

PRODUCT DATA SHEET

Sika® Patch-5 Rapid

RAPID SETTING & HARDENING, ONE COMPONENT, POURABLE (SCC), CEMENTITIOUS MORTAR FOR PATCH FLOORING AND CONCRETE REPAIR WORKS



DESCRIPTION

Sika® Patch-5 Rapid is a one component, rapid setting & hardening, pourable cementitious mortar with SCC (Self-compacting concrete) technology for patch flooring and concrete repair works, meeting the requirements of EN 1504-3 (class R4) and EN 13813 (CT-C70-F7-AR2). Sika® Patch-5 Rapid consistency can be adjusted by reducing the amount of water, in order to make the product suitable for sloping applications.

USES

Sika® Patch-5 Rapid is a free flowing, shrinkage compensated, cementitious mortar for layer thickness of between 15mm and 50mm, suitable for:

- Concrete restoration or by recasting with mortar into formworks (beams, columns, bridge decks).
- Patch repair and reconstruction of interior and exterior, concrete or cementitious industrial floors, roadway joints, manholes and generally where fast curing and high abrasion resistance are required or where disruption of service needs to be minimized.
- Restoration work (Principle 3, method 3.2 of EN 1504-9:2008). Repair of spalling and damaged concrete in building, bridges, infrastructure and superstructure works by recasting with concrete.
- Structural strengthening (Principle 4, Method 4.4 of EN 1504-9:2008). Increasing the bearing capacity of the concrete structure by adding mortar.
- Preserving or restoring passivity (Principle 7, Methods 7.1 & 7.2 of EN 1504-9:2008). Increasing cover with additional mortar or concrete or replacing contaminated or carbonated concrete.
- Flooring applications (EN 13813, CT-C70-F7-AR2). Reconstruction of cementitious interior or exterior industrial floors with high abrasion/ wear resistance.

CHARACTERISTICS / ADVANTAGES

- Easy to use, ready to mix powder; only add water (and aggregates if desired)
- Rapid setting and hardening
- Adjustable SCC consistency (Sika® Viscocrete® technology), showing excellent flow properties, workability and stability
- High abrasion / wear resistance, in class AR2 with BCA method
- No segregation or bleeding
- For application thickness of between 15 mm and 50 mm per layer (without aggregates addition)
- For application thickness of up to 100 mm with special aggregates addition - Quartz Sand 6-12 mm
- In accordance with EN 1504-3 standard as repair mortar (class R4)
- In accordance with EN 13813 standard as flooring applications mortar (CT-C70-F7-AR2)

APPROVALS / CERTIFICATES

- CE-marking and Declaration of Performance as Repair mortar CC for structural repair of concrete structures in buildings and civil engineering works, Class R4 according to EN 1504-3:2005, based on certificate of factory production control issued by notified factory production control certification body and type testing.
- CE-marking and Declaration of Performance as Cementitious floor screed material, Class CT-C70-F7-AR2 according to EN 13813:2002, based on certificate of factory production control issued by notified factory production control certification body and type testing.

PRODUCT INFORMATION

Composition	Portland cement, selected aggregates, silica fume and additives	
Packaging	25 kg bags	
Appearance / Colour	Powder, dark grey	
Shelf life	9 months from date of production	
Storage conditions	Store properly in original unopened, sealed and undamaged packaging in dry conditions, at temperatures between +5°C and +35°C. Protect from direct sunlight.	
Density	Fresh mortar density: ~ 2.23 kg/lit	
Maximum grain size	~3.5 mm	
Soluble chloride ion content	≤ 0.05 %	(EN 1015-17)

TECHNICAL INFORMATION

Compressive strength		At + 5°C	At + 10°C	At + 20°C	(EN 12190)
	1h	-	-	~ 14 MPa	
	2h	-	~ 19 MPa	~ 30 MPa	
	4h	~26 MPa	~ 30 MPa	~ 45 MPa	
	24h	~45 MPa	~ 47 MPa	~ 48 MPa	
	7 days	-	-	~ 60 MPa	
	28 days	-	-	~ 70 MPa	
Modulus of elasticity in compression	Results	Requirements Class R4			(EN 13412)
	37.2 GPa	≥ 20 GPa			
Tensile strength in flexure	1 day	7 days	28 days	(EN 196-1)	
	≥ 5.0 MPa	≥ 7.0 MPa	≥ 9.0 MPa		
Tensile adhesion strength	Results	Requirements Class R4			(EN 1542)
	≥ 2.5 MPa	≥ 2.0 MPa			
Restrained shrinkage / expansion	≥ 2.0 MPa			(EN 12617-4)	
Thermal compatibility	≥ 2.0 MPa			(EN 13687-1)	
Reaction to fire	Euroclass A1				
Capillary absorption	≤ 0.5 kg/m ² x √h			(EN 13057)	
Carbonation resistance	dk ≤ control concrete (MC (0.45))			(EN 13295)	

