

## **The Daubert Dilemma in the Slip & Fall Case.**

### **Does Forensic Science measure up?**

**By; Kenneth D. Newson, ACFEI, DABFE, DABFET and Neil C. Newson, Esq.**

**Abstract: A presentation of the field measurement protocols (or lack thereof) for Static Coefficient of Friction (SCOF) related to floors. The connection between ASTM (American Society for Testing and Materials) ANSI (American National Standards Institute), OSHA (U.S. Department of Labor-Occupational, Safety & Health Administration), and The Law (Statutory and Case). Now that ASTM has withdrawn International National certification of all field measurement protocols for Coefficient of Friction, with no replacements, can the Forensic Science Methodologies be acceptable by the courts as science under Daubert guidelines?**

*Scientific proof in the slip and fall courtroom setting has been given the whammy by the withdrawal of standards for the measurement of the coefficient of friction. Without a scientifically accepted method of measurement, how can it be said that a floor is not in safety compliance, is dangerous and is a cause of injury? Is the expert testimony to now be excluded from the courtroom?*

The dilemma: ASTM committees designate scientifically sound testing protocols to be used for the identification of standards. ANSI uses the designated testing protocols to quantify and create the proposed standard. "OSHA adopts the ANSI standard and makes it law under 29 UDC 654"<sup>1</sup>. ASTM has deemed all of the field measurement protocols for Static Coefficient of Friction (SCOF) as scientifically unsound and withdrawn their approval, any such evidence presented does not now meet the *Kelly-Frye* ("The Kelly-Frye standard was stated in its original form in *Frye v. United States* (1923) 293 F.1013., and was adopted by the California Supreme Court in *People v. Kelly* (1976) 17 Cal.3d 24. The Kelly-Frye standard mandates that test results used as evidence must be generally accepted within the relevant portions of the scientific community, and excludes from evidence any test results from scientifically unproven methods. The standard is thus also referred to as the "general-acceptance" standard.) standard.

A major tool in the Plaintiff's arsenal of proof has been lost, as well as the Defense's empirical basis for compliance. The "constructive notice stance" must now be weighed against the premises manager's due diligence in providing a safe floor. This does not sound the death knell on the expert's role. More than ever an expert voice is needed to make sense of the confusion, using a multi-disciplinary approach acceptable under "Daubert".

*In 1993 expert testimony became subject to a new, more rigorous, standard. Set by Daubert v. Merrell Dow Pharmaceutical, Inc. (509 U.S. 579) rules of evidence have changed. Now, before an expert can testify to any "scientific, technical, or other specialized knowledge," a court must be satisfied that "the testimony is based*

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<sup>1</sup> OSHA Memorandum January 19, 2001

upon sufficient facts or data, the testimony is the product of reliable principles and methods, and the witness has applied the principles and methods reliably to the facts of the case. (Fed. R Evid. 702: *see also, Kumho Tire Co., Ltd. V. Carmichael*, U.S. 137 (1999) (Extended Daubert to nonscientific testimony)

In California these limitations, upon proper objection, pursuant Evidence Code section 801. have been applied. This was the holding in the *LOCKHEED LITIGATION CASES* 115 Cal.App.4th 558, where it was held that an expert opinion has no value if its basis is unsound.

California evidence code section 801 provides:

If a witness is testifying as an expert, his testimony in the form of an opinion is limited to such an opinion as is:

(a) Related to a subject that is sufficiently beyond common experience that the opinion of an expert would assist the trier of fact; and (b) Based on matter (including his special knowledge, skill, experience, training, and education) perceived by or personally known to the witness or made known to him at or before the hearing, whether or not admissible, that is of a type that reasonably may be relied upon by an expert in forming an opinion upon the subject to which his testimony relates, unless an expert is precluded by law from using such matter as a basis for his opinion.

Evidence Code section 801 limits expert testimony to a matter of a type that reasonably may be relied upon by an expert in forming an opinion upon the subject to which his testimony relates". Upon objection, a trial court is statutorily required to "exclude testimony in the form of an opinion that is based in whole or in significant part on a matter that is not a proper basis for such an opinion (Cal. Evid. Code § 803).

Because the subjects on which expert opinion could be received may be so numerous, the legislature expressly left to the courts the task of interpreting the general foundation standard *to be used*. The party offering the evidence must present such expert opinion(s) that contains a reasonable explanation illuminating why the facts have convinced the expert and therefore should convince the jury.

