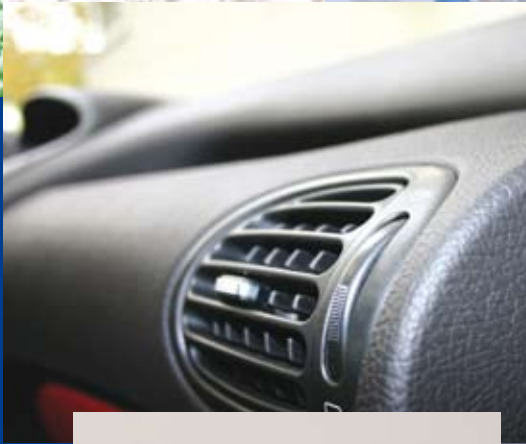


SACHTOTEC MD 300

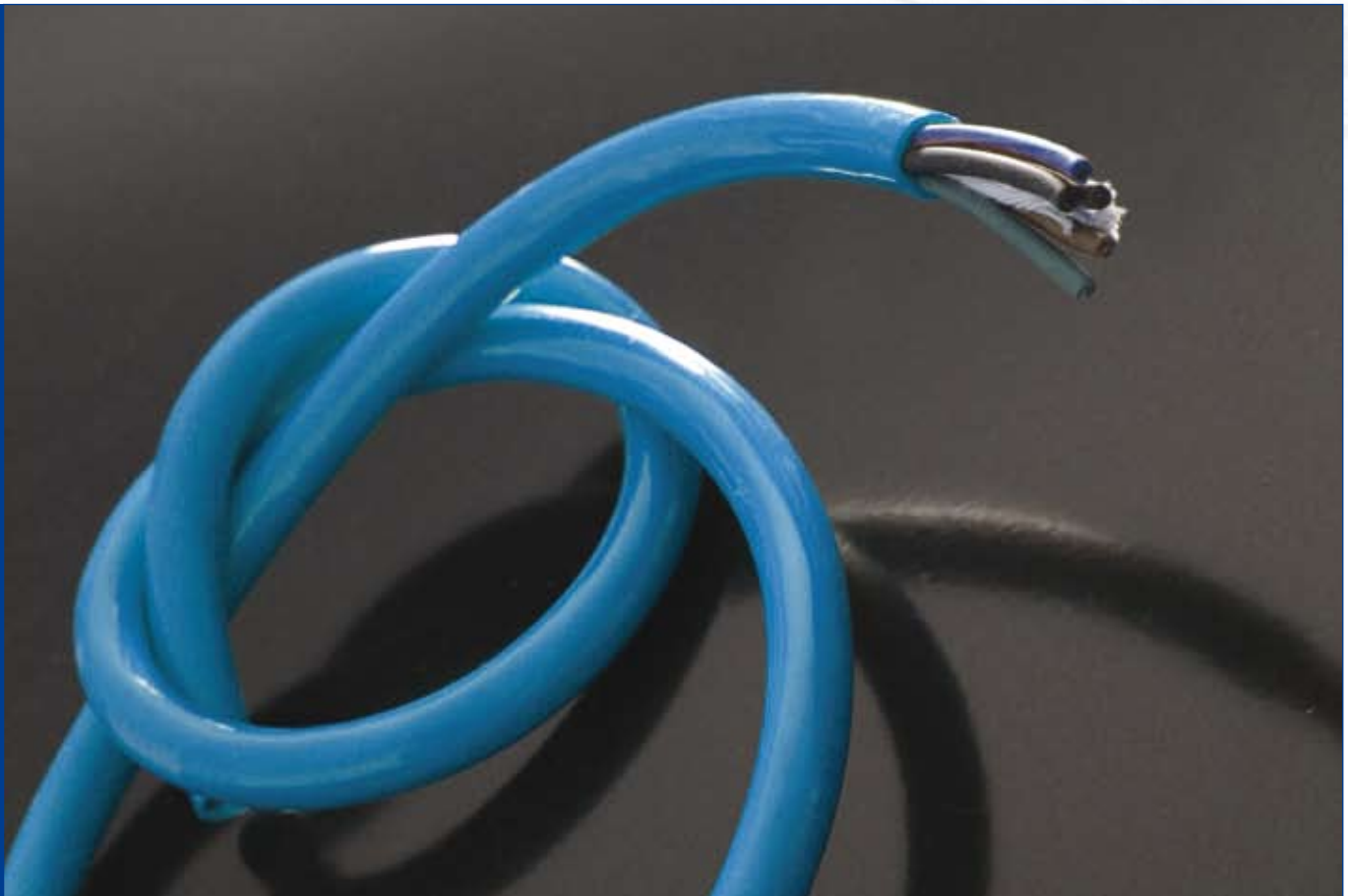
The new specialty for
the Plastics industry



