

**Production:** ICE CREAM WITH PARTICULATES

**Objective:** Hardness of Ice Cream containing particulates using a Multiple Puncture Probe

**Type of action:** Penetration test

**Test mode settings:**

Speed	Test mode	Trigger	Target	Hold
2 mm/s	Distance (c)	30 gf	50 mm	0 sec

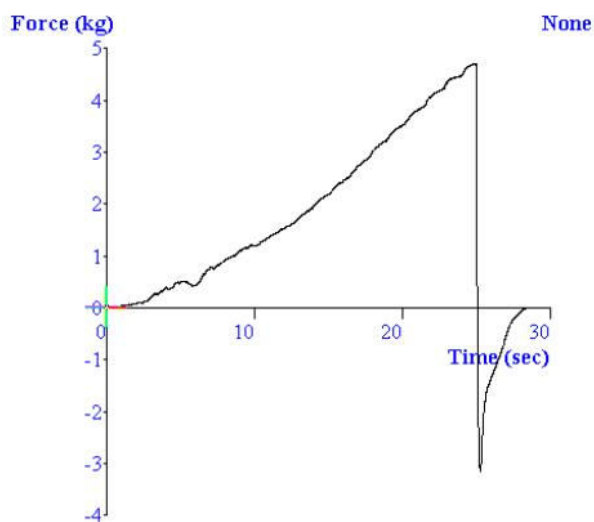
**Accessory:**

Multi-Penetration fixture (needle)

**Test Set-Up:**

Remove the samples from frozen storage just prior to testing. Position the sample under the probe over a region that has a relatively flat surface. Commence the penetration test.

**Typical plots:**



The above curve was produced from raspberry pavlova ice cream samples tested in containers with a diameter of 180mm and a depth of 60mm. The samples were tested immediately on removal from a freezer.

**Observations:**

Force is seen to gradually increase as penetration depth increases. The total force required to penetrate to a chosen depth, i.e. the total work/energy involved in penetrating the sample the firmer/harder is the sample.

**Data Analysis:**

☒Area (+)

**Results**

Sample	Mean Area 'Firmness' (+/- S.D.) (kg s)
Raspberry Pavlova Ice Cream	46.6 +/- 2.2

**Notes:**

- Depending on the regularity of the surface (i.e. the contents of the container may not have settled as a flat surface or particulates may sit unevenly on the surface), it may be necessary to increase the trigger force value slightly. This ensures that the test starts collecting data once there is full contact between the probe and product.
- Testing the product directly from the container in which it was originally dispensed is advised, so as not to delay testing where the sample may begin to melt. When comparing different samples ensure that the temperature, container size and the volume of the product dispensed are the same (and should always be specified) when reporting results.
- The distance of penetration to be set in the Test mode will depend upon the depth of the sample within the container, the depth of the container, and whether the chosen container is tapered towards the base or not. The chosen depth should be such that penetration probes do not come into contact (or indeed approach very close) to either the walls or the base during testing which could produce an erroneous result.
- During the tests' probe withdrawal stage (i.e. probe returning to start) the sample pot may be lifted-up. This can be prevented by physically holding onto the lip edges.
- 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.