The burden is with the offeror, to show relevance, scientific basis and reliability. Regardless of whether evidence is deemed "scientific", it will not be admitted unless it is relevant. In California evidence is relevant only if it has any tendency in reason to prove or disprove any disputed fact. The court of Appeals has made it clear that Evidence Code section 801 requires a link between the matter the expert relies on and the opinion offered. And the court concluded that "an expert

opinion based on speculation or conjecture is inadmissible (115 Cal. App. 4<sup>th</sup> at 564)<sup>2</sup>

The Slip and Fall expert must now identify the science used to determine safe walking conditions as well as justify his experiential background that supports his opinion. The scientific community, the government and the courts cannot agree on a standard to measure floor safety.

There has been a consensus of scientific opinion that the standard for safe slip resistance is a Static Coefficient of Friction (SCOF) 0.5 for dry, level pathways. This standard has been in existence since 1948. While this value has been constant the method of arriving at the value has evolved as well as public. Public law 101-336 has raised the bar to 0.6 SCOF, which is now incorporated into each state's Codes (Cal. Title 24 part 2 section 1124B)

There has been so much negative and contradictory evidence as to the ability to measure SCOF in the field, as well as setting a standard the covers both wet and dry measurements, that upon the mandatory eight year review, ASTM issued an announcement. ASTM standards D5859 thru 96e1, Standard Test Method for Determining Traction Using the Variable Incidence Tester (VIT, Tribometer), ASTM Standards F1678 Thru 96, Standard Test Method for using the Portable Articulated Strut Slip Tester (PAST), and ASTM C1028-96, Standard Friction of Ceramic tile and other Like Surfaces using the Horizontal Dynamometer Pull-meter Method have been "WITHDRAWN, NO REPLACEMENT"<sup>3</sup>

Without a protocol to empirically verify the SCOF in the field how can there be a scientific method that passes the courts needs under Daubert? The Forensic Scientist uses more than empirical test results to determine the causation of slippage in floor related litigation. "Scientific Method has many facets"<sup>4</sup>. The justification for and validity of the opinion will thus depend upon the thoroughness of the analysis made. The analysis must then encompass:

1. **Observation:** what is there in the world that gives us clues and answers. Look at documentation. There are a number of documents to be looked at relative to floor covering materials, their age, their use, their care. Match the information to the real world conditions as a scientific basis to present your findings. Materials are rated for SCOF using laboratory equipment. The trained examiner relates that to the real world experience and draws conclusions based on supporting documents and expert knowledge.
2. **Hypothesis:** In the world of Slip and Fall the floor is only half of the system, the person is the other half. There are life sciences pertaining to

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<sup>2</sup> Forensic Expert Witness Association Quarterly (M.C. Sunglaila, Esq., David M. Axelrod, Esq.

<sup>3</sup> ASTM WITHDRAWN standards 2005 from web-site (Docs 009, 010, 011)

<sup>4</sup> The Scientific Method by Anthony Carpi, Ph.D, Vision Learning

- people in a system and how they react: Physics, Biometrics, Ergonomics. This allows the Forensic Scientist a foundation for his hypothesis.
3. **Experimentation:** There is a variety of physical tests available upon which to base an opinion (i.e. shoe was stuck in syrup, test the floor temperature for its effect on syrup). Testing will require intuition, innovation and ingenuity. A thorough identification of the elements will lead to the final opinion.
  4. **Validation:** If properly presented most courts should accept a conclusion based upon the foregoing. The opinion based a comparison of the site conditions, with SCOF as one component and a Forensic Study of other sciences and technologies as the foundation.

Additionally: the courts have not been exposed to the tenets of Human Factors: *“Perceptual organization is particularly important for the design of any visual display. If a warning signal is grouped perceptually with other displays then its message may be lost. The concept of Gestalt, who’s basic idea of this law is that the organizational process will produce the simplest possible organization. Many sources of information come into play in the perception of distance and spatial relations, and the consensus view is that the perceptual system constructs the three dimensional representation using this information.*

*Studies have shown that it is common for people to see when they walk but not look”.*<sup>5</sup>

The science of physics discusses the effects of “Hydroplaning” as part of walking on a wet surface. The practical technology of mechanical engineering defines the content of airborne soil and identifies contaminants.

