



## Polymer additives

■ Antioxidants	2
■ UV Absorbers	2
■ HALS (Sterically Hindered Amines)	2
■ Process and heat stabilisers	2
■ The stabilisation of polymer recyclates	3
■ Antistatic agents	3
■ Flame retardants	3
■ Nucleating agents	3
■ Slip agents	3
■ Optical brighteners / Fluorescence indicators	3
■ Organic pigments	4
■ Effect pigments: pearlescent, fluorescent and metallized pigments	4
■ Plasticizers	5
■ Antimicrobials	5
■ Hydrophilic additives	5
■ Catalysts	5
■ Photosensitive additives	5
■ Multi-component additive packages	6
■ Processing aids and surface modifiers	6
■ Wax and surface control agents	6
■ Wetting and dispersing agents	6
■ Viscosity depressants	6
■ Conductivity agents	6
■ UV filters	7
■ Mineral fillers	7
■ Calcium carbonates	7
■ Dolomite	7
■ Kaolin	7





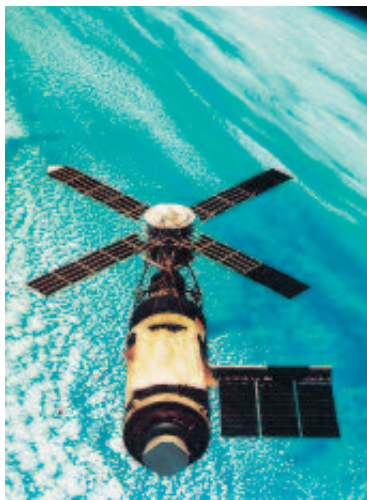
## Light protection for plastics

With our light stabilisers, we offer the right solution in order to protect plastics from damaging ultraviolet rays. The UV radiation contained in the sun light is energy-richer than visible light and provokes a photochemical degradation by polymers. Our wide range of UV stabilisers provides a high-efficient protection against light damages by a large variety of polymers. TINUVIN® and CHIMASSORB® are market leaders for almost all plastic systems. Our product range comprises UV stabilisers on the basis of benzophenone, benzotriazole, triazine and also sterically hindered amines (HALS).

## UV absorbers

UV absorbers are used to protect plastics or substrates from becoming brittle, discoloured or cracked through solar radiation. They absorb the harmful UV rays in a waveband range of 290-400 nm and convert this light energy into harmless heat.

TINUVIN®	UV absorbers
CHIMASSORB®	UV absorbers
SHELFLPLUS®	UV absorbers



## Process and heat stabilisers

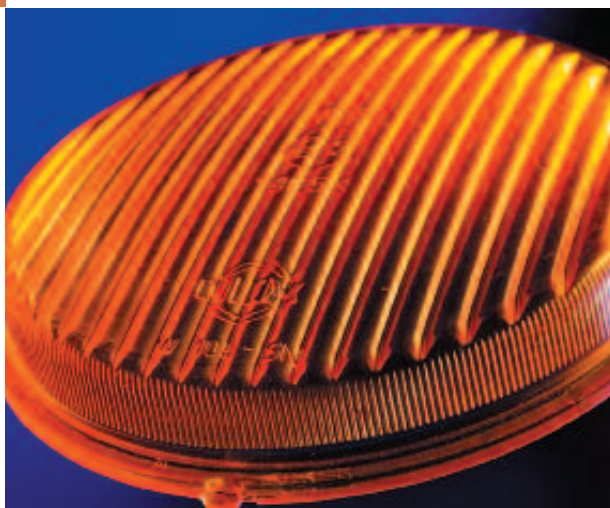
These stabilisers have the function to prevent unwanted premature polymerization and also any thermal decomposition of the polymer during processing. Heat stabilisers are, for example, among the obligatory additives in the processing of PVC. They give the PVC sufficient heat-stability for its treatment and provide the finished article with the required resistance to ageing during its life in use. Bodo Möller Chemie offers a carefully selected and versatile range of products for the stabilization of plastics. We are happy to advise you on which stabiliser system will best fulfil the operational requirements of your plastics application.

IRGASTAB®	Process- and heat stabilisers
FIBERSTAB®	Process stabilisers
IRGANOX®	Process- and heat stabilisers
IRGAMOD™	Process stabiliser for PET
IRGAFOS®	Phosphite process stabiliser
Baerostab®	PVC stabilisers (Lead based stabilisers, mixed metals, tin stabilisers)
Baeropan®	Stabilisers / Lubricant-one-packs

## Antioxidants

Our antioxidants protect plastics from oxidative damages, which arise from the effect of aggressive oxygen molecules, also known as free radicals. In numerous applications, for example in polyolefins, these products prevent decomposition and/or discoloration by halting chain-reactions and giving off electrons themselves, without turning into aggressive molecules.

