CLAIMS

The claims are as follows:

[Claim 1] A method of distributing the flow of a fluid stream within a process unit, the method comprising:

passing the fluid stream through a plurality of structured elements in the process unit, wherein the structured elements have a contact surface with a surface area ranging from 200 to 800,000 m^2/m^3, each structured element comprising one or more interconnected unit cells, each unit cell having a frame with a three-dimensional polyhedron structure and a plurality of faces, wherein the faces comprise a mix of open faces, partially open faces and closed faces, and wherein the frame has a plurality of differently-shaped asperities disposed on the surfaces thereof; and

contacting the fluid stream with the contact surface as the fluid stream flows through the structured elements, such that the fluid steam is subdivided into substreams;

wherein the asperities comprise one or more of fibrils and filaments.

[Claim 2] The method of claim 1, wherein the asperities comprise one or more of channels, flutes, spikes, fibrils and filaments.

[Claim 3] A method of filtration of a fluid stream containing filterable solids in a process unit, the method comprising:

passing the fluid stream through a plurality of structured elements in the process unit, wherein the structured elements have a contact surface with a surface area ranging from 200 to 800,000 m^2/m^3, wherein each structured element comprises one or more interconnected unit cells, each unit cell having a frame with a three-dimensional polyhedron structure and a plurality of faces, and wherein the faces are either open, partially open or closed, and wherein the frame has a plurality of differently-shaped asperities disposed on the surfaces thereof; and

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contacting the fluid stream with the contact surface, wherein the contact surface filters from the fluid stream filterable solids having a size in the range from 100 nanometers to 11 millimeters;

wherein the asperities comprise one or more of fibrils and filaments.

[Claim 4] The method of claim 3, wherein the fluid stream is an industrial process stream and the process unit is an industrial process unit.

[Claim 5] The method of claim 1, wherein the structured elements comprise a plurality of differently-shaped unit cells.

[Claim 6] The method of claim 3, wherein the structured elements comprise a plurality of differently-shaped unit cells.

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