

ZEOFREE®



ZEOTHIX®



Silicas and Silicates for Animal Feed and Nutrition

Enabling customer solutions through advanced product technology and dedicated application support

Industry Brochure 316 (EU)



FREE-FLOW ADDITIVES

At Evonik, we understand the headaches associated with manufacturing powdered animal feed and nutrition 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 we can provide the optimal solution for your application.



Typical Evonik Silica and Silicate Product Properties

PRODUCT	OIL ABSORPTION (ml/100g)	CARRYING CAPACITY* (wt%)	MEDIAN PARTICLE SIZE (µm)	pH	SURFACE AREA** (m ² /g)	DOA (ml/100g)	BULK DENSITY (kg/m ³)
SYNTHETIC SILICON DIOXIDES							
ZEOFREE® 80	190	63	12	7	140	235	140
ZEOFREE® 110SD	200	68	20	7	140	250	190
ZEOFREE® 200	200	63	12	7	210	260	130
ZEOFREE® 5161	220	72	20	7	160	260	160
ZEOFREE® 5161A	230	74	85	7	165	260	170
ZEOFREE® 5162	220	68	16	7	160	265	130
ZEOFREE® PLUS 5781	260	74	35	6.5	155	300	145
ZEOFREE® PLUS 5782	260	72	15	6.5	155	300	120
ZEOTHIX® 265	220	66	3	7	250	270	95
SYNTHETIC CALCIUM SILICATES							
ZEOFREE® 250	280	62	15	10	120	275	150
ZEOFREE® 600	475	71	8	10	250	440	95

* Carrying capacity for water: wt. liquid / (wt. liquid + wt. silica) x 100 ** BET

These typical product properties cannot be considered as specifications. Evonik strives for quality, consistency and reliability. Evonik's 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 FREE-FLOW ADDITIVES WORK?



While Evonik produces a broad range of silica and silicate products for powdered animal feed and nutrition 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

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 satisfaction

Improve your customers’ experiences with free-flowing, easy to use animal feed and nutrition powder products.

FORMULATING TIPS

- Evonik silicas and silicates must be blended carefully with the powdered animal feed 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 animal feed producers for many decades.

High-performing products

Evonik offers a broad range of silica and silicate products designed specifically for animal nutrition products.

Custom application support

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



Quality and GMP

Evonik's production facilities are ISO 9001 certified and operate under Good Manufacturing Practices (GMP).

Assurance of supply

Evonik has many production facilities globally.

EVONIK CARRIERS

PRODUCT	OIL ABSORPTION (ml/100g)	CARRYING CAPACITY* (wt%)	MEDIAN PARTICLE SIZE** (µm)	pH	SURFACE AREA*** (m ² /g)	DOA (ml/100g)	BULK DENSITY (kg/m ³)
SYNTHETIC SILICON DIOXIDES							
ZEOFREE® 110SD	200	68	20	7	140	250	190
ZEOFREE® 5161	220	72	20	7	160	260	160
ZEOFREE® 5161A	230	74	85	7	165	260	170
ZEOFREE® 5162	220	68	16	7	160	265	130
ZEOFREE® 5170†	160	57	250	7	160	160	330
ZEOFREE® 5180†	170	57	650	7	140	140	280
ZEOFREE® PLUS 5781	260	74	35	6.5	155	300	145
ZEOFREE® PLUS 5782	260	72	15	6.5	155	300	120
SYNTHETIC CALCIUM SILICATES							
ZEOFREE® 600	475	71	8	10	250	440	95

* Carrying capacity for water: $\text{wt. liquid} / (\text{wt. liquid} + \text{wt. silica}) \times 100$ ** Particle size measurements by HORIBA *** BET

† ZEOFREE® 5170 and ZEOFREE® 5180 are pelletized products and are differentiated by particle size, as measured by median screen analysis. These typical product properties cannot be considered as specifications. Evonik strives for quality, consistency and reliability. Evonik's 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 CARRIER PRODUCTS WORK IN ANIMAL HEALTH APPLICATIONS?

Carriers are powders that absorb liquids into their pores turning the liquid into a free-flowing powder. Carrying capacity can be calculated according to the following equation:

$$\text{WEIGHT OF THE LIQUID} / (\text{WEIGHT OF LIQUID} + \text{WEIGHT OF CARRIER}) \times 100$$

When a carrier has absorbed the maximum amount of liquid possible, the carrier is said to be at saturation. Typically, 5% to 10% less liquid than at saturation will result in a free-flowing powder. Evonik carriers are available in a range of particle sizes and base chemistries.



BENEFITS OF EVONIK CARRIERS

- Improves handling of high-viscosity liquids.
- Helps improve ease and accuracy of addition for chemicals used in small quantities.
- Create combinations of liquids that can be easily added as one powdered ingredient.
- Silica and silicates are tasteless carriers and will not add flavor.

HOW DO YOU USE EVONIK CARRIER PRODUCTS?

Blending for carriers, or absorbing a liquid onto a powder, requires a balancing of the carrying capacity of the carrier, the viscosity of the liquid, the liquid droplet size when sprayed onto the powder and the mixing time. Mixing time must increase for highly viscous liquids.

Also, in general it is acceptable to increase the temperature of the system to induce lower viscosity for improved absorption. In general, using a spray nozzle for the liquid is preferred. Always store Evonik products in clean, dry storage environments.

THE TRUSTED AND RELIABLE GLOBAL SOURCE FOR SPECIALTY SILICAS*



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



Contact Evonik today for more information and to order a sample of our high performing specialty silica products:

www.zeofree.com ask-si@evonik.com

This information and any recommendations, technical or otherwise, are presented in good faith and believed to be correct as of the date prepared. Recipients of this information and recommendations must make their own determination as to its suitability for their purposes. In no event shall Evonik assume liability for damages or losses of any kind or nature that result from the use of or reliance upon this information and recommendations. EVONIK EXPRESSLY DISCLAIMS ANY REPRESENTATIONS AND WARRANTIES OF ANY KIND, WHETHER EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, NON-INFRINGEMENT, MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE (EVEN IF EVONIK IS AWARE OF SUCH PURPOSE) WITH RESPECT TO ANY INFORMATION AND RECOMMENDATIONS PROVIDED. Reference to any trade names used by other companies is neither a recommendation nor an endorsement of the corresponding product, and does not imply that similar products could not be used. Evonik reserves the right to make any changes to the information and/or recommendations at any time, without prior or subsequent notice.

**Europe / Middle-East /
Africa / Latin America**

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

phone +49 6181 59-12532
fax +49 6181 59-712532
ask-si@evonik.com

www.evonik.com
www.zeofree.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 6809-6877
fax +65 6809-6677
ask-si-asia@evonik.com

**More silica grades
from Evonik see also**
www.aerosil.com
www.sipernat.com