

Additives for PVC Applications

BÆRLOCHER



Additives worldwide for your success



Additives play a crucial role in determining processing properties as well as product quality and character. The Baerlocher Group of Companies is one of the leading suppliers of additives for the plastics industry and looks back on a history of over 190 years. The family-owned group employs more than 1000 employees in its production sites and joint ventures which are strategically located around the globe in all key markets for plastics processing.

www.baerlocher.com

Baerlocher is your global partner for all PVC processing with consistent leading edge technology for sustainable solid Calcium-zinc and Calcium-organic stabilizer systems serviced locally from world-class production sites in many user-friendly forms.

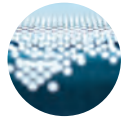
Metal stearates, integral as the raw materials for Calcium-based stabilizers and fundamental acid scavengers for the production of polyolefins serve as the backbone of our Special Additive portfolio. Combining Baerlocher's proprietary resin stabilizer technology with lubricants and additional functional additives, Baerlocher supplies sustainable solutions for plastics and rubber as well as innovative solutions for the construction and lubricant industries.

Additives for PVC Applications



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Baerlocher is known as a leading producer of additives developed for the processing of and to determine the properties of a variety of different polymers. The company provides solutions for window profiles, pipes and fittings, cables, floorings, foils and films, and many more applications – its focus is on offering a wide range of innovative additives that meet the highest requirements in terms of efficiency, sustainability and quality of the final product.

With its global reach and long experience in the plastics industry, Baerlocher individually develops tailor-made solutions supported by state-of-the-art laboratories combined with local technical service personnel to support its customer's needs. Experience and knowledge are the key additives of our service.

Baerlocher products

BAEROPAN **BAEROCID**
BAEROSTAB **BAEROCIN**
BAEROPOL **CEASIT**
BAEROLUB **ZINCUM**
BAEROPHOB

Technical service creates value

Additives and worldwide service

Baerlocher's technical service takes care of the customers' needs and transfers our research results to the various markets. Furthermore, we individually develop tailor-made solutions with our customers, combining experience and knowledge. Our technicians' toolbox helps support many related industries such as producers of machinery, tooling and raw materials and is backed by well-equipped application laboratories. Experience and knowledge is shared throughout our Technical Service groups worldwide.





Improving processability and quality



On-site analysis

An expert from our worldwide technical service team comes to your plant and analyses the local requirements. Depending on the formulation in use, raw materials, machinery, tooling system and the needs for the final product the specification for a new BAEROPAN is set.



Worldwide team expertise

Our data base offers a wide portfolio of high performance additive blends which act as a starting point for every tailor-made BAEROPAN. The international cooperation of our experts and their networks externally within the industry ensures a high level of technical knowledge.



Additive blend development

In an application laboratory with state-of-the-art equipment we mimic the processes of our customers, fine-tuning the additive system until it fits to the specification. A new BAEROPAN is created and a first samples is sent out for tests on site.



Production fine-tuning and extended trials

An interesting moment occurs when the new BAEROPAN has to show how it works in a real production environment. Our technical service manager will be present and has a critical view on the performance. If needed, some further modifications (e.g. adding lubricants) can be done on site.



Scale-up of the new BAEROPAN

The new BAEROPAN is scaled-up in your plant. At this stage, the BAEROPAN has to run on different machines all over the shop floor, making many final products which have to pass the quality control. We accompany the process and support your quality control with additional tests in our analytical laboratory.



Increase in quality and productivity

As a result of product development and a closely monitored introduction of the new BAEROPAN, you will see in many cases improved quality of your final product and a higher productivity. Many of our customers confirm that, when using our additive blends, their scrap rates declined and downtimes reduced significantly.

