SOLUTIONS FOR COMPOSITES

Great Solutions with Small Particles

SACHTLEBEN

GREAT SOLUTIONS WITH SMALL PARTICLES

WHO WE ARE

Sachtleben is a leading manufacturer of top-quality chemical products with a unique range of white pigments and extenders. The history of the company's involvement at its Duisburg location stretches back more than one hundred years.

Sachtleben supplies the entire world with innovative products in the fields of titanium dioxide and functional additives. Our outstanding product quality is matched by our excellence in problem-solving capabilities and technical Customer Service. The main fields of application for Sachtleben's products can be found, for instance, in synthetic fibers, paints and coatings, plastics and paper. Sachtleben also manufactures specialized products for the foods, pharmaceuticals and cosmetics industries and is the right address in the field of chromatography and catalysis as well as the production of construction materials.

As a specialist in ultra-small inorganic particles, Sachtleben provides individual, innovative solutions to polymer-industry problems. Our core capability is located in the production and functionalization of ultra-small inorganic particles. This know-how is based, not least of all, on our decades of experience in the production of the most diverse range of particles on a titanium dioxide and zinc/barium basis. The challenge for us is now the development of tailor-made solutions to meet our customers' specific needs.

SERVICE

Sachtleben has a far-reaching sales and marketing network, with the result that you will find highly qualified and capable contacts on-the-spot in more than eighty countries.

SACHTLEBEN CORPORATE POLICY

Based on the understanding of our customer needs our key competence is manufacturing, application and development of fine disperse inorganic solid particles. Our target is to provide substantial economic value and unique functional advantages to our customers. We focus on areas where we have competitive expertise in technology, products or market intelligence. Constantly we develop innovative products and solutions for the markets we serve. In our daily operations we apply internationally accepted standards of Good Manufacturing Practice and act in accordance with the law and self-imposed industry-specific obligations such as "Sustainable Development" and "Responsible Care®". Continuous improvement of our processes, quality improvement of our products, of environmental and health protection and of safety are mandatory for our staff.

CERTIFICATION

Naturally, quality management also includes that the development, production and sale of white pigments, extenders and products of facilities that use sulfuric acid are certified according to the standards of the Deutsche Gesellschaft für Qualitätssicherung, the German QA body. Our management system for the food industry is also subjected to regular inspections.

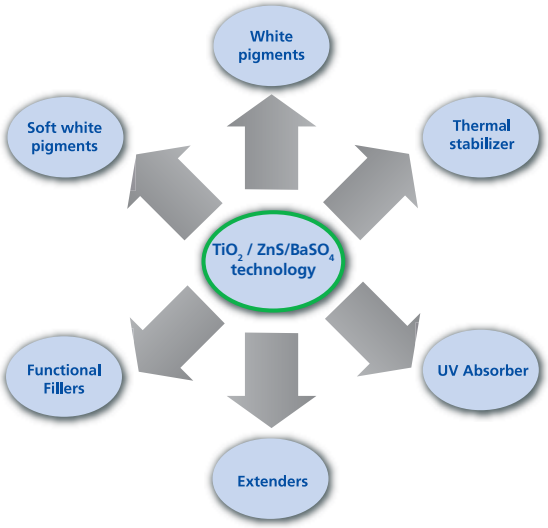
Certification to ISO 9001:2000, ISO 14001, ISO 22000:2005 and OHSAS 18001 are just some of the standards that our quality management system tests itself against. Our products and facilities also conform to "Kosher Mehadrin" and "Halal (TiO_2) ($ZnS/BaSO_4$)".

QUALITY

Quality-awareness in development, production and all services for our customers is an essential element in our thinking and our actions. Continuous improvement of our processes in order to optimize the quality of our products, and of our environmental, health and industrial safety, are thus a basic obligation imposed on all our employees.

SPECIALITIES FOR COMPOSITES

Sachtleben products are already in use in a wide range of applications in the plastics industry. Our pigments, additives, fillers and extenders with their diverse functions meet especially the demanding needs of compounders and composite manufacturers.



TITANIUM DIOXIDE

- Anatase pigments
- Rutile pigments
- Ultrafine-particles

FUNCTIONAL ADDITIVES

- Synthetic barium sulfate
- Zinc sulfide
- Lithopone

Thermosetting polymers (thermosets) are continuously gaining significance for a large range of applications. Materials derived from EP and UP resins, in particular, meet maximum standards for mechanical and also optical properties in the fields of automotive and civil engineering, sport, leisure and aviation. The demand for ever more sophisticated mechanical and thermal properties, lower weight and even more perfect surface characteristics (color, gloss, etc.) is also rising simultaneously. These surface properties can be further improved by applying an organic gelcoat, generally on a UP or epoxy resin basis.

