Application manual No. 058

Production: MARZIPAN

Objective: Measurement of the hardness and stickiness of golden marzipan by penetration

Type of action: Penetration test

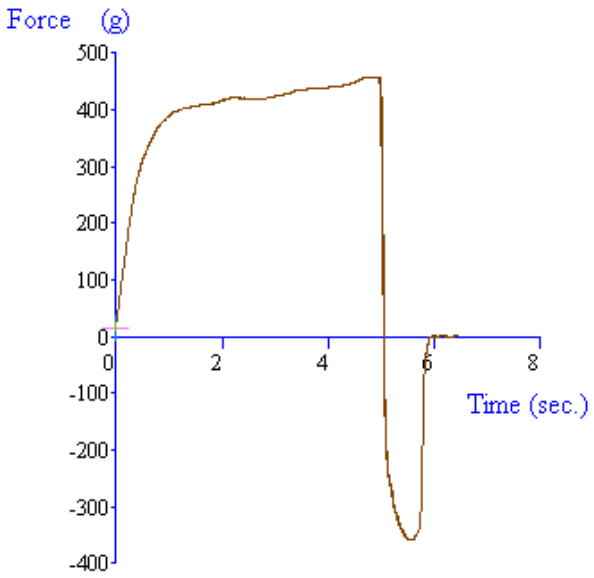
Test mode settings:

Speed	Test mode	Trigger	Target	Hold
2 mm/s	Distance (c)	3 gf	10 mm	0 sec

Accessory:
ϕ6 mm cylinder probe, Platform

Test Set-Up:
Secure the Heavy Duty Platform onto the machine base. Place the sample onto the blank plate of the Heavy Duty Platform. Due to the wide surface of the sample in comparison to the small probe size, a number of tests can be performed onto the same sample surface, providing they are done with enough distance apart and not too close to the edges.

Typical plots:



The above curve was produced from golden-type marzipan tested at room temperature.

Observations:
Once the probe triggers on the surface it then proceeds to penetrate to a depth of 10mm within the sample. At this point the force value is recorded and taken as a measure of 'hardness' of the sample. The probe then withdraws from the sample at which point the maximum (negative) force to withdraw or 'stickiness' is recorded. The curvature of the plot appears to indicate flow of the sample as the probe is penetrating to the required depth.

Data Analysis:

☒Max Force

☒Min Force

Results

Sample	Mean Maximum +ve Force 'Hardness' (+/- S.D.) (g)	Mean Maximum -ve Force 'Stickiness' (+/- S.D.) (g)
A	455.4 +/- 16.9	- 298.6 +/- 65.6

Notes:

- It may be necessary to modify the test to penetrate to a lesser/greater depth into the sample. This will subsequently decrease/increase the 'Hardness' values. Any values obtained are only relative at the specified distance to which they are penetrated.
- 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.
- Before performing the test, it may be necessary for the sample surface to be levelled-out by carefully flattening the rear side and having the smoothest side as the test surface.
- The probe is to be wiped between tests to remove any residue left upon it from the previous test.
- The Heavy Duty Platform is deemed advisable to prevent heat from the machine base transmitting into the sample and so possibly softening it. Heat transmission from physical handling is prevented by holding the sample within its' foil wrapper while transporting around.
- At the beginning of the tests' probe withdrawal stage (i.e. probe returning to start) the sample block may be slightly lifted-up. This can be prevented by physically holding it down.
- When attempting to optimize 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.