

Air Filter Micron Rating v. Life and Efficiency Ratings

Occasionally questions arise about the micron ratings and test procedures on air cleaners and replacement air filters. Typically, air cleaners and air filters are not assigned a "micron rating." Micron rating is a term used in liquid filtration. Air filters are evaluated for life and efficiency using an industry-wide standard (ISO 5011). The following should clarify the questions surrounding this issue.

Filter life is measured in total grams fed or in hours of lab life and is determined by testing at a standard test dust concentration of 1 g/m³ (0.028 g/ft³) for single-stage air cleaners or 2 g/m³ (0.056 g/ft³) for multistage units at either a constant or variable airflow. The end-of-life testing is determined using the restriction method. When the predetermined restriction service point is reached, the test is stopped and the filter is weighed. The amount of test dust held by the filter is considered the capacity or life of the filter. The life of an air cleaner requires some additional consideration. Many air cleaners have inertial separators included in the housing. These inertial separators remove up to 98% of the dust that is fed during one of these tests. Therefore, the inertial separator efficiency must also be evaluated.

Element efficiency is calculated by determining the increase in weight of an absolute filter (an absolute filter captures any dust that passes the test filter) located downstream of the test filter vs. the weight of the total dust fed.

Table 1 details the particle size distribution of the standard test dust used for life and efficiency evaluations (ref. ISO 12103-1).

Table 1
Particle Size Distribution by Weight %

Size (Microns)	Fine*	Coarse*
0 - 5	39 ±2	12 ±2
5 - 10	18 ±3	12 ±2
10 - 20	16 ±3	14 ±3
20 - 40	18 ±3	23 ±3
40 - 80	9 ±3	30 ±3
80 - 200	-----	9 ±3

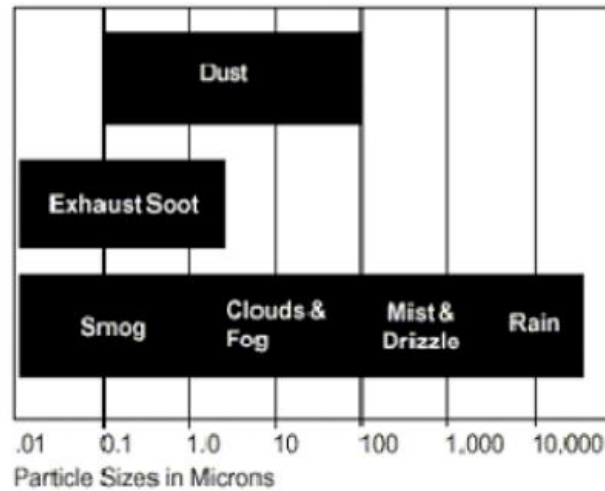
* **Fine** grade dust is used to test primary dry air cleaners and **coarse** grade dust is used to test 2-stage air cleaners.

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Fine test dust is used for testing primary dry air cleaners, which are most often used in on-road and automotive applications, and coarse dust is used for multistage air cleaners that typically use inertial separators and operate in very dusty applications.

Table 2 lists common contaminants found in field environments, as well as their particle size ranges. Although field conditions vary from one location to the next and from time to time, this test allows for a standard means of comparison and a laboratory method of evaluating air cleaner life and efficiency.

Table 2
Common Field Contaminants vs. Size



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