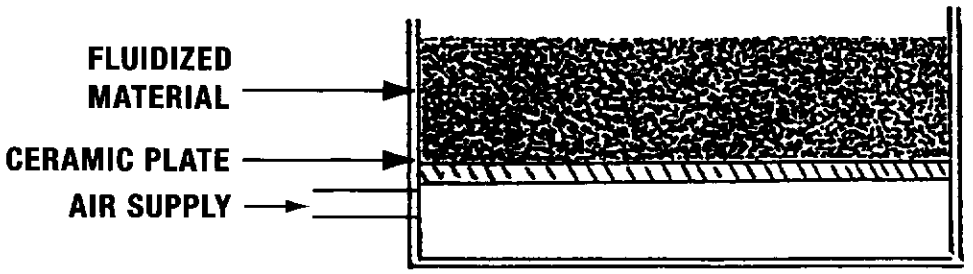
Filtros

Filtros Limited
603 West Commercial St.
P.O. Box 389
East Rochester, NY 14445
(585) 586-8770
1-800-633-2143
FAX (585) 586-7154
www.filtrosltd.com

FILTROS PERMEABLE CERAMICS FOR FLUIDIZED BEDS



The material to be fluidized rests on a permeable ceramic plate. Air is blown under the ceramic plate, diffusing through it and fluidizing the material above. The fluidized material has essentially no friction between particles which causes it to act like a liquid.

A special Filtros permeable ceramic plate, made to exact specifications, is the heart of the fluidized bed. Characteristics of this system using Filtros plates are:

1) **Mechanical Strength and Abrasion Resistance:** Both of these characteristics are inherently good. Special formulations are available for extreme conditions.

2) **Temperature and Chemical Resistance:** Formulations are available for temperatures up to 2500°F. The ceramic material is essentially inert and will not deteriorate from contact with most materials or chemicals.

3) **Uniformity:** The air permeability of the ceramic material is closely controlled to specifications for uniform air flow throughout the plate surface.

4) **Sizes:** Permeable ceramic plates are available in a variety of sizes and configurations. Standard thicknesses are 1" and 1-1/2". The most standard plate is 12" x 12", with up to 12" x 24" available. Other plates or discs are available in one piece up to 20" square and 20" diameter; larger, cemented plates or discs can be made to any specified size.

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5) **Materials:** For standard room temperature conditions, the resin bonded silica material (QR) is satisfactory. Glass bonded silica (QF), or ceramically bonded alumina (FAO), are also available for higher temperature or special applications.

6) **Grades:** The standard grades for QR material are QR-20, QR-50, QR-130 and QR-340, the coarsest. Other grades are available in QR, QF and FAO materials. Selection of grade is primarily dependent upon the fluidization characteristics of the materials and the volume of air available. Most materials larger than 35 mesh are difficult to fluidize uniformly and require maximum air flows. These materials can be fluidized using vibrators which impart motion to the materials, helping to eliminate excessive "boiling." Most materials to be fluidized perform satisfactorily with a QR-130 plate. A rule of thumb that can be used to determine air requirements is to design at least 20 cfm air per square foot of bed. A valve is recommended on the air inlet to regulate air flow to the bed for precise control.

7) **Applications:**

Investment Casting: Materials, such as zircon and silica sand, Molochite, Calamo and other refractory grogs and stucco sands, are fluidized to permit wax patterns to be easily immersed into them and rapidly coated.

Plastic Coating: Plastic resins specially developed for fluidized coating are available allowing a heated metal substrate (a wire basket, for example) to be dipped into resin, picking up a coating, and subsequently cured.

Blending and Separation: Various materials can be blended using fluidization. This can be done with the addition of a mechanical mixer. For blending in large silos, the silo floor is arranged with permeable plates with air flow controlled for each quadrant. The quadrants are sequenced for various air flow volumes, completely blending the fluidized material above. Tanks and silos can then be easily emptied using the air-gravity conveying principle (fluidization with inclined permeable plates).

Drying and Heat Processing: Materials with a low moisture content can be dried in a fluidized bed using heated dry air. The fluidized material can also be heated or cooled to a specified temperature providing a constant temperature bath. Constant temperature baths operating up to 2200°F have been constructed using Filtros plates.

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