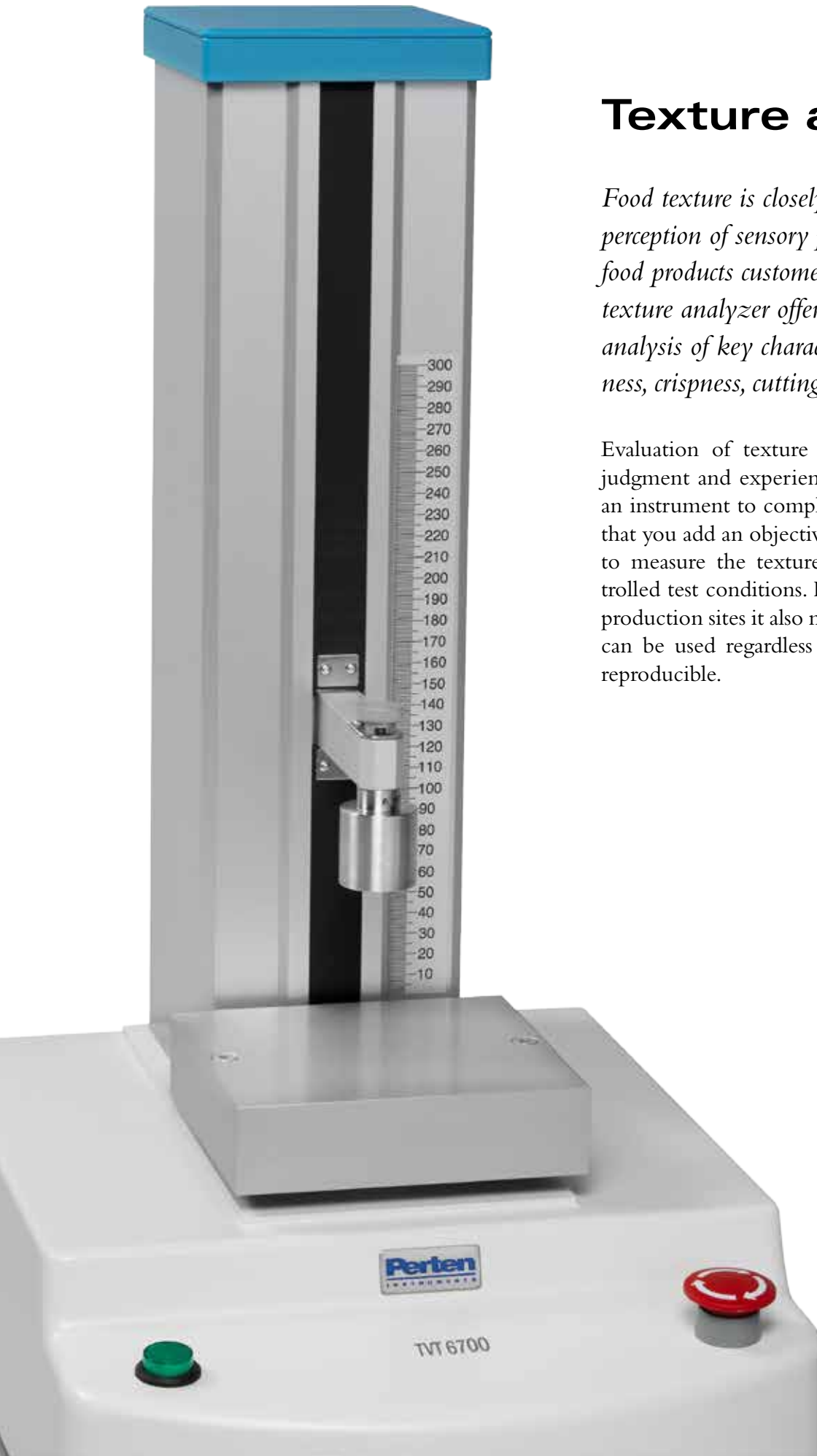


Texture Analyser

TexVol TVT 6700

Texture analysis made simple





Texture analysis

Food texture is closely linked with customer perception of sensory properties and hence with food products customer value. The TVT 6700 texture analyzer offers rapid and objective analysis of key characteristics, including firmness, crispness, cutting force and elasticity.

Evaluation of texture is often based on sensory judgment and experience. The advantages of using an instrument to complement sensory evaluation is that you add an objective, fast and cost efficient way to measure the texture in well-defined and controlled test conditions. For producers with multiple production sites it also means that the same methods can be used regardless of location, and results are reproducible.

