

# Newsletter

*June 5, 2014*

## Let's Agree to Agree

There seems to be a lot of people who have difficulty in agreeing on the definition of critical words in the dictionary of walkway safety and meaningful tribometry. These words include “meaningful”, “slip risk”, “at risk population”, “foreseeable footwear”, and “risk for slip injury”.

Why is it important to have a common understanding of these relatively simple words? If you don't define and have a clear understanding of what's important, you could easily be led astray or lose sight of your subject of interest.

There are a great number of peer-reviewed articles published that reflect competent study in the field of traction demand under different circumstances by different categories of persons. A bibliography with significant excerpts is being compiled which will be posted on the **EXCEL TRIBOMETERS, LLC** website soon. The papers generally and consistently agreed that traction demand, as measured by force plates, ranges from 0.20 to 0.40, depending on the study test subjects (people), and the tasks performed. That is “meaningful” for assessing “slip risk” because simple math and physics tells us when traction demand exceeds available traction, slip occurs.

If you are a member of the “at risk population” wearing “foreseeable footwear” and your traction demand exceeds the available traction on a particular walkway surface, under the prevailing conditions and with the footwear you are wearing, and if you don't have the physical ability to recover from the initiation of slip, serious injury frequently occurs. Then “slip risk” turns into “risk for slip injury”.

The National Safety Council and other organizations publish injury facts that tells us more than 8 million people each year are injured significantly in falls, as many as 10,000 people die from falls each year in the United States, and fall injuries are the number one type of injury in public places. That data tells us the “risk for slip injury” is a defined hazard of significant risk worthy of attention and mitigation.

Many of the papers also measure the slip resistance of the walkway surfaces used in the research to evaluate the correlation between slip resistance measured by a tribometer and the traction demand measured with force plates. The research that has used the English XL VIT in conjunction with the force

plates shows a strong correlation. So that means when you measure with a proper tribometer, you are actually correlating those readings with traction demand.

So where's the debate? The debate currently centers on the fact that there are a number of tribometers that don't agree with other tribometers. On that basis, it is argued vehemently that you can't measure walkway slip resistance, you can't get a meaningful value for slip resistance, and there is no way to agree on a number that represents a threshold for safety where safety is defined as a reasonable or tolerable "risk of slip injury" of humans walking in public places. Bunk. Just because a slip meter says it's a slip meter doesn't mean it is measuring anything that is "meaningful" or that it is measuring "risk of slip injury" for the "at risk population" wearing "foreseeable footwear." Read the published papers to assure yourself of what you're trying to do. If everyone understood how to measure slip resistance the right way, then we could all agree. What is the right way? The answer is too obvious.

If you are concerned with walkway safety and assessing the risk for human slip and fall injury events, then you need to measure what causes a slip for those people who get injured when they slip. In the majority of slip and fall injury events, imperfect persons wearing imperfect footwear encounter unexpected sudden reduced traction caused by a contaminant or foreign material on the walkway. At the instant of heel contact and heel loading, their gait dynamics are demanding a level of traction which exceeds the available traction, usually from a contaminated, lubricated condition that the person did not perceive. When the traction demand is greater than the available traction, a slip initiates, which the "at risk population" cannot arrest before the advanced foot accelerates uncontrollably away from the needed support position, and a fall occurs.

A "meaningful" tribometer has to reflect imperfect persons wearing imperfect footwear encountering contaminated or lubricated conditions, and be free to slip in the same manner as a human in a slip and fall injury event. There is no residence time between when the heel first contacts the floor and the unbalanced force of traction demand being greater than available traction acts to accelerate the foot forward freely. In a human slip and fall injury event, the foot is not placed on the floor and then pulled horizontally at a speed of 1 ft/s (0.3 m/s). Normally, the footwear is not a high performance non-slip soft compound, nor does it have a pronounced tread at the heel contact area. A tribometer with residence time suffers from stiction and is not "meaningful" in the context of walkway safety. Nor is a tribometer testfoot with a pronounced, sharp tread.

Since 2010, the ASTM F2508 standard provides a laboratory procedure for validating, calibrating and certifying walkway tribometers. For those who do understand our terminology and the objectives of walkway safety and tribometry "meaningful" in our context of "risk for slip injury", ASTM F2508 has a limited purpose; that is, prove the repeatability and precision of a walkway tribometer in

laboratory conditions, albeit not related to “meaningful” walkway safety. The laboratory procedure and the standard are not significant with respect to the “at risk population” nor the “risk for slip injury”, only for “slip risk” for the young, fit test subjects, under the specified laboratory conditions. The limitations in that regard are so stated in the standard.

