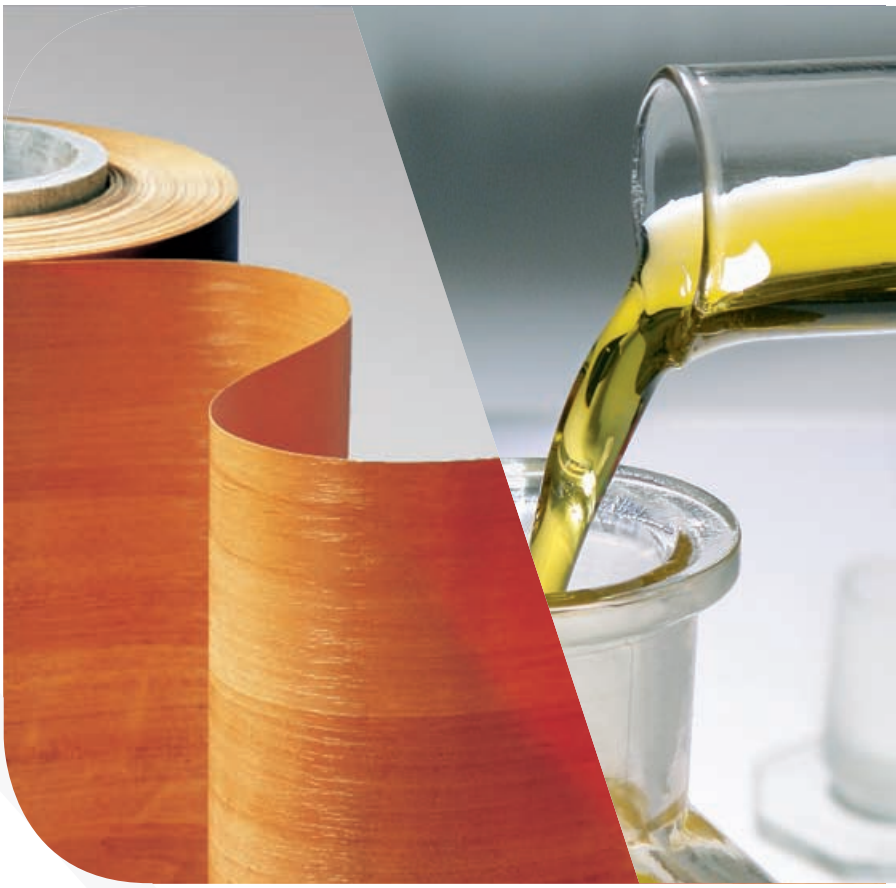
Baerlocher Additives for PVC

Calendered Films and Sheets



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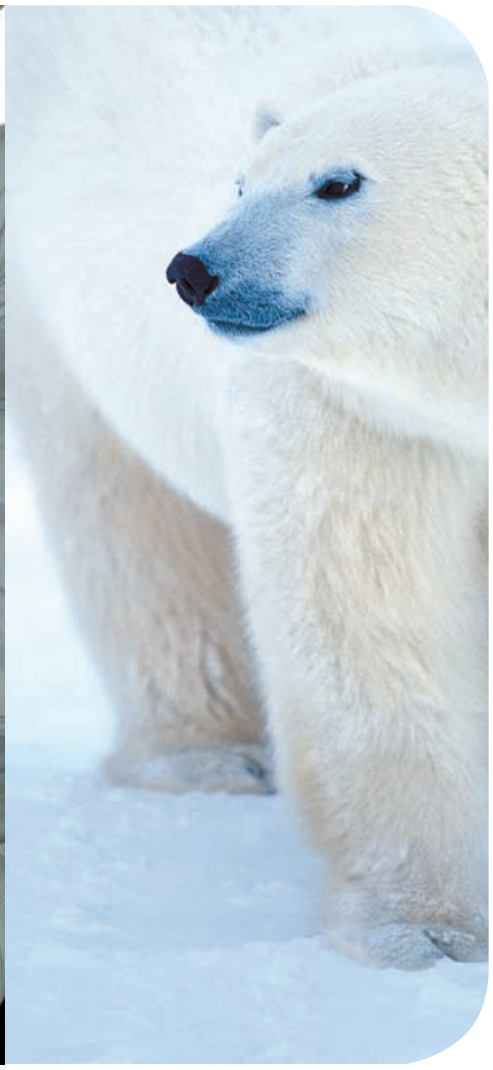

