Production: BISCUITS

Objective: Hardness measurement of biscuits by cutting

Type of action: Cutting

Test setting:

Speed	Test mode	Trigger	Target	Hold
2 mm/s	Distance (c)	25 gf	5 mm	0 sec

Accessory:

Blade of Warner Bratzler, Platform

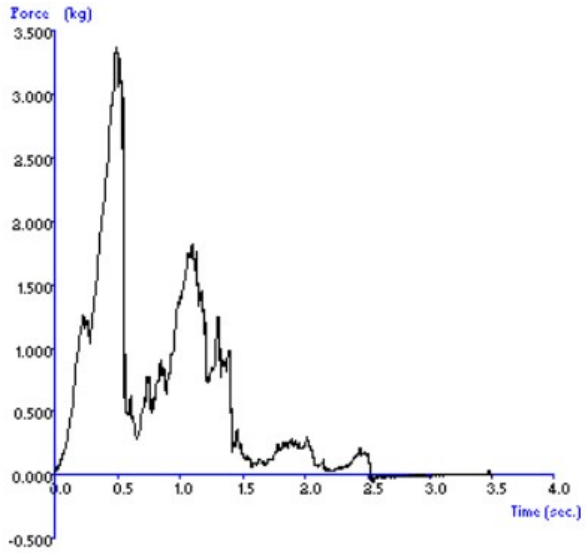
Sample Preparation:

Samples are removed from their place of storage just prior to testing. Samples may need to be cut to allow them to fit on the platform. For comparison purposes, sample dimensions should be noted and kept constant. The sample is then placed centrally under the Knife Edge.

Test Set-Up:

The Slotted Insert is secured on the Heavy Duty Platform. The Knife Edge is attached to the load cell carrier and lowered into the slotted insert. The Heavy Duty Platform is repositioned so that there is no contact between the blade and slot surfaces and a 'blank' test run as a check. The blade is then raised to allow placement of the sample.

Typical plots:



The above curve was produced from plain dough biscuits, tested at 20C.

Observations:
The maximum force reading (i.e. highest peak) is observed within the first second of the test. At this point the biscuit fractures into two major pieces. Force following this point is substantially reduced as the knife continues to penetrate through smaller broken pieces.

Data Analysis:
Max Force

Results

Sample	Mean Maximum Force 'Hardness' (+/- S.D.) (kg)
A	3.40 +/- 0.75

Notes:
- The Noise emitted during this test can be measured and analysed using an Acoustic Envelope Detector.
- In some varieties of biscuits the uppermost surface may be quite variable due to inclusions such as nuts. The trigger force may need to be increased slightly to avoid early triggering.
- Inclusions may also interfere with the fracturability and indeed may serve to strengthen the structure of the biscuit if in the line of the blade. The structure of the biscuits i.e. the presence of inclusions e.g. nuts may cause large fluctuations in the force. It is for these reasons that the variation of test results may appear to be quite high.
- Storage, packaging and handling of the sample before testing are considered variable conditions under which the biscuits are tested. These conditions should be identified and kept constant for comparison purposes.
- If the sample has a pattern/writing on the surface it should always be orientated in the same direction.
- 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.