

# Newsletter

*September 30, 2011*

## **XL VIT VALIDATED AS ASTM F2508 COMPLIANT**

As announced last month, any confusion is ended about whether or not there is a viable tribometer in the world of walkway safety. EXCEL TRIBOMETERS, LLC, as the patent owner, manufacturer and sole authorized supplier of the English XL Variable Incidence/Articulated Strut Tribometer (both the base XL VIT and the XL VIT with sequencer) performed all requisite testing that demonstrates full performance compliance of both models of the XL VIT with the requirements of F2508. The Reports of Validation for both machines are on the EXCEL TRIBOMETERS, LLC website, and have been submitted to ASTM as the first known tribometer that has been validated through the F2508 process, which was published in March 2011.

## **F2508 CALIBRATION**

Users of the XL VIT have raised the question, “Does every XL VIT now need to have the F2508 Calibration performed on it?” The best answer is “it depends.” If you are in an environment where you need to represent you have an ASTM F2508 Validated walkway tribometer, then “yes” you need to have a current F2508 Calibration, since F2508 Calibration is part of the F2508 Validation process, as defined in the standard practice. The interval for F2508 Calibration is annual, as defined in the standard practice.

The F2508 standard practice was written so that anyone can perform the F2508 Calibrations required after original distribution of a new walkway tribometer by the manufacturer. To perform the F2508 Calibration, you need a documented, serial numbered XL VIT F2508 treaded-model test foot (available from EXCEL TRIBOMETERS, LLC for \$85.00), a set of documented reference surfaces (the “adjunct tiles” available from ASTM) that have been properly stored and prepared with the appropriate reagents in accord with the extensive F2508 procedures. You are on your own as far as obtaining the reagents. You will need to perform 16 tests on each of the four reference surfaces using the specified reagent and distilled water, perform statistical analyses of the results, and prepare a comprehensive Walkway Tribometer Calibration Report. The precision required in the preparations of the reference surfaces should only be attempted by those qualified and experienced in laboratory work.

EXCEL TRIBOMETERS, LLC offers F2508 Calibration for those who request it at the time of purchase of a new instrument for \$750.00. For F2508 Calibration at any other time for any XL VIT, the fee is \$950.00. Due to the extensive testing required, please call ahead to schedule your F2508 Calibration.

### **XL VIT F2508 TREADED-MODEL TEST FOOT**

The ASTM F2508 validation standard practice establishes a thorough process for properly and adequately correlating the slip characteristics of a surface or contaminant, or both, to the actual propensity for human slips against a human gait-based reference system and standard practice with relevance to human ambulation using reference surfaces. The ASTM F2508 criteria establish the validity of the walkway tribometer albeit to a level that goes beyond that otherwise necessary to evaluate practical slip and fall injury risk.

The scientific study upon which the ASTM F2508 validation process is based was conducted with a select population of young adults (mean age 26 years) who were free from gait deviations while walking in a straight path on a level surface in a laboratory. Three very slippery reference surfaces were necessary to produce measurable slips since very slippery conditions were necessary to overcome the perception, reaction and recovery neurological and physiological capabilities of the study population. The ASTM F2508 walkway tribometer validation and calibration criteria require fine differentiation of those three very slippery reference surfaces.

The XL VIT F2508 treaded-model test foot was developed and used to assist in dissipating the squeeze film, enhancing the statistical differentiation in the slip resistance measurement of the three smoothest reference surfaces. A standard (non-treaded) XL VIT test foot is calibrated to  $0.15 \pm 0.03$ , then grooved as specified in the Validation Report, which XL VIT F2508 treaded-model test foot then calibrates as  $0.35 \pm 0.03$  on the same XL calibration tile. Testing showed orientation of the grooves of the XL VIT F2508 treaded-model test foot does not affect the testing results within the confidence limits established in the validation process.

The ASTM F2508 Validation of the XL VIT was conducted using the XL VIT F2508 treaded-model test foot to accommodate the F2508 test contaminant conditions on the F2508 reference surfaces. The three smoothest of the reference surfaces, the polished granite, the smooth porcelain, and the vinyl composite tile, all have very little differentiation in asperity prominence or character that would otherwise produce significant differences in the slip resistance in the presence of a contaminant. None of those materials have sufficiently prominent asperities to protrude through/penetrate or otherwise assist in dissipating the hydrodynamic squeeze film produced by the specified distilled

water or soapy solution contaminants. In other words, those three reference surfaces are all as slippery as ice or worse when wet with water or soapy water, and all of those three reference surfaces are associated with a high risk for human slip and fall injury.