Baerlocher service quality

- Global network of experts
- Trusted advisors to the industry
- Local solution provider
- Own research & development
- Consistent and assured supply

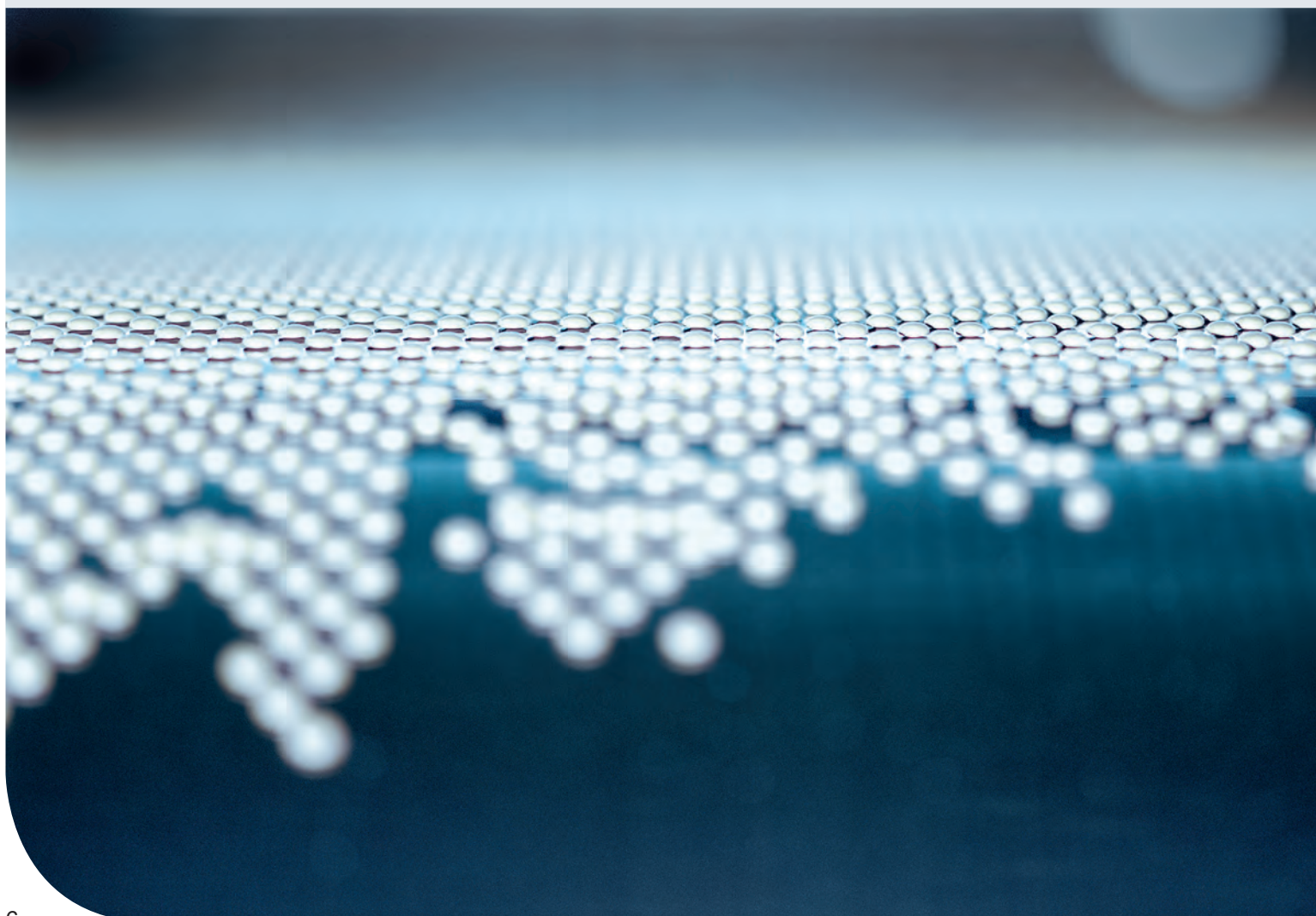
Forms for all functions

Product forms for high processing and production quality

All of Baerlocher's products comply with and even exceed the current status of directives like REACH in the European Union or other regional regulations. Based on the close partnership with the customers all products can be tailored to meet individual requirements.

