



CAMERON GREAT LAKES, INC.

MOLECULAR FILTRATION SPECIALISTS

Screen Size Distribution

SSD is the range of screens over which activated carbon is sized. The screen size, or mesh size to be used is determined by a square root of two progression in screen opening, starting with the largest screen used. The US standard sieve sizes are provided (opposite side). The Mean Particle Diameter (MPD) is calculated on the basis of screen size distribution. The weight percent of activated carbon passing through one screen sieve and remaining on the next smaller screen is determined (material on the largest screen and passing through the smallest screen is ignored). The weight fraction is multiplied by the average screen opening for the larger screen and the screen on which the activated carbon was retained. The summation of these fractions is the MPD.

Iodine Number

The amount of Iodine adsorbed by activated carbon from a 0.02N₂/KI aqueous solution. Iodine Number has been roughly correlated to the surface area in pores greater than 10 A diameter. However, it is best understood as an indicator of total pore volume.

Molasses Number

A measure of the relative decolorization of a boiling molasses solution by activated carbon. The Molasses Number has been interpreted as the surface area available in pores greater than 28 A diameter. Because molasses is a multicomponent mixture, one must be careful in assigning too strict an interpretation to this parameter.

Apparent Density (AD)

A measure of the mass of carbon that occupies a particular volume. The test is performed by gradually filling a graduated cylinder to 100cc and determining the mass of activated carbon contained. This value, corrected for less efficient settling in the field is used for calculating the amount of activated carbon needed to fill given adsorber volume.

Carbon Tetrachloride Number

Total pore volume indicator. This measured by passing an airstream saturated with CCl₄ at 0°C through a carbon bed held at 25°C. The weight of the CCl₄ adsorbed is determined at prescribed intervals until there is a negligible weight change in the sample.

Hardness Number

Measurement of the mechanical strength of activated carbon. It is the change in weight, expressed as a percentage, of a specific screen size fractions after 3 minutes of vigorous agitation with smooth steel balls.

Abrasion Number

Measurement of the attrition of resistance of activated carbon. This test measures the change in MPD, expressed as a percentage, of a sample after 3 minutes of vigorous agitation with smooth steel balls.

Ash

Inorganic material, primarily aluminum and silicon, contained in activated carbon. Ash is the residual from burning pulverized carbon in air for 3 hours at 1750°F (954°C).

Moisture

A measure of the water content of carbon . It is determined by boiling activated carbon in xylene using a Dean-Stark trap and condenser. The water is condensed and trapped in a volumetric arm in order to determine the water content. The moisture content of virgin activated carbon can also be estimated on the basis of the weight change that occurs after oven drying at 150°C for 3 hours.

ACTIVATED CARBON PARTICLE SIZE TABLE

To determine approximate mesh size of an activated Carbon sample, check the table below

STANDARD MESH OPENING PARTICLE

Tyler	U.S.	mm	inches
4	4	4.75	0.187
6	6	3.35	0.132
8	8	2.36	0.094
10	12	1.70	0.066
12	14	1.40	0.056
14	16	1.18	0.047
16	18	1.00	0.039
20	20	0.85	0.033
24	25	0.71	0.028
28	30	0.60	0.023
32	35	0.50	0.020
35	40	0.425	0.017
42	45	0.355	0.014
48	50	0.300	0.012
60	60	0.250	0.0098
65	70	0.212	0.0083
80	80	0.180	0.0070
100	100	0.150	0.0059
115	120	0.125	0.0049
150	140	0.106	0.0041
170	170	0.090	0.0035
200	200	0.075	0.0029
250	230	0.063	0.0025
270	270	0.053	0.0021
325	325	0.045	0.0017
400	400	0.038	0.0015
—	500	0.025	0.0010