IRGANOX® Antioxidants



## HALS (sterically hindered amines)

The maximum possible protection against the ageing process triggered by radicals, is provided by the synergistic combination of UV absorbers and oxygen stabilisers in one package. In combination the protective effect is even better than the total protection afforded by the individual components. Our range of oxygen stabilisers includes products for use against carbon radicals (HALS) and also against oxygen radicals (antioxidants).

TINUVIN®	HALS (sterically hindered amines)
CHIMASSORB®	HALS (sterically hindered amines)





## The stabilisation of polymer recyclates

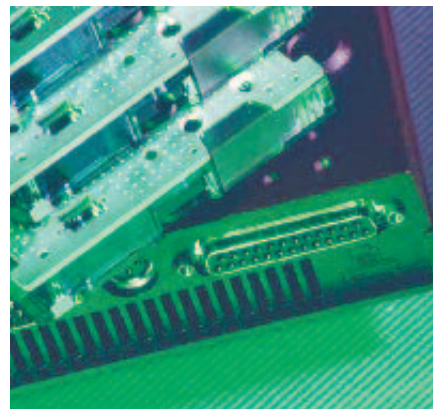
In recent years the recycling of plastics became more and more important. Altered legislative requirements, improved recycling techniques and the widespread installation of systems for separating high grade refuse, mean that the demand for recyclates will increase. For recyclates, the appropriate form of stabilisation depends on the composition of the material and on the degree of prior damage it has suffered. We are happy to advise you on all these questions.

- Recyclostab® Blend of antioxidants, co-stabilisers and aids to treatment
- Recyclosorb® UV stabilisers and base-stabilisers for polyolefins
- Recycloblend® Stabilisers for plastics with dye and paint residues

## Antistatic agents

So watch out when kissing in dry winter air – you run the risk of a short-circuit! In technical situations electrostatic discharge can cause severe impairment to polymers and serious risks. For example, heavy staining of plastic surfaces can occur, or production can be disrupted. One of the greatest dangers lies in the creation of sparks through a strong discharge with a consequent ignition of dust or solvents mixed with air, which time and again leads to severe explosions. Antistatic chemical aids prevent such electrical discharges. For example, the bonding of water molecules can conduct the charge better.

- IRGASTAT® Permanently active antistatics



## Flame retardants

Flame retardants are specialised chemicals, which can be added to a wide variety of materials in order to increase their non-flammability. Since many plastics are more or less easy to ignite, and since the use of plastics is growing, efforts are globally increasing to equip plastics as far as possible with anti-flammable agents. Experience of disastrous fires and an increased environmental awareness have led to the abandonment of certain halogen and bromide compounds. To provide a system solution, which promises the best possible fireproof qualities and at the same time the highest safety standards, we are marketing MELAPUR® Melamine Derivate.

- MELAPUR® Melamine-based flame retardants
- FLAMESTAB® Flame retardants combined with light protection
- TINUVIN®FR Flame retardants for polyolefins

## Nucleating agents

Ever since conventional nucleating agents were introduced for the first time in the 1960s, they have played a crucial role as additives, for example in the processing of polypropylene (PP). Through the addition of nucleating agents, the crystallinity and crystal structure are influenced in order to achieve higher translucency. Nucleating agents known as "clarifiers" are soluble in the melting process so as to achieve a nuclear density that is many times higher.

- IRGASTAB® NA Nucleating agents
- IRGACLEAR® Clarifier nucleating agents



## Slip agents

Slip agents are provided to assist the processing of thermoplastics. They improve the property of fluidity and inhibit clinging to the walls of the machines with which the melt comes into contact. As well as improving fluidity, lubricators also develop positive additional properties and serve to support other additives. We are happy to advise you on choosing the correct lubricator.

- IRGALUBE® Lubricators

## Optical brighteners / Fluorescence indicators

An optical brightener is an enhancing agent intended to reach a higher whiteness. It is a chemical compound with fluorescent properties, which are introduced into plastics like dyes and thus produce a more intense white. An additional area of use is as a fluorescence indicator for a wide variety of materials and applications.

