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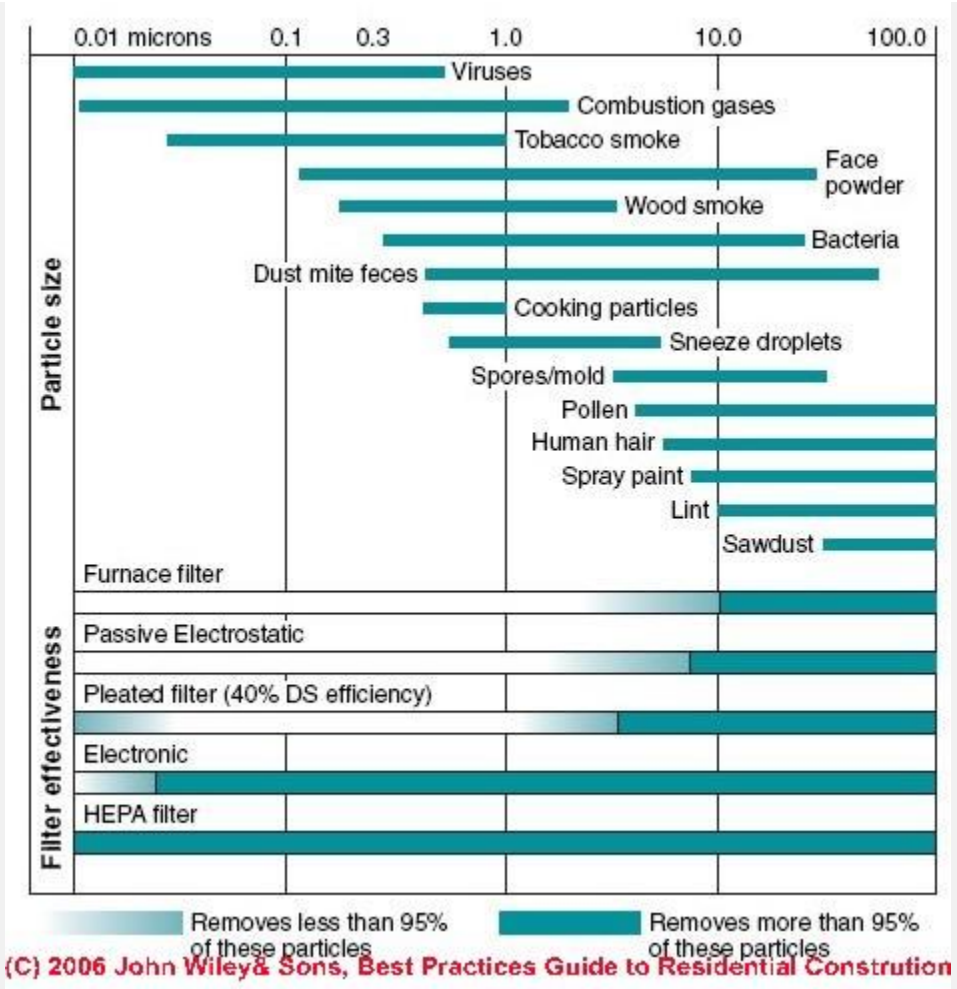
Composition of Dust Particles and Particulate Matter in The Air

BY SCANTECH CONSULTING · PUBLISHED DECEMBER 26, 2014 · UPDATED AUGUST 16, 2021

When I test for PM2.5 and PM10 which are Fine Particle and Coarse Particle designations used by the EPA, I am often asked what is the nature of this particulate matter. These may also be referred to as TSP (Total Suspended Particulate) or RSP (Respirable Suspended Particulate) matter. While it is very difficult to tell exactly what it is without microscopic analysis and will vary depending on the environment, an educated guess can be made based on what sources are nearby and the potential contribution of those sources based on typical size regimes.

Possible sources are pollen, toxic mold spores, smoke, bacteria, pet dander, construction dust, etc.

There are some useful reference charts that not only talk about the ranges of certain pollutants, but also give an indication of different filtration mediums which are relatively effective in removing these contaminants.

