

# **THE IMPORTANCE OF POROUS CERAMICS**

Porous ceramics play an important role in industry, environmental, soils and earth sciences. The materials used in their fabrication provide a natural wetting surface. Meaning that they love water (hydrophilic) and will wick water as if a straw placed in water and sucked on.

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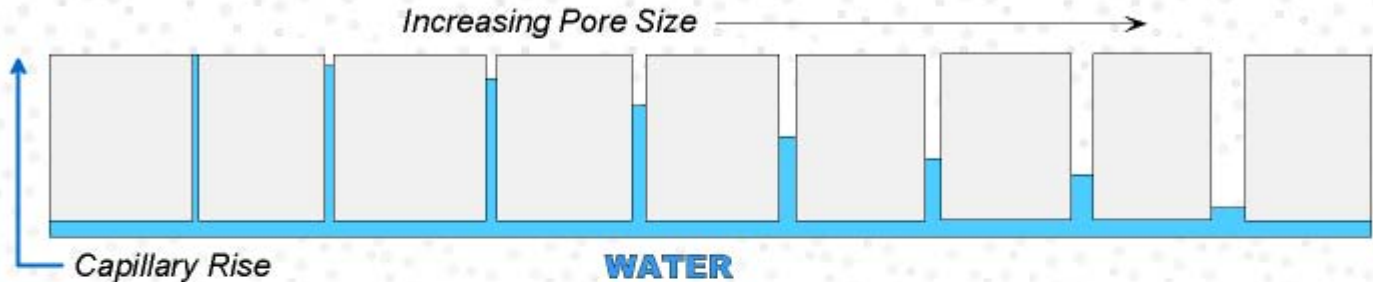
This holding, attractive ability to water surfaces makes for unique applications as we will show later. We need first to take a look at water's relationship to pore size, as it matters in making soil measuring instruments work.

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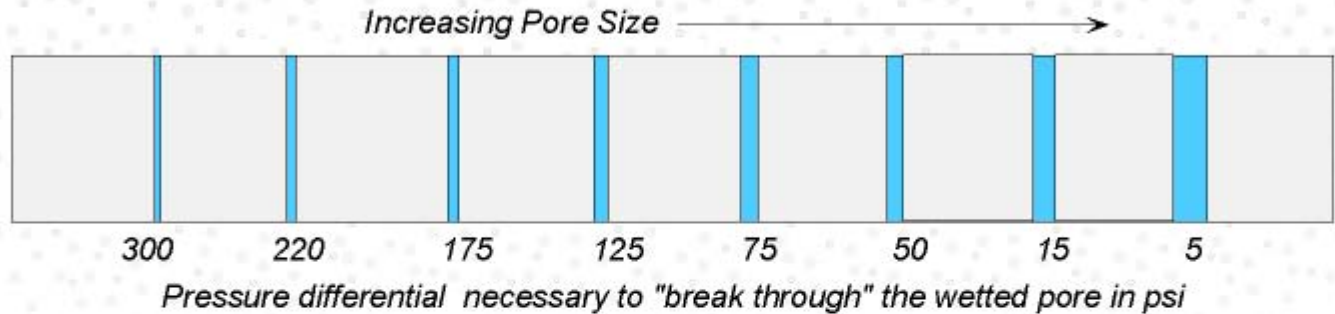
Once wetted by water, the pores within the ceramic will wick water up the interior, filling the pore to differing lengths based on their size.

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The smaller the pore diameter the better the wicking action (Capillary Rise). Once filled with water the pores provide a liquid interface for measuring and monitoring adjacent other water filled media such as a soil.

