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
SiO_2 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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RE-103-JUN16L+L