU)	105.0	—

Note: Tinting of medium tint base formulation MV-100-4 has been evaluated with UCD E-line colorants at 8 oz/gallon. Minimal decreases in viscosity were observed. Colorants tested include UCD 5150E (phthalo green), UCD 7949E (organic red), UCD 4830E (phthalo blue), and UCD 5696E (organic yellow).

High Gloss Black DTM/Topcoat for Conventional Air Spray

MV-100-5

Ingredients	Pounds	Gallons
AVANSE MV-100	625.00	72.23
Water	100.00	11.98
Ammonia (15%)	7.50	0.95
Tego Foamex 1488	3.00	0.36
Surfynol 104DPM	5.00	0.60
DOWANOL DPnB	12.73	1.67
DOWANOL DPM	19.85	2.50
UCD 1625E Lampblack colorant	50.00	5.16
Sodium Nitrite (15%)	9.00	0.99
Ammonia (15%)	4.50	0.57
Water	50.00	5.99
ACRYSOL RM-8W	3.00	0.35
Totals	**889.58**	**103.34**
PVC	2.6%	—
Volume Solids	36.3%	—
Weight Solids	38.6%	—
Density (lb/gal)	8.61	—
VOC (g/L)	99.0	—
pH	9.3	—
Viscosity (#3 Zahn cup)	21 sec	

Red Primer

MV-100-6

Ingredients	Pounds	Gallons
Grind		
Water	140.00	16.77
TAMOL 2001	11.19	1.26
Surfynol 104E	4.00	0.48
Tego Foamex 8050	0.25	0.03
Ammonia (28%)	2.00	0.27
Red iron oxide	50.00	1.17
2610 Lo Micron	135.00	5.99
Heucophos ZMP	50.00	1.71
Grind Subtotal	**392.44**	**27.69**
Letdown		
AVANSE™ MV-100	475.00	54.87
Water	90.00	10.78
Ammonia (15%)	1.00	0.13
Add grind from above		
Tego Foamex 1488	1.00	0.12
DOWANOL DPnB	9.67	1.27
Merrol 4221	9.67	1.19
Sodium Nitrite (15%)	9.00	0.99
Ammonia (15%)	1.00	0.13
Water	15.00	1.80
ACRYSOL RM-12W	6.00	0.69
ACRYSOL RM-8W	3.00	0.35
Totals	**1012.78**	**100.00**
PVC	24.8%	—
Volume Solids	38.0%	—
Weight Solids	49.0%	—
Density (lb/gal)	10.13	—
VOC (g/L)	35.0	—
pH	9.0	—
Viscosity (KU)	110.0	—

Handling Precautions

Before using this product, consult the Material Safety Data Sheet (MSDS)/Safety Data Sheet (SDS) for details on product hazards, recommended handling precautions and product storage.

CAUTION! Keep combustible and/or flammable products and their vapors away from heat, sparks, flames and other sources of ignition including static discharge. Processing or operating at temperatures near or above product flashpoint may pose a fire hazard. Use appropriate grounding and bonding techniques to manage static discharge hazards.

CAUTION! Failure to maintain proper volume level when using immersion heaters can expose tank and solution to excessive heat resulting in a possible combustion hazard, particularly when plastic tanks are used.

Form No. 884-00360-1113-NAR-EN-CDP,
Rev. 0, April 2010

Storage

Store products in tightly closed original containers at temperatures recommended on the product label.

Disposal

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Dow Coating Materials Technical Representative for more information.

Chemical Registration

Many countries within the Asia-Pacific require the registration of chemicals, either imported or produced locally, prior to their commercial use. Violation of these regulations may lead to substantial penalties imposed upon the user, the importer or manufacturer, and/or cessation of supply. It is in your interests to ensure that all chemicals used by you are registered. The Dow Chemical Company does not supply unregistered products unless permitted under limited sampling procedures as a precursor to registration.

Note on Asia-Pacific Product Line

Product availability and grades vary throughout the countries in Asia-Pacific. Please contact your local Dow Coating Materials representative for further information and samples.

Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products – from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

Contact:
North America: 1-800-447-4369
Latin America: (+55)-11-5188-9000
Europe: (+800)-3-694-6367
Asia-Pacific: (+800)-7776-7776
http://www.dowcoatingmaterials.com