

ZEODENT® 

ZEODENT®

High performing dental silicas

Engineered to Deliver Exceptional
Performance and Formulating Flexibility



THE TRUSTED AND RELIABLE SOURCE FOR DENTAL SILICAS*



*This world map shows manufacturing facilities and technology centres for the product range described in this brochure only.



High performing products. Rigorous quality systems. Unparalleled customer technical support and care. A global technology and support team. Worldwide distribution network. More than mere statements and words, these are the attributes and promises delivered upon by the associates of the only name you need to know and trust when it comes to dental silica: Evonik.

Globally, Evonik is trusted to deliver quality products and proudly serves industry-leading oral care companies worldwide. Evonik manufactures and supports its ZEODENT® dental silicas across the globe.

With more than 40 years of dental silica experience and expertise, Evonik brings unique value to its customers.

HIGH PERFORMING PRODUCTS

The ZEODENT® family of dental silica products is designed to provide superior performance in toothpaste applications. Selecting from this broad range of products, toothpaste producers can optimize the important characteristics of each toothpaste formulation, including: cleaning and whitening performance, abrasion and sensitivity, optical clarity, viscosity and compatibility with other ingredients.

Included in this product portfolio are detailed descriptions for our most common ZEODENT® dental silicas and typical performance results in standard toothpaste formulations.

ECOCERT VALIDATED FOR “NATURAL” FORMULATIONS

ZEODENT® dental silicas have been validated as fit for use in organic cosmetic formulations, as defined by ECOCERT’s Natural and Organic Cosmetic standards. With this confirmation, toothpaste manufacturers can seek organic certification when formulating with natural, organic and homeopathic ingredients, thereby leveraging the healing properties of herbal, citric and plant extracts, which are becoming more and more popular.

ZEODENT® DENTAL CLEANING SILICAS

KEY PERFORMANCE CHARACTERISTICS OF DENTAL SILICAS

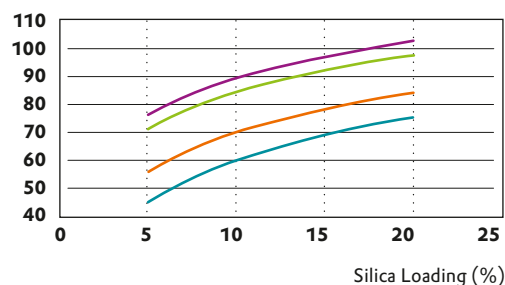
ATTRIBUTES	ZEODENT® 103	ZEODENT® 124	ZEODENT® 113	ZEODENT® 115
Level of Cleaning	High	Medium/High	Medium	Gentle
Level of Abrasiveness	High	Medium/High	Low	Gentle
Viscosity Build	Very Low	Low	Moderate	Moderate
Clarity Applications	Translucent	Translucent	Clear	Ultra Clear

ZEODENT® 103 is our highest cleaning silica. It offers excellent cleaning and whitening when used as a stand alone abrasive, or it can be used as a “booster” in combination with ZEODENT® 113 or ZEODENT® 115 cleaning silicas. At varying dosage levels, ZEODENT® 103 allows formulators to achieve a broad range of cleaning and whitening performance.

ZEODENT® 124 is our medium-to-high cleaning silica, offering improved optical performance over ZEODENT® 103. It also has reduced abrasion, making it more gentle on teeth enamel. Like ZEODENT® 103, it can be used as a stand alone abrasive or it can provide “boosted” cleaning performance in standard toothpaste formulations.

Figure 1: Product Cleaning

Pellicle Cleaning Ratio (PCR)



— ZEODENT® 103 — ZEODENT® 113
— ZEODENT® 124 — ZEODENT® 115

ZEODENT® 113 is a cost-efficient solution to achieve desired cleaning performance for standard toothpaste formulations. It offers formulators a wide range of flexibility with regards to active ingredient compatibility and overall final product stand up.

ZEODENT® 115 offers most of the benefits of ZEODENT® 113 with the addition of outstanding optical qualities, tailored for formulations where exceptional clarity is essential. Additionally, ZEODENT® 115 delivers lower abrasion for a more gentle cleaning, suitable when a softer touch is required.

