

TECHNICAL INFORMATION  
LIMBOPLAST KSP 130



# LIMBOPLAST KSP 130

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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

## LIMBOPLAST KSP 130...

- belongs to the group of environmentally friendly, solvent-free, sprayable multi-component reactive systems
- consists of two or more components that chemically react to form duroplastic, thin-layer markings
- can be applied as type I marking as well as type II rain safety marking with enhanced nighttime visibility in wet conditions
- is suitable for both bituminous (e.g. mastic asphalt, asphaltic concrete) and concrete surfaces
- appropriate for universal use with all common application techniques for cold spray plastic (system 98:2, system 1:1, open system with reactive beads)
- applicable using conventional spray methods or injection procedure; with high quality drop-on materials only
- available for airless and atomizer paint sprayer

# 2 Technical Data

<b>Color</b>	White, other colors on request
<b>Density</b>	approx. 1.58 kg/l +/- 0.1
<b>Potlife</b>	min. 5 min.
<b>Solvent content</b>	Solvent-free; do not add solvents
<b>Solvent for cleaning</b>	Special cleaner for marking machines (Art.-No.: 3086)
<b>Storage stability</b>	6 months unmixed in sealed original packaging and sheltered from frost and direct sun exposure!
<b>Trafficability / curing time</b>	Depends on the climatic conditions (cf. table "Potlife / Curing times"). In general the marking's trafficability must be checked before exposing it to traffic impact.
<b>Standard packaging</b>	<p><b>2-C KSP 130:</b> Tinplate container with 10/15/25/40 kg filling weight. Container upon request</p> <p><b>3-C KSP 130:</b> white container – 40 kg filling weight – component A blue container – 40 kg filling weight – reactive component B Container for component A and B available on request</p> <p><b>Hardener powder:</b> PE-bags, filling weight corresponds to cold spray plastic quantity and mixture ratio</p> <p><b>Liquid hardener:</b> Plastic cans – 20 kg filling weight</p> <p><b>Attention:</b> all hardener types are organic peroxides and must be separately packaged, shipped and stored away from cold spray plastics in special containers (special cartons and boxes).</p> <p><b>Drop-on material:</b> paper bags with PE inlay – 25 kg filling weight</p>
<b>Identification</b>	The regulations and instructions concerning appropriate transport, handling, storage, first aid 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.
<b>Processing temperature</b>	min. + 5°C
<b>Surface temperature</b>	+5°C to +45°C
<b>Rel. humidity</b>	max. 75% (dew point spreadsheet has to be regarded)
<b>Layer thickness</b>	0.3 - 1.2 mm depends on BAST report (Dry layer thickness = Wet layer thickness)
<b>Theoretical consumption</b>	0.47 – 1.89 kg/m <sup>2</sup> (0.3 – 1.2 l/m <sup>2</sup> ) <sup>2</sup> The actual consumption depends on the applied layer thickness and the type and state of the surface.

### 3 Mixing ratios / Application techniques / Hardener

Product	Art.-No.:	Technique	Hardener type
<a href="#">2-comp. LIMBOPLAST KSP 130</a> Reactive component B = base component	5175FI	Shielded mixture procedure, Application technique for system 98 : 2	Liquid hardener
Mixing ratio: reactive component B (KSP 130) : Liquid hardener = 98 : 2			
<a href="#">3-comp. LIMBOPLAST KSP 130</a> reactive component B = base component non-reactive component A*	5175B 5175A	Shielded mixture procedure, 3-comp. special machine	Hardener powder
Mixing ratio : component A * + hardener powder (BPO) : component B = 1 : 1 (non-reactive) (2% to 4%) (reactive)			
<a href="#">3-comp. LIMBOPLAST KSP 130</a> reactive component B = base component non-reactive component A*	5175BFI 5175AFI	Shielded mixture procedure 3-comp. special machine	Liquid hardener
Mixing ratio : component A * + Liquid hardener : component B = 1 : 1 (non-reactive) (2% to 4%) (reactive)			

\* Component A, mixed with hardener has limited storage stability / pot life. Remaining quantities have to be removed from the machine immediately after use.

Between October and April LIMBOPLAST KSP 130 is delivered in winter formulation, due to weather conditions

## 4 Processing instructions

### 4.1 Preparation of materials and application technique

LIMBOPLAST KSP 130 has to be **homogeneously** stirred in its original container. Only use the quantity needed for the actual marking job. Then add the required hardener using the correct mixing ratio, depending on the application technique and stir until evenly distributed.

When working with **2-component marking machines** with shielded mixture procedure (98:2 system) it is important to ensure the machine is adjusted to the correct mixing ratio inside the mixing tube. Even with short standstill times it is necessary to rinse the mixing and spray devices with **special cleaner for marking machines** (Art.-No.: 3086).

