

## CONCRETE SLAB CONTAMINANTS

Elevated levels of inorganic or organic contaminants in concrete can prevent proper adhesion of primers, sealers, and adhesives to the surface of the slab. In order to measure these contaminants core samples need to be extracted from the concrete slab. Two core samples should be taken for the first 10,000 SF of sub floor, and one additional core sample for every additional 10,000 SF. Extraction should be done dry if at all possible. Core sizes should be 1-4 inches in diameter and 1-4 inches in length.

Inorganic contaminants are salts that are usually transported to the surface by the evaporating water during the drying process. They will accumulate and form a very hard, yet unstable crust. Primers and sealers will stick to that crust, which in turn has only a limited adhesion to the concrete below and could break loose once mechanical stress is put on the sealer. In addition, these salts will “attract” more water from underneath and increase the surface moisture.

Testing for water soluble inorganic content using ion chromatography is to be performed at a sample depth of 0-3 mm and 3-6 mm below the surface of the slab for sodium ( $\text{Na}^+$ ), potassium ( $\text{K}^+$ ), sulfates ( $\text{SO}_4^{2-}$ ), and chlorides ( $\text{Cl}^-$ ). Based on an extensive database of core samples across the USA, the following “normal” concentration levels have been established:

$\text{Na}^+$ :	200 - 800 ppm
$\text{K}^+$ :	200 - 800 ppm
$\text{SO}_4^{2-}$ :	1500 - 5500 ppm
$\text{Cl}^-$ :	10 - 100 ppm

Organic contaminants such as oil, grease, fatty esters, are typically brought upon the surface after the installation of the slab to enhance and/or accelerate the curing process. Waterborne primers and sealers will have a low tolerance for such contaminants, epoxy based sealers are able to penetrate a higher percentage of such contaminants.

Solvent soluble organic content is detected using IR spectroscopy and provides a concentration for organic contaminants like oil, grease, fatty esters, fatty carboxylate salts in the 0-3 mm layer of the core sample. Acceptable levels of these organic contaminants are:

For water based primers, sealers, and adhesives:	< 300 ppm
For alcohol based primers and adhesives:	< 500 ppm
For epoxy based sealers and urethane adhesives:	< 700 ppm

One out of many testing laboratories that we can recommend is

Mineralogy, Inc.	Phone 877-744-8284
3221 East 27 <sup>th</sup> St	Fax 918-743-7460
Tulsa, OK 74114	Email: info@mineralogy-inc.com

Visit the Stauf web site for more information or call Stauf Technical Services at 901.820.0007.