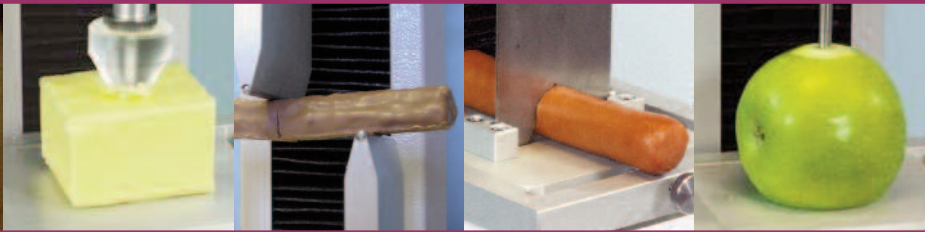


**FTC** FOOD TECHNOLOGY  
CORPORATION



# Test Cells & Fixtures

# Food Technology Corporation

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## Some Background

### WHO IS FOOD TECHNOLOGY CORPORATION?

FTC has provided the food and personal care industries with high quality texture testing solutions for 40 years. Our company has a unique heritage evolving from the groundbreaking Kramer Shear Press in providing robust systems for the field, factory and laboratory test environments. Our extensive experience in practical food texture measurements, combined with our cost effective solutions makes us the ideal partner for your texture testing.

### WHAT IS FOOD TEXTURE ANALYSIS?

Food texture in simple terms is how a product feels when we eat it or performs when we handle or produce it. Texture Analysis provides food technologists with the unique opportunity to manipulate or recreate conditions that foods are exposed to when we eat them or process them. This means that we are able to directly measure and predict how a food will behave or taste.

### WHY USE FIXTURES?

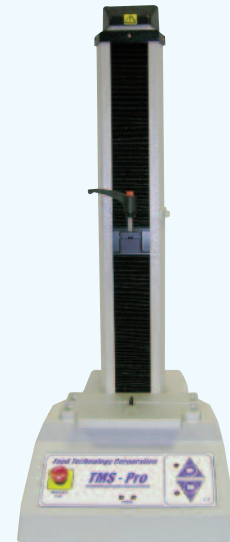
Probes and fixtures are what we use to manipulate the forces created during our texture measurements. We provide you with a texture analyser and then our team of Application Engineers will tailor the fixtures offered to meet you specific test requirements. All of the fixtures in this catalogue are compatible with our competitors and remember if you do not see what you want ask us if we can make it!

### OUR COMMITMENT TO QUALITY!

All of our probes and fixture are manufactured from food grade materials and conform to ASTM, BS, ISO and DIN international standards. Strict tolerances are maintained and dimensional conformity inspected in accordance with our ISO 9001:2000 quality system.

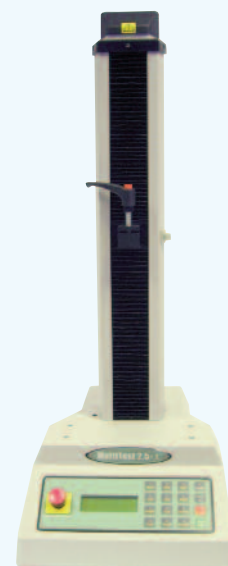
## Texture Analysers

### TMS-PRO



**Computer-operated multi-stage analysis for the laboratory**

### TMS-CONSOLE



**Stand-alone texture analysis for the factory and production floor**

# Probes & Adaptors

## Cylinder Probes

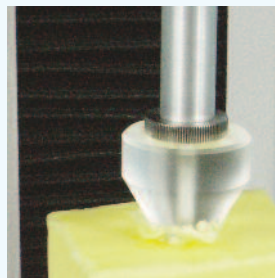
FTC cylinder probes may be used to perform puncture and penetration tests on a wide variety of food products including baked goods, confectionery, dairy products, fruits and vegetables and meats. Precision engineered stainless steel, perspex or acetate probes are included in our standard range. Custom designs and geometries are available on request. Universal fittings accommodate competitor products.



