
LUCOBIT® 1210A

THE ADDITIVE TO POLYMER MODIFICATION

OF ASPHALT AND BITUMEN



... make better roads

LUCOBIT® 1210A

THE ADDITIVE TO POLYMER MODIFICATION

CURRENT PROBLEMS IN ROAD CONSTRUCTION

The efficiency and utility value of our roads is dependent on various climatic forces and traffic-related developments.

The number of motorists increases exponentially. In particular, the rise in HGV traffic with higher axle loads is straining roads causing - with time elapsing - increasingly the potential for rutting and cracking. Taking into account the structurally accurate execution, we have to confront the increase in traffic growth with new solutions.

Those top layers that are especially strained have to be technically improved so that their durability is extended.

With budgets being tight and natural reserves becoming scarcer resulting in higher costs, thus future approaches will focus more on recycling and working with fewer layers of asphalt.



Rutting due to HGV traffic and higher axle loads

THE PRODUCT

Lucobit®1210A is a thermoplastic synthetic material consisting of a mixture of premium polyethylene copolymer and a special type of bitumen (ECB). The pure bitumen is homogeneously dispersed into the polymer matrix.

Lucobit®1210A is easily miscible with bitumen and asphalt mixtures like asphalt concrete, stone mastic or mastic asphalt either by pre-mixing with bitumen (PmB)

or simply by adding Lucobit®1210A into the mix during the asphalt production (PmA). Lucobit®1210A can also be used for industrial asphalt and/or binder courses because of high strain resistance of the final product.

Lucobit®1210A is viewed in industry as a product to be also utilized in various special asphalts for stability purposes and thus supporting the idea of lasting

quality. To comply with the requirements of future computer-assisted dimensioning of road surfaces, Lucobit®1210A will aid in the reduction of the various asphalt layer thicknesses as well.

The effects of weather: Stresses caused by thermal fluctuations due to direct sunlight exposure during the days and drastic cooling in shady areas or at night.

EXAMPLES OF SURFACE COURSES

(According to TL Asphalt-Regulation StB 07)

ROLLED ASPHALT		MASTIC ASPHALT
ASPHALTIC CONCRETE	STONE MASTIC ASPHALT	
<ul style="list-style-type: none">• higher resistance against mechanical strain• higher resistance against deformation and wear & tear• stronger affinity with grit• higher level of stability• low temperature of flexibility• ageing resistance• reduced thickness of courses		<ul style="list-style-type: none">• for support of mounting on inclined surfaces• higher resistance against rutting• higher resistance against dynamic depths of impression• resistance in mixing stays constant• on-site adding possible

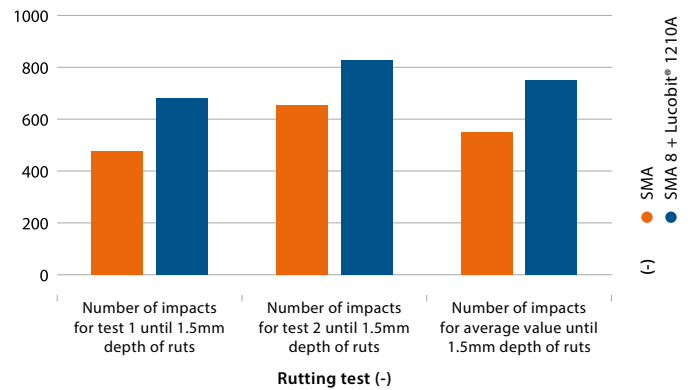
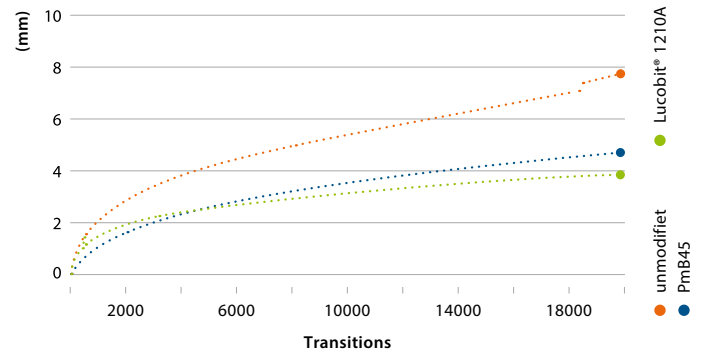
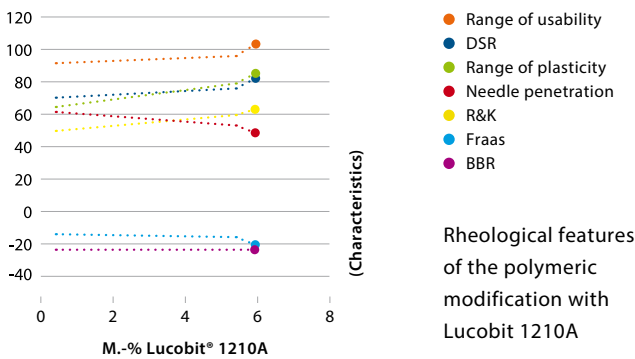


The effects of weather: stresses caused by thermal fluctuations due to exposure to direct sunlight during the days and drastic cooling down in shady areas or at nighttime.

