We Speak the Same Language but …

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… sometimes when you talk to your local sand and aggregate supplier about sand and drainage materials, you might as well be speaking Russian. Golf course superintendents use sand and gravel materials for many applications on the golf course, including new green and tee construction, greens topdressing, bunker sands, fairway topdressing, and other uses.

Throughout the United States there are sand suppliers who have identified the golf turf market as a good one and have developed products to meet your needs. They know what works in these different applications and understand the language we use. What do you do, however, if you want to check with a local sand supplier about a sand for a small construction project or some other use. When it comes to sand for construction or topdressing, the sand particle size matters. There are standards in our industry that we use for the selection of sands for the many applications on the golf course. The USGA Guidelines for greens construction is just one example.

Most of the guidelines we use in the turf industry for sand selection use the U.S. Department of Agriculture Classification (USDA) system. This classification system identifies sand as any mineral particle between 0.05 to 2 mm in diameter. Any particle larger than 2 mm up to ¼ inch is classified as gravel, while particles less than 0.05 mm are classified as silt and clay. Furthermore, we break down the sand into five size fractions, as shown in Table 1. If you look at a standard specification for greens construction, topdressing, or bunker sand selection, we define the sand size as the percent retained on these various sieves.

You would think, then, that when you are in need of sand, all you need to do is hand one of these specifications to a supplier, and they will know what you want. Right? Unfortunately that is often not the case. They speak a different language.

Highway and construction work provides the biggest market most sand and gravel suppliers. Here they use classification systems and specifications published by the American Association of State Highway and Transportation Officials (AASHTO), the American Society for Testing and Materials (ASTM), or the State DOT. All of these organizations use an entirely different series of sieves than the USDA and they always talk in terms of percent passing these sieves rather than % retained. They even have their own lingo. Your sand supplier may say something like this: "Our sand has 68% on the #8 and 20% on the 100". At first, you may think (as I did) that the sand has 68% retained on the #8 screen and 20% retained on the #100 screen. What they really mean is that there is 68% passing the #8 and 20% passing the #100 screen. Therefore, unless you're bilingual in these classifications systems, you can see why this can be pretty confusing.

To get you started, I have assembled a series of guidelines for sand and gravel selection for a number of different applications. These can be found in the Table 2. In doing these I tried to define the ranges that are most typical for a good quality sand used in that application. These are not all inclusive, that is, there could be sands not meeting these that may meet a standard guideline used in our industry. Likewise, there may be a sand meeting these size guidelines that may not be suitable for the application. There are other properties we look at in sand besides particle size that should be tested. The bottom line is that once you have identified a sand from your supplier that looks like it has potential, have it tested by a laboratory serving the golf turf industry.

TABLE 1. Textural classification of soil particles (including USGA), and particle size recommendations for sand based fields**.**

Sand Fraction/ Soil Separate	Sieve Number	Diameter (mm)	Particle Size Guidelines % retained	
			Sports Field[1]	USGA[2]
Gravel	No. 10	> 2	≤ 3% gravel	≤ 3% gravel
very coarse sand	No. 18	2.00 – 1.00	≤ 20% combined	≤ 10% combined
coarse sand	No. 35	1.00 – 0.50	≥ 60%	≥ 60%
medium sand	No. 60	0.50 – 0.25		
fine sand	No. 100	0.25 – 0.10	≤ 15%	≤ 20%
very fine sand	No. 270	0.10 – 0.05	≤ 5%	≤ 5%
Silt		0.05 – 0.002	≤ 5%	≤ 5%
Clay		<0.002	≤ 3%	≤ 3%

1 In addition, sand should have coefficient of uniformity of 2.5 to 3.5.
2 Combined very fine sand with silt and clay should not exceed 10%.

Table 2. Particle size guidelines for several golf and sports field applications.

	Sieve Size Particle Diameter % Passing									
Golf Course Application	**1/2"**	**3/8"**	**1/4"**	**No. 4 4.76 mm**	**No. 8 2.38 mm**	**No. 16 1.19 mm**	**No. 30 0.60 mm**	**No. 50 0.30 mm**	**No. 100 0.15 mm**	**No. 200 0.075 mm**
USGA Greens construction sand	100	100	100	100	98 - 100	92 - 100	46 - 100	19 - 40	0 - 10	0 - 9
California greens sand	100	100	100	100	87 - 100	94 - 100	63 - 94	14 - 43	2 - 11	0 - 6
Greens topdressing sand	100	100	100	100	100	98 - 100	46 - 100	19 - 40	0 - 10	0 - 3
Drainage gravel	100	60 - 100	40 - 100	15 - 40	0 - 12	0 - 7	0	0	0	0
Bunker sand	100	100	100	100	98 - 100	89 - 100	40 - 100	15 - 60	2 - 25	0 - 6
Fairway TD, Sports Field Sand	100	100	100	100	96 - 100	85 - 100	35 - 85	10 - 35	0 - 8	0 - 4

Ranges listed assume normal particle size distribution curves. Ultimately the sand or gravel should be tested with the appropriate screens.