*Efficient, easy
and productive*

TVT 6700 Series

This powerful yet easy-to-use texture analyzer can be used for a variety of tests on different products and materials. It ensures an efficient, easy and productive manner to objectively describe texture.

The instrument can compress, pull, or cut samples, and accurately measures position and force over time to describe textural properties of food products. Force data are stored in tables and displayed as graphs. The TVT software is intuitive, easy-to-use and doesn't require texture analysis expertise to provide valuable information, but still allows for extensive analysis of results.

Features and Benefits

Objective Analysis - The TVT provides fast, simple and objective evaluation of physical properties. Results are reproducible and will be the same regardless of operator.

User-Friendly - The comprehensive but easy-to-use software, allows operators to use the instrument immediately after installation. The TVT comes delivered with pre-installed standard curves and starter methods, and doesn't require expertise in texture analysis or rheology.

Easy Data Access - The TVT stores data in a database, and using the software you can at any time search, sort and filter to find exactly the data and results you need. The software also makes

it very easy to export any data and results to other applications such as spreadsheet programs or report software.

Rugged - The robustness of the instrument makes it equally suitable in laboratory or production line settings.

Versatile - Many sample testing attachments available for a wide range of products – solids, gels, crackers, baked goods, noodles and much more.

Configurable - Measure standard parameters or report in-house/customized terms developed by your R&D or customers. Create your own lexicon.





Gel

Confectionary



Bakery



Fruits

Applications

The TVT series of instruments are suitable for a wide range of applications. A variety of accessories are available for testing of different types of products. To get the most information on your samples the instrument can be set for different test modes, such as Single cycle, Multiple cycles, Hold until time, Fracturability, Tensile, Adhesiveness and Springback.

Regardless of the type of product you need to test and which characteristics that are necessary to determine, the TVT is very easy to use and results are easily interpreted and transferred to other software.

Texture characteristics

- | | |
|--------------------------|-------------------------|
| Hardness/Firmness | Rupture/Break |
| Relaxation | Force |
| Springiness | Crispness |
| Resilience | Brittleness |
| Adhesiveness | Chewiness |
| Cohesiveness | Gumminess |
| Stickiness | Tensile strength |
| Fracturability | Extensibility |
| Bending capacity | |



Vegetables

Bakery

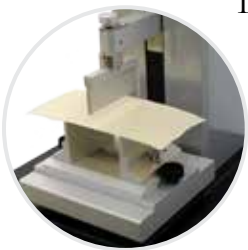
Analyze dough as well as finished products to ensure the right quality and characteristics, and to minimize rework and scrapping in production:

- Dough extensibility
- Bread firmness and staling rate
- Crispness of crackers and cookies



Use standardized methods (AACC and AIB) as well as generic or customized ones.

Pasta and noodles



Test cooked and dry pasta and noodle products to verify that every batch meets specifications. Using a TVT you can get information to complement your sensory experts and panel – in less than a minute:

- Cutting and shearing
- Firmness and adhesiveness
- Elasticity and break strength
- Fracture test

A number of probes and test profiles are available for pasta and noodle testing.

Fruits and vegetables

The TVT is suitable when breeding, producing, buying and processing fruits and vegetables. It can determine a range of characteristics, including:

- Ripeness
- Bruising
- Crispness
- Flexibility

Dairy products

In dairy products texture, consistency and mouth-feel are extremely important. A texture analyzer enables you to verify the key characteristics of most dairy products:

- Firmness and spreadability of butter and margarine
- Firmness in hard cheese
- Hardness, stickiness and spreadability of soft cheeses
- Consistency testing of yoghurt, ice-cream and similar products



Meat, fish and egg

Test firmness, toughness, cutting force, tensile strength and more in a wide range of products.

Confectionary

Determine hardness, flexibility and tensile strength of candy and stringiness of syrups.