Great Solutions with Small Particles

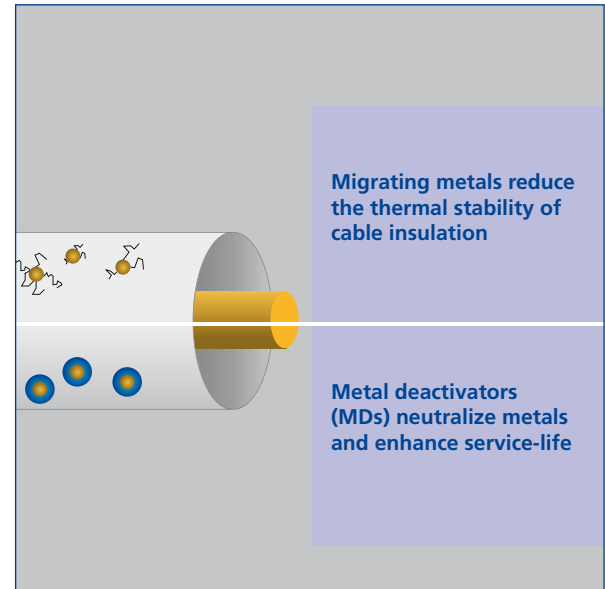
Great Solutions with Small Particles

Sachtleben is a leading producer of high-quality chemical products and supplies from its production locations in Finland and Germany a unique range of white pigments, functional additives, extenders and fillers for plastics. The company has a tradition extending back over more than 125 years. Sachtleben produces particles based on titanium dioxide, zinc sulfide and barium sulfate, and markets these products around the globe. A particular focus in this context is on problem-solving capabilities and technical service furnished on-site at the customer's. Sachtleben's world-spanning network of branches, agents and distributors makes the company a global player in its field. Sachtleben is certified to „Deutsche Gesellschaft für Qualitätssicherung“ standards. Production of Sachtleben products conforms to its ISO 9001-certificated Quality Management System. Production at both sites - Duisburg, Germany and Pori, Finland - is conducted in conformity to the company's ISO 14001-certificated Environmental Management System.



Metal Deactivation

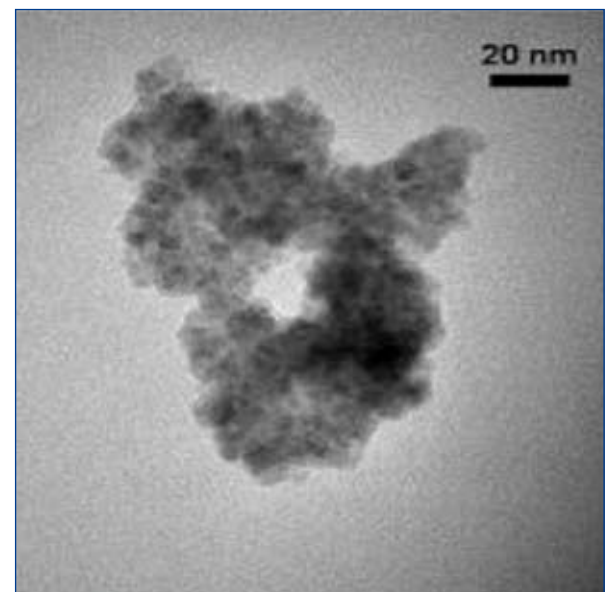
All polymers intended for long-term service, and those exposed to elevated temperatures, in particular, are modified by the addition of organic metal deactivators. As is well known, metal ions of various oxidation levels (e.g. manganese, copper, iron, etc.) are capable of acting as catalysts and causing oxidation of the polymer via a catalytic cycle process. The origins of these metals are diverse, and can be traced back to abrasion of metal equipment components and impurities contained in natural fillers such as calcium carbonate, talc and barytes. In the case of cables and wires, contact is, in fact, deliberate, since it is necessary to insulate the conductive core. Phosphites and hindered phenols have proven to be effective organic metal deactivators, while inorganic deactivators remain more or less unknown.



