Testing methods for moisture content in concrete, dealing with floor coverings: State-of-the-Art in Finland

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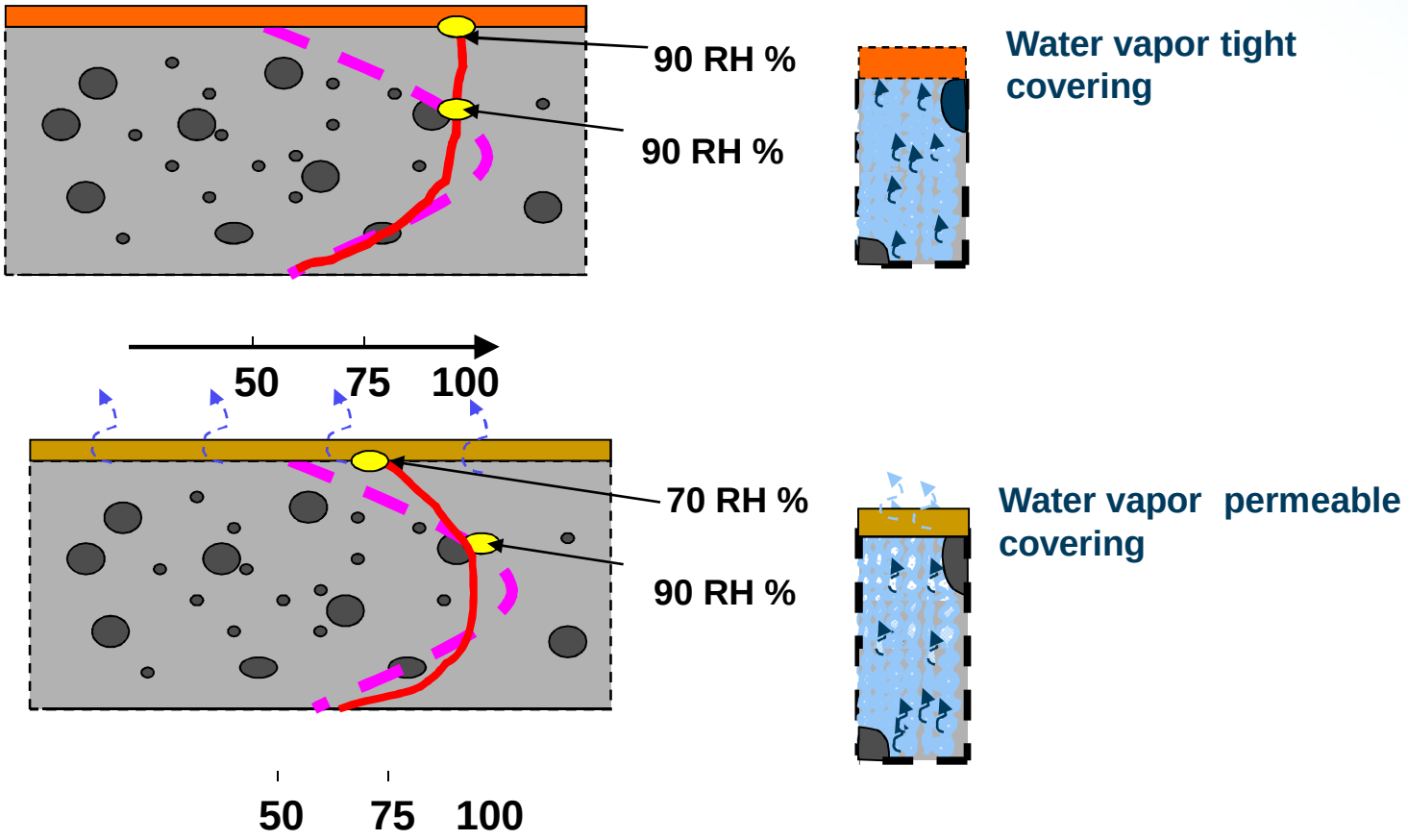
Background

- Lively discussion since 1970
- Development of practical measuring since 1995
- Water vapor permeability researches in the 21’th century
- Still too much mistakes
- BePO-project with all major quarters 2005 - 2008
- Commonly accepted covering instructions in 2008
- New RT-instruction card in 2010