ZEODENT® 103 AND 124 AS “BOOSTERS”

ZEODENT® 103 or ZEODENT® 124 can be formulated independently in toothpastes, or as a combination with other Evonik cleaning silicas, like ZEODENT® 113. Used in combination, various cost-effective cleaning levels can be achieved with reduced overall abrasion versus single system high cleaning silica formulations.

Figure 2: Product Abrasiveness

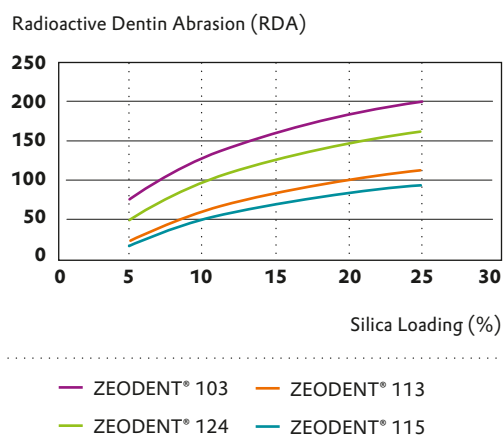
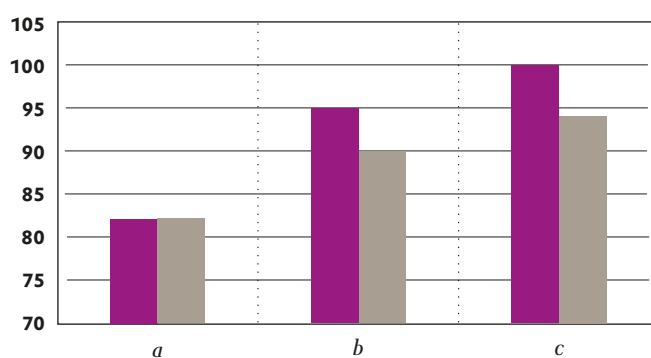


Figure 3: ZEODENT® 103 and 124 as “Boosters”

Pellicle Cleaning Ratio (PCR)



Legend: ZEODENT® 103 (purple), ZEODENT® 124 (grey)

a: 100% ZEODENT® 113 0% ZEODENT® 103/124
b: 75% ZEODENT® 113 25% ZEODENT® 103/124
c: 50% ZEODENT® 113 50% ZEODENT® 103/124

Total Cleaning Silica = 20%

FORMULATING TIPS

ZEODENT® 103 can be used as a stand alone abrasive at a typical loading of 8–15 % for superior cleaning and whitening. It can also be used as a booster typically at a loading of 3–5 % as a cost effective way to increase the level of cleaning and whitening.

ZEODENT® 124 can be used as a stand alone abrasive at a typical loading of 12–18 % for effective cleaning and whitening. When mixed with ZEODENT® 113 standard cleaning silica, a wide range of cleaning and whitening levels can be targeted.

ZEODENT® 113 offers effective cleaning and stand up in standard toothpaste formulations up to a loading of 20 %.

ZEODENT® 115 offers superior optical performance at loadings as high as 20 % when clarity of the toothpaste is extremely important. With its low levels of abrasion it is also the smartest choice when sensitivity and a gentle touch is an important consideration.



TYPICAL PRODUCT PROPERTIES

PROPERTY	ZEODENT® 103	ZEODENT® 124	ZEODENT® 113	ZEODENT® 115
Average Particle Size (APS µm)	8	10	9	9
Oil Absorption (cc/100g)	60	70	90	100
% 325 Mesh (44 µm)	2.0 % max	2.0 % max	1.0 % max	1.5 % max
Einlehner Abrasion (mg loss/100k rev)	18	8	4	3
Clarity (RI/%T)	1.435 – 1.441 (20 – 40 %)¹	1.438 – 1.441 (30 – 65 %)¹	1.438 – 1.448 (30 – 50 %)²	1.445 – 1.458 (50 – 90 %)²
Fluoride Compatibility	≥90 %	≥90 %	≥90 %	≥90 %
Total Al as Al ₂ O ₃	0.1 %	0.1 %	0.1 %	0.1 %

NOTE: Above properties cannot be considered as specifications

¹Formulated in Sorbitol (4 %), ²Formulated in Glycerin (10 %)

The forementioned Silica products manufactured by Evonik have Kosher and Pareve as well as Kosher for Passover approvals. Evoniks' precipitated dental silicas comply with various regulatory requirements and meet the purity criteria defined in the monographs for Dental Type Silica (USP/NF) and Silica, Dental Type (Ph. Eur.).