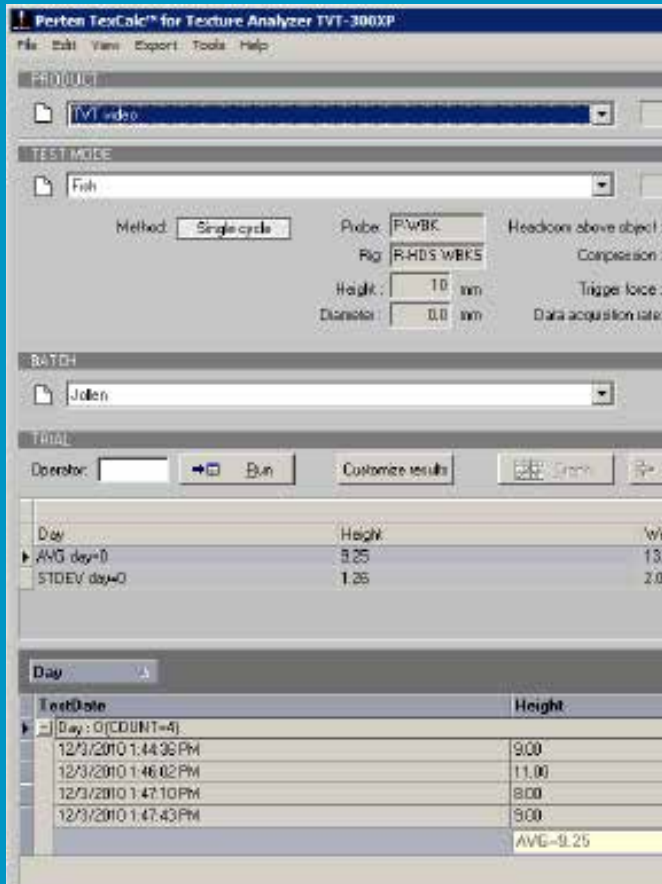
Other applications

The TVT is used in a wide range of applications. Please consult with Perten Instruments regarding your requirements.



Pasta & noodles

- 2.
- 3.
- 4.
- 5.
- 6.
- 6.



How the instrument works

The TVT texture analyzer is extremely easy to use, and requires very little training. Anyone can use the instrument, and new operators will confidently analyze samples after just a few minutes.

1. Attach suitable accessory to the instrument (depends on application) and place the sample on the instrument
2. Select a Product
3. Select a Test Mode
4. Select/Add a Batch
5. Start the measurement. Force is applied to the product either by pulling or compressing it and the force is plotted as a function of time or distance
6. Test results are shown on screen with statistical information calculated automatically. All test results and measurement data can easily be exported to a spreadsheet program for further analysis.

