



Consumer Solutions

DOWSIL™ 71 Additive and DOWSIL™ 74 Additive for Inks and Overprint Varnishes

DOWSIL™

Providing Superior, Long-Lasting Foam Control

PowerUp
YOUR COATINGS



Novel Properties Allow for Use in High-Speed Printing Processes and on Filmic Substrates

DOWSIL™ 71 Additive and DOWSIL™ 74 Additive allow you to power up your ink and overprint varnish (OPV) formulations by providing excellent, long-lasting foam control at reduced use levels while maintaining the integrity of the coating. Good foam control throughout both the manufacturing and printing processes leads to reduced production times and faster printing speeds while preventing surface defects, even on nonabsorbent filmic substrates.

For inks and OPVs designed for use in food-contact applications, DOWSIL™ 71 and DOWSIL™ 74 Additives comply with various food-contact regulatory requirements in the U.S. and Europe.

Advantages of DOWSIL™ 71 and DOWSIL™ 74 Additives:

- 100% organomodified silicones
- Self-emulsifying
- Easy to incorporate at low shear
- Can be used neat or in polar solvents
- Compatibility with a wide variety of ink and OPV resins
- Very low use levels
- Excellent foam control during both manufacturing and processing
- Shear stability
- Continued performance, even after long-term storage
- Prevent defects, even on filmic substrates
- Compliant with U.S. and European food-contact regulations

Superior Foam Control During Manufacturing, Storage and Printing

Good foam control during the production of inks and OPVs and in the printing process itself is essential. If foam control is effectively achieved, manufacturing times can be minimized and fast printing speeds can be reached, leading to higher productivity and lower overall cost. DOWSIL™ 71 Additive and DOWSIL™ 74 Additive provide good initial and long-lasting foam control in inks and OPV formulations. These low viscosity additives possess a surfactant-like structure that makes them self-emulsifying and thus easy to incorporate at low shear. And because DOWSIL™ 71 and DOWSIL™ 74 Additives are supplied as 100% products, there are no issues regarding emulsion instability during storage or in the printing process.

Even after long-term storage, DOWSIL™ 71 and DOWSIL™ 74 Additives have been shown to provide excellent foam control performance. In addition, they are effective at use levels as much as five times lower than competitor silicone emulsions.

Unique Structure Provides Foam Control Without Causing Surface Defects

Unlike many foam control additives that contain hydrophobic particles that cause defects in inks and OPVs, DOWSIL™ 71 and DOWSIL™ 74 Additives do not contain silica. They are organo-modified silicones with a high degree of organic character, which allows for good compatibility with many different acrylic resins. Foam control additives based on silicone emulsion technology can lead to noticeable defects, whereas the use of DOWSIL™ 71 and DOWSIL™ 74 Additives provides a defect-free surface.

While absorbent substrates can sometimes compensate for defects in the coating film caused by a foam control additive, this problem can be exaggerated on filmic substrates. DOWSIL™ 71 and DOWSIL™ 74 Additives have been shown to be effective even on these more challenging substrates and outperform more conventional silicone emulsion-based antifoam materials that can cause formation of severe craters in the coating surface.

Figure A. When used in acrylic formulations recommended for printing on filmic substrates (Joncryl FLX 5000 in this example), both foam control and surface appearance are improved with DOWSIL™ 71 and DOWSIL™ 74 Additives. Shown in the graph below, there is a clear reduction in the foam height after mixing, with an improved surface appearance.

