

# Specialty Additives product selection guide

Solutions that add real value  
to your systems



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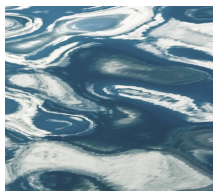


We take a holistic approach to improving  
our clients' competitive advantage . . .

we offer solutions, not just products.



# About us



## Committed to providing unmatched performance

Air Products seeks at all times to maintain its reputation as a leading supplier of exceptional specialty additives throughout the world. We do this through continual investment in product development and pace setting technology, as well as by anticipating the needs of our customers and offering innovative solutions – sometimes even in advance of our customers' anticipated requirements.

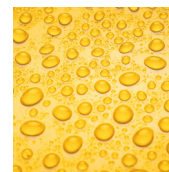
Over 40 years ago, we recognized the inevitable shift from solvent to water-based systems and helped guide formulators through the challenges of making the transition. From a small number of Surfynol surfactant products, we have applied our surface science knowledge to help create what is today recognized as an exceptional product portfolio. We continually strive to be the global supplier of choice of specialty additives, supplying, within a broad range of applications and markets, customers who value high performance solutions.

## A winning team

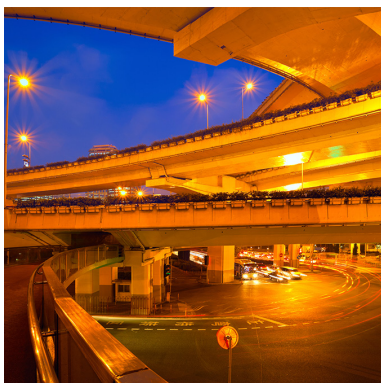
Additives may be able to help you solve formulating challenges – but it's the people behind the products that really make a difference. For decades, our chemists have been studying the unique challenges faced by the formulators of water-based systems. With their support, our goal is to help you achieve your goal of creating successful products. From product development to applications testing to technical service, we can help you put it all together by teaming the best products with an unparalleled applications development team. From ideas to finished products, our team can help you develop products, solve problems and grow your business.



# Offering you solutions, not just products



Air Products' families of Surfynol®, Dynol™, Airase®, ZetaSpense® and Carbowet® additives are widely used in countless industries, including coatings, inks, adhesives, metalworking and construction. Our continued commitment to developing new and beneficial surfactant technology promises to be an answer to ongoing challenges facing formulators. We are constantly working to provide unique products and performance solutions for a broad range of applications.



**Dynol superwetters** For your most demanding applications – we think these superwetting surfactants are second to none.

## **Surfynol multifunctional additives**

A top performing range of multifunctional surfactants and defoamers. Our broad product line includes low foam dynamic wetting agents, unique molecular defoamers, as well as specialty surfactants designed for specific end-use applications.

## **Airase defoamers and deaerators**

A complete line of defoamers and deaerators for waterborne applications, each formulated to provide the optimum of defoaming and compatibility in a given system. The product line includes our unique defoamers and deaerators as well as our innovative Structured Siloxane Defoamer Line (SSDL™ defoamers), a line of defoamers designed to provide predictable performance relative to each other.

**ZetaSpense dispersants** A dedicated line of products that address unique challenges of dispersing pigments and other particles efficiently and effectively.

**Carbowet surfactants** Perfect for applications where you need wetting and surface reduction with varying degrees of emulsification and stabilization.



We're dedicated to anticipating customer requirements and to helping our customers develop their business . . .

# Product overview

Some products are not available in all regions. Please check with your local office.

## Defoamers and deaerators

### Organic oil

Airase 4500  
Surfynol DF-37  
Surfynol DF-220

### Siloxane

Airase 5100  
Airase 5200  
Airase 5300  
Airase 5400  
Airase 5500  
Airase 5600  
Airase 5700  
Airase 8070  
Surfynol DF-58  
Surfynol DF-62  
Surfynol DF-66  
Surfynol DF-178  
Surfynol DF-695

### Molecular

Surfynol AD01  
Surfynol 104\*  
Surfynol 500S  
Surfynol DF-110\*  
Surfynol MD-20  
Surfynol MD-610S  
Surfynol PC

## Surfactants

### Superwetters

Dýnol 360  
Dýnol 604  
Dýnol 607  
Dýnol 800  
Dýnol 810  
Dýnol 960  
Dýnol 980

### Multifunctional

Surfynol AD01  
Surfynol 82  
Surfynol 104\*  
Surfynol 420  
Surfynol 440  
Surfynol 465  
Surfynol 485\*  
Surfynol 2502

### Specialty/Formulated

Carbowet GA-100  
Carbowet GA-210  
Carbowet GA-211  
Carbowet GA-221  
Carbowet LSF  
Carbowet 422  
Surfynol 500S  
Surfynol 61  
Surfynol FS-85  
Surfynol OP-340  
Surfynol PSA336  
Surfynol SE  
Surfynol SE-F

