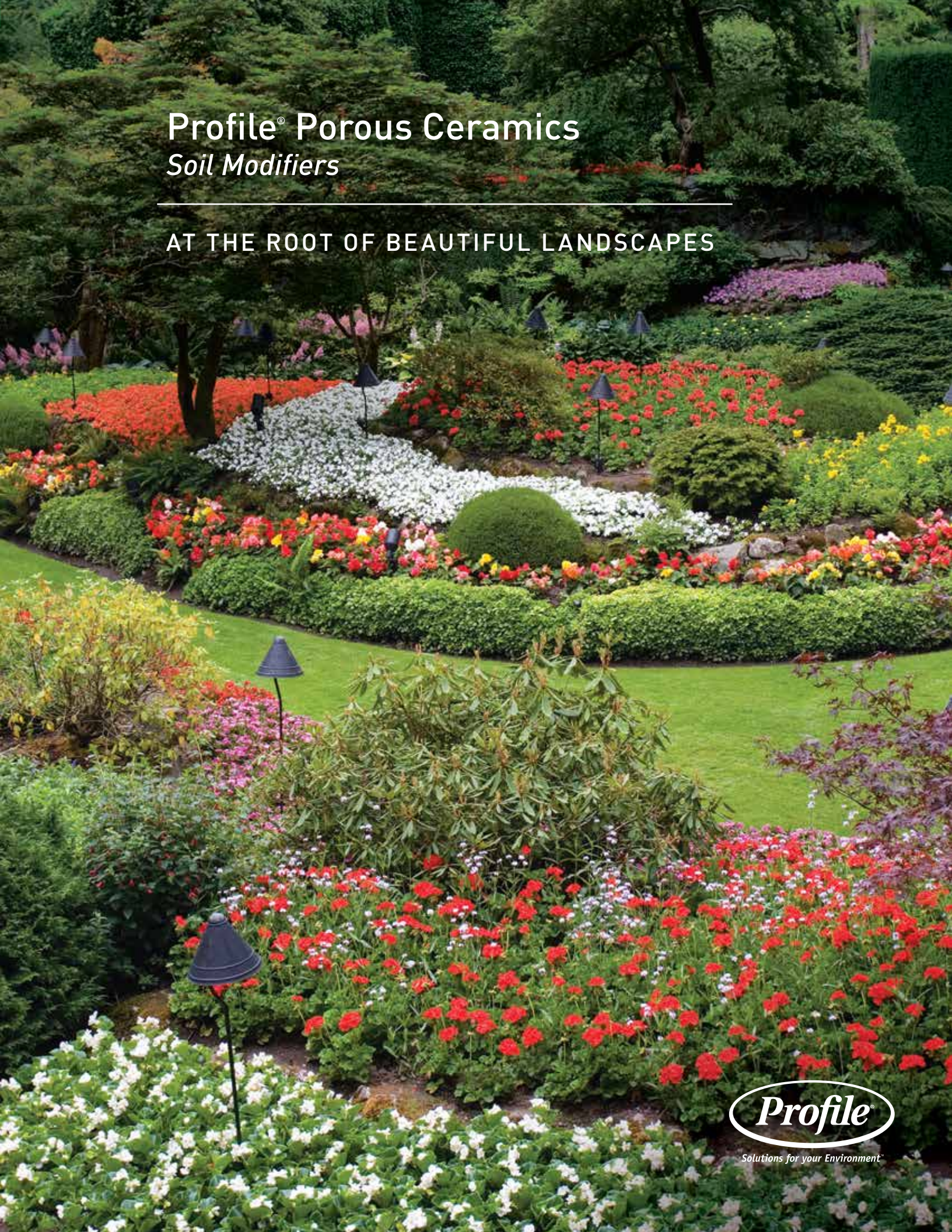


A detailed photograph of a garden. In the foreground, there are large beds of red and white flowers. A green lawn curves through the middle ground. The background is filled with dense green trees and shrubs. Several black landscape lights with conical shades are placed throughout the garden.

Profile® Porous Ceramics *Soil Modifiers*

AT THE ROOT OF BEAUTIFUL LANDSCAPES



Nothing Improves Soils More Effectively Than Profile® Porous Ceramics

Save water, reduce irrigation.

Profile® particles contain thousands of capillary pores, increasing the soil's water reservoir.

Increase water infiltration and air space.

Eliminate water surface ponding and runoff, and increase air space needed for deep, healthy roots.

Permanently modify soil.

Profile Porous Ceramics are made from montmorillonite clay and are kiln fired to produce porous ceramic particles. With only 3% degradation in 20 years, Profile becomes a permanent water-holding and air-providing amendment.



Why is Soil Structure so Important?

Soil plays a huge role in the success or failure of your design efforts. Unfortunately, most of the soil around existing sites do not have balanced structure and pore space.