	Part No.
FTC 1/2" (12.7mm) Ø cylinder	432-299
FTC 1" (25.4mm) Ø cylinder	432-300
FTC 1.5" (38.1mm) Ø cylinder	432-301
FTC 2" (50.8mm) Ø cylinder	432-302
FTC 2.5" (63.5mm) Ø cylinder	432-303
TMS 25.4mm Ø Perspex	432-057
TMS 38.1mm Ø Perspex	432-058
TMS 12.7mm Ø black acetate	432-059
TMS 6.35mm Ø black acetate	432-060
TMS 12.7mm Ø Perspex	432-061
TMS 25.4mm Ø Perspex	432-062
TMS Kobe st. steel (for agar gels)	432-063
TMS 10mm Ø st. steel	432-066
TMS 9mm Ø st. steel	432-067
TMS 8mm Ø st. steel	432-068
TMS 7mm Ø st. steel	432-069
TMS 6mm Ø st. steel	432-070
TMS 5mm Ø st. steel	432-071
TMS 4.5mm Ø st. steel (for margarine)	432-072
TMS 4mm Ø st. steel	432-073
TMS 3mm Ø st. steel	432-074
TMS 2mm Ø st. steel	432-076
TMS 1mm Ø st. steel	432-077

## Conical Probes

FTC offer six Perspex and one stainless steel conical probe with angles ranging from 15° to 90°. Cone penetrometry is traditionally used within dairy products to assess hardness and spreadability. It has also found application in biscuits and other similar brittle products.



	Part No.
TMS 90° Perspex	432-079
TMS 60° Perspex	432-080
TMS 45° Perspex	432-081
TMS 40° Perspex	432-082
TMS 30° Perspex	432-083
TMS 20° Perspex	432-084
TMS 15° st. steel	432-085

## Needle Probes

Available in either 1mm or 2mm diameter, the FTC needle probes are used on fruits, vegetables, confectionery, cosmetics and fats. Values relate to firmness, yield, consistency and even skin or coating characteristics.



	Part No.
TMS 2mm st. steel, 9-10° taper	432-087
TMS 1mm st. steel, 9-10° taper	432-086

## Spherical Probes

For determining surface hardness of products such as cheeses, fruits and vegetables, or the fracturability of potato chips, the FTC spherical probe range features precision-engineered stainless steel ball-end probes, and plastic hemispherical probes which replicate squeezing in hand.



	Part No.
TMS 1" Ø ball nylon (Avery test)	432-088
FTC 1" Ø ball probe	432-304
FTC 3/4" Ø ball probe	432-305
TMS 1/2" Ø ball st. steel	432-089
TMS 10mm Ø ball st. steel	432-090
TMS 8mm Ø ball st. steel	432-091
TMS 1/4" Ø ball st. steel	432-092
TMS 1mm Ø hemispherical st. steel	432-093
TMS 2mm Ø hemispherical st. steel	432-094
TMS 3mm Ø hemispherical st. steel	432-095
TMS 1" Ø hemispherical Perspex	432-096
TMS 1/2" Ø hemispherical acetate	432-097

## Auxiliary

	Part No.
FTC 1/2" Dovetail Top Bracket (Replacement fitting for 100 & 250N S-Beam load cells)	432-306
FTC 3/4" Dovetail Top Bracket (Replacement fitting for 500N S-Beam load cells)	432-317
FTC 3/4" Dovetail Top Bracket (Replacement fitting for 1000N S-Beam load cells)	432-098
FTC 1" Dovetail Top Bracket (Replacement fitting for 2500N S-Beam load cell)	432-099
TMS Extension Piece Set (Replacement load cell extension adapters for TMS-Console & TMS-Pro)	432-100
TMS Standard Fixture Nut & Bolt (Replacement 'T' bolt fittings for use with TMS-Console and TMS-Pro base plate)	432-101
TMS 'T' Slot Base Plate (Replacement aluminium plate for both Pro & Console instruments. Includes 'T' bolt fittings)	432-294
Protective Dust Cover (Protective fabric cover for 2500N capacity Console & Pro machines)	432-153
TMS Lightweight Chuck Set (3/8" (9.5mm max capacity) chuck with M6 top fitting)	432-308

## Load Cells

A range of 13 intelligent load cells compliments the TMS texture systems. It is recommended that the capacity of the load cell matches the product tested. Ideally the forces measured should be within 10-90% of the load cells total capacity. The broad spectrum of products tested in a typical food laboratory often requires more than one load cell. To prevent confusion FTC load cells are fitted with an automatic recognition feature to warn technologists if a selected test is not compatible with a load cell.

