

ZEOFREE®  **ZEOTHIX®** 

Free-Flow Additives for the Food Industry

Industry Brochure 315 (EU)



**ANTI-CAKING SILICA AND
SILICATE PRODUCTS
DESIGNED SPECIFICALLY
FOR POWDERED
FOOD PRODUCTS**



SILICA AND SILICATE PRODUCT PROPERTIES

At Evonik, we understand the headaches associated with manufacturing powdered food products. Caking and lumping can create serious problems during production, processing, storage and customer use. Evonik has solved these problems for hundreds of customer applications with its outstanding line-up of high-performing silica and silicate products and stands ready to remedy your issues today. Through advanced product technology and custom application development.

Typical Evonik Silica and Silicate Product Properties

PRODUCT	OIL ABSORPTION (ml/100g) *	MEDIAN PARTICLE SIZE (µm) ***	pH	SURFACE AREA ** (m ² /g)	BULK DENSITY (kg/m ³)
Synthetic Silicon Dioxides					
ZEOFREE® 80	190	12	7	140	140
ZEOFREE® 5161 A	230	85	7	165	170
ZEOFREE® 5162	230	12	7	150	120
ZEOFREE® PLUS 5781	260	35	6.5	150	145
ZEOFREE® PLUS 5782	260	15	6.5	150	120
ZEOTHIX® 265	220	3	7	250	95
Synthetic Calcium Silicates					
ZEOFREE® 250	280	15	10	120	150
ZEOFREE® 600	475	8	10	250	95
ZEOFREE® 5133	130	11	10	60	200

* Linseed Oil

** BET

*** Horiba

These typical product properties cannot be considered as specifications. Evonik strives for quality, consistency and reliability. Evonik precipitated silica and silicates comply with various global regulatory requirements. Please contact Evonik for specific information regarding regulatory approvals. The forementioned Silica products manufactured by Evonik have Kosher and Pareve as well as Kosher for Passover approvals.

How Do Evonik Silicas and Silicates Work?

While Evonik produces a broad range of silica and silicate products for powdered food applications, the general approach to solving caking and lumping problems is as follows:

- Coating the surface of powder, thereby reducing interparticle interactions
- Interspersing and preventing interparticle interactions
- Preferentially absorbing moisture to prevent bridging between particles
- Absorbing fats and oils to prevent non-aqueous bridging between particles



Formulating Tips

- Evonik silicas and silicates must be blended carefully with the powdered food product; metering equipment should be used and care taken to ensure the product is blended well
- Selecting the proper particle size anti-caking agent can reduce dusting; particles that are too large relative to the host cannot adhere to the host and thus create dust; the use of excessive amounts of anti-caking agent beyond what is needed to coat the surface of the host can result in dust
- In many applications, the Evonik silica or silicate can be added to the spray dryer (or drying step) to ensure good contact with the substrate; screw conveyors feeding to a dosing system are typically used

Evonik: A Partner You Can Depend On

Experience

Evonik has been solving the caking and lumping problems of powdered food producers for many decades.

High-performing products

Evonik offers a broad range of anti-caking silica and silicate products designed specifically for powdered food products.

Custom application support

Evonik provides custom application development in our dedicated food technology laboratory to ensure the optimal solution is provided for our customers.

Quality and GMP

Evonik's production facilities are ISO certified and operate under Good Manufacturing Practices (GMP).

Assurance of supply

Evonik has many production facilities globally.



Benefits of Evonik Free-Flow Additives

Increased production throughput

Free-flowing powder offers faster production rates and increased capacity.

Reduced production downtime and maintenance

Reduce or eliminate the need to stop equipment to clean out "clogged" powder.

Improved product quality and consistency

Less off-spec or reject material from lumping and caking.

Increased consumer satisfaction

Improve your customers' experience with free-flowing, easy to use food powder products.



EVONIK SPECIALTY SILICA USE RECOMMENDATIONS

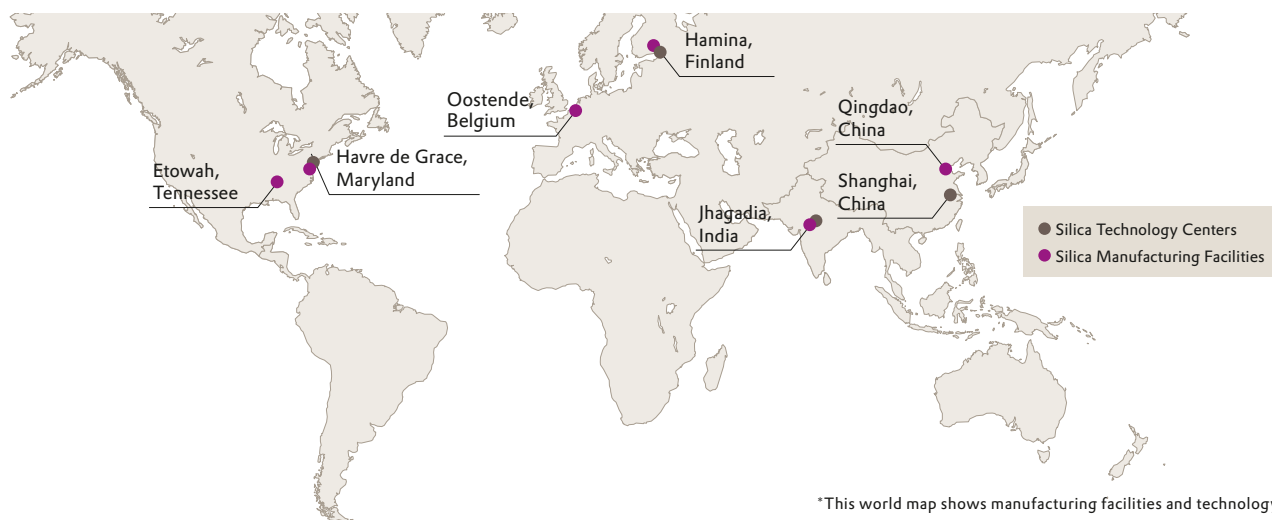
FOOD APPLICATIONS	SYNTHETIC SILICON DIOXIDES			
	ZEOFREE® 80	ZEOFREE® 5161 A	ZEOFREE® 5162	ZEOFREE® PLUS 5781
Substrate				
Powdered Egg			+	
Non-Dairy Creamer	+		+	
Soups and Bouillon			+	
Spice Seasonings	+	+	+	++
Chocolate Drink Mix	+	+	+	+
Cocoa Mix		+	+	+
Instant Iced Tea				
Brewer's Yeast	+	+	+	+
Ground Chili Powder	+	+	++	+
Low-Fat Brownie Mix		+		+
Cream Soup Mix		+	+	+
Buttermilk Biscuit Mix				
Pound Cake Mix				
Cornbread Mix				
Pizza Mix				
Dried Sauce Mix	+		+	
Pork Spice Blend			+	
Gravy Mix	+	+	+	+
Monocalcium Phosphate	++			
Flour	+		+	
Cane Sugar	+		+	+
Powder Gum	+	+	+	+
Drink Mix		+		
Instant Tomato Soup	+		+	
Shredded Cheese			+	
Sugar Substitute				
Sodium Bicarbonate			+	
Sweet Whey				
Cinnamon		++	+	++
Garlic Powder				
Salt				
HVP Powder*				
Tomato Powder				

+ Recommended ++ Specifically Recommended

The recommendations in this chart are based on testing performed in our laboratories. Actual results may vary depending on the specific ingredients.

*Hydrolyzed Vegetable Protein (HVP) Powder

The Trusted and Reliable Source for Specialty Silicas*



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

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