

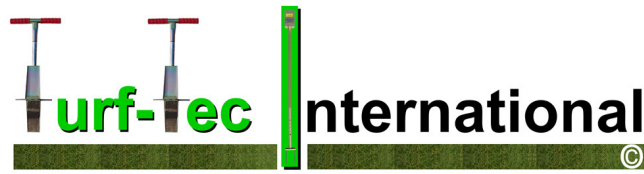
Turf-Tec Shear Strength Tester (Shear Vane) TSHEAR2-M







The new Turf-Tec Shear Strength Tester also known as a shear vane apparatus in scientific literature is a specially designed tool to test the stability of athletic field turfgrass root systems. In addition, the Turf-Tec Shear Strength Tester can also test the types and depth of cleats that will perform best in your particular turfgrass root system and environment. Knowing the correct cleat to play in will not only insure proper footing during play, but will also reduce slipping and may also create a safer playing environment for athletes.






The unique design of the new Turf-Tec Shear Strength Tester with the shear vane foot allows the turf stability to be tested to insure the health of the root system directly on athletic fields. The Turf-Tec Shear Strength Tester can also test different cleat designs and cleat depths to insure proper footing during play. Simply unscrew the shear vane testing foot and screw in the cleats to be used during play and insert the tool into the soil. By simply pressing down and turning the tool until the turf fails, you can get a reading in Newton Meters as to the shear strength of the turf. Different cleat types and depths can be tested and compared to each other right on the playing field. This will insure the cleat choice is optimum for that field on that given day, regardless of field moisture, soil types, turf varieties or weather conditions.

Turf-Tec Shear Strength Tester - TSHEAR2-M



Turf-Tec Shear Strength Tester Instructions

	<p>Step 1. Determine if you are going to test with cleats or the shear vane foot.</p>
	<p>Step 2. Using the horizontal foot pad press Turf-Tec Shear Strength Tester firmly into the ground until tool shear vane foot or cleats are all the way into the soil surface. <u>Do not push the unit into the soil with the torque wrench on the unit as damage to the calibration may occur.</u></p>
	<p>Step 3. Place torque wrench into receptacle on top of Turf-Tec Shear Strength Tester as shown. **Make sure the follower needle is on zero and aligned with the direction of turn.</p>
	<p>Step 4. <u>Do not apply any downward pressure on the device when taking a reading!</u> Using slow but steady pressure, turn the torque tool using both handles toward the follower needle. When the turf starts to tear, this is the highest number you will see on the follower needle. It is not necessary to completely tear the turf or shear the roots off.</p>
	<p>Step 5. Read maximum reading on the follower needle and record this number.</p>

	<p>Step 6. Remove torque wrench from tool.</p> <p><u>Do not lay the unit down with the torque wrench attached to the unit as damage to the precision calibration may occur.</u></p>
	<p>Step 7. Remove the tool from the soil and if any turf is on the shear vane, eject it by hand with the ejection foot and lever.</p>
	<p>Step 8. Pressing down on ejector level to remove soil.</p>
	<p>Step 9. After Testing, remove the torque wrench and reset the follow needle to zero. Re-apply torque wrench before testing again.</p>
	<p>Step 10. Repeat above procedure for each different type of cleat to be tested.</p>












Testing Areas with Shear Vane foot

Using the shear vane foot on the Turf-Tec Shear Strength tester (See above photos) will produce a shear value number that has been researched by the scientific community on sports field s for over 25 years, however data is still being collected on different grass species and soil types. Take at least three readings from each area of the field being tested to get an average of the shear strength of the turf for each cleat to be tested. It is recommended that the field be tested as close to game time as possible to insure variables like soil moisture content does not change. Different soil moisture contents will be the

greatest variable in testing shear strength. It is recommended that when testing shear strength, soil moisture readings should also be recorded by using a Turf-Tec Moisture Sensor. This will insure that soil moisture is in the same range each time you test that particular field. Worn areas should be tested and compared to non-worn areas to see the difference in shear strength between these areas.

