

Information Bulletin

DEFINING PRODUCT PROPERTIES

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 U.S. 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 first 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 0.02 N₂/KI aqueous solution. Iodine Number has been roughly correlated to the surface area in pores greater than 10 Å 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 Å diameter. Because molasses is a multi-component 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 100 cc 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 a given adsorber volume.

Carbon Tetrachloride Number

Total pore volume indicator. This is 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 fraction after 3 minutes of vigorous agitation with smooth steel balls.

Abrasion Number

Measurement of the attrition 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.



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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	●

Safety Message

Wet activated carbon preferentially removes oxygen from air. In closed or partially closed containers and vessels, oxygen depletion may reach hazardous levels. If workers are to enter a vessel containing carbon, appropriate sampling and work procedures for potentially low oxygen spaces should be followed, including all applicable federal and state requirements. For additional details, see Calgon Carbon Bulletin AB-006-08/94: Safety Considerations with Activated Carbon.

Limitations of Liability: The Supplier's liability and the purchaser's exclusive remedy for any cause of action arising out of this transaction, including, but not limited to, breach of warranty, negligence and/or indemnification, is expressly limited to a maximum of the purchase price of spare parts or equipment sold hereunder. All claims of whatsoever nature shall be deemed waived unless made in writing within forty-five (45) days of the occurrence giving rise to the claim. In no event shall the Supplier for any reason or pursuant to any provision of the warranty be liable for incidental or consequential damages, or damages in excess of the purchase price, nor shall the supplier be liable for loss of profits or fines imposed by governmental agencies.



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