



SIPERNAT[®], AEROSIL[®],
AEROXIDE[®] Processing
aid for plastic powders
and plastic additives

Evonik. Power to create.



EVONIK
INDUSTRIES

Your Benefits

Free flowing, antistatic plastic powders and pellets are easy to handle. They don't cause any problem when being conveyed and fed into subsequent processing procedures such as compounding, extrusion, injection molding and sintering processes. SIPERNAT® Specialty Silica, AEROSIL® Fumed Silica and AEROXIDE® Fumed Metal Oxides are highly efficient flow- and anticaking aids. They can help to render a sticky polymer powder or granule free-flowing, even when being long term stored at elevated pressure and temperature. If electrostatic charging during mixing and handling processes is an issue, the addition of AEROXIDE® Alu C can help to reduce the electrical charge of polymer powders.

In case handling of a fluffy powder like AEROSIL® is challenging in your process, we can offer our ready to use highly filled AERODISP® fumed silica dispersions.

Liquid plastic additives are often not easy to homogeneously distribute into solid mixtures or polymer melts. So-called "concentrated dry liquids" represent easy flowable powder mixtures, which contain high amounts of liquid plastic additives absorbed on carrier silica from our lineup of SIPERNAT® specialty silica grades. Those dry liquid products provide all the benefits described above. Within our broad product portfolio, we have solutions for almost every special require-

ment, e.g. hydrophobic silica grades, which have both, a very low moisture content and low tendency to absorb water. Their use is recommended for water sensitive polymers such as thermoplastic polyurethanes (TPU) or polyamides (PA). Easy to disperse silica grades can be divided extremely fine and do not block filter screens during thermoplastic processing. Selected silica and metal oxide grades provide high transparency of the final plastic articles, reduce the dust formation during mixing processes or provide antistatic properties. Silica types with food contact compliance are available, if essential.

Our Offer – Your Value

- Improved flowability
- Reduced caking tendency
- Antistatic properties
- Low dust formation
- Easy dispersibility
- Low water content
- Stable feeding and manufacturing processes
- Increased productivity
- Facilitated milling



SIPERNAT®, AEROSIL® and AEROXIDE® as free flow aid for plastics and plastic additives – typical applications*

- TPS (Styrene Block-Copolymers, e. g. SBS, SEBS)
- TPU (Thermoplastic Polyurethane)
- TPO (Olefinic Thermoplastic Elastomers)
- PVC (Polyvinyl Chloride)
- EVA (Ethylene Vinyl Acetate)
- Acrylic Polymers
- Additive concentrates (MB)
- EPS (Expanded Polystyrene)
- Impact modifier
- Pigments
- Stabilizer

General product recommendations for free flow/anticking effects in plastic applications

Product name	Product type	Typical amount added	Easy/Fine dispersion during mixing	Filterability (thermoplastic manufacture)
SIPERNAT® 22 S	hydrophilic precipitated silica	≤ 1 %	++	+
SIPERNAT® 350	hydrophilic precipitated silica	≤ 1 %	++	++
SIPERNAT® D 13	hydrophobic, precipitated silica	≤ 1 %	++	++
AEROSIL® 200	hydrophilic fumed silica	≤ 1 %	++	++
AEROSIL® OX 50	hydrophilic fumed silica	≤ 1 %	++	++
AEROSIL® R 972	hydrophobic fumed silica	≤ 0,5 %	+++	+++
AEROSIL® R 812	hydrophobic fumed silica	≤ 0,5 %	+++	+++
AEROXIDE® ALU C	hydrophilic fumed alumina	≤ 0,5 %	+++	+++
AEROXIDE® ALU C 805	hydrophobic fumed alumina	≤ 0,5 %	+++	+++

