SILIKAL® RM 611

Cold spray plastic resin for thin line markings

SILIKAL® RM 611 is a liquid, solvent free binder for the production of 400 – 800 µm wear resistant low dirt-pick-up cold spray plastics. SILIKAL® RM 611 is UV-stable and free of softeners and toxic ingredients. The resulting cold spray plastic can be applied from +5 °C to +35 °C using airless 2K or 3K high pressure equipment. The rapid curing time of about 12 minutes ensures the road to be quickly reopened for traffic.

Resin characteristics

SILIKAL® RM 611 is the binder ("the heart") for various cold spray plastic formulations. It utilizes non-toxic accelerators that yield a long pot-life. SILIKAL® RM 611 contains pigment-wetting polymers and exhibits a low sedimentation tendency when filled. The resin can be used for low and high temperature applications.

SILIKAL® RM 611 comes in 2 versions:

1) Standard resin for 98/2 spray machines:
   SILIKAL® RM 611

2) Resin-split for 50/50 spray machines:
   SILIKAL® RM 611 A
   SILIKAL® RM 611 B (marking component B based on RM 611 B will be blended with BPO first)

Characteristics as delivered

Property	Measuring method	Approx. value
Viscosity at +20 °C (ISO 4 mm cup)	DIN EN ISO 2431	70 – 130 sec.
Density D_4^{20}	EN ISO 2811-2	0.95 – 1.01 g/cm³
Flash point	DIN 51 755	+10 °C
Packaging	180 kg steel drums or 900 kg IBC container	
Storage time	Minimum of 6 months in original packing, below +25 °C	

Cold plastic formulations based on Silikal® RM 611

About 2/5 weight parts of SILIKAL® RM 611 are mixed with 3/5 of fine fillers and pigments. By varying fillers, pigments or additives, properties can be adjusted. Attached is a guideline formulation for a white 3 component (aka 50:50 or 1:1) line marking that works well with Silikal local fillers.

Different fillers need to be checked with respect to induced viscosity, curing without tack, polymerisation or sedimentation during storage, texture and others. Silikal offers its expertise to work with you finding your local fillers and/or adapting the cold plastic formula in order to meet local specifications. For white pigmentation, we recommend using rutile type titanium dioxide. Inorganic pigments such as iron oxides are suitable for coloured paints. Carbon black is not suitable as black pigment. Paint additives, such as silicone oils, dispersing agents or anti-settling agents may lead to a tacky surface, reduce hardness or other curing related issues. The cured road markings have a good resistance to water, salt, grease and mineral oil.

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Cold-spray-plastic line marking, white
Guideline recipe for 3K machine application

Item	Component	Guideline recipe (% by weight)		Comments
1	**SILIKAL® RM 611 A**	39.0%		RM 611 A is WITH BPO-decomposers aka Accelerators aka Amines
2	**SILIKAL® RM 611 B**		39.0%	RM 611 B is WITHOUT BPO-decomposers. Final Marking component B to be blended with doubled amount of BPO compared to marking based on RM 611 (98:2). When marking component B is blended with BPO then marking component B can be stored for up to 6h at room temperature, afterwards marking component B cures even without blending with marking component A.
3	BYK Anti Terra 204	0.4%		Dispersing agent, flocculating
4	Hydrophilic fumed silica – e. g. HDK N20	0.2%		Thixotropic agent
5	BYK 1790	0.5%		Defoamer
6	TiO_2 Rutile-Type	9.0%		White pigment, verify usability by observing settling behaviour of final marking on a shaker: 24h at 50 rpm
7	$CaCO_3$ <15 µm	50.9%		Fine filler with oil absorption 15 – 20 g/100g; ≈300 mesh; too high oil absorption leads to too high viscosity; verify usability by observing settling behaviour of final marking on a shaker: 24h at 50 rpm
8	**Total:**	**100.0%**	**100.0%**	**Average consumption: approx. 1.5 kg/m² per mm thickness**

Typical hardener dosages for 600 µm cold spray plastic lines (with respect to complete marking – item 8 from table above)

Temperature	SILIKAL® BPO % pbw.	Pot life min	Hardening time min
+5 °C	3.0	10	20
+20 °C	2.0	7	12
+35 °C	0.8	5	10

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Typical features of cold spray plastics based on Silikal® RM 611

Flexibility of cured road marking	hard
Resin content	35 – 45%
Viscosity at 50 RpM, small spindle	2.0 – 3.0 Pa·s
Density	1.4 g/ml
2K (aka: 98/2) / 3K (aka: 1:1; 50/50; 50/48/2)	yes / yes
Product thickness	0.4 – 0.8 mm
Pot-life / curing-time of appropriate films at +20 °C	7 min / 12 min with 2.0% BPO-50
Application temperature	0 °C to +35 °C
Application surface temperature	0 °C to +40 °C
Application window of relative humidity & dew point	The relative humidity needs to be < 80%, surface temperature needs to be 3 °C above dew point (check a dew point table)
Recommended drop on beads	0.4 – 1.2 mm (Type I or II)
Contains softener / contains solvent / VOC acc. to ASTM 2369 –10	no / no / < 30 g/litre
Storage stability	6 months in sealed original packaging, stored below +30 °C

Application

Cold plastics manufactured using SILIKAL® RM 611 can be applied directly onto asphalt, whereas concrete has to be pretreated (e.g. milling, shot blasting, high-pressure water blasting) and primer needs to be applied (recommendation: SILIKAL® RU 380). The curing procedure is a chemical reaction initiated by mixing approximately 0.7% (high ambient temperature) up to 3% (low ambient temperature) of the hardener into the marking. The cold spray plastics manufactured using SILIKAL® RM 611 are applied in 400 – 800 µm layers by automatic marking machines. Hardener is supplied as liquid for 98/2 machines respectively powder hardner can be added to the non-accelerated cold plastics based on SILIKAL® RM 611 B. The pot life is about 7 minutes and curing time is about 12 minutes.

Drop on beads for retroreflection shall be sprinkled onto the fresh marking as soon as possible (within seconds). Glass beads need to have a silanization for MMA/cold-plastics otherwise they will not stick to the marking. Glass beads typically incorporate friction grains for skid resistance.

Special remarks

Road markings based on our guide formulations do not automatically meet local or national requirements. All formulations must be designed (together with drop on blends, if required) and checked with regard to local requirements. Silikal does not assume any responsibility, which lies beyond the control of the resin itself. Silikal guarantees the product specification of its resins.

Shelf life

Min. 6 months in original packaging, below +30 °C. Transport and storage may lead to floating of waxes. The material is ready again after mixing back to homogeneous state.

Safety advise

See section 2 of the safety data sheet for the specific component.

Other applicable documents

SILIKAL® BPO	Data sheet BPO
General notes	Technical documentation MMA
Safety data sheets	For all Silikal products used

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