All of those three reference surfaces are in the same category from a practical slip and fall injury risk perspective, and all are ranked as high slip and fall injury risk by a standard (non-treaded) XL VIT test foot. When assessing the practical risk for human slip and fall injury, there is no significant difference between the three smoothest reference surfaces; all are dangerous: one is very dangerous, the next is very, very dangerous, and the third is very, very, very dangerous.

Considering that the heel contact area is subject to wear and is frequently worn virtually smooth on the footwear of persons who are at the highest risk for injury in a slip and fall event, and based on years of studies and data, the standard (non-treaded) XL VIT test foot remains appropriate, proper, and accurate for relative ranking of practical slip and fall injury risk, and the slip resistance values obtained from all that experience remain accurate, meaningful and significant.

The XL VIT F2508 treaded-model test foot dramatically mitigates the effects of the hydrodynamic squeeze film and significantly reduces the lubrication of the squeeze film. Since lubrication between the footwear bottom and walkway surface is a critical element in practical slip and fall injury events, and since the standard (non-treaded) XL VIT test foot is appropriately sensitive to the effects of the squeeze film, the XL VIT F2508 treaded-model test foot is intended for application only in the F2508 Validation and F2508 Calibration testing. The prior studies and peer-reviewed publications that correlated the relative ranking of slip and fall injury risk used the standard (non-treaded) XL VIT test foot. The standard (non-treaded) XL VIT test foot remains appropriate, proper and accurate for relative ranking of practical slip and fall injury risk.

### **TEST FOOT PREPARATION AND CALIBRATION**

The manner of sanding of the XL test foot (or any meaningful tribometer's test foot) can affect the calibration value on the same spot on the same XL Calibration Tile. A clean, ***perfectly flat*** sanded standard (non-treaded) XL VIT test foot will measure  $0.10 \pm 0.02$  on an XL Calibration Tile. The more the test foot wobbles during sanding, the more domed or rounded the test foot surface becomes, and the higher the calibration value. The XL test foot calibration value can increase to as much as 0.30 or higher depending on the extent of doming/rounding of the test foot.

The test foot calibration value is a reflection of the manipulation of the squeeze film on generally smooth hard surfaces. The more domed/rounded the test foot (and similarly the more treaded a test foot), the more rapidly the squeeze film is

dissipated, the less lubrication between the test foot and test surface, and the higher the slip resistance reading.

EXCEL TRIBOMETERS, LLC has stressed in our CXLT programs and in the current XL User Guide that a user can easily avoid wobble during sanding, and thus avoid doming/rounding of the test foot surface, by grasping the test foot down at the very base and by using only enough pressure to produce a sanding dust “bagel” on the 180 grit silicon carbide sand paper after about five circles. Grasping higher on the threads of the test foot while sanding tends to produce more doming/rounding of the test foot.

The variations in competent test foot preparation do not affect the relative ranking of practical slip and fall injury risk, and only become significant when measuring very similar materials in the context of limited statistical analyses. The slip resistance values measured by the XL VIT when the User Guide is followed have been proved repeatedly to be highly accurate and meaningful for properly assessing and ranking the risk for real world slip and fall injury events.

As a matter of convenience for current tribometer users so as not to require perfect test foot preparation all the time, and to correlate with the characteristics of the worn heel contact area observed in analysis of footwear from actual, real world slip and fall injury events, manually sanding the test foot to a calibration value of 0.15 to 0.20 on an XL Calibration Tile is recommended until the standardized test foot sanding device is available for distribution.

Whether you calibrate your test foot to 0.10 or 0.20, a smooth hard surface will meter less than 0.20 when wet, which is extremely dangerous with respect to walkway safety and is representative of a high risk for slip and fall injury events. Surfaces that have sufficiently prominent asperities to meter higher than 0.30 when wet are virtually unaffected by whether your test foot was 0.10 or 0.20 on an XL Calibration Tile. In other words, whether your test foot was calibrated to 0.10 or 0.20 on an XL Calibration Tile, you will still properly assess and rank the risk for real world slip and fall injury events.

The suggested protocol until the standardized test foot sanding device is available is to calibrate your flat (ungrooved) test foot to a value of from 0.15 to 0.20 on the XL Calibration Tile a number of consecutive times to be confident in your technique, that your technique is repeatable, and then use that same sanding technique in the field for your actual testing. The same rules still apply for recalibration as specified in the current XL User Guide.

### **NOVEMBER CXLT PROGRAM – PHOENIX, AZ.**

The world of walkway safety and meaningful tribometry is more challenging every day. Risk management and loss control is more significant in today’s economy,

and everyone knows the cost of slip and fall injuries is gargantuan. Court challenges to the validity of the meaning and measuring of slip resistance are more insidious, and are based on misinformation and misunderstanding.

