

DOW COATING MATERIALS

# TAMOL™ dispersants

**DOW**

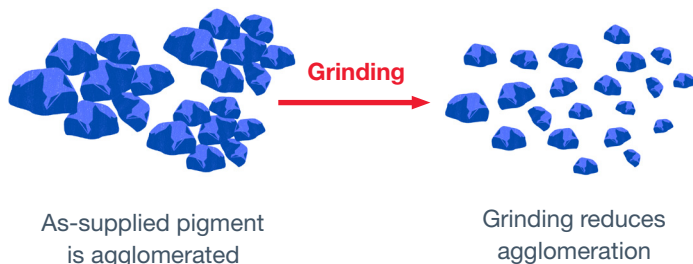
®

Product solutions guide

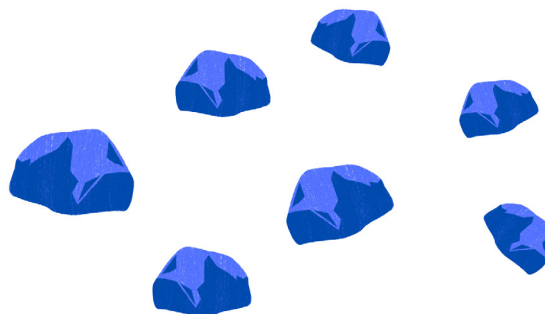
## Getting more from your paint

The goal of the dispersion phase in the paint making process is to mechanically separate pigment particles by high shear and stabilize these pigment particles for optimum performance. Properly dispersing and stabilizing pigment particles will help improve the light scattering for higher hiding and a tighter, more durable coating. If not properly stabilized, the pigment particles in dispersion will re-agglomerate over time and thus provide lower gloss, poor hiding and reduced durability.

**The mechanical breakup and separation (deagglomeration) of pigment clusters to isolated primary particles.**

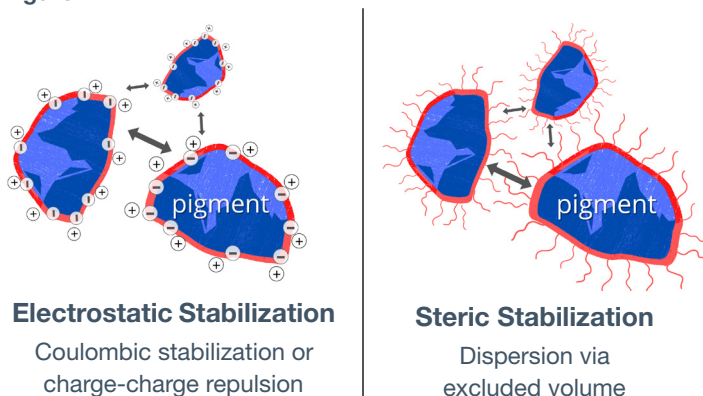


**TAMOL™ dispersants keep particles separated over time.**



Dispersant molecules play an active role in this phase. The role of a dispersant molecule is to prevent re-agglomeration of dispersed pigment particles over time; this is key to developing a high-performance, durable coating for any surface you want to protect.

Figure 1.



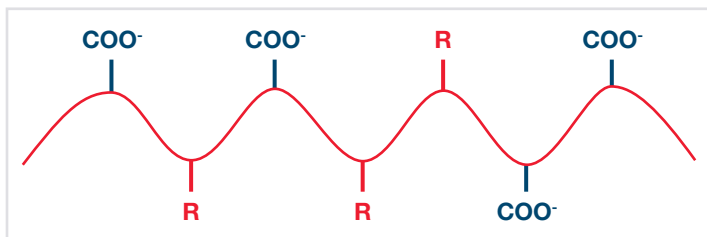
### Stabilization Mechanism

Dispersants provide stabilization of pigment particles by two different mechanisms: electrostatic or steric stabilization, as shown in Figure 1. Electrostatic stabilization depends on the ionic charges on the pigment particle surfaces, creating repulsive force between the particles. Steric stabilization relies on the steric hindrance from polymer chains on pigment particle surfaces, which make it thermodynamically unfavorable for such pigment particles to get closer due to the reduction in entropy. A combination of both electrostatic and steric stabilization mechanism is called electrosteric stabilization, which often provides more universal application and better overall performance.