### Traditional/Stabilizing

Carbowet 76  
Carbowet 103  
Carbowet 106  
Carbowet 109  
Carbowet 125  
Carbowet 138  
Carbowet 144  
ZetaSpense 170  
ZetaSpense 179  
ZetaSpense 182

## Dispersants

### Resin-free systems

ZetaSpense 1200  
ZetaSpense 2300  
ZetaSpense 2500  
ZetaSpense 3100  
ZetaSpense 3400  
ZetaSpense 3600  
ZetaSpense 3700

### Resin-containing systems

ZetaSpense 170  
ZetaSpense 179  
ZetaSpense 182  
ZetaSpense 2500  
ZetaSpense 3600

\* This product is available in different forms.

# Additives for coatings and paints

- Top recommendations
- Secondary options

● Top recommendations ○ Secondary options			Architectural	Industrial & maintenance	Automotive	Specialty paper	Plastic	Wood	Powder	Pigment dispersion (base)	Pigment dispersion (colorant)
Defoaming		Airase® 5100	●	○						●	●
		Airase 5200	●	○						●	●
		Airase 5300	●	●			○	○		○	○
		Airase 4500	●	●	○					●	○
		Airase 5400	○	●			○	○		○	○
		Surfynol® DF-220	●		○	○					
		Surfynol DF-58	●	●			○	●		●	●
		Airase 8070	○	○	○		○	●			●
		Surfynol DF-37		○							
		Airase 5500	○	●				●			○
		Surfynol DF-62	○				●	●			
		Surfynol DF-66	○				●	●			
		Airase 5600	○	●			○	●			
		Surfynol DF-178		○	○		●	●			
		Airase 5700		○			●	●			
Wetting	Molecular defoamers	Surfynol DF-110*		●	●		●				●
		Surfynol AD01	●	●	●	●	○	○		●	●
		Surfynol MD-20		○	●	●	●	●			●
		Surfynol 104*	●	●	●		●	●	●	○	○
		Surfynol PC				●					
		Surfynol 500S							●		
		Surfynol MD-610S							●		
	Dynol™ 960		○				●	●			
	Dynol 980		○				○	○			
	Dynol 360	○	●	●	●	●	●	●			
	Dynol 800		●	●	○	●	●				
	Dynol 810		○	○	○	○	○				
	Dynol 607		●	○	●	○	○				
	Surfynol 420			●	●						
	Surfynol SE-F			○	●		●				
	Surfynol PSA336				●	○					
	Surfynol 440		●	○	●	○	●				
	Surfynol 2502		○	●	●	○	○				
	Carbowet® 422	●						●			
	Surfynol 485*		●								
	Carbowet 106	○									
	Carbowet 109	○									
	Carbowet GA-100	●								●	○
	Carbowet GA-210	●		●						●	●
	Carbowet GA-211	○		●						●	●
	Carbowet GA-221			●						○	●
	ZetaSperse® 170	○	○							○	●
	ZetaSperse 179	●	○							●	●
	ZetaSperse 182	○	○							●	●
	ZetaSperse XXXX**	●	●	●	●	●	●	●		●	●

\* This product is available in different forms.

\*\* For specific pigment dispersant recommendations, use the FAZT tool at [FAZT.com](http://FAZT.com) or contact Air Products.  
All products may not be available in all regions. Please contact your local supplier for availability.



# Additives for inks and graphic arts

- Top recommendations
- Secondary options

			Inks	Fountain solutions	Overprint varnishes	Pigment dispersions (resinated)	Pigment dispersions (resin-free)	
Defoaming		Airase® 5100			●	●		
		Airase 5200			●	●		
		Airase 5300	○		●	●	○	
		Surfýnol® DF-695	●					
		Airase 4500	●		●	○	○	
		Airase 5400	●		●	○	○	
		Surfýnol DF-58	○			○	○	
		Airase 8070	○		○	○	○	
		Airase 5500	●		○	○	●	
		Surfýnol DF-62	●					
		Surfýnol DF-66	●		●			
		Airase 5600	●		○		○	
		Surfýnol DF-178				○	○	
		Airase 5700	○		○			
		Wetting	Molecular defoamers	Surfýnol DF-110*	○	●		●
Surfýnol AD01	●				●	○	○	
Surfýnol MD-20	○			○		●	●	
Surfýnol 104*	●			○	○	○	○	
Dýnol™ 960	●				○			
Dýnol 980	○				●			
Dýnol 360			●					
Dýnol 800	○				○			
Dýnol 810	●				●			
Dýnol 607			●					
Surfýnol 420	●		●					
Surfýnol SE-F	●							
Surfýnol OP-340				●				
Surfýnol 440	●		●					
Surfýnol 2502	●		●	●				
Surfýnol 465			●					
Surfýnol FS-85			●					
Stabilizing	Carbowet® GA-100						●	●
	Carbowet GA-210						●	●
	Carbowet GA-211					●	●	
	Carbowet GA-221					●	●	
	ZetaSperse® 170					●	○	
	ZetaSperse 179					●	○	
	ZetaSperse 182	●				●	○	
	ZetaSperse XXXX**					●	●	