Compare Ideal Soil to Heavy Clay, Potting and Sandy Soils

Ideal Soil

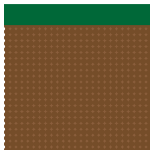
- Comprised of 50% solid material and 50% pore space (for holding water and air)
- The air and water pores allow soil to drain properly while maintaining ideal moisture levels

Potting Soils

- Potting soils typically contain high amounts of organics and do not have the water-holding properties of a balanced soil
- Organics become hydrophobic and repel water when dry, increasing the need for frequent watering

Heavy Clay Soils

- Clay soils have limited air porosity for infiltration and air space for deep rooting
- This reduction of air porosity results in poorly draining, saturated soils and shallow rooting



Middle East Native Sands

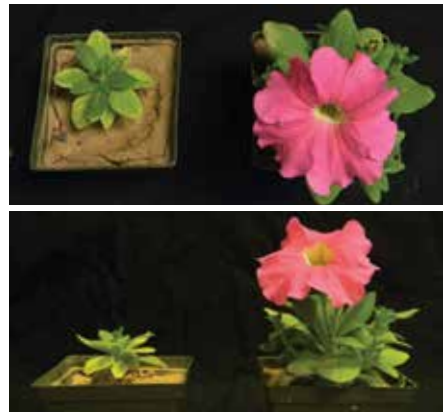
- Contain many fines and have deficient air space for infiltration and deep rooting
- Have limited water-holding capacity
- Are high in pH, decreasing fertilizer uptake
- Can be toxic due to pH and are typically high in sodium, which is detrimental to plants



Long-Lasting Beauty Begins with Profile® Porous Ceramics

Whether it's in containers, hanging baskets, rooftop gardens, planting beds, vegetable gardens, backfill around trees or shrubs, for lawn maintenance or aerification, Profile creates ideal conditions that lead to:

- Larger plants
- More flowers
- Larger blooms
- Reduced plant stress



*100% Middle
East Sand*

*80/20 Sand and
Profile Porous Ceramics*

Turn Native Sands into an Ideal Growing Medium with Profile

Sands in the Middle East are typically clean, but have deficiencies that need to be addressed to support sustainable vegetation. These deficiencies can be permanently corrected by incorporating Profile Porous Ceramics into native sands.

Middle East native sands typically:

- Do not possess the air porosity needed for water infiltration and deep rooting
- Have limited water-holding capacity
- Are high in pH, preventing nutrient uptake or may cause toxic levels of metals
- Contain higher levels of sodium or salts that hurt plant growth

Incorporating Profile Porous Ceramics will permanently:

- Increase the water-holding capacity of the sands
- Increase the air porosity, allowing infiltration of water and air space for deep rooting
- Lower the pH to increase nutrient uptake and save on fertilizer requirements
- Help in managing salt issues in native sands or TSE irrigation water that contains salts

Organics, like peat, provide water and nutrient benefits in most soils. But in native sands, they decay and disappear quickly in a desert environment. Organics can become hydrophobic and repel water. They can hold sodium and organics reduce the air space, which minimizes infiltration and prevents deep rooting.

Permanently Improve Existing Garden and Landscape Soils

MODIFY BACKFILL FOR TREE AND LARGE SHRUB PLANTING:

Utilize existing native sand soil, modified with Profile Porous Ceramics, to create the ideal soil that allows deep rooting and a large water reservoir for the trees and shrubs.

Application rate is determined by the quality of the soil being removed. A blend of 5% to 20% by volume of Profile will turn the removed native soils into an excellent growing medium, preventing loss of transplanted trees and long-term water and nutrient saving benefits.



SMALL CONTAINER APPLICATIONS:

Increase the water- and nutrient-holding properties of soilless growing medium used in containers and hanging baskets by incorporating Profile Porous Ceramics into the mix.

Application rate should be 20% by volume or 4 parts potting soil to 1 part Profile. This ratio will provide long-term benefits that save fertilizer and reduce watering.



LANDSCAPE BEDS AND LARGE CONTAINERS:

Maintaining air porosity as high organic soil mixes decay can be dramatically improved by blending Profile Porous Ceramics into mixes prior to planting. While Profile will increase the water- and nutrient-holding capacity of the existing organic soil, the permanent air porosity that Profile adds is the most beneficial.

Application rate should be 20% by volume or 4 parts soil to 1 part Profile.



LAWNS AND TURF:

Profile Porous Ceramics will provide fast turf establishment and a beautiful lawn that requires less water and fertilizer. Grass will also stand up to hot summer heat and high pedestrian traffic.

New Lawns

Application rate is determined by the quality of the soil/sand on site. Mixing or tilling a blend of 5% to 20% by volume of Profile 100 mm (or 4 inches) deep will balance the air and water porosity, creating ideal soil conditions.

Established Lawns

Core-aerifying existing turf by creating holes 60 mm apart and 100 mm deep, will allow Profile spread on the surface to fall into the holes, thereby increasing water infiltration and saving water and nutrients. Aerification holes will remain open after being filled with Profile.



The Agronomic Science Behind Profile® Porous Ceramics

An ideal soil must have a good balance between air- and water-pore space and a pH between 6.3 and 7.3.