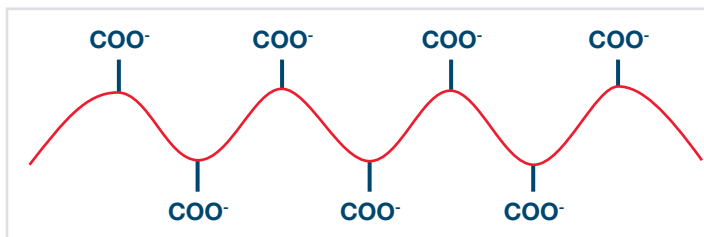
## Dispersant Chemistry

Dow offers several different types of dispersants for waterborne coatings application: polyacid, hydrophilic copolymer, hydrophobic copolymer, and polymeric dispersants. The category of dispersant chosen depends on pigment type, dispersing efficiency, rheology modifier compatibility, ZnO compatibility, and dry film performance requirements for a particular formulation.

### Acrylic or Polycarboxylate Copolymer



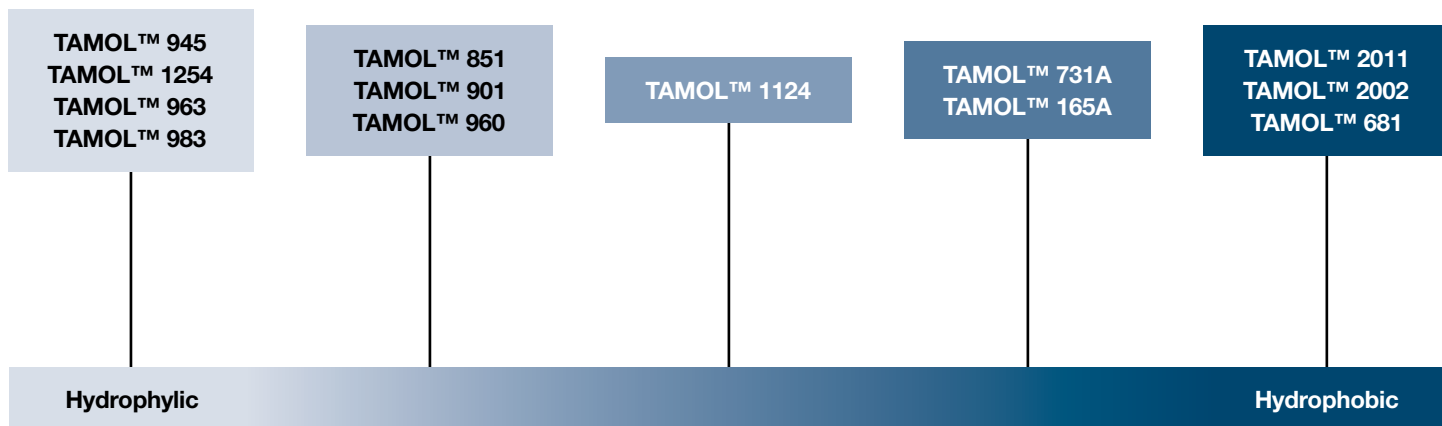
### Polyacid Dispersant



- Hydrophilic copolymer
- Hydrophobic copolymer



The TAMOL™ family of dispersants includes both the polyacid and acrylic or polycarboxylate copolymer types.



## Polyacid dispersants

Polyacid dispersants are made by polymerizing acrylic, methacrylic, crotonic, or maleic acids together. They are typically supplied in the neutralized form using either ammonium or alkali metal salts. Polyacid dispersants are efficient and cost effective for inorganic pigments dispersion, but not always the best choice for facilitating overall paint performance. Polyacid dispersants are best paired with ASE, HASE, and cellulose ether rheology modifiers.

## Acrylic or Polycarboxylate copolymer dispersants

Acrylic or polycarboxylate copolymers contain hydrophilic or hydrophobic comonomers. These copolymer dispersants are typically supplied in the neutralized form using either ammonium or alkali metal salts. Hydrophilic copolymers are recommended with the use of HASE/HEUR rheology modifier packages. Hydrophilic copolymers are the most versatile dispersants and balance efficiency and broad compatibility. Hydrophobic copolymer dispersants are commonly recommended with HEUR rheology modifier packages. Hydrophobic copolymer dispersants sacrifice dispersant efficiency, but can impart other film properties such as improved gloss development, stain resistance, and/or water resistance (hydrophobicity).