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# Additives for adhesives and latex dipping

- Top recommendations
- Secondary options

		Adhesives: film and PSA	Adhesives: engineered lumber	Lamination adhesives	Latex dipping
Defoaming	Molecular defoamers	Surfynol® DF-695		○	
		Airase® 4500	○		
		Surfynol DF-220		○	○
		Surfynol DF-58			
		Airase 8070		○	
		Surfynol DF-37			●
		Airase 5500		○	
		Surfynol DF-66	○	●	
		Airase 5600		○	
		Surfynol DF-178	●		
Wetting	Molecular defoamers	Airase 5700		○	
		Surfynol DF-110*		○	
		Surfynol AD01	○	●	
		Surfynol MD-20	○	○	○
		Surfynol 104*	○	○	
		Dynol™ 960	○		
		Dynol 980	○		
		Dynol 360	○	○	
		Dynol 800	●	○	
		Dynol 810	○	○	
		Surfynol 420	○		
		Surfynol SE-F	○	○	
		Surfynol PSA336	○	●	
		Surfynol 440	●		○
		Surfynol 2502	○		
		Surfynol 465			●
		Surfynol 485*			●
Stabilizing	Molecular defoamers	Carbowet® 109	○	○	○
		Carbowet GA-100	○		○
		Carbowet GA-210	○		○
		Carbowet GA-211			●
		Carbowet LSF			●
		ZetaSperser 179	○		○
		ZetaSperser XXXX**	○		○

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We are committed to providing products and solutions that offer unmatched performance gains . . .



# Complete product offering

Some products are not available in all regions.  
Please check with your local office.

## Surfynol multifunctional additives

### Surfynol AD01

A nonionic wetting agent, molecular defoamer and coalescing surfactant (100% active liquid). Surfynol AD01 surfactant is a patented alkane diol surface active agent that provides defoaming, dynamic wetting, and coalescing benefits in waterborne coatings, inks, and adhesives systems. No added solvents or APEs.

### Surfynol 2502

An alkoxyated low-foam wetting agent (100% active liquid). Surfynol 2502 surfactant is based on patented alkoxyated acetylenic diol surface active chemistry. Provides ideal balance of dynamic surface tension reduction and system compatibility with very low foam in waterborne coatings, inks, and adhesives systems. FDA clearances, no added solvents or APEs.

### Surfynol 420

Surfynol 420 surfactant performs as a dynamic wetting agent and molecular defoamer in a wide variety of applications, including waterborne coatings, inks, adhesives, agricultural chemicals, and numerous industrial specialty applications. It is a 100% active, easy-to-handle liquid that contains no added alkylphenol ethoxylates (APEs) or hazardous air pollutants (HAPs). Surfynol 420 surfactant complies with several regulations needed for applications requiring food contact compliances in the U.S., Europe and Asia, as well as EPA compliances needed for use in agricultural chemical applications.

### Surfynol 440

An ethoxylated low-foam wetting agent (100% active liquid). Surfynol 440 surfactant provides low foam dynamic and equilibrium surface tension reduction with improved dispersibility and ease of incorporation in waterborne coatings, inks, and adhesives systems. FDA and EPA clearances, no added solvents or APEs.

### Surfynol 465

An ethoxylated low-foam wetting agent (100% active liquid). Surfynol 465 surfactant is an ethoxylated acetylenic diol that provides low foam surface tension reduction with improved solubility and compatibility in waterborne coatings, inks, and adhesives systems. FDA and EPA clearances, no added solvents or APEs.

### Surfynol 485

An ethoxylated low-foam wetting agent (100% active liquid/semi-solid). Provides low-foam surface tension reduction with slight emulsification properties, improved solubility and compatibility in waterborne coatings, inks, and adhesives systems. FDA and EPA clearances, no added solvents or APEs.

### Surfynol 485W

An ethoxylated low-foam wetting agent (75% active solution in water). Provides low-foam surface tension reduction with slight emulsification properties and improved solubility and compatibility in waterborne coatings, inks, and adhesives systems. FDA and EPA clearances, no added solvents or APEs.

