

Filters, Water & Instrumentation, Inc.

Micron Madness



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We're always asked what micron rating filter should we use.
There are infinite levels of micron ratings.

If a filter removes 1 particle out of 100 of the 5 micron particles, I guess we could call it a 5 Micron filter. It's not a very good 5 micron filter but after a while in a recirculation system not making up any more 5 micron particles it would help.

Now we can go to the other extreme and say if we have a filter that removes all 100 of the 5 micron particles we have a really good 5 micron filter. Chances are in this instance is that we also probably have a pretty good 1 micron filter. Most of the time we'll get pretty close to 90 of the 100 one(1) micron particles if we're getting 100% of the 5 micron.

Over the years we have a recurring complaint from the users of filters of why the ratings can't be standardized. There have been repeated efforts to standardize resulting in Absolute rated and Beta rated filters. Unfortunately it's not possible to have standardization because there are too many variables in the real life situations where we have to use filters.

The real super applications of cartridge filters are the pharmaceutical bacterial filters which must remove a fixed challenge of specially grown bacterial and reduce them by a log factor of 6. These are the real performers. They have to work. The tests are rigorous and do give a level of protection from bacteriological contamination. The micron removal ratings of these filters are 0.1 and 0.2 micron. We're, however, not talking about particles here. We're talking about living organisms.

The smallest particles the human eye can discriminate are commonly 40 micron. When you get down below 10, 5 and 1 micron filters – these are small particles – you can see a haze. Also at these levels in liquid filtration the particle capture mechanisms are often a result of van der Waals forces which are inter-molecular attractions.

Above 40 microns we can have screen capture which is a very sturdy way to hold particles. The van der Waals forces which work at the lower microns can be defeated by increased pressures – flows – and cause the particles to unload – to be released from the filter and go back downstream. Going back, if we have a 90% effective 1 micron filter at 5 GPM, if we ramp the flow up to 10 GPM, we'll probably knock the efficiency down to 80% and after a fairly short period of time, the filter will no longer hold those particles. This is now not a good 1 micron filter.

When are asked which micron ratings we should use in a filter, this discussion is the tip of the iceberg. We have just scratched the surface. With past experience as a guide, we can get the right filters for an application. There are many variables which make up micron madness.

You may want to look at the page on our website where we describe the different types of cartridge filters and bag filters we have available.



Cartridge
Filters

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