



Sand Summary Report

For Use In USGA Putting Green Construction

The sand has been compared to the USGA (2004 version) recommendations for a method of putting green construction.

Client: SIBELCO S.P.A. – Loc Ripa o Mucchi 04015 Abbazia di Fossanova (LT)

Date: 15/07/09

Order: 8815

Sample: : AF25 Sand

Particle Size Distribution

The table below summarises the particle size distribution results.

Name	Particle Size (mm)	USGA Recommendation (2004)	Result	In Range
Fine Gravel	2.0 – 3.4	Not more than 10% total particles in this range, incl. maximum of 3% fine gravel (preferably none)	2.4	in range
Very Coarse Sand	1.0 – 2.0			
Coarse Sand	0.5 – 1.0	Minimum of 60% of particles	76.7	in range
Medium Sand	0.25 – 0.5			
Fine Sand	0.15 – 0.25	Not more than 20% particles	17.5	in range
Very Fine Sand	0.05 – 0.15	Not more than 5% particles	3.2	in range
Silt / Clay	< 0.05	Not more than 8% particles	0.2	in range
Total Fines	< 0.15	Not more than 10% particles	3.4	in range

Therefore, this sand does satisfy the USGA recommendation for particle size distribution.

Particle Shape & pH

An agronomist may be able to provide further advice particular to your project, as the USGA offer no recommendation for these parameters.

pH measurements are made in both distilled water and a calcium chloride solution because the calcium displaces some of the exchangeable aluminium. The low ionic strength counters the

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dilution effect on the exchange equilibrium by setting the salt concentration of the solution closer to that expected in the soil solution.

The pH values obtained in the solution of calcium chloride are slightly lower than those measured in water due to the release of more aluminium ions that then hydrolyses. Therefore, both measurements are required to fully define the character of the soil pH.

Percolation Rate & Porosities

Physical Property	USGA Recommendation (2004)	Result	Range
Percolation Rate (mm/hr)	> 150 mm/hr	782.5	in range
Total Porosity (%v/v)	35 – 55%	40.7	in range
Air-Filled Porosity (%v/v)	15 – 30%	23.2	in range
Water-Filled Porosity (%v/v)	15 – 25%	17.5	in range

At 30cm tension, this rootzone does satisfy the USGA recommendation for percolation rate, total, air-filled and water-filled porosity.

Sand Summary

This sand has been compared to the 2004 version of the USGA recommendations and does satisfy the particle size distribution, percolation rate and porosities and is suitable for use in mixing with an approved organic/inorganic amendment to form a rootzone.

The final rootzone mix should also satisfy the USGA recommendations for a method of putting green construction.

Signed:

Date: 15th July 2009

Position: Assistant Laboratory Manager, European Turfgrass Laboratories Ltd

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