

Construction

Evaluation of substrates & Substrate preparation



Sika Australia

Evaluation of Substrates



Substrate Quality

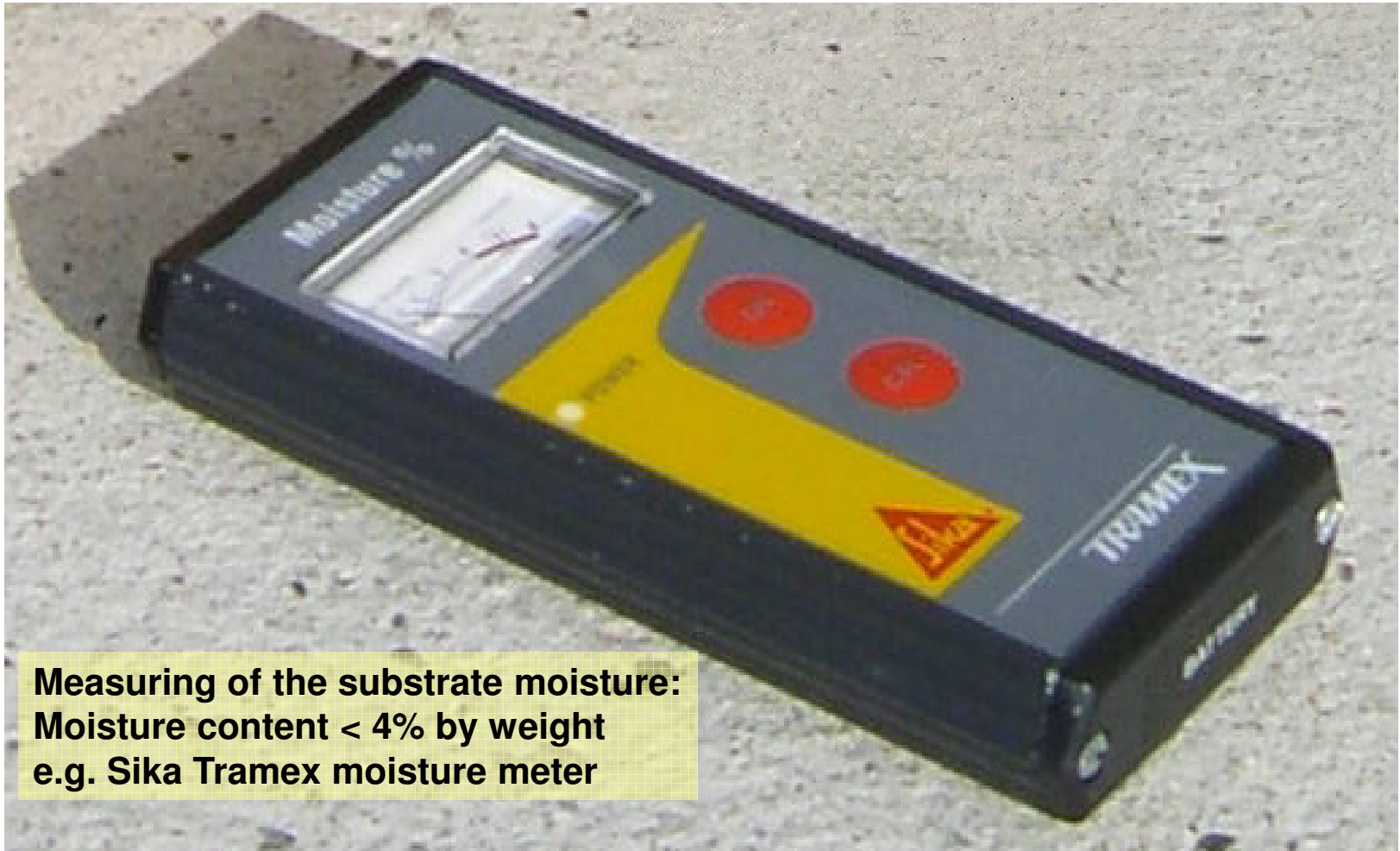
- The concrete substrate must be sound and of sufficient compressive strength (minimum 25 N/mm²) with a minimum pull off strength of 1.5 N/mm².
- The substrate must be clean, dry and free of all contaminants such as dirt, oil, grease, coatings and surface treatments, etc.
- If in doubt, apply a test area first.