Switching from shear vane to cleats on Turf-Tec Shear Strength Tester

		
To switch from the shear vane foot to testing cleats follow these steps...	Place Phillips screwdriver in ejector foot center hole and remove screw	Remove ejector foot plate from unit
		
Remove four Phillips screws from shear vane foot	Remove shear vane foot	Place cleats in holes provided.
		
Do not over tighten cleats	Test as instructed above	

Testing Areas with Cleats

Using cleats on the Turf-Tec Shear Strength tester (See photos above) will allow different cleats to be tested before a game is played. It is recommended that cleat readings be taken on the practice field with the same length cleat the particular athlete or team regularly uses. At least three reading from different areas of each area of the field should be tested to get an average of the shear strength of the turf. These "baseline" numbers from your own practice fields can be then compared to the field about to be played on and different length cleats can then be tried until similar numbers (as compared to the baseline numbers) are achieved. It is recommended that the field be tested as close to game time as possible to insure variables like soil moisture content does not change. Different soil moisture contents will be the greatest variable in testing shear strength. If

you are testing the same field over time and comparing the shear strength, it is recommended that a Turf-Tec Moisture Sensor also be used to insure that soil moisture is in the same range each time you test that particular field. Worn areas should be tested and compared to non-worn areas to see the difference in shear strength between these areas. Use the new Turf-Tec Shear Strength Tester with cleats to be sure your players are wearing the right cleat for that field. Take the guess work out of choosing the correct cleat and let science determine the best choice.

Uses

The Turf-Tec Shear Strength Tester is not only useful in determining what types of cleats to wear before play. In addition it is useful in testing the strength of the turfgrass root system and the ability to resist wear.

New Sod

The Turf-Tec Shear Strength Tester is also useful in testing areas that have been re-sodded to be sure the sod is rooted down enough for play. Test the seam and corner areas the most to insure safe footing.

Testing qualifications

The Turf-Tec Shear Strength Tester is designed to give an indication of what the playability of an athletic field will be like. Turf-Tec does not guarantee cleat selection will be the best for athletes, as the ultimate cleat selection depends on skill and ability of each player.

Results and readings

Research has shown in general that readings as listed below are good general guidelines for footing*, however, additional testing and research is being conducted. The Turf-Tec Shear Strength Tester is also useful in testing areas that have been re-sodded to be sure the sod is rooted down enough for play. Test the seam and corner areas the most to insure safe footing.

10 Newton Meters or less*	The minimum acceptable value since the turf is easily torn under 10 Nm
Between 10 to 15 Newton Meters*	Fair Shear Strength
Between 15 and 20 Newton Meters*	Good shear strength
+ 20 Newton Meters*	Exceptional shear strength

* Reference - J.C. Stier, Dep. of Horticulture, Univ. of Wisconsin, Madison, WI "Kentucky bluegrass grown under reduced irradiance" 53706-1590; J.N. Rogers III, Dep. of Crop and Soil Sciences, Michigan State Univ., East Lansing, MI 48824-1325. Published in Crop Sci. 41:457-465 (2001).

Other References:

J.N. Rogers III, DV Waddington and J.C. Harper II, Penn State College of Agriculture Progress Report 393, Dec. 1988 "Relationship between Athletic Field Hardness and Traction, Vegetation, Soil Properties and Maintenance Practices"

J.C. Stier, Dep. of Horticulture, University of Wisconsin, Madison, McBee (1969) WI 53706-1590; J.N. Rogers, III, J.R. Crum, and P.E. Rieke, Dep. of Crop and Soil Sciences, Michigan State University, East Lansing, MI 48824-1325. "Flurprimidol Effects on Kentucky Bluegrass under Reduced Irradiance" Received 8 Oct. 1998. Published in Crop Sci. 39:1423-1430 (1999).



Turf-Tec Shear Strength Tester - TSHEAR2-M