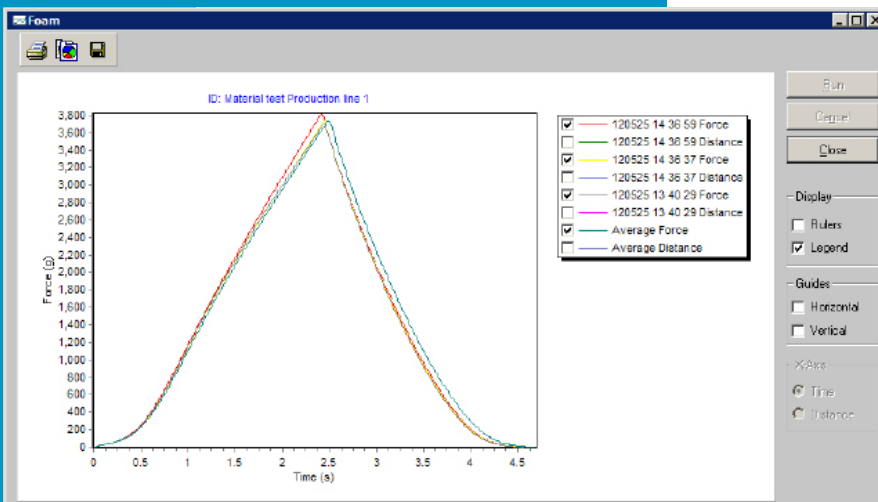
How to view the results

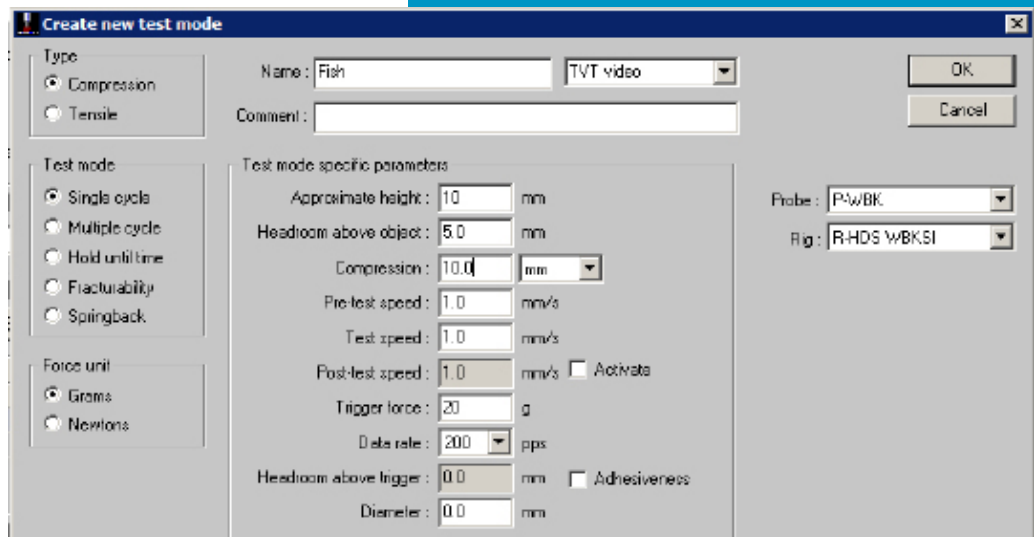
Statistics are automatically calculated for the results. Sort the results on the screen. Choose which results to be shown on screen by dragging them to and from the Customize box.

Several graphs can be shown in the same window for comparison.

It is possible to add specific information to a batch by adding a comment. E.g. if different enzymes are used in the batches to the same Product name, it is possible to specify which enzyme that is used before starting the test.

For further processing of the data, you can transfer it to a spreadsheet software.

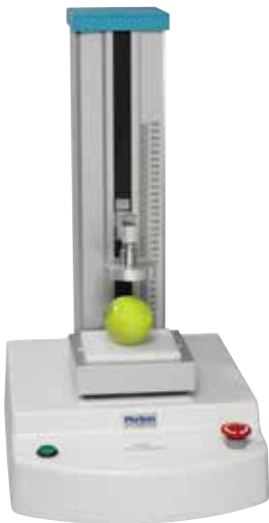




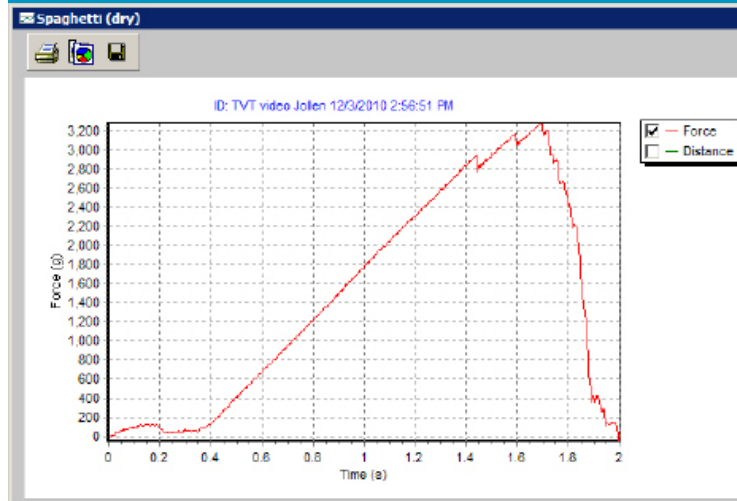
Setting up new products

The TVT software includes a number of selectable starter methods. You can also set up your own measurement profiles, with settings that allow you a “SOP”-Standard Operating Procedure and give the results you need from your samples.

Compare a stored standard profile with your result curve in order to visualize the accepted variation. After the measurement several curves can be overlaid in order to identify abnormal results.



Place the sample on the instrument.



Accessories - rigs and probes

A wide range of rigs and probes are available, and a few examples are listed below. We also offer customization and can develop accessories according to your requirements.

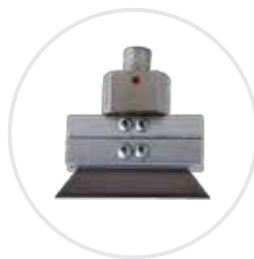


Cylinder probes and compression plates

Cylinder probe is most commonly used for compression and puncture test. Compression plates are used for back and forward extrusion of a product.



Spherical and conical probes Conical probes are used to test the spreadability of plastic products, spherical probes are used for sensitive products for a gentle compression.



Break and knife probes Used for the fracturability and break strength, firmness, hardness and cutting force.

Technical Specifications

Two configurations are available based on the load cell requirements. The TVT 6700 is supplied with load cells ranging from 5 to 100 Kg. The load cell should be selected to correspond to the estimated maximum force the test will apply to the product or range of products.