Sachtleben makes use of its decades of experience in the production of the most diverse range of titanium dioxide and zinc/barium particles, assuring for its customers a broad spectrum of innovative solutions for the creation and development of these high-tech formulations.

WHITE PIGMENTS – ZINC SULFIDE

SACHTOLITH HD-S

SACHTOLITH HD-S is produced by precipitation. The resultant white pigment consists of virtually pure zinc sulfide. In addition to its excellent optical properties, SACHTOLITH HD-S is also notable for its extremely low abrasiveness. Zinc sulfide is the only white pigment which permits retention of the mechanical properties of glass-fiber reinforced composites at a high level, since the glass fibers are not damaged by its addition.

SHEET AND BULK MOULDING COMPOUNDS

Sheet and bulk moulding compounds (SMCs + BMCs) pigmented using SACHTOLITH are notable for improved mechanical properties compared to systems incorporating titanium dioxides.

WHITE + WEATHER-RESISTANT + EFFICIENT

There are a number of requirements to be taken into account in the development of thermoset materials:

- Mechanical properties
- Weathering-resistance
- Hue

Pigment selection is determined by the requirement profile for the material. Sachtleben's specialties fulfill these specific requirements.

LOW WEAR

SACHTOLITH's low Mohs hardness avoids wear on tools and machinery. SACHTOLITH HD-S eliminates contamination of the polymer with abraded metal and metal ions.

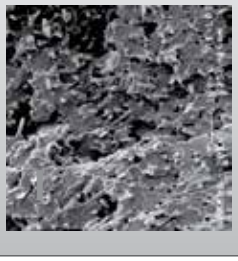
THE MOHS HARDNESS SCALE

INFLUENCE ON THE MECHANICAL PROPERTIES OF GLASS FIBER REINFORCED COMPOUNDS

GLASS FIBER

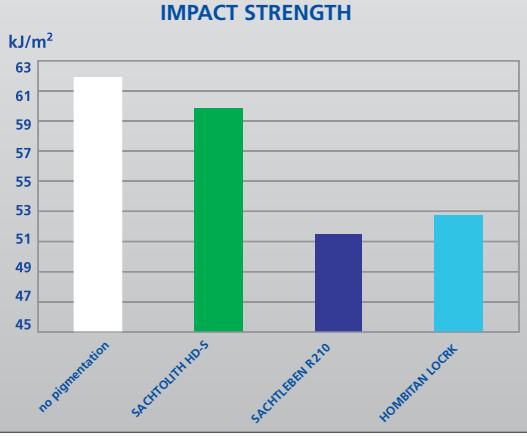
BROKEN GLASS FIBER

PP CONTAINING SACHTOLITH HD-S



PP CONTAINING TIO_2

IMPACT STRENGTH OF GLASS-FIBER REINFORCED MOULDINGS CONTAINING VARIOUS PIGMENTS



WHITE PIGMENTS – TITANIUM DIOXIDE

WEATHERING RESISTANCE

SACHTOLITH HD-S is lightfast. Glass-fiber-reinforced mouldings pigmented using SACHTOLITH HD-S offer improved weathering resistance compared to non-pigmented systems. SACHTLEBEN RD3 and SACHTLEBEN R 420 achieve maximum resistance to outdoor exposure - but, in the case of glass-fiber-reinforced systems, at the cost of impact strength.

HOMBITAN LOCRK

HOMBITAN LOCRK is a stabilized, organically and inorganically coated micronized titanium dioxide pigment of the anatase modification. It is less abrasive than rutile, and offers advantage in applications in which a bluish undertone is desirable.

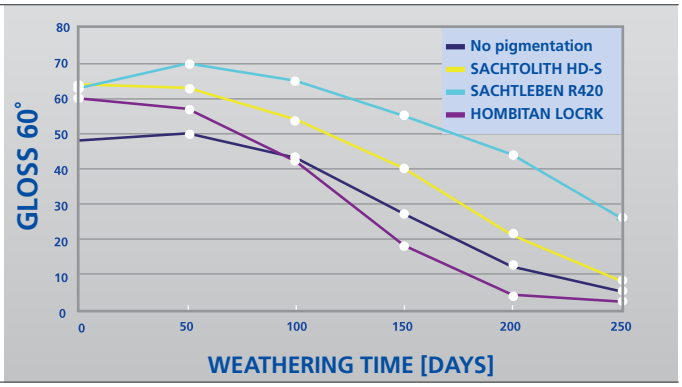
SACHTLEBEN R420, RFK3, RD3, RKB4

SACHTLEBEN R420, RFK3, RD3 and RKB4 are stabilized, organically and inorganically coated micronized titanium dioxide pigments of the rutile modification. These pigments are notable for their high whiteness and excellent dispersibility in polyester and in epoxy resins. All grades are particularly suitable for use in weather-resistant thermosets. These grades can be used either in the batch or in a gelcoat. RD3 and RKB4 can be used in all outdor systems, which are sensitive with respect to potentially migrating hydrophobic pigment coating components.