For **3-comp. marking machines** (mixture ratio 1:1) also consider:

- Mix the hardener with the non-reactive component A until evenly distributed and pour it into the storage container A. Close container A. Only then stir component B and pour it into storage container B.
- Extremely clean working conditions are essential when processing the components. Smallest contaminations / intermixings of the components can lead to premature curing. Therefore it is advisable to use different stirring devices and auxiliaries for the different components.
- Even with only short standstill times of the machine it is necessary to rinse the mixing and spray devices with special cleaner for marking machines (Art.-No.: 3086).
- Non-reactive component A has a limited storage stability / potlife when mixed with the hardener. Therefore it is necessary to remove residuals of the non-applied, premixed material from the machine. Otherwise machine damage can occur due to polymerisation.

Cold spray plastic (reactive systems) are solvent-free and must be applied without adding solvent (optimizing of material processability, see 4.2).

The cleaning must occur before the curing of the material is complete by using special cleaner for marking machines (Art.-No.: 3086).

The exact machine adjustments have to be made according to the manufacturer's instructions. An even distribution of marking material and drop-on material over the entire marking area is important. Scattering losses on both line sides make modified machine adjustments necessary.

## 4.2 Optimizing of application properties

### 4.2.1 General information

The application properties and reactivity of the material depend on the temperatures of cold spray plastic, air and surface. Proper storage conditions may partly improve application conditions.

**Attention:** Only use methods described in 4.2.2 and 4.2.3. Exceeding the stated quantities and simultaneous usage of two or more methods (agents) will lead to unwanted results regarding application properties and/or traffic technological properties.

### 4.2.2 Viscosity

**Increase of viscosity** (e.g. high material, air and surface temperatures): add about 0.2 % thixotropic agent (Art.-No.: RH10802 solid or RH10459 liquid).

**Reduction of viscosity** (e.g. low material- air- and surface temperatures) add about 1% condenser (Art.-No.: 3044).

**Attention:** Add the needed agent quantity only, otherwise viscosity or settle properties may change.

### 4.2.3 Reactivity / curing time

**Acceleration of reactivity / curing time** (e.g. spring/autumn application in low temperatures)

- a) addition of max. 0.2 % accelerator (Art.-No.: 8060) or
- b) increase hardener quantity up to max. 2% weight percentage

**Retarding of reactivity / curing time** (e.g. high temperatures in the summer)

- a) add max. 0.2 % retarder (Art.-No.: 8050) or
- b) reduce hardener quantity, but not below 0.5% weight percentage

**Attention:** to ensure proper chemical reaction do not get below 0.5% weight percentage and do not exceed 2% weight percentage for hardener.

Changes of pot life and curing times depend on material and surface temperatures, with varying hardener quantities, as well as the addition of accelerator or retarder are shown in the table below.

**Curing time of 2-comp. KSP 130 (liquid hardener 98:2) depends on material and surface temperature**

Temp. (°C)	Liquid hardener (weight %)	Curing time (min)
0°	2	23
5°	2	15
10°	2	13
15°	2	10
20°	2	9
25°	2	7
30°	2	5
40°	2	4
45°	2	3



**Curing times of 3-comp. KSP 130 in relation to material and surface temperature.**

**Curing times of 3-comp. KSP 130 depending on temperature while adding accelerator or retarder.**

Temp. (°C)	Hardener quantity liquid / powder (weight %)*	Curing time (min)	Temp. (°C)	Hardener quantity liquid / powder (weight %)	Accelerator (weight-%)	Retarder (weight-%)	Curing time (min)
0°	4	35	0°	2	0.2	-	27
5°	4	30	5°	2	0.2	-	22
10°	4	15	10°	2	0.2	-	7
15°	4	10	15°	2	0.1	-	6
20°	2	6	20°	2	-	-	6
25°	2	5	25°	2	-	0.1	7
30°	2	5	30°	2	-	0.1	6
30°	1	8	30°	2	-	0.2	5
40°	1	5	40°	2	-	0.2	7
45°	1	5	45°	2	-	0.2	7

\* regarded to non-reactive component A

## 5 Road surfaces / pre-treatment

### 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 adhesion tests are required. Ideally, old markings should be removed with appropriate mechanical procedures.

**Attention:** LIMBOPLAST KSP 130 is not appropriate for large area 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). We recommend conducting test applications.

