

## APPLICATION GUIDE

### BENTONE®SD-2 in a Solvent-free Epoxy Adhesive

In a solvent free epoxy adhesive based on a guide formulation, BENTONE SD-2 was compared to fumed silica and to a blank. Both Brookfield viscosities (Helipath, 10 rpm) and sag resistance were determined.

**Image:** Sagging

BENTONE®

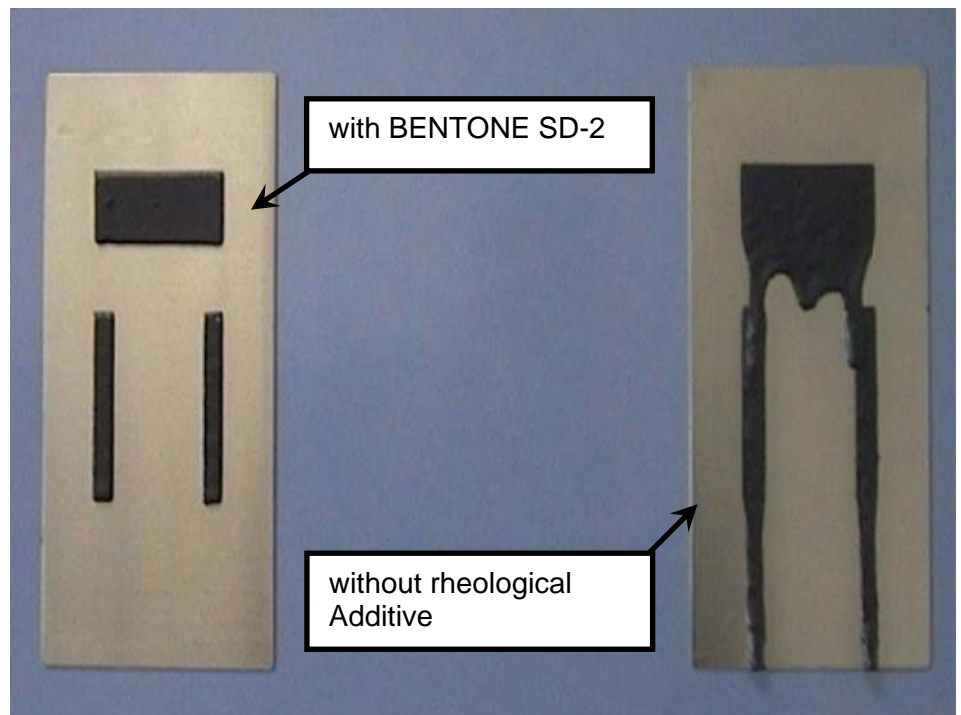
BENAQUA®

RHEOLATE®

NUOSPERSE®

DAPRO®

THIXATROL®



