

AEROSIL® fumed silica for dental composites



AEROSIL® fumed silica increase the hardness and abrasivity resistance of dental composites. In addition, they reduce the edge gap that can occur when the composite is cured.

A high filler content can be achieved with unmodified hydrophilic AEROSIL® fumed silica grades as well as by surface modified types. AEROSIL® fumed silica are white powders with high purity, which do not impair the optical properties of the resulting dental composites.

Characteristic physico-chemical data

Properties and test method	Unit	AEROSIL® OX 50	AEROSIL® R 709	AEROSIL® R 711	AEROSIL® R 7200
Specific surface area (BET)	m ² /g	35–65	25–45	125–175	125–175
pH value in 4% dispersion	–	3.8–4.8	4.5–7.5	4.0–6.0	4.0–6.0
Loss on drying	%	≤ 1.5	≤ 2.5	≤ 1.5	≤ 1.5
Carbon content	%	–	1.5–3.5	4.5–6.5	4.5–6.5
Tamped density	g/L	approx. 100	approx. 130	approx. 60	approx. 230
SiO₂ content based on ignited material	%	≥ 99.8	≥ 99.8	≥ 99.8	≥ 99.8

The given values are typical data, specifications on request.



Benefits of AEROSIL® fumed silica in dental composites

AEROSIL® OX 50 is a hydrophilic silica, consisting of particles with low surface area and thereby barely affects the rheology of the composite.

AEROSIL® fumed silica can be functionalized by a treatment of the hydrophilic surface. One class of these AEROSIL® fumed silica grades with modified surface chemistry bears methacrylate groups. These functional groups are ideal to crosslink in the polymerization reaction of the composite.

AEROSIL® R 709 has a marginal influence on the rheology due to its low surface area.

AEROSIL® R 711 has a thickening effect. The rheology of the monomer solution may be adjusted by adding this product.

AEROSIL® R 7200 can control the rheology of the formulation. It has an improved incorporation behavior and increased processability.



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Europe/Middle-East/ Africa/Latin America

Evonik Resource Efficiency GmbH
Business Line Silica
Rodenbacher Chaussee 4
63457 Hanau
Germany

PHONE +49 6181 59-12532
FAX +49 6181 59-712532
ask-si@evonik.com

North America

Evonik Corporation
Business Line Silica
299 Jefferson Road
Parsippany, NJ 07054-0677
USA

PHONE +1 800 233-8052
FAX +1 973 929-8502
ask-si-nafta@evonik.com

Asia Pacific

Evonik (SEA) Pte. Ltd.
Business Line Silica
3 International Business Park
#07-18, Nordic European Centre
Singapore 609927

PHONE +65 6 809-6877
FAX +65 6 809-6677
ask-si-asia@evonik.com

www.aerosil.com

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