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Technical Association of Pulp and Paper Industry
Standard Method T 427 SU-71
An American National Standard

# Standard Test Method for Kerosine Number of Roofing and Flooring Felt by the Vacuum Method[1]

This standard is issued under the fixed designation D 727; 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. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This test method covers the determination of the relative saturating capacity of felt papers for roofing and flooring.

1.2 The results are reported in terms of the kerosine number of the sample.

1.3 While the results reported are numerical, they are used only as a relative measure of the saturating capacity of felt papers, and this test method as generally used provides a qualitative means to differentiate and rank various papers which are to be subjected to bituminous saturation.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* Specific warning statements are given in 10.5.

## 2. Referenced Documents

2.1 *ASTM Standards:*

D 70 Test Method for Specific Gravity and Density of Semi-Solid Bituminous Materials[2]

D 585 Practice for Sampling and Accepting a Single Lot of Paper, Paperboard, Fiberboard, and Related Products[3]

D 1298 Practice for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method[4]

E 122 Practice for Choice of Sample Size to Estimate a Measure of Quality for a Lot or Process[5]

## 3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *kerosine number*, *n*—the volume of kerosine absorbed by 100 g of a sample of saturating felt under the conditions specified in this test method.

## 4. Summary of Test Method

4.1 Test specimens cut in the form of rectangles of defined dimensions are dried in an air oven at 105°C for a specified time, cooled, and weighed. The test specimens are then allowed to absorb kerosine under specified conditions of time and pressure. After controlled draining of excess kerosine, the test specimens are reweighed and the kerosine number calculated using a specified formula.

## 5. Significance and Use

5.1 Felt papers for roofing and flooring are important in the construction industry. Felt papers with different end use properties can be made. The kerosine number is a relative measure of the amount of a bituminous saturant a lot of saturating grade paper is capable of absorbing, and is useful in choosing papers for specific levels of saturation or manufacture into specific end products. Generally, higher relative kerosine numbers based upon this test method are desirable.

## 6. Apparatus

6.1 *Glass Vessel*, approximately 1500-mL capacity, for soaking specimens of felt in kerosine, under vacuum.

6.2 *Vacuum Pump*, capable of reaching and maintaining a vacuum of at least 700 mm Hg in the glass vessel.

6.3 *Lightweight Glass or Metal Weighing Container*, with tightly fitting cover, 60 by 140 mm (2½ by 5½ in.) or larger; to contain felt strips in a horizontal position without bending or distorting them.

6.4 *Drying Oven*, with dimensions at least 300 by 300 by 300 mm (12 by 12 by 12 in.).

6.5 *Other Apparatus*—Desiccator, wire hook, and if necessary a punch to make a small hole in a corner of the specimens after they are cut.

## 7. Materials

7.1 *Water-White Kerosine*, having a specific gravity of 0.800 ± 0.025 at 25°C, as determined in accordance with Test Method D 1298.

## 8. Sampling

8.1 *Acceptance Sampling*—Obtain a sample in accordance with Practice D 585.

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[1] This test method is under the jurisdiction of ASTM Committee D06 on Paper and Paper Products and is the direct responsibility of Subcommittee D06.92 on Test Methods.

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[2] *Annual Book of ASTM Standards*, Vol 04.03.

[3] *Annual Book of ASTM Standards*, Vol 15.09.

[4] *Annual Book of ASTM Standards*, Vol 05.01.

[5] *Annual Book of ASTM Standards*, Vol 14.02.

8.2 *Sampling for Other Purposes*—The sampling and the number of test specimens depends on the purpose of the testing. Practice E 122 is recommended.

## 9. Test Specimens

9.1 From each test unit of the sample cut two sets of six test specimen strips, each strip measuring 51 by 127 ± 3 mm (2 by 5 ± ½ in.) with the longer side parallel to the machine direction of the sheet.

## 10. Procedure

10.1 Place a set of strips in the tared weighing container and expose them, uncovered, for at least 1 but not more than 2 h in an oven, the interior of which is maintained at a temperature of 105 ± 3°C. Keep the felt strips flat; do not fold, roll, or distort them in any way. Handle the six strips as a unit in all the following operations:

10.2 Remove the strips in the weighing container from the oven and place them, with the container still uncovered, in a desiccator to cool.

10.3 After cooling, rapidly close the container and weigh it with enclosed strips to the nearest 10 mg to obtain the net weight of the dry strips.

10.4 Insert a wire hook in one corner of the strips and immerse them at once in a vertical position in 1000 mL of kerosine at 25 ± 1°C in the glass vacuum vessel. Apply a vacuum of at least 700 mm Hg to the vessel containing the strips and hold it under these conditions for 15 min, or for 5 min after the bubbles cease to come from the felt strips, whichever period is the longer. Remove the felt strips from the kerosine and let them drain in the machine direction of the felt for 3 min (±1 s), allowing the lower corner of each strip to touch the edge of the kerosine container.

10.5 Return the soaked strips to their weighing container, close the container, and determine the combined weight of the strips and the absorbed kerosine.[6] (**Warning**—Care should be exercised in the use of kerosine because it is flammable. The material and its vapors should not be exposed to open flame or electrical spark.)

## 11. Calculation

11.1 Calculate the kerosine number using the following equation:

$$\text{Kerosine number} = \frac{b - a}{a} \times \frac{l}{d} \times 100 \quad (1)$$

where:

$a$ = weight of dry felt, g,
$b$ = weight of felt plus absorbed kerosine, g,
$d$ = specific gravity of kerosine, and

100 is a factor used to allow reporting on the basis of the volume of kerosine absorbed per 100 g of dry felt.

11.2 The kerosine number of a felt as calculated above assumes that the specific gravity is equal to the density of kerosine at the temperature of the testing (25°C). In some cases, it is desirable to estimate the quantity of a specific bituminous saturant (rather than kerosine) a specific felt will absorb. In such cases, the specific gravity of the bituminous saturant may be determined using a suitable test method such as Test Method D 70, and that value inserted as "d" in Eq 1.

## 12. Report

12.1 Report as kerosine number the average of two determinations, to three significant figures.

## 13. Precision and Bias

13.1 *Repeatability (Within Laboratory)*—2.5 %.

13.2 *Reproducibility (Between Laboratories)*—It is not practicable to specify the between laboratory reproducibility of the procedure in this test method as the method is generally used only as a qualitative tool for ranking various lots of paper.

13.3 *Bias*—The procedure in this test method has no bias because the value of kerosine number is defined only in terms of this test method.

## 14. Keywords

14.1 flooring felt; kerosine number

[6] Codwise, P. W., "Testing Method for Roofing Felt," *Paper Trade Journal*, PTJOA, Vol 9, pp. 43–45, Feb. 28, 1929; *Technical Association Papers*, Vol 12, No. 1, pp. 52–54, June 1929.