### Surfynol 500S

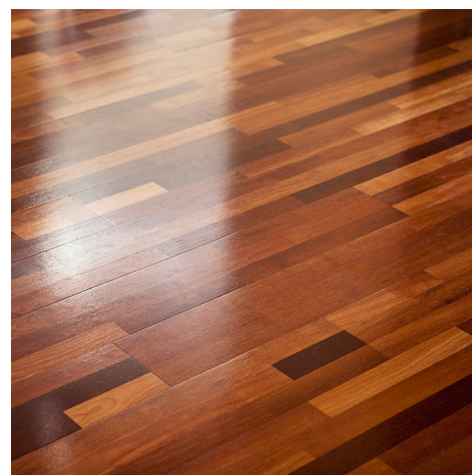
A powdered nonionic wetting agent and molecular defoamer. Surfynol 500S surfactant is a powdered preparation that provides rapid wetting of solid particles, fillers, pigments, and fibers; fast mixing and enhanced workability of cementitious systems. FDA clearances, no added APEs.

### Surfynol 61

A volatile wetting agent (100% active liquid). Surfynol 61 surfactant is a multifunctional surface active agent based on acetylenic chemistry that provides substrate wetting in systems where surfactant residues or contamination are undesirable, such as silicon wafer or glass cleaning. The properties of Surfynol 61 allow it to completely evaporate under normal use conditions in variety of aqueous systems. No added solvents or APEs.

### Surfynol 82

A nonionic surfactant (100% active solid) Surfynol 82 offers excellent non-foaming wetting in aqueous systems and is strongly synergistic with other surface active agents. It can be volatilized without degrading when heated to its boiling point of 221 Celsius. EPA and FDA clearances, no added APEs.





#### Surfynol DF-110C

A nonionic, organic molecular defoamer. Surfynol DF-110C defoamer is an acetylenic diol-based product that provides defoaming and de-airentaining in aqueous systems without the side effects typical of many traditional foam control agents. Benefits include: microfoam elimination, long-lasting foam control, defect-free foam control, and good dynamic wetting. No added APEs.

#### Surfynol DF-110D

A nonionic, organic molecular defoamer. Surfynol DF-110D defoamer is an acetylenic diol-based product that provides defoaming and de-airentaining in aqueous systems without the side effects typical of many traditional foam control agents. Provides microfoam elimination, long-lasting foam control, defect-free foam control, and good dynamic wetting. No added APEs.

#### Surfynol DF-110L

A nonionic, organic molecular defoamer. Surfynol DF-110L defoamer is an acetylenic diol-based product that provides defoaming and de-airentaining in aqueous systems without the side effects typical of many traditional foam control agents. Benefits include: microfoam elimination, long-lasting foam control, defect-free foam control, and good dynamic wetting. No added APEs.

#### Surfynol DF-178

A formulated siloxane-based defoamer and de-aerator (100% active liquid). Surfynol DF-178 defoamer was developed specifically for applications in waterborne coatings and graphic arts that demand both powerful defoaming and defect-free surfaces. Provides strong defoaming and microfoam control and is particularly effective in spray applications. No added APEs.

#### Surfynol DF-37

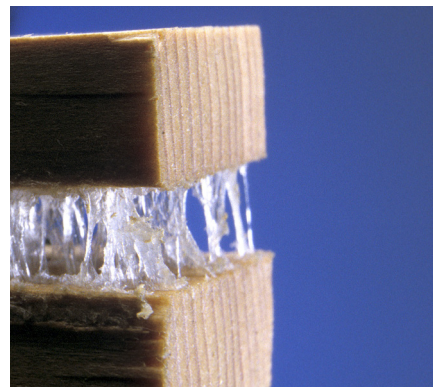
A nonionic, organic defoamer (100% active liquid). Surfynol DF-37 defoamer is a proprietary acetylenic-based additive that provides foam control and surface wetting in water-based formulations. FDA compliance. No added APEs.

#### Surfynol DF-58

A siloxane-based defoamer (100% active liquid). Surfynol DF-58 defoamer is a proprietary formulation that provides strong foam control and de-aeration performance in water-based formulations. No added APEs.

#### Surfynol DF-62

An ether-modified polysiloxane defoamer (100% active liquid). Surfynol DF-62 defoamer is a proprietary formulation that provides excellent balance of initial foam knockdown and sustained antifoaming over time in water-based formulations. No added APEs.



#### Surfynol DF-66

A modified polysiloxane based defoamer. Surfynol DF-66 defoamer is a proprietary formulation that provides excellent balance of initial foam knockdown and sustained antifoaming over time in water-based formulations. FDA compliances, no added APEs.

#### Surfynol DF-695

A silicone emulsion defoamer. Surfynol DF-695 defoamer is a proprietary emulsified silicone additive. Provides initial and sustained defoaming performance in water-based formulations. FDA compliances, no added APEs.

#### Surfynol DF-220

An organic defoamer (100% active liquid). Surfynol DF-220 defoamer is a proprietary, non-silicone additive that provides rapid and sustained defoaming in water-based printing inks, coatings and adhesives systems. Surfynol DF-220 defoamer is ideally suited for architectural and medium- to high-PVC systems. No added APEs.

