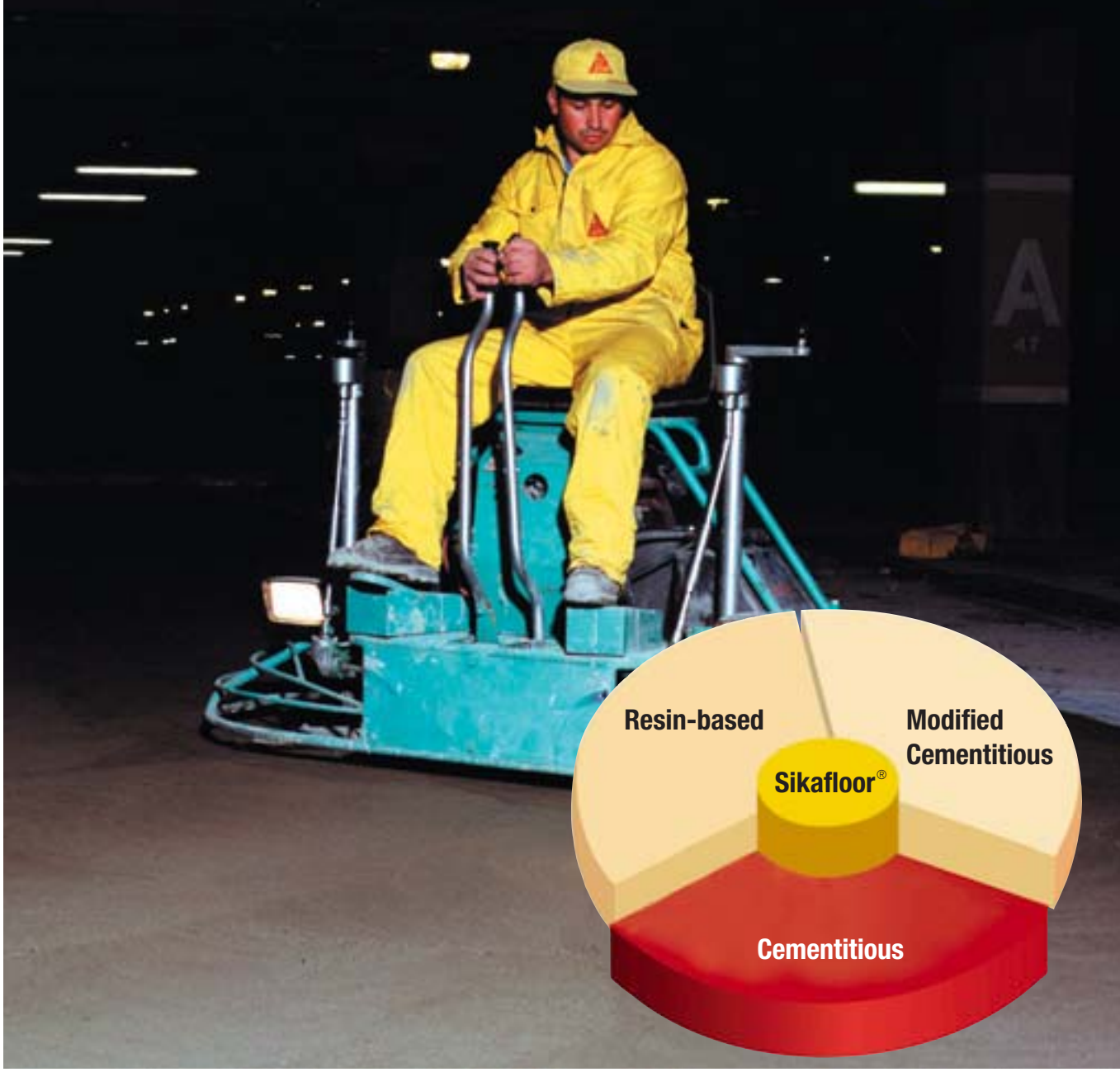
Construction



Technology and Concepts for Cementitious Flooring

Sika®

Sikafloor®
Technology and Concepts for Cementitious Flooring

1 Concrete Sourcing and Quality

Admixtures

Standard quality concrete
Standard compressive strength: 25–30 N/mm²

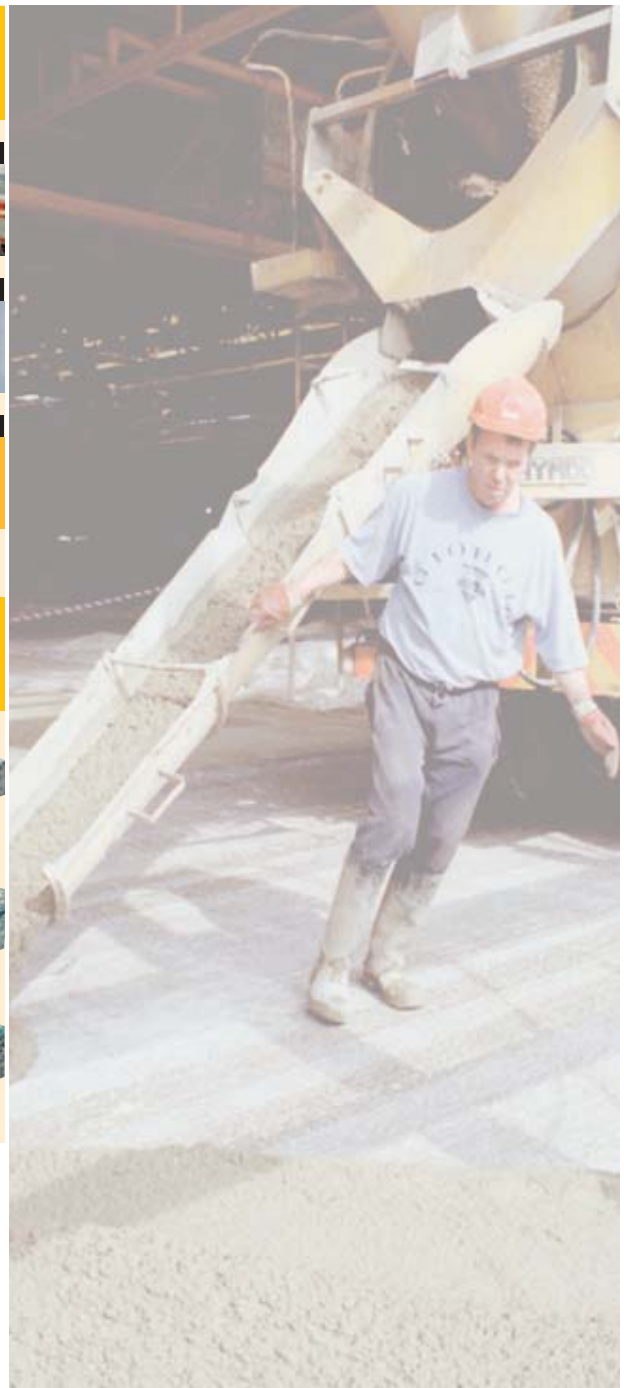
Premixed concrete

Improved quality
Concrete compressive strength ≥ 35 N/mm²

Site batched concrete

Additional concrete performance

Site batched concrete



3 Improved Surface Finishes

Admixtures **Surface Hardener** **Curing / Sealing Compounds**

Increasing durability

Enhancing safety

Improving appearance

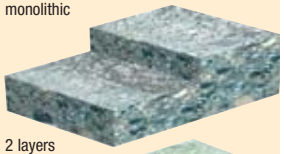
2 Installation Procedure

Admixtures **Curing Compounds** **Cementitious Floor Levelling**

Standard performance concrete slab

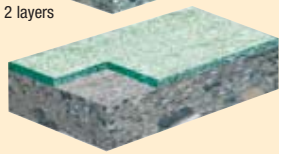
monolithic

Standard performance for highest surface tolerance



2 layers

Retrofit for surface flatness



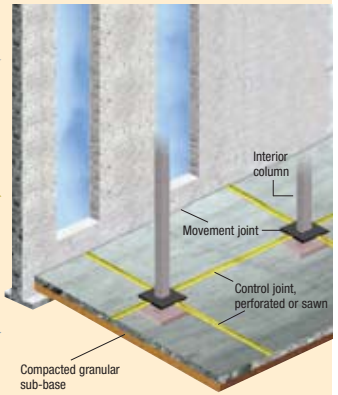
4 Additional Requirements

Joint Sealants **Resin-based Impregnations and Coatings**

Detailing and joint design

Chemical attack

Aesthetics



Sikafloor®
Technology and Concepts for Cementitious Flooring

