

TECHNICAL INFORMATION LIMBOROUTE LW48



LIMBOROUTE LW48

Art.-No.: 11702 Airless, white

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1	Main characteristics / Fields of applications	3
2	Technical Data	3
3	Theoretical consumption of material	4
4	Processing instructions.....	4
4.1	Preparation of material and application techniques	4
4.2	Optimizing of application properties of water paint.....	5
4.3	Rain resistance / WOT (Wash-out-time)	5
5	Road surface / pretreatment.....	5
5.1	General information	5
5.2	Concrete or cement-bound surfaces	5
5.3	Bituminous surfaces	5
5.4	Cobbled pavement	6
5.5	Floor coatings	6
6	Application techniques	6
7	Test reports / Field test reports.....	6
7.1	Table 1: RPA – test reports by BAST (German Road Institute)	6
7.2	Table 2: Field test reports	6

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 applications

LIMBOROUTE LW48 ...

- is a water-thinnable, environmentally sound high solid waterborne paint.
- its technical values comply with the requirements by the German Road Institute (BASt) as type I marking as well as type II rain safety marking
- is suitable for both bituminous (e. g. mastic asphalt, asphaltic concrete) and concrete surfaces
- is suitable for applications with airless and atomizing techniques
- is characterized by good drying and bead embedment properties, excellent covering power and good resistance against abrasion

2 Technical Data

Color	White, other colors upon request																				
Density	approx. 1.63 kg/l +/- 0.04																				
Solid content	≤ 80%																				
Solvent-content	< 2%																				
Thinner	max. 2% water to optimize the material's properties. Cleaning of equipment and machinery with water																				
Storage stability	6 months, in sealed original packaging; protect from frost and direct sun light																				
Overrollability / curing time	The drying times stated in the BASt test reports are laboratory values that may differ from field conditions depending on climate (temperature, humidity, wind), material, layer thickness and road surface. In general the markings' overrollability must be checked before exposing them to traffic impact.																				
WOT (Wash-out-time)	approx. 30 minutes after application depending on layer thickness and climatic conditions.																				
Standard packaging	Plastic container with 25 kg filling weight Larger container upon request Drop-on material: paper bags with PE inlay – 25 kg filling weight																				
Identification	The regulations and instructions concerning appropriate transport, handling, storage, first aid and measures, toxicology and ecology are stated in detail in our material safety data sheets! The instructions stated on the product label and in the MSDS must be followed.																				
Processing temperature	min. +10°C																				
Surface temperature	+10°C to +45°C																				
Rel. humidity	max. 75% - (dew point spreadsheet has to be regarded)																				
Layer thickness / Theoretical consumption	<table> <tr> <td>Layer thickness</td> <td>=</td> <td>dry film thickness</td> <td>=</td> <td>Theoretical consumption</td> </tr> <tr> <td>300 µm</td> <td>=</td> <td>200 µm</td> <td>=</td> <td>ca. 0,49 kg/m² (0,3 l/m²)</td> </tr> <tr> <td>400 µm</td> <td>=</td> <td>268 µm</td> <td>=</td> <td>ca. 0,65 kg/m² (0,4 l/m²)</td> </tr> <tr> <td>600 µm</td> <td>=</td> <td>400 µm</td> <td>=</td> <td>ca. 0,98 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>	Layer thickness	=	dry film thickness	=	Theoretical consumption	300 µm	=	200 µm	=	ca. 0,49 kg/m ² (0,3 l/m ²)	400 µm	=	268 µm	=	ca. 0,65 kg/m ² (0,4 l/m ²)	600 µm	=	400 µm	=	ca. 0,98 kg/m ² (0,6 l/m ²)
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3 Theoretical consumption of material

Product	RAL color	density	Theoretical consumption, layer thickness		
		kg/l	kg/m ² *	kg/m ² *	kg/m ² *
			0,3mm	0,4 mm	0,6 mm
LIMBOROUTE LW48 white	9016	1.63	0,489	0,652	0,978
LIMBOROUTE LW48 traffic yellow	1023	1.60	0,480	0,640	0,960
LIMBOROUTE LW48 traffic orange	2009	1.62	0,486	0,648	0,972
LIMBOROUTE LW48 traffic red	3020	1.64	0,492	0,656	0,984
LIMBOROUTE LW48 traffic blue	5017	1.64	0,492	0,656	0,984
LIMBOROUTE LW48 traffic green	6024	1.64	0,492	0,656	0,984
LIMBOROUTE LW48 traffic black	9017	1.60	0,480	0,640	0,960

*rounded theoretical consumption

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

4 Processing instructions

4.1 Preparation of material and application techniques

The LIMBOROUTE LW48 has to be **homogeneously** stirred in the original container. The exact machine adjustments have to be done according to the manufacturer` 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.

Theoretical consumption of material and drop-on material is listed:

- in the respective test reports by BAST
- in the table 1 “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

Note: All devices and tubes must be totally free from paint residues and solvents before LIMBOROUTE LW48 is applied! All devices and tubes must be totally free from old paint residue and solvents. Do not use equipment that has any brass or copper parts. Stainless steel parts are recommended.