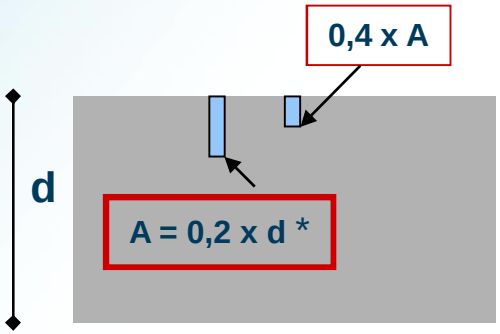
Proper measurements on sites

- Relative humidity
- Borehole method
- Sample method
- Measuring accuracy
- Properties of the surface structures
- Real evaluation of covering
- Shrinkage control

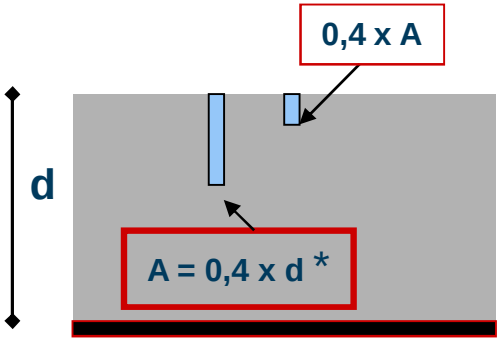
Redistribution of moisture profile



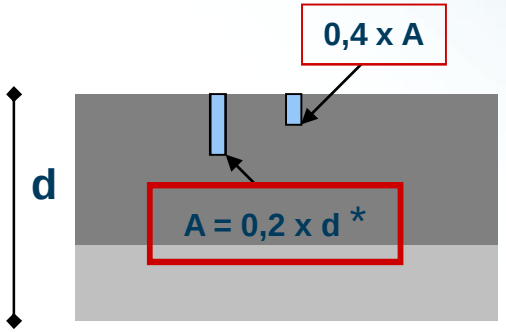
Measuring depths



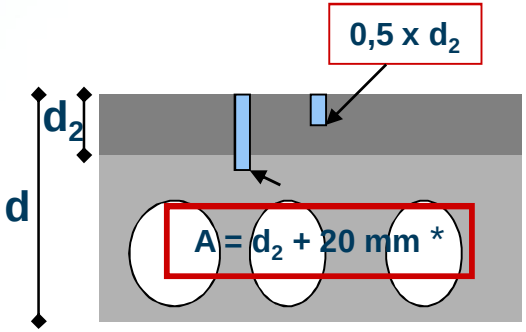
Intermediate floor
(drying both sides)



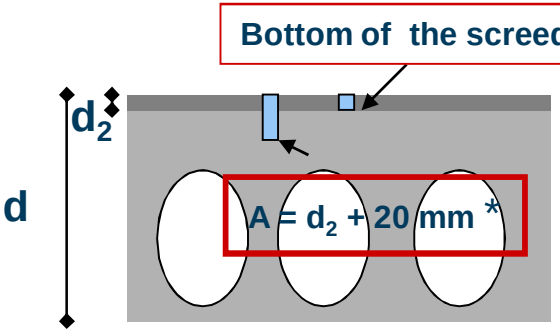
Joint slab or slab on ground
(drying one sided)



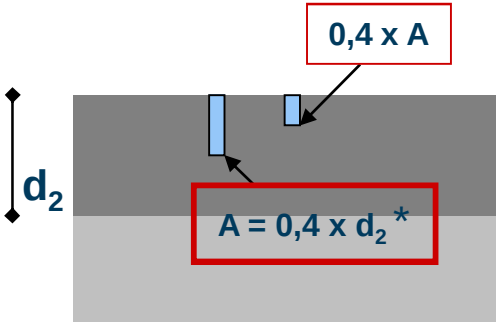
Partly pre-cast intermediate floor



Hollow Core slab + upper concrete (d_2)



Hollow Core slab + screed (d_2)