Project-related Need	Requirements / Exposures	Testing	Admixtures: Premixed: – Plastiment® – Sikament® – Sika® ViscoCrete®	Admixtures: Site batched: – SikaLatex® Emulsion – Sikament® – Sika® ViscoCrete®	Surface Hardeners: Liquid hardener: – Sikafloor®-CureHard 24	Surface Hardeners: Dry shake floor hardener: – Sikafloor®-1 MetalTop – Sikafloor®-2 SynTop – Sikafloor®-3 QuartzTop	Curing / Sealing Compounds: Antisol® types	Curing / Sealing Compounds: Curing/Sealing compounds: – Sikafloor®-ProSeal – Sikafloor®-ColourSeal	Joint Sealants: – Sikaflex® PRO-3WF	Cementitious Floor Levelling Systems: – Sikafloor®-Level 5 – Sikafloor®-Level 25 – Sikafloor®-Level 50 – Sikafloor®-Level 75	Resin-based Impregnations and Coatings: – Sikafloor®-2420 – Sikafloor®-2430 – Sikafloor®-261
1 Concrete sourcing and quality	Standard quality		✓	✓							
	Improved quality		(✓)	✓							
	Additional concrete performance		(✓)	✓							
2 Installation procedure for concrete slabs	Standard performance concrete slab	Compressive strength Abrasion resistance	✓	✓	✓		✓	✓	✓		
	Standard performance for highest surface tolerance	Compressive strength Abrasion resistance	(✓)	✓	✓	✓	✓	✓	✓		
