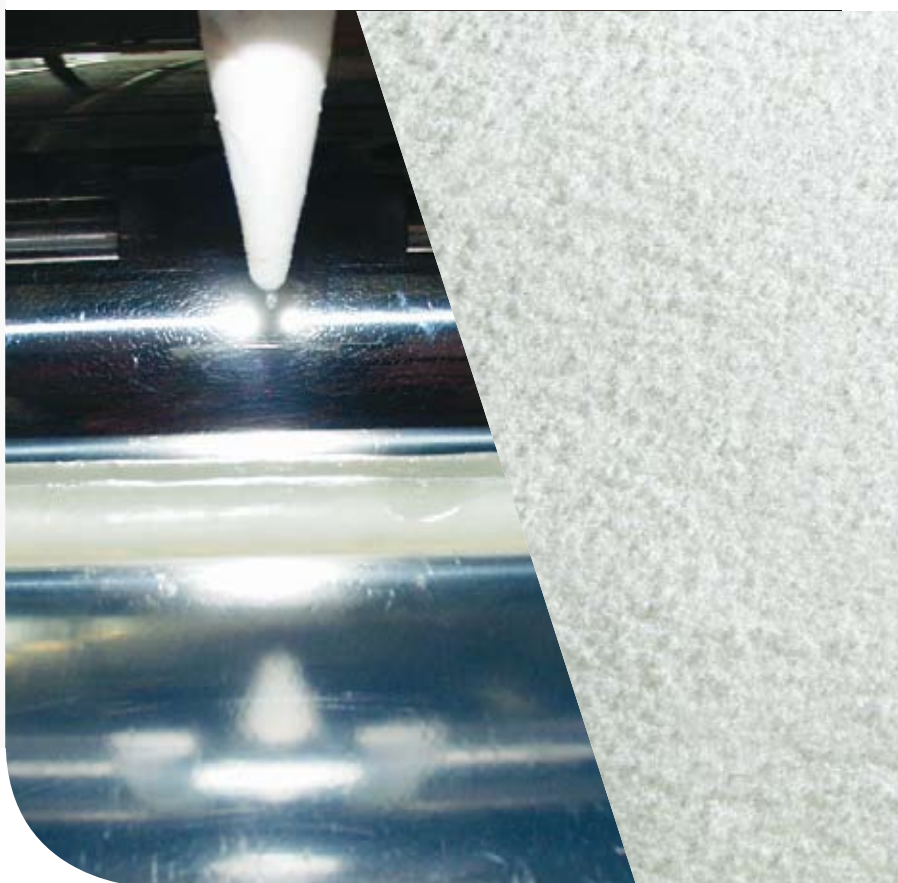




Baerlocher Additives for PVC
Lubricants



we add character to plastics

BÆRLOCHER





we add character to plastics

Plastics open new avenues for the future. Additives essentially determine properties and quality of the end product.

As a global leader in additive supply, Baerlocher has for more than 50 years been successfully providing support to the plastics industry by developing and manufacturing high-quality plastics additives.

www.baerlocher.com

Baerlocher products

Baeropan	Baerocid
Baerostab	Ceasit
Baeropol	Zincum
Baerolub	



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), the United States (Dover, Ohio) and India (Mumbai).

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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Lubricants

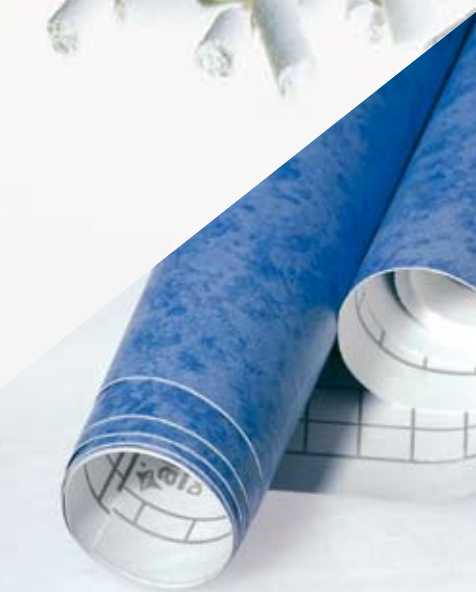
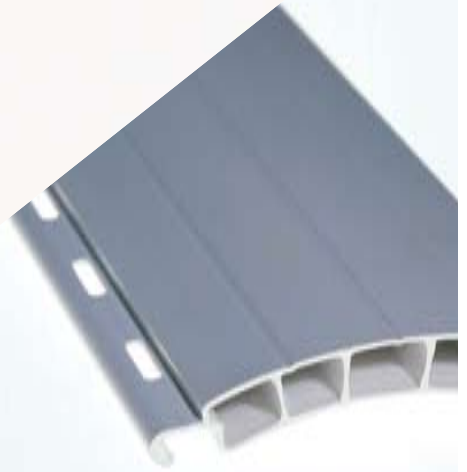
Like stabilisers, lubricants belong to those additives indispensable for PVC processing. They enable and facilitate the processing of PVC by reducing friction. Typical lubricants which are used for PVC applications are hydrocarbons, stearates, fatty acids, esters and amides, some of them modified with functional groups.

Baerlocher PVC Additives

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

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Classification of Lubricants

Depending on their way of action, one distinguishes between internal and external lubricants, with continuous transition. Internal lubricants often exhibit a certain external lubrication and vice versa. Lubricants having both effects are called “combined”.

