

Fruit quality - Firmness Firmtech FT7



Firmtech FT7

check the firmness of soft-fruit:

- quick test - non-destructive - easy to use

Firmtech –Principles

The Firmtech has been developed as a tool for the rapid evaluation of firmness of soft fruit. The idea is as good as it is simple – fruit are tested similarly to how a consumer might test fruit with his fingers before buying them in the supermarket. The Firmtech gently squeezes the fruit to determine firmness. When a fruit is squeezed by the instrument load cell the force increases. The rate at which the force (grams) increases per unit of deformation (mm) is defined as firmness (grams/mm). A firmness measurement of 200 g/mm would mean that if a force of 200 grams is placed on the fruit, it would deflect 1 mm.

The Advantage of the Firmtech is its objectivity and reproducibility of firmness measurement – an important fact for quality control management.

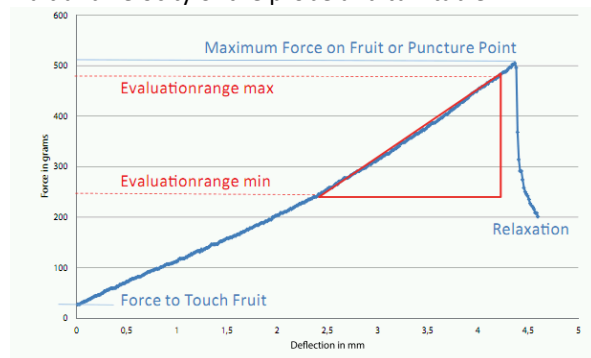


Firmtech - Instrument

Firmtech is a precise laboratory measuring instrument. Two stepper motors control turntable and load cell movement. The turntable, suitable for 25 fruits, processes test series with 50 fruits within 2 min.

Control-Soft – Controlling

Fruits are automatically tested using Windows custom program. Depending on your aim of the test you can choose between several different procedures and set up suitable parameters like maximum force on the fruit and velocity of the probe and turntable.



- **Compression Proc. (Force thresholds)**

This procedure uses a maximum force threshold. The Firmtech squeezes the fruit to a specified force and determines firmness.

- **Compression Proc. (Deflection thresholds)**

This procedure uses a maximum deflection threshold. The Firmtech squeezes the fruit to a specified deflection and determines firmness.

- **Puncture**

Firmtech detects the pressure of destroying the skin. You should use special probe suitable for your object.

- **Relaxation Procedure**

Fruit are compressed according to the max. force procedure. The probe keeps this position for a certain time (maximum 1 sec), resulting in an inelastic remodeling of the fruit. This gives a force drop and is detected by the Firmtech.

- **Size measurement (optional)**

Height above table can be measured at the same time as firmness.



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Firmtech - Applications

Although the Firmtech has been developed for cherries, it is suitable for a large number of other things. The standard setup can be used for a number of soft objects which yield to a measurable amount of deformation when compressed with a maximum force of 5000g.

The Firmtech can be used for non-destructive testing of:

- cherries
- blueberries
- radish
- plums
- cherry-tomatoes ...

Since there is no protecting skin, it can be used as a destructive system for:

- strawberries
- raspberries
- blackberries ...

Or you can think of really other objects – Limited only by your imagination, many other items have potential for testing:

- mushrooms
- rubber balls
- jelly babies
- olives ...

Depending on the application, the turntable and the probe can be made suitable for many different types of fruit or specimens.

Fruit-Soft – the database for post harvest control

Fruit-Soft manages all information you may add to your firmness test in an easy-to-use database and defines unequivocal datasets, characterized by sort/variety – supplier/farmer – plant – orchard – delivery-no. – picking date.

Nr.	Firmness	Height
7	210	24,4
8	234	28,5
9	201	30,1
10	225	26,5
11	294	29,1
12	241	32,1
13	209	28,9
14	304	31,6
15		
16		
Mean	241	29,1
Min	201	24,4
Max	309	32,1
Reference	300	30,0

The last results from Firmtech instruments can be entered in the database with a single key stroke.

Additional to the firmness data you can enter the following data via keyboard to your dataset:

- Color measurements
- Size, Height
- Holding-Force between cherry and stem
- Acid, Sugar
- Store temperature and storeroom

This list can be adapted to your special task. An automatic statistic function calculates mean, minimum, maximum, standard deviation and median from all data series. The color values will be sorted according the most frequently value.

Each dataset can be completed with a detail form, where you can enter physical properties and diseases, taste characters and other particular information. Free space is provided for the harvest consultant to enter his evaluation.

Finally all important data of one measurement series are printed out on a control form (certificate) with only one click on the screen. We can easily adapt the layout from your companies standard form.

The data can be exported with a clear data selection query window (e.g. all data from one orchard measured in the last years), thus keeping your experiences useful for yourself and for others.

The software is available in German and English.

Technical information:

- Size: 360 x 400 x 360 mm (WxLxH)
- Weight: 5 kg
- Power supply: 5V (power unit included)
- Step resolution: stepping motor 0,001 inch/step
- Measuring range: max. 5000 g +/-0.1%
- Vertical distance: max 31mm
- Velocity: about 50 fruits in 2 min.
- Turntable change: cherry table 25 indentures
plum table 12 indentures
blueberry on side
- Probes to change: Flat probe (default)
Puncture probe cherry
Puncture probe grape 0.16mm