	Retrofit for surface flatness	Compressive strength Abrasion resistance			Existing hardened concrete slabs and screeds with insufficient surface flatness or poor surface quality				✓	✓	✓

Sikafloor®
Technology and Concepts for Cementitious Flooring

Sika Systems and Solutions

			Admixtures		Surface Hardeners				Curing / Sealing Compounds		Joint Sealant	Resin-based		
					Liquid	Dry Shake								
			Premixed	Site batched	Sikafloor®-1 MetalTop	Sikafloor®-2 SynTop	Sikafloor®-3 QuartzTop	Sikafloor® ProSeal	Sikafloor® ColourSeal	Sikaflex® PRO-3WF	Impregnation Sikafloor®-2420 Sikafloor®-2430	Sikafloor® Coatings	
3 Improved surface finishes	Increasing durability	Compressive strength (load)			✓	✓ N/mm² > 85	✓ N/mm² < 85	✓ N/mm² ≥ 50					✓
		Abrasion resistance			✓	✓	✓	✓	✓			✓	✓
		Impact resistance				✓	✓	✓					✓
	Enhancing safety	Slip resistance				✓	(✓)	(✓)					✓
		Electrostatic behaviour				✓							✓
		Light reflectivity				✓	✓	✓		✓			✓
	Improving appearance	Dustproofing			✓	(✓)	(✓)	(✓)	✓	✓		✓	✓
		Colour				✓	✓	✓		✓	✓	✓	✓
		Cleanability			(✓)	(✓)	(✓)	(✓)	✓	✓	(✓)	✓	✓
		Permeability			✓	✓	✓	(✓)	✓	✓	✓	✓	✓
4 Additional requirements	Detailing and joint design										✓		
	Chemical attack	Chemical resistance							(✓)	(✓)	(✓)	✓	✓
	Hygiene								(✓)	(✓)	✓	✓	✓

