

SikaGrout[®]-212 HP

High performance shrinkage compensated cementitious grout

Description	<p>SikaGrout-212 HP is a ready mixed, high quality, Portland cement that expands in two stages to counteract the shrinkage normally associated with Portland cement grouts.</p> <p>SikaGrout-212 HP is a blend of Portland cement, carefully selected and graded aggregates and Sika Admixtures, enabling it to achieve high strengths in short times, making SikaGrout-212 HP suitable for grouting fixing bolts and anchors or bedding machinery in the most demanding of circumstances.</p>
Uses	<ul style="list-style-type: none">■ Machine bedplates■ Anchor bolts.■ Bridge bearing pads.■ Pre-cast concrete sections.■ Cavities, gaps and recesses.■ Any high performance grouting
Advantages	<ul style="list-style-type: none">■ Shrinkage compensating properties, classed as a non-shrink grout as per CRD-C 621-81.■ High early strengths.■ High 28 day strengths.■ Good flow characteristics.■ Adjustable consistency.■ Does not segregate or bleed.■ Good impact and thermal resistance.■ Non corrosive to steel or iron.■ Lab tested in accordance with AS 1478.2
Shelf life	Stored in unopened original containers protected from direct sunlight and frost, shelf life is at least nine (9) months.
Instructions for Use	
Surface Preparation	<p>Correct and thorough surface preparation is essential to achieve the high performance qualities of SikaGrout-212 HP.</p> <p>All surfaces must be clean, sound and free from dust, ice, oils, grease or other surface contaminants such as curing membranes and form release agent etc. Bolt holes and fixing pockets should be free of dirt and debris by air blasting. For maximum bond, surfaces should be abraded or roughened, preferably by mechanical means such as needle gun, grit blasting, grinding etc.</p> <p>All prepared surfaces must be saturated with water several hours prior to grouting, ensuring it is free of any surface water or puddles.</p>
Formwork	<p>The formwork used must be leak proof to allow for free flowing SikaGrout-212 HP. The formwork should be arranged so that the grout head is maintained on the side above the level of the underside of the base plate. This will allow gravity flow to completely fill the void to be grouted.</p> <p>Formwork should be coated with form oil to allow easy removal of forms. Ensure adequate air holes are provided.</p>
Temperature control	Temperature affects setting time and rate of increase for strength. For optimum performance maintain grout, concrete and/or steel substrates within the range of 18-25°C prior to, during, and for 48 hours after placement of the grout.



Temperature control (continued)

At low temperatures (below 10°C) grout setting time is extended and bleeding may occur. As a result, base plate contact may be reduced. To reduce the setting time of SikaGrout-212HP, accelerating admixtures such as Sika-4A or Sika Rapid-1 may be added.

At high temperatures (greater than 30°C) grout setting time is reduced, affecting placement. It is recommended that grouting at high temperatures be sheltered from the heat, or be conducted early in the morning.

It is good practice to keep materials cool in high temperatures using cold water for mixing. Setting times can also be increased using a retarding admixture such as SikaTard-930.

It is suggested that site trials be conducted to determine optimum dosage rates for recommended admixtures. For further details contact Sika's Technical Department.

Application

Mixing equipment

SikaGrout-212 HP must be mechanically mixed using a mechanical grout mixer or a suitable drum mixer. The grout mixer will reduce the chances of the mix becoming lumpy or aerated.

Smaller quantities should be mixed in clean drum using an electric drill and spiral drill and spiral mixer at a speed of approximately 500 rpm.

DO NOT MIX BY HAND.

Mixing Method

- 1) Plastic grout, add 2.8 litres of water per 20 kg bag.
Flowable grout, add 3.7 litres of water per 20kg bag.
- 2) Add the powder component to approximately 70% of the total amount water component while mixing.
- 3) Add the remaining 30% of the water component to the grout at a steady rate while continuing to mix.
- 4) Mix until the grout appears homogenous (3-5 minutes). Allow to stand so any entrapped air can escape. Do not add more water to increase flow of the grout if a mix has stiffened due to time delays. If the grout is unworkable discard.

Placement

SikaGrout-212 HP can be placed by gravity flow or by pump. It is essential that proper placing on the job site is practised to ensure placement is completed without problems. Sufficient labour, grout and equipment must be present to ensure continuous placement.

Gravity Flow

Mixed grout should be poured one side of the void to avoid air entrapment. Grout is best poured over short distances to ensure this. Use a suitable header box, maintaining the grout head at all times to ensure continuous flow.

To facilitate grout compaction and top plate contact, use rodding, tamping or flexible strapping in short strokes while maintaining an adequate head of grout. Do not vibrate as this will cause segregation. Any adjacent machinery or equipment causing vibration should be shut down until initial set (5 to 6 hours)

Pumping

When pumping SikaGrout-212 HP, ensure the pump is suitable for the grout consistency and for the distance and height it is to be pumped. A positive displacement pump is recommended. Place grout by pumping into the farthest corner, filling the space gradually. Ensure that air is not entrapped under the base plate.

Placement Thickness

Recommended thickness of SikaGrout-212 HP in one pour is 20 mm to 50 mm. Minimum thickness is 10mm. Maximum thickness in one pass is 100mm. Any grout pour that exceeds this should be done in stages, or have stone aggregate added to it, to reduce the exothermic heat. Contact Sika's Technical Department for further information.



Aggregate Addition Coarse aggregate can be added to mixed SikaGrout-212 HP to achieve a stronger grout, to increase the thickness of grout placed in one pass, or to increase yield.