#### Surfynol FS-85

An anionic/nonionic wetting agent. Surfynol FS-85 surfactant is a proprietary additive designed for use in lithographic fountain solutions. Provides important wetting and emulsification properties, allowing the elimination of solvents and other undesirable additives from fountain solution formulations. No added APEs.

#### Surfynol MD-20

A nonionic, organic defoaming/de-aerating wetting agent (100% active liquid). Surfynol MD-20 molecular defoamer is based on proprietary modified acetylenic diol chemistry. Provides foam control and reduces microfoam without any of the incompatibilities or other issues associated with silicone or mineral oil defoamers. No added APEs.

#### Surfynol MD-610S

A highly effective powder defoamer designed to eliminate air entrapment in cementitious based products for the construction industry. The unique chemistry of Surfynol MD-610S defoamer combines the benefits of fast-acting defoaming with long-lasting deaeration at a molecular level. Surfynol MD-610S defoamer enables the fast escape of entrapped air while incorporating water and during mixing. The resulting cementitious compositions exhibit enhanced flow, excellent self-leveling, reduced air content and a smooth and defect-free hardened surface. Surfynol MD-610S defoamer is universally applicable for use in both neutral and alkaline systems.



**We take a responsible lead in offering additives  
that perform to the highest environmental  
standards . . .**



## Surfynol additives continued

### Surfynol OP-340

An anionic/nonionic wetting agent. Surfynol OP-340 wetting agent is a proprietary additive designed specifically for use in waterborne overprint varnish systems. Helps eliminate surface tension related issues like poor wetting, retraction, surface defects, or orange peel over both wet and dry lithographic inks. FDA compliances. No added APEs.

### Surfynol PC

A molecular defoamer. Surfynol PC defoamer is a proprietary formulation designed specifically to provide foam control and pigment shock reduction in paper coating formulations. Provides long-lasting defoamer activity. Stable through continued recycling of the formulation. No added APEs.

### Surfynol PSA336

A formulated wetting agent. Surfynol PSA336 surfactant is based on a proprietary combination of surface active chemistries. Provides very low dynamic surface tension and substrate wetting while minimizing foam creation in water-based pressure sensitive and laminating adhesives. No added solvents or APEs.

### Surfynol SE

A self-emulsifiable wetting agent and defoamer. Surfynol SE surfactant is a self-emulsifiable product based on acetylenic diol chemistry. Provides similar performance to Surfynol 104, but with improved handling and incorporation in a wide variety of aqueous systems. No added APEs.

### Surfynol SE-F

A self-emulsifiable wetting agent and defoamer. Surfynol SE-F surfactant is a self-emulsifiable product based on acetylenic diol chemistry. Provides similar performance to Surfynol SE, but with greater FDA approvals in a wide variety of aqueous systems. FDA compliance, no added APEs.

### Surfynol 104

A nonionic wetting agent and molecular defoamer (100% active waxy solid). Surfynol 104 surfactant is an acetylenic diol based surface active agent that provides dynamic wetting and defoaming in waterborne coatings, inks, and adhesives systems. Surfynol 104 is available in a number of solvent cuts as well as powdered forms. FDA and EPA compliances, no added solvents or APEs.



## Dynol superwetters

### Dynol 360

A high-performance nonionic superwetting and coalescing surfactant (100% active liquid). Dynol 360 surfactant is based on patented technology that provides extremely low dynamic and equilibrium surface tension reduction with low foam and film formation/coalescing benefits. Helps enable low-VOC coatings customers to meet environmental regulations in a variety of demanding waterborne applications. With no added solvents or APEs, this organic chemistry makes it a performance alternative to silicone and fluorosurfactants.

### Dynol 604

A high-performance, ethoxylated nonionic superwetter (100% active liquid). Dynol 604 surfactant is based on patented ethoxylated, acetylenic diol surface active chemistry. Provides extremely low dynamic and equilibrium surface tension with low foam in a variety of demanding waterborne applications. With no added solvents or APEs, this organic chemistry makes it a performance alternative to silicone and fluorosurfactants.

### Dynol 607

A high-performance, ethoxylated nonionic superwetter (100% active liquid). Dynol 607 surfactant is based on patented ethoxylated, acetylenic diol surface active chemistry. Provides extremely low dynamic and equilibrium surface tension with low to moderate foam and improved solubility in a variety of demanding waterborne applications. With no added solvents or APEs, this organic chemistry makes it a performance alternative to silicone and fluorosurfactants.