Sikafloor®
Surface Hardeners

Liquid Hardener

Dry Shake Hardeners: In general consist of a mix of cement and aggregates. Differentiation is according to the type of aggregates used.

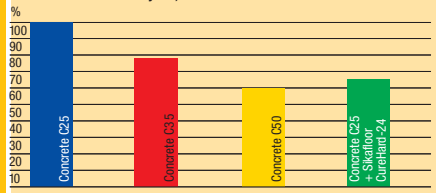
Sikafloor®-CureHard 24

Definition
Salts, fundamentally sodium silicates or magnesium fluoro-silicates dissolved in water.

How do they work?
- Liquid hardeners are being used to seal, harden and dustproof concrete surfaces.
- By penetrating into the concrete, a chemical reaction with the cement binder gets started to densify and thereby permanently seal the concrete surface.
- Over the first few months normal cleaning with a power scrubber produces a shiny appearance as the chemical reaction develops.

The Sika Solution
Sikafloor®-CureHard 24
- Improvement of the concrete performance
- Reduced permeability
- Increased abrasion resistance
- Increased compressive strength
- Reduced dusting
- Combination of curing, hardening, sealing

Abrasion loss after 1000 cycles, H-22 wheel



Comparison of abrasion resistance according to ASTM D-4060 Concrete and concrete + Sikafloor-CureHard 24. Application of liquid hardener after 24 h

Sikafloor®-3 QuartzTop

Definition
Quartz aggregates with well-defined granular consistency, cement, pigments and additives

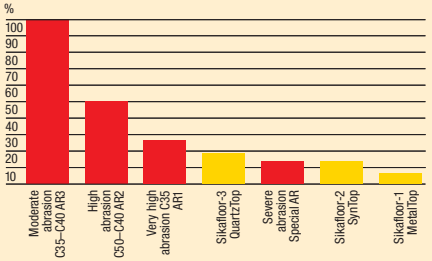
The Sika Solution
Sikafloor®-3 QuartzTop
- High abrasion resistance
- Impact resistance
- Slip resistance
- Easy cleaning
- Multicolour shade

Sikafloor®-2 SynTop

Definition
Graded aggregates of furnace slag mixed with cement, pigments and additives

The Sika Solution
Sikafloor®-2 SynTop
- Very high abrasion resistance
- Impact resistance
- Slip resistance
- Easy cleaning
- Multicolour shade

Abrasion resistance according to BS 8204



Sikafloor®-1 MetalTop

Definition
Crushed and graded ferroalloy aggregates mixed with cement, pigments and additives

The Sika Solution
Sikafloor®-1 MetalTop
- Severe abrasion resistance
- Excellent impact resistance
- Slip resistance
- Conductive floor (BS 2050)
- Easy cleaning

How do they work?
Moisture migration to the top surface of any newly laid concrete slab continues even after the initial bleed water has been removed. Untreated, this results in a weaker surface. A dry shake floor hardener contains hard aggregates, cements and additives which, once the bleed water has gone, is spread on the wet concrete. The material is worked in, power-floated to a finish and then sealed.
Dry shake floor hardeners produce a monolithic layer typically 2–3 mm thick. The superior aggregates, controlled mix proportions and lower water/cement ratio at the surface give enhanced wear and long-term durability.

Curing / Sealing Compounds

Curing Compound with no specified Standard

Sikafloor®-CureHard 24

Selection Criteria
For unregulated specification on concrete slabs, in colder climates as well as for low budget reasons.

