

CAB-O-SPERSE[®]
DISPERSIONS





Introduction

Cabot Corporation is a global performance materials company and we strive to be our customers' commercial partner of choice. We have been a leading manufacturer of specialty chemicals for more than 130 years.

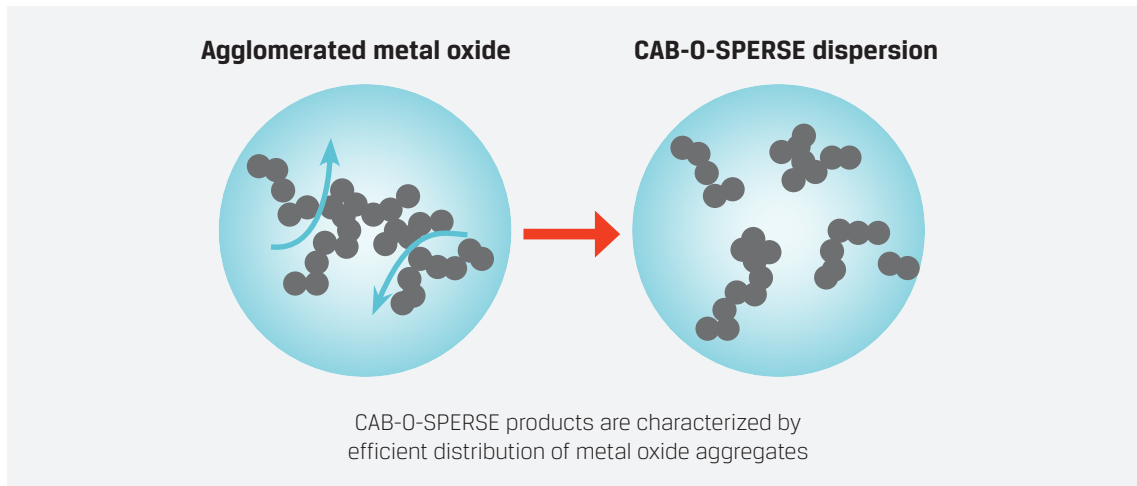
Our global reach enables us to work closely with customers to meet the highest standards for performance, quality and service. Our global production network and applications development facilities provide our customers with global service capabilities as well as the latest technical innovations.

We provide CAB-O-SPERSE fumed metal oxide dispersions to customers who require consistent application performance coupled with improved formulation characteristics. CAB-O-SPERSE dispersions blend our particle expertise with a liquid delivery system to enable improved performance in waterbased systems.



What are CAB-O-SPERSE dispersions?

CAB-O-SPERSE dispersions are highly stable dispersions of fumed alumina or fumed silica. They are dispersant-free and electrostatically stabilized. CAB-O-SPERSE dispersions deliver mechanical and optical properties of the dispersed particles in an easy-to-use waterbased system that reduces formulation processing time. CAB-O-SPERSE dispersions can be used in a wide variety of formulations and is particularly suited to latex polymer systems. The preserved state of dispersion in formulation enables very efficient use of the added metal oxide particles for the final application.



Why CAB-O-SPERSE dispersions?

CAB-O-SPERSE dispersions delivers three primary benefits to waterborne formulations:

- 1. Multifunctional application performance**
- 2. Ease of processing**
- 3. Ultra-high purity**



Multifunctional application performance

Typical applications

- ◆ Coatings
- ◆ Metal pretreatment
- ◆ Adhesives (PSA)
- ◆ Polishing abrasives
- ◆ Paper
- ◆ Elastomers
- ◆ Plastics
- ◆ Lighting
- ◆ Composites
- ◆ Energy

Properties improved

- ◆ Abrasion resistance
- ◆ Corrosion resistance
- ◆ Transparency
- ◆ Rheology control
- ◆ Adhesion
- ◆ Tensile strength
- ◆ Tear strength
- ◆ Shear strength
- ◆ Modulus
- ◆ Thermal stability
- ◆ Hardness
- ◆ Tack-free time
- ◆ Free-flow
- ◆ Anti-block



Sample application case studies

Improved corrosion resistance in waterborne industrial coatings

CAB-O-SPERSE® dispersions provide excellent corrosion resistance through mechanical reinforcement in the polymer film, which creates strong barrier properties. The dispersions effectively inhibited corrosion in a salt spray test of an acrylic-coated B1000 steel panel. See Figure 1.

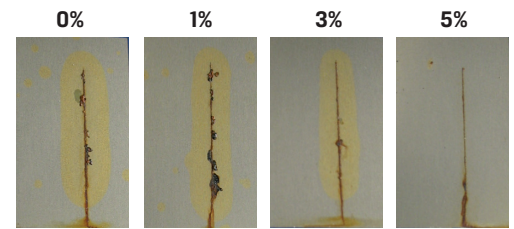
Increased shear strength in waterborne adhesives

CAB-O-SPERSE dispersions improve the shear strength properties of water-borne adhesives without negatively impacting other properties of the formulation. The dispersions minimize performance trade-offs for formulators. See Figure 2.

