

# Additive Selection Guide

a little makes a big splash!

WITH **ADDITIVES** FROM DOW CORNING



## A Little Makes a Big Splash!

It takes only a little of a *Dow Corning*<sup>®</sup> brand additive to make the significant performance difference your customers demand from your paint, ink and coating formulations. *Dow Corning* additives provide problem-solving performance.

- Use in waterborne or solventborne formulations
- Compatible with virtually any binder system
- High efficiency at low concentration levels to help lower raw materials costs
- Suitable for use in low VOC, sustainably formulated products
- Formulated for versatility and ease of use

### Problem-Solving Performance

For more than half a century, Dow Corning has led the way in silicon-based technology and is a global leader in the development of problem-solving, silicon-based technologies for paints, inks and coatings. Many *Dow Corning* additives impart a combination of benefits, giving you a high benefit-to-cost ratio. Whether you need foam control; improved pigment dispersion, surface wetting leveling or adhesion; water resistance, mar resistance, slip, gloss, texturization or any combination, silicon-based technology from Dow Corning can help you achieve it.

### Global Resources, Local Expertise and Support

With global manufacturing facilities, sales offices, research and development laboratories, and Technical Information Centers all linked to a worldwide

network of expert local distributors, Dow Corning is able to provide you with an exceptional level of service, support and value. Dow Corning is known for outstanding technical support. Our team of experts will work hand-in-hand with yours to ensure your success with these amazingly versatile materials.

### How to Use This Guide

This guide will help you explore the properties and performance capabilities of Dow Corning's global line of additives for paints, inks and coatings. Table 1 offers additive suggestions for use in a variety of delivery systems and resins. First, from the left-hand column, select the delivery system and resin you plan to use. Then, simply follow that row across to the column for the benefit you wish to achieve. In the box where the two intersect, you will find suggested additives for your application. Table 2 groups the additives by their primary benefit and describes their physical makeup, features, secondary benefits and properties.

[dowcorning.com/coatings](http://dowcorning.com/coatings) gives you immediate access to:

- Product samples
- Product literature and technical data sheets
- Technical articles
- “Live Help” – the opportunity to chat with a Dow Corning paints, inks and coatings expert online
- Customer service
- The name of a technically knowledgeable Dow Corning distributor near you

### About Concentrations and Blending

The amount of *Dow Corning* additive required to achieve a particular benefit depends on the type of formulation, the solvent it contains, the resin system and total system solids. Generally, *Dow Corning* additives are effective at the concentrations noted in Table 2. Since advantages do not increase proportionally, avoid using excessive amounts. *Dow Corning* additives are usually added during grind, let-down or are post-added. However, some may be added during any processing stage. See Table 2 for additional information.



**Table 1. Dow Corning® brand Additives Application Guide** (For additional products, please see Table 2.)

Benefit ▶										
System/Resin	Slip	Mar Resistance	Foam Control	Adhesion Promotion	Pigment Treatment	Water Resistance	Leveling/Wetting	Gloss	Texturing	
Waterborne	55N	55N	62			84	67	28	33	
	51	51	65			85	57	30		
	52	14								
	57	52								
Acrylic	55N	55N	62		57	51	67	28		
	30	51	65							
		HV-495								
	52									
Alkyd	55N	55N	65		57	84	67			
	57	57								
	14	51								
	52									
Epoxy	55N	55N	65		Z-6032	84	67			
	51	18	7							
	52	51								
	57	52								
Polyester	55N	55N	65			84	67			
	51	18	163							
	52	54								
	54	52								
Polyurethane	55N	55N	65	Z-6042		84	67	57		
	14	51	163							
	51	52	73							
	52	14								
Vinyl	14	51	65			84	67			
	51	52	163							
	52	14								
Solventborne	14	57	7	Z-6121	3		57	29	23N	
	11	11	163							
	55N	55N								
Acrylic	11	11	7		3		57	54	23N	
	55N	55N	163							
	14	57								
Alkyd	14	11	7	Z-6121	3		7		23N	
	11	55N	56							
	55N	56								
Amide	19	65	7		3		19			
	11	11	Antifoam A							
Epoxy	11	57	7	Z-6121	57		11		23N	
	14	11	163							
Nitrocellulose	14	11	7				56	29		
	11	57	65							
Phenolic	14	65	65		57		57			
		14								
Polyester	14	11	65	Z-6121	57		57	29	23N	
	11	14	7							
Polyurethane	11	11	7		57		11		23N	
	55N	55N	163							
	57	54								
Vinyl	14	14	7		3		57		23N	
	11	11	163							
Radiation-Cured	31	14	163	Antifoam A			57	31	23N	
		11								