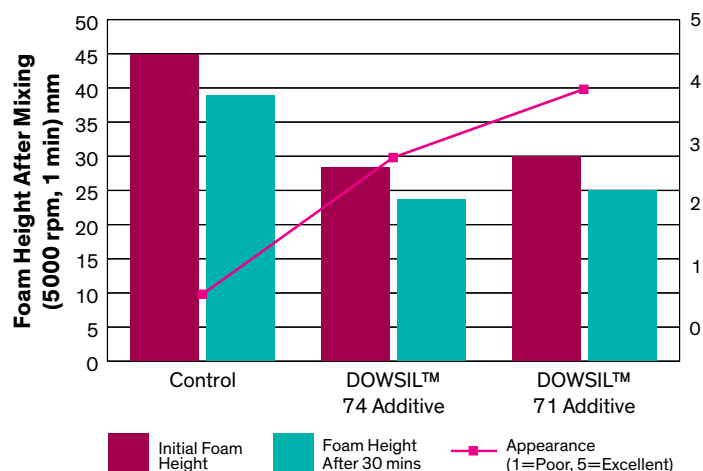


Figure B. Comparison of DOWSIL™ 71 Additive to a silicone emulsion in a waterborne OPV. A higher density after high-speed mixing indicates a superior foam control performance on the day of formulation and after storage for nine weeks.

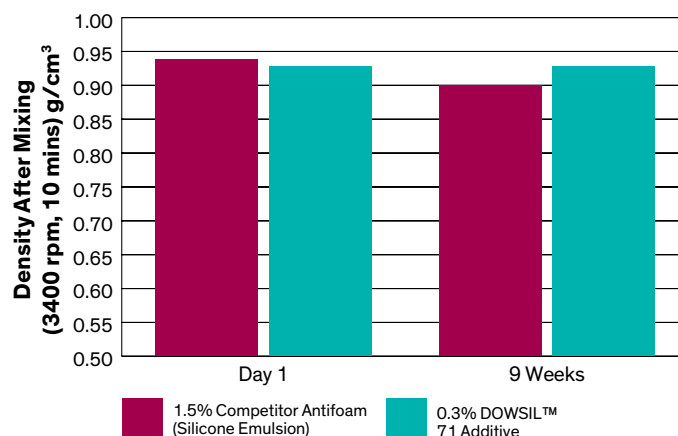
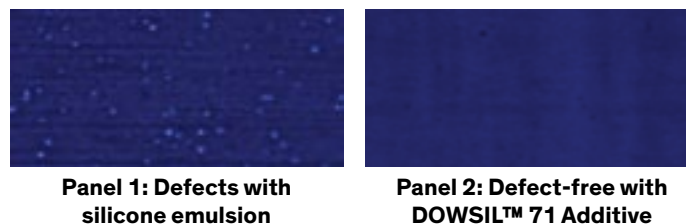


Figure C. Waterborne flexographic ink based on Joncryl ECO 2124 – silicone emulsion technology vs. DOWSIL™ 71 Additive.



An Excellent Foam Control Solution

Today, finding solutions to troubling ink and OPV formulation challenges is more critical than ever. Not only do DOWSIL™ 71 Additive and DOWSIL™ 74 Additive lead to fast manufacturing and printing processes, but they also have been designed to provide excellent foam control at very low use levels. In fact, the products can be used at lower levels than what typically is required for foam control additives based on silicone emulsion technology.

While DOWSIL™ 71 and DOWSIL™ 74 Additives are provided as 100% products, they can be diluted in polar solvents such as glycol ethers to give solutions that are stable for >12 months if required to allow for greater formulation flexibility. Equivalent performance was achieved with DOWSIL™ 71 Additive, whether added neat or incorporated as a 20% active solution pre-diluted in different solvents in a waterborne ink at 0.5% by weight.

Foam Control for Food-Contact Applications

For printing inks and overprint varnishes that will come in contact with food, stringent regulatory requirements must be met. These regulations vary depending on geographic region. Because DOWSIL™ 71 and DOWSIL™ 74 Additives comply with U.S. and European food-contact regulations, as well as certain local country regulations within Europe, choosing these foam control agents makes it easier to ensure that legal requirements are met.

Table 1. DOWSIL™ 71 and DOWSIL™ 74 Additives are compliant with food-contact regulations.

	DOWSIL™ 71 Additive	DOWSIL™ 74 Additive
US FDA 21 CFR Compliance	175.105, 175.300, 175.320, 176.170, 176.180, 176.200, 176.210	176.210
European/Local Regulatory Compliance	BfR XV about Silicones Plastics directive 2002/72/EC	BfR XV about Silicones Plastics directive 2002/72/EC



Figure D. Comparison of DOWSIL™ 71 and DOWSIL™ 74 Additives to a silicone emulsion in a waterborne OPV applied onto PVC.