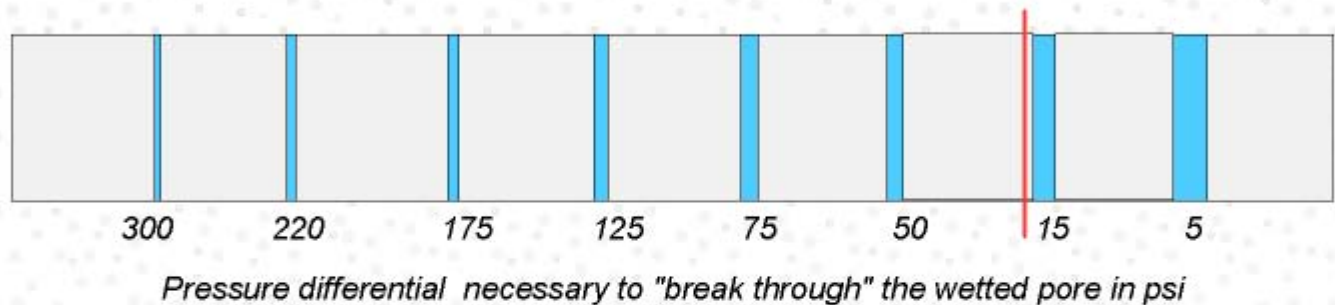
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Once filled with water, its pore size will determine the highest pressure differential before it will empty. In making instruments, one wants the right size pore to support the pressure differentials it will encounter.

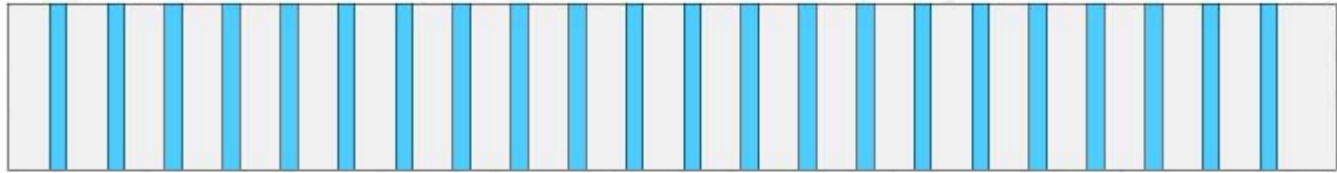


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For instrumentation used at the earth's surface, the differential is 14.7 psi (one atmosphere) compared to 0 or a vacuum. Therefore, pore size of the ceramic used in instruments must be able to support greater than 15 psi. when wetted.

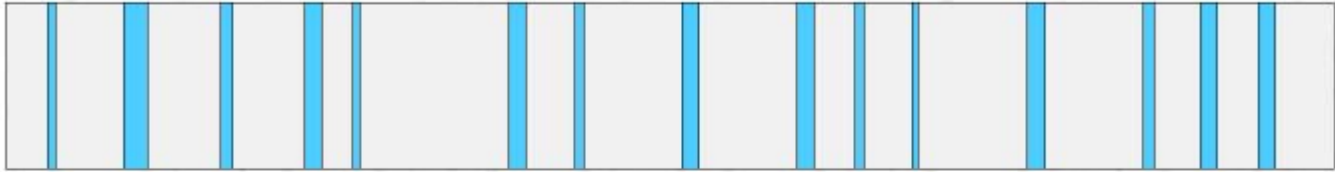
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Now that the size of pore can be determined its important to have as many pores per unit volume of ceramic to allow the greatest transfer of liquid from one surface side to the other without breakthrough.

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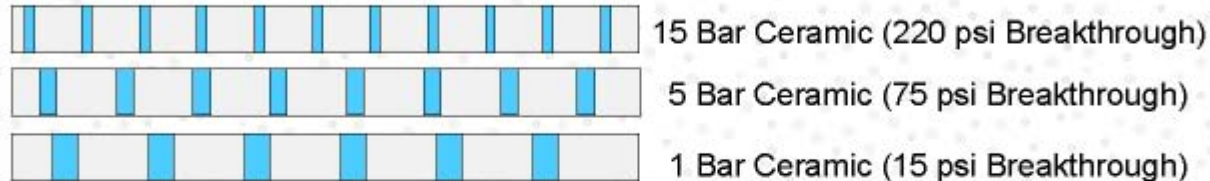
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Distribution and uniformity of the pores within the ceramic will also account for its ability to function at an optimum level when used in a measuring or monitoring instrument.



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Soilmoisture prides itself on manufacturing a wide selection of porous ceramics with differing pore sizes having high pore volumes of uniform distribution. These specialized porous ceramics are used on all our instruments.