How do they work?
- Liquid hardeners are used to seal, harden and dustproof concrete surfaces.
- By penetrating into the concrete, a chemical reaction starts with the cement binder and thereby permanently seals the concrete surface.
- Over the first few months, normal cleaning with a power scrubber produces a shiny appearance as the chemical reaction develops.

The Sika Solution
Sikafloor®-CureHard 24 is a translucent aqueous sodium silicate.

Curing Compounds according to ASTM C-309

Sikafloor®-ProSeal

Selection Criteria
For specified curing efficiency to ASTM C-309 Curing Efficiency as well as according to ASTM D-4060 Abrasion Resistance, and where curing, dust proofing, ease of cleaning and optical requirements have to be fulfilled.

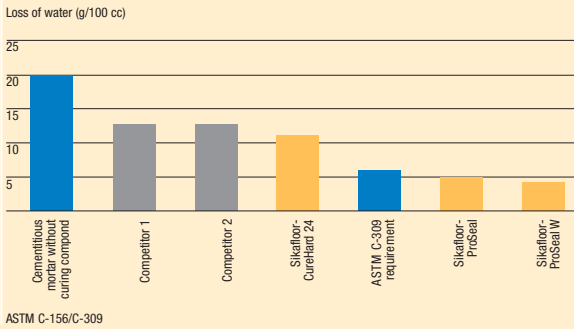
How do they work?
Specifications always call for high durability of concrete, therefore it is essential that concrete achieves to the expected strength without any surface defects (e. g. cracking, excessive dusting, etc). Such defects mainly occur due to:
- excessive drying caused by wind or sun
- extreme temperature (cold, heat) and temperature changes
- rain
- vibrations

The Sika Solution
Sikafloor®-ProSeal is a clear solvent-based acrylic resin polymer.

Sikafloor®-ProSeal W
Sikafloor®-ProSeal W is a clear water-based acrylic resin polymer.

Sikafloor®-ColourSeal
Sikafloor®-ColourSeal is a coloured solvent-based acrylic resin polymer.

Liquid hardeners and Curing / Sealing Compounds used as Curing Compounds:
Comparison of Curing Efficiency – according to ASTM C-309
Application after concrete setting



ASTM C-156/C-309

Cementitious Floor Levelling Systems

Sikafloor® Levelling Systems

Sikafloor®-Level 25

Description
Is a one-component versatile and durable sub-floor pumpable cementitious screed formulated from special cements, aggregates, admixtures, additives and co-binders. The product can be applied manually or by pump to achieve rapid, flat, economic substrate levelling (5 mm – 25 mm) prior to the application of the final floor finish. Optional colours are available based on minimum order.

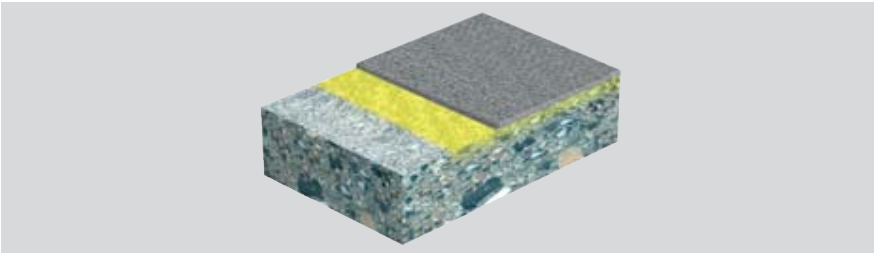
Where are they used?
Levelling of concrete slabs with or without an additional floor finish in:
- Manufacturing industry
- Institutional buildings
- Residential buildings
- Domestic buildings
- Levelling of pre-cast concrete planks
- Pre-levelling for roof membranes