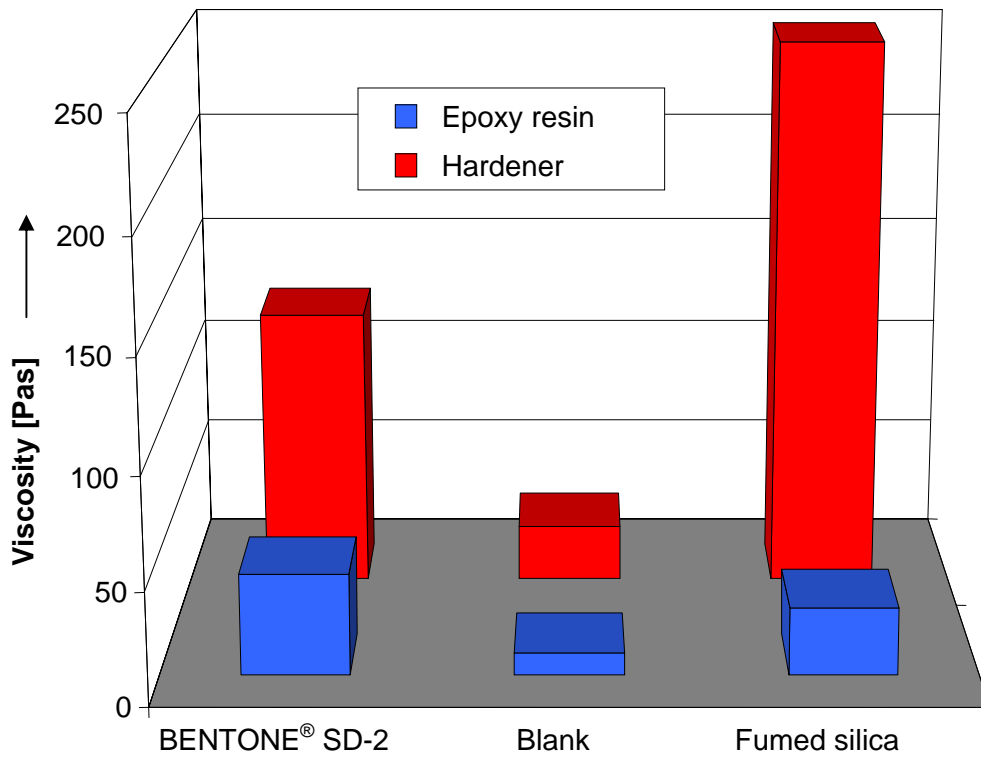
Elementis Specialties  
Stolberger Strasse 370  
50933 Cologne  
Germany

+49.221.485 2900 Tel  
+49.221.485 2910 Fax

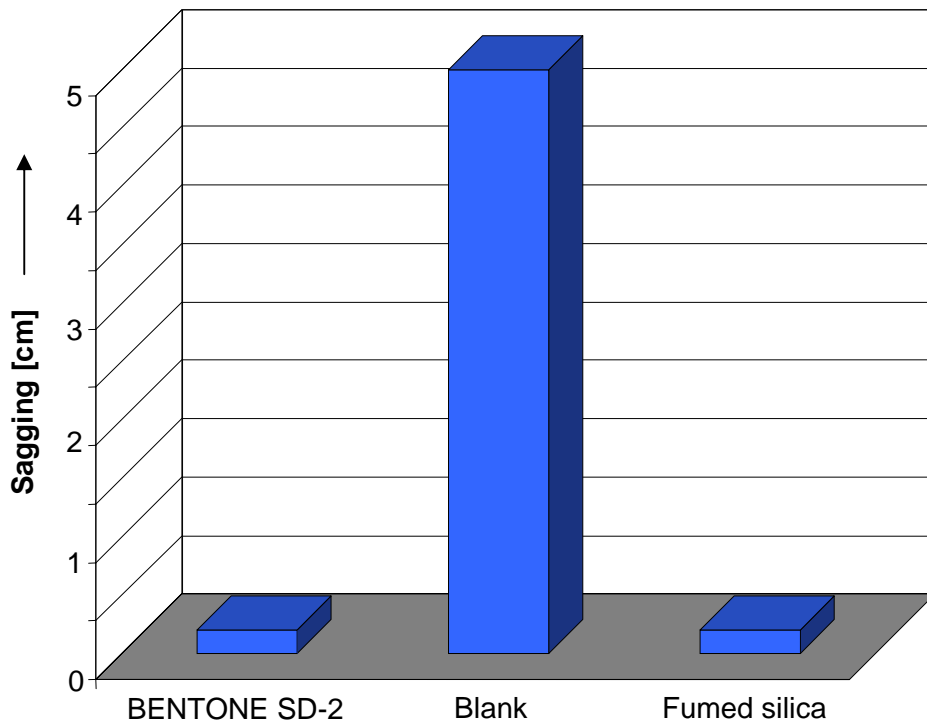
[www.elementis-specialties.com](http://www.elementis-specialties.com)

The use of BENTONE SD-2 leads to optimum sag control combined with improved levelling and easier mixing in comparison with fumed silica or the blank.

