Technical Data Sheet

DOWSIL™ 54 Additive

Silicone polyether copolymer which provides slip and mar resistance in solvent-borne and waterborne coatings.

Features & Benefits

- Provides slip, mar resistance and leveling
- Aids defoaming in some systems
- Improves gloss
- Can improve abrasion resistance, water repellency and flow-out of urethane systems
- This product may potentially be used in materials or articles intended to come into contact with food

Composition

- Silicone polyether copolymer supplied at 100 percent active concentration

Applications

- Primarily for solvent-borne
- Evaluated in waterborne

DOWSIL™ 54 Additive has been successful in these industrial applications[1]:

To provide leveling:

- Inks
  - Solvent-based inkjet ink at 0.05–0.1%
  - Solvent-based screen printing ink at 0.1–0.5%

To improve mar resistance and slip:

- Inks
  - Water-based screen printing ink at 1.0–2.0%

[1]All usage levels are weight percents based on the total formulation.

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Typical Properties

Specification Writers: These values are not intended for use in preparing specifications.

Property	Unit	Result
Appearance		Clear to hazy liquid
Active Component	percent	93.5
Flash Point, Closed Cup	°C (°F)	> 101.1 (> 214)
Viscosity at 25°C (77°F)	cs	149–185

How to Use

DOWSIL™ 54 Additive is effective at low concentrations. The amount required depends on type of formulation, the solvent it contains, resin system and total system solids. DOWSIL™ 54 Additive is generally effective at concentrations typically ranging from 0.05 to 1.0 weight percent or as low as 0.05 to 0.1 weight percent, based upon total formulation. This additive can be added during the let-down or can be post-added. Characteristics may vary when used with different systems and formulations.

DOWSIL™ 54 Additive is compatible with acrylic, alkyd, epoxy, polyesters, polyurethane and vinyl systems. Thorough preproduction testing is necessary to ensure expected performance.

Results of Studies for a Water-based Flexographic Ink

This data is based on a laboratory study. The control consisted of the formulation with no additives added. See Figures 1 and 2 for results.

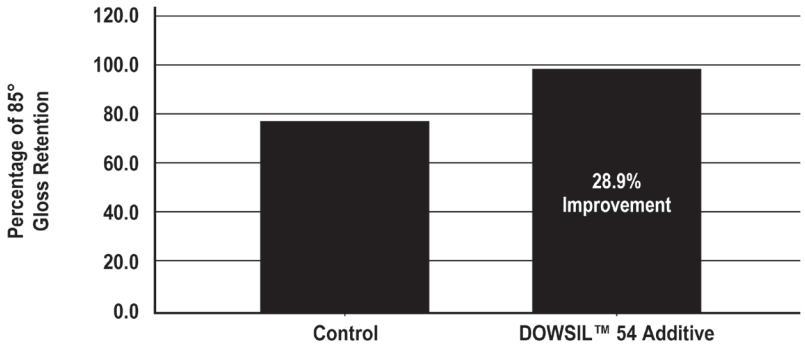

Figure 1: Mar Resistance Performance

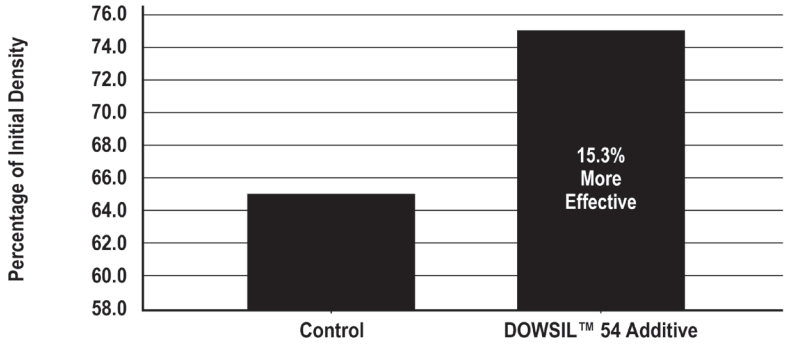

Figure 2: Defoaming Performance – Density Measured Immediately After Shearing

Results of Studies for a Water-based Flexographic Ink (Cont.)

DOWSIL™ 54 Additive provided a 97.6 percent retention in 85° gloss after marring. That was a 28.9 percent improvement in gloss retention over the control. This performance was achieved with no pinholes seen in the drawdown and a 15.3 percent improvement in the defoaming performance over the control.

Test Conditions: Water-based Flexographic Ink
DOWSIL™ 54 Additive was tested in a water-based, flexographic ink that consisted of a non-film-forming, styrene-acrylic resin for paper and paperboard. DOWSIL™ 54 Additive, at 0.5 weight percent, based on actives, was post-added at 1200 rpm.

Formulation

Ingredient	Percent
Joncryl 87	45.5
Flexiverse Diarylide Yellow Dispersant	52.9
Water	1.6

Drawdowns
On a NWH Leneta chart using a #6 wire wound rod.

Defoaming
Shear the ink at 3500 rpm for 20 minutes. The density was measured immediately after shearing and compared to the initial density. The higher the percentage retention in density, the more effective a defoamer is at eliminating the air entrapped during shearing.

Mar Resistance
Using the Sutherland Rub Tester, the sample was rubbed against the white portion of a N2C Leneta chart for 100 double rubs using the four-pound test block. 85 degree gloss was measured before and after the marring. The higher the percent retention in gloss, the more effective an additive is in protecting the coating/ink.

Handling Precautions

Caution: Direct contact with eyes irritates slightly with redness and swelling. Single, short exposure to skin may irritate.

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE SAFETY DATA SHEET IS AVAILABLE ON THE DOW WEBSITE AT DOW.COM, OR FROM YOUR DOW SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CUSTOMER SERVICE.

Packaging Information

DOWSIL™ 54 Additive is available in 500 mL (16.9 fl oz) samples, 20 kg (44.1 lb).

Limitations

This product is neither tested nor represented as suitable for medical or pharmaceutical uses. Not for human injection.

Health and Environmental Information

To support customers in their product safety needs, Dow has an extensive Product Stewardship organization and a team of product safety and regulatory compliance specialists available in each area.

For further information, please see our website, dow.com, or consult your local Dow representative.

Disposal Considerations

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 Technical Representative for more information.

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.

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