



Floor and Deck Solutions TM²S

(Testing, Materials, Marketing & Sales Consulting)

Floor and Deck Solutions TM²S provides owners, end-users, architects/engineers and contractors with assistance during all phases of a project, including but not limited to design, construction, post-construction and maintenance.

Floor and Deck Solutions TM²S specializes in the measurements and readings of industry recommended standards and guidelines with a comprehensive line of field inspection tools and instruments needed to support Quality Assurance, Quality Control and Safety for commercial, industrial, institutional and government facilities, and their customers, employees and others.

As an example, Floor and Deck Solutions TM²S works with the owner or end-user to develop measurement and reading programs to maintain the safe environment post-construction with ongoing analysis, such as, ANSI/NFSI B101.1 (SCOF) and B101.3 (DCOF) Standard Test Method for Accurately Measuring (SCOF) Static Coefficient of Friction and (DCOF) Dynamic Coefficient of Friction for Wet or Dry Surfaces. (Portable, Non-Destructive, Physical Read-Out).

STANDARDS TRADE GROUPS

- **ACI – American Concrete Institute**
- **AIA – Architectural Institute of America**
- **AIA-CES – Architectural Institute of American Education**
- **ASTM - American International (formerly American Society of Testing and Materials)**
- **ANSI – American National Standard Institute**
- **ANSI/ESD - American National Standard Institute/Electrostatic Discharge Association**
- **California Council of Inspection Industry**
- **CPAA – Concrete Polishing Association of America**
- **ICRI – International Concrete Repair Institute**
- **NACE – National Association Corrosion Engineers**
- **NFSI – National Floor Safety Institute**
- **NTMA – National Terrazzo and Mosaic Association**
- **SSPC – Society of Protective Coatings**
- **TCNA – Tile Council of North America**
- **SWR Institute - Sealant, Waterproofing and Restoration Institute**



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| American Concrete Institute (ACI) Guides, Designs and Standards | |
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| Design and Condition of Concrete | ACI 201.1R Guide for Making a Condition Survey of Concrete in Service |
| Allowable Crack Widths | ACI 224R Control of Cracking in Concrete Structures |
| Design | ACI 302.1R Guide for Concrete Floor and Slab Construction |
| Design | ACI 302.2R Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials |
| Design | ACI 360 Design of Slabs on Grade |
| Use of Epoxy | ACI 503.1 Standard Specification for Bonding Hardened Concrete, Steel, Wood, Brick, and Other Materials to Hardened Concrete with a Multi-Component Epoxy Adhesive |

If Floor and Deck Solutions TM²S is called upon to assist a designer in making a moisture sensitive flooring recommendation, the first thing that must be done, is understanding the condition of the new or existing concrete.

Concrete compressive strength is always important, tensile strength and moisture concerns are even more of a concern. Concrete substrate durability can be measured and read prior to placement of the floor finishes.

Concrete cracks, some cracks are acceptable, others are not. Measurements and readings, and the facilities end-use will determine if they need to be repaired, bridged or ignored.



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| Concrete Tests | |
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| Concrete Compressive Strength | ASTM C805 Standard Test Method for Rebound Number of Hardened Concrete (Portable, Nondestructive) |
| Concrete Tensile Strength | ASTM C1583 Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method) Portable with minor non-structural destruction at test site. (Destructive) |
| Post 72 Hours to Measurement Concrete Flatness and Levelness | ASTM E1155 Standard Test Method for Determining F _F Floor Flatness and F _L Floor Levelness Numbers. (Portable, nondestructive) |
| Change in Slope | ASTM E1486 Standard Test Method for Determining Floor Tolerances Using Waviness, Wheel Path and Levelness Criteria (Portable, nondestructive) |
| Concrete Surface Profile Reads | ICRI – Concrete Surface Profile. ICRI Guideline No. 310.2R – Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings and Polymer Overlays. (Nondestructive - post surface preparation inspection, usually accompanied with surface contaminate testing.) |

Concrete testing prior to the acceptance and placement of a floor finish is extremely important. The soundness and durability of the concrete compressive strength and tensile strength are always important.

The flatness, levelness, slope and waviness are also important, since most flooring finishes follow the contour of the concrete substrate.

Terrazzo, ceramic tile, etc. industry standards require that the concrete substrate is within “industry tolerances” before installation. Corrective action is required before starting to place the finishes.

Surface preparation is critical, validating that the concrete substrate is compliant with the material manufacturer’s guidelines is important.

Finally, concrete contamination, often over looked as something separate from mechanical surface preparation.



