

Solutions for the Thermoset Composites Industry





BTC – your expert for composites

BTC understands the needs of the composites industry and knows how we can help our customers in all kind of applications. Our solutions for thermoset composites cover the major ones like unsaturated polyester, epoxy, polyurethane, acrylics and UV systems. Our broad technology base of formulation and performance additives, vinyl and acrylic monomers, resins and colourants help enable performance-driven solutions. All kind of thermoset composites requirements, from aerospace to transportation, automotive, energy, sports and military are covered.

Products for the Composite Industry

Formulation Additives

Formulation additives impart the optimization of thermoset composites properties by enhancing adhesion, rheology and wetting abilities. BTC's formulation additives for the thermoset composites comprise of air release agents, wetting and dispersing agents, flow and levelling agents and slip agents.

Air Release Agents

Air release agents improve the air-release behaviour of the compound first by eliminating air bubbles, secondly by preventing the formation of air-bubbles and by enabling the air bubbles to rise to the surface and collapse.

Low to Medium Molecular Weight Dispersants

The use of wetting and dispersing agents results in increased filler or pigment loading, reduced viscosity and improved flow behaviour, increased colour strength and a stable dispersion of the compound.

High Molecular Weight Dispersants

The use of polymeric dispersants results in increased pigment loading and reduced viscosity while improving the flow behaviour, increased colour strength and a stable dispersion compound.

Substrate Wetting Agents and Surface Modifiers

Wetting agents and surface modifiers are often used in the composite industry to prevent surface defects during the application of the compound or to optimize the profile of the dry surface. They influence levelling, flow and spreading.

Performance Additives

Performance additives assist organic substrates such as composites which are exposed to a variety of environmental and artificial factors like radiation, humidity, temperature change, microbiological attack, air pollution and more.

Vinyl Monomers for Styrene Reduction

Styrene reduction is an important topic in the composite industry; vinyl monomers can replace a part of it by up to 20 %. Formulators need to balance between the different vinyl monomers of the range by mixing them to obtain the properties expected. Vinyl monomers are used in unsaturated polyester glass fibre reinforced, artificial marble and gelcoat.

Resins for thermoset composites

Thermoset composites consist of a matrix, the thermoset resin and reinforcements. Thermosets are reactive systems like unsaturated polyester, epoxy, polyurethane, acrylics and UV systems. For all types of thermoset composites BTC provides the appropriate solution.

Colourants

From solar heat management to eco-friendly lead replacement technologies, our organic and inorganic pigments and dyes help you meet your functional and environmental aims without compromising technical performance. They can also be used to create a variety of eye-catching aesthetic effects.

Formulation Additives for the Composite Industry

Technical information and features

Air Release Agents

Applications	Unsaturated Polyesters					Epoxies					Features
	Gelcoat	Pultrusion	SMC/BMC	Casting	Laminating	Putties	Gelcoat	Pultrusion	Casting	Laminating	

Air Release Agents free of Silicone

Efka® PB 2720	■	■	□		■	■		■		■	■	Most efficient air release agents combined with broad applicability. Suitable for pigmented compounds
Efka® PB 2020	■	■		□	■	□	■				■	Brings fast de-aeration while increasing wetting (e.g. towards fibres), even in viscous compounds
Efka® PB 2050	■	■		□	■	□	■		■	■	■	Contributes to fast de-aeration in a large number of thermosetting systems including reinforced mats
Efka® PB 2010	■	□		□	□		■	□	□	□	■	Most suitable air release agent for transparent systems up to medium thicknesses
Efka® PB 2001	■	■		□	□	□	■		□			Brings fast de-aeration even in viscous compounds
Efka® PB 2744	□	■	■	■	■	■	■	■	■	■	■	Ultra Low VOC de-aerator with excellent and fast performance against micro and macro foam