Incorporation solutions for additives via innovative product forms and one-packs are tailor-made to the industry. Our aim is to increase our customers' efficiency and improve working conditions in their operations.

Innovative products, product forms and packaging ensure safe handling during transport, storage and production at our customers' facilities. Main focus lies on granular (AV and R) products, prills (SP), flakes (SMS) and pastilles (TX) that ensure dust-free handling combined with excellent dispersability.



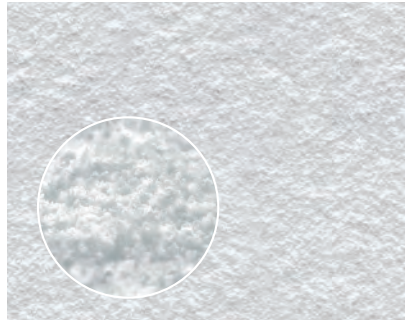
Product forms



R granules

A variety of additives is mixed and compacted to form Baerlocher's R granules.

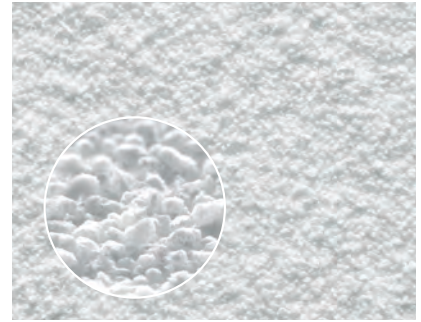
- free-flowing
- robust handling characteristics
- high feeding accuracy
- good dispersability
- suitable to be stored in silo
- low dust



MC/SW powder

Single components and customer specific additive blends in powder forms, ranging from micronized to free flowing coarse powders.

- small particles, high active surface area
- good dispersability in final applications
- good compatibility with powder blends
- medium bulk density



AV granules

A broad range of high quality stearates is produced by Baerlocher's proprietary AV technology.

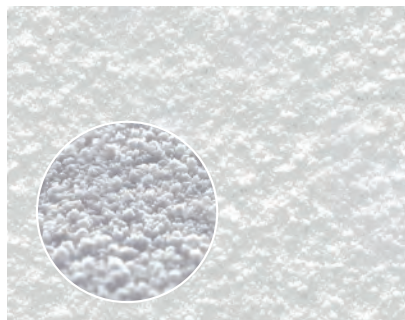
- free-flowing
- very low dust
- good dispersability in polymers
- easy to handle, accurate dosing
- high bulk density
- granular fractions selected to customer needs



SMS/TX melt products

Originating from specific melt processes, Baerlocher offers zinc stearates and multi component stabilizers as pastilles (TX) and flakes (SMS).

- absolutely dust-free
- suitable to be stored in silo
- free-flowing
- durable, high abrasion resistance
- improved industrial hygiene



SP sprayed prills

Highest purity zinc stearates and a range of Baerlocher's lubricants are offered as sprayed prills.

- very low dusting
- absolutely free-flowing granules, compatible with powder blends
- very high bulk density
- high feeding accuracy



Liquids

Various families of stabilizers and other additives are available in liquid form.

- high dosage accuracy
- easy storage in tanks
- easy homogenisation in polymers and with other ingredients
- quick and safe flow through pumps

Baerlocher's global network

We speak your language

Over 1,000 employees worldwide make sure that we are close to our customers and sustainably support their growth. For Baerlocher, being a global company, it is essential to be local in both presence and thought. We remain close to the markets, due to our employees who continue to make Baerlocher a reliable and trusted advisor.

Baerlocher operates a global network of production plants. Each and every one of these facilities fulfills the very highest technical and safety standards. This allows us to provide our teams the resources they need to deliver consistently excellent quality for our customers. In addition, we are deeply committed to promoting best practices, and to the principle of continuous improvement.



Headquarters

Baerlocher's headquarters are located in the area of Germany's metropolis Munich. As a family-owned company, Baerlocher is aware of its social responsibility, welcoming and developing talents from all over the world regardless of their religion and cultural background.



