

# KNOW YOUR SAND

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Of all the products used in the turfgrass industry, perhaps the most abundant and often misunderstood is sand — common sand.

Sand is one of the most abundant, naturally occurring resources on earth.

It is readily available throughout the world in many different textures and colors.

Sand is used in great quantities by the turfgrass industry, from building athletic fields and fairways, to filling bunkers, to mixing topdressing and greens mixes.

Sand is the building block for golf courses and athletic fields. The right sand holds tremendous benefits for superintendents and turf managers — and yet, how little is really known about selecting it. There are many uses and each may have its own specific needs. Great care should be taken to make sure your supplier understands just what your needs are. There are many people on the supply side that have little or no knowledge of USGA specs.

Most sand sources are suppliers of DOT spec materials, with golf courses as an afterthought.

## All sands not alike

Historically, turf managers often purchase a local, inexpensive sand without regard for USGA specifications. This sand is not always suited for their needs.

All sands are not alike!

They vary in particle size, shape, composition, color and purity.

So, where do you find a good sand that will be the proper sand for your needs?

This question is often asked by contractors, agronomists, architects and turf managers alike. Finding and selecting a quality sand that is affordable is not always easy. It will take a basic understanding of what makes a good sand to make an intelligent choice.

To better understand sands and their uses, let's look at what sand really is.

To begin with, the term sand is very vague. In soil science, any soil that contains 85% or more sand and not more than 10% clay is texturally classified as a sand.

By this very definition alone, no one could select a proper sand.

Soil and sand are not the same, so let's look at what exactly makes up sand.

Basically for our purposes there are three classifications of sand:

1) Manufactured sand, which is the least desirable of all sand because of chemical content and poor quality.

2) Calcareous sand, which is not recommended because it has a high pH, normally in the neighborhood of 8. All efforts should be made to avoid using calcareous sand because it substantially reduces the availability of secondary or minor nutrients for uptake by grass roots, and it increases maintenance costs.

3) Quartz silica, which is preferred for the turfgrass industry and particularly for every phase of golf course usage — bunkers, greens, tees, fairways. That's because it is chemically inert and very resistant to further breakdown (or weathering). The higher the quartz silica content, the better turfgrass results will be.

## Five selection keys

When selecting sand for turfgrass uses there are five keys to making the right choice. Briefly, those keys are:

1) **SIZE** — particle size is probably the single most important factor in choosing the proper sands. For golf course construction and maintenance, the USGA has very specific guidelines on particle size. To the naked eye, the need for such exactness may seem doubtful. In order to put the significance of the size factor into perspective, consider this scale of rough analogies to grains of sand:

Clay .....	Oatmeal
Silt.....	Poker chips
Very fine sand.....	Softball
Fine sand.....	Basketballs
Medium sand.....	Medicine balls
Coarse sand.....	4-foot beachballs
Very coarse sand.....	8-foot beachballs

This is why specifications, and laboratory testing for them, are worthwhile to ensure proper particle size distribution.

2) **SHAPE** — sand shape varies depending on geographical location, weather and other physical and mineral conditions. Basic shapes are round, angular, sub-angular and crushed.

A. Crushed, sharp particles tend to shear the roots and the particles do not conform to one another.

B. Round sand tends to be like ball bearings and will shift underfoot or under machine traffic. They tend to be droughty.

C. Angular or sub-angular sands are preferred because they tend to shift less and are more resistant to compaction.

These particles tend to conform to one another, giving optimum capillary spaces for root growth and water movement.

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3) **COMPOSITION** — sand composition varies greatly. Most sand, however, contains quartz the most common form of silicon dioxide or silica. A hard quartz sand is preferred for golf courses since quartz resists weathering and retains its original shape permanently. Your sand should contain 95% or greater quartz silica. A simple chemical test can be supplied to you for verifying silica content.

4) **COLOR** — sand color should always be secondary in importance to proper particle size and composition.

What good is a white sand if it does not play well? or has poor drainage and quickly discolors due to staining or has high water retention?

5) **ANGLE OF REPOSE** — every material has an angle of repose.

This is the angle with the horizontal at which a material will stand when piled.

The angle of repose will vary with particle size distribution, particle shape and moisture. This is why when you see a pile of sand you find larger particles that have run down the sides and gathered at the bottom. The angle of repose for typical construction sand is approximately 35 degrees. If you are trying to make bunker faces at a 45° angle or greater, you are working against known laws of physics. Damp or wet sand also holds angles better than dry sand. So a sand of proper particle size that retains adequate moisture without being wet is preferred.

Once again size, shape, composition!

### Production

A note on sand production: although there are several methods used to produce sand depending on the type of deposit and its intended use. For our purposes here in Florida, we see two methods — wet and dry.

1) Dry production is typically a dragline or loader taking sand directly from a bank or natural deposit. There usually is no or very little effort

to screen the sand. There is very little chance for any quality control with this method.

2) Wet screening is the method most major sand producers are doing and by far the preferred method. Wet processing uses a screening tower that washes out the excess: fines, silts and clays. Also, a classifier which separates sand into different gradations. Depending on the type of classifier system being used sand can be classified into more than just fine or coarse. The number of “splits” made determines how well graded a specialty sand will be.

Keep in mind that most sand manufacturers are producing DOT spec material for their own uses. Few sand and/or gravel companies produce a sand screened and washed for the specific purpose of growing turfgrass. Very often, you are getting someone else's DOT sand.

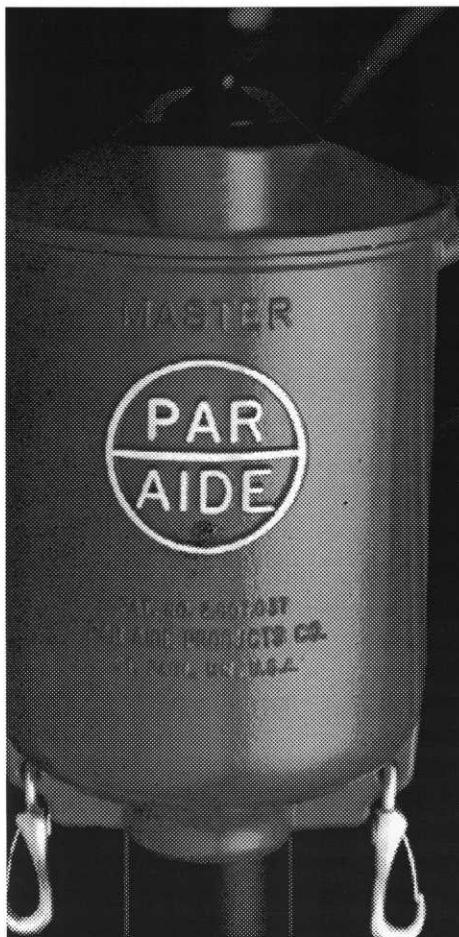
Once again, I cannot emphasize enough to have your supplier show proof that they are producing a material that complies with USGA specs. Current testing is important.

### In conclusion

As we have seen, finding the right sand is not as easy as it may first seem. Hopefully, we have learned that sand is not just sand! There are tremendous differences within the sand classifications, sand testing methods and, indeed, within sand sources themselves.

Your supplier must take the responsibility to ensure that what they sell you meets your needs. You must take the responsibility to ensure that you are buying the proper sand.

It is imperative that you choose the proper sand and continue to use the sand intended for each specific purpose.



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