

T 261 cm-10

PROVISIONAL METHOD – 1979

CLASSICAL METHOD – 1990

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CAUTION:

This method may require the use, disposal, or both, of chemicals which may present serious health hazards to humans. Procedures for the handling of such substances are set forth on Material Safety Data Sheets which must be developed by all manufacturers and importers of potentially hazardous chemicals and maintained by all distributors of potentially hazardous chemicals. Prior to the use of this test method, the user should determine whether any of the chemicals to be used or disposed of are potentially hazardous and, if so, must follow strictly the procedures specified by both the manufacturer, as well as local, state, and federal authorities for safe use and disposal of these chemicals.

Fines fraction by weight of paper stock by wet screening

1. Scope

1.1 This method measures the weight percent fines content of paper stock or of pulp samples by means of a single-screen classifier. A modified procedure permits the use of the apparatus to measure the tendency of the fines fraction to be retained by the fiber fraction under graduated turbulent conditions.

1.2 Separation of suspended particles of different shapes and sizes by wet screening may be accomplished using various devices. The apparatus described below is recommended for convenience and accuracy.

2. Significance

2.1 Samples of paper stock, particularly those taken from the paper machine circulating system, are characterized by having different proportions of particles generally classified as “fibers” and “fines.” The proportions of these two components may vary greatly, depending upon the furnish, upon stock preparation, and whether mineral fillers are added to the stock. The greater tendency of the fines fraction to pass through the wire during sheet formation and to be recycled leads to an accumulation of fines in the headbox. The extent of this buildup is an indication of the retention performance of the machine and affects, for example, drainage, felt filling, and saveall loading.

2.2 A suspension such as paper stock contains a range of solid particles that differ in size by small increments. Any dividing line between what is defined as fiber and as fines is an arbitrary decision. From review of published literature and microscopic examination, it is recommended that the dividing line should be particles that will pass a round hole 76 μm in diameter or a nominally 200 mesh screen. Other hole sizes may be chosen as discussed under Section 4.3.

2.3 This technique may be used to measure the relative tendency of the fines fraction to stay with the fiber rather than to follow the water into the filtrate under graduated turbulence in simulation of paper machine conditions. The determination of fines retention is of particular importance in determining the effect of graduated turbulence in the evaluation of additive materials such as retention aids.

Approved by the Standard-Specific Interest Group for this Standard



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3. Safety precautions

Tamol 850™ contains formaldehyde. Inhalation of vapor or mist can cause headaches, nausea, and irritation of the nose, throat, and lungs. May cause eye/skin irritation. Formaldehyde is a suspected human carcinogen.

4. Apparatus and materials

4.1 *Fiber classifier (drainage jar)*. The single-screen classifier consists of a cylindrical sample holder equipped for the insertion of a bottom screen and air chamber. A sketch of the apparatus is shown in Fig. 1. The swingout base support is attached by means of a short pipe nipple and tee to a pipe section, into which has been inserted the upright rod of a support stand. This arrangement fixes the elevation of the base support and by swing-out permits the insertion and removal of the jar with no change in elevation of the jar or the propeller of the stirrer. The distance between propeller blade and the screen must be constant for all tests, normally 3.2 mm ($\frac{1}{8}$ in.). The jar itself consists of two parts: the upper chamber or barrel is formed from a section of clear plastic pipe 10.16 cm (4 in.) i.d., 6.35 mm ($\frac{1}{4}$ in.) wall thickness, and 15.24 cm (6 in.) long. The total volume is about 1 L and the normal sample volume is 500 mL. The lower chamber and the barrel are threaded to fit each other and to hold the perforated plate between them. The perforated plate is shown as a dotted horizontal line in Fig. 1. This assembly is sealed with rubber gaskets. The lower chamber forms an air lock to hold the sample in the reservoir until the start of the test. The size of the aperture may be varied to control the rate of flow of the filtrate. If greater turbulence is required in the sample jar, cement plastic vanes 6.35 mm ($\frac{1}{4}$ in.) square in cross section to the wall of the jar.

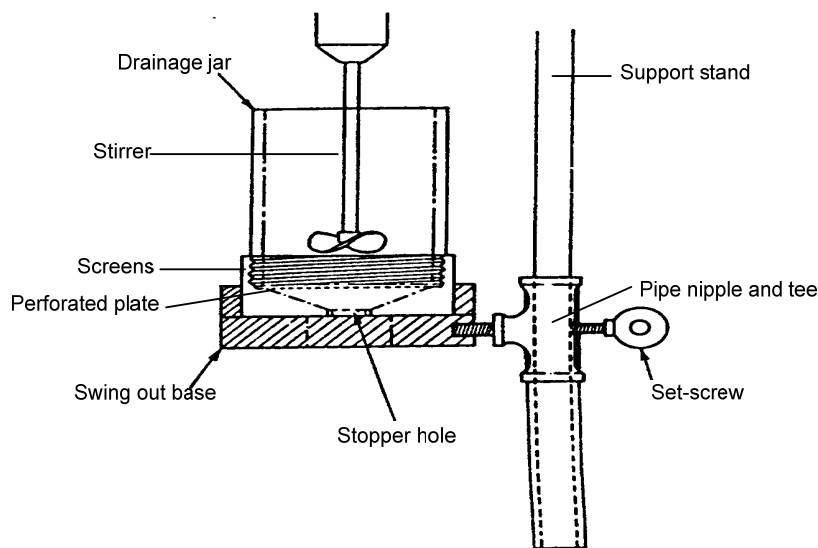


Fig. 1. Drainage jar assembly

4.2 *Stirrer*. The 150-mm stirrer shaft carries a three-blade, 5×1 mm (0.2×0.04 in.) propeller. The blades are circular, 17.5 mm ($\frac{11}{16}$ in.) in diameter and with a pitch of 30° . The stirrer must be centered in the jar and be free of wobble or vibration. The distance between propeller and screen is 3.2 mm ($\frac{1}{8}$ in.), set with a shim. The direction of rotation of the motor shaft must be counterclockwise so that the push of the propeller blades is downward toward the screen. The stirrer motor and control shall maintain 99% of set speed within the range of speed (50–3000 rpm) and torque used in the test. An integrally-wound motor-generator with servo feedback amplifier type motor drive has been found to be satisfactory. See Figure 2.

4.3 *Screens*. It is recommended that perforated metal plates supplied with equipment be used in this test. The holes in these screens have a conical cross section which is produced by electrodeposition of nickel. Screens furnished have a shiny side and a dull side. The shiny side of the screen is the designated hole size of the screen and is placed face up in the fractionator to minimize plugging.