Baerlocher worldwide

Production sites and Joint Ventures in Germany, United Kingdom, Italy, San Marino, Turkey, the United States, China, Malaysia, Korea, India, Brazil, Peru and Argentina as well as a worldwide sales network make the Baerlocher group of companies a strong partner. Future-oriented, we are continuously investing in research and development. Our innovative power results from the creativity of our in-house scientists and technical experts as well as our global inhouse research & development facilities and application laboratories.



Extrusion and injection moulding of rigid PVC

PVC offers excellent environmentally friendly qualities, and inherent structural and design advantages over other materials, including weather and impact resistance, excellent heat insulation and noise protection, long service life and low maintenance costs.

The fact that PVC can be recycled several times helps improving the ecological footprint.

Baerlocher's stabilizer/lubricant one-packs for rigid PVC extrusion and injection moulding are as diverse as the requirements by the many customers. Stemming from a well-proven stabilizer base, each one-pack is

fine-tuned to produce the desired properties. This way, PVC articles – typically meant for the building industry – with pleasant aesthetics and high functionality are achievable which meet the most stringent regulations. Finely balanced lubricant systems ensure excellent melt flow properties for PVC processing with high filler content even on complex extrusion and injection molding dies.





Pipes and fittings

Extruded PVC pipes and injection-molded fittings are products with excellent technical properties that meet the most demanding economic and ecological requirements. The variety of PVC pipe systems derives not only from the multitude of dimensions, shapes and colors available, but also the many applications. Specific additives and manufacturing techniques can be used to achieve the best end-product results for a range of different PVC pipe systems: potable water pipes, sewer and waste water pipes, foam core pipes, corrugated drainage pipes, rain gutters, irrigation pipes, conduit and cable ducts. PVC additives enable high-quality pipes and fittings to be made efficiently, and impart specific properties to the finished products – such as high mechanical stability and longevity.

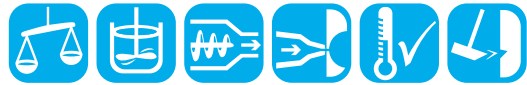
PVC pipes and fittings are the backbone of modern infrastructure around the world. Their global use is down to their favorable characteristics which include strength and durability (expected life of 100 years), ease of installation and maintenance, resistance to corrosion, low migration, good mechanical properties, recyclability, very low permeability, high chemical resistance and excellent cost efficiency. In addition to technical and economical requirements, modern society places a high value on sustainability. Innovative PVC pipes and fittings have been developed to meet growing requirements and make PVC even more attractive as piping material.

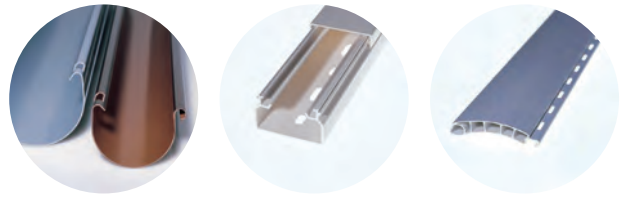
Applications

Potable Water Pipe
Sewage Pipe
Corrugated Electrical Pipe
Smooth Electrical Pipe
Drainage Pipe
Fitting

Advantages of our additives

- Excellent processing
- Excellent heat stability
- High output rates
- Excellent dimensional stability
- Low wall tolerances during extrusion
- Excellent surface finish





Technical and window profiles

Exactly producing the specified initial color is a key criterion in the manufacture of white window profiles. To this end, Baerlocher has developed stabilizer/lubricant one-packs with outstanding static and dynamic thermal stability. Moreover, all Baerlocher stabilizers for PVC window profiles support the required UV resistance.

Unplasticized PVC has demonstrated its versatility as a raw material for the production of technical profiles and window profiles in particular, and enables a multitude of construction and design possibilities. Important applications are window profiles and frames, cladding profiles, roller shutters, electrical conduits and roofing systems.