Types of Substrates

- Concrete
- Vacuum concrete
- Steel fibre reinforced concrete
- Cement screed
- Anhydrite screed
- Magnesia screed
- Hot poured asphalt
- Synthetic resin screed
- Hard aggregate floor screed
- Tiles
- Existing old resin based coatings

Measuring equipment for substrate humidity



Measuring of the substrate moisture:
Moisture content < 4% by weight
e.g. Sika Tramex moisture meter



Dew point table

Table for the determination of the dew point

Air temperature	Dew point temperatures in °C at a relative air moisture of					
+ °C	40 %	50 %	60 %	70 %	80 %	90 %
20	6,0	9,3	12,0	14,4	16,4	18,3
19	5,1	8,3	11,1	13,4	15,5	17,3
18	4,2	7,4	10,1	12,5	14,5	16,3
17	3,3	6,5	9,2	11,5	13,5	15,3
16	2,4	5,6	8,2	10,5	12,6	14,4
15	1,5	4,7	7,3	9,6	11,6	13,4
14	0,6	3,7	6,4	8,6	10,6	12,4
13	- 0,1	2,8	5,5	7,7	9,6	11,4
12	- 1,0	1,9	4,5	6,7	8,7	10,4
11	- 1,8	1,0	3,5	5,8	7,7	9,4
10	- 2,6	0,1	2,6	4,8	6,7	8,4
9	- 3,4	- 1,0	1,6	3,8	5,8	7,5
8	- 4,4	- 1,5	0,7	2,9	4,8	6,5
7	- 5,0	- 2,4	- 0,2	1,9	3,8	5,5
6	- 5,8	- 3,2	- 1,0	0,9	2,8	4,5
5	- 6,7	- 4,0	- 1,9	0,0	1,8	3,5

Example:

at +10°C air temperature and 80 % relative air moisture is the dew point at substrate temperatures of + 6,7°C.

At substrate temperatures of less then $6,7 + 3,0 = 9,7°C$, it is not possible to apply coating systems.

Pull-off test

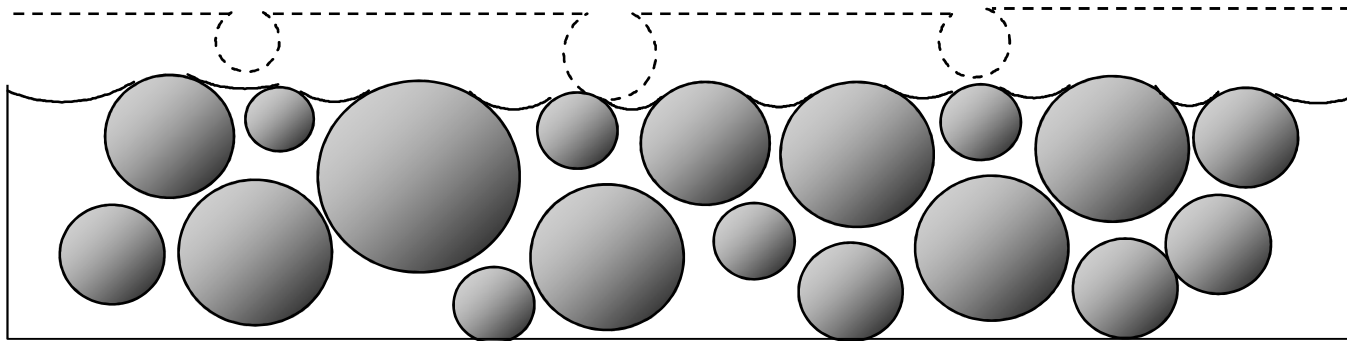
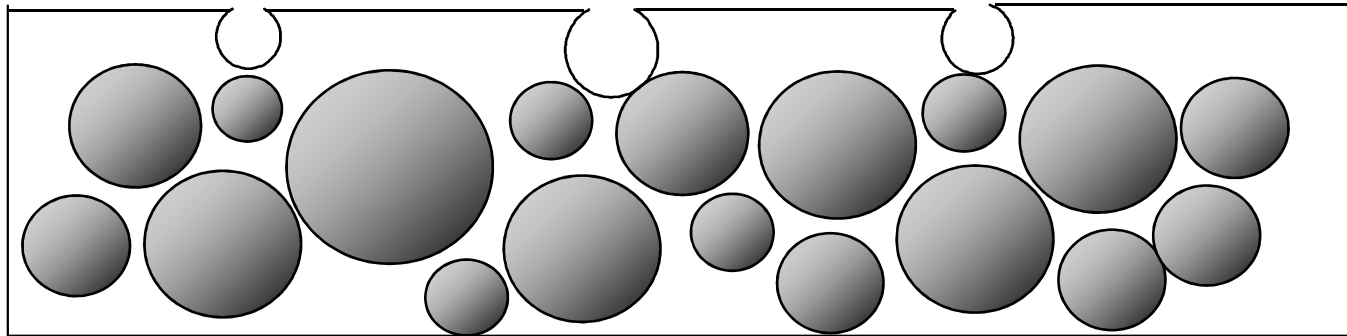
Requirements