SACHTOTEC MD 300 is a preparation consisting of ultra-fine zinc sulfide and an organic dispersion agent. As a co-stabilizer, it combines excellent metal-deactivation properties with outstanding migration stability and ease of use.

Thanks to its fine crystallite and particle sizes, SACHTOTEC MD 300 can be used in a large range of systems without affecting color.

Since SACHTOTEC MD 300 is an inorganic product, it is largely immune to fogging and sweating.



Transmission electron microscope image of SACHTOTEC MD 300

SACHTOTEC MD 300

SACHTOTEC MD 300 is highly suitable for use as a thermal co-stabilizer in combination with organic metal deactivators.

SACHTOTEC MD 300 offers significant benefits in terms of:

- ▶ Stabilization
 - Long polymer service-life
 - High-temperature stability
 - Low loading
- ▶ Optical properties
 - Coloured, grey and black systems without lightening effect
- ▶ Possible reduction of organic metal deactivator quantity
 - Cost-efficiency
 - Reduction of secondary effects, such as fogging and sweating

Typical Properties

Appearance	white, colorless powder	
Surface treatment	organic dispersant	
Zinc sulfide content [%]	C 101101 A	approx. 90
Density [g/ml]	DIN ISO 787, Part10	approx. 3.7
Volatiles (105°) [%]	SC-211	approx. 0.5
Specific surface area [m ² /g]	SC-203	> 30
Primary crystallite size (Scherrer) [nm]	C 108016	approx. 10

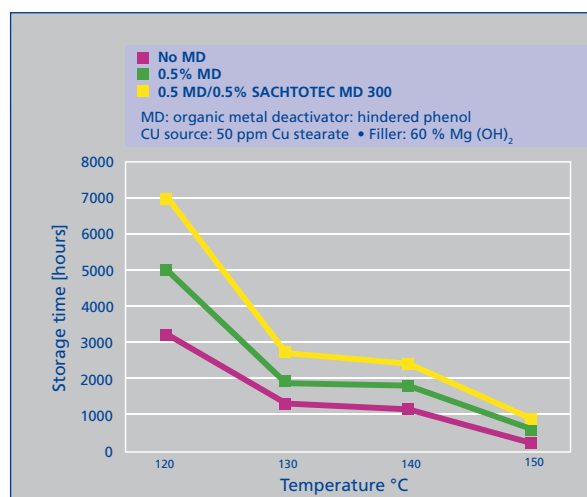
SACHTOTEC MD 300 is extremely well suited for use in all polyolefins, such as PE and PP. In combination with established organic metal deactivators, it permits achievement of significant increases in thermal stability. Best performance is observed when SACHTOTEC MD 300 is used in combination with hindered phenol compounds.

As optimized formulation a recipe of 0.5% of SACHTOTEC MD 300 and 0.2 - 0.3% of organic metal deactivator is suggested.

The beneficial effects of SACHTOTEC MD 300 have been demonstrated at a large range of temperatures; it must, nonetheless, be assumed that the advantages of this product are diminished at very high temperatures.