Advantages
- Self-smoothing and highly fluid
- Pumpable or manual application
- Levels and renovates old floors
- Rapid drying: 4-hour walk-on time (at 20 °C)
- Excellent underlay for tiles, sheet systems, resin floors
- Protein-free
- Low odour
- Water-based

Additional System Components – Primers
Sikafloor®-155 W N
Where the screed remains uncoated or open for water vapour diffusion

Sikafloor®-156
Where the screed is sealed with an impervious system (resin / sheet / tile)

Sikafloor®-552 W Aquaprimer
Multi layer-bonding primer for maximum intercoat adhesion



Additional Solutions

Type	Range of Layer Thickness	No. of Components
Sikafloor®-Level 5	1 – 5 mm	**2** (liquid + powder)
Sikafloor®-Level 50	20 – 50 mm	**1**
Sikafloor®-Level 75	50 – 75 mm	**2** (powder + quartz sand)

Application Steps

1 Concrete Delivery

2 Compaction

3 Floating

4 "Trowel Test" Is the concrete ready for the dry shake?

5 Hand Application of Dry Shake

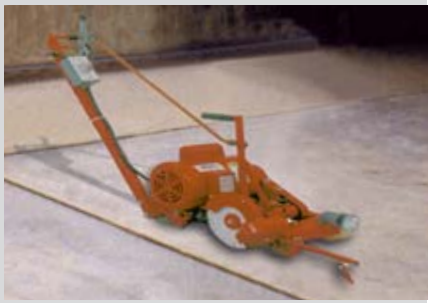
6 Mechanical Application of Dry Shake

7 Initial floating

8 Power-floating

9 Curing/Sealing Compound

10 Cutting of Joints



11 Sealing of Joints

12 Finished Floor

Case Studies

Production Hall, UK

Sikafloor®-Level 25

Situation
- The existing production hall floor had failed in many areas and was at the end of its useful life.

Requirements
- The renovated building had to give a flat, hi-tech environment for precision manufacturing.

Sika Solutions
- **Sikafloor®-81 EpoCem®** with **Sikafloor®-156** (Seal coat)
- **Sikafloor®-Level 25** to achieve high tolerance levels, to 7 mm thickness

Tatu Bar, Belfast, Northern Ireland

Sikafloor®-2 SynTop

Situation
- New flooring construction for a restaurant

Requirements
- Tough, durable floor with natural concrete feel
- Foot and trolley traffic
- Polished finish

Sika Solutions
- Concrete mix design: **Sikament®** Superplasticizer
- Floor hardener: **Sikafloor®-2 SynTop**
- Curing/sealing compound: **Sikafloor®-ProSeal**
- Joints: **Sikaflex® PRO-3WF**

Royal Mail, UK

Sikafloor®-1 MetalTop

Situation
- New floor construction

Requirements
- Very high abrasion resistance
- Impact resistance
- Frequent wheeled traffic combined with high point loading
- Enhanced slip resistance to platform edges

Sika Solutions
- Concrete mix design: **Sikament®** Superplasticizer
- Floor hardener: **Sikafloor®-1 MetalTop**
- Curing/sealing compound: **Sikafloor®-ProSeal**
- Joints: **Sikaflex® PRO-3WF**

Transport Center, Thessaloniki, Greece

Sikafloor®-3 QuartzTop

Situation
- New floor construction

Requirements
- Abrasion-resistant concrete floor for frequent forklift traffic
- Coloured dustproof surface

Sika Solutions
- Concrete mix design: **Sikament®** Superplasticizer
- Floor hardener: **Sikafloor®-3 QuartzTop**
- Curing/sealing compound: **Sikafloor®-ProSeal**
- Joints: **Sikaflex®** sealants

Advanced Sika® Technologies

Protection works in Chloride contaminated and carbonated Concrete
Advanced Sika® FerroGard® Corrosion Inhibitor Technology