To improve Middle East Sands, you need to:

- Increase the air/infiltration pore space
- Increase water-holding pores
- Lower the high pH; high pH will prevent uptake of fertilizers or create toxicity for plants

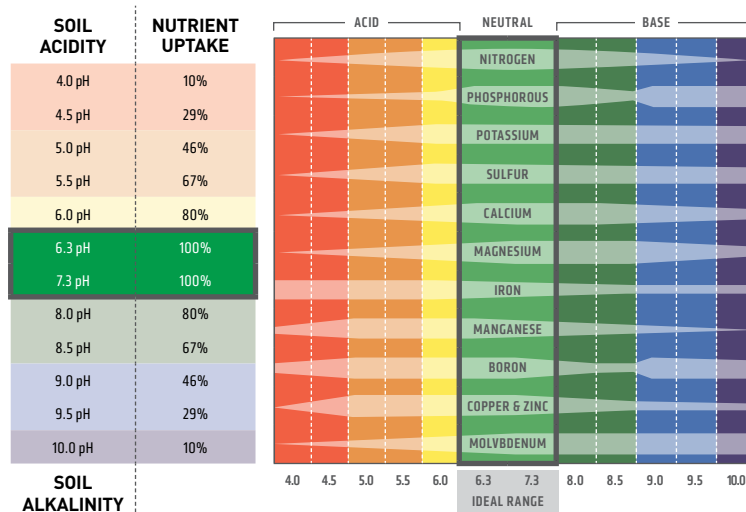
	Infiltration/Saturated Hydraulic Conductivity			% Air Pore Space		% Water Holding Pore Space		% Water Retention at Field Capacity (Water Reservoir)	
	in/hr	mm/hr	↑ ↓ *	Space	↑ ↓ *	Space	↑ ↓ *	Retention	↑ ↓ *
100% Middle East Sand	8.7	221	–	17.0%	–	27.0%	–	18.5%	–
95% sand / 5% Profile	10.0	255	15.2% ↑	18.0%	5.0% ↑	28.0%	3.0% ↑	19.8%	7.0% ↑
90% sand / 10% Profile	12.1	307	39.1% ↑	19.0%	10.0% ↑	29.0%	6.0% ↑	21.1%	14.1% ↑
80% sand / 20% Profile	15.9	404	82.8% ↑	21.0%	20.0% ↑	31.0%	12.0% ↑	24.0%	29.7% ↑
95% sand / 5% Competitive Amendment	3.1	79	-64.4% ↓	15.0%	-13.0% ↓	29.0%	5.0% ↑	19.2%	3.8% ↑

*↑↓= % Increase / Decrease

	pH	Fertilizer Lost
100% Middle East Sand*	8.1	20%
95% sand / 5% Profile	7.7	14%
85% sand / 10% Profile	7.5	5%
85% sand / 15% Profile	7.3	0%
80% sand / 20% Profile	7.1	0%
100% Middle East Sand**	8.6	36%
95% sand / 5% Competitive Amendment	8.4	30%

* Accredited testing lab data

** Competitive published data



"I have used Profile Porous Ceramics on all of my landscape, golf and sports pitch projects in the Middle East for the past 10 years. Profile is the only amendment that corrects native sand issues of infiltration, water retention and high pH. Rarely do I lose date palm transplants when Profile is blended into the backfill. The quality of turfgrass is outstanding when the native sands are modified with Profile."

Charles Graham — On Course Consulting

"For over ten years I have personally seen the positive effects Profile products have when used as soil amendments: increased resistance to compaction, consistent moisture-holding capability, and improved root-zone porosity. During that time, I also tried competitive amendments. Only Profile products have consistently performed as advertised, did not break down over time, and achieved the results I promised to the owner."

Don Campbell — Landscape Architect

UNIVERSITY TESTED. FIELD PROVEN.

More than 30 years of university and independent research underscore the benefits of Profile®. And more than two decades of success on thousands of golf courses, athletic fields, public landscapes and even NASA reinforce their findings. They prove that Profile makes it easier to work soil, help plants grow faster, reduce the frequency of irrigation, make more efficient use of fertilizer, and produce healthier turf and ornamentals.

Chosen by NASA® for the International Space Station

Profile Porous Ceramic particles met the strict requirements of NASA, and were selected over competitive products to effectively support plant growth in space.



Independent Research:

- *Duke University, Department of Botany, C. H. Jaeger & H. Hellmers*
- *Michigan State University, Department of Horticulture, C.E. Wildon & F.L.S. O'Rourke*
- *Mississippi State University, Adolph Laiche & V.E. Nash*
- *Purdue University, Horticulture & Landscape Architecture Dept, West Lafayette, IN*
- *The Ohio State University, School of Natural Resources, Dr. Ed McCoy*
- *Turf Diagnostics & Design, Olathe, KS*
- *University of Missouri Turf Research Center, Dr. David Minner*
- *Washington State University, Department of Horticulture & Landscape Architecture, L. K. Hiller & D. C. Koller*

Ask your distributor about Profile Porous Ceramics for your landscape. To locate a distributor call +847-215-1144.



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