

Production: BOILED SWEETS

Objective: Measurement of the hardness and fracturability of boiled sweets by penetrating

Type of action: Penetration test

Test setting:

Speed	Test mode	Trigger	Target	Hold
1 mm/s	Distance (c)	50 gf	4 mm	0 sec

Accessory:

φ2 mm cylinder probe, Platform

Sample Preparation:

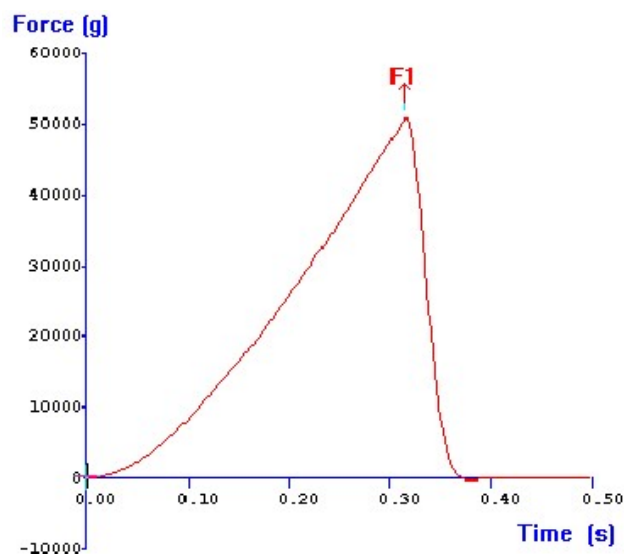
Allow the samples to equilibrate at controlled temperature e.g. 20C, then remove from the place of storage just prior to testing.

Test Set-Up:

Secure the Heavy Duty Platform on to the machine base. Place the sample on the blank plate of the Heavy Duty Platform and position centrally under the probe. Commence the penetration test.

NOTE: Samples should be shielded by a shatter screen before testing, to avoid potential injury on shattering.

Typical plots:



The above curve was produced from a boiled sweet, tested at 20C.

Observations:

The probe applies force until such a time that the surface of the sample shatters and the sample moves away from its path. At this point the force required to rupture the sample is seen as the maximum peak force which is an indication of the sample hardness. The distance at which this peak force occurs gives an indication of the fracturability of the sample, i.e. the shorter the distance at the peak the greater is the fracturability characteristic.

Data Analysis:

- ☒ Max Force
☒ Peak Distance

Results

Sample	Mean Max. Force 'Hardness' (+/- S.D.) (kg)	Mean Distance at Max. Force 'Fracturability' (+/- S.D.) (mm)
A	53.95 +/- 4.29	0.43 +/- 0.08

Notes:

- The Noise emitted during this test can be measured and analysed using an Acoustic Envelope Detector.
- If it is found that fracture does not take place due to the nature of the sample, e.g. it possesses flow characteristics, then the use of the distance comparison at the peak force becomes redundant.
- Storage, packaging and handling of the sample before testing are considered variable conditions under which the sample is tested. It is important to identify these conditions and keep them constant when reporting results of firmness tests for comparison purposes.
- When attempting to optimise test settings it is suggested that the first tests are performed on the hardest samples to anticipate the maximum testing range required and ensure that the force capacity allows testing of all future samples.