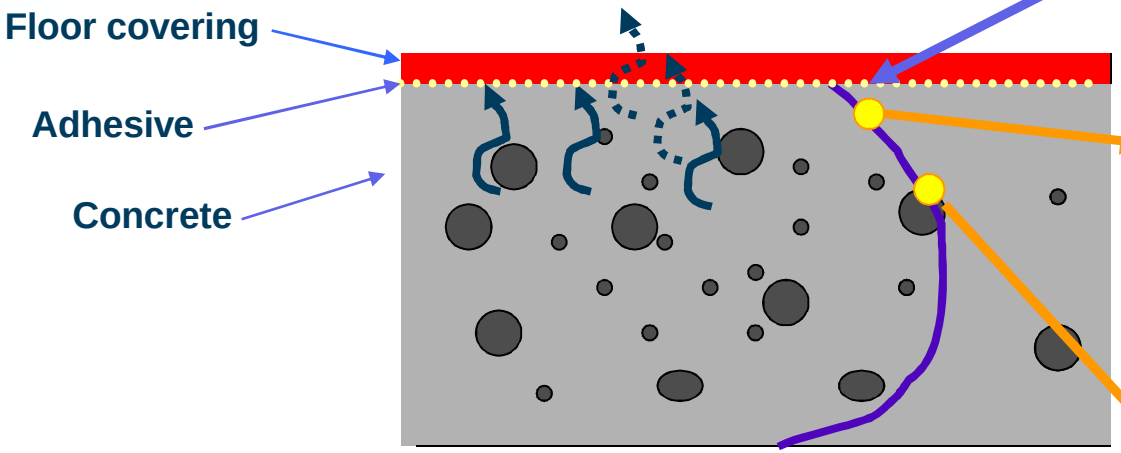
Dumped Hollow core + bathroom floor

Always at least two depths
Maximum measuring depth 70 mm

Elastic carpets

The moisture permeability affects remarkably to the rate the moisture can diminish from the structure without causing any damage.

Moisture content just under the covering may not rise above 85 %RH



At the depth 0.4 x A the moisture content has to be under 75 %RH to allow the moisture from adhesives to absorb into the concrete

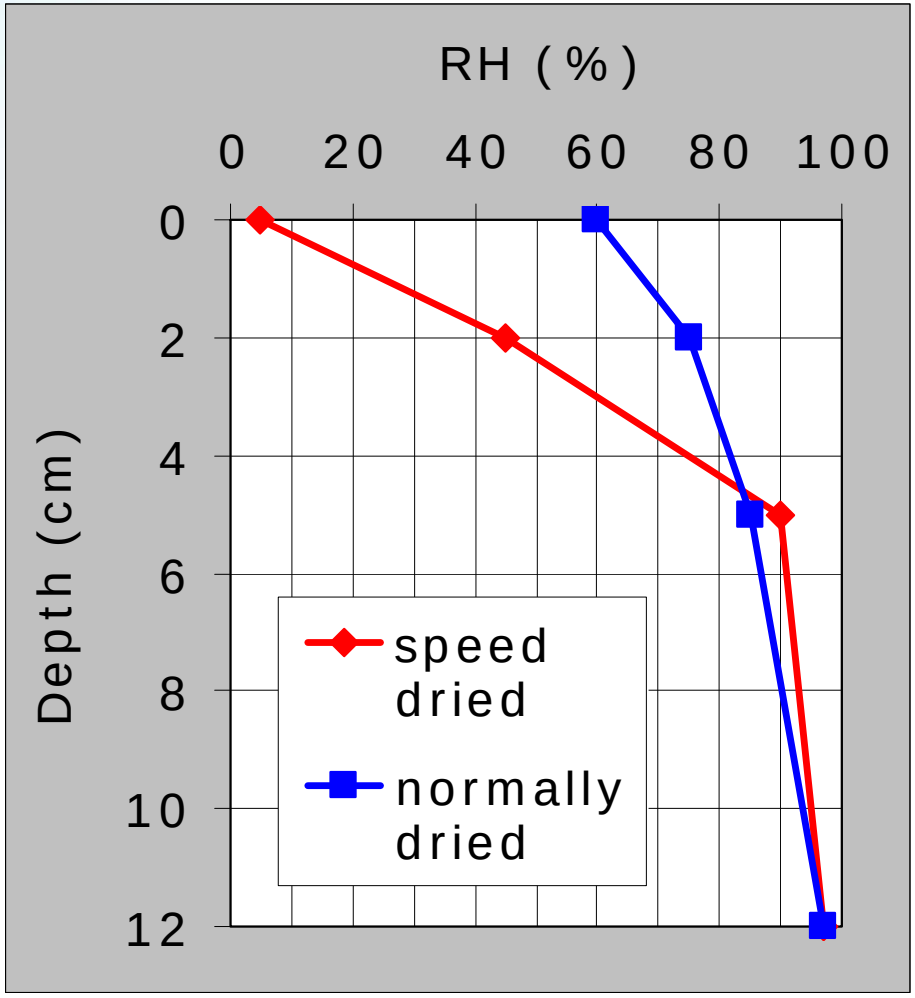
Moisture measurement at the depth (A) at which the moisture content has to be under the covering limit. The limit can be exceeded if the depth 0,4 x A and the surface is very dry.