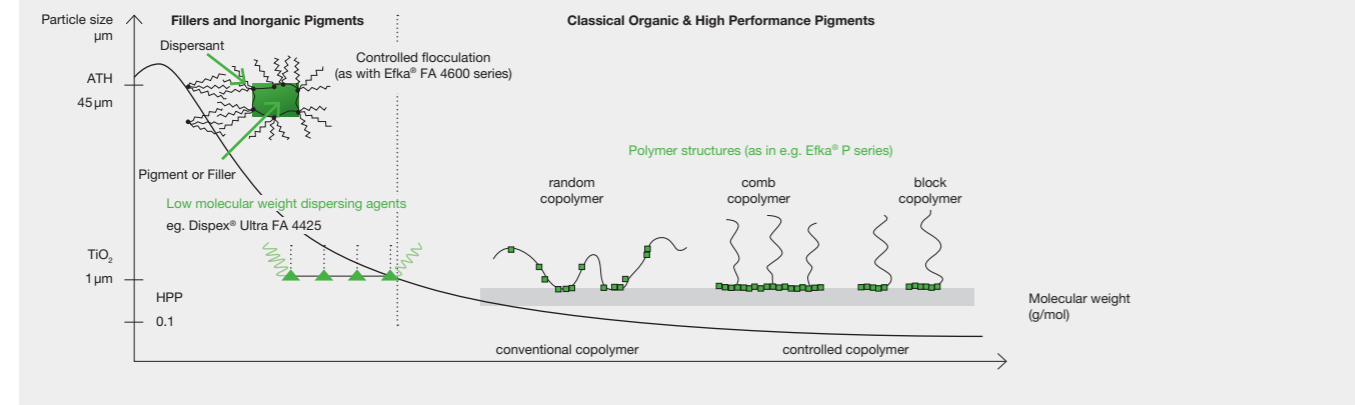
Silicone-based Air Release Agents

Efka® SI 2009	□		■	■		■	■		■		■	Designed to perform in 2-pack transparent systems
Efka® SI 2040				□	□	□			□	■	□	Designed for ambient cured systems and low shear forces
Efka® SI 2722				□	□	■	■	■	■	■	■	Efka® SI 2722 can be used in pigmented or non-pigmented resin systems
Efka® SI 2723				□	□	■	■	■	■	■	■	Low odour version of Efka® SI 2722

■ excellent □ good

Wetting and Dispersing Agents

Guidance for dispersing and wetting of pigments and fillers



■ excellent □ good

Low to Medium Molecular Weight Dispersants

Applications	Unsaturated Polyesters					Epoxies					Active Ingredients (%)	Features	Filler Loading	
	Gelcoat	SMC / BMC	Pultrusion	Casting	Laminating	Putties	Gelcoat	Pultrusion	Casting	Laminating				Flooring / Lining
Efka® FA 4644	■	□			■		■					52	For fillers such as ATH or CaCO ₃ . Antisettling properties are inherent	100–150 phr
Efka® FA 4647	■	■	■				□	■	■		□	80	For fillers in fiber-reinforced thermosetting systems. Antisettling properties are inherent	100–150 phr
Efka® FA 4665		■	■									52	For fillers and inorganic pigments. Prevents settling and colour separation. Antisettling properties are inherent	ca. 150 phr
Efka® FA 4666	□	■	■	■	■		□	■	□	□	■	52	For fillers and inorganic pigments. Prevents settling and colour separation. Efka® FA 4666 can be used in pastes. Antisettling properties are inherent	ca. 150 phr
Efka® FA 4610	□	■	■	■	■	□			■			50	Standard choice for fillers and inorganic pigments (e.g. 200 phr of CaCO ₃). Antisettling properties are inherent	> 170 phr
Efka® FA 4611		■	■	■	■		□	■	□	■	□	100	Improves capacities over a standard choice such as Efka® FA 4610. For inorganic pigments and extenders such as talc, ATH. Antisettling properties are inherent	> 200 phr
Efka® FA 4612		■	■	■	■		□	■	□	■	□	100	Improves capacities over a standard choice such as Efka® FA 4610. Antisettling properties are inherent	> 170 phr
Efka® FA 4620	■	■	■		■	■	□	■	■	■	■	100	For inorganic pigments and fillers in cobalt catalyst free compounds. Able to wet 275 phr of ATH. Same anchoring group as Efka® FA 4612. Antisettling properties are inherent	> 170 phr
Efka® FA 4672	■	■		□		■	■		■		■	100	For inorganic pigments and extenders such as talc, ATH and quartz	> 170 phr
Dispex® Ultra FA 4420	■	□		□	■	■	■					100	Increases colour acceptance of inorganic colours	100–150 phr
Dispex® Ultra FA 4425	■	□			■	■	■					100	Increases colour acceptance and reduces floatation	100–150 phr
Dispex® Ultra FA 4431	■	■	■	■	■	■	■		■	□	■	100	For fillers. Possible fluidizing by post addition	100–150 phr