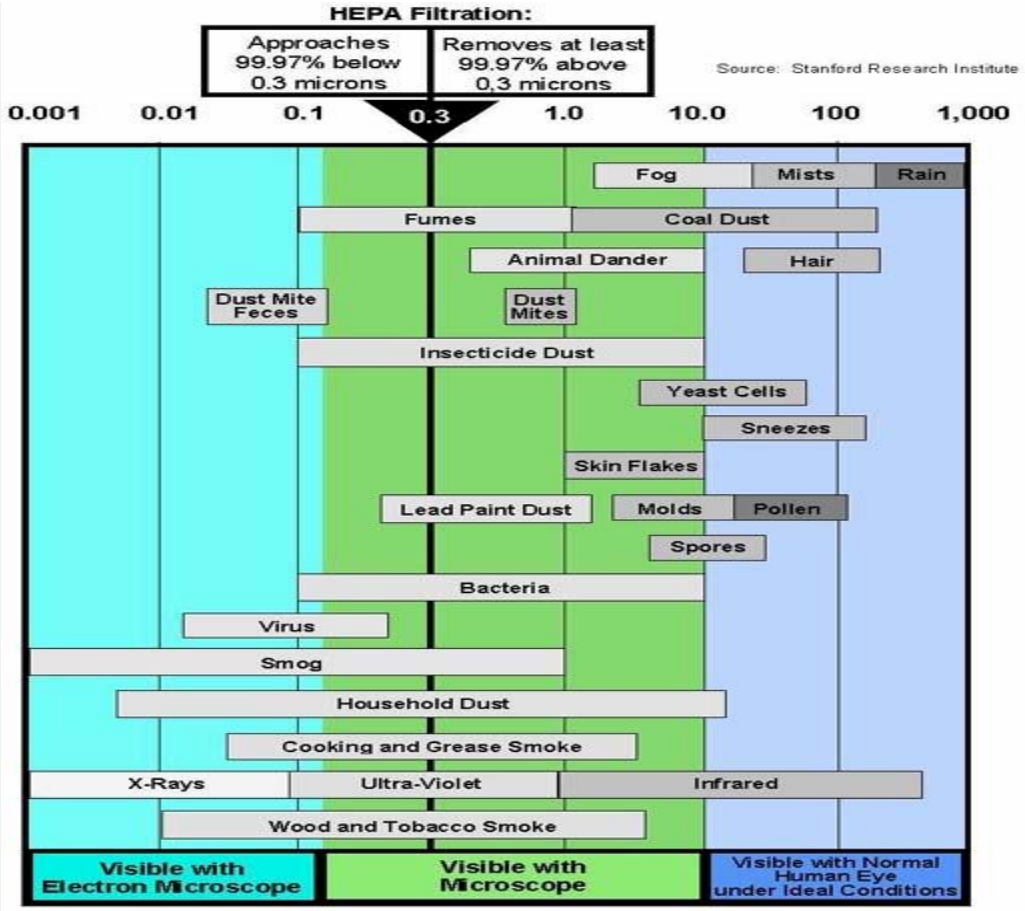


Air Filtration with Regard to Particle Size

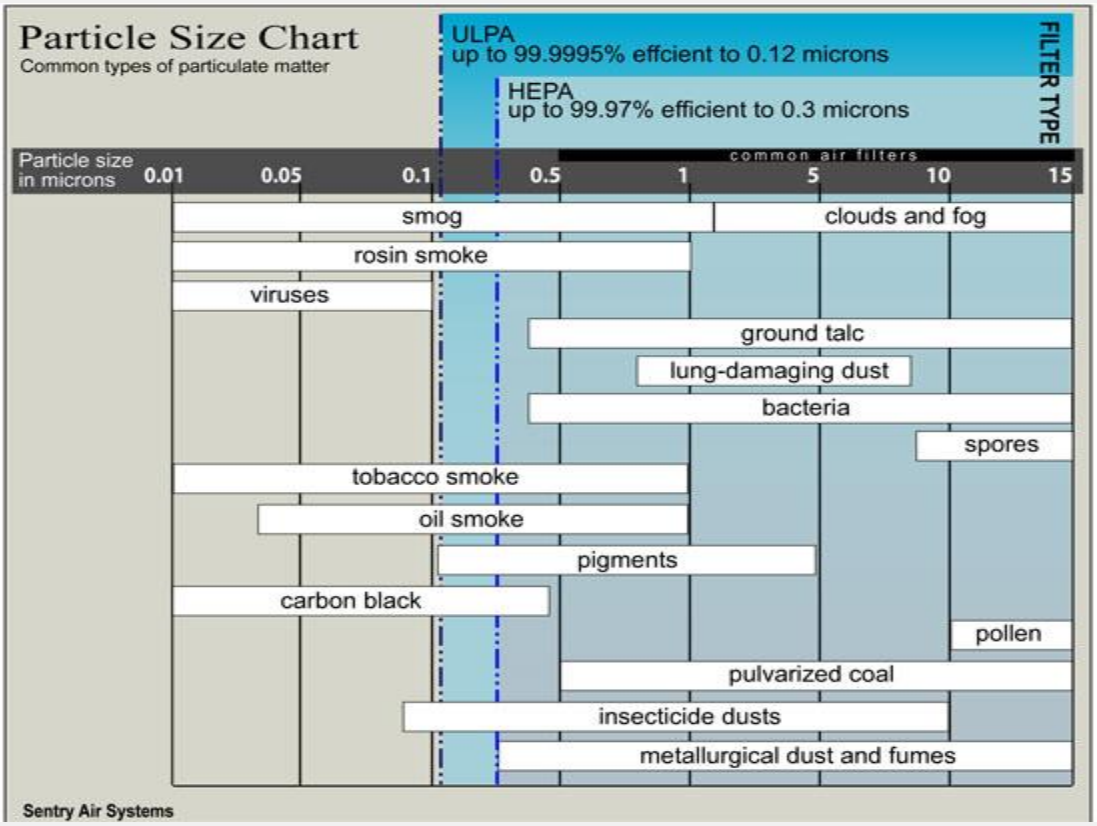
*NOTE – HEPA (High Efficiency Particulate Air) filters are typically rated at 99.97% efficiency for particles of 0.3 um or larger. At this time, I am not sure that a HEPA filter will remove more than 95% of particles which are 0.01 microns in size as this chart seems to imply.

