

## Bagel Firmness by Compression, *AIB Standard Procedure*

### TVT Texture Analyzer

The TVT Texture Analyzer (Figure 1) offers rapid and objective analysis for different products. The following parameters can be characterized for your product category:

- Firmness
- Springiness

Both international standard methods as well as customer tailor-made profiles are available.



Figure 1: TVT Texture Analyzer

### Scope

- Determination of bagel crumb firmness by single cycle compression, AIB Standard Procedure (AIB).

### Method Description

The recording of the measurement data commences once the probe reaches the pre-set trigger force. The probe will then compress the sample to a pre-defined distance. After compression, the probe returns to its starting position.

### Calibration

Make sure the instrument is correct calibrated before the measurements. How to perform the calibration can be found in the User's Manual.

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Load cell (recommended) 5 – 10kg

#### Probe

P-CY18R, Cylinder probe 18 mm diameter, rounded edges stainless steel (Figure 2)  
Part number: 67.30.18



Figure 2: P-CY18R

## Profile settings

### Setting Parameter

Single Cycle Compression

|                                    |      |
|------------------------------------|------|
| Sample height [mm]                 | 26.0 |
| Starting distance from sample [mm] | 5.0  |
| Compression [mm]                   | 6.2  |
| Initial speed [mm/s]               | 2.0  |
| Test speed [mm/s]                  | 1.7  |
| Retract speed [mm/s]               | 10.0 |
| Trigger force [g]                  | 10   |
| Data rate [pps]                    | 200  |

## Sample preparation

Let new-baked bagels cool down for 1 hour in room temperature before being packed in double bags. Store the packed bagels in room temperature until further testing. Texture measurements are most commonly performed at day 1, 3 and 7 after baking. Slice the bagels in 26 mm thick slices (Figure 3a), preferably by using a template to ensure a correct thickness. Use ~5 bagels for every testing day. Place the sample on the measuring table below the probe (Figure 3b). Each bagel can be used for 3-5 measurements, resulting in 15-25 peaks per test day.

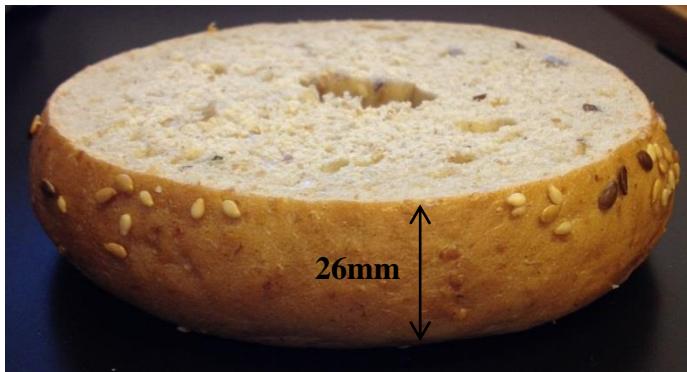


Figure 3: a, Sample size



b, Sample set-up

## Curve Description

In Figure 4 a typical Force-Distance curve is illustrated. The maximum peak<sup>+</sup> force value is here used for the firmness.

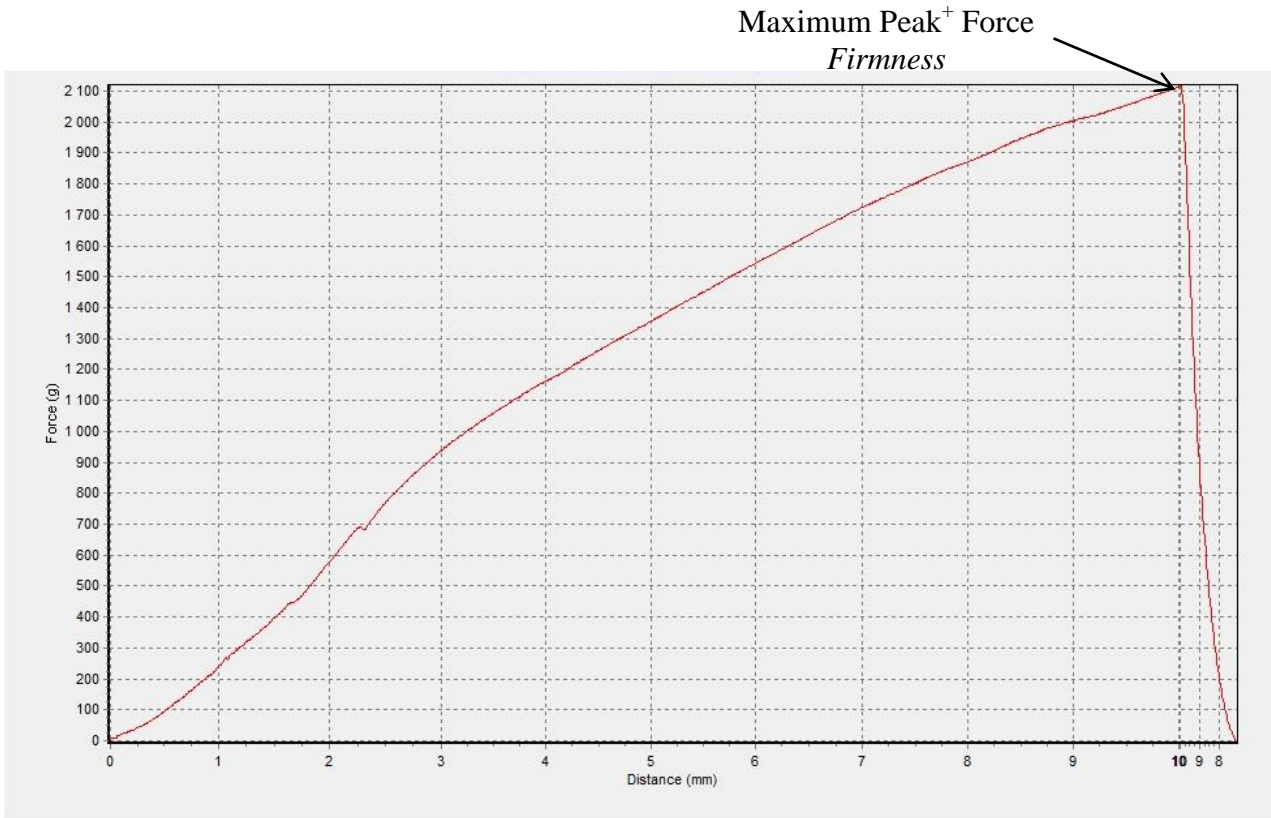


Figure 4: Compression of bagel crumb

## Data Analysis

The force required to compress the sample to a certain distance is here defined as firmness and can be measured in the units [g] or [N]. Except raw data (force, time and distance) the program also directly provides calculated results such as *mean value* and *standard deviation*.

## Reference

AIB Bagel Firmness Measurement. AIB - American Institute of Baking. Lab in Manhattan, Kansas.  
<https://www.aibonline.org/aibOnline/Documents/EN/DevelopYourProductSolutions/AIBTextureAnalysisProcedures.pdf> (2017-03-01)