



**CAB-O-SIL®
ULTRABOND™ 5760**

**Treated Fumed Silica
for Superior Structural
Adhesives**

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CAB-O-SIL® ULTRABOND™ 5760

TREATED FUMED SILICA FOR SUPERIOR STRUCTURAL ADHESIVES

CAB-O-SIL® ULTRABOND™ 5760 is a high performance, surface treated fumed silica additive that delivers benefits to both adhesive manufacturers and end-users. The silica is designed to provide superior rheology control for adhesives requiring very high sag resistance and stable bond lines for structural adhesives. Compared to other Polydimethylsiloxane (PDMS) treated silicas, this silica benefits adhesives systems by reducing the viscosity in the application without compromising sag resistance.

When adhesive producers use CAB-O-SIL ULTRABOND 5760 in their formulations, they achieve significant time and energy savings during the adhesive manufacturing process. Because this silica provides higher sag resistance, adhesives producers can reduce their silica loading by approximately 10 to 15 percent, resulting in a lower viscosity adhesive. The lower loading and lower viscosity allows adhesive producers to save time, energy, and money in their manufacturing processes. Alternatively, higher sag resistant adhesives can be formulated for demanding applications without compromising pumping and dispensing.

Applications

CAB-O-SIL ULTRABOND 5760 maximizes adhesive performance, particularly in epoxy formulations, and can be used in adhesives for use in a wide range of industries including automotive, aerospace, construction, electronics and flooring.

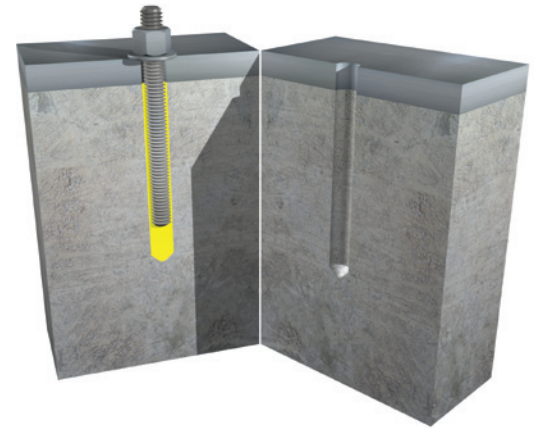
One of the strongest industry demands in the transportation industry is for structural adhesives used in vehicle construction to replace traditional welding or riveting to bond two parts together. The use of structural adhesives in transportation manufacturing has steadily increased over the years as it offers advantages over classic bonding techniques, including the ability to use lightweight design components with improved mechanical strength. These lightweight components will help the transportation industry achieve more aggressive weight-reduction goals and improve fuel efficiency.

For a variety of manufacturing and construction end users, the dynamic viscosity profile of adhesives using CAB-O-SIL ULTRABOND 5760 fumed silica enables a faster application of the material, regardless of the choice of dispensing device. The silica delivers higher sag resistance, creating stable bond lines of the adhesives as the viscosity of the adhesives using CAB-O-SIL ULTRABOND 5760 snaps back to a higher level once the shear forces of application have been removed. CAB-O-SIL ULTRABOND 5760 fumed silica enables a more than 50 percent faster viscosity recovery rate when compared to competitive silica grades.

Sag Resistance and Stability

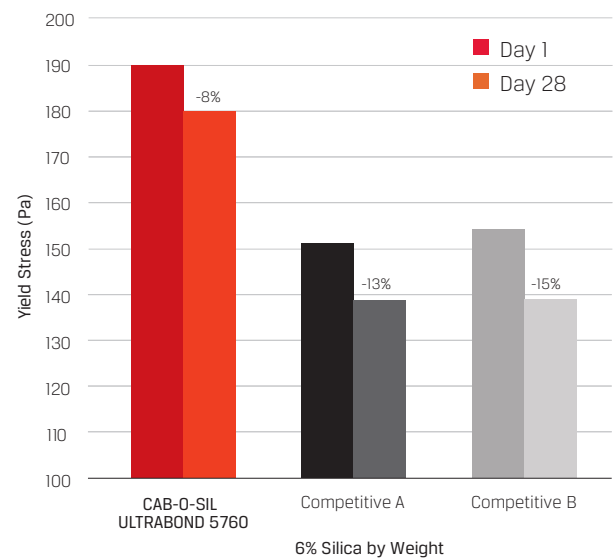
In epoxy resin, CAB-O-SIL ULTRABOND 5760 provides superior sag resistance and stability compared to competitive PDMS treated silicas. The chart below shows the sag resistance, as assessed by a Yield Stress measurement in epoxy resin, and the loss of sag resistance (Yield Stress) after 28 days of accelerated aging at 60°C.

