



September 22, 2009

Keith Wallis
U.S. Silica Company
P.O. Box 98, FM 2749
Kosse, TX 76653

RE: Product Development - File #09090047

Dear Mr. Wallis:

Enclosed are the laboratory results of the sand sample received by our laboratory on 9/17/09. This sample was tested for potential use as a bunker sand. These results are being compared to published guidelines for bunker sands.

The penetrometer value of the Sure Play sample is 2.3 kg/cm², which is an acceptable rating indicating a slight tendency to bury the ball. The crusting value of none is a desirable rating.

The infiltration rate of this sample is 60.3 in/hr at a bulk density of 1.6 g/cc. This meets the recommended minimum infiltration rate of 20 in/hr for a well-drained bunker sand.

It is desirable for a bunker sand used in green side bunkers to be compatible with the rootzone mix to reduce the risk of layering on the greens. The particle size results indicate the Sure Play sample should be compatible for use in green side bunkers with most USGA style greens.

If you have any questions or are in need of further assistance, please do not hesitate to contact us. Samples are generally kept on the premises for 45 days after report date. Thank you for using Turf Diagnostics and Design, Inc.

Sincerely,

Sam Ferro
President

File: U.S. Silica
Page 1 of 4



U.S. Silica Company
Keith Wallis
PO Box 98, FM 2749
Kosse, TX 76653
PHONE: 254-375-2226

Date received Sep-17-2009
Account No. 06928150
Date reported Sep-22-2009
Facility Product Development



Bunker Sand Evaluation

Lab ID#	Sample Name	Dry Color	Wet Color	Penetrometer Value kg/cm2
09090047-1	Sure Play	10YR 7/1 Light Gray	10YR 5/1 Gray	2.3

Lab ID#	Sample Name	Shape Angularity	Shape Sphericity	Crusting	Set-Up
09090047-1	Sure Play	Sub-Rounded to Sub-Angular	Medium	None	Slight

A2LA Testing Certificate Number 797-01

Bunker SOP

Samples were tested as received and comments pertain only to the samples shown.

This report may not be reproduced in part, but only in full.

Sample condition upon receipt was normal.

Samples were received with a transmittal letter.

Reviewed by _____



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30 cm USGA Physical Evaluation*

Lab ID#	Sample Name	Infiltration Rate* in/hr	Bulk Density g/cc
09090047-1	Sure Play	60.3	1.56
USGA Recommendations		> 6	-

A2LA Testing Certificate Number 797-01

*ASTM Method F1815

* Saturated Hydraulic Conductivity (K-SAT) determined with constant head and adjusted to 20°C.

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TURF
 DIAGNOSTICS
 & DESIGN
"Managing the Elements Through Science"



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Particle Size Evaluation*

Lab ID#	Sample Name	% Sand 2.0 - 0.05 mm	% Silt 0.05-0.002mm	% Clay < 0.002mm	Gravel 2.0 (10)	% Retained on USGA mm (US sieve)				
						V. Coarse 1.0 (18)	Coarse 0.5 (35)	Medium 0.25 (60)	Fine 0.15 (100)	V. Fine 0.05 (270)
09090047-1	Sure Play	99.7	< 1.0	< 1.0	0.1	4.3	40.3	44.4	9.6	0.9
USGA Recommendations for Greens		> 92%	< 5%	< 3%	< 3%	< 7%**	> 60% Combined		< 20%	< 5%

Lab ID#	Sample Name	Uniformity Coefficient Cu	D15 mm	D50 mm	D85 mm	Shape Angularity	Shape Sphericity	Acid Reaction	pH [‡] 1:1	% Organic Matter Dry Wt.***

A2LA Testing Certificate Number 797-01 *ASTM F1632 Method B & Determination of Size Factors SOP †ASTM D4972 w/ H2O ***ASTM F1647 Method B

**Maximum of 10% combined on Gravel (2.0 mm) and Very Coarse (1.0 mm) fractions.

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