Max Product Height: 300 mm

Dimensions (HxWxD), Net Weight: 64x34x44 cm, 24 kg

Load Cells/Force Range: 5, 10, 15, 20, 30, 50 or 100 kg

Force Resolution: 1 gf (grams-force)

Force Accuracy: <0.025% C_n *

Speed Range: 0.1-30 mm/sec

Speed Accuracy: 0.03% at 5 mm/sec

Position Accuracy: ± 0.02 mm

Precision (RSD_r^{}):** $\leq 0.5\%$

Power Requirements: 110-240 V, 50 - 60 Hz

* Total combined error (C_n) = Maximum output deviation between the calibration curve and the ideal straight line calibration, % full scale

** Relative Standard Deviation within-instrument repeatability

PC Requirements

Operating System: Windows 2000, XP, Vista, Win7

Processor: 1.6 GHz

Memory: 512 Mb RAM

Hard Drive Space: 100+Mb

Graphics Card: DirectX 8 compatible 3D card.

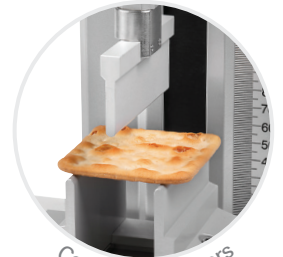


Texture Analyzer

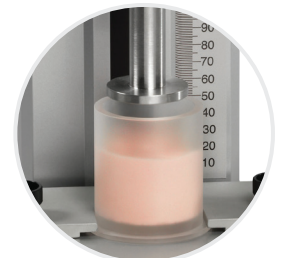
TVT 6700



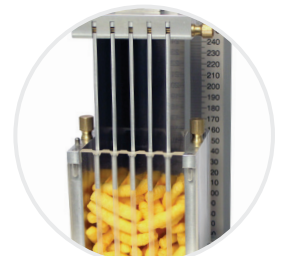
Bread



Cookies & Crackers



Dairy



Snack Food

Texture Analysis Made Easy

Texture Analyzer TVT 6700

Evaluation of texture is often based on sensory evaluation and experience. The TVT 6700 texture analyzer is rapid, objective and more sensitive and reproducible than subjective sensory judgement. The TVT 6700 applies controlled conditions of stress or strain to food and other samples to measure a complete texture profile. It accurately measures compressive and tensile force and position over time using standard test modes including single and multiple cycle compression, tensile strength, compress-and-hold, extend-and-hold, fracturability and springback to describe product texture. Data is captured as a graph and stored in a tabular database for analysis and export to spreadsheet programs. The TVT 6700 texture analyser is user-friendly, efficient and versatile, with rigs and probes to quantify textural properties of a range of food products and materials.

Features and Benefits

Simple: A single model suits the needs of the food industry.

User friendly: Easy to use, standard test routines and starter methods in software.

Objective: Sensitive, accurate and reproducible complete texture profiles.

Powerful software: Comparison graph overlay, customizable analysis and report options, automated statistical calculations, flexible data export to spreadsheet programs, graph export.

Rugged: Robust design suits laboratory and production environments.

Versatile: Standard and custom tests for hardness/firmness/softness, fracturability (brittleness), cohesiveness, adhesiveness/stickiness, springiness (elasticity), chewiness, gumminess, stringiness/shortness.

Cost Efficient: Reduce the need for sensory panels.

Applications

Quality control of raw materials, in-process and finished products; formulation and process development; evaluate ingredient and processing changes; monitor changes during storage and transport; imitate chewing and consumer handling.

Accessories

Cylinder probes: Compression, adhesiveness, puncture of solid foods (bread, cake, cookies, breakfast cereals, candy, marshmallows, beans, fruits, vegetables, eggs, cheese, meat).

Compression plates: Compression-extrusion testing of viscous liquids (yoghurt, custards, puddings), irregular shaped products (pasta), gels, fats, fresh & processed beans, fruits, vegetables.

Spherical probes: Compression and penetration of soft products (fish, butter, solid fats).

Conical probes: Compression and penetration of plastic and soft products (spreading of butter).

Knife blades, wires, break probes: Cutting force (shear) and hardness of solid foods (meat, sausage, flat bread, spaghetti, noodles, vegetables) and bending-snapping (cookies, potato chips, fruits, vegetables). Kramer Shear Cell for bulk bite test (crush & shear).