**Table 2. Features, Typical Use and Properties Information of Dow Corning brand Additives<sup>(1)</sup>** (Products are listed under their primary benefit.)

Dow Corning® brand Product	Description	Features/Benefits	Compatible Binder Systems	Point of Addition	Typical Concentration <sup>(2)</sup>	Suitable Diluents <sup>(3)</sup>	Reactive Groups	Solvent	Flash Point, closed cup	Viscosity at 25°C (77°F), cSt	Shelf Life, months <sup>(4)</sup>	Food Contact Compliance <sup>(5)</sup>
<b>Slip, Mar Resistance</b>												
11 Additive	Silicone polyether copolymer; 10% active in toluene	Increases mar resistance; also improves leveling, gloss, wetting, and prevents pigment separation	Acrylic, alkylid, amide, epoxy, nitrocellulose, polyester, polyurethane, vinyl	Grind or let-down or post add	0.1-0.5%	Aromatics such as xylene or toluene; mineral spirits or ketones	Carbinol	Toluene	7°C (45°F)	1.5	36	—
14 Additive	Silicone polyether copolymer; 10% active in isopropanol	Improves slip and mar resistance; provides leveling and gloss	Acrylic, alkylid, epoxy, polyester, polyurethane	Grind or let-down or post add	0.1-0.5%	Water, alcohols, hydrocarbons	Carbinol	Isopropanol	10°C (50°F)	4	30	—
18 Additive	Dispersion of high molecular weight polydimethylsiloxane and silicone surfactant; 100% active	Provides high degree of slip, mar resistance and anti-blocking	Acrylic, alkylid, epoxy, polyester, polyurethane, vinyl	Let-down or post add	0.1-1.0%	Polar solvents, including water, alcohols, ketones	None	None	168°C (334°F)	400,000	21	—
19 Additive	Silicone polyether copolymer; 100% active	Imparts mar resistance and anti-blocking; improves leveling and substrate wetting	Amide, epoxy, nitrocellulose, polyurethane	Grind or let-down	0.1-1.0%	Water or alcohols	None	None	63°C (145°F)	1,750	18	—
28 Additive	Silicone polyether copolymer; 100% active	Improves slip and mar resistance; provides leveling and gloss	Acrylic, alkylid, epoxy, nitrocellulose, polyester, polyurethane, vinyl	Grind or let-down or post add	0.1-1.0%	Water, alcohols or aromatics	Carbinol	None	99°C (210°F)	425	30	—
29 Additive	Silicone polyether copolymer; 100% active	Imparts mar resistance and anti-blocking; also improves leveling and wetting	Acrylic, epoxy, polyester, polyurethane	Grind or let-down or post add	0.1-1.0%	Water, alcohols or aromatics	Carbinol	None	67°C (153°F)	310	30	—