APPLICATION INFORMATION

Mixing ratio	12 - 14% of water (3.0 lt - 3.5 lt) per 25 kg bag For sloping applications, it is possible to reduce the amount of water to 8 - 10% (2.0 lt - 2.5 lt) per 25 kg bag.
Consumption	~ 2.0 kg of powder per 1 lt of mixture or per 1 mm thickness per m ² , depending on the substrate's roughness and fresh mortar density.
Layer thickness	min. 15 mm - max. 50 mm min. 15mm - max. 100 mm with addition of 25% by weight Quartz Sand 6-12 mm
Consistency	25 kg of powder yields approximately 12.5 litres of mortar

Flowability	240-280 mm	Sika Internal Method
	65-85 cm	EN 12350-2 with Abrahms cone
	approx. 40 cm	EN 13395-2 Grout Flow through, with flow channel
Product temperature	+ 5°C min. / + 35°C max.	
Ambient air temperature	+ 5°C min. / + 35°C max.	
Substrate temperature	+ 5°C min. / + 35°C max.	
Pot Life	~20 min at 20°C	

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY / PRE-TREATMENT

Concrete:

The substrate must be structurally sound, thoroughly clean and free from dust, dirt and loose material, surface contamination such as oil or grease, cement laitance which reduce bond, prevent suction or impair the mortar's flow. Delaminated, weak, damaged and deteriorated concrete and where necessary sound concrete - but not to the detriment of the structural integrity - shall be removed by suitable mechanical preparation techniques, such as high-pressure water cleaning or sandblasting. No vibration cleaning methods are preferable. Roughen concrete surface to expose aggregates to 2 mm depth, in accordance with EN 1766 or CSP 5 from ICRI Guidelines. The edges of the area affected by the intervention will have to be cut perpendicular (90 degrees) up to a minimum depth of 5 mm. The concrete's tensile strength (pull-off) shall be > 1.5 MPa. Follow the directions given by the Supervising Officer or Qualified Engineer.

Steel:

Steel reinforcement surface must be free from rust products, mill scale, mortar, concrete residues, oil, grease, dust and other loose materials which may reduce bond or may contribute to corrosion. In case of rust, clean uniformly the whole circumference of the steel bars (where applicable) by using abrasive blast cleaning techniques or high pressure waterblasting to Sa 2 in accordance with ISO 8501. Protect cleaned bars from further contamination, prior to application of the mortar.

Formwork:

Any formwork shall be capable of withstanding the load and forces imposed on it. Formwork shall be clean and placed in position after preparation of the substrate and the reinforcement. Release agents such as Sika® Separol series, shall be applied prior to placing the bars into position to avoid contact with prepared substrate. Formwork shall be correctly designed in order to allow air and water bleed to escape, to support pouring technique, to provide a complete filling, to ensure free flowing, to prevent leakage of the product, e.t.c. Please consult Sika Hellas' S.A. technical support for more specific directions.

Reference should also be made to EN 1504-10 for specific requirements.

MIXING

Sika® Patch-5 Rapid can be mixed with a low speed (~500 r.p.m.) electrical hand drill mixer with vertical axis for 1 to 2 bags taking care not to entrap air in the mix or using a force action pan mixer for 2 to 3 bags or more - at once, depending on the type and size of the mixer. Pour the water in the correct desired proportion into a suitable container. While stirring slowly, add the powder gradually in the water and mix thoroughly at least for 3 minutes, adding additional water during the mixing time if necessary up to the maximum specified amount, until the required homogeneous and lump-free consistency is achieved. For larger mixes the mixing time could be extended (up to 5 minutes or as necessary) until the mortar is homogeneously mixed with no lumps and no remaining dry powder. Mix full bags for best results.

25 kg of Sika® Patch-5 Rapid powder is mixed with 3.0 - 3.5 L of water depending on the required consistency.

APPLICATION

Sika® Patch-5 Rapid can be applied manually using traditional techniques by pouring into the cavities or the formworks. If necessary, it can be mechanically pumped by means of standard equipment (e.g. Turbosol, Putzmeister).

Pre-Wetting:

Concrete surfaces shall be saturated with clean water minimum 2 hours before application, ensuring that all pores and pits are adequately wet. The surface shall not be allowed to dry before application of the mortar. Just before application, remove excess water and ensure there is no standing water on the surface. The surface shall achieve a dark matt appearance without glistening and surface pores and pits shall not contain water (saturated surface dry - SSD). Use pressurised air (oil free) to blow away excess water in difficult to reach areas.