The CXLT program was started in 2001 as certification in “Using the English XL Expertly.” Today, the CXLT program gives you more than expertise in the operation of the XL VIT. State of the art sciences related to walkway safety and meaningful tribometry are offered to arm a current CXLT with the knowledge to evaluate the validity of any tribometer, and to provide a solid basis to perform competent slip resistance analyses, and achieve meaningful evaluations of practical slip and fall injury risk.

The next CXLT Certification Program will be conducted by EXCEL TRIBOMETERS, LLC on Thursday, November 10, 2011, in Phoenix, Arizona, at the Residence Inn Phoenix Airport.

A block of studio suites has been reserved at \$129.00 for November 9-10. To get this rate, you must book under the EXCEL TRIBOMETERS, LLC group name on or before October 14. A shuttle from the airport is available by calling the hotel. Space at the hotel and in the CXLT program is limited, so reserve early. Contact the hotel directly at:

Residence Inn Phoenix Airport  
801 North 44th Street  
Phoenix, AZ 85008  
(602) 273-9220

If you prefer to reserve your room online, the link below will direct you to the property's home page with the negotiated rate code already entered in the appropriate field.

[Residence Inn Phoenix Airport](#)

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.

- “The case studies presented provided insights into how to address other factors that may affect required slip resistance.” - J.H. (Current CXLT)
- “The hands-on part was very good – it is good to get feedback on my technique from those that have so much experience with the equipment.” - R.M. (Current CXLT)

- “Superb. Your outfit is very professional and committed to the science and working with the users.”... “you are real engineers that I can relate to.” - S.P. (Current CXLT)
- “... this program focused on the most important points rather than spending a whole day on flooring materials identification, etc. as other courses do. The program seemed very well-organized and well-run.” - B.R. (New CXLT)
- “Good value and good balance of information for those who are new vs. those who have been doing this for a while.” - A.F. (New CXLT)
- “It fully met my expectations. I've been in other topics seminars, but this one is my favorite by far.” - O.A. (New CXLT)

Of course, we encourage anyone who owns an 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 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 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 CXLT had extensive hands-on instruction in the proper use of the XL VIT and proved his or her proficiency with the most respected slip meter.

Make sure you review the **updated and expanded** CXLT 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.

### **XL VIT WITH SEQUENCER**

The Sequencer is available as an upgrade for the base XL VIT, primarily for operator convenience to eliminate the need for a relative strong return spring on the thumb actuation button. The spring force created some stress on our aged users and users of lesser stature, and on all users who were exposed to many actuations in one session, such as researchers and laboratory technicians performing materials testing with many samples. The ease of use of the XL VIT



with sequencer is even more desirable if you are doing the extensive F2508 validation and calibration testing.

As an added benefit, one more aspect of operation was standardized; the duration of actuation is uniformly and consistently ½ second with the Sequencer, even though there was no evidence that manual operation of the XL was ever anything other than reliable and accurate when the User Guide, or formerly ASTM F-1679, was followed. Everyone who owns or has used an XL VIT with sequencer agrees that the ease and speed of using the already easy-to-use and fast XL was even better.

The XL VIT with sequencer is for sale new for \$4,800.00. The sequencer upgrade is available for existing base machines for \$800.00, which includes an XL VIT Instrument Calibration (XL VIT instrument calibration is not the same as the ASTM F2508 calibration).

### **INSTRUMENT CALIBRATION AND REFURBISHING SERVICE**

Your XL VIT is a scientific instrument and requires regular instrument calibration and refurbishing, as with any similar credible metering device. The fee for XL VIT instrument calibration, if you are on time, is \$200. For those of you who are not current and your slipmeter is overdue, we are offering new standard pricing of \$300 plus parts, which encourages overdue XL VIT users to bring their instrument up to date. The XL VIT instrument calibration is **not the same** as the F2508 calibration, which is not the same as the F2508 validation testing and reporting. The extensive testing, on the four (4) reference surfaces, with special cleaning procedures and reagents, and the required calibration reporting, are all much more extensive than the XL VIT calibration and refurbishing.

Please keep in mind that if you maintain your tribometer by sending it for the XL VIT instrument calibration service at the proper intervals, **we will repair anything** within 6 months following service, for shipping costs only, unless there is clear evidence of physical abuse or extraordinarily extensive use. Some machines are shared by many and used constantly. Those slipmeters need servicing more often.

Be careful when packing and shipping your instrument. The most common form of abuse is from poor packing. See the Instrument Calibration page on the EXCEL TRIBOMETERS, LLC website for the recommended shipping methods. A custom fit Pelican Hard Case is available for your XL VIT on the website.

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.

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