Thirteen production sites in Germany, Great Britain, Italy, France, the United States, Malaysia, India, Korea, Brazil, Peru and Argentina as well as a sales network covering more than 40 countries make the Baerlocher group of companies a strong partner. This global presence and more than 1200 employees worldwide make sure that we are always close to the customer. Future-oriented, we are continuously investing in research and development.
A large number of in-house research scientists and technical experts ensure our considerable creative potential and innovative power. Baerlocher has R+D facilities in Germany (München-Unterschleissheim), France (Marseille), Italy (Lodi) and the United States (Dover, Ohio).

Environmentally sound production processes as well as the safety and protection of people and environment are key corporate goals. As a globally active group of companies we are aware of our responsibility, regardless of time or place. We are committed to the principles of “Responsible Care”: Our quality management is certified to ISO 9001 and our environmental management system to ISO 14001, encouraging our employees to work together in a responsible way. This policy will not least benefit our customers.

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Baerlocher worldwide

1	**Germany** **Baerlocher GmbH** Lingen	· Solid Ca-based stabilisers · Pb stabilisers and one-packs	· Stearates · Baeropols · Fatty Acids
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4	**United Kingdom** **Baerlocher UK Ltd.** Bury	· Solid Ca-based stabilisers · Pb one-packs	
5	**France** **Baerlocher France SAS** Marseille	· Solid Sn-based one-packs · Lubricants · Waxes	

6	**Malaysia** **Baerlocher (M) Sdn Bhd** Seremban	· Solid Ca-based stabilisers · Pb stabilisers and one-packs	· Stearates · Baeropols
7	**India** **Baerlocher India Additives Pvt. Ltd.** Dewas	· Solid Ca-based stabilisers · Pb stabilisers and one-packs	· Liquid Mixed Metal stabilisers
8	**Korea** **DOOBON Fine Chemical Co., LTD** Chungchong	· Stearates · Baeropol	
9/10	**USA** **Baerlocher Production USA LLC** **Baerlocher USA LLC** Cincinnati and Dover	· Solid Ca-based stabilisers · Liquid Mixed Metal stabilisers	· Stearates · Baeropols
11	**Peru** **Compania Quimica SA** Lima	· Solid Ca-based stabilisers · Pb stabilisers and one-packs	· Liquid Mixed Metal stabilisers · Plasticiser
12	**Brazil** **Baerlocher do Brasil SA** Americana	· Solid Ca-based stabilisers · Pb one-packs · Liquid Mixed Metal stabilisers	· Stearates · Baeropols
13	**Argentina** **Lestar Quimica SA** Junín (Buenos Aires)	· Solid Ca-based stabilisers · Pb one-packs · ESBO	· Phosphites · Stearates · Baeropols

Additives for the Production of Calendered PVC Films and Sheets

After the substitution of Cd stabilisers for plasticised and semi-rigid films in Europe, the liquid BaZn stabilisers became new standards for these applications.
In addition to BaZn stabilisers, modern CaZn stabiliser systems fulfil stabilisation requirements. The application field for CaZn is still expanding.
For applications as for example food contact, toys, tablecloth, CaZn stabilisers have been developed.
Independent from metal base aspects like VOC, odour, toxicity, labelling are becoming increasingly important for the processing of films. Where special emphasis is placed on low odour and emission-free products, mixed metals in powder form are available as fatty acid salts with good self-lubrication or as stabilisers based on inorganic co-stabilisers with varying degrees of self-lubrication for extreme demands on odour and emissions.
Rigid PVC sheets are generally stabilised by organo-tin compounds. Very effective completely odourless stabiliser lubricant compounds in powder form are under development.
Baerlocher stabilisers for films are developed regarding the safety and protection of people and environment.
When choosing a stabiliser, the requirements of the final product need to be specified in detail in order to adjust both the performance and the good cost performance.