Please contact Evonik for specific information regarding regulatory approvals or for a copy of the MSDS.

ZEODENT® DENTAL THICKENING SILICAS

KEY PERFORMANCE CHARACTERISTICS OF EVONIK DENTAL THICKENERS

ATTRIBUTES	ZEODENT® 153	ZEODENT® 165
Viscosity Build	Medium	High
Clarity Applications	High Clarity Applications	High Clarity Applications
Fluoride Compatibility	Yes	Yes
Compatible with other Abrasives	Yes	Yes

ZEODENT® 153 dental thickener is a cost-efficient solution to build suitable levels of viscosity without compromising on performance. It offers formulators a wide range of flexibility with regards to active ingredient compatibility and overall final product stand up.

ZEODENT® 165 dental thickener is our premier thickener, offering outstanding performance when building high levels of viscosity is essential. This is useful when formulating toothpastes that offer extreme cleaning and whitening because most high cleaning silicas do not build sufficient viscosity on their own. ZEODENT® 165 also delivers exceptional optical clarity, making it the first choice when formulating toothpastes.

Figure 4: ZEODENT® 153 – Viscosity Build

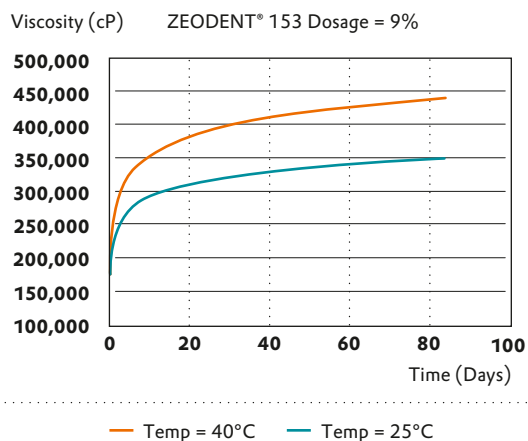


Figure 5: ZEODENT® 165 – Viscosity Build

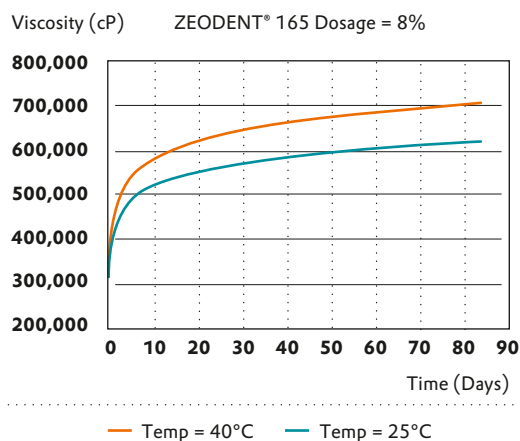


Figure 6: Product Transmittance

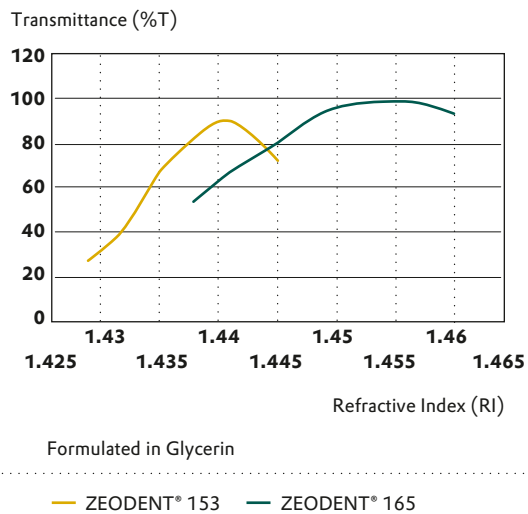
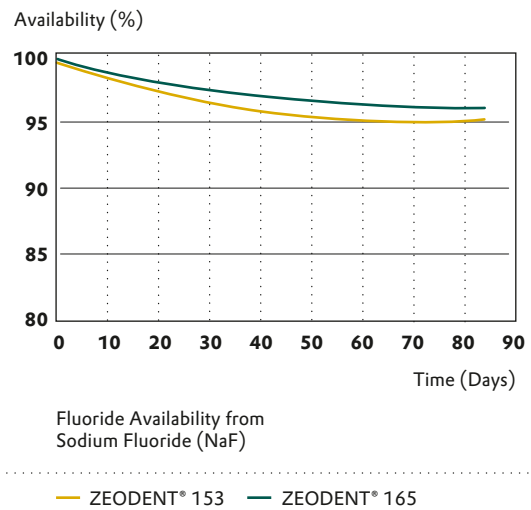


Figure 7: Fluoride Availability



HIGH CLARITY

Both ZEODENT® 153 and ZEODENT® 165 offer excellent optical properties with percentage transmittance being greater than 85 % at their respective refractive index (RI) peaks. Together these products offer formulating flexibility for clear gels, striping, and other aesthetic choices where both clarity and contrast are critical.

CUSTOMER EXPERIENCE

Both ZEODENT® 153 and ZEODENT® 165 deliver superior stability, smoothness, clarity, dispersion and mouthfeel. These attributes ensure the desired customer experience can be achieved. In combination with ZEODENT® cleaning silicas, toothpaste manufacturers have the ability to achieve a broad range of high-performance toothpaste products with great aesthetic appeal.