- CAB-O-SIL ULTRABOND 5760 provides the highest Yield Stress both initially and after aging than competitive PDMS-treated silicas.
- CAB-O-SIL ULTRABOND 5760 is more stable, has the smallest change in Yield Stress over time, than competitive products.



Adhesive anchor in construction

Figure 1: Fumed Silicas in Epoxy Resin



Shear Thinning and Recovery Rate

The thixotropic (shear thinning) behavior imparted by PDMS-treated silica in epoxy system is important to the adhesive formulator and user. At high shear rates equal to mixing or bead application, viscosity decreases facilitating processing, pumping and dispensing of adhesive.

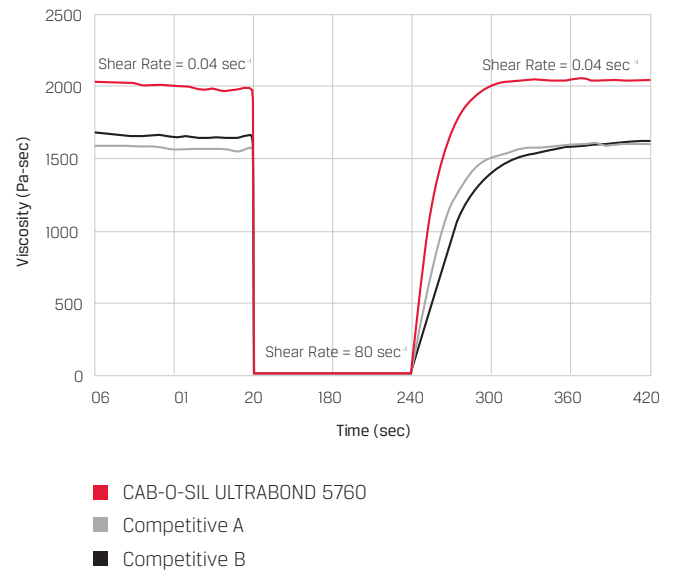
Afterward, viscosity recovers quickly to the same level prior to high shear preventing adhesive bead from slumping or sagging and fillers from settling.

CAB-O-SIL ULTRABOND 5760 imparts higher viscosity than competitive PDMS-treated silicas yet is equally shear thinning and has faster rate of viscosity recovery.

Efficiency

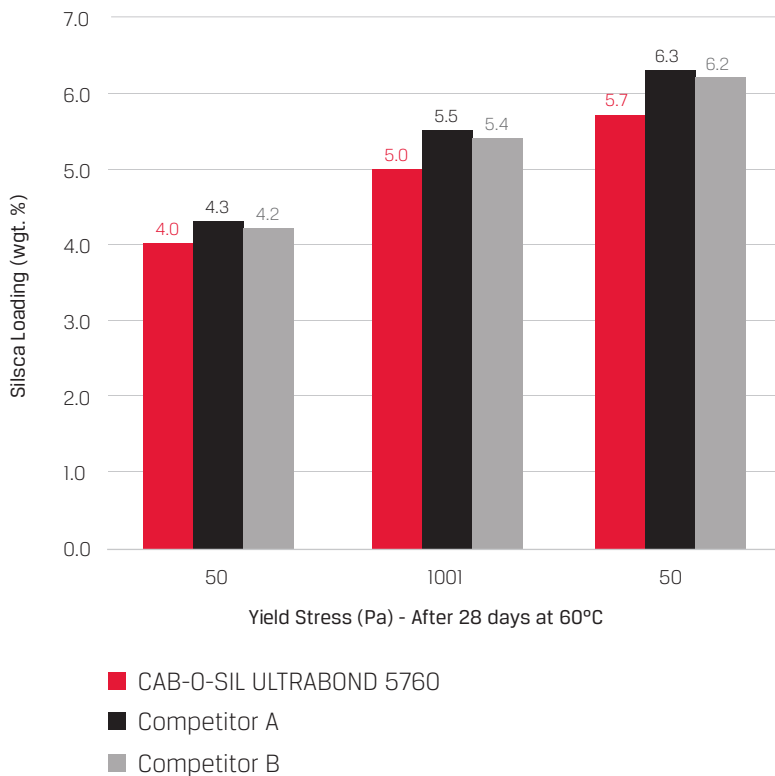
Formulators frequently "over-design" the structural adhesives to get improved rheology by adding additional silica in anticipation of the loss of sag resistance and viscosity that can occur during shipping and storage. The superior rheological performance stability of CAB-O-SIL ULTRABOND 5760 allows the formulator to forgo the additional silica resulting in overall lower silica loadings and formulation cost without compromising the rheology performance or shelf-life of the adhesive.