Clamps, roller grips: Tensile strength, stickiness and adhesion (processed meats, dough, cheese, noodles). Also for packaging and packaging materials.

Technical Specifications

Max Product Height: 300 mm

Dimensions (HxWxD), Net Weight: 64x34x44 cm, 24 kg

Load Cells/Force Range: 5, 10, 15, 20, 30, 50 or 100 kg

Force Resolution: 1 gf (grams-force)

Load Cell Accuracy: <0.03%

Speed Range: 0.1-30 mm/sec

Speed Accuracy: 0.03% at 5 mm/sec

Position Accuracy: ± 0.02 mm

Precision (RSD_r*): $\leq 0.5\%$

Power Requirements: 110-240 V, 50 - 60 Hz

Computer Requirements: PC with Windows Vista, Win7 or Win8 operating system, DirectX 8 compatible 3D Graphics card, 1 RS 232 com port, 1 USB com port, 1.6 GHz CPU, 512 Mb RAM, hard disk space for data files (>100Mb recommended).

* Relative Standard Deviation within-instrument repeatability

Perten
INSTRUMENTS

Analysis with Value

www.perten.com

Accessory List

TVT Texture Analysis



Rigs and Probes for Optimal Texture Analysis

Accessories

TVT

Probe Kits



Bread & Cake Products Probe Kit, consisting of:

Cylinder Probe, 3mm Diameter, SS	67.30.03
Cylinder Probe, 5mm Diameter, SS	67.30.05
Cylinder Probe, 18mm Diameter, SS, Radius	67.30.18
Cylinder Probe, 21mm Diameter, Alu, Radius	67.01.59
Cylinder Probe, 25mm Diameter, SS	67.30.25
Cylinder Probe, 25mm Diameter, SS, Radius	67.30.26
Cylinder Probe, 36mm Diameter, Alu, Radius	67.01.60
Cylinder Probe, 75mm Diameter, Alu	67.30.75

Part # 677010

For Method Descriptions Bakery group 01 and 02



Biscuits & Cookies Probe Kit, consisting of:

Cylinder Probe, 2mm Diameter, SS	67.30.02
Break Probe, 70mm, Aluminium	67.11.70
Three Point Bend Rig	67.50.40
Craft Blade Knife	67.13.80
Heavy Duty Stand	67.50.80
HDS insert with 10 mm hole	67.50.81

Part # 677015

For Method Descriptions Bakery group 06 and 07



Dairy Products Probe Kit, consisting of:

Cylinder Probe, 5mm Diameter, SS	67.30.05
Cylinder Probe, 10mm Diameter, SS	67.30.10
Cylinder Probe, 25mm Diameter, SS	67.30.25
Cone Probe, 45°, SS	67.15.45
Spherical Probe, 1 Inch Diameter	67.31.25
Cutting Wire, 90mm Length, 0.4mm Gauge	67.13.95
Warner Bratzler Knife Blade w. probe holder	67.13.06
<i>Back Extrusion Set, 60mm, consisting of:</i>	67.50.60
Back Extrusion Container Holder	67.50.31
Container, 60mm Height, 50mm Diameter	2x 67.50.65
Compression Plate, 35mm Diameter, SS	67.20.35
Compression Plate, 40mm Diameter, SS	67.20.40
Compression Plate, 45mm Diameter, SS	67.20.45

Part # 677030

For Method Descriptions Dairy group 21 to 26

Cylinder Probes

This is the most common type of probe and they are used for most puncture, compression, adhesiveness and extrusion tests. The diameter chosen is depending on the product and the type of measurement to be tested. A small sample is best tested with a narrow probe for e.g. puncture test. For compression test the diameter should be equal to the sample diameter.



2mm Diameter, Stainless Steel P-CY02S Part # 673002
Hardness of cookies and texture of butter typically using 2-5mm cylinder probes.

3mm Diameter, Stainless Steel P-CY03S Part # 673003
Puncture test typically using 10mm or larger diameter cylinder probes.



5mm Diameter, Stainless Steel P-CY05S Part # 673005

6mm Diameter, Stainless Steel P-CY06S Part # 673006

10mm Diameter, Stainless Steel P-CY10S Part # 673010

12mm Diameter, Stainless Steel P-CY12S Part # 673012



18mm Diameter, Stainless Steel, w. Radius P-CY18R Part # 673018
The edge has a 0.1 mm Radius

20mm Diameter, Stainless Steel P-CY20S Part # 673020

21mm Diameter, Stainless Steel, w. Radius P-CY21R Part # 673021
The edge has a 0.1 mm Radius

25mm Diameter, Stainless Steel P-CY25S Part # 673025

25mm Diameter, Stainless Steel, w. Radius P-CY25R Part # 673026
The edge has a 0.1 mm Radius.