Applications

- ▶ Electrical cables and wire; tube and pipe products
- ▶ Appliances
- ▶ Vehicle interiors
- ▶ Air-conditioning and heating systems



SACHTOTEC MD 300

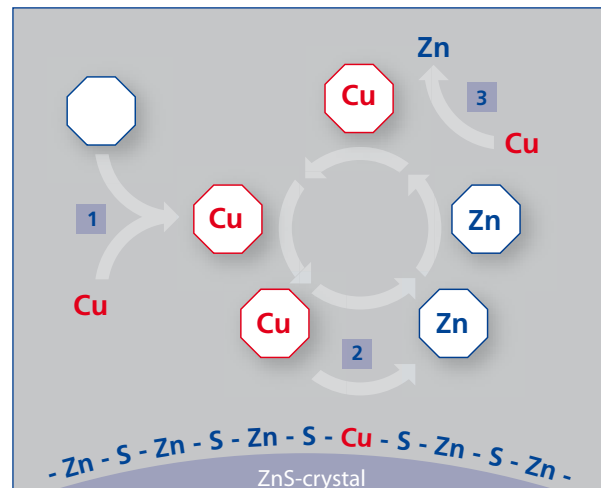
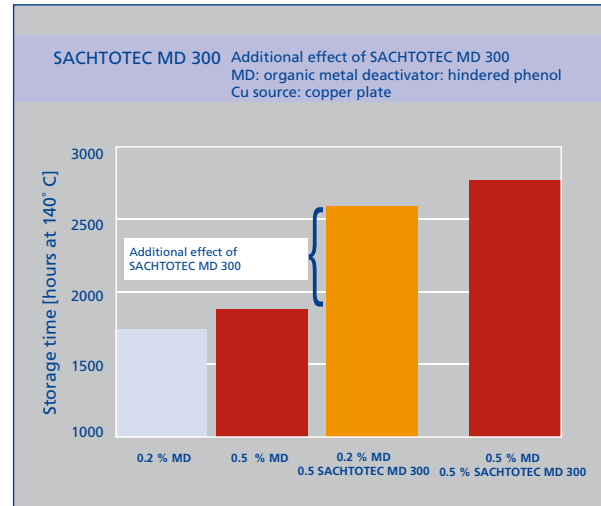


Higher doses of the organic component, in particular, will not increase the thermal stability of the polymer, whether used in combination with SACHTOTEC MD 300 or alone.

The benefits of SACHTOTEC MD 300 can be exploited in two ways - it is possible, on the one hand, to reduce input of an organic metal deactivator if, for example, problems with fogging are encountered; it is also possible, on the other hand, to increase service-life to a previously unknown level, and thus meet the challenges to which future systems will be exposed.

A three-stage cycle process may explain the performance of SACHTOTEC MD 300 as a co-stabilizer:

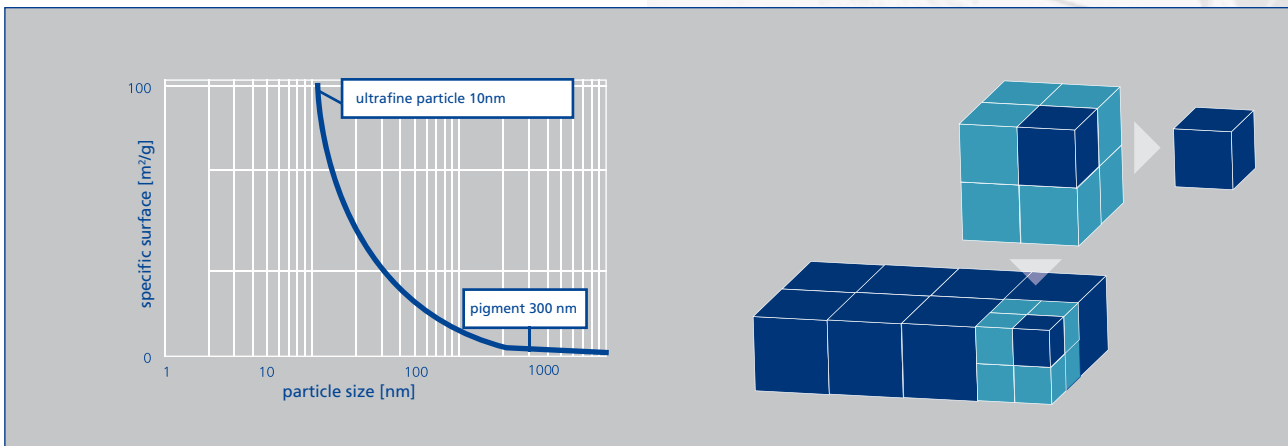
1. Complexing of organic MD and copper ions
2. Ion exchange on the crystal surface
3. Ion exchange in the complex