Baerlocher PVC Additives

- **high-performance**
- **tailor-made**
- **quality-controlled**
- **future-orientated**
- **cost-efficient**

Contents

Applications

The requirements a stabiliser must comply with depend essentially on:

- application
- processing and specific necessities
- the performance required of the final product
- the legal requirements during manufacture and use of the final product

Stabiliser properties are affected by its composition. The stabiliser itself can influence the processing and the performance of the finished article.

Stabiliser	Processing	Finished product
Colour	Adhesion	Adhesive receptivity
Compatibility with ESBO/plasticiser	Condensation	Amine resistance
Compatibility with pigments	Heat/dynamic stability	Blocking
Efficiency	Lubrication	Colour
Emission/VOC	Melt viscosity	Fogging
Flashpoint	Melting characteristic	Gloss
Odour	Plate-out	Heat ageing resistance
Pumpability/viscosity		Light/UV resistance
Storage stability		Migration
Phenol or Nonyl phenol content		Non-tox properties
		Odour
		Printability
		Residual heat stability
		Surface
		Transparency
		Weather resistance
		Weldability
		Whiteness

Important notice

Non-tox products: A group of stabilisers composed of those components approved by the different regulations as substances in PVC intended to come into contact with foodstuffs. For detailed pieces of information please contact one of Baerlocher's representatives.

Rigid films

Food and pharma: Organo-tin stabilisers are traditionally used for the manufacturing of non-tox rigid films (crystal clear and pigmented), e.g. thermo-formed food packaging and pharmaceutical blisters.
Today, new odourless CaZn stabilisers in powder form are under development:

Baerostab	Form	Approvals	Characteristics
OM 710 S	L	EU 2002/72, FDA	Octyl tin mercaptide “high mono” with reduced odour, standard for food packaging, Dosage approx. 1,0–2,0 phr
OM 710 N	L	EU 2002/72, FDA	Octyl tin mercaptide “low mono” standard for food and pharmaceutical packaging, Dosage approx. 1,0–2,0 phr
MTS 1200	L	EU 2002/72	Methyl tin mercaptide, for food packaging and pharmaceutical pakkaging, Dosage approx. 1,0–2,0 phr
NT 352-1 P	P	EU 2002/72, FDA	CaZn, highly self lubricated, low odour, good early colour and transparency, synergetic effects with ESBO, Dosage: stabiliser approx. 1,5–2,0 phr / ESBO approx. 2,0–2,5 phr
NT 1601 P	P	EU 2002/72, FDA	CaZn, low lubricated, low odour, good early colour and transparency, synergetic effects with ESBO, Dosage: stabiliser approx. 1,5–2,0 phr / ESBO approx. 2,0–2,5 phr
NT 1358 P	P	EU 2002/72, FDA	CaZn, non self lubricated, low odour, designed for pigmented formulations, synergetic effects with ESBO, Dosage : stabiliser approx. 1,5–2,0 phr / ESBO approx. 2,0–2,5 phr
NT 1426 P	P	EU 2002/72, FDA	CaZn for extrusion, blow moulding and blown films, low odour, good early colour and transparency, synergetic effects with ESBO, Dosage: stabiliser approx. 1,5–2,0 phr / ESBO approx. 3,0–5,0 phr

L = liquid; P = solid/powder

Technical: Liquid butyl-tin stabilisers are used for technical applications (crystal clear and pigmented). However, in special cases tin stabilisers in powder form may be required, for example to meet the highest demand of printability and high vicat value (e.g. credit cards).