Pouring / Filling:

The product should be poured directly on the wet mat substrate or inside the formwork prepared for the casting. By using more than one mixer and with the proper organization, you can pour the fresh material reducing construction joints. After mixing Sika® Patch-5 Rapid, leave the mortar to stand for ~1-2 minutes; stir again with a trowel and then pour immediately into sealed, rigid - stable, prepared formworks. To make optimum use of the product's expansion properties apply the mortar as quickly as possible (within max. 15

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minutes). Pot life shall also be taken into consideration, adjusting for climatic conditions, when planning the work duration.

Bonding primer / Reinforcement Corrosion Protection:

On a well prepared and roughened substrate, a bonding primer is generally not required. Where a bonding primer and/ or a reinforcement coating is required (e.g. Sikadur®-32 EF, Sika MonoTop®-910 or SikaTop® Armatec®-110 Epocem®) refer to the relevant Product Data Sheet for more detailed information. In any case, the bonding primer / reinforcement corrosion protection shall be applied on a pre-wet substrate and subsequent application of Sika® Patch-5 Rapid shall be applied wet on wet. Open time of the bonding primer and/ or the reinforcement corrosion protection shall be taken into account if it fulfills the application demands.

Increased Maximum Layer Thickness:

For large (> 20 lt) or thick (> 50mm) applications, increased maximum layer thickness can be achieved either by built-up in layers or by adding aggregates.

Built-up in layers:

The first layer shall be hardened and exothermic reaction of the material shall be completed. The 1st layer shall be started to set and be at ambient temperature before applying the second layer. Do not smooth the first layer before applying the second one. The 1st layer shall be cleaned using low pressure water or compressed air before applying subsequent mortar layers.

Adding Additional Aggregates:

Pour the water in the correct proportion into a suitable mixing container. While stirring slowly, add Sika® Patch-5 Rapid to the water. Mix with low speed (< 500 r.p.m.) hand drill mixer to avoid entraining too much air. Mix thoroughly at least for 3 minutes until homogeneous with no lumps. Afterwards, gradually add Quartz Sand 6-12 mm (25% by weight of Sika® Patch-5 Rapid) and mix slowly for 1-2 more minutes until homogeneous. Mix full bags for best results. Do not exceed maximum water mixing ratio.

Quartz Sand 6-12 mm are pre-weighted in 25 kg bags, rounded, no filler including, clean and well-graded aggregates. Any other aggregate has to be evaluated prior any use.

<u>System</u>	<u>Water</u>	<u>Layer Thickness</u>
Sika® Patch-5 Rapid + 6,25kg of Quartz Sand 6-12 mm	3.0 - 3.5 (kg)	15-100 (mm)

Contact with Sika Hellas' S.A. technical support in order more specific details and internal test reports concerning characteristics of Sika® Patch-5 Rapid with the addition of Quartz Sand 6-12 mm to be provided.

CURING TREATMENT

Protect the freshly applied mortar from early dehydration and/ or premature drying by using the relevant curing methods (at least for 24 hours), e.g. curing compound such as Sika Antisol® or Sikafloor® Proseal once surface water has evaporated. Use suitable curing covers such as jute and water, plastic sheets or other suitable membranes.

CLEANING OF EQUIPMENT

Removal of fresh remnants from tools and application equipment can be carried out using water immediately after use. Hardened / cured material can only be mechanically removed.

FURTHER INFORMATION

For concrete repair works refer to the Sika Method of Statement for "Restoring Concrete Structures by Recasting Using Sika® Ready to use Mortars" (Ref. 8503202) for more information regarding repair system application, substrate preparation and/ or refer to the recommendations provided in EN 1504-10.

IMPORTANT CONSIDERATIONS

- Mixing must always be performed with mechanical means; hand mixing does not allow the optimum workability to be obtained.
- Do not add water over the recommended dosage.
- Do not add cement or any other substances that could affect mortar's properties.
- Do not add water or fresh mortar in a mix that has already started to set.
- Consider storing bags in a warm environment and using warm water to assist with achieving strength gain and maintaining physical properties, when cold weather conditions prevail.
- Avoid application under direct sunlight and/ or strong wind.
- Apply only on sound, prepared substrate.
- In case of floor casting, especially outdoors, avoid too rapid drying of the product in the early days of curing.
- Do not cast floors under bad weather conditions, which could affect in a negative way setting and hardening process of the product.
- Protect the applied product from sun and wind for at least 24 hours after application.
- Always check the material after pumping.
- Ensure formwork is strong enough to hold the fresh mortar and sealed to prevent leakage.
- Cure exposed surfaces immediately with protective sheet or membranes. Shield the fresh mortar from direct sun, wind and frost.

- Finish exposed surface as desired as soon as the mortar has started to stiffen. Do not add additional water on surface.
- Avoid free falling of the material to prevent segregation of the aggregates.

BASIS OF PRODUCT DATA

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

ECOLOGY, HEALTH AND SAFETY

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Safety Data Sheet (SDS) containing physical, ecological, toxicological and other safety-related data.

LEGAL NOTES

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

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