

TECHNICAL INFORMATION
LIMBOROUTE 2-C K809
Information for Outdoor Use



LIMBOROUTE 2-C K809

Art.-No.: 14809A, white airless technique

Art.-No.: 211....RAL coloured

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Important Information:

Please consider our General Terms and Conditions and the general notes of the Technical Information Sheet! No liability is accepted for any errors! The information is provided to our best knowledge and experience. This information is, however, no warranty for any properties of the material. We provide this information without obligation, also regarding the rights of third parties. The user has to make sure that the material is appropriate for the respective application.

1 Main characteristics / Fields of application

LIMBOROUTE 2-C K809...

- is a high quality, low-solvent, aromatic-free 2-component high solid paint based on modified epoxy and polyaminoamide hardeners
- is a tried and tested, thin-layered marking material with excellent technical properties for the application on humid surfaces (e. g. fresh concrete and/or residual humidity >4%, alleys, forest roads)
- has been tested on the turntable simulator of the German Road Institute (BASt) and approved as Type I and Type II marking
- is suitable for both bituminous surfaces (mastic asphalt, asphalt concrete) and concrete and cement-bound surfaces
- can be applied with common application machines
- useable for airspray and airless technique
- is distinguished from conventional one-component paints by a chemical reaction that results in extended durability, resistance against chemicals and abrasion. Chemical reaction occurs alongside physical drying by evaporation of the solvent

2 Technical Data

Colour	White, (other colours upon request)												
Density	approx. 1.49 kg/l +/- 0.04 kg/l (with hardener)												
Mixing ratio	base component 2-K K809 : hardener (8623) = 20 : 1												
Potlife	approx. 3 days												
Solid content	min. 75%												
Volume solid content	approx. 53.48%												
Solvent content	max. 25%												
Thinner	When needed add max. 2% Thinner for 2-comp. EP, Art.-No.: 3130 for viscosity adjustment and for cleaning of machine and tools												
Storage stability	6 months (unmixed), in sealed original packaging; protect from frost and direct sun light												
Drying time / Trafficability	The drying times stated in the BASt test report are laboratory values that may differ from field conditions depending on climate (temperature, humidity, wind), material, layer thickness and road surface. In general, the marking's trafficability must be checked prior to exposing it to traffic.												
Standard packaging	2-C K809: tin container with 6/10/25/35 kg filling weight Other tin container / filling weights on request Hardener 8623: cans with 1.75 kg filling weight (corresponds with mixing ratio) Drop-on material: paper bags with PE-inlay – 25 kg filling weight												
Identification	The regulations and instructions concerning appropriate transport, handling, storage, first aid measures, toxicology and ecology are stated in our material safety data sheets! The instructions stated on the product label and in the MSDS must be followed.												
Processing temperature	min. +5°C												
Surface temperature	+5°C to +45°C												
Layer thickness / Theoretical consumption	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Wet film thickness</td> <td style="width: 33%;">= Dry film thickness</td> <td style="width: 33%;">= Theoretical consumption</td> </tr> <tr> <td>300 µm</td> <td>= 160 µm</td> <td>= 0.45 kg/m² (0.3 l/m²)</td> </tr> <tr> <td>400 µm</td> <td>= 214 µm</td> <td>= 0.59 kg/m² (0.4 l/m²)</td> </tr> <tr> <td>600 µm</td> <td>= 321 µm</td> <td>= 0.89 kg/m² (0.6 l/m²)</td> </tr> </table> <p>The actual consumption depends on the applied layer thickness and the type and state of the surface</p>	Wet film thickness	= Dry film thickness	= Theoretical consumption	300 µm	= 160 µm	= 0.45 kg/m ² (0.3 l/m ²)	400 µm	= 214 µm	= 0.59 kg/m ² (0.4 l/m ²)	600 µm	= 321 µm	= 0.89 kg/m ² (0.6 l/m ²)
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3 Processing instructions

3.1 Preparation of material and application techniques

Before processing LIMBOROUTE 2-C K809 must be homogenously stirred in the original container. Then the hardener must be added into the base component at the stated mixing ratio while stirring uniformly. The exact machine adjustments depend on the application conditions, type of machine, desired wet film thickness, type and quantity of drop-on material and need to be made according to the machine manufacturer's instructions.

The uniform spread of marking material and drop-on material over the entire application surface must be observed. Losses of drop-on material must be regarded when adjusting bead pistol or bead dispenser.