Baerostab	Form	Characteristics
M 25 S	L	Butyl tin mercaptide of high efficiency with reduced odour, no self-lubrication, Dosage approx. 1,0–2,0 phr
M 170 M 170 E	L	Modified butyl tin mercaptide, good early colour, colour hold and dynamic heat stability, calendering of films and sheets, stabilisation of E-PVC and acetate-based co-polymers, Dosage approx. 1,5–2,5 phr
OM 36	P	Octyltin mercaptide carboxylate for special applications or as co-stabiliser (booster) in combination with liquid tin or Cd- and Pb-free mixed metal stabilisers. Requires a balanced lubrication, Dosage approx. 0,7–1,2 phr
MC 9991-2 CR	P	CaZn, low odour, very low self lubrication, designed for pigmented formulations, synergetic effects with ESBO, Dosage: stabiliser approx. 2,0–3,0 phr / ESBO approx. 2,0–2,5 phr

L = liquid; P = solid/powder

Plasticized films

Main characteristics of these stabilisers are self-lubrication with low plate-out tendency and good colour hold during process. In the most of the cases synergetic effects with ESBO (2,0–3,0 phr) are utilised.

Transparent films:

Baerostab	Form	semi rigid	Characteristics
UBZ 711-1 X RF	L	●	Standard, low phenol, 2-EHA free, nonylphenol free, ptBBA free
UBZ 733-1 X RF	L	●	High performance, low phenol, nonylphenol free, ptBBA free, 2-EHA free, high transparency,
UBZ 780 X RF	L	●	High performance, low phenol, nonylphenol free, ptBBA free, high transparency, good dynamic heat stability
UBZ 730 N 5 RF	L	●	Standard plus, 2-EHA free, nonylphenol free, ptBBA free
UBZ 780 RF	L	●	High performance, nonylphenol free, ptBBA free, high transparency, good dynamic heat stability
UBZ 784 RF	L	●	Standard, nonylphenol free, ptBBA free, 2-EHA free
UBZ 715 RF	L	●	High performance, nonylphenol free, ptBBA free, high transparency, low lubricated
UBZ 771 RF	L	●	High performance, nonylphenol free, ptBBA free, high heat stability
UBZ 756 RF	L	●	High performance, nonylphenol free, ptBBA free, 2-EHA free, high transparency, good dynamic heat stability
UBZ 751 RF	L	●	Standard plus, 2-EHA free, nonylphenol free, ptBBA free, high transparency
UBZ 752 X RF	L	●	Standard plus , low phenol, 2-EHA free, nonylphenol free, ptBBA free
CT 9083 RF	L		Standard, 2-EHA free, nonylphenol free, ptBBA free,
CT 9090 RF	L	●	Standard, 2-EHA free, nonylphenol free, ptBBA free
CT 9063 X RF	L	●	Standard plus, low odour, low phenol, 2-EHA free, nonylphenol free, ptBBA free, highly lubricated
CT 341 P	P		Standard plus, phenol free, 2-EHA free, nonylphenol free, ptBBA free, low odour, low emission, good self-lubrication
NT 319 P MC 8763-1 CP	P		High performance, phenol free, 2-EHA free, nonylphenol free, ptBBA free, low odour, low emission, good self-lubrication
MC 8807-16 CP	P		Standard plus, phenol free, 2-EHA free, nonylphenol free, ptBBA free, low odour, low emission, good self-lubrication
NT 170 PS	PS		Standard, non-tox, phosphite free, phenol free, 2-EHA free, nonylphenol free, ptBBA free, paste with approval in many countries

L = liquid; P = solid/powder; PS = paste

Pigmented films:

Baerostab	Form	semi rigid	Characteristics
UBZ 711-1 X RF	L	●	Standard, low phenol, 2-EHA free, nonylphenol free, ptBBA free, highly self lubricated
UBZ 733-1 X RF	L	●	High performance, low phenol, nonylphenol free, ptBBA free, 2-EHA free, highly self lubricated
UBZ 780 X RF	L		High performance, low phenol, nonylphenol free, ptBBA free, highly self lubricated, good dynamic heat stability
UBZ 729 RF	L	●	Standard plus, 2-EHA free, nonylphenol free, ptBBA free, highly self lubricated, high whiteness, high compatibility with bonding agent
UBZ 730 N 5 RF	L	●	Standard plus, 2-EHA free, nonylphenol free, ptBBA free, highly self lubricated, good printability
UBZ 780 RF	L	●	High performance, nonylphenol free, ptBBA free, highly self lubricated, good dynamic heat stability
UBZ 784 RF	L	●	Standard, nonylphenol free, ptBBA free, 2-EHA free, highly self lubricated
UBZ 715 RF	L	●	High performance, nonylphenol free, ptBBA free, high transparency, low lubricated
UBZ 771 RF	L		Standard, nonylphenol free, ptBBA free, high heat stability, highly self lubricated
UBZ 726 RF	L	●	Standard, 2-EHA free, nonylphenol free, ptBBA free, good early color
UBZ 756 RF	L	●	High performance, nonylphenol free, ptBBA free, 2-EHA free, high transparency, good dynamic heat stability
UBZ 751 RF	L	●	Standard plus, 2-EHA free, nonylphenol free, ptBBA free, high transparency
UBZ 752 X RF	L	●	Standard plus , low phenol, 2-EHA free, nonylphenol free, ptBBA free
CT 9083 RF	L		Standard, 2-EHA free, nonylphenol free, ptBBA free,
CT 9090 RF	L	●	Standard, 2-EHA free, nonylphenol free, ptBBA free
CT 9063 X RF	L	●	Standard plus, low odour, low phenol, 2-EHA free, nonylphenol free, ptBBA free, highly lubricated
CT 341 P	P		Standard plus, phenol free, 2-EHA free, nonylphenol free, ptBBA free, low odour, low emission, good self-lubrication
NT 319 P MC 8763-1 CP	P		High performance, phenol free, 2-EHA free, nonylphenol free, ptBBA free, low odour, low emission, good self-lubrication
MC 8807-16 CP	P		Standard plus, phenol free, 2-EHA free, nonylphenol free, ptBBA free, low odour, low emission, good self-lubrication
NT 580 A	P		Standard plus, non-tox stabiliser, phenol free, 2-EHA free, nonylphenol free, ptBBA free, good self-lubrication
NT 584	P		Standard plus, non-tox stabiliser, phenol free, 2-EHA free, nonylphenol free, ptBBA free, good self-lubrication, designed for formulations containing E-PVC
NT 585	P		Standard plus, non-tox stabiliser, phenol free, 2-EHA free, nonylphenol free, ptBBA free, good self-lubrication, designed for formulations containing E-PVC
NT 170 PS	PS		Standard, non-tox, phosphite free, phenol free, 2-EHA free, nonylphenol free, ptBBA free, paste with approval in many countries

L = liquid; P = solid/powder; PS = paste

Calendered Foams

Manufacturing of artificial leather by calendering process is mainly used in Asia and Eastern Europe.

Baerostab	Form	Type	Characteristics
KK 42	L	KZn	Self-lubricated kicker, good early colour
KK 64-1 X RF	L	BaZn	Self-lubricated kicker, high heat stability

Car interiors

The main requirements for car interiors are low fogging, colour resistance in contact with PUR foam which – due to the amine sensitivity. PVC discolouration resistance can only be achieved by additional use of special co-stabilisers. In the most of the cases synergetic effects with ESBO (2,0–3,0 phr) are utilised.

Baerostab	Form	Type	Characteristics
UBZ 711-1 X RF	L	BaZn	Standard, low phenol, 2-EHA free, nonylphenol free, ptBBA free, highly self lubricated, low fogging
NT 580 A	P	CaZn	Standard plus, non-tox stabiliser, phenol free, 2-EHA free, nonylphenol free, ptBBA free, good self-lubrication
NT 319 P MC 8763-1 CP	P	CaZn	High performance, non-tox for all types of films and profiles, phenol free, 2-EHA free, nonylphenol free, ptBBA free, low emission,
ASM 711 ASM 715	P	co-stabiliser	Co-stabiliser in combination with BaZn and CaZn for improvement of • the heat ageing resistance in the temperature range of 120–150 °C • the amine resistance when backed with PUR foam

Outdoor applications

Main characteristics of these formulations are presence of TiO_2, biocides, UV absorber and very often fire retardants.

In some cases synergetic effects with ESBO (2,0–3,0 phr) are utilised.