TECHNICAL BACKGROUND

Research by registered and independent institutions showed impressively the suitability of Lucobit®1210A as bitumen and asphalt modifier. Its advantages over established competitors became evident (cp. Index- research in product file folder LUCOBIT AG): The constantly growing strain on roads caused by HGV traffic was counteracted by the use of Lucobit®1210A so that the resistance against rutting and cracking was significantly improved over any kind of non-modified standard asphalt.

Lucobit®1210A verifiably holds up to the strains of climatic forces like hot or cold exposures by widening the plasticity range of the modified bitumen. The softening point, ring and ball, as well as Fraass breaking point are significantly improved. The penetration of the bitumen decreases accordingly when adding Lucobit®1210A.



Exemplification of rutting tests about mastic and stone mastic asphalt

PRODUCTION AND MOUNTING

Lucobit®1210A has a very high thermal stability up to 300°C. No signs of polymer matrix degeneration are detected. Consequently, the production of PmB or PmA will be worry-free. Similarly, transport periods – and thus range – are extended even after hours of high temperature exposure.

When adding Lucobit®1210A directly into the asphalt mix (PmA production), the amount of Lucobit®1210A-granules is chosen according to the asphalt design

parameters: the average percentage amount ranges between 3.0 to 7.5% by mass (based on the percentage of binder used while simultaneously reducing the bitumen as to the percent by weight of the polymer added). The addition can be made before or after apportioning the binder. An extension of mixing time duration between 10 and 15 seconds is necessary depending on the composition and bitumen/asphalt batch size (temperature of mixture can be found in table 5 in ZTV Asphalt-StB 07).

For producing PmB (C), a homogenous mixture of common bitumen with Lucobit®1210A is prepared at temperatures between 165 and 195°C. Even with a screw-type agitator at a low rotation speed, a very thorough mixture (with respect to PmB-standards) is achieved and detected under an electron microscope. The bitumen incorporated into the polymer matrix guarantees an easy and rapid blending of the polymer into the bitumen or asphalt. For applying Lucobit®1210A modified asphalt, there is no further requirement necessary.

APPLICATION WITH REGARDS TO GERMAN RULES AND REGULATIONS

Lucobit®1210A as a composite of bitumen complies with the technical requirements of the TL Bitumen-StB 07 as well as with Index 3 for plastomer modified bitumen (PmB C).

Irrespective of whether the polymer modified asphalt has been mixed with PmB (C) or PmA (C), the quality of the asphalt is increased in a way that does and will comply with the requirements of the TL Asphalt-StB 07 and ZTV Asphalt-StB

07 and exceeds considerably those of any other standard product. This is especially relevant for rutting and cracking of roads. Currently, there is no regulation for rutting, it can be expected that rutting limitations will be implemented in the future. Thus, it could become mandatory in the future for constructors to indicate them under the TL Asphalt-StB 07.

LONG-TERM RESULTS

THE BUNDESANSTALT
FÜR STRASSENBAU (BAST)
CONFIRMS THE HIGH
QUALITY SURFACE AND
FUNCTIONING OF
LUCOBIT® 1210A

EFFECT OF LUCOBIT 1210A ON THE FUNDAMENTAL FEATURES OF BINDER

PROPERTIES	UNIT	BITUMEN 30/45	BITUMEN 30/45 + 5% BY MASS LUCOBIT 1210A	BITUMEN 50/70	BITUMEN 50/70 + 5% BY MASS LUCOBIT 1210A	TEST ACCORDING TO
Needle Penetration (100g, 5 s, 25°C)	0,1 mm	30 - 45	10 - 40	50 - 70	25 - 55	DIN EN 1426
Softening Point Ring and Ball	°C	52 - 60	≥ 65	46 - 54	≥ 55	DIN EN 1427
Fraas Breaking Point (max.)	°C	≤ -5	≤ -5	≤ -8	≤ -10	DIN EN 12 593

Lucobit 1210A-modified binder complies with the requirements according to TL Bitumen-StB 07, Issue 2007

AMOUNT OF LUCOBIT 1210A DEPENDING ON THE APPLICATION

APPLICATION	AMOUNT OF LUCOBIT 1210A REGARDING THE AMOUNT OF BINDER [% BY MASS]
POLYMER MODIFICATION OF	
Rolled asphalt (top layer, binder course and black base)	5,0
Mastic asphalt (top layer and coat)	5,0
HELP FOR PAVING INCLINED SURFACES	
up to 7%	approx. 3,0
up to 10%	approx. 5,0
> 10%	Zugabemenge anhand erweiterter Eignungsprüfung

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