Before using waterborne paints, we recommend to clean equipment and machinery used earlier for solvent-based paints in the following three steps:

1. Rinse thoroughly with solvent (Art.-No. RH10010 Acetone)
2. Rinse with industrial alcohol or an alcohol / water mix (Art.-No. RH10070 Ethanol)
3. Rinse with plenty of water

At each work interruption the nozzles must be cleaned. Once the work is completed, the machine must be thoroughly rinsed. Immediately after the application of waterborne paints,

equipment and machinery must be cleaned in reverse order to prepare them for the use of solvent-based paints.

4.2 Optimizing of application properties of water paint

The LIMBOROUTE LW48 in its delivery state is ready for processing. Usually, the addition of thinner is not necessary. It is, however, possible to optimize the material's spray properties by adding max. 2% water as thinner.

4.3 Rain resistance / WOT (Wash-out-time)

In contrast to other marking materials and in addition to trafficability, rain resistance must be considered when working with waterborne paint. Rain resistance / WOT describes the time beyond trafficability / curing time after which waterborne paint is resistant against weather-related influences and after which it can no longer be washed out. It is recommended to apply water-soluble marking systems only under stable weather conditions without the probability of rain.

5 Road surface / pretreatment

5.1 General information

The surface must be dry, clean and 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 bonding checks 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 our "General notes on technical information sheets".

Information: LIMBOROUTE LW48 is not appropriate for large surface applications.

5.2 Concrete or cement-bound surfaces

The pavement components in new road surfaces that prevent good bonding (fine mortar layer, concrete slurries) must be appropriately removed (e. g. with high pressure waterjet, fine millcut or similar). 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 LW48 blended 1:1 with water as a primer (approx. 200µm). The humidity of the concrete must not exceed 4% during the marking work. After precipitations a waiting period of minimum 48 hours is recommended.

5.3 Bituminous surfaces

Any loose components such as chippings must be removed. Fluxoils of new bituminous surfaces are detrimental to the good bonding of markings and may lead to discoloration of the striping. Since these oils are hardly removable mechanically, the surface should either be exposed to traffic for 4–6 weeks or initially be marked with paint.

5.4 Cobbled pavement

All kind of cobbled pavements are moveable surfaces. That can lead to crack formation or spillings on the marking. Material is used without any manufacture guarantee. Test applications, surface pretreatments are recommended. Cobbled pavement must ensure proper bonding.

5.5 Floor coatings

For markings on floor coatings our indoor marking products should be used. LIMBOROUTE LW48 is not suitable for floor coatings.

6 Application techniques

With conventional marking machines with stainless steel equipment (airless or atomizing technique); manually with brush or roller. The marking paint must be homogeneously stirred in the original container before processing! The exact machine adjustments depend on the application conditions and the machine type and should 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. Layer thicknesses and drop-on material quantities must be respected.

7 Test reports / Field test reports

7.1 Table 1: RPA – test reports by BASt (German Road Institute)

Test report-no.	Layer thickness	Consumption		Drop-on material (DOM) Identification (divergent identification possible – see relevant test report)	Traffic technological properties	
	mm	Material kg/m ²	DOM kg/m ²		New condition	Used condition
Type I marking						
2006 1DW 01.04	0.3	0.489	0.23	SWARCOLUX P21 T14 M25	P5, S1, R5, Q5, T2	P5, S1, R5, Q5
2013 1DW 07.14	0.3	0.489	0.24	SWARCOFLEX 100-600 T14 M25	P5, S2, R5, Q5, T2	P5, S2, R4, Q5
2013 1DW 07.15	0.4	0.652	0.32	SWARCOFLEX 100-600 T14 M25	P5, S1, R4, Q5, T3	P5, S1, R4, Q5
2020 1DW 13.03	0.6	0.978	0.60	SWARCO SOLIDPLUS 10 425-1400 T14 MK30	P5, S1, R5, Q5, T3	P5, S1, R5, Q5
2020 1DW 13.04	0.6	0.978	0.60	SWARCOLUX 50 425-1400 T14 MK30	P5, S1, R5, Q5, T3	P5, S1, R5, Q5
Type II marking						
2022 1DW 02.04	0.6	0.978	0.48	SWARCO SOLIDPLUS 30 425-1400 T14 MK30	P6, S1, R4, RW4, Q5, T3	P6, S1,R4, RW4, Q5

7.2 Table 2: Field test reports

Report no.	Testing Institute	stretch	Traffic exposure	Layer thickness	Bead type	Traffic technological properties / used condition
6171	DSGS	A31	15 months	0.6 mm edgeline	Meg.0.8-1.5 KT14	Q3-Q4, R5, RW3, S1-S2
6243	DSGS	A31	21.5 months	0.6 mm edgeline	Meg.0.8-1.5 KT14	Q4, R4, RW2, S1
6427	DSGS	B16	11.5 months	0.6 mm edgeline	Swarco P21	Q4, R3, S2
5469	DSGS	A352	13 months	0.6 mm edgeline	Meg.0.6-1.5 KT14	Q3, R4, RW4, S1