

Hamburger Bun Crust Toughness, *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
- Toughness
- Springiness

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



Figure 1: TVT Texture Analyzer

Scope

- Determination of hamburger bun crust firmness and toughness by single cycle puncture test, 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 puncture the sample to a pre-defined distance. After puncture, 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.

Load cell (recommended) 5 - 10 kg

Probe

P-CY03S, Cylinder probe 3 mm diameter, stainless steel
(Figure 2)

Part number: 67.30.03



Figure 2: P-CY03S

Profile settings

Setting Parameter

Single cycle compression

Sample height [mm]	40.0
Starting distance from sample [mm]	5.0
Compression [mm]	5.00
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 buns cool down for 1 hour in room temperature before being packed in double bags. Store the packed buns in room temperature until further testing. Texture measurements are most commonly performed at day 1, 3 and 7 after baking. Use 2-5 buns for every testing day. Place the bun sample on the measuring table and center it below the probe, Figure 3. Each bun can be punctured several times depending on the size of the bun.



Figure 3: Sample set-up

Curve Description

In Figure 4 typical Force-Time curves are illustrated. The first peak⁺ in the curves is associated with the crust, while following peaks are related to the crumb. The first maximum peak⁺ force value, here defined as the firmness of the crust, is used in the AIB standard procedure. The distance to the first maximum peak⁺ force is here defined as the toughness of the crust. As seen in the graph, sample C has tougher crust than sample A and sample B although the firmness is less. The crumb firmness is depending on the penetration depth. This method it is only measuring the crumb closest to the crust area.

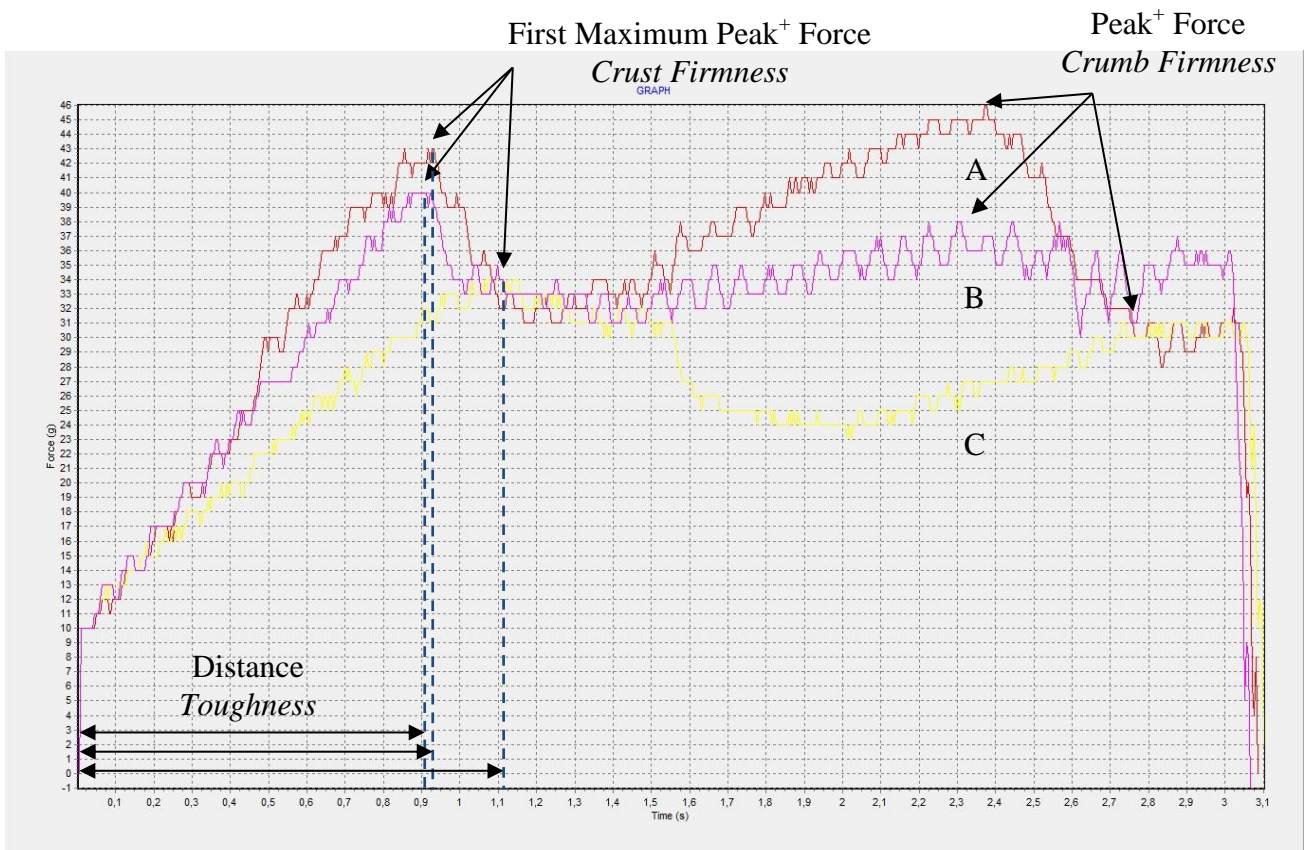


Figure 4: Puncture of hamburger crust

Data Analysis

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

Reference

AIB Hamburger Bun Crust Toughness. AIB – American Institute of Baking. Lab in Manhattan, Kansas.

<https://www.aibonline.org/aibOnline/Documents/EN/DevelopYourProductSolutions/AIBTextureAnalysisProcedures.pdf> (2017-03-01)