### Dynol 800

A high-performance, nonionic superwetter (100% active liquid). Dynol 800 surfactant provides a superior balance of properties compared to traditional fluorosurfactants and silicone surfactants, with exceptional performance in wood, plastic, and automotive coatings as well as a wide variety of other water-based coating applications. Based on Gemini technology, Dynol 800 surfactant is easy to formulate and has the ability to reduce both equilibrium and dynamic surface tension to levels not achieved with other surfactants. This excellent balance of properties makes Dynol 800 surfactant an excellent alternative for difficult-to-wet substrates requiring good flow and leveling under diverse application conditions.



#### Dýnol superwetters continued

##### Dýnol 810

A high-performance, nonionic superwetter (100% active liquid). Dýnol 810 surfactant provides a superior balance of properties compared to traditional fluorosurfactants and silicone surfactants, with exceptional performance in inks and a wide variety of other water-based coating applications. Based on Gemini technology, Dýnol 810 surfactant is easy to formulate and has the ability to reduce both equilibrium and dynamic surface tension to levels not achieved with other surfactants. This excellent balance of properties makes Dýnol 810 surfactant an excellent alternative for difficult-to-wet substrates requiring good flow and leveling under diverse application conditions.

##### Dýnol 960

Dýnol 960 superwetting surfactant is an optimized siloxane-based surfactant providing excellent equilibrium and dynamic surface tension reduction in a wide range of aqueous formulations. Designed to provide superwetting on difficult-to-wet substrates, it offers superior substrate wetting with extremely low foam. The characteristics of Dýnol 960 surfactant enable exceptional performance in waterborne plastic coatings and printing inks. Dýnol 960 surfactant can also provide good flow and leveling under diverse application conditions. Contains no added solvents, APEs or HAPs.

##### Dýnol 980

Dýnol 980 superwetting surfactant is an optimized siloxane-based surfactant providing good equilibrium and dynamic surface tension reduction in a wide range of aqueous formulations. Designed to provide superwetting on difficult-to-wet substrates, it offers superior substrate wetting with low foam and excellent compatibility. The characteristics of Dýnol 980 surfactant enable exceptional performance in waterborne wood coatings and overprint varnishes. Dýnol 980 surfactant can also provide good flow and leveling under diverse application conditions. Contains no added solvents, APEs or HAPs.

## Airase defoamers and deaerators

##### Airase 4500

A proprietary organic oil defoamer designed to eliminate foam, pinholes and entrapped air in water-based inks, adhesives and coatings without generating surface defects. It contains no added mineral oils, HAPs, or APEs and has several FDA compliances.

##### Airase 5100

The Airase Structured Siloxane Defoamer Line (SSDL™ defoamers) consists of products that span the application space from strong defoaming to high compatibility. Airase 5100 defoamer is the strongest defoamer of the SSDL defoamer line. Designed for applications where strong defoaming is required and the formulations are not sensitive to cratering.

##### Airase 5200

The Airase Structured Siloxane Defoamer Line (SSDL defoamers) consists of products that span the application space from strong defoaming to high compatibility. Airase 5200 defoamer, a product in the SSDL defoamer line, is designed for applications where strong defoaming is required and the formulations are not particularly sensitive to cratering. Provides excellent long-term, persistent defoaming in formulations. Better film compatibility than Airase 5100 defoamer.

##### Airase 5300

The Airase Structured Siloxane Defoamer Line (SSDL defoamers) consists of products that span the application space from strong defoaming to high compatibility. Airase 5300 defoamer, a product in the SSDL defoamer line, is designed for applications where strong defoaming is required with good long-term persistency, especially in high shear applications.

##### Airase 5400

The Airase Structured Siloxane Defoamer Line (SSDL defoamers) consists of products that span the application space from strong defoaming to high compatibility. Airase 5400 defoamer, a product in the SSDL defoamer line, is designed for applications where strong defoaming is required with good long-term persistency, especially in high shear applications. Better film compatibility than Airase 5300 defoamer.

##### Airase 5500

The Airase Structured Siloxane Defoamer Line (SSDL defoamers) consists of products that span the application space from strong defoaming to high compatibility. Airase 5500 defoamer, a product in the SSDL defoamer line, can be incorporated in the grind or used as a let-down defoamer. Designed for applications where good defoaming is required with good long-term persistency and film compatibility.

##### Airase 5600

The Airase Structured Siloxane Defoamer Line (SSDL defoamers) consists of products that span the application space from strong defoaming to high compatibility. Airase 5600 defoamer, a product in the SSDL defoamer line, can be incorporated in the let-down of a coating or ink. Airase 5600 defoamer provides an excellent balance of effective defoaming and film compatibility.



#### Airase 5700

The Airase Structured Siloxane Defoamer Line (SSDL defoamers) consists of products that span the application space from strong defoaming to high compatibility. Airase 5700 defoamer, a product in the SSDL defoamer line, is formulated for incorporation in the let-down of a coating or ink and has the best compatibility in the SSDL defoamer line. Airase 5700 defoamer provides an excellent balance of effective defoaming and film compatibility.