Internal lubricants reduce friction occurring between the molecular chains of PVC, thus lowering the melt viscosity. They are polar, highly compatible with PVC, give excellent transparency even in high dosages and do not tend to exudate which could impair the weldability, printability and bonding properties.

External lubricants mainly reduce wall adhesion between PVC and metal surfaces. Most of them are non-polar substances, such as paraffins or polyethylene. The external lubrication is influenced by the length of the hydrocarbon chain, the branching or the functional groups. In high dosages “over-lubrication” can lead to haziness and exudation. External lubricants increase the fusion time.

Overview of lubricants:

Baerolub	Chemical name	Length of chain	Polar moiety	Lubrication
L-OH	Fatty alcohol	C ₁₄₋₁₈	-OH	
L-TP	Dicarboxylic acid ester	C ₁₄₋₁₈	-COO-	
L-PL	Fatty acid glycerol ester	C ₁₄₋₁₈	-COO-	
L-MS	Fatty acid glycerol ester	C ₁₄₋₁₈	-COO-	
Ceasit SW	Metal soap	C ₁₄₋₁₈	-COO-Ca	
L-CD	Fatty acid glycerol ester	C ₁₆₋₁₈	-COO- and -OH	
GTS	Fatty acid glycerol ester	C ₁₆₋₁₈	-COO-	
L-PM	Fatty acid ester	C ₁₆₋₁₈	-COO-	
L-PK	Fatty acid ester	C ₁₄₋₁₈	-COO-	
A 275	Ester wax	C ₆₋₁₈	-COO-	
43 C	Ester wax	C ₆₋₁₈	-COO-	
LS 100	Ester wax	C ₁₄₋₁₈	-COO-	
L-AK	Fatty acid amide	C ₁₄₋₁₈	-CO-NH-CO-	
Zincum SW/F	Metal soap	C ₁₈	-COO-Zn	
FTO	Hydroxy fatty acids	C ₁₄₋₁₈	-COOH and -OH	
FTA	Fatty acid	> C ₁₄₋₁₈	-COOH	
L-KM	Paraffin wax	> C ₂₀	Non-polar	
L-KO	Paraffin wax	> C ₂₀	Non-polar	
PA-L	Polyethylene wax	≈ C ₁₀₀	Non-polar	

Parameters influenced by Lubricants

Performance of Lubricants

Properties	Mainly internal lubricants	Mainly external lubricants
Release PVC-metal	low	high
Inner friction	will be reduced	will be reduced
Fusion time	almost no influence	will be prolonged
Torque	will be decreased	will be decreased
Transparency	no negative influence	can lead to haziness
Surface gloss	will be improved	will be improved
Exudation	does not occur	can lead to exudation
Printability Adhesion Weldability	no negative influence	could worsen
Pigment and filler dispersion	will be improved	no influence
melt viscosity	is reduced	is reduced

Product Range

Type	Baerolub	Chemical composition	Physical form	Melting (°C)	Lubrication
Solid fatty esters	L-MS	Glycerol partial ester of saturated fatty acids (glyceryl monostearate ca. 40%)	Powder	56 – 62	Internal
	L-CD	Glycerol ester of saturated fatty acids (Castor oil, hydrogenated)	Powder	84 – 88	Internal
	GTS	Glycerol ester of saturated fatty acids	Powder	50 – 54	Combined
	L-TP	Fatty alcohol phtalate	Powder	46 – 50	Internal
	L-PM	Fatty acid ester wax	Powder	52 – 55	Combined
	A275	Fatty acid complex ester and fatty acid Calcium soap	Powder Pellets	125 – 135	Combined
	43C	Fatty acid complex ester	Powder Pellets	59 – 65	Combined
	LS100	Fatty acid complex ester	Powder Pellets	58 – 65	Combined
Liquid fatty acid esters	L-PL	Glycerol partial ester of unsaturated fatty acids (glyceryl mono/dioleate)	Liquid	liquid at room temp.	Internal
	L-PK	Fatty acid ester	Liquid	liquid at room temp.	Combined
Solid hydro-carbons	L-KO	Synthetic paraffin wax	Powder	100 – 105	External
	L-KM	Paraffin wax	Powder	54 – 56	External
	PA-L	Polyethylene wax	Powder	102 – 110	External
Solid fatty acids, alcohol, and amide	FTA	Mixture of fatty acids	Powder	54 – 60	External
	FTO	Mixture of hydroxy fatty acids	Powder	70 – 80	External
	L-OH	Mixture of fatty alcohols	Powder	52 – 54	Internal
	L-AK	Amide wax (N,N'-ethylene distearamide)	Powder	138 – 144	External
Metal soaps	Ceasit SW	Calcium stearate	Powder	approx. 160	Internal
	Zincum SW/F	Zinc stearate	Powder	approx. 120	External

Applications								Food contact (release date Aug. 2007)
Extrusion		Injection moulding		Calender		Hollow articles	Plastisols	
Rigid	Flexible	Rigid	Flexible	Rigid	Flexible			
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Food contact: * = listed in Commission directive 2002 (as amended)
 ** = in accordance with certain national regulations, details on request
 -- = no agreement
 ++ = under evaluation

Please ask Baerlocher for the actual food contact status.

Product Forms

Our customers can choose from a variety of product forms for Baerolub lubricants:
Fine powder, low-dusting spray granules as well as pellets, flakes and liquids.



Disclaimer

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September 2007, Version 2



The following brochures are available:

Baerlocher Additives for PVC

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

Baerlocher Additives

- Metallic Stearates

*PDF-File only

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