

Tifton Physical Soil Testing Laboratory, Inc.

1412 MURRAY AVENUE
TIFTON, GEORGIA 31794
Phone: (229) 382-7292
Fax: (229) 382-7992
www.tiftonsoillab.com



TESTING CERT

Date Received: November 18, 2019
Date Reported: November 21, 2019
Sample: L31C-19

Test Report For: Vicotek Company Limited
312 Nguyen Huu Tho Street
Da Nang City, Vietnam
Attn: Ms. Duyen Vo

RE: USGA Topdressing Sand Test

PHYSICAL ANALYSIS¹

| MIXES ANALYZED (% by Volume) | | | SATURATED HYDRAULIC CONDUCTIVITY in/hr | POROSITY (%) | | | BULK DENSITY g/cm ³ | WATER RETENTION AT FIELD CAPACITY % | CHEMICAL | |
|----------------------------------------------|------|-----------|-------------------------------------------|-------------------------------|-----------------------------|---------|-----------------------------------|----------------------------------------|-----------------|-----------------------------|
| SOIL | SAND | AMENDMENT | | NON-CAPILLARY (air-filled) | CAPILLARY (water-filled) | TOTAL | | | pH ² | EC ³ mmhos/cm |
| 111219 - YG3S (Yellow) Sand | | | 43.7 | 32.0 | 12.2 | 44.2 | 1.48 | 8.2 | 4.9 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| USGA Recommendations for a Topdressing Sand: | | | Minimum of 6 in/hr. | 15 - 30 | 15 - 25 | 35 - 55 | | | | |

PARTICLE DENSITY⁴ 2.65 g/cm³

PARTICLE SIZE ANALYSIS

| SAMPLES | GRAVEL 2 mm % | SAND FRACTIONS (% Retained) ⁵ | | | | | SAND ⁶ 0.05-2 mm % | SILT ⁶ 0.002-0.05 mm % | CLAY ⁶ <0.002 mm % | ORGANIC MATTER ⁷ % by wt. |
|----------------------------------------------|---------------------|------------------------------------------|------------------|-------------------|-----------------|----------------------|-------------------------------------|--------------------------------------------|----------------------------------------|--------------------------------------------|
| | | VERY COARSE 1 mm | COARSE 0.5 mm | MEDIUM 0.25 mm | FINE 0.15 mm | VERY FINE 0.05 mm | | | | |
| 111219 - YG3S (Yellow) Sand | 0.0 | 1.3 | 35.6 | 41.7 | 15.9 | 4.0 | 98.5 | 1.0 | 0.5 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| USGA Recommendations for a Topdressing Sand: | ≤ 10% (≤3% gravel) | 60% minimum | | | ≤ 20% | ≤ 5% | | ≤ 5% | ≤ 3% | |

Note: Total "fines" (very fine sand, silt, and clay) should be less than (<) 10% in a rootzone mix.

1. Determined at 30 cm tension by USGA testing protocol (ASTM F1815) 2. ASTM D4972 Method A (water only) 3. SSSA Soluble Salts 4. ASTM D854-98 5. ASTM C136 and F1632 6. Bouyoucos, 1962 7. ASTM F1647
Topdressing Sand Form (Version 1) - Effective Date: 5/12/17

Tifton Physical Soil Testing Laboratory, Inc.

1412 MURRAY AVENUE
TIFTON, GEORGIA 31794
Phone: (229) 382-7292
Fax: (229) 382-7992



TESTING CERT #1014.01

Date Received: November 18, 2019

Date Reported: November 21, 2019

Sample Number: L31C-19

www.tiftonsoillab.com

Test Report For: Vicotek Company Limited

RE: USGA Topdressing Sand Test

312 Nguyen Huu Tho Street

Da Nang City, Vietnam

Attn: Ms. Duyen Vo

Recommendation Form (Version 1) - Effective Date: 5/17/10

Recommendations:

The 111219 - YG3S (Yellow) Sand from Vicotek Company Limited was evaluated on November 19, 2019, to determine if it meets USGA recommendations for a topdressing/greensmix sand. The condition of the sample as received was normal.