■ excellent □ good

High Molecular Weight Dispersants

Applications	Unsaturated Polyesters		Epoxy		Features	
	Gelcoat	Pultrusion	Gelcoat	Pultrusion		
Polyurethanes						
Efka® PU 4009			□		□	Stabilizes TiO ₂ and standard organic pigments as found in our Irgalite® range
Efka® PU 4010	□	■		■	□	Stabilizes TiO ₂ , matting agents and usual organic pigments. Improves anti sag resistance in UPE
Efka® PU 4047	■					Stabilizes inorganic and organic pigments such as our Heliogen® Blue and Green and carbon black pigments
Efka® PU 4050	■		□		■	Stabilizes all kinds of pigments and is particularly effective with pigments such as our DPP reds
Efka® PU 4061	■		■		□	Stabilizes TiO ₂ , matting agents and usual organic pigments
Efka® PU 4063	■		■		□	Stabilizes all kinds of pigments and is particularly effective with red pigments such as our DPP reds
Polyacrylates						
Efka® PX 4401	■		□		■	Conventional for all standard inorganic and organic pigments in high quality systems
Efka® PA 4402	■		□		■	Conventional for all standard inorganic and organic pigments (e.g. Irgalite® range); suited for colourants (higher pigment loading)
Efka® PX 4300	■		■		■	Efka® PX 4300 is a controlled polymer for the use against flooding, floating and flocculation in high quality systems and difficult organic pigments
Efka® PX 4340	■					Controlled polymer with higher efficiency towards pigment stabilization and viscosity reduction. Specific of high performance organic pigments (e.g. Paliotol®, Cromophtal®, Irgazin®)

■ excellent □ good

Product Highlight: Efka® PU 4061

Efka® PU 4061 provides excellent effects as an anti-separation additive to prevent phase separation between the unsaturated polyester (UP) resin and the LS/LP component

Substrate Wetting Agents and Surface Modifiers

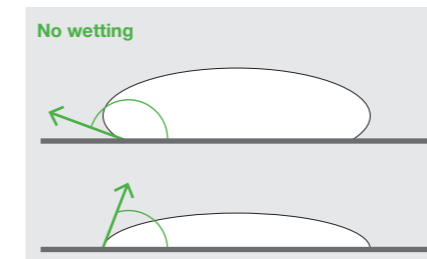
Applications	Unsaturated Polyesters		Epoxy				Active Ingredients (%)	Features	
	Gelcoat	Laminating	Gelcoat	Laminating	Pultrusion	Casting			
Modified Polysiloxanes									
Efka® SL 3031			■	■	□	■		52	Slip & levelling agent with good substrate wetting and anti-cratering properties
Efka® SL 3033	■	■	■		□	■	■	15	Slip & levelling agent with good substrate wetting and anti-cratering properties
Efka® SL 3035	■							52	Levelling agent with moderate slip
Efka® SL 3200	■	■	■	□	□			100	Solvent-free slip and levelling agent with a strong reduction of surface tension
Efka® SL 3236			■		■	■		100	Slip & levelling agent with additional air release effect
Fluorinated Polyacrylates									
Efka® FL 3277	□	■	□	■	■	■	■	100	Provides additional substrate wetting as well as anti-cratering over straight polyacrylate additives
Straight Polyacrylates									
Efka® FL 3778	■	■	■	■	■			70	Brings levelling without slip, supports well the action of air release agent Efka® PB 2720
Efka® FL 3785	■	■	□	□	□		□	50	Brings levelling, no slip and contributes to de-aeration
Efka® FL 3740	■	■	■	■	□		□	100	Flow agent with higher de-aeration properties to the Efka® FL 3741
Efka® FL 3741	■	■	■	□	□			100	Highly compatible flow agent with additional air release effect