Weathering resistance

Weathering resistance is a key requirement of profiles in outdoor applications. Over the last decades, Pb-stabilized window profiles have proven their outstanding durability under different climatic conditions. Nowadays, CaZn stabilizers enable similar or even better color hold than traditional Pb systems both in artificial and natural weathering. PVC window profiles stabilised this way maintain their mechanical properties, such as impact strength or dimensional stability, even when exposed to strong temperature changes, alternate periods of humid and dry weather and solar radiation.

Applications

White window profiles
Coloured window profiles
Coextruded window profiles
Rainwater gutters
Roller shutters
Furniture trim
Sidings
Transparent profiles
Foamed profiles (free foam or celuka)
Coextruded foam profiles

Advantages of our additives

- Fine-tuned processing properties
- High heat stability
- Excellent weatherability and impact resistance
- Accurate initial color and very high color fastness
- Low plate-out properties





Rigid sheets

PVC sheets are products with excellent technical properties that meet the most demanding economic and ecological requirements. The field of application for PVC sheets is further enlarged by employing not only compact but also foamed structures with various foam densities. Foaming allows for higher material efficiency, lower density and improved insulation properties. Applications of PVC sheets include apparatus engineering, worktops, siding and exhibition stands. Sandwich systems can be used for interior trimmings of railway carriages and airplanes, PVC doors, etc.

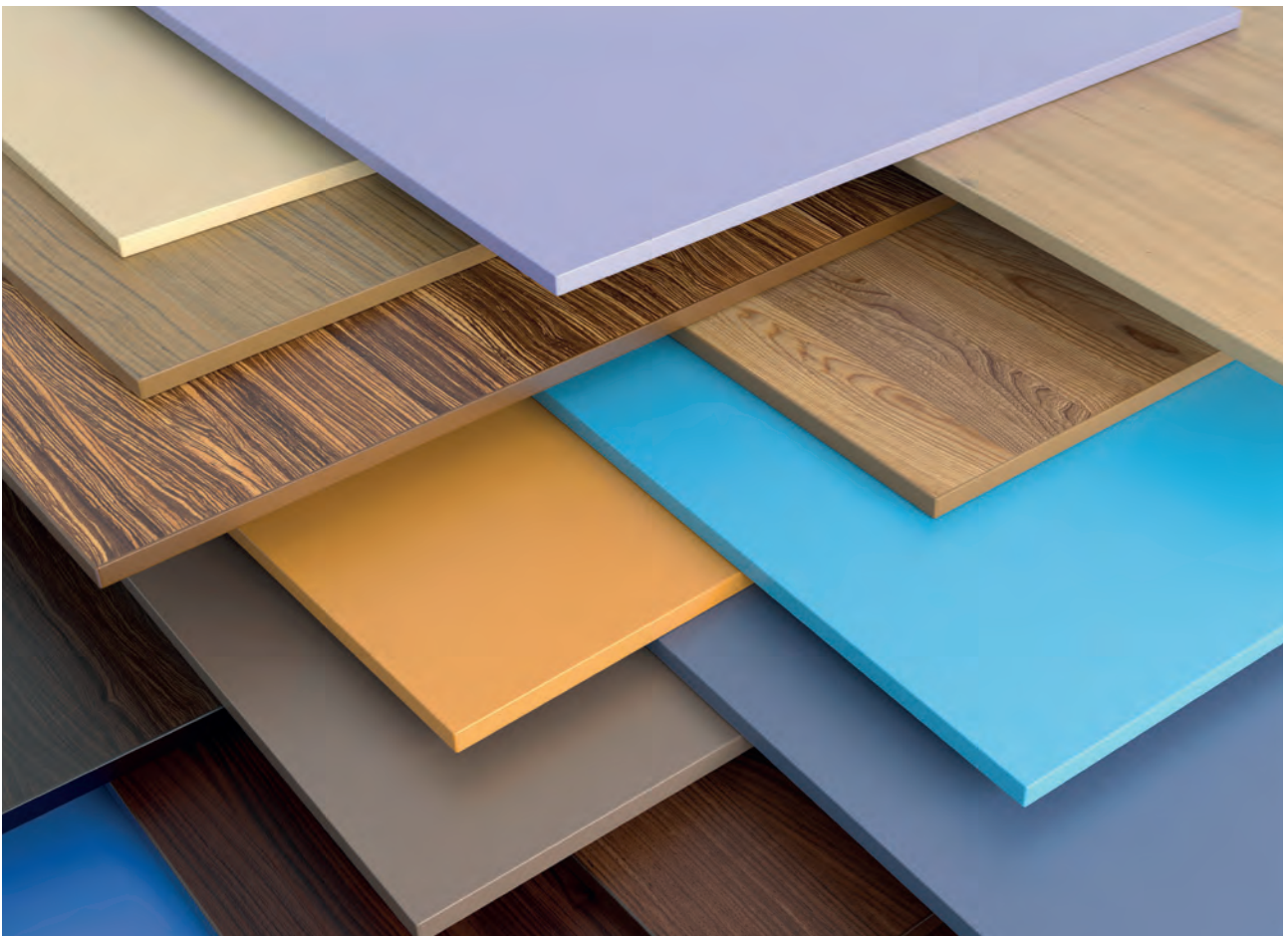
Baerlocher PVC additives enable high-quality sheets to be produced efficiently and impart key properties to the finished products – including chemical resistance, weathering resistance, low foam density, a high Vicat softening point and low flammability. Baerlocher offers a full range of stabilizers, from Sn stabilizers to increasingly important CaZn stabilizers for all sheet applications.

