

## Margarine Firmness 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:

- Firmness
- Cutting Force
- Consistency
- Stickiness

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



Figure 1: TVT Texture Analyzer

### Scope

- Determination of margarine firmness 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. After penetration, 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-CY05S, Cylinder probe 5 mm diameter, stainless steel  
(Figure 2)

Part number: 67.30.05



Figure 2: P-CY05S

## Profile settings

### Setting Parameter

Single Cycle Compression

Sample height [mm]	60.0
Starting distance from sample [mm]	5.0
Compression [mm]	12.00
Initial speed [mm/s]	1.0
Test speed [mm/s]	2.0
Retract speed [mm/s]	2.0
Trigger force [g]	5
Data rate [pps]	200
Adhesiveness	Marked <input checked="" type="checkbox"/>

## Sample preparation

Take the samples from their packaging just before testing and place under the probe, Figure 3. Work quickly, since the sample is sensitive for the surrounding temperature. If the same sample is used for several measurements, make sure that there is sufficient space between the penetration points. Storage, temperature and handling of the samples might influence the result and should thereby be kept constant.



Figure 3: Sample set-up

## Curve Description

In Figure 4 a typical Force-Distance curve is illustrated. Maximum peak<sup>+</sup> force is here defined as the firmness of the sample, while the compression area is the total work of penetration. It is here clearly shown that the curve changes its slope at a distance of 2.7 mm which is a result of a dryer surface- and outer layer region as compared to the rest of the product. In this graph, not only the maximum firmness can be of interest but also the slopes, surface hardness, adhesiveness and stickiness.

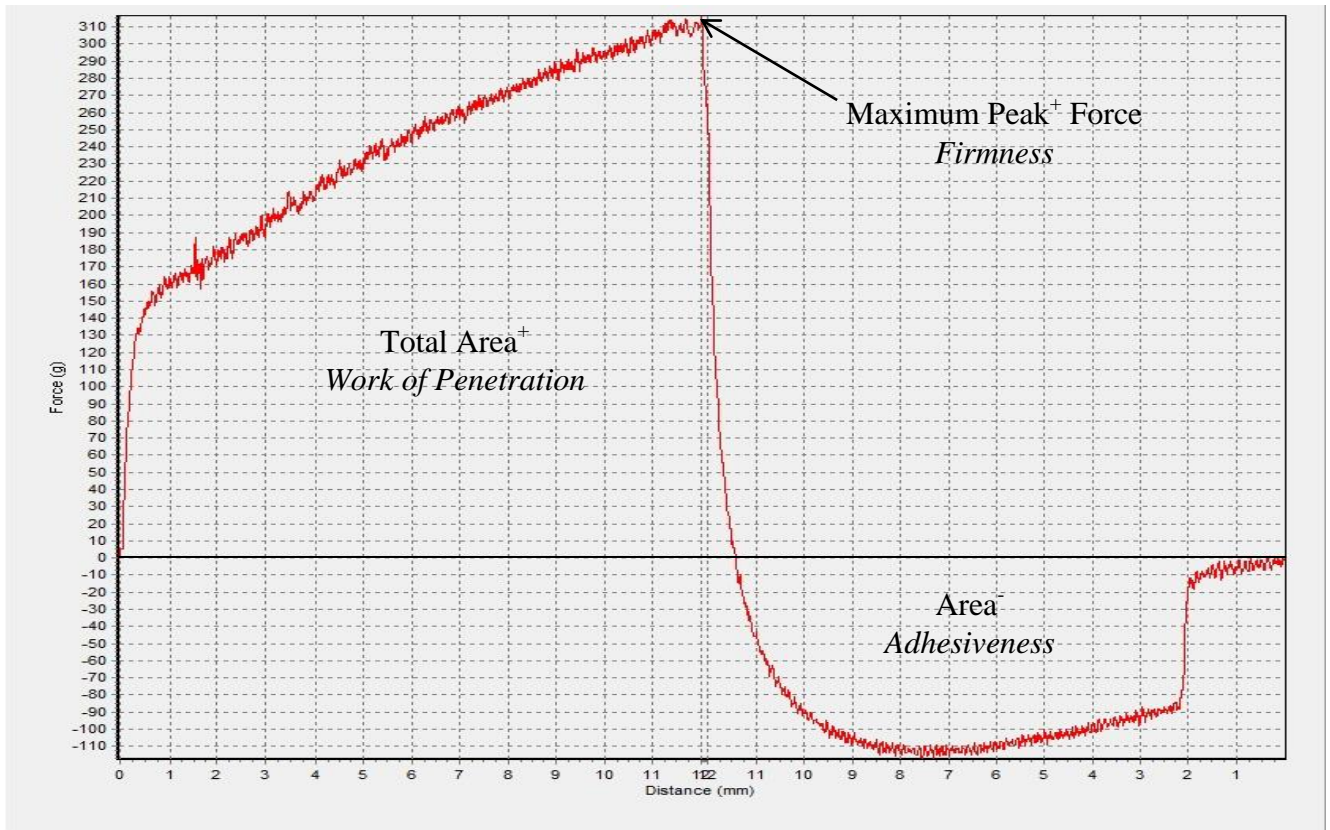


Figure 4: Penetration test of margarine

### Data Analysis

The force required to penetrate 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*.