SACHTLEBEN R610L

SACHTLEBEN R610L is a high stabilized, inorganically dense-coated micronized titanium dioxide pigment of the rutile modification. It offers a very good wetting and dispersion performance. The light-fastness of SACHTLEBEN R610L is excellent. R610L is highly recommended for Aminoplast application like MF, MP or UF resin systems. Absence of any organic coating has been proven to be beneficial in order to prevent flow pattern or other stain like surface marks. Therefore SACHTLEBEN R610L is the first choice for thermosets used in electric and electronic industry, sidings, appliances or dinner ware.

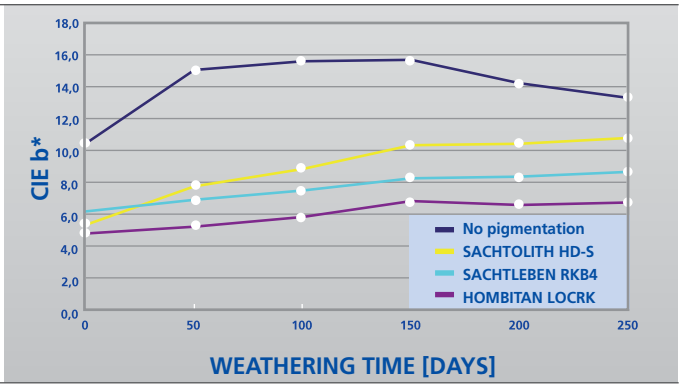
ARTIFICIAL WEATHERING (Ci65) OF VARIOUS PIGMENTS IN SMC



FORMULATION

- Polymer: Palapreg P17-02, Palapreg H814-01
- Fillers: ATH (120 phr), $CaCO_3$, (50 w-%), Glass fibers (25 w-%)
- Additive: BYK-W996, BYK P 9060, Coathylene HA 1681, Luvatol MK 35 NV

*Source: SMC project: Cooperative venture between Byk Chemie and Sachtleben Chemie



	HOMBITAN LOCRK	SACHTLEBEN R420	SACHTLEBEN RFK3	SACHTLEBEN RKB4	SACHTLEBEN RD3	SACHTLEBEN R610L
Titanium dioxide classification	A1	R2	R2	R2	R2	R2
TiO_2 content [%]	> 97	95	93	94	93	90
Inorganic treatment (compounds based on:)	Al	Al, Si, Zr	Al, Si, Zr	Al, Si, Zr	Al, Zr	Al, Si
Organic treatment	hydrophobic modified polysiloxane	hydrophobic modified polysiloxane	hydrophobic modified polysiloxane	hydrophilic polyalcohol	hydrophilic polyalcohol	–
Undertone	very bluish	neutral / bluish	bluish	neutral / warm	neutral	warm
Weathering stability/lightfastness	moderate	excellent	excellent	excellent	very good	excellent

ADDITIVES

SACHTOPERSE HU-N

SACHTOPERSE HU-N is an ultra-fine synthetic barium sulfate noted for its defined particle size of 40 nm and extremely narrow particle-size distribution.

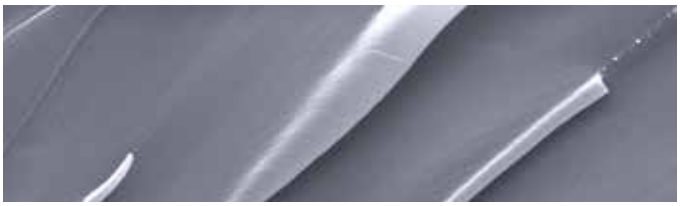
HOMBITEC RM

The HOMBITEC RM range of products consists of transparent rutile-modification titanium dioxides with a uniform crystallite size. The individual grades differ in their inorganic and organic coating.

