



## Method 1.5 - Official Methods: prepared cane fibre

### 1. Rationale

This method of direct fibre determination is not normally applied in South Africa since the fibre % cane is determined indirectly from the Brix and moisture of prepared cane (Methods 1.3 and 1.4).

### 2. Principle

In the case of whole stalk cane, the stalks must first be cut into billets approximately 70 mm in length and then put through the cutter grinder. Mill prepared cane is fed directly into the cutter grinder. A 500 g sample of the prepared cane is placed in an air-tight container for analysis.

### 3. Apparatus

- 3.1 Cutter grinder
- 3.2 Ultra-Turrax high speed extractor
- 3.3 Light duty balance
- 3.4 Sintered glass funnel (120 mm  $\phi$ , porosity 1)
- 3.5 Buchner flask (1 000 cm<sup>3</sup>)
- 3.6 Beaker (1 000 cm<sup>3</sup>)
- 3.7 Stirring rods
- 3.8 Spencer type oven (105°C)
- 3.9 Moisture tray with gauze base (pore openings 0.25 mm, 200 mm  $\phi$ )
- 3.10 Paint brush (50 mm)

### 4. Procedure

Place a clean dry beaker on the balance and zero the balance. Weigh  $200.00 \pm 0.01$  g of the prepared sample into the beaker. Transfer to the extractor container and add approximately 600 cm<sup>3</sup> of water. Extract for 5 minutes.

Transfer the extractor container contents to the sintered glass funnel and apply vacuum. Recycle the runnings twice through the fibre bed to remove any small suspended particles.

Wash the funnel and contents thoroughly with ten one litre aliquots of clean tap water, occasionally disturbing the fibre in the funnel during the washing process to reduce channelling. Finally rinse with one litre distilled water.

Allow the water to drain away under vacuum, squeezing the mat of fibre with a suitable plunger, *e.g.* the base of a 250 cm<sup>3</sup> beaker, to dewater it as much as possible.

Clean the moisture tray with the brush to remove all fibre particles and heat in the oven for 5 minutes. Place the heated tray on the balance and record the mass.

Transfer the fibre mat to the tray by blowing through the inverted end of the funnel. Brush out all adhering fibres, adding them to the tray. Break up the fibre mat on the screen and dry in the oven for 120 minutes.

Weigh the moisture tray and contents immediately after drying, and record the mass.

## 5. Calculations

The fibre % cane is calculated as follows:

$$\text{fibre \% cane} = \frac{M_2 - M_1}{200} \times 100 = \frac{M_2 - M_1}{2}$$

where  $M_1$        ≡       mass of empty moisture tray (g)  
       $M_2$        ≡       mass of moisture tray plus dry fibre (g)

## 6. Example

If

mass of empty moisture tray       =       300.00 g  
mass of moisture tray plus dry fibre =       328.00 g

then

$$\begin{aligned} \text{fibre \% cane} &= \frac{328.00 - 300.00}{2} \\ &= 14.00\% \end{aligned}$$

## 7. References

SASTA (1985). *Laboratory Manual for South African Sugar Factories*. 3<sup>rd</sup> Edition: 237 – 238.