

STRENGTH TEST OF ACTIVATED CARBON

Application

This method outlines a means of obtaining the strength (resistance to abrasion) of activated carbon.

Apparatus Required

Ro-Tap Sieve Shaking Machine

Catalog No. 57420-039

Source: VWR Scientific Inc.
3140 Grand River Ave.
Detroit, MI 48208

or equivalent.

Timer

Catalog No. 62366-001

Source: VWR Scientific Inc.
3140 Grand River Ave.
Detroit, MI 48208

or equivalent.

Sieves

U.S. Standard, sieve series, 200 mm diameter consisting of:

#4	#12
#6	#14
#8	#20
#10	Pan

Steel Balls (Ball Bearing Grade)

Twenty 13 mm balls

Ten 19 mm balls

Analytical Balance

Accurate to 0.5 g

Date	Action	Revisions
2001 01 31	Revised	Editorial - no technical change A. Cockman
1997 12 01		

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Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Test Procedure

1. Make sieve analysis of activated carbon per ASTM D 2862.
2. Weigh each fraction, to the nearest 0.5 g, remaining on each sieve.
3. Combine the fractions and place in the special pan with the thirty steel balls (see Figure 1) Shake pan on Ro-Tap Shaker for 20 minutes. The number of rotations per minute shall be between 220 and 300 and the number of taps per minute shall be between 140 and 160. The special pan shall be on the bottom of an equivalent 7 (full height) high sieve nest with a bottom pan, half height with extended rim (blank sieve) directly above it. The remainder of the 7 high sieve nest can be made with any combination of assorted sieves.
4. After 20 minutes of shaking, remove balls and pour the sample on the top sieve of the sieve nest used in step one. Repeat steps 1 and 2 (Ro-Tap time 10 minutes).
5. Calculate the average particle size and strength.

Calculations: The average particle size of each fraction is assumed to be midway between the size of opening of the sieve which that portion passed and the size of the opening of the sieve that retained that part of the sample. For example, the opening of the #4 standard sieve is 4.76 mm and that of the #6 standard sieve is 3.36 mm. The diameter of the particles that pass the #4 sieve and are retained by the #6 sieve is assumed to be the mean, or 4.06 mm. Using the values in the third column of the typical computation that follows, compute the average particle size of the material both before and after making the strength test. The "strength" is obtained by dividing the final average particle size by the original average particle size and multiplying by 100. The "strength" number is reported to the nearest whole number. The mean opening used for the #4 sieve is computed on the basis of a sieve having an opening of 6.35 mm and the #4 sieve having an opening of 4.76 mm.