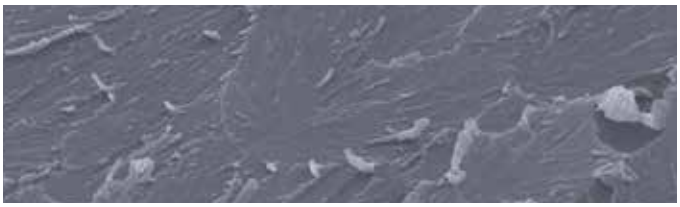
NANOCOMPOSITES

Ultra-fine additives for EP and UP resin systems open up entirely new applications for composite materials, thanks to the improved materials properties achieved in comparison to conventional fillers. Ultra-fine TiO_2 and $BaSO_4$ additives are capable of improving the mechanical properties of both EP and UP resins, including fracture toughness, without loss of these systems' transparency. Sachtleben has developed special products for these applications.

BENDING FRACTURE



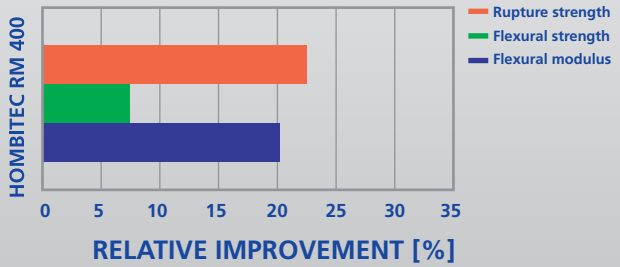
surfaces in Epilox



surfaces in Epilox with HOMBITEC RM (5 %vol.)

*Source: Cooperation with the Institute for Composite Materials, D-67663 Kaiserslautern, Germany

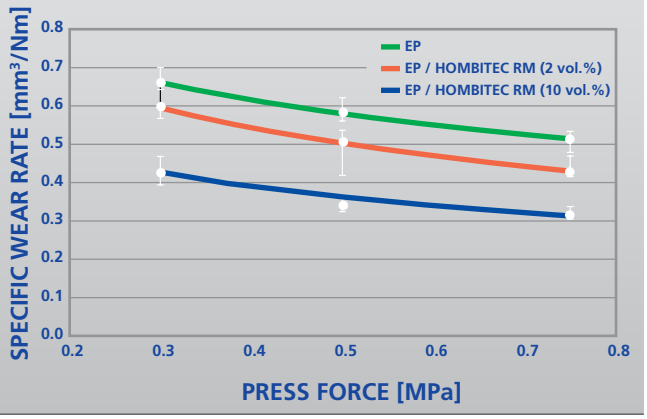
MECHANICAL PROPERTIES



FORMULATION

- Polymer: Epilox
- Fillers: HOMBITEC RM 400 [5.0 vol.%]

TRIBOLOGICAL PROPERTIES



FILLERS – SYNTHETIC BARIUM SULFATE

BLANC FIXE MICRO PLUS

BLANC FIXE micro PLUS is a synthetic barium sulfate. Thanks to its synthesis from high-purity solutions, BLANC FIXE micro PLUS is free of disruptive impurities, such as quartz, for example. In addition, BLANC FIXE micro PLUS also possesses an extremely narrow particle-size distribution permitting maximum standards for gloss. The low specific surface area and organic coating provides extremely good wettability to BLANC FIXE micro PLUS, and permits high filling levels and an increased interaction with the respective polymer, thus giving an excellent composite material.

MULTI-FUNCTIONAL PROPERTIES

BLANC FIXE micro PLUS is suitable for use in applications involving maximum demands for appearance and utility. With respect to the low refractive index, the positive properties of BLANC FIXE micro PLUS can be exploited in black systems as well without turning the black color to grey.

BLANC FIXE N

BLANC FIXE N is a synthetic barium sulfate produced from high-purity solutions in a defined growth process. It is resistant to acids and alkalis, and is insoluble in water and organic solvents. BLANC FIXE N, an inert product, is lightfast and resistant to weathering, neutral hued thanks to its low refractive index, and extremely easily wettable, due to its low specific surface area. The absence of impurities and the low Mohs hardness of barium sulfate ensure minimized abrasion during processing. As an inert neutral hued filler resistant to weathering and to chemicals, BLANC FIXE N is suitable, for example, for use in color-sensitive systems requiring long-term stability. In gloss fiber-reinforced systems it can be used to increase dimension stability withour hurting glassfibers. BLANC FIXE N is free of quartz and other very abrasive impurities.

	BLANC FIXE micro PLUS	BLANC FIXE N
$BaSO_4$ [%]	approx. 99	approx. 99
Volatiles (105° C) [%]	< 0.2	< 0.2
pH	approx. 9	approx. 9
Electrical conductivity [µS/cm]	< 300	< 250
Color coordinate L* (powder)	approx. 99	approx. 99
Median value d_{50} (sed.) [µm]	approx. 0.7	approx. 3
Sieve residue, with brush < 45 µm[1] [%]	< 0.004	< 0.01

Product Brochure
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Link to MSDS

Great Solutions with Small Particles

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