The theoretical consumption of paint and drop-on material is listed in the BASt-test report and in the table "Theoretical consumption of material and drop-on materials" on our website in kg/m² as well as in kg/km of line to be marked depending on typical line width.

Cleaning of machine (paint tank and hoses) and tools must take place before curing is complete with Thinner for 2-C EP (Art.-No.: 3130) exclusively. Avoid blending with other thinners or marking materials.

Before longer marking interruptions remove any paint that has already been mixed with the hardener.

3.2 Optimizing of application properties

The paint in its delivery state is ready for processing. In general, it is not necessary to add thinner but for optimizing the material's spray properties add max. 2% Thinner for 2-C EP (Art.-No.: 3130). Remaining LIMBOROUTE 2-C K809 (from the day before) must be applied completely before new paint is filled into the machine's paint tank. Use thinner recommended by the manufacturer only.

4 Road surfaces / pretreatment

4.1 General information

The surface must be dry, clean, free from grease, oil and loose gravel and other contaminations. The surface and potential existing old markings must be checked for their carrying capacity and compatibility with the material to be applied. In case of doubt, test applications and adhesion tests are required. Ideally, old markings should be removed with appropriate mechanical procedures.

Attention: LIMBOROUTE 2-C K809 is not appropriate for large area applications on bituminous surfaces (e.g. playground, sportsground, cycle path or similar).

The effects of moisture (rain, dew, fog, etc.) on the freshly applied LIMBOROUTE 2-K K809 can lead to the so-called carbamate formation on its surface (whitish surface, white streaks or spots). This is particularly noticeable with colored and dark shades. See also General notes on Technical Information "Carbamate formation".

4.2 Concrete and cement-bound surfaces

The pavement components that prevent good bonding, especially on new concrete, like fine mortar layers, concrete slurries, concrete after-treatments as setting retarders, paraffin, impregnations on silicate basis etc. must be appropriately removed (e. g. with high pressure water jet, fine millcut or similar). We recommend conducting test applications. In case of doubt address your concerns in written form.

When applying the paint to concrete or cement-bound surfaces, bubble formation is likely occur. In order to prevent the formation of bubbles the concrete should be pretreated with LIMBOROUTE 2-C K809 blended 1 : 1 with Thinner for 2-C EP (Art.-No.: 3130), wet film thickness approx. 200µm. Once dried, a second, undiluted layer can be applied.

Before applying an initial marking instead of spraying the final marking, good bonding between temporary and final marking has to be ensured. Otherwise, the initial marking needs to be removed or the surface must be pretreated.

4.3 Bituminous surfaces

Any loose components such as chippings must be removed. On new asphalt surfaces additives (flux oils, adherents etc.) are detrimental to good bonding of markings and can cause discolorations. Prior to application, test markings / bonding checks are necessary. Since a mechanical removal is hardly possible, the surface should be exposed to traffic for 4-6 weeks or an initial marking must be applied. A bonding check is required before applying the final marking.

4.4 Cobbled pavement

Natural, artificial and compound stone pavements are non-static surfaces that move. Basically, such surfaces are not suitable for LIMBOROUTE 2-C K809. No guarantee is given in case of crack formation, chippings caused by the movement of pavement parts, poor marking bonding (e. g. natural or artificial stone), penetration of moisture and wear of the marking.

4.5 Floor coatings

LIMBOROUTE 2-C K809 is suitable for floor coatings. We recommend the application of additional varnish (2-C UV clear varnish) or alternatively check our various SWARCO SAFETY-LINE™ products. For further information please refer to the technical information of the LIMBOROUTE 2-C K809 Information for Indoor Use.

5 Application technique

Apply with conventional marking machines (airless or atomising technique), manually with brush or roller. For airless machines use airless quality only.

Attention: when applying with brush, roller or spray gun (e. g. jobs with stencils) take note of the paint's fast drying time.

It is absolutely necessary to immediately add the drop-on material. Otherwise, the drop-on material will not be embedded properly, which will lead to poor traffic technological properties. Two-layer applications are an option (first layer + drop-on material, second layer + drop-on material). Well embedded drop-on beads from the first layer will be visible when the second layer is worn off.

