

Micron Ratings in Filters

A MICRON (or 1 micrometer) is a length of measurement used by filter manufacturers to measure the diameter of a particle. Fluid filters can have a micron rating which expresses the filter’s ability to remove contaminants based on the size of the particles. For example, a filter rated for “twenty (20) microns” means that the filter will capture and contain all particles in the fluid that are 20 microns and larger in diameter.

- 1 Micron = .001 mm
- 1 Micron = .000039 inches
- 2 Microns = Bacteria
- 8 Microns = Red blood cells
- 25 Microns = White blood cells
- 40 Microns = Visible with naked eye
- 70 Microns = Diameter of a human hair

Measuring a micron rating through testing can be done through three methods:

1. **Nominal Micron Rating** means that the filter can capture a given percentage of particles of the stated size. For example, a nominal micron rating of 10 microns at 95% means that the filter media retains 95% of the particles that are 10 microns and larger.
2. **Absolute Micron Rating** means that the filter is tested using a single pass of contaminants through a filter media and any particles that pass through are measured. You could end up with a 96.7% retention of that micron number.
3. **Multipass Beta Ratio Testing** is the most accurate method of rating filters. Measured samples of the fluid are then taken at timed intervals from both the *downstream* and the *upstream* of the filter simultaneously, particles are measured and counted by electronic means using automatic particles counters. From these measurements a **Beta ratio** (b) is formulated by dividing the number of particles of a particular size in the upstream flow by the number of particles of the same size in the downstream flow, and is an indicator of how well a filter stops a particulate. For example, if one out of every two particles in the fluid pass through the filter, the beta ratio is 2, if one out of every 200 of the particles pass through the filter the beta ratio is 200. Therefore, filters with a higher beta ratio retain more particles and have higher efficiency.

For a NapaGold by Wix 1748, the beta ratio is $2/20 = 10/22$, which means that the filter will capture 50% of the 10 micron particles and 95% of the 22 micron particles. (<http://www.wixfilters.com/Lookup/PartDetails.aspx?Part=132788>)

Beta Ratios and their Efficiencies:

Beta Ratio	Efficiency
1.00	0.00 %
1.50	33.00 %
2.00	50.00 %



10.00	90.00 %
20.00	95.00 %
50.00	98.00 %
75.00	98.70 %
100.00	99.00 %
200.00	99.50 %
1000.00	99.90 %
10000.00	99.99 %

Most filter manufacturers will try to offer the ratings on their filters, but many do not. Of the four brands FleetFilter sells (NapaGold by Wix, Fram, Luberfiner, Baldwin), only Wix publishes a nominal micron rating and a beta ratio of their filters.

I hope this article answers questions - a more knowledgeable customer can make better choices. Thank you for choosing FleetFilter.com!