Applications

Foamed sheets
Free foamed sheets
Celuka foamed sheets
Compact sheets
Edge banding
Translucent sheets
Transparent sheets
Coextruded sheets

Advantages of our additives

- Excellent processing
- High heat stability
- Good dimensional stability
- Extremely regular cell structure (foamed)



Flooring

The flooring market is one of the most dynamic application areas for PVC products of the last years. Design floor coverings (multilayer modular flooring, e.g. LVT, WPC, SPC) are increasingly dominating the flooring market and are gaining more and more share towards other floorings, esp. laminate flooring. This segment is expected to grow from approx. 500 M square meters in 2018 to approx. 920 M square meters in 2023 world-wide.

The development focuses on aspects like “indoor air quality impact” and “sustainability”. For the production of PVC floor coverings almost all standard methods are used (plastisol processing, calendering, extrusion, press method, lamination).

PVC floor coverings, partly equipped with fabric-reinforcement, score with simple installation, hygienic properties, dimension stability, stain resistance, low soiling, impact sound and true aesthetic state-of-the-art stabilizers give characteristics like low emission, low odor and a realistic color reproduction to PVC floor coverings.

Moreover, modern stabilizers ease the processing in different processing steps and increase printability, lamination properties and recyclability.

Besides stabilizers also kickers for the activation of blowing agents are used in foamed products.





Applications

Compact flooring
Contract flooring
CV/Cushion vinyl
Electric static dissipative flooring
EPC/Expanded polymer core tiles
Heterogeneous flooring
Homogeneous flooring
Industrial flooring
LVT/Luxury vinyl tiles
MMF/Multilayer modular floors
Residential flooring
Resilient flooring
RCB/Rigid core board tiles
Safety flooring
Sound insulation flooring
Sports flooring
SPC/Stone polymer core tiles
Traffic flooring
Transport vehicle flooring
WPC/Waterproof polymer core tiles

Advantages of our additives

- Low VOC
- Low odor
- High transparency
- Excellent heat stability
- Stable colour hold
- Excellent processing
- Easy dispersion
- Fast foaming



Our portfolio

Liquid & paste products

- CaZn stabilizers
- BaZn stabilizers
- MgZn stabilizer
- KZn stabilizers & kicker
- Zn-based stabilizers & kicker
- Zn-based stabilizers
- Organophosphite boosters
- ESBO
- Internal lubricants
- External lubricants
- Antistatic agents

Solid products (powder, granules, pastilles)

- CaZn stabilizers
- Ca-based stabilizers
- Zn-based stabilizers
- Metal soap-free stabilizers
- Metal soaps
- Internal lubricants
- External lubricants
- Antistatic agents



Rigid Films

Since decades, PVC rigid films have been used for different applications, besides technical solutions with one time usage, these films are also applied, among others for packaging in medical engineering, food and pharma industry. Based on current discussions regarding environmental protection and sustainability, this market segment will face key challenges in future.