Exposure

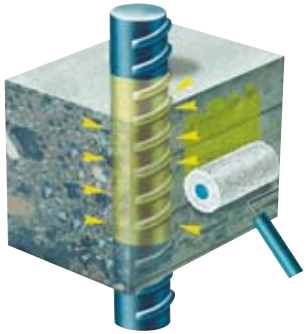
Chloride contamination

Carbonated concrete

Problems and Damage

Where carbonation or chloride ingress has allowed steel to corrode and cause cracking and spalling – all of the damaged concrete must be removed and repaired with the appropriate **Sika Repair System.**

Where concrete has carbonated, but the steel has not yet started to corrode, or where chloride contamination is < 1% by weight of cement, at the level of the steel, without the onset of corrosion: Then these areas do not need to be removed.



Sika FerroGard-903 penetrates the concrete

Requirements and Testing

Sika® FerroGard®-903 can be applied as a surface impregnation, to penetrate to the steel and form a protective layer around the reinforcement. This will delay the onset of corrosion and reduce the rate of any eventual corrosion.

Sika® FerroGard®-903 is proven to:

- → penetrate to the depth of the steel reinforcement
- → form a protective adsorbed film on the steel surface
- → increase the time to the onset of corrosion
- → reduce the rate of corrosion
- → prevent incipient anode formation

Application of Sika FerroGard-903 onto the prepared and repaired deck

Sika Systems and Solutions

Sika® FerroGard®-903 can be applied to horizontal and vertical surfaces, prior to the application of the **Sikafloor®** and **Sikagard®** protective coating systems.

With Sika® FerroGard® Technology, the Service Life can be effectively doubled.

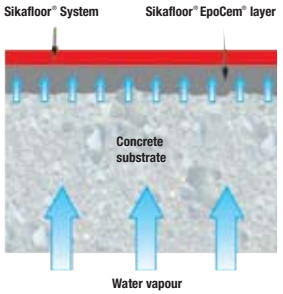
Repair and Protective Coating works on Concrete that is damp or has a high Moisture Content
Advanced Sika® EpoCem® Moisture Barrier Technology

Exposure

Damp concrete surfaces

Problems and Damage

Where concrete has a high moisture content (in excess of 4% by volume), such as new, recast, repaired, or simply exposed balcony decks, it is impossible to apply waterproofing membranes or protective coatings without serious risk of subsequent failure. This is usually through blistering or delamination. Traditionally contractors had to wait for extended drying periods – often arbitary (and inviting further moisture ingress), or expensive and complex protective sheeting and heating to drive out the residual moisture.



The moisture barrier function of Sika EpoCem technology

Requirements and Testing

Where surface ponding exists, all standing water must be removed. The concrete surface must be thoroughly prepared to provide a dry, sound, open-textured, sandpaper-like texture. With **Sikafloor® EpoCem®** technology the waiting is over! It is normally possible to complete even complex deck coating projects within two weeks of finishing the concrete work.

Private balconies and terraces waterproofed with minimum waiting time using Sikafloor EpoCem

Sika Systems and Solutions

Sikafloor® EpoCem® and **Sikagard® EpoCem®** can be applied to horizontal and vertical surfaces respectively.
The **Sika® EpoCem®** technology optimises the benefits of both epoxy resin and cement chemistry. This creates a moisture barrier allowing safe and secure application of the **Sikafloor®** and **Sikagard®** protective coating systems – without any delay and without additional expense.

Sika® EpoCem® the Solution against Blistering and Delays.

Advanced Sika® Technologies

Structural Strengthening of reinforced Concrete Balcony Structures
Advanced Sika® CarboDur® Composite Strengthening Systems

Exposure

Structural strengthening is required

Problems and Damage

Conventional strengthening requires heavy steel plates or bulky reinforced concrete additions to the structure. This is often not only unsightly for the owners but can also cause obstruction and add unnecessarily to the deadload.

