# Chocolate Hardness & Fracturability by 3-Point Bend

## 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
- Fracturability

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

Figure 1: TVT Texture Analyzer

## Scope

- Determination of hardness and fracturability of chocolate by single cycle breaking test.

## Method Description

The recording of the measurement data commences once the probe reaches the pre-set trigger force. The force will then increase until the sample fractures. After fracturing the sample, 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)** 10 kg

**Breaking Rig Set**
Part number set: 67.50.45

*Consisting of:*
P-BP70A, Break probe 70 mm,
aluminum (Figure 2a), Part Number: 67.11.70

R-TPBR, Three point bend rig (Figure 2b)
Part Number: 67.50.40

Figure 2a: P-BP70A

Figure 2b: R-TPBR

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## Profile settings

| Setting Parameter | |
|---|---|
| Fracturability | |
| Sample height [mm] | 8.0 |
| Starting distance from sample [mm] | 5.0 |
| Initial speed [mm/s] | 2.0 |
| Test speed [mm/s] | 2.0 |
| Trigger force [g] | 20 |
| Data rate [pps] | 200 |

## Sample preparation

Choose the gap carefully between the support plates so that they support the sample. A too long gap might cause the sample to fall down and too short causes a penetration of the sample instead of a bending. Both sample diameter and support rig distance should be kept as constant as possible for comparability of the samples. Take the sample from the package just before testing and place it on the support plates. Samples with squares or surface pattern should always be placed in the same direction/orientation, Figure 3. Storage and handling temperature of the samples might influence the result and should thereby be kept constant.

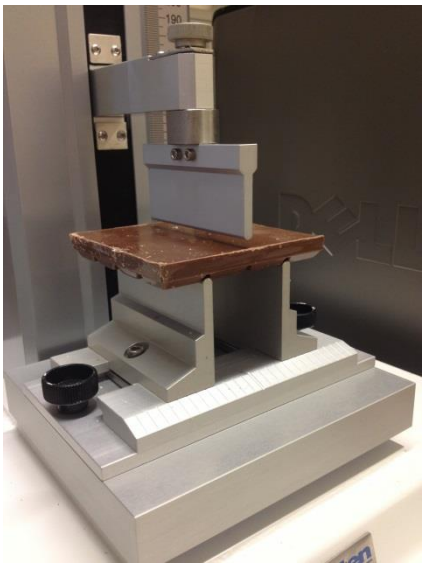

Figure 3: Sample set-up

## Curve Description

In Figure 4 typical Force-Time curves are illustrated. Maximum peak$^{+}$ force is here defined as the hardness of the sample, while the distance to the hardness is the break resistance.

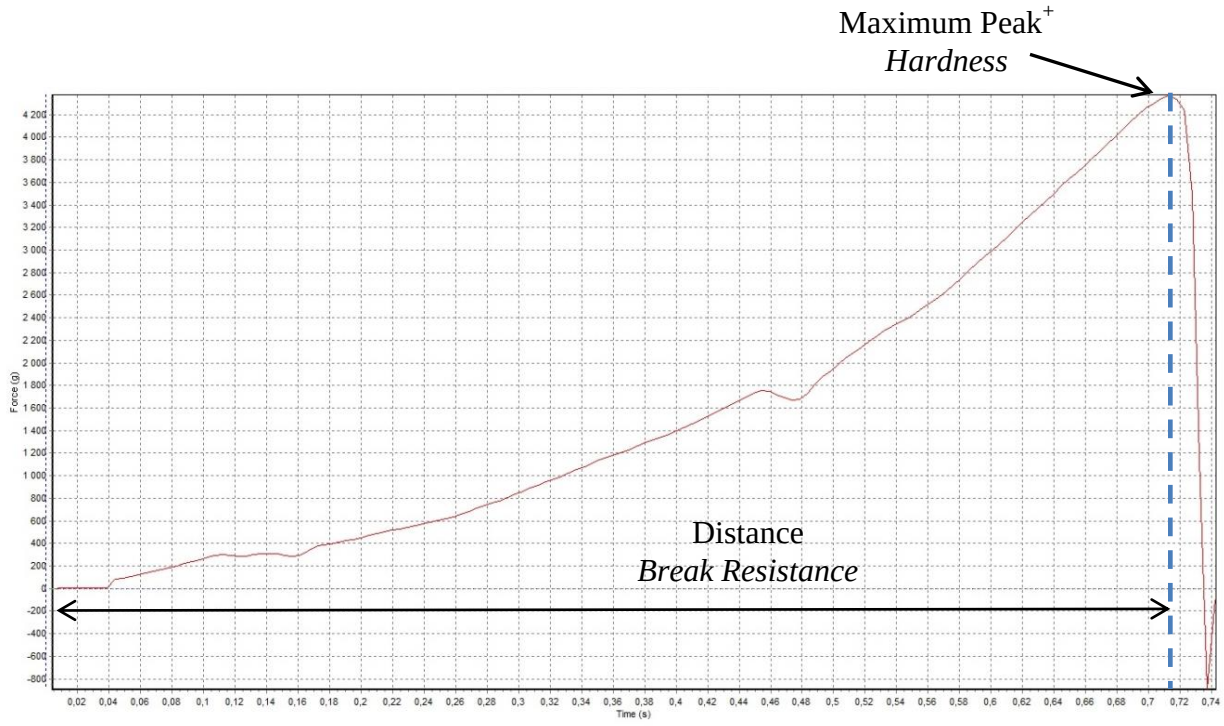


Figure 4: 3-Point break test of chocolate

## Data Analysis

The force required to penetrate the sample to a certain distance is here defined as hardness 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***.