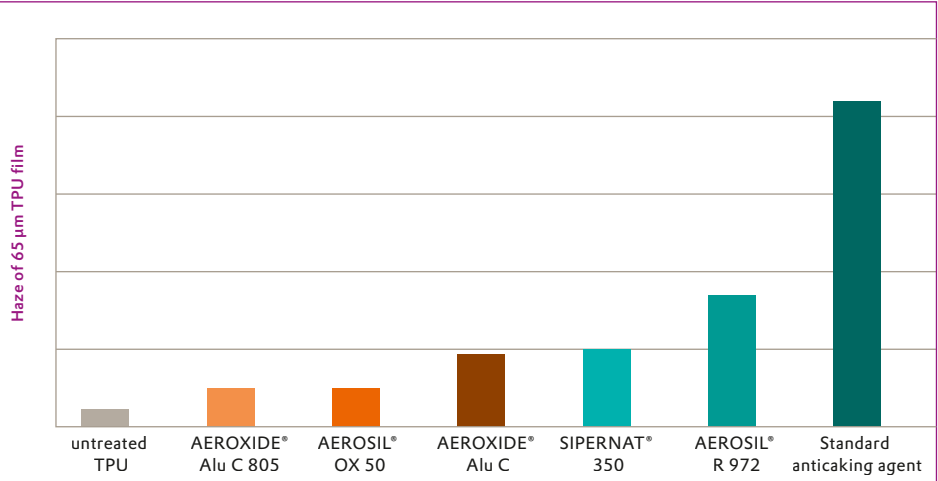
+ good ++ very good +++ excellent

* SIPERNAT® Specialty Silica, AEROSIL® Fumed Silica and AEROXIDE® Fumed Metal Oxides

Keeping plastic films transparent

Besides providing proper handling of plastic powders or pellets, the anticaking agent must not impair major characteristics of the final plastic article. One example is the potential influence of anticaking aids on the transparency of subsequent manufactured film products. With the proper choice of an anticaking agent, the impact on the transparency and Haze respectively can be minimized.

Influence of 0.2% addition of anticaking agent on the final transparency of extruded TPU films





SIPERNAT® Specialty Silica as carrier for plastic additives – typical applications

SIPERNAT® specialty silica is the choice for converting liquid plastic additives into free flowing powders. Our Applied Technology team has the expertise and equipment to solve your individual challenges.

- Plasticizer
- Lubricants
- Blowing agents
- Peroxides
- Antistatic agents
- Anti-fogging agents

General product recommendations for carrier silicas in plastic applications

Silica grade	Flowability of absorbate	Absorption capacity	Dispersibility in polymer matrix	Additional remarks
SIPERNAT® 22	+++	++	o	comparatively large average particle size
SIPERNAT® 22 S	+	++	+	
SIPERNAT® 22 LS	+	++	++	
SIPERNAT® 50	++	+++	o	comparatively large average particle size
SIPERNAT® 50 S	+	+++	+	
SIPERNAT® 500 LS	+	+++	++	

+ good ++ very good +++ excellent o standard

Our Service to you

- Product quality and product safety
- Customer proximity
- R&D, Applied Technology
- Technical Service
- Handling technology
- Supply security
- Logistic concepts
- Technical literature

Our Applied Technology team will be pleased to assist you to solve your individual challenge. Our laboratories are equipped to prepare solid mixtures, measure flowability in different ways and simulate caking by adjusting defined pressure, temperature and moisture conditions. Dust properties and fluidizing behavior of polymer blends can be determined as well. Moreover, a pilot plant with facilities for plastic compounding and processing is available. The potential influence of silica products on the final plastic article can be investigated.

In case you need support regarding the handling of our silica products, e.g. how to store, dust-free conveying and dosage, our Handling Team will be pleased to get into contact with you to discuss your specific requirements.



EVONIK
INDUSTRIES

Evonik Resource Efficiency GmbH

Business Line Silica
Rodenbacher Chaussee 4
63457 Hanau
Germany

PHONE +49 6181 59-8118

FAX +49 6181 59-78118

www.evonik.com

Evonik. Power to create.

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.

AEROSIL®, SIPERNAT®, AEROXIDE® and AERODISP® are registered trademarks of Evonik Industries or its subsidiaries.