30 Additive	Silicone polyether copolymer; 50% active in propylene carbonate	Provides slip, mar resistance, and anti-blocking; also improves leveling and wetting; contains very low level of volatile silicone material	Polyesters and epoxy-based acrylate radiation-curable formulations	Let-down	0.1-2.0%	Acetone and some aromatic solvents	Carbinol	Propylene carbonate	120°C (248°F)	600	24	—
31 Additive	Silicone polyether copolymer; 50% active in propylene carbonate	Provides consistent and long-lasting slip, mar resistance, and anti-blocking to UV-cured coatings; cross-links under UV radiation	Polyesters and epoxy-based acrylate radiation-curable formulations	Let-down	0.1-2.0%	Acetone and some aromatic solvents	Methacrylate	Propylene carbonate	>80°C (>176°F)	250	18	—
51 Additive	Dispersion of high molecular weight polysiloxane and surfactants; 80% active in water	Imparts mar resistance and slip to systems with water-based emulsions; also effective in solvent-borne coatings containing alcohol or polar solvents	Acrylic, alkylid, epoxy, nitrocellulose, polyester, polyurethane, vinyl	Grind or let-down or post add	0.05-0.3%	Polar solvents, including water and alcohols	Silanol	Water	>101°C (>214°F)	500,000	18	FDA 175.105, 176.180, 176.210
52 Additive	Dispersion of high molecular weight polysiloxane and surfactants; 64% active in water	Imparts mar resistance and slip to systems with water-based emulsions; also effective in solvent-borne coatings containing alcohol or polar solvents	Acrylic, alkylid, epoxy, nitrocellulose, polyester, polyurethane, vinyl	Grind or let-down or post add	0.01-3.5%	Polar solvents, including water and alcohols	Silanol	Water	>101°C (>214°F)	4,000	12	FDA 176.210
54 Additive	Silicone polyether copolymer; 100% active	Provides mar resistance, slip, leveling and gloss; aids defoaming in some systems	Acrylic, alkylid, epoxy, polyester, polyurethane, vinyl	Let-down or post add	0.05-1.0%	Aromatics such as xylene or toluene, mineral spirits and chlorinated hydrocarbons	Carbinol	None	>101°C (>214°F)	170	30	—
55N Additive	Silicone polyether copolymer; 10% active in propylene glycol methyl ether acetate	Multi-purpose additive; imparts mar resistance, improves leveling and reduces cratering, pinholing, orange peel and cissing	Acrylic, alkylid, polyurethane, vinyl	Grind or let-down or post add	0.1-0.5%	Water, alcohols and glycols	Carbinol	Propylene glycol methyl ether acetate	67°C (153°F)	5	36	—
HV-495	Silicone emulsion; 37% active	Provides slip and mar resistance	Acrylic, epoxy, polyester, polyurethane	Let-down or post add	0.05-0.5%	Water	Silanol	Water	>101°C (>214°F)	10	18	FDA 175.105, 176.180, 176.200, 176.210

