EVONIK INDUSTRIES

SIPERNAT®
for the Animal Feed Industry

Industry Information

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SIPERNAT®

Evonik. Kraft für Neues.

What SIPERNAT® can do for you?

Efficient handling is becoming increasingly important to the users of animal feed additives. Customers prefer products that can be easily, conveniently, and especially accurately dosed in automated processes. Powdered products are desirable for this purpose. Since the additives usually occur in liquid or paste form, they need to be transformed into powders. The resulting products must exhibit excellent flow properties, generate a minimum of dust during handling and not cake during storage. Evonik Degussa has developed specific SIPERNAT®-grades that successfully address these challenges.

The benefits to you and your customers:

- Dust free concentrates
- Free flowing powders
- Protection against caking
- Precise dosing
- Consistent quality
- Cost savings

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SIPERNAT® helps transform liquid or paste feed additives into free flowing powders

Many of the additives used in the animal feed industry, such as vitamins, feed acids, choline chloride solutions, pigment dispersions or antioxidants, occur in liquid form and have to be mixed with a powder or granulate premix. Your customers require free flowing powders that can be easily mixed withother dry feedstuffs. As a producer of absorbates, you convert the liquids into a powder and enable your customers to distribute the valuable additives homogeneously in order to deliver quality feed products. This requires using specifically designed carrier substances for active ingredients. The solution is the range of carrier silica products called SIPERNAT®. They are highly absorbent, free flowing, chemically inert and physiologically safe. The finished absorbate consists of 30–50 % silica. The choice of carrier silica determines the particle shape and handling properties of the final product, to optimize flow, dust generation and caking characteristics. For free flowing, dust-free absorbates Evonik Degussa developed the silica grade SIPERNAT® 2200.

Fig. 1: Vitamin E-acetate as liquid and as absorbate on SIPERNAT® 2200

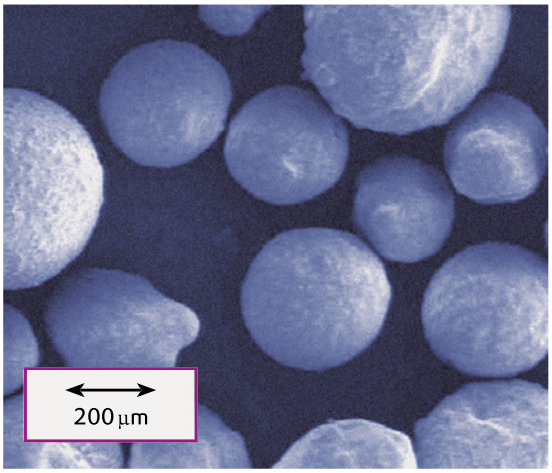
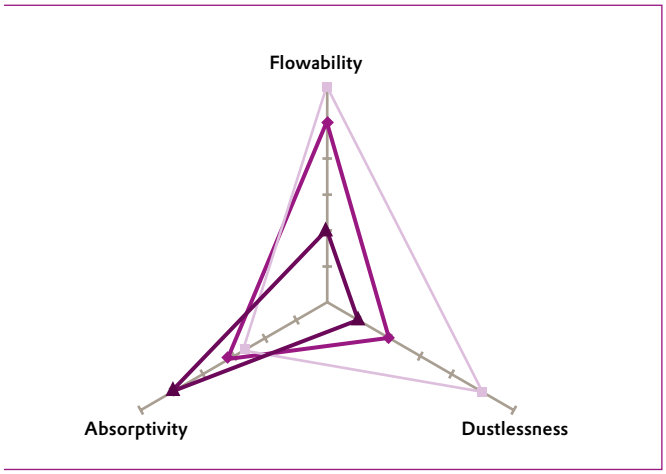


Fig. 2: SEM of vitamin E-acetate on SIPERNAT® 2200

Fig. 3



SIPERNAT® 22 SIPERNAT® 2200 SIPERNAT® 50

Product profile of various SIPERNAT®-grades as carrier silica

SIPERNAT® delivers outstanding premix flow properties and prevents caking

As a producer of premixes, you want to provide your customers with free flowing powders that will not cake when stored. Very often mineral premixes, vitamin premixes and other powder-form additives are not sufficiently free flowing on their own. The addition of 0.5–2 % hydrophilic or 0.1–0.5 % hydrophobic SIPERNAT® grades will significantly improve the flow properties while reducing the caking tendency. As result, valuable feed additives can be dosed more evenly and accurately, dramatically improving handling and minimizing expensive downtime.

Fig. 4 shows the effect of a silica on copper sulfate which is commonly used in mineral premixes.

Fig. 4: Copper sulfate without and with addition of SIPERNAT®

Recommended Products

The following tables provide an overview of the main applications and corresponding SIPERNAT®-types as well as selected typical physico-chemical values. We will gladly answer any questions you may have and assist with the selection of the optimum silica solution to address your needs. We are also at your service for issues regarding mixing and handling.

Table 1

	SIPERNAT®					
Application	2200	22	22 S	50	50 S	D 17
Carrier						
Vitamin E-acetate	++	+				
Choline chloride (carrier silica)		++				
Feed acids	++	+				
Antioxidants	++	++				
Highly concentrated active absorbates				++		
Pigment pastes e.g. Marigold	++	+				
Flow agents						
Powder-like vitamins/premixes			++		++	++
Feed salts/ mineral premixes			++		++	++
Choline chloride (flow improvement)						++
Feed urea			++		++	
Milk replacer			++		+	

Typical applications and recommended products

Table 2

		SIPERNAT®					
	Einheit	2200	22	22 S	50	50 S	D 17
Behaviour vs. water		**Hydrophilic**					**Hydrophobic**
Specific surface (N2) Areameter	m^2/g	185	190	190	475	475	100
Median particle size d50 laser diffraction	µm	320	110	11.5	40	16	10
Tamped density Not sieved	g/l	250	260	90	180	100	150
Loss on drying 2 h at 105 °C	%	5	6	6	6	6	4
DBP absorption Based on dried substance	g/100 g	250	260	265	335	325	195

Selected physico-chemical properties of specific SIPERNAT®-grades. The values depicted here serve as guides only and do not reflect actual specifications

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Fig. 5: High Rack Warehouse

Fig. 6: Pressure Filled FIBC

Additional Evonik Degussa publications on the subject

- Synthetic Silica as a Flow Aid and Carrier Substance, Technical Bulletin Fine Particles No 31. reihe Pigmente Nr. 31. Evonik Degussa GmbH, D-60278, Frankfurt am Main.

- Performance Silica as Flow Aid and Carrier Substance Recommended Mixing Procedure for Powders and Granulates, Technical Information TI 1213. reihe Pigmente Nr. 31. Evonik Degussa GmbH, D-60278, Frankfurt am Main.

Feed additive certification

Synthetic amorphous silicon dioxide and silicates of type SIPERNAT® are in line with the quality requirements for the anticaking agent E 551 a, "silicic acid, precipitated and dried", resp. E 552, "calcium silicate, synthetic" resp. E 554, "sodium alumino silicate, synthetic" of Commission Regulation (EC) No 2439/1999. E 551 a and E 552 are listed also in the Community Register of Feed Additives, pursuant to Regulation (EC) No 1831/2003.

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November 08