Improved metal coating interfacial properties

In addition to enhancing the coating's properties, CAB-O-SPERSE dispersions can be used to improve the interaction between the coating and its metal substrate. The dispersions improve the distribution of the metal oxide particles throughout the pretreatment layer resulting in better adhesion and durability of the coated surface. See Figure 3.

Fig. 1: Improved corrosion resistance



Salt spray tests (120 hr) for WB acrylic coating on B1000 steel panels. Percentages represent silica content delivered by CAB-O-SPERSE dispersions.

Fig. 2: Relative shear strength: pressure sensitive adhesive

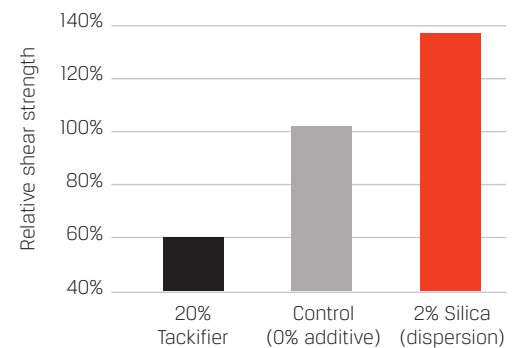
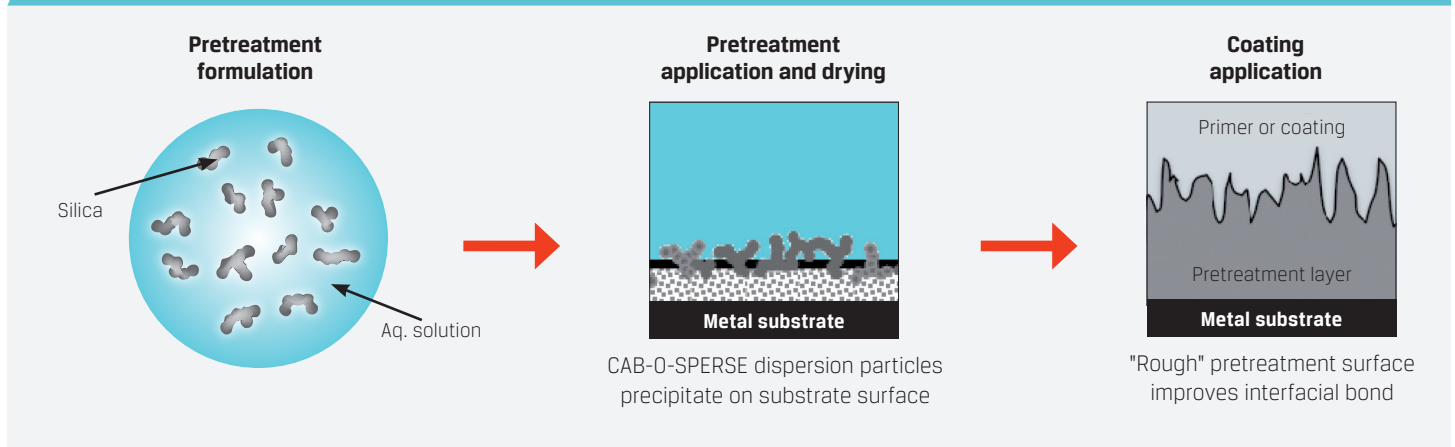


Fig. 3: Dispersions in a metal pretreatment system

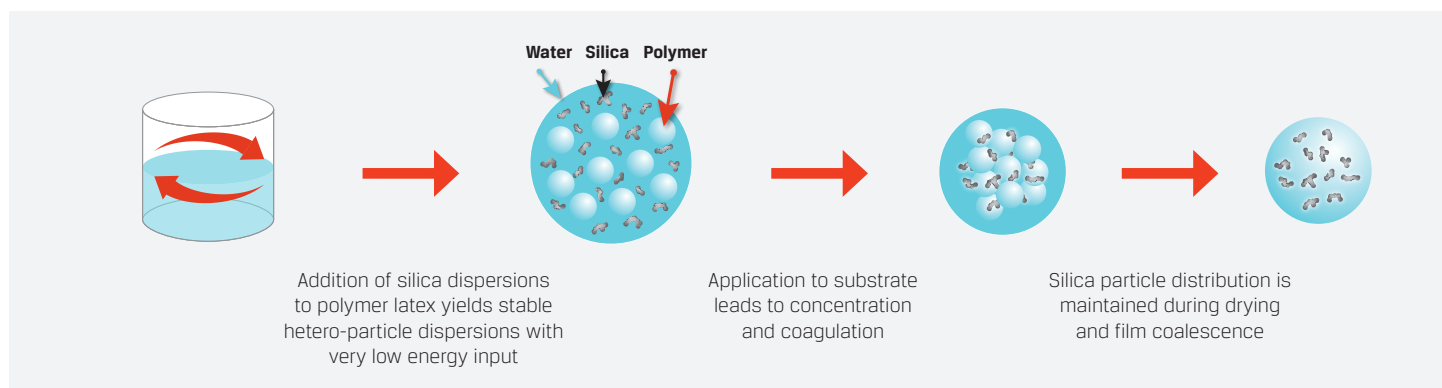


Ease of processing

CAB-O-SPERSE® dispersions provide process and handling benefits to formulators, such as:

- ◆ Increased throughput - shorter cycle time
- ◆ Less investment required in dispersion equipment
- ◆ Formulation flexibility - no additional dispersant required
- ◆ Easier flow control
- ◆ No dust during processing

In general, the better a particle is dispersed, the better performance it delivers in the end application. Because these products enable a level of dispersion that can be at times unobtainable with dry powder additives, their handling characteristics improve application performance.



Ultra high purity

CAB-O-SPERSE dispersions are manufactured using some of the highest purity materials available, including CAB-O-SIL® fumed silica and SpectraAl® fumed alumina, which are virtually contaminant-free. In addition to particle purity, we use only deionized, reverse osmosis filtered water to make CAB-O-SPERSE dispersions.

The purity of CAB-O-SPERSE dispersions delivers formulation benefits including:

- ◆ Reduced risk of changes in performance caused by trace contaminants
- ◆ Compatibility with other formulation components
- ◆ Consistent and stable end properties

CAB-O-SPERSE® dispersions

BENEFITS

- ♦ Multifunctional application performance
- ♦ Ease of processing
- ♦ Ultra-high purity

CHARACTERISTICS

- ♦ Aqueous alumina or silica dispersions
- ♦ Uniform particle size distributions with mean < 0.2 microns
- ♦ Solids loadings from 12 – 40% by weight
- ♦ Viscosities below 200cP
- ♦ pH range from 3.5-10.5
- ♦ Particle surface area from 50-380 m²/g
- ♦ Cationic or anionic surface charges

PRODUCT OVERVIEW AND SELECTION GUIDE

Please refer to the selection guide below to determine which CAB-O-SPERSE product is right for your application. Please see detailed application guides or contact a Cabot representative for further information.

NEW PRODUCT RESEARCH AND DEVELOPMENT

With a dedicated team and track record of innovation, we welcome cooperative development opportunities.

Properties				Performance benefits					Suggested applications								
Products	Particle	pH	Surface charge	Drying rate	Anti-block/abrasiveness	Adsorption/adhesion	Reinforcing	Rheology	Metal pretreatment	Coatings	Adhesives	Plastics	Elastomers	Polishing abrasives	Paper	Lighting	Energy
1015A	S	6	(-)		●		◐		✓					✓		✓	
1020K	S	10	(-)		●		◐	◐		✓		✓	✓	✓			
1030K	S	10	(-)		●		◐	●	✓			✓	✓	✓			✓
2012A	S	6	(-)			◐	◐		✓							✓	
2017A	S	10	(-)			◐	●	●	✓	✓	✓	✓	✓				✓
2020K	S	10	(-)			◐	●	●		✓	✓	✓	✓	✓			✓
4012K	S	10	(-)			◐	◐	◐		✓	✓						✓
PG 001	S	10	(-)	◐			●	●							✓		
PG 002	S	10	(-)	◐		◐	●	●							✓		
PG 003	A	4	(+)	●		●	◐		✓						✓	✓	
PG 008	A	4	(+)	●		●	◐		✓						✓	✓	
PG 022	S	4	(+)	◐		●	◐	●	✓		✓	✓		✓			

S = Silica
A = Alumina

○ Good performance
● Best performance

NORTH AMERICA

Cabot Corporation Business
and Technology Center
157 Concord Road
P.O. Box 7001
Billerica, MA 01821 - USA
Technical service
T +1 800 462 2313
Customer service
T +1 678 297 1300
F +1 678 297 1245

SOUTH AMERICA

Cabot Brasil Industria
e Comercio Ltda.
Rua do Paraiso 148 - 5 andar
04103-000 Sao Paulo,
Brazil
T +55 11 2144 6400
F +55 11 3253 0051

EUROPE

Cabot Specialty Chemicals
Coordination Center
SIA Cabot Latvia
101 Mukusalas Street
Riga, LV-1004, Latvia
T +371 6705 0700
F +371 6705 0985

MIDDLE EAST & AFRICA

Cabot Dubai
P.O. Box 17894
Jebel Ali Free Zone
LOB 15, Office 424
Dubai
United Arab Emirates
T +371 6705 0700
F +371 6705 0985

ASIA PACIFIC

Cabot China Ltd.
558 Shuangbai Road
Shanghai 201108
China
T +86 21 5175 8800
F +86 21 6434 5532

JAPAN

Cabot Specialty Chemicals Inc.
Sumitomo Shiba-Daimon Bldg. 3F
2-5-5 Shiba Daimon,
Minato-ku
Tokyo 105-0012
Japan
T +81 3 6820 0255
F +81 3 5425 4500

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