- Tinopal® Optical brighteners





## Organic pigments

Not only our CROMOPHTAL® DPP red pigments have set standards on the plastics market, but also the IRGALITE®, IRGAZIN®, and CINQUASIA® ranges offer a wide variety of colours for numerous plastic applications. Our MICROLEN®, FILOFIN®, MICRANYL®, ORACET®, FILAMID® and FILESTER® ranges enable a new dimension of transparent and opaque colours for packaging, household goods and toys, that can be perfectly aligned with the designers requirements. Our pigments can be used in polypropylene fibres and in high transparent plastic applications, for pastel-coloured in formulations with titanium dioxide and in combination with effect pigments.

CROMOPHTAL®	Organic pigment powder
IRGALITE®	Organic pigment powder
IRGAZIN®	Organic pigment powder
CINQUASIA®	Organic pigment powder
MICROLEN®	Organic pigment powder
FILOFIN®	Organic pigment powder
MICRANYL®	Organic pigment powder
ORACET®	Organic pigment powder
FILAMID®	Organic pigment powder
FILESTER®	Organic pigment powder

## Effect pigments

### Pearlescent pigments

XYMARA™ pearlescent effects undergo a special surface treatment to stabilize the pearlescent pigments, stopping the yellowing of plastics and thus enhancing the appearance and also the lifetime of numerous objects. Decorative pearlescent pigments can reproduce on plastics the special shine and colours of natural pearls or of metal. By changing the particles size it is possible to match exactly with the customers' requirements: small particles generate a smooth, silky glimmer while bigger particles generate noticeable glitter effects. Our range of pearlescent effects includes: XYMARA™ Silver Pearl, Gold Pearl, Dual Pearl, Bronze Pearl und XYMARA Nordic™.

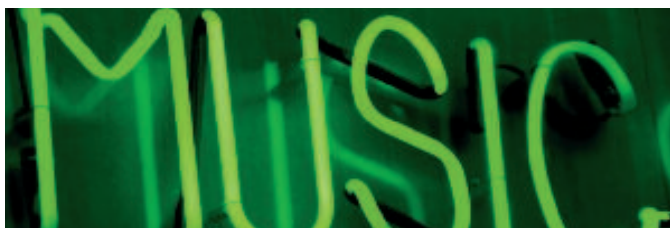
XYMARA™ Pearlescent pigments



### Metallized pigments

The METASHEEN® metallized pigments enable to get a large scope of luminescent, sparkly and reflective effects. Manufacturers and designers both benefit of the broad spectrum of possibilities and can satisfy the market's wishes to have more brilliant and shinning colours in plastics.

METASHEEN® High brilliance silver Aluminium effect pigment



### Fluorescent pigments

Fluorescent pigments for luminescent paints change through fluorescence the blue and UV domain of the day light in light of bigger wavelength. Typical colours for this are blue-green, yellow and red. Especially by bad weather and by dawn, when the proportion of blue in light is the highest, we can obtain bigger contrasts. Our RADGLO® fluorescent pigments are used in lacquers, dispersions and plastics.

RADGLO® Fluorescent pigments



## Plasticizers

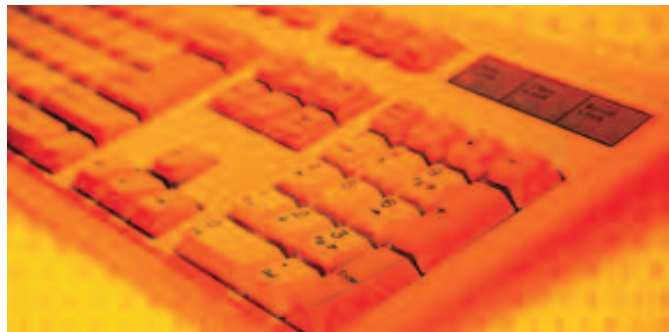
The epoxidizing of vegetable oils, that is to say the conversion of vegetable oils to oleochemical products – especially of soya oil – is a well-known technical process. Oils that have been epoxidized in this way are used as softeners in PVC. In addition, these substances also have a very beneficial co-stabilizing effect, chiefly when used in PVC. Epoxidized oils are increasingly being tested as plasticizers in other plastic applications. Epoxidized sunflower-, sugarbeet-, linseed- or soya-oils are renewable raw materials and therefore represent an environmentally friendly alternative.

Baerostab® Epoxidized vegetable oils

## Antimicrobials

The IRGAGUARD® products are an effective method of protecting plastic products against unwanted growth of micro organism such as algae, bacteria and fungi. IRAGUARD® is suitable for use in a wide variety of plastic materials such as plastic foils and sheets, moulded plastic parts, paints and laminates, adhesives and sealants for specific applications. Other applications in which the end product can be protected are artificial fibres for clothing and for industrial and household products.