Before applying LIMBOPLAST KSP 130, concrete or cement-bound surfaces should be pre-treated with primers,

- using spray technique (paint spray machine) with 2-component EP-primer (Art.-No.: 8609000) or
- manually (roller) with 2-component primer B71 for concrete (Art.-No.: 8010)

It is essential to have a sufficient and uniform coverage with primer in order to obtain an optimum bonding between cold spray plastic and concrete. Primer consumption may vary depending on the concrete's porosity. The humidity of concrete must not exceed 4% when applying 2-component primer B71 for concrete. Primers based on epoxide resins are suitable for residual damp surfaces.

Primers diminish formation of bubbles that are likely to occur when concrete surfaces are not pre-treated with a primer.

### 5.3 Bituminous surfaces

Any loose components, e.g. road grit, must be removed. Fluxoils and releasing agents for road rollers are detrimental to good bonding of markings or can cause discoloration of the striping. Since a mechanical removal is hardly possible, the surface should be exposed to traffic for 4 - 6 weeks or an initial marking is to be applied. It is recommended to use LIMBOROUTE 2-K K809 instead of a one-component paint when applying an initial marking. A bonding check is required prior to the application the final marking.

[www.swarco.com/rms](http://www.swarco.com/rms)

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## 5.4 Cobbled pavement

All kinds of cobbled pavement are non-static surfaces which can lead to crack formation or spallings on the marking. Therefore no guarantee can be given for any problems resulting from the application of any marking material on cobbled pavement. Test applications and surface pre-treatment are recommended to ensure proper bonding.

### **Compound concrete stone pavements:**

The pavement has to be primed with 2-comp. primer B71 for concrete (Art.-No.: 8010), see Technical Information). Afterwards coldplastic can be applied.

### **Natural or cast stone pavement (basalt, granite, etc.):**

The surface to be marked has to be pretreated with primer 2-comp. primer B55 for cobbled pavement (Art.-No. 8011).

Afterwards apply paving mortar (Art.-No.: 5232...). Pay attention to an even and flat surface. The area should extend 2-3 cm of the size of the final marking. After the curing is complete, the coldplastic is applied. Consumption of primer and pavement mortar depends on shape of cobblestone pavement.

## 5.5 Floor coatings

For markings on floor coatings our indoor marking products should be used.

## 6 Application techniques

Application with 2-comp. or 3-comp. marking machines. Airless products need airless machines.

The quality of cured cold spray plastic is independent of chosen application technique. Powder or liquid hardener are chemically identical.

Following application techniques are used:

### 1. 3-component marking machine, 1 : 1 technique

Component A (mixed with 2-4% liquid or powder hardener) and the reactive component B are conveyed from separate containers with a mixing ratio of 1 :1, then constantly mixed in a mixing tube and finally applied with an airless paint sprayer. The recommended drop-on material is applied on the fresh marking using the recommended quantity.

### 2. 2-component marking machine, 98 : 2 technique

Reactive component B and the liquid hardener are stirred up inside the mixing tube and applied using airless or airspray technique. The recommended drop-on material is applied on the fresh marking using the recommended quantity.

## 7 Test reports

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

Test report-no.	Layer thickness	consumption		Drop-on material (DOM)	Traffic technological properties	
	mm	Material kg/m <sup>2</sup>	DOM kg/m <sup>2</sup>	Identification (divergent identification possible – see relevant test report)	new condition	used condition
<b>Type I marking</b>						
2008 1DY 03.13	0.3	0.474	0.40	Swarco No.1 beads Solid Plus 300-1000 T18 MK35	P6, S3, R5, Q5, T2	P6, S2, R5, Q5
2008 1DY 03.12	0.4	0.632	0.40	Swarco No.1 beads Solid Plus 300-1000 T18 MK35	P6, S3, R5, Q5, T2	P6, S2, R5, Q5
<b>Type II marking</b>						
2008 1DY 02.08	0.6	0.948	0.60	Swarco plus9spots 30 300-1400 T18MK35	P7, S4, R5,RW4, Q5,T2	P7, S2,R5,RW3, Q5
<b>Type II marking injection</b>						
2008 1DY 03.05	0.4 wet (>0.6 injection)	0.632	0.45	Megalux 600-1400 T18 MK35 (injection)	P7, S3, R5,RW5, Q5,T2	P7, S1,R5,RW4, Q5
			0.45	Swarco No.1 beads Solid Plus 300-1000 T18 MK35 (after gritted)		
2008 1DY 03.10	0.6 wet (1.6 injection)	0.948	0.40	Swarco plus9spots 30 300-1400 T18 MK35 (injection)	P7, S3, R5,RW4, Q5,T2	P7, S3,R5,RW3, Q5
			0.40	Swarco No.1 beads Solid Plus 300-1000 T18 MK35 (after gritted)		