It is up to the expert to validate to the trier of fact the worthiness of the scientific approach. There are studies in physics that deal with the life cycle of floors after installation related to maintenance. There are behavioral studies discussing “walking memory”. There are other national safety standards that deal with floor surfaces and walking.

And what has happened to the concept of “reasonable expectation of safety”<sup>6</sup>? Under the United States Uniform Commercial Code there is an expectation of good faith in any contract<sup>7</sup>, and that carries over to a person’s expectation of safety.

There have been many studies proving that the existing protocols for measuring SCOF can be biased, manipulated and not repeatable. ASTM has ample justification for the de-certification of field methodologies that quantify SCOF.

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<sup>5</sup> Handbook of Human Factors & Ergonomics 2<sup>nd</sup> edition 1997 pg. 77

<sup>6</sup> Baji 8<sup>th</sup> Edition 3.51

<sup>7</sup> Federal U.C.C. 1-304

“In 1940, there were 22 deaths per hundred thousand from falls; today that number has fallen to about 1.6. Reductions are due in part to improvement in products and materials. A growing understanding of floor surfaces has resulted in the elimination of surface materials and finishes once considered acceptable. We seldom see carnauba waxes on new terrazzo floors, for example. Our walking surfaces are inherently safer than they used to be. We now understand more about the human components that contribute to falls.

Friction or traction is the resistance to lateral movement caused by the contact between two surfaces. Slipperiness = Too Little Friction. Dividing the horizontal force by vertical force (weight), we get a number called the coefficient of friction. Concrete, with .8 COF, would have more traction, and be less slippery, than ice with a COF of .3, for example. The concept may be used to describe the friction relationship between many kinds of objects. COF has become one of the common performance measurements for products like floor finishes. However, the mere application of the concept of slip resistance can be misleading unless it is paired with information on the test method used to make the measurement”<sup>8</sup>.

## CONCLUSION:

After 25 years of discontent, the scientific community became aware that there might be a need for further discussion and clarification between the three agencies responsible for setting public policy and laws. The ASTM F-13 committee took on this task.

“The United States Department of Justice has made recommendations as to the relative values for slip resistance”<sup>9</sup>. Included is the idea that the SCOF readings are affected by contaminants. This is part of Public Law 101-336. As public law it is mandatory that it become the minimum standard of each state’s code. As an example, California has adopted the provisions of the American With Disabilities Act Access Guide as its minimum standard in their Title 24 part 2 of the State Code of Regulation, the Uniform Building Code”<sup>10</sup>

Barrett Miller, BA, Med, OHST wrote to OSHA on July 28, 2003 describing the contradictions and biases present in ANSI 1264.2. He states, “the history of the courts can be fooled” by slip meter evidence. Also, “OSHA research shows that

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<sup>8</sup> MEASUREMENT OF SLIP RESISTANCE, *a legal and practical perspective*

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<sup>9</sup> ADAAG appendix A4.5.1 Ground and floor surfaces (Doc 001)

<sup>10</sup> Cal. UBC Title 24 part 2, Vol. 1 1124B (Doc 019)

on wet surfaces, there is a 400% difference between the readings of each protocol for the machines sponsored in ANSI 1264.2”<sup>11</sup>.

“There has been so much negative and contradictory evidence as to the ability to measure SCOF in the field, as well as setting a standard the covers both wet and dry measurements, that upon the mandatory eight year review, ASTM issued an announcement. ASTM standards D5859 thru 96e1, Standard Test Method for Determining Traction Using the Variable Incidence Tester (VIT, Tribometer), ASTM Standards F1678 Thru 96, Standard Test Method for using the Portable Articulated Strut Slip Tester (PAST), and ASTM C1028-96, Standard Friction of Ceramic tile and other Like Surfaces using the Horizontal Dynamometer Pull-meter Method have been WITHDRAWN, NO REPLACEMENT”<sup>12</sup>

Forensic Engineering is the investigation of Materials, products, structures or components that fail or do not operate/function as intended.<sup>13</sup> Clarity, openness, and responsibility are in the hands of the Forensic Scientist. It take a Forensic Scientist to evaluate floor safety conditions.

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<sup>11</sup> Barrett Miller to OSHA Docket Office, Re: S-029, July 28, 2003 (Doc 006)

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