Principle covering limits with carpets

Floor covering	Concrete RH (%) at the depth A	Concrete and/or screed RH (%) at the surface and at the depth 0,4 x A
PVC carpets	85	75
Linoleum carpets	85	
Rubber carpets	85	
PVC-, rubber- and linoleum tiles	90	

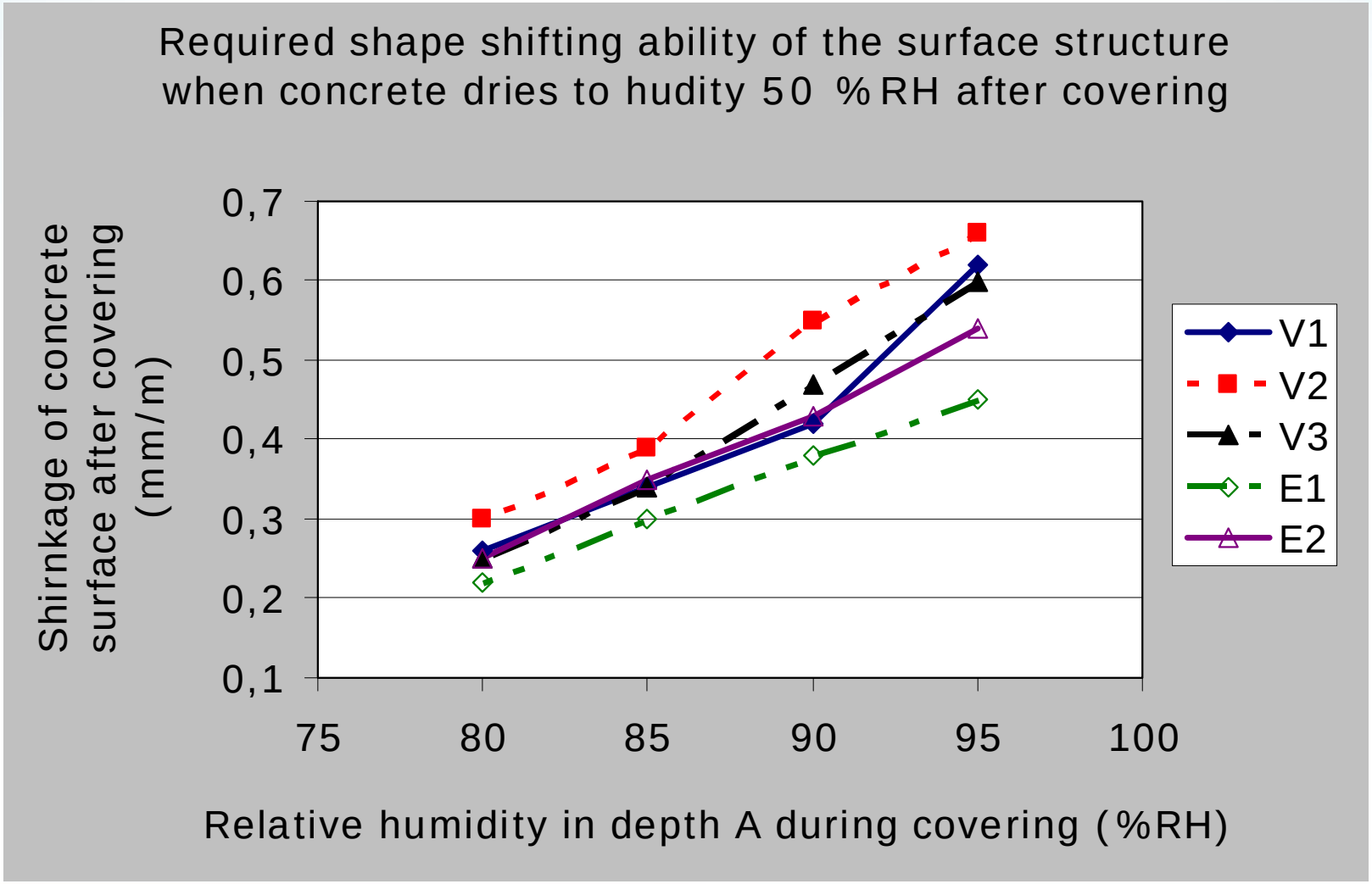
- Contributors can have their own limits
- Limits can be changed according to more accurate analysis

Special covering limits



Depth (mm)	Principle RH-limit (%)	Special RH-limit (%)
5	75	50
15	75	80
30	75	90
70	85	95

Control of shrinkage



In the future

- Acceptance of only proper measurements on sites
- Water vapor permeabilities of materials better into use
- RH 85 % ≠ 3,3 p% quite often, which means that imported coverings should be taken into account more accurately.