It is recommended that aggregate size be 10mm, however as a guide the maximum aggregate size should not be more than 1/5 of the thickness of the section to be cast. The aggregate shape, and the quantity added, will effect the workability of the mix. Smooth rounded aggregate is found to produce the most workable mix.

The recommended maximum aggregate addition rate is 20kg per 20kg bag of SikaGrout-212HP.

The other option will be to add SikaGrout Aggregate to the mix to increase the thickness of the grout placed.

Curing Suitable curing methods such as plastic sheet, wet hessian, liquid membrane (eg, Antisol curing membranes) etc. must be used to protect the freshly applied grout from the drying effects of sun and wind. Curing must commence immediately after placement, and continue for at least 7 days. Curing is vital to the ultimate performance of grout as it allows optimum strength development and ensures tight contact with the baseplate.

Cleaning Remove uncured SikaGrout-212HP from tools and equipment with water. Hardened material can only be removed mechanically.

Technical Data (Typical)

Form	Grey Powder			
Granulometry	0-2.0 mm			
Density (mixed)	2200 kg/m ³ approx. (dependent on water addition rate)			
Pot life @ 20°C	30 minutes approx.			
Application temperature	Minimum 5°C Maximum 35°C			
Colour	Grey (when mixed)			
Yield @ 20°C		Plastic	Flowable	
	Approximate yield per 20kg bag	10 litres	11 litres	
	Approximate number of 20kg bags required for 1m ³ of grout	96	88	
Workability (tested to AS1478.2-2005)	35 secs (flowable consistency)			
Setting times (hrs : mins)		Temp	Initial	Final
	Plastic	10°C	4:00	4:35
		20 °C	3:15	3:45
		30 °C	2:20	2:30
	Flowable	10 °C	6:15	6:50
		20 °C	5:30	6:15
		30 °C	4:50	5:15
Typical Flow Distance Under Bearing Plate (mm) (Tested at 20 °C flowable consistency)	Gap Depth	Pouring Head		
		100 mm	200 mm	
	10mm	950	1550	
	20mm	1150	2600	
	30mm	1900	3200	
	40mm	2800	3950	
	50mm	3700	4250	
Packaging	20 kg bag			



Strength Properties

Compressive Strength (MPa): (Tested at 20°C) (AS 1478.2)	Age	Plastic		
	1 day	25		
	3 days	40		
	7 days	60		
	28 days	75		
Compressive Strength (MPa): (Flowable consistency at varying temperatures) (AS 1478.2)	Age	10°C	20°C	30°C
	1 day	17	20	25
	3 days	30	35	40
	7 days	50	60	70
	28 days	70	75	90
Compressive Strength (MPa): (Flowable consistency with addition of SikaRapid-AF) (AS 1478.2)	Age	SikaRapid-AF/20kg bag (litres)		
		0.1	0.2	0.3
	6 hours	0.2	0.5	1.0
	8 hours	1.5	3	4
	12 hours	5	8	10
	1 day	25	25	25
Flexural Strength (MPa) (Tested at 20°C) (ASTM C348)	Age	Plastic	Flowable	
	1 day	1.5	2.0	
	3 days	2.5	4.0	
	7 days	8.0	9.0	
	28 days	9.0	10.0	

Important Notes

- The strength values mentioned are the average values of laboratory test results. The results on the site may vary due to different environment, curing conditions and test
- For detailed information on grouting application and guidelines, refer to Sika Grouting Method Statement.
- Store SikaGrout-212HP in dry conditions in unopened original packaging.
- Never apply to a dry substrate.
- Trials should always be conducted when adding a recommended Sika Admixture to SikaGrout-212HP to determine the optimum dosage rates under local conditions.
- Sika Ferrogard-901 can be added to the mixing water (0.3 litres per 20kg bag) before mixing the grout to enhance protection of steel reinforcement.
- For dry pack consistency use SikaGrout-GP.

Handling Precautions

- Avoid contact with skin and eyes.
- Wear protective gloves and eye protection during work.
- If skin contact occurs, wash skin thoroughly.



Disclaimer

Sikagrout and Sikadur products are tested in accordance with Australian Standards and/or Internationally accepted Standards. The published performance data is achieved by testing strictly in accordance to the procedures of these standards.

Any test procedures performed by others on our products that are not in strict accordance with the standard in every facet will likely produce results different from the published above. On site testing by others can be affected by external factors such as incorrect mixing methods, poor sampling techniques, varying temperatures, curing, crushing procedures etc.

Sika can provide Certificates of Compliance of all products delivered to site prior to installation if required.

If results of site testing or testing facilities by others vary from the Sika published data we recommend the following items be reviewed before contacting the manufacturer as one or all of these items could be influencing the results attained on site.

These include but are not limited to the following: site conditions, ambient, substrate and product temperature, mixing equipment, mixer speed, pump equipment, contractor experience, and incorrect test methods.

Sika Australia do not take responsibility nor have to make a case for any such tests where results of testing by others do not achieve the published data as above.

Important Notification

The information, and, in particular, the recommendations relating to the application and end-use of Sika's 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 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 proprietary rights of third parties must be observed. All orders are accepted subject of our terms and conditions of sale. Users should always refer to the most recent issue of the Australian version of the Technical Data Sheet for the product concerned, copies of which will be supplied on request.

PLEASE CONSULT OUR TECHNICAL DEPARTMENT FOR FURTHER INFORMATION.



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