30mm Diameter, Stainless Steel P-CY30S Part # 673030

35mm Diameter, Stainless Steel P-CY35S Part # 673035

36mm Diameter, Stainless Steel, w. Radius P-CY36R Part # 673036
The edge has a 0.1 mm Radius

40mm Diameter, Stainless Steel P-CY40S Part # 673040

45mm Diameter, Stainless Steel P-CY45S Part # 673045

50mm Diameter, Stainless Steel P-CY50S Part # 673050

60mm Diameter, Stainless Steel P-CY60S Part # 673060

75mm Diameter, Aluminium P-CY75A Part # 673075

Compression of fruit typically using 75mm diameter

21mm Diameter, Aluminium, AACCI 74-09 Part # 670159
The edge has a 0.1 mm Radius

36mm Diameter, Aluminium, AACCI 74-09 Part # 670160
The edge has a 0.1 mm Radius.

Puncture test of bread typically use 25 or 36mm diameter with radius.

12,7 mm Diameter, Perspex Part # 673213

25 mm Diameter, Perspex Part # 673225

Bloom test jar Part # 673290

Compression Plates

These probes are used for compression, adhesiveness and extrusion testing. The probes are mostly used for semi-liquid products like yoghurt or irregular shaped products like pasta shapes. In an extrusion test the probe diameter should be slightly smaller than the container used, so the probe can move through the container without contacting the walls.



35mm Diameter, Stainless Steel

P-CP35S

Part # 672035

40mm Diameter, Stainless Steel

P-CP40S

Part # 672040

45mm Diameter, Stainless Steel

P-CP45S

Part # 672045

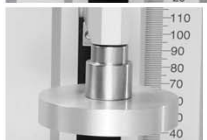
Best suited with the 60mm high and 50mm diameter Container (RA-C-60H50D).

75mm Diameter, Aluminium

P-CY75A

Part # 673075

Compression of fruit typically using 75mm diameter



Spherical Probes

These spherical probes are for testing soft and sensitive products, often to simulate a finger pressing down into the product. Fish is an example of application.



5 mm Diameter

P-SP5

Part # 673105

0.25 Inch Diameter

P-SP0.25

Part # 673106

10 mm Diameter

P-SP10

Part # 673110



0.5 Inch Diameter

P-SP0.5

Part # 673112

15 mm Diameter

P-SP15

Part # 673115

1 Inch Diameter

P-SP1

Part # 673125

Cone Probes

The conical probes are used to test plastic and soft products, for example to simulate the spreading of butter or cream cheese.



40° Stainless Steel

P-CO40S

Part # 671540

45° Stainless Steel

P-CO45S

Part # 671545

60° Stainless Steel

P-CO60S

Part # 671560

90° Stainless Steel

P-CO90S

Part # 671590

Needle Probes

Needle probe

Part # 670170

Back Extrusion set



Back Extrusion Set, 60mm, consisting of:
 Compression Plate, 35mm Diameter, SS
 Compression Plate, 40mm Diameter, SS
 Compression Plate, 45mm Diameter, SS
 Container, 60mm Height, 50mm Diameter
 Back Extrusion Container Holder

R-BES-60
 67.20.35
 67.20.40
 67.20.45
 2x 67.50.65
 67.50.31

Part # 675060



Container, 60mm Height, 50mm Diameter
 Use together with Container Holder (R-BECH).

RA-C-60H50D

Part # 675065

Back Extrusion Container Holder

R-BECH

Part # 675031

Holds the container in the same position during the test. For Container (RA-C-xxHxxD).

Knife, Cutter and Break Probes

These probes are used for testing cutting force and hardness of products.



Blade Set, consisting of:

PS-BS

Part # 671300

Probe Holder Knife

67.13.30

Knife Blade

67.13.01

Triangular Blade

67.13.03

Blade Set Insert - HDS

67.50.10

(R-HDS is necessary but not included in the set)

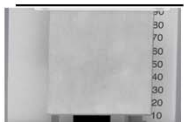


Probe Holder Knife

P-PHK

Part # 671330

Holder for knife and triangular blades



Knife Blade, blade only

P-WBK

Part # 671301

For meat products, vegetables and cheese. Use together with the Heavy Duty Stand (HDS).