Baerostab	Form	Type	Characteristics
UBZ 711-1 X RF	L	BaZn	Standard, low phenol, 2-EHA free, nonylphenol free, ptBBA free
UBZ 729 RF	L	BaZn	Standard plus, 2-EHA free, nonylphenol free, ptBBA free, highly self lubricated, high whiteness, high compatibility with bonding agent
UBZ 730 N 5 RF	L	BaZn	Standard plus, 2-EHA free, nonylphenol free, ptBBA free
CT 9083 RF	L	CaZn	Standard, 2-EHA free, nonylphenol free, ptBBA free,
NT 319 P MC 8763-1 CP	P	CaZn	High performance, non-tox for all types of films and profiles, phenol free, 2-EHA free, nonylphenol free, ptBBA free, low emission, performance could be improved by combination with liquid phosphites like Baerostab CWM 201
MC 8763-3 CP	P	CaZn	High performance, especially developed for pool liner, non-tox for all types of films and profiles, phenol free, 2-EHA free, nonylphenol free, ptBBA free, low emission, performance could be improved by combination with liquid phosphites like Baerostab CWM 201

L = liquid; P = solid/powder; PS = paste

Flooring

Flooring producers show high concern in environmental issues. For that reason low odour, low emission and low phenol stabilisers are mainly used in this application. In the most of the cases synergetic effects with ESBO (2,0–3,0 phr) are utilised.

Transparent wear layer:

Baerostab	Form	Type	Characteristics
CT 9063 X RF	L	CaZn	Standard plus, low odour, low phenol, 2-EHA free, nonylphenol free, ptBBA free, highly lubricated
CT 341 P	P	CaZn	Standard plus, phenol free, 2-EHA free, nonylphenol free, ptBBA free, low odour, low emission, good self-lubrication
MC 8807-16 CP	P	CaZn	Standard plus, phenol free, 2-EHA free, nonylphenol free, ptBBA free, low odour, low emission, good self-lubrication
MC 9269 CP-series	P	CaZn	High performance, phenol free, 2-EHA free, nonylphenol free, ptBBA free, low odour, low emission
UBZ 733-1 X RF	L	BaZn	High performance, low phenol, nonylphenol free, ptBBA free, 2-EHA free, highly self lubricated

L = liquid; P = solid/powder

Pigmented, filled:

Baerostab	Form	Type	Characteristics
CT 9063 X RF	L	CaZn	Standard plus, low odour, low phenol, 2-EHA free, nonylphenol free, ptBBA free, highly lubricated
MC 8807-16 CP	P	CaZn	Standard plus, phenol free, 2-EHA free, nonylphenol free, ptBBA free, low odour, low emission, good self-lubrication
MC 8807-18 CP	P	CaZn	Standard plus, phenol free, 2-EHA free, nonylphenol free, ptBBA free, low odour, low emission, low self-lubrication
MC 9098-series	P	CaZn	Standard, phenol free, 2-EHA free, nonylphenol free, ptBBA free, low odour, low emission, low self-lubrication
MC 9296-series	P	CaZn	High performance, phenol free, 2-EHA free, nonylphenol free, ptBBA free, low odour, low emission
MC 9268 CP	P	CaZn	High performance, phenol free, 2-EHA free, nonylphenol free, ptBBA free, very good thermo stability, good self lubrication, low emission
UBZ 733-1 X RF	L	BaZn	High performance, low phenol, nonylphenol free, ptBBA free, 2-EHA free, highly self lubricated