6 Test reports / Field test reports

6.1 Table 1: Test reports by BASt (German Road Institute)

Test report – No.	Thick-ness	Consumption		Drop- on material (DOM) <small>Identification (divergent identification possible - see relevant test report)</small>	Traffic technological properties	
	mm	Material kg/m ²	DOM kg/m ²		New condition	Used condition
Type I marking						
2005 1DS 07.17	0.3	0.447	0.24	SWARCOLUX P21 T14 M25	P5, S2, R5, Q5, T2	P5, S1, R5, Q5
2018 1DS 05.09	0.3	0.447	0.30	SWARCO SOLIDPLUS 10 P21 T14 M25	P5, S1, R5, Q5, T2	P5, S2, R5, Q5
2021 1DS 05.10	0,3	0,447	0,24	SWARCO SOLIDPLUS 30 P21 T14 M25	P5, S1, R5, Q5, T2*	P5, S1, R5, Q5
2005 1DS 04.07	0.4	0.596	0.32	SWARCOLUX P21 T14 M25	P5, S2, R5, Q5, T3	P5, S1, R5, Q5
2017 1DS 03.18	0.4	0.596	0.32	SWARCO SOLIDPLUS 10 P21 T14 M25	P5, S1, R5, Q5, T3	P5, S1, R5, Q5
2020 1DS 04.09	0,6	0,894	0,60	SWARCO SOLIDPLUS 10 P21 T14 M25	P5, S1, R4, Q5, T3	P5, S1, R4, Q5
Type II marking						
2005 1DS 05.07	0.6	0.894	0.50	MEGALUX-BEADS 600-1400 T14 K25	P6,S1, R5, RW5, Q5, T3	P6, S1, R5, RW5, Q5
2018 1DS 05.03	0.6	0.894	0.60	SWARCO SOLIDPLUS 10 425-1400 T14 MK30	P6,S1, R5, RW5, Q5, T3	P6, S1, R5, RW5, Q5
2018 1DS 05.04	0.6	0.894	0.60	SWARCOLUX 50 425-1400 T14 MK30	P6,S1, R4, RW4, Q5, T3	P6, S1, R4, RW4, Q5
2020 1DS 04.07	0.6	0.894	0.60	SWARCO SOLIDPLUS 10 425-1400 T14 MK30	P6,S1, R5, RW5, Q5, T3	P6, S1, R5, RW4, Q5
2021 1DS 05.11	0.6	0.894	0.45	SWARCO SOLIDPLUS 50 425-1400 T14 MK30	P6,S1, R5, RW6, Q5, T2	P6, S1, R5, RW6, Q5
2021 1DS 05.12	0.6	0.894	0.45	SWARCO SOLIDPLUS 30 425-1400 T14 MK30	P6,S1, R5, RW6, Q5, T2	P6, S1, R5, RW5, Q5

6.2 Table 2: Field test reports

Test report-no.	Testing institute	Stretch	Traffic exposure	Layer thickness	Bead type	Traffic techn. properties / used condition
5407	DSGS	A38	13 months	0.6 mm edge line	Meg. 0.6-1.5 KT 14	Q4, R4, RW3, S3, B4
5407.1	DSGS	A38	13 months	0.6 mm edge line	Meg. 0.6-1.5 KT 18	Q4, R4, RW3, S5, B4
5463.1	DSGS	B167	25 months	0.6 mm edge line	Meg. 0.6-1.5 KT 14	Q4, R4, RW3, S2
5495.7	DSGS	B253	12 months	0.6 mm edge line	Swarco P21 (Type I)	Q4, R2, RW3, S5
5632	DSGS	B167	49 months	0.6 mm edge line	Meg. 0.6-1.5 KT 14	Q2, R4, RW3, S2, B1
6524	DSGS	A38	25 months	0.6 mm edge line	Meg. 0.6-1.5 KT 14	Q4, R4, RW3, S4
6525	DSGS	A38	25 months	0.6 mm edge line	Meg. 0.6-1.5 KT 18	Q4, R3, RW2, S5
6543	DSGS	B167	36 months	0.6 mm edge line	Meg. 0.6-1.5 KT 14	Q2-Q3, R4, RW3, S2
6616	DSGS	A27	12 months	0.6 mm edge line	Meg. 0.6-1.5 KT 14	Q4, R4, RW3, S2
7037.2	DSGS	Ind. area	13 months	0.6 mm edge line	Swarco P21 (Type I)	Q4, R4, RW2, S2
7107	DSGS	Ind. area	24 months	0.6 mm edge line	Swarco P21 (Type I)	Q4, R3, S2
7490 renovation D480 structure	DSGS	B61	12 months	0.3 mm K809 on D480	Swarco N°1 Solid Plus 300-850 T14 without anti-skid	Q3, R4, RW2-3
7489 renovation D480 structure	DSGS	B61	12 months	0.3 mm K809 on D480	Swarco P21 without anti-skid	Q3, R3, RW1

DSGS - German Road Marking Society