#### Airase 8070

A proprietary formulated modified siloxane deaerator. Particularly suitable for waterborne airless and air-assisted spray applications, this product is designed to eliminate foam, pinholing and solvent popping without generating surface defects.

## ZetaSpense dispersants

#### ZetaSpense 170

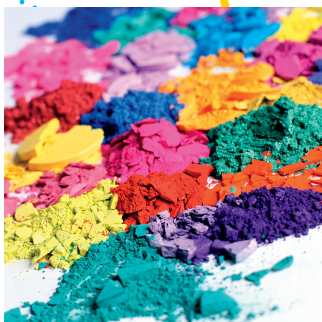
A nonionic stabilizing surfactant (100% active liquid). ZetaSpense 170 dispersant is a tailored combination of wetting and stabilizing chemistries that provides optimized stabilization of acidic carbon black pigments and polar inorganics like TiO<sub>2</sub> in waterborne coatings and inks. ZetaSpense 170 additive is best in conjunction with an anionic dispersant or grind resin.

#### ZetaSpense 179

A high HLB nonionic stabilizing surfactant and wetting agent. ZetaSpense 179 dispersant offers excellent nonionic stabilization properties for dispersion, emulsification and surfactancy benefits in a variety of waterborne applications including coatings inks and adhesives. In pigment dispersions specifically, ZetaSpense 179 dispersant can be used in the milling phase as a co-dispersant to improve the dispersion characteristics of an anionic polymeric dispersant as well as added during letdown to improve compatibility and color acceptance. ZetaSpense 179 dispersant contains no added APEs, offering a good alternative to highly ethoxylated alkyl phenol-based surfactants.

#### ZetaSpense 182

A high HLB nonionic stabilizing surfactant and wetting agent. ZetaSpense 182 dispersant offers excellent nonionic stabilization properties for dispersion, emulsification and surfactancy benefits in a variety of waterborne applications including coatings inks and adhesives. In pigment dispersions specifically, ZetaSpense 182 dispersant can be used in the milling phase as a co-dispersant to improve the dispersion characteristics of an anionic polymeric dispersant as well as added during letdown to improve compatibility and color acceptance. ZetaSpense 182 dispersant contains no added APEs, offering a good alternative to highly ethoxylated alkyl phenol-based surfactants.



#### ZetaSpense 1200

A high-performance dispersant (45% active solution in water and propylene glycol). ZetaSpense 1200 dispersant is a tailored combination of wetting and stabilizing chemistries. Provides optimized viscosity, gloss, and performance for polar inorganic pigment dispersions, such as titanium dioxide and iron oxides in waterborne coatings and inks.

#### ZetaSpense 2300

A high-performance dispersant (95% active liquid with water). ZetaSpense 2300 pigment dispersing additive is a tailored combination of wetting and stabilizing chemistries that provides robust stabilization of most pigment and particle chemistries in waterborne coatings and inks.

#### ZetaSpense 2500

A high-performance dispersant (40% active solution in water). ZetaSpense 2500 pigment dispersing additive is a tailored combination of wetting and stabilizing chemistries that provides excellent viscosity stability and stabilization of demanding organic pigment chemistries in waterborne coating and ink systems. ZetaSpense 2500 offers exceptional viscosity stability in the dispersion of metal salt pigments and contains no added APEs; as such, it is an alternative to Surfynol CT-171 additive.

#### ZetaSpense 3100

A high-performance dispersant (40% active solution in water). ZetaSpense 3100 dispersant is a tailored combination of stabilizing chemistries that provides outstanding stabilization of carbon black and inorganic pigment dispersions with robust letdown compatibility in waterborne coating and ink systems.

#### ZetaSpense 3400

A high-performance dispersant (29% active solution in water). ZetaSpense 3400 dispersant is a tailored combination of wetting and stabilizing chemistries that provides excellent color and viscosity stability in the dispersion of problematic and high-performance organic pigments such as quinacridone, perylene, azo, and metal complex chemistries in waterborne coating and ink systems.

#### ZetaSpense 3600

An anionic/nonionic pigment dispersant and wetting agent (52% active solution in water). ZetaSpense 3600 pigment dispersing additive is a proprietary formulation of surface active and polymeric chemistries that provides excellent milling, stabilization, and viscosity benefits in the dispersion of a wide range of organic and carbon black pigment chemistries in aqueous systems. Contains no added solvent or APEs and can be used as an alternative to Surfynol CT-131 and CT-136 additives.

#### ZetaSpense 3700

A high-performance dispersant (40% active solution in water). ZetaSpense 3700 dispersant is a tailored combination of wetting and stabilizing chemistries that provides excellent color and viscosity stability in the dispersion of problematic and high-performance organic pigments such as DPP, phthalocyanine, azo and dioxazine chemistries in waterborne coating and ink systems.