IRGAGUARD® Antimicrobials

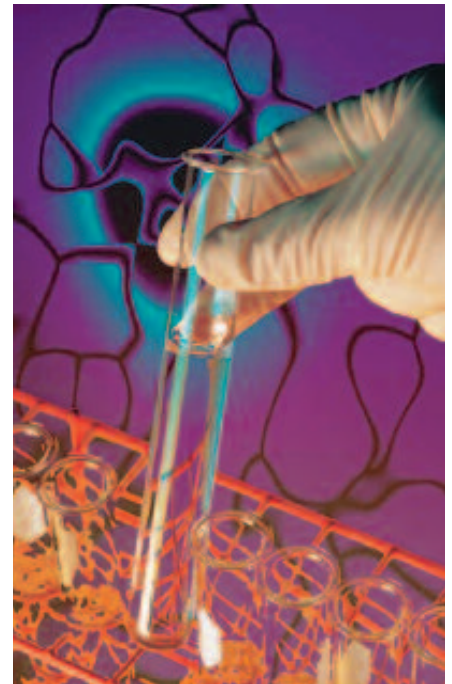


## Catalysts

Baerostab® catalysts have been developed for polyurethanes (PU), for example for flexible foam materials and other PU products, as well as for silicon products and for esterization applications. Over the last few years Johnson Matthey developed a technology platform that creates a different family of catalysts for polyurethane CASE and selected microcellular foam applications. These products are able to outperform the current catalysts available in the market, were it is the need for because on European regulations. In particular, the SNAPCURE™ 2000 series of fully water stable catalysts formulated for mixing with the Polyol. We have helped our customers to substitute Mercury-based catalysts in the elastomers area, delivering a unique product 100% environmentally friendly, based on titanium, which are able to mimic and in some cases exceed the heavy metal catalyst performances. In microcellular foams we helped our customers to substitute the tin-based catalysts with an environmentally friendly catalyst, able to reduce the density of the foam from 0,4 kg/m<sup>3</sup> to 0,297 kg/m<sup>3</sup>. In the pre-polymer production we could help our customers to substitute a tin-based catalyst with an environmentally friendly highly selective titanium based catalyst, able to deliver a pre-polymer with reduced allophanate formulation.

Baerostab® PU catalysts

SNAPCURE™ 2000 Heavy metal free organic titanium catalysts



## Hydrophilic additives

IRGASURF™ is described as the leading integrated surface modifier for polypropylene fibres. Its durability makes it an attractive solution in numerous applications. The surface modifier is a durable hydrophilic additive, which is integrated in polyolefin fibres and fleecy fabrics and gives these a durable, moisture-proof surface effect.

IRGASURF™ Hydrophilic additive



## Photoselective additives

The Smartlight™ range of products has a new photoselective additive for agricultural plastic coverings. This can help to foster the growth of certain flowers. The luminescent red additive shifts the UV portion of the total spectrum towards visible light, which is then used by the plants in photosynthesis. This is a natural method of improving agricultural productivity.

Smartlight™ Additive for promoting photoselective processes



## Multi-component additive packages

In close co-operation with our partner PolyAd Services we offer solutions for additive incorporation problems - customized to your formulation and regardless of the additives you are using or the supplier you've chosen. Your additive formulation is the basis for our service. Our solutions are supplied via a uniform blend of your formulation - in an easy-to-handle and dispersible product form.

PolyAd® Customized Additive Blends



## Processing aids and surface modifiers

The products of the Ciba® EFKA® 8000 range are utilised in the plastics industry as processing aids and surface modifiers. Viscosity depressants facilitate the processability of plastisols, surface modifiers improve scratch resistance, matting agents enhance the matt appearance of surfaces and the soft-touch feeling. Wetting and dispersing agents improve dispersibility and enable filler or pigment loading to be increased. They also help to reduce viscosity and improve flow behaviour, increase colour strength and allow a stable dispersion of the solid particles.

## Wax and surface control agents

Ciba® EFKA® 83 range of products modify product properties in many ways. They reduce surface tension, improve levelling and enable better substrate adhesion. The final product has excellent slip and anti-sticking properties; it facilitates the handling and the transport. The de-aeration behaviour during the processing operations leads to an amelioration of the final product.