FLUORIDE AVAILABILITY

Both ZEODENT® 153 and ZEODENT® 165 are engineered to be compatible with a number of fluoride delivery systems, including sodium fluoride. This provides toothpaste manufacturers the freedom to control dosages, knowing that their active ingredient is available when and where it is needed.



TYPICAL PRODUCT PROPERTIES

PROPERTY	ZEODENT® 153	ZEODENT® 165
Average Particle Size (APS μm)	9 – 12	12
Oil Absorption (cc/100g)	170	220
% 325 Mesh (44 μm)	$\leq 1.0\%$ max	$\leq 1.0\%$ max
Einlehner Abrasion (mg loss/100k rev)	<2	<2
Clarity (RI/%T)	1.436 – 1.443 (>80%)	1.445 – 1.46 (>80%)
Fluoride Compatibility	$\geq 90\%$	$\geq 90\%$
Total Al as Al_2O_3	0.1%	0.1%

NOTE: Above properties cannot be considered as specifications

The forementioned Silica products manufactured by Evonik have Kosher and Pareve as well as Kosher for Passover approvals. Evonik precipitated dental silicas comply with various regulatory requirements and meet the purity criteria defined in the monographs for Dental Type Silica (USP/NF) and Silica, Dental Type (Ph. Eur.).

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ZEODENT®153 FORMULATING TIPS:

- Best suited for building viscosity when formulating with cleaning silicas like ZEODENT® 113 and ZEODENT® 115, both which build viscosity at moderate level. Typical loading should be 5–10% when using standard cleaning silica.
- When using a calcium carbonate abrasive, consider loading ZEODENT® 153 to approximately 5–8% to improve the stability and cosmetic appeal of the formulation.

ZEODENT®165 FORMULATING TIPS:

- Best suited for building viscosity when formulating with high cleaning silicas like ZEODENT® 103 and ZEODENT® 124 when extreme cleaning and whitening is important. Typical loading should be 4–9% when formulating with high cleaning silica.
- Typical loading should be 3–7% when formulating with cleaning silicas like ZEODENT® 113 and ZEODENT® 115.
- Typically loaded to 3–5% to improve the stability and cosmetic appeal of the formulation when using a calcium carbonate abrasive.

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