### TAMOL™ dispersant benefits

	PolyAcid	Hydrophilic copolymer	Hydrophobic copolymer
Ultra-low VOC capable	Yes	Yes	Yes <sup>1</sup>
Easy to pour	Yes	Yes	Yes <sup>1</sup>
Dispersant efficiency	•••	••	••
Gloss potential	•	••	•••
Water resistance	•	••	•••
Stain resistance	•	••	•••
ZnO stability	• <sup>2</sup>	•	•••
Cellulosic thickener	•••	•••	•••
ASE/HASE thickener	•••	••	•
HEUR thickener	•	••	•••

<sup>1</sup>TAMOL™ 681 Dispersant contains solvent and is higher in viscosity.

<sup>2</sup>TAMOL™ 851, 901, 960, 1254 have good ZnO stability.

• = fair; ••• = best

TAMOL™	Solids %	Salt	pH	Solvent	User Level on Inorganic Pigment*	Features
Polyacid Dispersant						
945	45	Na	6-8	Water	0.3-1.0%	Excellent cost/performance balance; Low foam.
963	35	NH <sub>4</sub>	9-10	Water	0.3-1.0%	Low cost-in-use, non-foaming dispersant; Good water resistance.
983	35	K	6-8	Water	0.3-1.0%	Low cost-in-use, non-foaming dispersant; Excellent color acceptance and viscosity stability.
1254	35	Na	6-8	Water	0.3-1.0%	Excellent cost/performance balance; Low foam; Good color acceptance and stability with reactive pigments.
851	30	Na	9-11	Water	0.6-1.0%	High efficiency with low foam generation; Excellent stability with ZnO and other reactive pigments;
901	30	NH <sub>4</sub>	9-10	Water	0.6-1.0%	High efficiency with low foam generation; Excellent stability in paints containing ZnO and other reactive pigments; Ammonia version of TAMOL™ 851 Dispersant.
960	40	Na	8-10	Water	0.6-1.0%	High efficiency with low-foam generation; Excellent compatibility with ZnO and other reactive pigments.
Hydrophilic Copolymer Dispersants						
1124	50	NH <sub>4</sub>	6-8	Water	0.5-1.5%	Broad formulating latitude; Excellent cost/performance balance; Low foam.
Hydrophobic Copolymer Dispersants						
731A	25	Na	10-11	Water	0.75-2%	Workhorse hydrophobic dispersant; Good pigment wetting; Excellent overall compatibility
165A	21.5	NH <sub>4</sub>	8-9	Water	0.75-2%	Excellent early blister resistance and wet adhesion; Low thickener demand, enhancing stain removal performance; Good color acceptance; Good gloss development
2002	42	N/A	3-5	Water	1.0-5.0%	Allow for neutralizer choice; Maximizes gloss potential; Good corrosion resistance.
2011	27.5	K	8-10	Water	1.0-5.0%	Maximizes gloss potential; Enhance viscosity retention on tinting; Enhanced application performance.
681	35	NH <sub>4</sub>	9-10	Water / Propanediol	1.0-5.0%	Maximizes gloss potential; Good stability with ZnO and other reactive pigments; Good corrosion resistance.

These properties are typical but do not constitute specifications.

\*Based on dispersant solids to pigment solids; with TiO<sub>2</sub> slurries, subtract 0.2% to 0.5%.

## For more information, contact Dow Coating Materials

US Toll Free 800-447-4369

[dow.com/coatingmaterials](http://dow.com/coatingmaterials)

NOTICE: No freedom from infringement of any patent owned by Dow or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where Dow is represented. The claims made may not have been approved for use in all countries. Dow assumes no obligation or liability for the information in this document. References to "Dow" or the "Company" mean the Dow legal entity selling the products to Customer unless otherwise expressly noted. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

®™ Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow

© 2025 The Dow Chemical Company. All rights reserved.

2000025021-280800

Form No. 884-02316-01-0725 S2D