Cooked Rice Firmness & Stickiness, by Compression

**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
- Stickiness

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

**Figure 1: TVT Texture Analyzer**

**Scope**
- Determination of firmness and stickiness for cooked rice by single cycle compression.

**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 – 10 kg**

**Probe**
- P-Cy35S, Cylinder probe 35 mm diameter, stainless steel
(Figure 2)
- Part number: 67.30.35

**Figure 2: P-Cy35S**
Profile Settings

Setting Parameter

Single Cycle Compression

Sample height [mm] 3.0
Starting distance from sample [mm] 5.0
Compression [%] 90.00

Initial speed [mm/s] 0.5
Test speed [mm/s] 0.5
Retract speed [mm/s] 10.0

Trigger force [g] 5
Data rate [pps] 333
Adhesiveness Marked ✔

Sample preparation

Cooking, cooling and other preparation and handling of the product are critical actions for the outcome of the results. In order to compare different samples, these procedures needs to be kept constant and well documented. Place the sample (3 grains of rice) on the measuring table centered below the probe and commence the test, Figure 3. Work quickly, since contact with air dries out the rice and increases the firmness.

Figure 3: Sample set-up

Curve Description

In Figure 4 typical Force-Time curves are illustrated. The maximum positive peak force value is here used for the hardness while the peak value of the negative peak is the stickiness of the rice grains. Distance to maximum peak force give information about the size of the grains. As seen in the graph, variety A rice grains were smaller, slightly less hard and more sticky than the variety B rice grains.
Data Analysis
The force required to compress the sample to a certain strain of the sample height is here defined as hardness while the force required for withdraw of the probe is the stickiness. These parameters can be measured in the units [g] or [N]. In addition, the ratio between the positive and negative force gives a texture property often used within the rice industry. Except raw data (force, time and distance) the program also directly provides calculated results such as mean value and standard deviation.