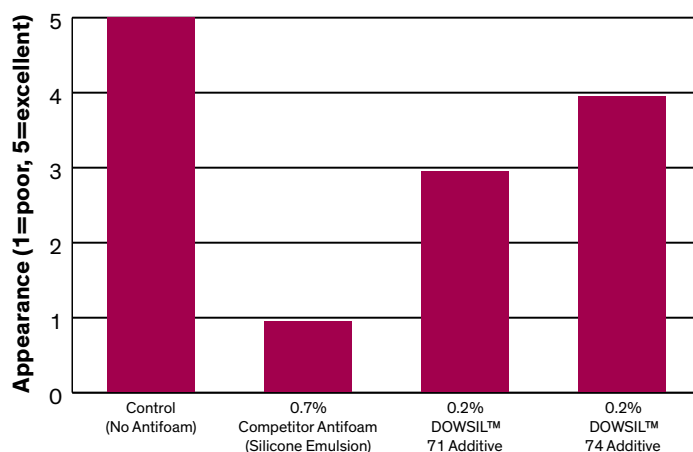


Figure E. DOWSIL™ 71 Additive used at nearly half the level of a silicone emulsion in a waterborne flexographic ink.

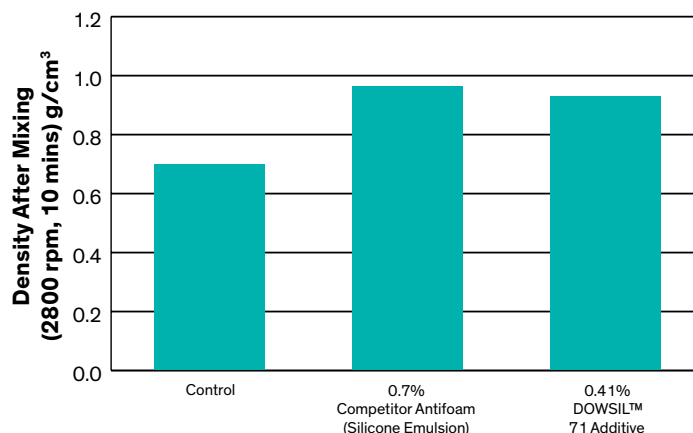
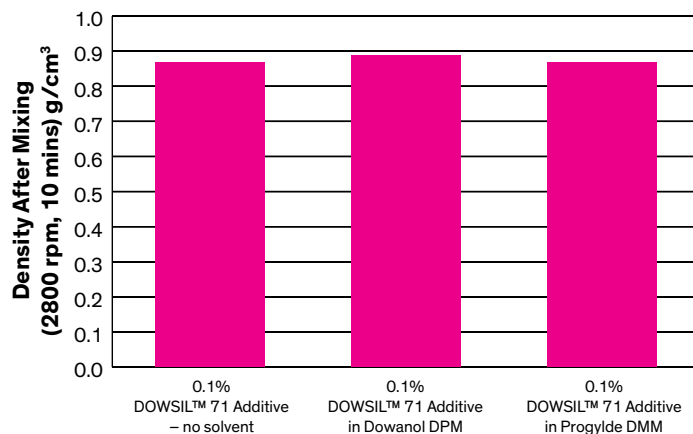


Figure F. Performance of DOWSIL™ 71 Additive (100% as supplied and diluted to 20% actives).



More Than Additives

Our innovative, silicon-based enabling technologies can help you infuse your products with high-value performance attributes that will give you a competitive advantage in the marketplace. As a leader and innovator with a long history of success in the industry, Dow's performance-enhancing coating technology platforms are well-aligned to the needs of the increasingly competitive global coatings market. Consider what adding the following enabling technologies could do to improve your products' performance and support your business goals:

- Gloss enhancement
- Mar resistance and slip
- Impact deadening
- UV resistance
- Feel and touch
- Heat and temperature resistance
- Water resistance
- Anti-fouling

For More Information

Visit [consumer.dow.com/coatings](https://www.consumer.dow.com/coatings) to learn how Dow's innovative coatings technology platforms can help you power up your product line.



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