The ASTM F2508 standard is a single useful tool in a very large toolbox for assessing the “risk of slip injury” for humans in slip and fall injury events on any particular walkway. Make sure you are up to date with all the other tools as well. Also keep in mind an ASTM F2508 validated slip meter does not necessarily have to perform to the same confidence intervals in the field as it does in the ASTM F2508 laboratory procedures. That means, if the manufacturer runs a validation and shows that the instrument is accurate and repeatable to a confidence interval of 0.008, the slip meter does not have to perform to that degree of accuracy to meet the required accuracy of  $0.03\pm$  and  $0.05\pm$  to be “meaningful” in the context of “risk for slip injury” for the “at risk population” wearing “foreseeable footwear.” When we know that traction demand is greater than 0.25, we know slip resistance values of 0.08, 0.12 and 0.20 are all unreasonable dangerous with respect to “risk for slip injury.” We don't need to know if the value is 0.12 versus 0.128 or 0.112 ( $0.008\pm$ ); rather, 0.09 or 0.15 ( $0.03\pm$ ) is good enough to tell us what we need to know.

Don't be confused or misled because you don't have a clear understanding of the terminology. Know your stuff—the right stuff. If all of this knowledge is not clear in your mind, you probably want to take the current **EXCEL TRIBOMETERS, LLC CXLT Certification Program** or do some independent study.

### **NEXT CXLT PROGRAM: Chicago, IL**

The next **CXLT Certification Program** will be conducted by **EXCEL TRIBOMETERS, LLC** on Wednesday, July 9, 2014, in Chicago, IL, at the Marriott Chicago O'Hare Hotel, where a block of rooms has been reserved at a special rate of \$195.00. The rate is available for a limited time, as is space in the Program, so book early. Contact the hotel directly for room reservations at 800-228-8290, or reserve rooms online: [Online Reservation](#)

Marriott Chicago O'Hare  
8535 west Higgins Road  
Chicago, IL 60631

The current program is constantly being improved to maximize the value for your investment, with expanded sciences and extensive hands-on instruction with the instrument. First time CXLT program participants, very experienced XL users

who wanted a refresher, as well as CXLT's who chose to retake the course and the test to maintain their current status have all touted the program.

To read comments received, check out: [CXLT Program Testimonials](#)

### **NEW CERTIFIED XL TRIBOMETRISTS**

The March 2014 CXLT Program once again received strong support and rave reviews. The new and returning CXLT's now entitled to use the CXLT designation are listed below and on the website (click here for the [CXLT Registry](#)). Congratulations to all!

Alfred L. Cipriani	SEA Limited	
C. Michael Dickinson, PE	Dickinson and Associates, Inc	
Paul Bennett Wellington Dorothy	SEA Limited	
Stephen Fleming	Page Engineering Inc	
Michael P. Garove	US Forensic, LLC	
Juff George	Exponent	
Norman B. Golinkin	SEA Limited	Current CXLT
Brian C. Grieser	Applied Safety and Ergonomics, Inc.	
Mathew Jones	Jenish Forensic Engineering	
Franco Magliozzi	Chubb Insurance	
Aron M. Olson	Warren Forensics	
Daniel J. Rollino	Chubb Insurance	
Joseph C. Saccoccio	Chubb Insurance	
Bethany Suderman	Guidance Engineering	
Kelley Work	Chubb Insurance	

### **ALL ENGLISH XL VIT OWNERS SHOULD CONSIDER THE CXLT PROGRAM**

Of course, we encourage anyone who owns an English XL VIT who has never taken the program to please do so in order to ensure your compliance with both the understanding of the science and principles of walkway safety and slip resistance metering, as well as proper and accurate use of the English XL VIT. Please consider the importance of your participation.

Holding the CXLT certification assures your **recognition and respect** as an expert who is knowledgeable, competent, and proficient in walkway safety, meaningful tribometry, and in the use of the English XL VIT. Anyone who wants to perform a competent risk assessment of a walkway, or evaluate flooring and footwear products, needs to establish a strong foundation in the principles of safety engineering, the sciences of walkway safety, the scientific and mechanical aspects of the available slipmeters, and the effects of reasonably foreseeable variables on the performance of walkways and slipmeters. The certification also

shows the CXL T had extensive hands-on instruction in the proper use of the English XL VIT and proved his or her proficiency with the most respected slip meter.

Make sure you review the **updated and expanded** [CXL T Certification Program](#) on the **EXCEL TRIBOMETERS, LLC** website. Also please keep in mind on-site programs are available if you are one of the many organizations that have a large staff who are interested in tribometry and walkway safety.

Note our **updated mailing address** that provides a more secure facility for receiving your equipment.

We **value your input** and questions, and look forward to hearing from you. All of your comments and concerns are welcome and will be thoroughly addressed. Your communications are treated with respect, and kept in the strictest of confidence. You may contact Peter directly at 757-897-2853, or by email at [pwidas@exceltribometers.com](mailto:pwidas@exceltribometers.com)

Thank you for your participation in the continuing efforts for advancements in the field of walkway safety and meaningful tribometry.

Peter Widas, BSMSE, CXL T, Vice President, Chief Operating Officer

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