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| Moisture Tests | |
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| Moisture Sensitive Floors | ASTM E1907 Standard Practices for Determining Moisture-Related Acceptability of Concrete Floors to Receive Moisture-Sensitive Finishes. (Minor destructive or non-destructive, depending on tests.) |
| Surface Preparation (pH only) | ASTM F710 Standard Practice for Preparing Concrete Floors for Resilient Floors. (Nondestructive - pH only testing) |
| Moisture Passing Through Concrete | ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride. (Requires minor destructive diamond grinding to an ICRI – Concrete Surface Profile of 2.) (Minor destructive or non-destructive depending on surfacing) |
| Relative Humidity in Concrete | ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete floor Slabs Using in situ Probes. (Requires drilling of 3/4 inch hole to a depth of 40% of the concrete thickness.) (Destructive) |

Testing and remedial action, if needed, before installing a moisture sensitive floor finish is critical.

Per ACI 302.2 a positive side (below the concrete) moisture vapor barrier must be installed that meets ASTM E1745 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs Moisture.

If a membrane is not present or is placed in the wrong position, a negative side (on top of the concrete) must be applied as a moisture mitigation procedure.



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| Static Coefficient of Friction and Dynamic Coefficient of Friction Tests | |
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| Slip Resistance (SCOF and DCOF) | ANSI/NFSI B101.1 (SCOF) and B101.3 (DCOF) Standard Test Method for Accurately Measuring (SCOF) Static Coefficient of Friction and (DCOF) Dynamic Coefficient of Friction for Wet or Dry Surfaces. (Portable, Non-Destructive, Physical Read-Out) Nondestructive |
| Ceramic Tile DCOF | ANSI 137.1 Dynamic Coefficient of Friction (DCOF) Standard Nondestructive |
| Slip Resistance (SCOF) | ASTM C1028 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method (Testing Available, but Withdrawn by ASTM no replacement, See NSI/NFSI B101.1 and B101.3 current) Nondestructive |
| Slip Resistance (SCOF) | ASTM F1679 Standard Test Method for Using a Variable Incident Tribometer (Testing Available, but withdrawn by ASTM– use current ANSI/NFSI B101.1 and 101.3) Nondestructive |

| Walkway Audits | |
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| Walkway and Working Surfaces Safety Inspection | NFSI Walkway Auditor Guideline (Walkway and working surfaces safety inspection) See new ASNI/NFSI B101 Standards. (Nondestructive) |
| Floor Finish Audit | Floor Finish Audits are intended to review the floor finish to its compliance with the specification, suppliers and industry standards. |

Minimizing slips or trips and flats is an important safety practice, being proactive to eliminate the potential is good business.

Proactive Preventative Accident Programs, validated by Third Party Slip Resistance Testing reduces the litigation and mitigation claims that the slips or trips, and falls incidents were caused by your Company's negligence.

Floor audits, such as SCOF and DCOF, ESD ohms, floor flatness, levelness and slope, the floor finish condition immediately after placement is evaluated before other trades access it, etc., measurements and readings are not only practical, but they make good business sense.



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| Hardness of Polymers | |
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| Hardness of Sealants | ASTM C661 Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer (Non-destructive) |
| Hardness of Polymer Floors | ASTM D2240 Standard Test Method for Rubber Property – Durometer Hardness (used for epoxies, MMA and some urethanes) (non-destructive) |

| Polymer Coating and Flooring Finishes Gloss, Clarity and Staining Tests | |
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| Gloss Index | ASTM D523 Standard Test Method for Specular Gloss (Nondestructive) |
| Clarity | ASTM D5767 Standard Test Methods for Instrumental Measurement of Distinctness-of-Image Gloss of Coating Surfaces (Nondestructive) |
| Staining | ASTM D1308 Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes (Maybe minor destructive depending on chemical reaction) |

| Polymer Coatings and Mortars Adhesion Tests | |
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| Coating Adhesion | ASTM D3359 Standard Test Methods for Measuring Adhesion by Tape Test (Destructive) |
| Coating Strength (non-concrete) | ASTM D4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers (Destructive) |
| Coating Adhesion | ASTM D6677 Standard Test Method for Evaluation Adhesion by Knife (Destructive) |
| Coating and Mortar Adhesion (concrete) | ASTM D7234 Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers (Destructive) |

| Polymer Fluid Applied Electric Floors | |
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| Conductive Floors | ANSI/ESD STM7.1 Conductive Floor Materials have a resistance to ground of less than or equal to 1.0×10^6 ohms. (Nondestructive) |
| ESD Floors | ANSI/ESD STM7.1 Electro Static Dissipative Floor Materials have a resistance to ground of greater the 1.0×10^6 ohms and less than or equal to $1.0^6 \times 10^9$ ohms. (Nondestructive) |



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Measurements and readings of existing or “just installed” concrete and polymer flooring and joint sealants is an inexpensive way to validate the products/systems that have been installed.

Contact Floor and Deck Solutions TM²S assistance in measurements and readings before, during or after installations.

Visit [www: flooranddecksolutions.com](http://www.flooranddecksolutions.com)

Offices in:

Southern California Area

Phoenix, Arizona Area