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Determination of useful fiber in bagasse

Scope

This method describes a procedure for estimating the percentage of useful fiber, pith, and soluble matter in bagasse.

Pith and fiber occur in bagasse closely adhered together. Both of them, after swelling in water, become loose and can be effectively separated from each other by a washing and combining action on a sieve.

Safety precautions

There are no specific safety precautions for this method.

Apparatus

1. *Disintegrator*, see TAPPI T 205 "Forming Handsheets for Physical Testing of Pulp."
2. *Sieves*: (a) stainless steel or brass plate 0.79 mm (0.032 in.) thick with round perforations 1.5 mm in diameter and a pitch of 3 mm fixed in a square or round frame having a 15-cm (6-in.) side or diameter and wall depth of about 10 cm (4 in.), for washing the fibrous bagasse slurry to remove the pith and fines; (b) wire sieve, 300 mesh, at least 25 × 30 cm (10 × 12 in.), fixed over a frame and covered with fine muslin cloth to collect the pith and fines during washing of treated bagasse.
3. *Rubber tubing*, about 8 mm in diameter, connected to a domestic water supply.
4. *Other apparatus*: drying oven and balance.

Approved by a Working Group of TAPPI in accordance with the Useful Method Guidelines
TAPPI

Sampling

Collect a representative sample of raw or treated bagasse, about 25 g (dry) for each determination.

If prolonged storage of moist pulp is required, use a preservative such as cupric sulfate (crystal), at a level of 0.1 to 0.5 ppm based on dry pulp weight, will permit storage at 9°C for at least 18 months without changes in freeness, strength, and optical properties. The use of formaldehyde, glutaraldehyde, or similar preservatives is discouraged because of their potential carcinogenicity.

Procedure

Determine the moisture content, if not known, and disintegrate a known quantity of about 25 g (dry weight) in 2500 mL of water for 100,000 revolutions (about 33 min). Wash the slurry in small lots over the round hole sieve under a jet of water to wash all the adhering pith and fines from the fibrous portion, and collect the washings on the muslin spread over the large sieve.

NOTE 1: Manipulate the jet with the pressure of the forefingers to avoid any breaking of fiber yet to effectively remove the loosened fine material. Avoid vertical pressure over the fiber and maintain an angle of 45 to 60°, squeezing the tubing to form a jet.

Replace the fibrous portion in the agitator, dilute to about 1% concentration, and disintegrate for 60,000 revolutions (about 20 min).

Again wash the slurry and collect the washings retained on fast drainage filter paper or muslin cloth. Dry the fibrous portion retained in the round hole sieve and the retained washings in an oven to constant weight.

Weigh each portion separately

Deduct the total weight of the fibrous portion (first screen) and the washings (pith and fines on muslin) from the original weight of sample to obtain the weight of organic soluble matter and adhering fine dust present in the bagasse.

Calculate the percentage of fiber, fines, and soluble matter.

Report

Report the results to the nearest 0.1% (see Table 1).

Precision

Reproducibility is within 5%. The precision of this test is affected by unavoidable breaking of fiber into fines and the presence of some pith cells in the useful fiber portion.

Table 1. Analysis of fiber and pith in bagasse

<i>Useful fiber, %</i>	<i>Pith fines, %</i>	<i>Losses due to dust and soluble matter, %</i>
53.0	33.0	14.0
53.2	32.2	14.6
50.9	33.8	15.3
53.2	35.4	11.4
51.2	32.4	16.4
50.2	33.8	18.0
53.4	30.1	16.5