## Carbowet surfactants

### Carbowet 76

An ethoxylated nonionic surfactant (HLB: 7.6). Carbowet 76 surfactant is an additive for pigment and substrate wetting for waterborne coatings, inks, and adhesives systems. Excellent water in oil emulsifier. FDA and EPA compliances, no added solvents or APEs.

### Carbowet 103

An ethoxylated nonionic surfactant (HLB: 8.9). Carbowet 103 surfactant is a proprietary formulation that provides the surface tension reduction necessary to wet both pigment and substrate, and can enhance/stabilize color acceptance in waterborne coatings, inks, and adhesives systems. FDA and EPA compliances, no added solvents or APEs.

### Carbowet 106

An ethoxylated nonionic surfactant. Carbowet 106 surfactant is a proprietary formulation designed to provide performance comparable to NP-6 type and similar alkyl phenol-based surfactants in waterborne coatings, inks, and adhesives systems. Allows for the surface tension reduction necessary to wet both pigment and substrate, and can enhance/stabilize color acceptance. FDA and EPA compliances, no added solvents or APEs.

### Carbowet 109

An ethoxylated nonionic surfactant. Carbowet 109 surfactant is a proprietary formulation designed to provide performance comparable to NP-9 type and similar alkyl phenol-based surfactants in waterborne coatings, inks, and adhesives systems. Allows for the surface tension reduction necessary to wet both pigment and substrate, and can enhance/stabilize color acceptance. FDA and EPA compliances, no added solvents or APEs.

### Carbowet 125

An ethoxylated nonionic surfactant. Carbowet 125 surfactant is a low viscosity liquid that is rapidly soluble in water and provides good surface tension reduction for substrate and pigment wetting in a wide range of applications. FDA and EPA compliances, no added solvents or APEs.

### Carbowet 138

An ethoxylated nonionic surfactant (HLB: 13.8). Carbowet 138 surfactant is mid-HLB traditional surfactant with balanced properties for use in typical waterborne formulations. This low viscosity, easy-to-handle liquid provides an excellent alternative to APE chemistries of similar HLB and has a number of FDA and EPA compliances.

### Carbowet 144

An ethoxylated nonionic surfactant (waxy solid at room temperature; HLB: 14.4). Carbowet 144 surfactant is an additive for pigment and substrate wetting in waterborne coatings, inks, and adhesives systems. Provides surface tension reduction and wetting, improves freeze-thaw stability of acrylic systems. Excellent oil in water emulsifier. FDA and EPA compliances, no added solvents or APEs.



### Carbowet LSF

A nonionic wetting agent and dispersant that provides good wetting as well as good foam control to coagulant baths for both natural and synthetic rubber dipping process and in the preparation of latex tank compounds. It is an easy-to-dissolve liquid with a high cloud point that provides excellent wetting, rapid destabilization of foam, and reduced defects. No added APEs.

### Carbowet 422

Carbowet 422 surfactant is a nonionic flow additive designed to enhance flow and leveling of brush applied waterborne paints and coatings that are based on alkyd, acrylic, PUD and other resin technologies. Carbowet 422 surfactant contains no added APEs or HAPs.

### Carbowet GA-100

Carbowet GA-100 surfactant is a proprietary combination of nonionic wetting and stabilizing surface active chemistries. It offers low foam wetting of substrates and pigments as well as providing compatibilization and stabilization benefits in coating and ink formulations and dispersions. Carbowet GA-100 surfactant offers balanced performance for architectural paint formulations and excellent compatibility with associative thickeners.

### Carbowet GA-210

Carbowet GA-210 surfactant is a proprietary combination of nonionic wetting and stabilizing surface active chemistries. It offers efficient wetting and stabilization benefits for a wide range of waterborne applications and can improve milling efficiencies in pigment grinds and dispersions. Compared to its sibling products in the GA series, Carbowet GA-210 surfactant offers the most universal and balanced properties and is suitable for all applications.

### Carbowet GA-211

Carbowet GA-211 surfactant is a proprietary combination of nonionic wetting and stabilizing surface active chemistries. It offers low foam wetting of substrates and pigments as well as providing compatibilization and stabilization benefits in coating and ink formulations and dispersions. Compared to its sibling products in the GA series, Carbowet GA-211 surfactant offers the lowest foam and strongest dynamic wetting properties.

### Carbowet GA-221

Carbowet GA-221 surfactant is a proprietary combination of nonionic wetting and stabilizing surface active chemistries. It offers low foam wetting of substrates and pigments as well as providing compatibilization and stabilization benefits in coating and ink formulations and dispersions. Compared to its sibling products in the GA series, Carbowet GA-221 surfactant offers the most stabilization benefits and a first choice for organic and carbon black pigment dispersions.





Continually striving to be the global supplier of choice of specialty additives in a broad range of applications and markets which value high performance solutions.

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