Biscuits & Cookie Dough Hardness & Adhesiveness by Penetration

**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:

- Hardness
- Adhesiveness
- Stringiness
- Stickiness

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

![Figure 1: TVT Texture Analyzer](image)

**Scope**
- Determination of hardness, adhesiveness, stringiness and stickiness of biscuits and cookie dough by single cycle penetration test.

**Method Description**
The recording of the measurement data commences once the probe reaches the pre-set trigger force. The probe will then penetrate the sample to a pre-defined distance. The probe will return to its starting position once the pre-set distance is reached.

**Calibration**
Make sure the instrument is correct calibrated before the measurements. How to perform the calibration can be found in the User’s Manual. **Note** The penetration distance may need to be adjusted to a greater depth which subsequently increases the hardness. Do not increase to more than 75% of the depth of the sample.

<table>
<thead>
<tr>
<th>Load cell (recommended)</th>
<th>5 - 10 kg</th>
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</thead>
<tbody>
<tr>
<td><strong>Probe</strong></td>
<td></td>
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<tr>
<td>P-CY06S, Cylinder probe 6 mm diameter, stainless steel (Figure 2)</td>
<td>Part number: 67.30.06</td>
</tr>
</tbody>
</table>

![Figure 2: P-CY06S](image)
Profile settings

Setting Parameter

Single Cycle Compression

Sample height [mm] 30.0
Starting distance from sample [mm] 5.0
Compression [mm] 20.00

Initial speed [mm/s] 2.0
Test speed [mm/s] 3.0
Retract speed [mm/sec] 10.0

Trigger force [g] 5
Data rate [pps] 200
Distance above trigger [mm] 5.0
Adhesiveness Marked ✓

Sample preparation

Prepare the dough according to a set standard and place a certain amount (e.g. 100g) of dough centrally under the probe. Always keep the treatment and amount of dough similar for all samples since the degree of handling and preparation are critical points that influence the results. If the same sample is used for several punctures, make sure the holes are well spread and separated. **NOTE** Air bubbles and an uneven dough surface could lead to variations in the results. It is also suggested to start with the hardest samples to anticipate the force range for the testing.

Curve Description

In Figure 3 Force-Time curves are illustrated. The maximum peak force indicates the hardness of the dough at the pre-set penetration depth while the area under the peak is the work of penetration. The maximum of the negative peak indicates the stickiness of the sample and the area of the negative peak is a result of the adhesion.

![Force-Time curve](image)

Figure 3: Puncture curves of cookie dough with two different fat contents.

Data Analysis

The force required to penetrate the sample to a certain distance and withdraw to the starting position 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**.