Although rigid film were and are still mostly stabilized with Sn products, alternatives with Sn-free solutions will become increasingly critical. In this respect it is necessary to pay attention to different statutory

regulations, such as Pharmacopeica, food contact approval, indoor air impact regulation or toy standard.

PVC rigid films are premdominantly produced by calandring, often in combination with subsequent lamination, however, there are also other processing methods in use, e.g. film blowing – or flat extrusion.





Applications

Food packaging films
Labels & sleeves
Blister & box-making Films
Bottle cap films
Pharma packaging films
Thermoforming films
Card films
Medical device films
Toy device films
Shrink films
Stationary films
Adhesive tape films
Decorative surface films
Furniture films
Print films
Technical films
Technical packaging films
Pipe insulation films
Lamination films

Our portfolio

Liquid & paste products

- Sn stabilizers
- BaZn stabilizers
- Organophosphite boosters
- Internal lubricants
- External lubricants
- ESBO

Solid products (powder, granules, pastilles)

- CaZn stabilizers
- Ca-based stabilizers
- Zn-based stabilizers
- Metal soap-free stabilizers
- Metal soaps
- Internal lubricants
- External lubricants
- Antistatic agents
- Antifogging agents
- Antiblocking agents
- Anti-plate out agents
- Anti-slip agents



Advantages of our additives

- Excellent processing
- Excellent heat stability
- Excellent residual stability for inline recycling
- Low odor
- High transparency



Flexible Films

Besides PVC rigid films, there is also a large variety of applications for flexible PVC films. The market is dominated by plasticized films, although more and more plasticizer-free flexible films are entering the market. While in the past in many applications Sn, Pb and BaCd stabilizers were used, today at least within the EU, almost solely BaZn- and CaZn stabilizers are used. Also other regions in the world are now slowly following this development and are increasingly choosing these solutions. As in other application areas, also here a growing consumption of sustainable stabilizers can be noted, based on aspects of environment protection and sustainability.

There are comparable demands to flexible films as in other market segments, but with a special focus on emissions, fogging, odor and the prevention of recipe components subject to labelling.

Moreover, also the requirements of various regulations, such as Pharmacopoeia, food contact approval, indoor air impact regulations and toy standard have to be observed.

Flexible PVC films are mostly produced by calendering, often in combination with subsequent lamination, but also processing methods like film blowing – or flat extrusion are used.





Applications

Furniture films
Lamination films
Window wrapping films
Self adhesive films
Advertisement films
Adhesive tape films
Labels & sleeves
Stationary films
Stretch films
Shrink films
Cling films
Water proofing membranes
Roofing films
Pond films
Pool liner films
Car wrapping films
Inflatable device films
Insulation films
Paper finishing films
Print films
Shrink ceiling films
Traffic sign films
Toy device films
Medical films / blood bags / urine bags
Table cloth films

Our portfolio

Liquid & paste products

- BaZn stabilizers
- CaZn stabilizers
- Organophosphite boosters
- ESBO
- Internal lubricants
- External lubricants
- Antistatic agents
- Release agents

Solid products (powder, granules, pastilles)

- CaZn stabilizers
- Ca-based stabilizers
- Zn-based stabilizers
- Metal soap-free stabilizers
- Metal soaps
- Internal lubricants
- External lubricants
- Antistatic agents
- Antifogging agents
- Antiblocking agents
- Anti-plate out agents
- Anti-slip agents
- Anti ageing agents



Advantages of our additives

- Excellent processing
- High heat stability
- Low plate-out properties
- Low odor
- Excellent printability
- Very good transparency



Flexible PVC applications

The plasticizer incorporated in the PVC matrix increases its flexibility to almost any desired level and significantly extends the scope of applications for plasticised PVC. Normally, plasticised PVC formulations are processed at lower temperatures compared to rigid and semi-rigid PVC. Type and dosage of PVC stabilizers are selected according to the process technology, working conditions and finished products.