Triangular Blade, blade only

P-WBT

Part # 671303

For circular products, like sausage and shrimps.

Triangular Blade with holder

Part # 671305

For circular products, like sausage and shrimps.

Knife Blade, with holder

Part # 671306

For meat products, vegetables and cheese. Use together with the Heavy Duty Stand (HDS).



Blade Set Insert - for HDS

RA-WBKI

Part # 675010

For cutting tests. Enables the probe to completely penetrate the product.



Craft Blade Knife

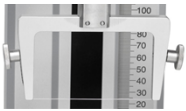
P-CBK

Part # 671380

For cutting tests (sharp knife blade)

Spare blades for CBK, pack of 3.

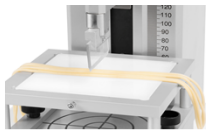
Part # 671381



Cutting Wire Probe
For testing of butter and cheese.

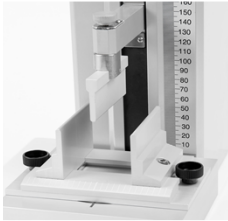
P-CW9004

Part # 671395



Transparent Noodle Knife Probe
For noodles test according to AACC 16-50.

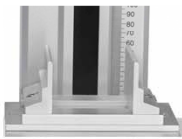
Part # 671340



Break Rig Set, consisting of:
Break Probe, 70mm, Aluminium
Three Point Bend Rig

P-TECKN-ING
67.11.70
67.50.40

Part # 675045



Three Point Bend Rig
For fracturability tests. Use together with the Break Probe (P-BP70A).

R-TPBR

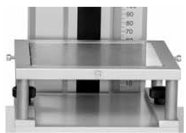
Part # 675040



Break Probe, 70mm Aluminium
For small cookies etc. Use together with the Three Point Bend Rig (R-TPBR).

P-BP70A

Part # 671170



Heavy Duty Stand
Use together with inserts listed below.

R-HDS

Part # 675080



Standard Insert
For cutting and hardness tests of products.

RA-HDSSI

Part # 675088

Insert w. hole 10 mm

RA-HDSIH10

Part # 675081

For tensile tests.

Insert w. hole 18 mm

RA-HDSIH18

Part # 675082

For tensile tests.

Insert w. hole 50 mm

RA-HDSIH50

Part # 675085

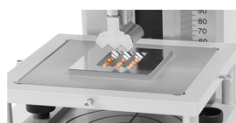
For tensile tests.

Polythene Protection Insert - HDS

RA-HDSPPI

Part # 675011

For cutting tests, sticky and soft products and for protection of the base plate.



Grain and Pellets Set
For hardness/brittleness test. Use together with the Heavy Duty Stand.

Part # 675050



Parallel Clamp
For tensile test of ham etc.

R-PC

Part # 675025



Self Tightening Roller Grip
45mm width. For tensile test of noodles etc.

R-STRG

Part # 675021

Kramer shear cell
(Heavy Duty Stand is necessary but not included in the Kramer Shear Cell kit)

Part # 670104

Adapters

Extention adapter 40 mm for TVT probes	Part # 671097
Adapter for SMS probe, 23 mm, standard	Part # 671003
Adapter for SMS probe, 100 mm To fit hollowed out SMS probes)	Part # 671004

Extra Load Cells

Extra Load Cell, TVT 6700 (XPH) 5 Kg	Part # 678105
Extra Load Cell, TVT 6700 (XPH) 10 Kg	Part # 678110
Extra Load Cell, TVT 6700 (XPH) 15 Kg	Part # 678115
Extra Load Cell, TVT 6700 (XPH) 20 Kg	Part # 678120
Extra Load Cell, TVT 6700 (XPH) 30 Kg	Part # 678130
Extra Load Cell, TVT 6700 (XPH) 50 Kg	Part # 678150
Extra Load Cell, TVT 6700 (XPH) 100 Kg	Part # 678100

Calibration Weights



Calibration Weight, 1 Kg, with plastic cover	Part # 679001
Calibration Weight, 2 Kg, with plastic cover	Part # 679002
Calibration Weight, 5 Kg, with plastic cover	Part # 679005

PERTEN INSTRUMENTS AB

P.O. Box 9006

126 09 Hägersten, Sweden

customerservice@perten.com

Tel: +46 8 505 80 900

Fax: +46 8 505 80 990

2016-08-22