**Diagram 1:** Brookfield Helipath viscosity



**Diagram 2:** Sagging



**Conclusion**

BENTONE<sup>®</sup> SD-2 shows excellent sag resistance in the ready-to-use product. It produces a markedly lower viscosity in the hardener component. This decrease in viscosity is particularly perceptible when the two components are mixed at equal ratio for further processing. It improves processing in terms of application and levelling. Lap shear strength ASTM D-1002 was 1750 psi.

## Products

BENTONE® SD-2 is an easy dispersible organoclay for medium- and high-polarity systems. It provides high viscosity in the low shear rate range and is shear-thinning.

## Test system

### Part A

	Concentration [%]	Supplier	Description
Epikote 828	70.4	Shell	Bisphenol A-based epoxy
Kronos 2059	7.1	KRONOS	Titanium dioxide
BENTONE SD-2	2.8	Elementis	Rheological additive
Celite 110	19.7	Laporte	Silica flour, 240 mesh
	100.0		

### Part B

	Concentration [%]	Supplier	Description
Unirez 1007	59.0	Arizona	Polyamide
Microcalc AT-1	35.0	Omya	extender
BENTONE SD-2	4.0	Elementis	Rheological additive
Special black 100	2.0	Degussa	Colourant
	100.0		

## Preparation

The rheological additives, at equal loadings, were dispersed for ten minutes in the resin or the hardener compound using high shear forces, disc diameter 4 cm, about 8000 rpm. Subsequently, all the other ingredients were added and again dispersed for 10 minutes at the highest possible shear force.

## Test methods

### <sup>1</sup> Viscosity

The viscosity of each component was measured on a Brookfield RVT Helipath. Geometries D&F; 10 rpm.

### <sup>2</sup> Sagging

Equal quantities of mixed adhesives were applied on the upper edge of a glass plate with a metal spatula. The plate was then placed vertically.

The mixed adhesive was applied to an aluminium panel by means of a template of 2 mm thickness. Excessive adhesive was tripped off by a metal spatula before the template was removed. The panel was then placed vertically and the adhesive allowed to harden. We then assessed sagging (see graphic on page 1).

---

For more details please contact:

<b>AMERICAS</b>	<b>Elementis Specialties</b> PO Box 700 329 Wyckoffs Mill Road Hightstown New Jersey 08520, USA Tel: +1.609.443 2500 Fax: +1.609.443 2422	<b>ASIA PACIFIC</b>	<b>Elementis Specialties</b> 120 Jalan Kapar 27/89 Megah Indah Industrial Park - Section 27 40400 Shah Alam, Selangor Darul Ehsan Malaysia Tel: +603.5192 2887 Fax: +603.5192 3887
<b>EUROPE</b>	<b>Elementis Specialties</b> De Kleetlaan 12a – PO Box 3 1831 Diegem Belgium Tel: +32.2.790 7600 Fax: +32.2.790 7660	<b>JAPAN</b>	<b>Elementis KK</b> 15-14 Minamisemba 1-Chome Chou-ku, Osaka 542-0081 Japan Tel: +81.6.6267 6211 Fax: +81.6.6267 6215

Website: [www.elementis-specialties.com](http://www.elementis-specialties.com)

*The information in this publication is, to the best of our knowledge, true and accurate, but since the conditions of use are beyond our control, no warranty is given or to be implied in respect of such information. In every case, caution must be exercised to avoid violation or infringement of statutory obligations and any rights belonging to a third party. We are, at all time, willing to study customers' specific outlets involving our products in order to enable their most effective use.*

©Copyright 2006, Elementis Specialties, Inc. All rights reserved. Copying and/or downloading of this document or information therein for republication is not allowed unless prior written agreement is obtained from Elementis Specialties, Inc.

®Trademark of Elementis Specialties, Inc.