Plasticized PVC has been used to produce cable and wire insulation and sheathing for more than 50 years. The PVC formulation must possess characteristics to match the

respective application, which can range from grounding, telecommunications, installation and heating lines to cables for the electronics and automotive industries.

Furthermore, plasticised PVC is used to manufacture flexible tubes and hoses as well as gaskets which serve in many different end applications.





Cables

The stabilizer system has a significant influence on the performance and service life of PVC cables. It enables efficient manufacture of cables and wires and imparts specific attributes to the finished product – including good heat stability and electrical properties, initial color and color stability, good mechanical properties, stabilizer dispersion and light stability.

Applications

Ground cables
Installation cables
Telecommunication cables
Automotive cables

Advantages of our additives

- Excellent processing
- High heat stability
- Excellent electrical properties
- Low water absorption
- Excellent dispersion



Other Applications

Flexible PVC applications can be divided into two main categories: technical and medical. To cover the different requirements, Baerlocher offers a great variety of liquid mixed metal stabilizers, such as BaZn and CaZn, to choose from. Solid mixed metals are preferred when the final application requires low VOCs (volatile organic compounds) and the absence of solvents.

Applications

Tubes (food, medical)
Hoses (pressure, garden, pump)
Gaskets
Handrails
Swing doors

Advantages of our additives

- Excellent processing
- High heat stability
- Low odor
- Excellent indoor air quality (low VOCs)
- Good compatibility with plasticizers



Plastisol applications

Plastisol processing (and also Organosol processing) is a special form of PVC processing and significantly differentiates from thermoplastic processing. Main characteristic is the first processing step which takes place at room temperature.

The various types of processing allow many applications not possible with the classic thermoplastic processes. Due to the plastisol method, the products are made in two or more layers whereat each layer has special properties.

Unlike with other application areas in this market segment, sustainable stabilizers have already been used since years.

There is a particular focus on emissions, fogging, odor and the prevention of recipe components subject to labelling. Moreover, the requirements of various regulations such as Indoor Air Regulations and toy standard have to be fulfilled.

Typical plastisol methods are spreading, coating, spraying, dipping and rotation moulding. In some cases plastisol methods are combined with thermoplastic processes, e.g. for textile coating.





Applications

Artificial leather
Automotive artificial leather
Textil coating / coated fabrics
Construction fabrics / textile architecture
Conveyor belts / processing belts
Tents / sun protection fabrics
Tarpaulins
Billboards / mega poster
Bigbags
Boots
Table Cloths
Screens / movie screens / beamer screens
Inflatable Devices
CV / Cushion vinyl flooring
Wall covering
Self adhesive films
Advertisement films
Traffic sign films
Toys
Gloves
Coat hangers
Handholds / tool handholds
Crown caps

Our portfolio

Liquid & paste products

- BaZn stabilizers
- CaZn stabilizers
- MgZn stabilizers
- Epoxy resin stabilizers
- KZn kicker & stabilizers
- Zn kicker & stabilizers
- Organophosphite boosters
- ESBO
- Internal lubricants
- External lubricants
- Antistatic agents
- Release agents

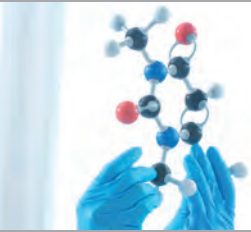
Solid products (powder, granules, pastilles)

- CaZn stabilizers
- Ca-based stabilizers
- Zn-based stabilizers
- Metal soap-free stabilizers
- Metal soaps
- Internal lubricants
- External lubricants
- Antistatic agents
- Antifogging agents
- Antiblocking agents
- Anti-plate out agents
- Anti-slip agents

Advantages of our additives

- Excellent processing
- Excellent heat stability
- Low odor
- Excellent indoor air quality (low VOCs)
- Excellent dispersion





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