The benefit of ultra-fine particles

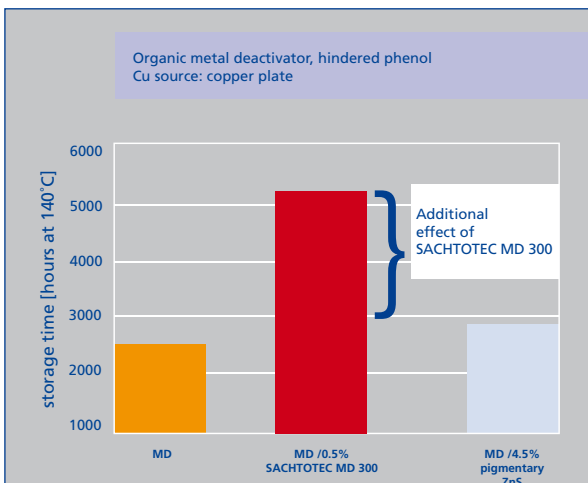
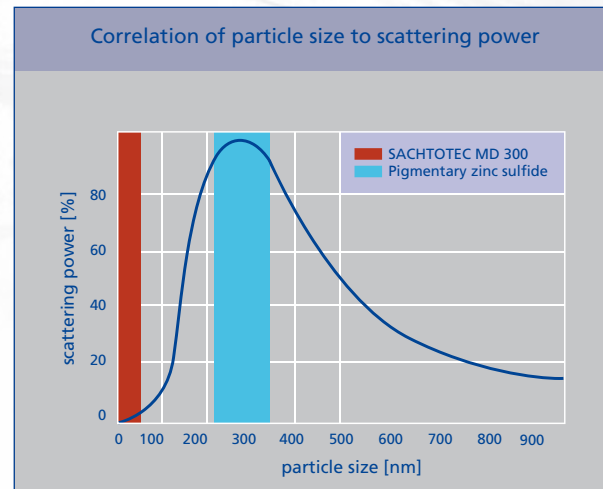
1. Geometrical effect

- ▶ Ultrafine particles possess a vastly increased specific surface area
- ▶ Ultrafine particles permit a huge number of particles at low loadings
- ▶ The reactive surface is increased, migration routes decreased



2. Effects of ultrafine particles on optical properties

- ▶ Pigment properties are greatly reduced
 - Virtually no scattering power
 - Virtually no lightening power
- ▶ Easy to use in non-white systems
 - Coloured systems/Grey systems/Black systems



3. Stabilizing effect

The effects of ultrafine SACHTOTEC MD 300 compared to coarser zinc sulfide are readily apparent. Zinc sulfide pigments in combination with hindered phenol stabilizer produce only a slight improvement, of around 10%, in thermal stability compared to the basic system, whereas SACHTOTEC MD 300 increases long-term stability by around 100% for a fraction of the dose.

Testing procedure

All results stated in this brochure were obtained using the following procedure:

The aging behaviour of polyolefin specimens was determined in accordance with DIN 53 383. The specimens were stored in a drying cabinet, with circulation of air at temperatures ranging from 130° C to 150° C. Visual evaluations were initially performed at intervals of 100 h in order to determine whether discoloration or blooming had occurred. The extensibility of the test specimen was then determined by means of the mandrel bending test. All thermal stability tests were performed using the test specimens used in the UL 94 test (125 mm x 13 mm x 1.6 mm). Metallic copper or, alternatively, copper salts were used to simulate contact with copper, as in cable applications, either by wrapping the specimens in a copper plate, or by incorporating copper stearate directly into the polymer.

Safety Precautions

Please see the Material Safety Data Sheet before handling the material.



PP rods in the drying cabinet

Packaging

The product is supplied in 25 kg cardboard boxes with a PE inliner, 675 kg (27 cartons) on CP2 pallets.



Sachtleben does not guarantee the accuracy, topicality, correctness, completeness, quality or usefulness of any information provided.
Any liability claims in connection with such information are excluded.

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Great Solutions with Small Particles



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