TECHNICAL INFORMATION

LIMBOROUTE 2-COMPONENT K809F AIRPORT

swarco

Road Marking Systems

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LIMBOROUTE 2-COMPONENT K809F AIRPORT

Art.-no.: 14809F, white
Art.-no.: 212….(RAL)

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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-component K809F airport…

- is a high quality, low-solvent, free-aromatic 2-component high-solid-paint based on modified epoxy and polyaminoamide hardeners
- is a well-proven, thin-layered marking material with excellent technical properties (durability, chemical resistance, abrasion resistance)
- suitable for application on humid surfaces (e. g. fresh concrete with residual humidity > 4 %)
- suitable for airfield runways and taxi ways with low to middle impact by aircrafts
- available in colors according to DIN 6171, standard colors for airfields
- has been tested by the German Federal Institute of Materials Research and Testing (BAM) regarding: determination of the color coordinates (DIN 5033), evaluation in line with ICAO-Annex 14-Aerodroms and according to STANAG 3711 (see BAM test report S1E1089)
- according to the requirements of chromaticity co-ordinates, luminance factor and resistance to chemicals of EASA (European Aviation Safety Agency (confirmation is conformed to the DSGS certificates)
- has been tested on the turntable simulator at the German Road Institute (BASt) as marking system with different high-index beads developed especially for airfield markings
- has been tested for resistance against kerosene according to DIN EN ISO 2812-1 and DIN EN ISO 4628-2 (LGA- test report BP015 1007/1) and chemical resistance on basis of DIN 68861, part 1 / DIN EN 12720 / DIN ISO 4628-2 (test report ILF Magdeburg, no.1-083/2006 and test report no.2 from 2001)
- has been tested according to the requirements of TT-P 1552F (Test Report No. 210077-1 and 210077-2). (According to TT-P 1952F, water-thinnable systems are intended. Since low-solvent high-solids systems are currently also used for airfields in Europe, the product was tested in accordance with TT-P 1952).
- is suitable for bituminous and concrete surfaces
- is applicable with any standard application machine used at present
- available in airless quality only
- distinguished from conventional one-component paints by its chemical reaction results in extended durability, resistance against chemicals and abrasion. Chemical reaction occurs besides physical drying through evaporation of the solvent

2 Technical Data

Color	White; RAL-colors, within limits of color coordinates, according to Annex 14 ICAO and EASA* (without chromaticity co-ordinates of the color sky blue and grass-green)
Density	approx. 1.49 kg/l +/- 0.04 kg/l (with hardener)
Mixing ratio	base component 2-comp. K809F : hardener component (8623) = 20 : 1
Potlife	approx. 3 days
Solid content	min. 75%
Volume solid content	approx. 53.48%
Solvent content	max. 25%
Thinner	If required add max. 2-5% Thinner for 2-comp. EP, Art. No.: 3130 for viscosity adjustment, optimizing of spray properties 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 time 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 before exposing it to traffic impact.
Standard packaging	**2-comp. K809F :** tin container of 35 kg filling weight **Hardener 8623:** cans of 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	Wet film thickness = Dry film thickness = Theoretical consumption 300 µm = 160 µm = 0.45 kg/m² (0.3 l/m²) 400 µm = 214 µm = 0.60 kg/m² (0.4 l/m²) 600 µm = 321 µm = 0.89 kg/m² (0.6 l/m²) The actual consumption depends on the applied layer thickness application technique and type and state of the surface

*In order to simplify color selectin: in practice RAL colors with color co-ordinates within limits of Annex 14 ICAO and EASA are used. The colors sky blue and grass-green are recommended due to improved recognizability.

3 Theoretical consumption of material

Product	RAL color	Density	Theoretical Consumption* / layer thickness		
		approx. kg/l	kg/m²	kg/m²	kg/m²
		with hardener	0.3 mm	0.4 mm	0.6 mm
LIMBOROUTE 2-comp. K809F airport white	9016	1.49	0.45	0.60	0.89
LIMBOROUTE 2-comp. K809F airport traffic yellow	1023	1.40	0.42	0.56	0.84
LIMBOROUTE 2-comp. K809F airport traffic orange	2009	1.40	0.42	0.56	0.84
LIMBOROUTE 2-comp. K809F airport traffic red	3020	1.43	0.43	0.57	0.86
LIMBOROUTE 2-comp. K809F airport sky blue	5015	1.47	0.44	0.59	0.88
LIMBOROUTE 2-comp. K809F airport grass-green	6010	1.42	0.43	0.57	0.85
LIMBOROUTE 2-comp. K809F airport traffic black	9017	1.48	0.44	0.59	0.89

*rounded consumption
The actual consumption depends on the applied layer thickness and the type and state of the surface.

4 Processing instructions

4.1 General information

In addition to ICAO-Annex 14 national guidelines / recommendations regarding the marking of aircraft operations areas, airport ramps, taxiways and runways have to be observed.

4.2 Preparation of material and application techniques

Before processing LIMBOROUTE 2-component K809F airport must be **homogenously** stirred in its original container. Then the hardener must be added und stirred uniformly into the base component at the specified mixing ratio (20:1). The exact machine adjustments depend on the application conditions, type of machine, requested wet film thickness, type and quantity of drop-on material and need to be made according to the machine manufacturer's instructions. Layer thickness and quantity of drop-on material need to be evenly distributed. Scattering losses on both line sides make modified machine adjustments necessary.