(continued on pages 5, 6, 7)

**Table 2. Features, Typical Use and Properties Information of Dow Corning brand Additives<sup>III</sup>**

Dow Corning® brand Product	Description	Features/Benefits	Compatible Binder Systems	Point of Addition	Typical Concentration <sup>[2]</sup>	Suitable Diluents <sup>[3]</sup>	Reactive Groups	Solvent	Flash Point, closed cup	Viscosity at 25°C (77°F), cSt	Shelf Life, months <sup>[4]</sup>	Food Contact Compliance <sup>[5]</sup>
<b>Foam Control</b>												
7 Additive	Fluorosilicone; 5% active in methylisobutyl ketone	Provides foam prevention and defoaming	Acrylic, alkylid. amide, epoxy, nitrocellulose, polyester, polyurethane, vinyl	Grind or let-down or post add	0.01-0.05%	Ketones	None	Methyl-isobutyl ketone	12°C (54°F)	0.8	18	FDA 177.2600
62 Additive	Silicone emulsion; 57% active in water	Provides effective foam control in inks and coatings; good compatibility and low tendency to cause defects; APEO-free	Acrylic, polyurethane	Grind or let-down or post add	0.05-0.5%	Water	None	Water	>101°C (>214°F)	2,000	18	FDA 175.105, 176.210, BFR XXXVI
65 Additive	Silicone emulsion; 59% active in water	Prevents and eliminates foam in high-shear mixing processes; long-term defoaming action	Acrylic, alkylid. amide, epoxy, nitrocellulose, polyester, polyurethane, vinyl	Grind or let-down or post add	0.05-0.5%	Water	None	Water	>101°C (>214°F)	2,000	24	-
71 Additive	Organo-modified silicone copolymer; 100% active	Effective foam control in water-borne coatings, especially ink; balancing effective foam control and good surface appearance	Acrylics	Grind or let-down or post add	0.1-1.0%	Water	None	None	>100°C (>212°F)	500	24	FDA 175.105, 175.300 <sup>[6]</sup> , 175.320 <sup>[6]</sup> , 176.200 <sup>[6]</sup> , 176.210 <sup>[7]</sup> , BFR XV, EU 2002/72/EC
73 Additive	Silicone emulsion; 10% active in water	Excellent persistency, stable over a wide pH range; good performance in dispersion paints	Acrylic emulsion, polyacrylate PU-modified systems	Grind or let-down or post add	0.1-1.0%	Water	None	None	>100°C (>212°F)	1,500	12	-
74 Additive	Organo-modified silicone copolymer; 100% active	Effective foam control in water-borne coatings, especially wood coatings; balancing effective foam control and good surface appearance	Acrylics	Grind or let-down or post add	0.1-1.0%	Water	None	None	>100°C (>212°F)	750	24	FDA 176.210
76 Additive	Organo-modified silicone; silica-free; 20% active in dipropylene glycol monomethylether	Effective, low-cost foam control for waterborne printing applications; wood, protective and plastic coatings; does not influence gloss or cause surface defects	Acrylics	Grind or let-down or post add	0.1-1.5%	Water	None	Dipropylene-glycol mono-methylether	75	45	24	FDA 175.105, 176.170, 176.180, 176.210
163 Additive	Silicone anti-foam compound; 100% active	Provides foam control in coatings and inks	Acrylic, epoxy, polyester, polyurethane, vinyl	Let-down or post add	0.1-0.5%	Aromatics, aliphatics, glycols, water	Silanol	None	>101°C (>214°F)	1,000	18	FDA 175.105, 175.300, 176.170, 176.180, 176.200, 176.210, BFR XV
Antifoam A	Silicone anti-foam compound; 100% active	Silicone defoamer effective in solvent-based amide systems	Solvent-borne amide and UV	Grind or let-down or post add	0.1-1.0%	Aliphatic, aromatic and chlorinated solvents and glycols	None	None	>101°C (>214°F)	1,500	36	FDA 175.105, 175.300, 176.170, 176.180, 176.200, 176.210, 177.2600
Antifoam 22 10	Silicone emulsion; 10% active in water	Provides foam control in waterborne coatings, especially dispersion paints	Acrylic	Grind or let-down or post add	0.1-1.0%	Water	None	Water	>100°C (>212°F)	2,700	24	-

(continued on pages 6, 7)