Also, beware of filters and vacuum cleaners which claim to be “HEPA-like”, “HEPA-type” or “99% HEPA” as these are not true HEPA filters and are often inferior in quality with regard to air filtration efficiency.

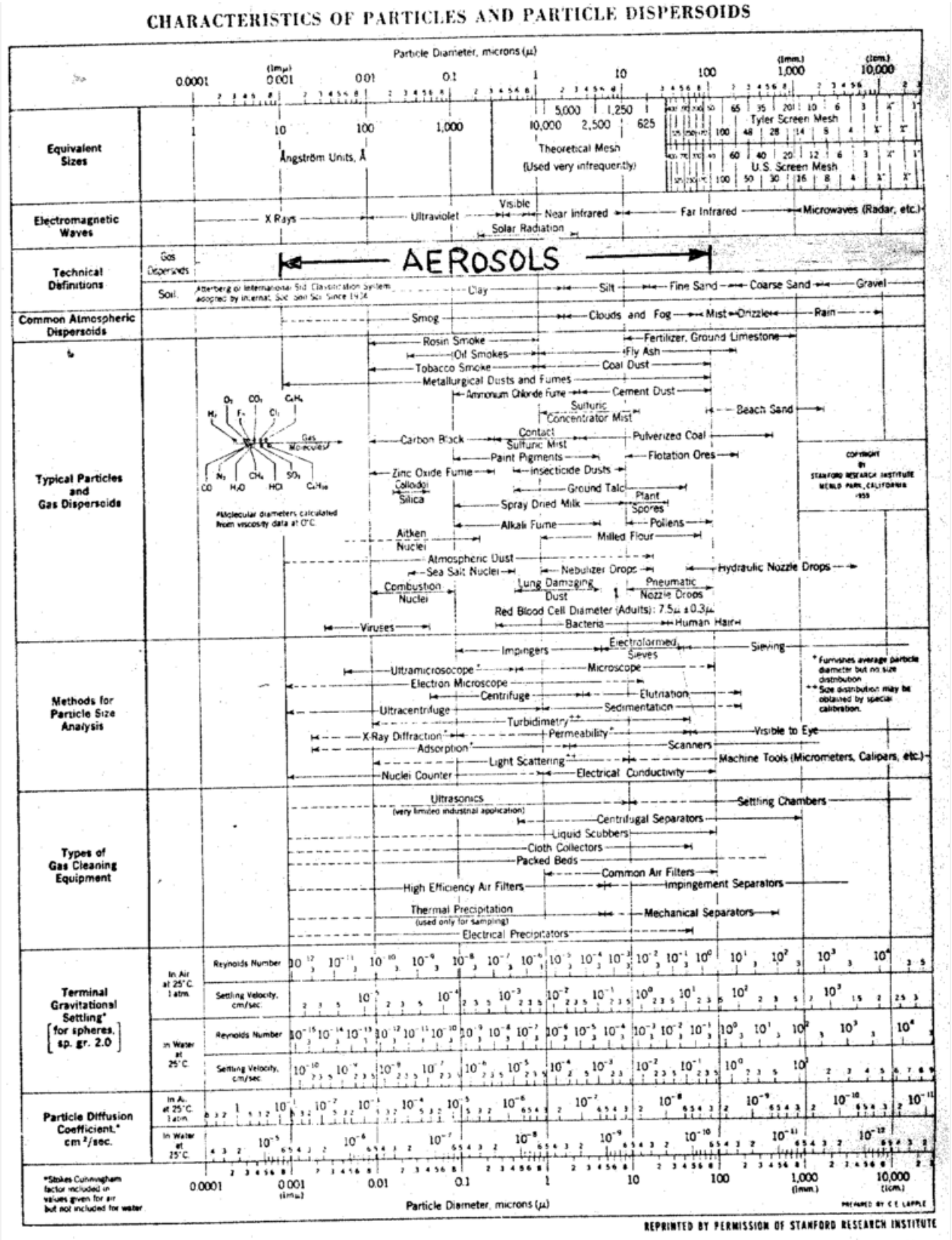
BTW – the term DS efficiency mentioned in the Pleated Filter (40% DS) refers to Atmospheric Dust Spot Efficiency which measures how well a filter removes staining dust from the air.