The Sand is a coarse medium sand with 93.2 particles within the USGA range of 1.0 to 0.15 mm for a topdressing sand. This is a very high percentage of particles within this range with a majority of the particles (41.7%) in the medium sand fraction range. The USGA has recognized for many years that the medium sand fraction is the best sand fraction for a topdressing sand. This topdressing sand has only 1.3% particles larger than 1.0 mm and only 5.5% "fines" (4.0% very fine sand, 1.0% silt, and 0.5% clay). This sand meets USGA particle size recommendations for a topdressing and rootzone mix (greensmix) sand.

The Sand has a Coefficient of Uniformity (D_{60}/D_{10}) of 2.6, which is within the USGA recommended range of 2.0 - 3.5 for Pure Sand Rootzone Mixtures (USGA Recommendations for a Method of Putting Green Construction, 2018 Revision).

The Sand has a penetrometer reading of 2.7 kg/cm₂ which means it has a very low tendency to bury based on the fried-egg lie potential test.

The Sand is a silica sand with a soil water pH of 4.9.

The Sand had a water permeability rate of 43.7 in/hr. when compacted by the USGA procedure ASTM F1815 to simulate a compacted golf green. This is a very adequate rate for a topdressing sand. A topdressing sand should have a rate > 20 in/hr. to allow for adequate drainage.

Conclusion: According to USGA guidelines for selecting a topdressing sand, this Sand is a very good topdressing sand. This topdressing sand is very compatible with any green that meets USGA particle size recommendations and will greatly benefit those greens that do not. This Sand also meets USGA recommendations for a greensmix sand for golf green construction.

Powell Gaines

Recommendations are based on the samples received. Results and comments relate to the samples tested. This report cannot be reproduced except in full, and not without written approval of the laboratory.

1412 MURRAY AVENUE
 TIFTON, GEORGIA 31794
 Phone: (229) 382-7292
 Fax: (229) 382-7992
www.tiftonsoillab.com



TESTING CERT

Date Received: November 18, 2019
 Date Reported: November 21, 2019
 Sample: L31C-19

Test Report For: Vicotek Company Limited
312 Nguyen Huu Tho Street
Da Nang City, Vietnam

Attn: Ms. Duyen Vo

RE: USGA Topdressing Sand Test

PHYSICAL ANALYSIS¹

| MIXES ANALYZED (% by Volume) | | | SATURATED HYDRAULIC CONDUCTIVITY in/hr | POROSITY (%) | | | BULK DENSITY g/cm ³ | WATER RETENTION AT FIELD CAPACITY % | CHEMICAL | |
|----------------------------------------------|------|-----------|-------------------------------------------|-------------------------------|-----------------------------|---------|-----------------------------------|----------------------------------------|-----------------|-----------------------------|
| SOIL | SAND | AMENDMENT | | NON-CAPILLARY (air-filled) | CAPILLARY (water-filled) | TOTAL | | | pH ² | EC ³ mmhos/cm |
| 111219 W60S (White) Sand | | | 42.8 | 28.5 | 13.5 | 42.0 | 1.54 | 8.8 | 7.9 | |
| USGA Recommendations for a Topdressing Sand: | | | Minimum of 6 in/hr. | 15 - 30 | 15 - 25 | 35 - 55 | | | | |

