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CoatOSil* DRI Waterborne Silicone

MARKETING BULLETIN

SILANES - COATINGS ADDITIVES

CoatOSil DRI waterborne silicone can help reduce water uptake and improve UV resistance in organic waterborne coating compositions. Its innovative chemical structure enables CoatOSil DRI waterborne silicone to overcome the difficulties of combining silicone materials with organic waterborne resins.

CoatOSil DRI waterborne silicone has been shown to improve hydrophobicity and elongation properties when used as a cobinder with acrylic latexes, resulting in more flexible coatings and sealants. CoatOSil DRI waterborne silicone may also be considered as a sole binder when maximizing thermal and UV stability is a priority. When applied alone, CoatOSil DRI waterborne silicone typically cures at room temperature to form an elastomeric film.

Key Features and Typical Benefits

- Reduced water uptake and improved UV resistance in latex systems
- Outstanding thermal and UV resistance as a sole binder
- A more flexible coating as a cobinder with acrylic latex, without detrimental effects on dirt pick-up
- Compatible with a variety of waterborne polymer systems, including many:
  - Acrylics
  - Styrene Acrylics
  - Epoxies
  - PUDs
  - Alkyds

Potential Applications

- Roof coatings
- Exterior coatings
- Wood coatings
- Industrial coatings

Typical Physical Properties

CoatOSil DRI waterborne silicone is a low viscosity emulsion with the following typical characteristics:

Property	Value
Actives Content, %wt	~ 45%
Viscosity at 25 °C	~ 20 cps
pH	~ 11
Appearance	White, opaque liquid

Typical physical properties are average data and are not to be used as or to develop specifications.

*CoatOSil is a trademark of Momentive Performance Materials Inc.

General Considerations for Use

Typical dosages of CoatOSil DRI waterborne silicone are between 5% and 30% when used as a cobinder in latex systems to improve water and UV resistance. To aid in evaluating our silicone for use as a sole binder, the typical physical properties of the neat product applied via drawdown and cured at room temperature are shown below.

Typical Properties of Cured Film	Value
Tensile (psi)	~ 500
Elongation (%)	~ 450
Hardness (Shore A)	~ 30
Elastic Recovery (%)	> 90
Tg (by DSC)	- 41 °C
Water Contact Angle (°)	> 90

Typical properties are average data and are not to be used as or to develop specifications.

A demonstration of the flexibility and strength of a cured film of CoatOSil DRI waterborne silicone is shown below.

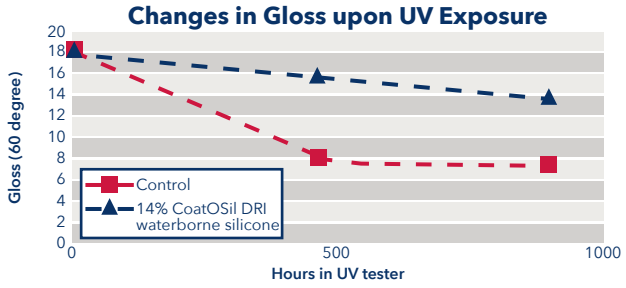
Note: Test results. Actual results may vary.

CoatOSil DRI waterborne silicone was formulated into a low PVC satin finish exterior paint as a cobinder with an acrylic latex. Color change and gloss retention was used as a measure of improved resistance to UV-A radiation. The full formulation and test results are shown below.

Satin Formulation, Low PVC (29%)

Ingredient	Acrylic Control	CoatOSil DRI waterborne silicone and Acrylic Blend (30%/70%)
Water	18.70	18.70
Dispersing Agent	0.90	0.90
TiO_2	17.50	17.50
$CaCO_3$	9.50	9.50
Hydroxyethyl Cellulose	0.40	0.40
Aminopropanol	0.20	0.20
Letdown		
Control Latex (50 wt%)	43.20	30.24
CoatOSil DRI Waterborne Silicone	0.00	14.40
Nonionic Surfactant	0.10	0.10
Coalescent	1.50	1.06
Water	8.00	7.00
Total	100.0	100.0

In our testing, the addition of 14% CoatOSil DRI waterborne silicone in an acrylic latex resulted in a significant improvement in gloss retention and color stability, along with a reduction of water uptake of near 50% compared to the control.



Note: Test results. Actual results may vary.

Reduced Color Change with CoatOSil DRI waterborne silicone

Paint Sample	Color Change (ΔE) After QUV 1000 hours
Acrylic Control	2.5
Acrylic + 14% CoatOSil DRI waterborne silicone	1.8
Improvement %	29%

Reduced Water Absorption with CoatOSil DRI waterborne silicone

Paint Sample	Water Absorption (wt %)
Acrylic Control	14.6
Acrylic + 14% CoatOSil DRI waterborne silicone	7.5
Improvement %	49%

Note: Test results. Actual results may vary.

A higher 66% PVC matt finish exterior style test paint was also prepared with CoatOSil DRI waterborne silicone used as a co-binder with an acrylic latex.

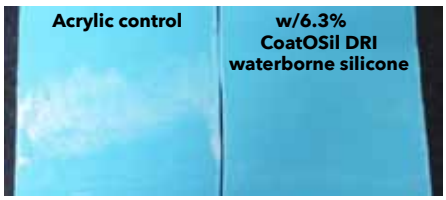
Matt Formulation (High PVC, 66%)

Ingredient	Acrylic Control	CoatOSil DRI Waterborne Silicone/Acrylic Blend (30%/70%)
Water	27.89	27.89
Dispersing agent	1.56	1.56
Nonionic surfactant	0.11	0.11
TiO_2	10.04	10.04
$CaCO_3$ #1	10.04	10.04
$CaCO_3$ #2	26.77	26.77
Hydroxyethyl cellulose	0.45	0.45
Aminopropanol	0.22	0.22
Letdown		
Acrylic latex control	18.96	13.27
CoatOSil DRI waterborne silicone	0.00	6.32
Coalescent	0.95	0.66
Water	3.00	2.67
Total	100.0	100.0

The addition of 6.3% of CoatOSil DRI waterborne silicone reduced the color fading and water absorption while improving effluorescence resistance in the test formulation.

Additonally, the water uptake and color change on UV exposure was significantly decreased with the addition of CoatOSil DRI waterborne silicone in the model paint formulation.

Improved Efflorescence Resistance



Reduction of Water Absorption and Color Change with CoatOSil DRI Waterborne Silicone Addition

Paint Sample	Water Absorption (wt %)	Color Change After 1000 hours in QUV
Acrylic Control	23.9	4.5
Acrylic Blend 6.3% CoatOSil DRI waterborne silicone	11.7	2.5
Improvement %	51%	45%

Note: Test results. Actual results may vary.

Patent Status

Nothing contained herein shall be construed to imply the nonexistence of any relevant patents or to constitute the permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of the patent.

Limitations

Customers must evaluate Momentive Performance Materials products and make their own determination as to fitness of use in their particular applications.

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