HEPA Filtration Particle Chart

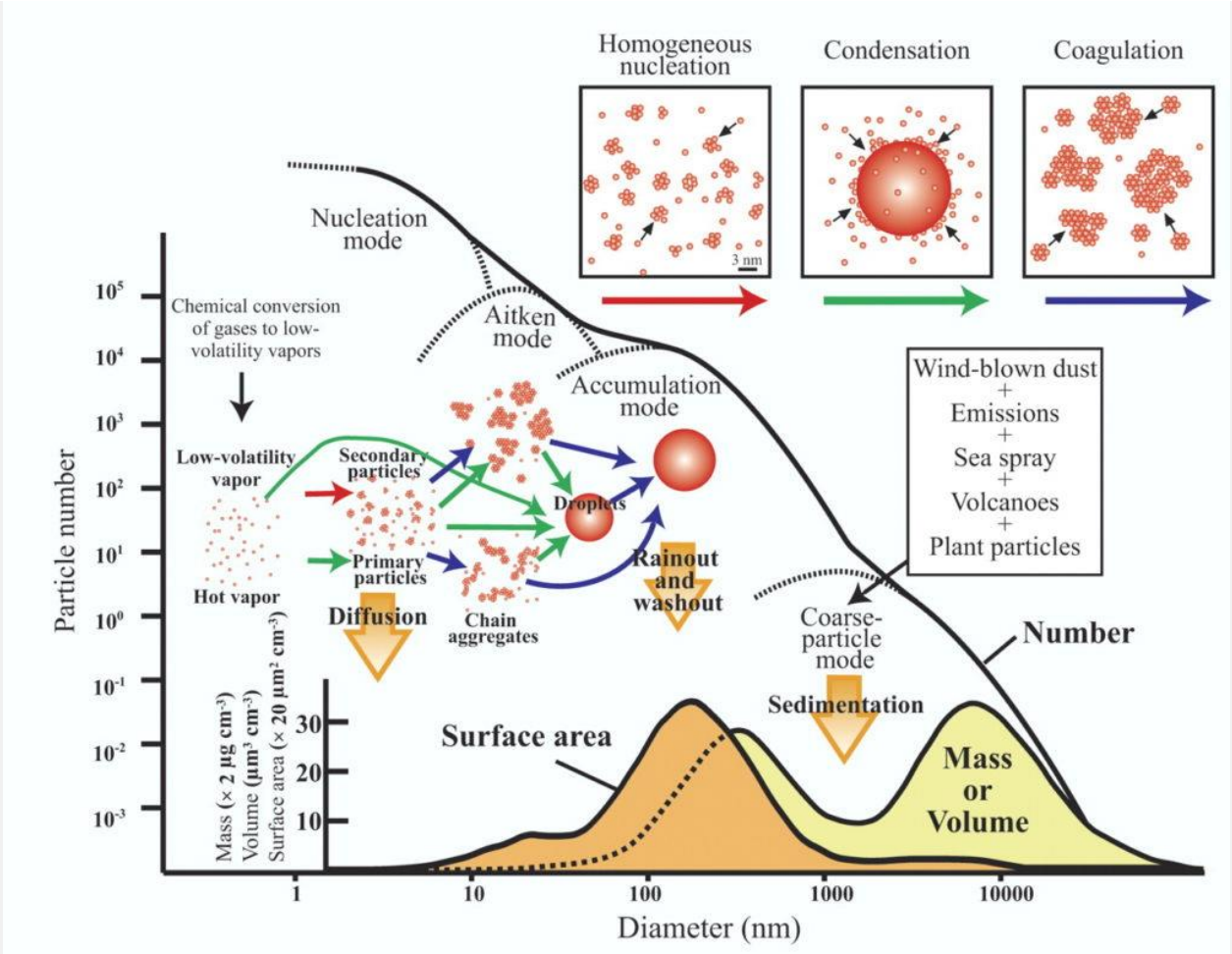


Particle Filtration Size Chart HEPA vs. ULPA



Characteristics of Particles and Particle Dispersoids

This is a fairly technical diagram for general reference use.



Origin of Dust Particulate Matter

Tags: HEPAIAQIAQ testingindoor air quality testingorganic dustParticulate matterPM10PM2.5Toxic Metals