Cleaning of machine (paint tank and hoses) and tools must take place before the material has cured. Only use Thinner for 2-comp. EP (Art. No.: 3130) for cleaning. Avoid blending with other thinners or marking materials. Before longer marking interruptions remove the paint mixed with hardener from the machine.

Theoretical consumption of material and drop-on materials are stated in:

- In the respective test reports by BASt
- In the table “RPA-test reports by BASt see point 7.1
- In the table “Theoretical consumption of material” see point 3
- 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

4.3 Optimizing application properties and application techniques

The paint is ready for processing in its delivery state. In general, it is not necessary to add thinner but for optimizing the material’s spray properties add max. 2-5% Thinner for 2-comp. EP (Art.-No.: 3130). Remaining LIMBOROUTE 2-component K809F airport (from the day before) must be applied completely before new paint is filled into the machine’s paint tank. Only use thinners recommended by the manufacturer.

5 Road surface / pretreatment

5.1 General information

The surface must be dry, clean free from grease, oil and loose gravel and other contaminations. The surface and potentially 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.

Colored marking materials may fade after some time of outside exposure. This is a normal effect caused by sun exposure, water, road salt, dew, condensed water and heat. Constant traffic impact reduces bleaching and shift of color intensity but is not able to prevent fading completely. See our elaborations on that subject in in our “General notes on technical information sheets”.
If necessary colored markings are to be renewed. Annex 14 ICAO describes under 3, “Colors for markings, signs and panels“, that color shade can fade, therefore specifications for paints are valid for freshly applied paint only.

Attention: LIMBOROUTE 2-component K809F airport is not suitable for large scale asphalt markings.

5.2 Concrete and cement-bound surfaces

The pavement components that prevent good bonding, especially on new concrete, including 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 waterjet, fine millcut or similar). We recommend conducting test applications. In case of doubt communicate your concerns in written form.
When applying the paint on concrete or cement-bound surfaces, the formation of bubbles is likely to occur. In order to prevent bubble formation the concrete should be pretreated with LIMBOROUTE 2-component K809F airport blended 1 : 1 with Thinner for 2-component EP (Art. No.: 3130), wet film thickness approx. 200µm. Once dried, a second, undiluted layer can be applied.

5.3 Bituminous surfaces

Any loose components such as chippings must be removed. Fluxoils, releasing agents for road rollers, are detrimental to good bonding of markings and can cause discoloration of the striping. Since airfields with new surfaces cannot be left unused and unmarked for 4–6 weeks, test markings and bonding checks are required before applying the final marking. It is recommended to conduct both in sufficient time prior to the final application.

5.4 Floor coatings

2-component K809F airport is suitable for floor coatings. In addition, we recommend the application of a varnish (2-component UV clear varnish) or consider one of our various indoor marking products.

6 Application technique

With conventional marking machines (airless or atomizing technique), or 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!
Adding Thinner for 2-comp. EP (Art.-No.: 3130) will partly improve processing properties. Immediate broadcasting of drop-on material is absolutely necessary. Otherwise the drop-on material will not be embedded properly, which leads to poor traffic technological properties.
Two layer applications are an option (first layer + drop-on materials, second layer + drop-on material). Well embedded drop-on beads from the first layer get visible when the second layer is worn.

7 Test reports

7.1 RPA – test reports by BASt (German Road Institute)

Test report no.	Thick-ness	Consumption		Drop- on material (DOM)	Traffic technological properties	
	mm	Material kg/m²	DOM kg/m²	Identification (divergent identification possible - see relevant test report)	New condition	Used condition
Type I marking white						
2005 1DS 07.17	0.3	0.45	0.24	SWARCOLUX P21 T14 M25	P5, S1, R5, Q5, T2	P5, S1, R5, Q5
2020 1DS 04.10	0.3	0.45	0.30	**Airport beads Type I T14 M30**	P5, S1, R5, Q5, T2	P5, S1, R5, Q5
2005 1DS 04.07	0.4	0.60	0.32	SWARCOLUX P21 T14 M25	P5, S1, R5, Q5, T3	P5, S1, R5, Q5
2007 1DS 08.10	0.4	0.60	0.32	**Airport beads Type I T14 M30**	P5, S1, R5, Q5, T2	P5, S1, R5, Q5
Type I marking yellow						
2020 1VS 05.08	0.3	0.42	0.30	**Airport beads Type I T14 GG30**	P5, S1, R5, Q3, T2, Y2	P5, S2, R5, Q3
2021 1VS 05.09	0,4	0,58	0,40	**Airport beads Type I T14 GG30**	P5, S1, R5, Q3, T2, Y2	P5, S1, R5, Q3
Type II marking white						
2005 1DS 05.07	0.6	0.89	0.50	MEGALUX-BEADS 600-1400 T14 K25	P6, S1, R5,RW5, Q5,T3	P6,S1, R5,RW5, Q5
2006 1DS 02.08	0.6	0.89	0.60	**Airport beads Type II T14 M25**	P6, S1, R5,RW6, Q5,T4	P6,S1, R5,RW6, Q5
2018 1DS 05.04	0.6	0.89	0.60	SWARCOLUX 50 425–1400 T14 MK30	P6, S1, R4,RW4, Q5,T3	P6,S1, R4,RW4, Q5
2013 1DS 08.05	0.6	0.89	0.50	**Airport beads Type II T14 M25**	P6, S1, R5,RW6, Q5,T4	P6,S1, R5,RW5, Q5
Type II marking yellow						
2012 1VS 01.12	0.6	0.84	0.50	**Airport beads Type II T14 GG30**	P6, S1, R4,RW4, Q3,T4, Y2	P6,S1, R4,RW4, Q3