Substrate	Average value	Lowest single value
Concrete/Screeds	1.5 N/mm ²	1.0 N/mm ²
Crack bridging coatings (1-part)	1.3 N/mm ²	0.8 N/mm ²
Crack bridging coatings (2-part)	1.5 N/mm ²	1.0 N/mm ²
Rigid coatings (1-part/2-part)	1.5 N/mm ²	1.0 N/mm ²



Surface preparation

Substrate before preparation



Surface preparation



Shot blasting



How shot blasting works



Construction

Shot blasting



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Surface preparation



Dust free grinding



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Grinding

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Grinding

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Surface preparation



Surface preparation



The International Concrete Repair Institute (ICRI)

has defined nine different guidelines for proper surface preparation and has developed profile replica blocks to give a visual point of reference for the user.

Each profile carries a CSP number ranging from a base line of 1 (nearly flat) through 9 (very rough).



International Concrete Repair Institute (ICRI)
3166 River Rd. Suite 132 Des Plaines,
IL 60018
USA
Phone: 001 847-827-0830
Fax: 001 847-827-0832
Web Site: www.icri.org

Concrete Surface Profiles (CSP)



CSP 1
Acid Etched



CSP 2
Grinding



CSP 3
Light shot blast



Concrete Surface Profiles (CSP)



CSP 4
Light Scarification



CSP 5
Medium shot blast



CSP 6
Medium scarification



Concrete Surface Profiles (CSP)



CSP 7
Heavy Abrasive Blast



CSP 8
Scabbled



CSP 9
Heavy Scarification



Method Selector Flooring Type & CSP

FLOORING TYPE	CONCRETE SURFACE PROFILE									
	CSP 1	CSP 2	CPS 3	CSP 4	CSP 5	CSP 6	CSP 7	CSP 8	CSP 9	
Sealer < 150 µm	█									
Thin Film 150-300 µm	█									
High Build 300-1000 µm			█							
Self Smoothing 2-3 mm				█						
Screed Overlays 3-6 mm					█					



Method Selector

Preparation Method & CSP

PREPARATION METHODS	CONCRETE SURFACE PROFILE								
	CSP 1	CSP 2	CSP 3	CSP 4	CSP 5	CSP 6	CSP 7	CSP 8	CSP 9
Detergent scrubbing	■								
Low-pressure water cleaning	■								
Acid etching		■	■						
Grinding		■	■						
Abrasive (sand) blasting			■	■	■				
Steel shotblasting			■	■	■	■	■	■	
Scarifying				■	■	■	■	■	■
High/ultra high-pressure water jetting						■	■	■	■
Scabbling							■	■	■
Flame blasting								■	■



Surface preparation

Coatings must have a sufficient bonding to the substrate, therefore no contaminations and other separating materials may be exist.

The substrate must be able to take up the stresses, caused by the shrinkage of the coating during the reaction, as well as stresses which the coating can effect after application (mechanical load).

The substrate can meet these requirement first after corresponding surface preparation.