Figure 2: Viscosity in Epoxy Resin - 4% silica by weight



A formulator must factor rheology stability or loss of sag resistance over time into a formulation so that the adhesive has adequate sag resistance at the end of its shelf life. For this reason, Figure 3 compares Yield Stress (correlated to sag resistance) results after aging at 60°C.

Figure 3: Performance in Epoxy Resin



Because CAB-O-SIL ULTRABOND 5760 has the highest Yield Stress initially and has the least loss of Yield Stress over time, less silica is needed to achieve the same performance as with competitive PDMS-treated silicas.

Why Choose CAB-O-SIL ULTRABOND 5760?

CAB-O-SIL ULTRABOND 5760 has the best performance in epoxy resins compared to other PDMS-treated fumed silicas and provides a variety of performance advantages in structural adhesives including:

- High sag resistance
- Rheology stability over time – low loss of sag resistance
- Anti-settling of pigments and fillers
- Shear-thinning rheological behavior

Cabot in the world

With manufacturing sites in 20 countries and five sites solely dedicated to fumed metal oxides, Cabot focuses on developing new products, technologies and solutions for its customers.



Technical centers:

- Billerica, MA - USA
- Rheinfelden - Germany
- Shanghai - China

NORTH AMERICA

Cabot Corporation Business and Technology Center
157 Concord Road
P.O. Box 7001
Billerica, MA 01821 - USA

Technical service
Tel: 1-800-462-2313

Customer service
Tel: +678-297-1300
Fax: +678-297-1245

EUROPE

Cabot Specialty Chemicals
Coordination Center
Interleuvenlaan 15 i
3001 Leuven
Belgium

Tel: +32 16 39 24 51

Tel: +32 16 39 24 13

Fax: +32 16 39 24 44

JAPAN

Cabot Specialty Chemicals Inc.
Sumitomo Shiba-Daimon Bldg. 3F
2-5-5 Shiba Daimon,
Minato-ku
Tokyo 105-0012
Japan

Tel: +81 3 6820 0255

Fax: +81 3 5425 4500

SOUTH AMERICA

Cabot Brasil Industria
e Comercio Ltda.
Rua do Paraíso 148 - 5 andar
04103-000 Sao Paolo,
SP Brazil

Tel: +55 11 2144 6400

Fax: +55 11 3253 0051

MIDDLE EAST & AFRICA

Cabot Dubai
P.O. Box 17894
Jebel Ali Free Zone
LOB 15, Office 424
Dubai

United Arab Emirates

Tel: +971-4-8871800

Fax: +971-4-8871801

ASIA PACIFIC

Cabot China Ltd.
558 Shuangbai Road
Shanghai 201108
China

Tel: +86 21 5175 8800

Fax: +86 21 6434 5532

As our society continues to drive toward greater energy-efficiency, we are developing products that enable end users to better address these issues and provide the necessary materials to deliver maximum performance. We are creating what matters.

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