■ excellent □ good

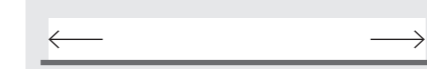
Substrate Wetting

Main factors

- Surface tension of the compound
- Surface tension of the substrate



Complete wetting

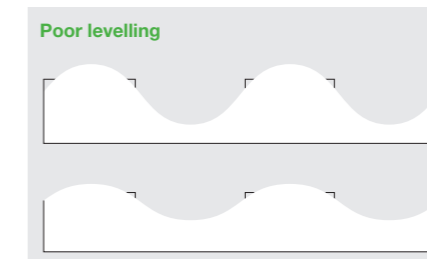


Poor wetting can cause fish eyes, craters, low fiber wetting

Levelling

Main factors

- Rheology of the compound
- Surface tension of the compound



Complete levelling

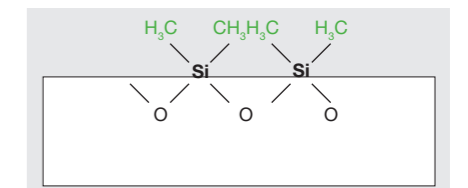
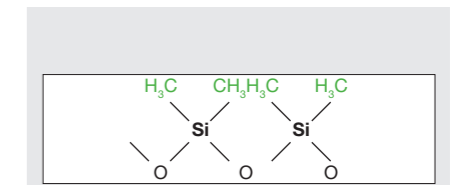


Lack of levelling can induce wrinkling, alligating, pinholes

Slip

Main factors

- Placement on the surface of the compound
- Chemistry of the additive



A default of such chemistry supports adhesion / painting in moulding

Composite Performance Additives

Technical information and features

Light Stabilizers and Hindered Amine Light Stabilizers (HALS)

Products	Chemical Nature	Features
Chimassorb® 81	Benzophenone	UVA light stabilizer, used for mass stabilization of gelcoat
Tinuvin® 328	Benzotriazole	UVA light stabilizer, used for low to medium performance applications
Tinuvin® 171	Benzotriazole	Liquid UVA light stabilizer for low to medium performance applications
Uvinul® 3035	Cyano-Acrylate	UVB light stabilizer, initially transparent, perfect synergy with TiO ₂ compound
Tinuvin® 5060	Benzotriazole/ NOR HALS blend	Light stabilizer blend for solvent based oxidative curing coatings
Tinuvin® 400	Triazine	High performance UVA light stabilizer, UV curing and multipurpose applications
Tinuvin® 123	NOR HALS	Non-basic HALS especially for acid-catalyzed and UV curing coatings

Thermal Stabilizers

Products	Chemical Nature	Features
Irganox® 1010, Irganox® 1035, Irganox® 1076, Irganox® 245, Irganox® 3114	Phenol	Primary antioxidant, for solvent and solvent-free coatings
Irgafos® 126, Irgafos® 168	Phosphite	Secondary antioxidant, for solvent and solvent-free coatings

Miscellaneous

Products	Chemical Nature	Features
Melapur® MP	Melamine Cyanurate	For fire-retardant coatings
Melapur® MC	Melamine Phosphate	For fire-retardant coatings
Melapur® 200	Melamine Ployphosphate	For fire-retardant coatings
Tinopal® OB CO	Benzoxazole-based	Optical brightener, used in solvent and solvent-free coatings
Efka® IO 6782	Ammonium Salt-based	Anti-static agent usable during process