**Table 2. Features, Typical Use and Properties Information of Dow Corning brand Additives<sup>III</sup>**

Dow Corning® brand Product	Description	Features/Benefits	Compatible Binder Systems	Point of Addition	Typical Concentration <sup>II</sup>	Suitable Diluents <sup>II</sup>	Reactive Groups	Solvent	Flash Point, closed cup	Viscosity at 25°C (77°F), cSt	Shelf Life, months <sup>II</sup>	Food Contact Compliance <sup>II</sup>
<b>Adhesion Promotion</b>												
Z-6032 Silane	Vinyl/benzyl-amine-methoxy-functional silane; 40% active	Adhesion promoter and pigment treatment	Alkyd, epoxy, vinyl	Let-down	0.05-2.0 wt%	Alcohols and water	Vinyl/benzyl-amine-methoxy	Methanol	13°C (55°F)	2	18	FDA 175.300
Z-6121 Silane	Amino-methoxy-functional silane; 50% active	Improves adhesion and water resistance of coatings and adhesives when bonded to glass or metal substrates; can be used as an additive or primer	Acrylic, alkyd, epoxy, polyester	Grind or let-down or post add	Primer: dilute to 10% active Additive: 1.0-5.0%	Alcohols and water	Amino-methoxy	n-Butanol	27°C (81°F)	5	36	FDA 175.105
Z-6137 Silane	Aqueous solution of amino-functional silicone polymers; low alcohol content (<1%); 24% active; when used as a primer, apply by dipping or brushing	Promotes adhesion of a wide variety of coating systems to glass, ceramics and metals	Acrylic, epoxy, phenol, polyurethane	Let-down	Primer: dilute to 10% active Additive: 1.0-5.0%	Water, isopropyl alcohol	Aminosilanol	Water	100°C (212°F)	7	24	–
<b>Pigment Treatment</b>												
3 Additive	Silanol-functional (Si-OH) additive; 10% active in toluene	Improves pigment dispersion and reduces separation and flotation; also provides leveling, flow-out and gloss	Epoxy, polyurethane	Grind or let-down or post add	0.1-0.5%	Aromatics such as xylene or toluene; mineral spirits or ketones	Silanol	Toluene	7°C (45°F)	1	36	–
Z-6300 Silane	Vinyltrimethoxysilane; 99% active	Pigment treatment	Acrylic, alkyd, epoxy, polyester, polyurethane, vinyl	Let-down	0.05-0.1%	Alcohols and water	Vinyl-methoxy	Methanol	22°C (72°F)	3	36	FDA 177.2600
<b>Water Resistance</b>												
84 Additive	Low-viscosity emulsion of elastomeric silicone; 60% active	Provides water resistance for waterborne systems, particularly inks	Mainly acrylics	Let-down or post add	2.0-5.0%	Water	Silanol	Water	>100°C (>212°F)	500	24	–
85 Additive	Medium-viscosity emulsion of elastomeric silicone; 60% active	Provides water resistance for waterborne systems, particularly inks	Mainly acrylics	Let-down or post add	2.0-5.0%	Water	Silanol	Water	>100°C (>212°F)	40,000	24	–
<b>Leveling/Wetting, Gloss</b>												
56 Additive	Arylalkyl-modified silicone; 100% active	Aids denaturation and stabilizes the curtain in curtain coatings; improves leveling and gloss; aids pigment orientation; good thermostability	Acrylic, alkyd, epoxy, nitrocellulose, polyester, polyurethane, vinyl	Grind or let-down or post add	0.01-0.5%	Aromatics such as xylene, toluene, mineral spirits and chlorinated hydrocarbons	None	None	>101°C (>214°F)	1,500	36	–
57 Additive	Silicone polyether copolymer; 100% active	Improves leveling, slip, mar resistance and gloss; excellent substrate wetting	Acrylic, alkyd, amide, epoxy, nitrocellulose, polyester, polyurethane, vinyl	Grind or let-down or post add	0.1-1.0%	Acetone, toluene, naphtha, mineral spirits and isopropyl alcohol; dispersible in water	None	None	>80°C (>176°F)	270	30	FDA 176.2107 <sup>I</sup>
67 Additive	Silicone polyether copolymer; 100% active	Imparts good spreading and wetting on difficult substrates, e.g., low-energy substrates such as polyethylene, polypropylene, polyester; suitable in inks, decorative and industrial coatings for plastic, metal and wood	Acrylate, polyester, polyurethane	Let-down	0.1-1.0%	Isopropyl alcohol, acetone and toluene; dispersible in water	Carbinol	None	>100°C (>212°F)	40	24	–

(continued on page 7)