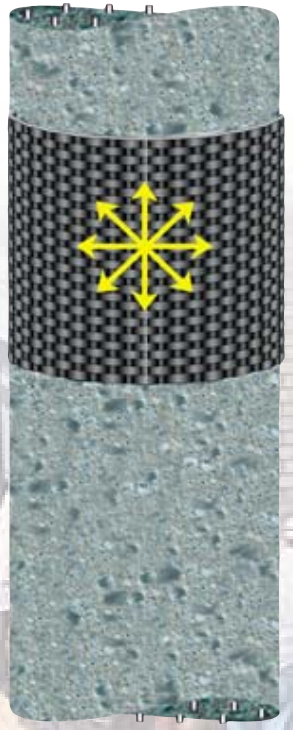
Unobtrusive lateral strengthening with Sika CarboDur plates

Requirements and Testing

Where the owner wants to maintain use or access of the balcony, and wants to avoid additional obstructions or loading, then the lightweight, easy to apply, high strength minimal thicknesses of the **Sika® CarboDur® Composite Strengthening Systems** are ideal.

Sika Systems and Solutions

The **Sika® CarboDur®** range includes: **Sika® CarboDur®** carbon fibre plates for flexural strengthening and reducing defection on beams, deck slabs and walls. They are particularly easy to apply around utility services. **SikaWrap®** Carbon fibre, e-glass and hybrid fabrics for restraint, impact resistance, reducing deflection on beams, slabs and particularly for all applications on columns. They are easy to apply on circular and square members and around construction details.



SikaWrap Unidirectional fabrics applied to strengthen in any direction

Protective Coating of galvanised Steel and Aluminium Surfaces in a single Application
Advanced Icosit® High Build Coating Technology

Exposure

Direct coating of galvanised steel and aluminium surfaces

Problems and Damage

Conventional steel paints have a limited life and require frequent maintenance, and the difficulties of painting directly onto galvanised or aluminium surfaces are well known – without dangerous acid etch primers or additional mechanical pretreatment.

One-coat application of Icosit HS 6630 directly onto galvanised parapet railings

Requirements and Testing

Where the owner and contractor want minimal surface preparation, the minimum number of applications, and no dangerous acidic substances on site: the new **Icosit® Technology** is now available.

Sika Systems and Solutions

Icosit® HS 6630 is an advanced single pack coating based on durable acrylic resins. It is available in an extensive architect designed range of colours including many metallic shades (MiO). It can easily be applied using conventional brush or spray techniques. In many cases a single application is all that is required.

Icosit HS 6630 applied during overall refurbishment directly onto the galvanised hand rail

Technologies and Concepts for Cementitious Flooring

Admixtures for RMC	**Sikament® / Plastiment® / Sika® ViscoCrete®**			
Admixtures for site batching	**SikaLatex® Emulsion / Sikament® / Sika® ViscoCrete®**			
Liquid hardeners	**Sikafloor®-CureHard 24**			
Dry shake floor hardeners		**Sikafloor®-3 QuartzTop**	**Sikafloor®-2 SynTop**	**Sikafloor®-1 MetalTop**
Curing/sealing compounds	**Antisol® Type 1** **Antisol® Type 2**	**Sikafloor®-ProSeal** **Sikafloor®-ColourSeal**		
	Sikafloor®-CureHard 24			
Cementitious floor levellers	**Sikafloor®-Level 25**			
Joint sealants	**Sikaflex® PRO-3WF**			
Resin based impregnations and coatings	**Sikafloor®-2420 / Sikafloor®-2430 / Sikafloor®-261**			

Also available from Sika

Our most current General Sales Conditions shall apply. Please consult the Product Data Sheet prior to any use and processing.

Your local Sika Company

Sika Services AG
Corporate Construction
CH-8048 Zürich
Switzerland
Phone +41 1 436 40 40
Fax +41 1 436 46 86
www.sika-construction.com

Responsible Care

Certified Quality System ISO 9001/EN 29001 since 1986

Certified Management System SQS ISO 14001 since 1997

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