Vinyl Monomers for Styrene Reduction

Technical information and features

Products	Chemical Nature	Features
DVE-3	Triethyleneglycol Divinyl Ether	Increases flexibility; DVE-3 is labelling free
CHDM-di	1,4 Cyclohexanedimethanol Divinyl Ether	Increases surface hardness, heat and chemical resistance, high added value formulation
HBVE	Hydroxybutyl Vinyl Ether	Increases flexibility; cost-effective formulation
BDDVE	ButaneDiol DiVinyl Ether	Good properties/price balance

Composites Resins

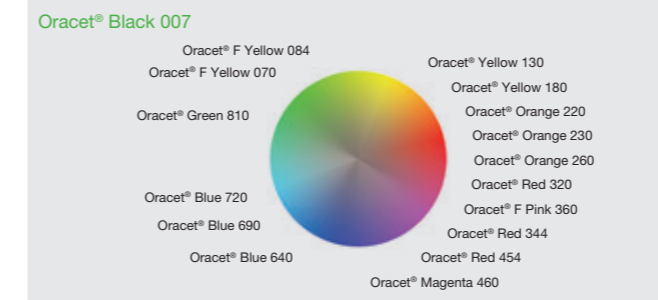
Technical information and features

Products	Chemical Nature	Features
Laromer®	UV monomers and oligomers	For Styrene emission reduction and 100% UV system composites
Laropal®	Aldehyde cetic resins	For composites pigment pastes production
Laromin®	Alicyclic polyamine	Hardener for epoxy composites
Sovermol® Basonat®	Biobased Polyol IPDI / HDI polyisocyanates	For PUR composites

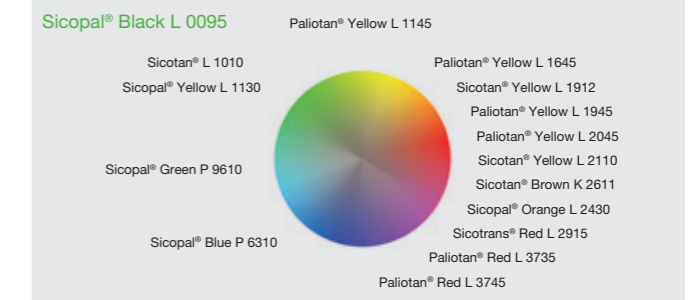
Composite Colourants

Technical information and features

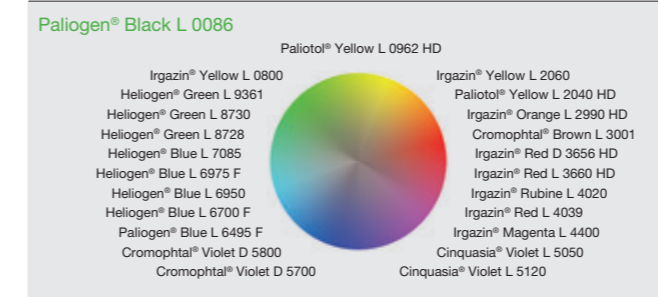
Soluble Dyes



Inorganic Pigments



Organic Pigments



Our expertise – your success. Our strengths lie in our knowledge of the industry, based on many years of experience, and our proximity to our customers.

BTC belongs to the world's leading chemical group, BASF – We create chemistry.

BTC is BASF's European sales organization for speciality chemical distribution. The company's eleven regional sales offices supply customers from numerous industry sectors all over Europe with about 6 000 high-quality chemicals and specialities.

Making sure that our customers benefit from a single contact person and one-stop service, we develop tailor-made solutions together with them. They also profit from the unique advantages of the BASF Verbund in terms of logistics and product availability and from the individual service provided by our local contacts.

Successful together

Customers from different industries have different requirements and needs. The fact that we focus fully on the specific expectations of each individual customer allows us to produce tailor-made service packages for our clients. This also includes complementing the innovative BASF products with those of selected suppliers. At your request, we will also support you in all laboratory and application-related questions.

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We offer to the **Composites Industry** more than **200 products** in more than 20 countries in Europe.



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