PARTICLE DENSITY⁴ 2.65 g/cm³

PARTICLE SIZE ANALYSIS

| SAMPLES | GRAVEL 2 mm % | SAND FRACTIONS (% Retained) ⁵ | | | | | SAND ⁶ 0.05-2 mm % | SILT ⁶ 0.002-0.05 mm % | CLAY ⁶ <0.002 mm % | ORGANIC MATTER ⁷ % by wt. |
|----------------------------------------------|---------------------|------------------------------------------|------------------|-------------------|-----------------|----------------------|-------------------------------------|--------------------------------------------|----------------------------------------|--------------------------------------------|
| | | VERY COARSE 1 mm | COARSE 0.5 mm | MEDIUM 0.25 mm | FINE 0.15 mm | VERY FINE 0.05 mm | | | | |
| 111319 W60S (White) Sand | 0.0 | 2.6 | 16.0 | 63.8 | 13.8 | 3.5 | 99.7 | 0.2 | 0.1 | |
| ← Topdressing Sand → | | | | | | | | | | |
| USGA Recommendations for a Topdressing Sand: | ≤ 10% (≤3% gravel) | 60% minimum | | | ≤ 20% | ≤ 5% | | ≤ 5% | ≤ 3% | |

Note: Total "fines" (very fine sand, silt, and clay) should be less than (<) 10% in a rootzone mix.

1. Determined at 30 cm tension by USGA testing protocol (ASTM F1815) 2. ASTM D4972 Method A (water only) 3. SSSA Soluble Salts 4. ASTM D854-98
 5. ASTM C136 and F1632 6. Bouyoucos, 1962 7. ASTM F1647 Topdressing Sand Form (Version 1) - Effective Date: 5/12/17

Tifton Physical Soil Testing Laboratory, Inc.

1412 MURRAY AVENUE
TIFTON, GEORGIA 31794
Phone: (229) 382-7292
Fax: (229) 382-7992



TESTING CERT #1014.01

www.tiftonsoillab.com

Date Received: November 18, 2019

Date Reported: November 21, 2019

Sample Number: L31C-19

Test Report For: Vicotek Company Limited

312 Nguyen Huu Tho Street

Da Nang City, Vietnam

Attn: Ms. Duyen Vo

RE: USGA Topdressing Sand Test

Recommendation Form (Version 1) - Effective Date: 5/17/10

Recommendations:

The 111219 - W60S (White) Sand from Vicotek Company Limited was evaluated on November 19, 2019, to determine if it meets USGA recommendations for a topdressing/greensmix sand. The condition of the sample as received was normal.

The Sand is a coarse medium sand with 93.6 particles within the USGA range of 1.0 to 0.15 mm for a topdressing sand. This is a very high percentage of particles within this range with a majority of the particles (63.8%) in the medium sand fraction range. The USGA has recognized for many years that the medium sand fraction is the best sand fraction for a topdressing sand. This topdressing sand has only 2.6% particles larger than 1.0 mm and only 3.8% "fines" (3.5% very fine sand, 0.2% silt, and 0.1% clay). This sand meets USGA particle size recommendations for a topdressing and rootzone mix (greensmix) sand.

The Sand has a Coefficient of Uniformity (D_{60}/D_{10}) of 2.0, which is within the USGA recommended range of 2.0 - 3.5 for Pure Sand Rootzone Mixtures (USGA Recommendations for a Method of Putting Green Construction, 2018 Revision).

The Sand has a penetrometer reading of 1.5 kg/cm₂ which means it has a high tendency to bury based on the fried-egg lie potential test.

The Sand is a silica sand with a soil water pH of 7.9.

The Sand had a water permeability rate of 42.8 in/hr. when compacted by the USGA procedure ASTM F1815 to simulate a compacted golf green. This is a very adequate rate for a topdressing sand. A topdressing sand should have a rate > 20 in/hr. to allow for adequate drainage.

Conclusion: According to USGA guidelines for selecting a topdressing sand, this Sand is a very good topdressing sand. This topdressing sand is very compatible with any green that meets USGA particle size recommendations and will greatly benefit those greens that do not. This Sand also meets USGA recommendations for a greensmix sand for golf green construction.

Powell Gaines

Recommendations are based on the samples received. Results and comments relate to the samples tested. This report cannot be reproduced except in full, and not without written approval of the laboratory.