**Table 2. Features, Typical Use and Properties Information of *Dow Corning* brand Additives<sup>(1)</sup>**

<b>Dow Corning® brand Product</b>	<b>Description</b>	<b>Features/Benefits</b>	<b>Compatible Binder Systems</b>	<b>Point of Addition</b>	<b>Typical Concentration<sup>(2)</sup></b>	<b>Suitable Diluents<sup>(3)</sup></b>	<b>Reactive Groups</b>	<b>Solvent</b>	<b>Flash Point, closed cup</b>	<b>Viscosity at 25°C (77°F), cSt</b>	<b>Shelf Life, months<sup>(4)</sup></b>	<b>Food Contact Compliance<sup>(5)</sup></b>
<b>Texturing</b>												
23N Additive	Powder consisting of transparent spherical silicone elastomer particles with epoxy functionality; average particle diameter of 2-3 microns	Imparts mar and abrasion resistance with a silky, smooth, matte finish	Acrylic, polyester, polyurethane, vinyl	Prepare premix; see product data sheet	0.5-5.0%	Solvents such as glycols, glycol ethers, esters, alcohols, water or monomers used for UV coatings such as TPGDA	Epoxy	None	NA	NA	27	-
33 Additive	Waterborne suspension of spherical silicone elastomer particles with epoxy functionality; average particle diameter of 2-3 microns; 46% active	Imparts mar and abrasion resistance with a silky, smooth, matte finish	Acrylic, polyurethane	Grind or let-down or post add	5-10%	Water	Epoxy	Water	>101°C (>214°F)	50	12	-

<sup>(1)</sup> These values are not intended for use in preparing specifications.

<sup>(2)</sup> The typical concentrations are usage levels where the materials have performed successfully. Usage levels can vary depending on application and performance requirements. Please evaluate for optimum performance in each specific application.

<sup>(3)</sup> Review the Safety Data Sheet for each solvent prior to use. Safety Data Sheets can be obtained from your solvent supplier.

<sup>(4)</sup> From date of manufacture, months.

<sup>(5)</sup> **FDA Title 21 CFR** – 175.105, 175.300, 175.320 Indirect food additives: adhesives and components of coatings; 176 (176.130, 176.170, 176.180, 176.200, 176.210) Indirect food additives: paper and paper board components; 177 (177.1390, 177.2600, 177.1520(b)) Indirect food additives: polymers.

**EU Legislation** – BFR recommendation XV about silicones; BFR recommendation XXXVI about paper and paperboard for food contact. EU Directive 2002/72/EC and its amendments up to and including Directive 2004/19/EC.

<sup>(6)</sup> Per Food Contact Notification 516

<sup>(7)</sup> Per Food Contact Notification 142

NA = Not Applicable.

## Your Global Connection

At home or abroad – wherever your business takes you – you will find the product supply, customer service and technical support you need to succeed available locally from Dow Corning.

Whether you are facing a challenge that could benefit from Dow Corning's international business and market experience, or you need a reliable, local source of supply for innovative paints, inks and coatings solutions, contact your Dow Corning representative. Product samples, technical information and assistance are also available online at [dowcorning.com/coatings](http://dowcorning.com/coatings).

## Contact Information

[dowcorning.com/ContactUs](http://dowcorning.com/ContactUs)

Front cover photos: AV13358, AV13359

### LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that our products are safe, effective and fully satisfactory for the intended end use. Suggestions of use shall not be taken as inducements to infringe any patent.

Dow Corning's sole warranty is that our products will meet the sales specifications in effect at the time of shipment.

Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted.

**DOW CORNING SPECIFICALLY DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY.**

**DOW CORNING DISCLAIMS LIABILITY FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

*Dow Corning* is a registered trademark of Dow Corning Corporation.

*We help you invent the future.* is a trademark of Dow Corning Corporation.

©1999, 2002, 2003, 2004, 2006, 2009 Dow Corning Corporation. All rights reserved.

Printed in USA

AGP10461

Form No. 24-391U-01

**DOW CORNING**

*We help you invent the future.™*