

Filters are rated on their ability to remove particle of a specific size from a fluid.

Pore size ratings refer to the size of a specific particle or organism retained by the filter media to a specific degree of efficiency.

A filter that is marked '10 micron' has some capability to capture particle as small as 10 micrometres however you do not know exactly what this means unless you also have a description of the test methods and standards used to determine the filter rating.

The two most used reported media ratings are absolute and nominal micron rating.

ABSOLUTE RATING

The absolute rating, or cut-off point, of a filter refers to the diameter of the largest spherical glass particle, normally expressed in micrometres (mm), which will pass through the filter under laboratory conditions. It represents the pore opening size of the filter medium.

Filter media with an exact and consistent pore size or opening thus, theoretically at least, have an exact absolute rating.

The absolute rating shouldn't be confused with the largest particle passed by a filter under operating conditions: the absolute rating simply determines the size of the largest glass bead which will pass through the filter under very low pressure differentials and non pulsating conditions.

This does not usually apply in practice: pore size is modified by the form of the filter element and it is not necessarily consistent with the actual open areas.

Furthermore the actual form of the contaminants are not spherical and the two linear dimensions of the particle can be very much smaller than its nominal one, permitting it to pass through a very much smaller hole (i.e. cylindrical particles with a thickness less than the slot opening of the filter).

The passage of oversize particles in this manner depends very largely on the size and shape of the opening and on the depth over which filtering is provided.

Most filters generate a filter bed: contaminants collecting on the surface impart a blocking action decreasing the permeability of the element but improving filter efficiency. When the blocking is so severe that the pressure drop is excessive, the flow rate through the system decreases seriously. This explains why the performance of a filter can often exceed its given rating based on the performance of a clean element and why test figures can differ widely with different test conditions on identical elements.

NOMINAL RATING

The nominal rating refers to a filter capable of cutting off a nominated minimum percentage by weight of solid particles of a specific contaminant (usually again glass beads) greater than a stated micron size, normally expressed in micrometres (mm). i.e. 90% of 10 micron.

It also represents a nominal efficiency figure, or more correctly, a degree of filtration.

Process conditions such as operating pressure, concentration of contaminant etc. have a significant effect on the retention of the filters.

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