Ciba® EFKA® 83 range



## Wetting and dispersing agents

Optimal wetting and dispersing of organic and inorganic pigments and fillers are essential for a stable high quality of plastics. The 84 and 85 ranges target these properties and improve flow behaviour. In the case of pigments these products improve the colour strength. These agents also enable filler or pigment loading to be increased. Special dispersing agents have been designed for the PVC industry to facilitate the use of fillers which has positive consequences on the processing parameters.

Ciba® EFKA® 84 and 85 ranges

## Viscosity depressants

Viscosity depressants are designed for use in PVC plastisols (unfilled or lightly filled). They enhance the handling and processability of PVC plastisols by lowering the viscosity and improving the de-aeration behaviour.

Ciba® EFKA® 86 range



## Conductivity agents

Ciba® EFKA® 8660 increases the conductivity in elastomers (polyurethane foams) and thermoplasts (polyesters). This permanent conductivity leads to a reduction of the electrostatic structure of the component and of the associated potential danger.

Ciba® EFKA® 8660 range





## UV filters

UV filters have been specially developed to protect the contents of packaging. This means that the shelf-life of products can be significantly prolonged. SHELFPLUS™ UV provides good stability in processing and, particularly for transparent packaging, can be regarded as a broad-band protection against UV radiation. Areas of application range from the packaging of personal care and cleaning products to that of food and drinks.

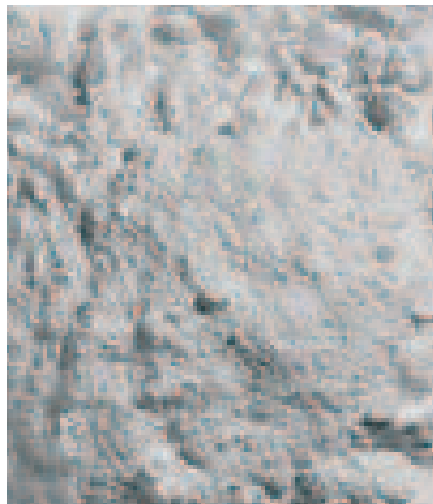
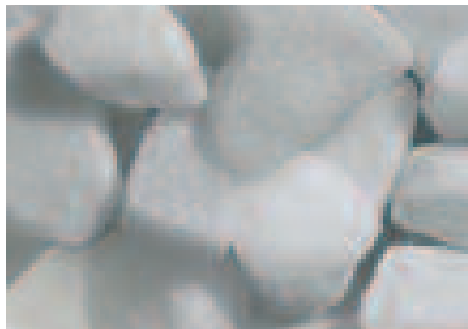
SHELFPLUS™ UV UV filters

## Mineral fillers

### Calcium carbonates

Calcium carbonates are composed of the crystalline mineral, calcite, which occurs naturally in the form of chalk, limestone or marble. Calcium carbonate is the most significant filler nowadays and one of the most widespread binders on earth. Calcium carbonates are used in many plastic applications in order to ameliorate the mechanical, rheological and optical properties. Calcium carbonates can be processed by crushing and fractionation to suit almost all applications. Some product forms undergo a surface treatment with a stearate ameliorating the processing and the dispersion. A good dispersibility and a high degree of whiteness combined with positive mineral properties make the use of calcium carbonate as ecological filler inoffensive. It suits perfectly to applications in plasters, adhesives, PVC, polyolefins, lastomers and thermosets.

Carbital™	Calcium carbonate on the basis of chalk and marble
Polcarb™	Calcium carbonate on the basis of chalk
Feriplast	Calcium carbonate
ImerCarb™	Coated and uncoated calcium carbonate
Micronic™	Micronized calcium carbonate
Queensfil™	Special calcium carbonate
ImerSeal™	Special calcium carbonate



### Dolomite

Dolomite is a calcium magnesium carbonate. Its colours reach from white, grey, yellowish to red brown. The colour red brown is a sign of strong alteration. Dolomite is composed of calcite and fine grained sediment. It is used as filler in plastics and paints. The construction materials industry uses it as additive for wet mix aggregate, as filler for bitumen and concrete, as bulking material and filler for plasters, road construction materials and cement row materials.

### Kaolin

Calcined kaolins are produced by heating natural kaolin (China Clay) to high temperatures (ca. 1000°C). They are used as fillers in the plastic industry and also in rubbers, sealants and adhesives. Fully calcined kaolin can be coated with silane in order to obtain a surface that chemically bounds with the polymer. Due to its properties like a high chemical resistance, kaolin has many special applications.

PoleStar™	Calcined kaolins
Argical	Calcined kaolins
MetaStar	Metakaolin





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