L = liquid; P = solid/powder

PVC flooring of the Olympic handball hall in Athens


Panasonic

Other Additives for Calendering

Product	Type	Form	Dosage [phr]	Application
Baerolub FTA	Stearic acid	P	0,2–0,4	External lubricant, plate-out tendency reduced or completely prevented
Baerolub LS 100	Complex ester	P	0,3–0,5	External lubricant, plate-out tendency reduced or completely prevented
Baerolub PA Special	Oxidised PE wax	P	0,05–0,15	External lubricant, high efficient, very good metal release behaviour
Baerolub L-PL	Glycerol partial ester GMO / GDO	L	0,3–2,0	Internal lubricant, very soluble in PVC, antifogging agent, improves heat stability particularly in formulations based on sulphur containing tin stabilisers, some antistatic effect
Baerolub L-CD	Hydrogenated castor oil	P	0,3–0,5	Internal lubricant for PVC-R formulation,
Baerolub L-MS	Glycerol partial ester GMS	P	0,5–0,8	Internal lubricant for PVC-R formulation, 40% glycerol mono stearate
Baerolub L-TP	Phthalate ester	P	0,3–1,0	Internal lubricant, primarily for processing of rigid films, guarantees highest transparency,
Baerostat 318 S	Antistatic agent	L	0,5–10,0	Improves electrical conductivity, imparts antistatic properties, plasticizing effect
Baerostat 350 R	Antistatic agent	P	1,0–2,0	Improves electrical conductivity, imparts antistatic properties, primarily for rigid films
Baerostat 351	Antistatic agent	L	0,5–10,0	Improves electrical conductivity, imparts antistatic properties, plasticizing effect
Antiblocking 3780	Silica complex	P	0,3–0,5	Reduction of surface tackiness in plasticized PVC films
Antiblocking 7831	Silica complex	P	0,5–1,5	Reduction of surface tackiness in plasticized PVC films
Baerolub MC 9739-1 CP	Amide batch	P	0,6–1,5	Antiblocking-batch, reduction of surface tackiness in plasticized PVC films
Baerolub L-AK Baerolub L-AS	Amide wax, EBS	P	0,4–0,6	External lubricant, impart antiblocking properties and dry grip
Laevisiel SL	Silica	P	0,5–1,0	Avoids formation of plate-out during processing, d50 = 5 µm
Laevisiel SP	Silica	P	0,5–1,0	Avoids formation of plate-out during processing, d50 = 20 µm
Baeroblue II NT	PVC Pigment blend	P	0,05–0,3	Bluish toner for transparent and white coloured films,
Baerostab ASM 104	Co-stabiliser	P	0,1–0,5	Organic co-stabiliser for combination with mixed metal stabilisers in order to prevent a pink discolouration during heat ageing (especially in darkness)
Baerostab ASM 711 Baerostab ASM 715	Co-stabiliser	P	0,5–2,5	Improvement of the heat ageing resistance in the temperature range of 120-150°C (prevents discolouration and embrittlement) and for achievement of amine resistance (PUR foam backing)
Baerostab B 200 P	UV Absorber	P	0,2–0,4	Improvement of the light stability / weatherability for outdoor applications
Baerostab LSA	ESBO	L	2,0–4,0	Epoxidised soya bean oil, improvement of heat and light stability by synergetic effect together with mixed metal stabilisers
Baerostab LSU	Epoxy octyl stearate	L	2,0–4,0	Co-stabiliser, improvement of heat and light stability by synergetic effect together with mixed metal stabilisers
Baerostab CWM 35	Organo-Phosphite, TNPP	L	0,3–1,0	Organic co-stabiliser, improvement of heat stability and colour, low odour
Baerostab CWM 201	Organo-Phosphite, TTDP	L	0,3–1,0	Organic co-stabiliser, improvement of heat stability and colour, low odour, for outdoor applications
Baerostab CWM 203	Organo-Phosphite, DDPP	L	0,3–1,0	Organic co-stabiliser, improvement of heat stability and colour, low odour

L = liquid; P = solid/powder

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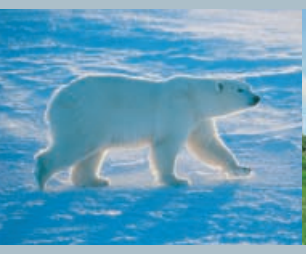

The following brochures are available as PDF-files:

Baerlocher Additives for PVC

- Additives for PVC (Overview)
- Lubricants
- Lead Stabilisers
- Extrusion & Injection Moulding
- Cables and Wires
- Calendered Films and Sheets
- Plastisol
- Sheets and Foamed Profiles

Baerlocher Special Additives

- Metallic Stearates

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BÆRLOCHER

Contact:
Baerlocher GmbH
Freisinger Straße 1
D-85716 Unterschleissheim
phone: +49/ 89 14 37 30
fax: +49/ 89 14 37 33 12
info@baerlocher.com
www.baerlocher.com

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