



SWARCO LIMBURGER LACKFABRIK GmbH

Road Marking Systems



LIMBORROUTE HR

TECHNICAL INFORMATION

SWARCO | First in Traffic Solutions.

LIMBOROUTE HR

One-component paint

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Attention should be paid to our general notes of our technical information!
No liability is accepted for any errors.

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1 Main characteristics / Fields of application

LIMBOROUTE HR ...

- is an aromatic-based, one-component high-solid paint with low solvent content
- has been especially developed for use in warm climatic zones
- is suitable for both bituminous surfaces (e.g. mastic asphalt, asphalt concrete) and concrete surfaces
- the use of special acrylate binders accelerates the solvent release out of the wet film and thus results in very good drying properties when applying thicker layers
- is applicable with common application machines
- is available for airless and airspray (automising) techniques

2 Technical Data

Color	White, other colors on request
Density	approx. 1.54 – 1.60 kg/l white
Solid content	min. 75%
Solvent content	max. 25%
Thinner	When needed add 2% Thinner for HR (Art.-No.: 3140L/3140HR) for optimizing spray properties or add 2% thinner for high temperatures (Art.-No.: 3160) to optimize bead embedment
Cleaning thinner	Special cleaner for marking machines Art.-No.: 3086 or Thinner for HR (Art.-No.: 3140L/3140HR)
Storage stability	1 year in unmixed, sealed original packaging and sheltered from frost and direct sun exposure
Drying time / Overrollability	The drying time stated in the BASt test report is based on 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.
Standard packaging	Tin containers of 6 / 15 / 40 kg filling weight or 80 kg steeldrums, 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 observed.
Processing temperature	min. +5°C
Surface temperature	+ 5°C to +45°C
Relative humidity	max. 75 % (dew point spreadsheet has to be regarded)

3 Processing instructions

3.1 Preparation of material and application technique

Before processing LIMBOROUTE HR must be homogenously stirred in the original container. The exact machine adjustments depend on the application conditions, type of machine, required wet film thickness, type and quantity of drop-on material and need to be made according to the machine manufacturer's instructions.

The uniform distribution 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.

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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 homepage (in kg/m²).

The cleaning of machinery (paint tank and hoses) and tools with special cleaner for marking machines (Art.-No.: 3086) or Thinner for HR (Art.-No.: 3140L/3140HR) must take place before curing is complete.

The paint LIMBOROUTE HR 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 approx. 2% Thinner for HR (Art.-No.: 3140L/3140HR) may be added.

When processing LIMBOROUTE HR at temperatures above 25°C it is recommended to add approx. 2% Thinner for high temperatures (Art.-No.: 3160). Only thinner recommended by the manufacturer must be used.

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 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. We recommend conducting test applications. In case of doubt about bounding properties address your concerns in written form.

Attention: LIMBOROUTE HR is not suitable for large scale asphalt markings (bicycle lanes, sports fields, childrens' playgrounds) or for indoor markings.

4.2 Concrete or cement-bound surfaces

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

On new washed concrete surfaces (with grit) poor bonding properties may occur, not caused by the quality of the marking paint. We recommend the application of test markings.

When applying the paint to 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 HR blended 1:1 with Thinner for HR (Art.-No.: 3140L/3140HR) and sprayed with approx. 200µm wet film thickness. Once dried, a second, undiluted layer can be applied. The humidity of concrete must not exceed 4% during the application of the marking.

4.3 Bituminous surfaces

Any loose components such as chippings must be removed. On new asphalt surfaces additives (fluxoils, adherents etc.) are detrimental to good bonding of markings and can cause discolorations. Prior to application, test markings / bounding checks are necessary. Since a mechanical removal is hardly possible, the surface should be exposed to traffic for 4 - 6 weeks.

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4.4 Cobbled pavement

Natural, artificial and compound stone pavements are loose, non-static surfaces. Basically these are not suitable surfaces for the application of LIMBOROUTE HR. No guarantee is given in case of crack formation, chippings caused by the movement of pavement parts, poor marking bonding (e.g. on natural or artificial stones), penetration of moisture and the wear of the marking. In case of doubt test markings / bounding checks are necessary.

4.5 Floor coatings

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

5 Application techniques

Apply with conventional marking machines (airless or atomising technique) or 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. Use airless LIMBOROUTE HR quality for airless machines only.

It is absolutely necessary to immediately add the drop-on material. Otherwise the drop-on material will not be embedded properly resulting in 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 will be visible when the second layer is worn off.

6 Test report

6.1 RPA – test report by BAST (German Road Institute)

Test report-no.	Layer thickness	Consumption		Drop-on material (DOM)	Traffic technological properties	
		Material	DOM		New condition	Used condition
	mm	kg/m ²	kg/m ²	Identification		
97 1DS 04.17	0.3	0.462	0.20	Swarco beads Type I	/	P4, S1, R3, Q4, T2