Designation: D 1620 – 60 (Reapproved 1969)



# Standard Method of Test for VOLATILE CONTENT OF CARBON BLACK[1]

This Standard is issued under the fixed designation D 1620; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval.

***The committee responsible for this standard has voted its withdrawal. In the absence of substantial reasons that it should be continued, the Society will approve its withdrawal from publication in July 1973.***

## 1. Scope

1.1 This method[2] covers the determination of the volatile material other than moisture in carbon black (Note 1). The volatile content test applies more specifically to those blacks used by the paint and ink industry.

NOTE 1—Since the air space in the crucible for an unpelleted black is higher than that for a pelleted black, greater oxidation of the sample will result in an apparent high volatile content value for the unpelleted black.

## 2. Apparatus

2.1 *Electric Furnace*,[3] capable of temperature regulation of ±20 C at 950 C, and equipped with a thermocouple-activated indicating pyrometer.

2.2 *Platinum Crucible*, 20-ml capacity, equipped with insert form cover.

2.3 *Interval Timer*, checked for accuracy.

2.4 *Oven*, gravity-convection type capable of temperature regulation of ±1 C at 105 C.

2.5 *Analytical Balance*, having a sensitivity of 0.1 mg.

2.6 *Desiccator*.

## 3. Procedure

3.1 Ignite the platinum crucible with cover in the electric furnace at 950 ± 20 C for approximately ½ h, with the crucible not more than 6 mm from the thermocouple terminal. Then place the crucible and cover in the desiccator. Cool to room temperature and weigh to the nearest 0.1 mg.

3.2 Dry an adequate sample of carbon black for 1 h at 105 C as described in ASTM Method D 1509, Test for Heating Loss of Carbon Black.[4]

3.3 Fill the platinum crucible with the dry carbon black to a level not more than 2 mm below the cover line (Note 2). The small air space is necessary to allow for expansion of the escaping volatile matter, thus preventing the raising of the cover and possible oxidation of the black. The crucible cover should fit firmly in place, but should have sufficient clearance to permit the volatile matter to escape.

NOTE 2—This is designed primarily for pelleted carbon blacks. Where the volatile content of unpelleted carbon black is desired, firmly tamp the black in the crucible to minimize oxidation.

3.4 Weigh the crucible, cover, and contents to the nearest 0.1 mg.

3.5 Ignite the covered crucible and contents in the electric furnace for exactly 7 min at a temperature of 950 ± 20 C (see Section 5).

3.6 Remove the crucible to the desiccator, allow to cool to room temperature, and weigh to the nearest 0.1 mg.

## 4. Calculation

4.1 Calculate the percent volatile content as follows:

$$V = [(B - C)/(B - A)] \times 100$$

where:

$V$ = volatile content percent

$A$ = weight of crucible and cover, g

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[1] This method is under the jurisdiction of ASTM Committee D-24 on Carbon Black.

Current edition effective Sept. 19, 1960. Originally issued 1958. Replaces D 1620 – 58 T.

[2] This method is essentially the same as the procedure for determination of volatile matter described in Sections 13 and 14 of ASTM Methods D 271, Laboratory Sampling and Analysis of Coal and Coke, *Annual Book of ASTM Standards*, Part 19.

[3] A vertical electric-type furnace, such as the Hoskins type FA-120, or a standard muffle furnace, or equivalent, is satisfactory for this purpose.

[4] *Annual Book of ASTM Standards*, Part 28.

$B$ = weight of crucible, cover, and sample before ignition, and

$C$ = weight of crucible, cover, and sample after ignition, g.

## 5. Report

5.1 The report shall include the following:

5.1.1 Proper identification of the sample and,

5.1.2 Average results obtained from two individual determinations.