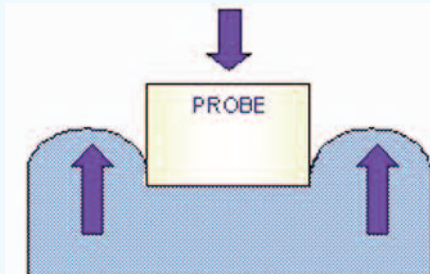
N	MAX FORCE		STANDARD ILC	TMS-PRO HEAVY DUTY ILC 'S' BEAM	STANDARD XLC	TMS-CONSOLE HEAVY DUTY XLC 'S' BEAM
	Kgf	lbf				
2	0.2	0.45	879-009-V10	-	879-027-V10	-
5	0.5	1.12	879-010-V10	-	879-028-V10	-
10	1.0	2.25	879-001-V10	-	879-029-V10	-
25	2.5	5.62	879-002-V10	-	879-030-V10	-
50	5.1	11.24	879-003-V10	-	879-031-V10	-
100	10.2	22.48	879-004-V10	879-064-V10	879-032-V10	879-052-V10
250	25.5	56.20	879-005-V10	879-065-V10	879-033-V10	879-053-V10
500	50.9	112.40	879-006-V10	879-066-V10	879-034-V10	879-054-V10
HIGH FORCE LOAD CELLS FOR USE WITH FTC CODED FIXTURES						
1000	101.9	224.81	-	879-067-V10	-	879-055-V10
2500	254.9	562.02	-	879-008-V10	-	879-036-V10

*Use 'S' Beam type load cells with FTC prefix fixtures or in heavy duty type applications. If in doubt refer to individual fixture sheets.*

# Puncture & Penetration

## Fixture Principles

Small diameter cylinders, balls and cones are used to puncture and penetrate a samples surface. The forces generated in the sample depend upon the geometry of the probe used and can be manipulated to accommodate sample irregularities, or recreate conditions imposed during consumption. FTC also offer a range of multiple probe assemblies for the measurement of several test sites in a single sample.



Probe has surface area smaller than that of sample. Probe will puncture sample when sufficient stress is reached, resulting in irreversible damage to the sample.

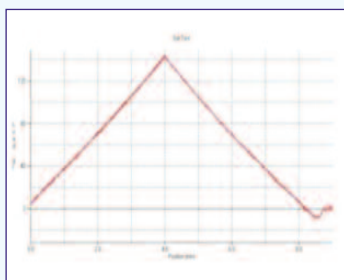
## Typical Products Tested

- **Biscuits** to determine hardness
- **Bread** crust and crumb firmness
- **Butter and margarine** penetrometry as quality indicators
- **Chocolate** to measure tempering hardness
- **Fish muscle** profile as fat content indicator
- **Fruits** for ripeness testing in the field
- **Gelatine** Bloom quality measurement
- **Hydrocolloid** functionality and blend development
- **Roasted nuts** to optimise oven profile
- **Sugar confectionery** for sensory correlations

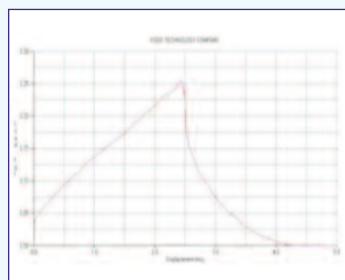
## Characteristics

- **Consistency**
- **Firmness**
- **Fracture**
- **Gel Strength**
- **Hardness**
- **Rigidity**
- **Ripeness**
- **Softness**
- **Spreadability**
- **Yield Point**

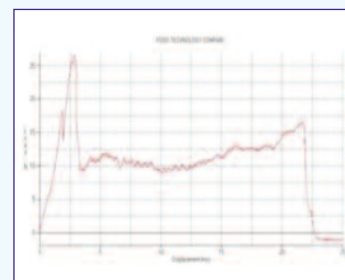
## Test Images



*Gelatine Bloom strength testing*



*Wine gum penetration test*



*Apple puncture testing*

## Fixtures



**FRUIT RIPENESS TEST**

### TMS Magness-Taylor Probe Set

3/8" (9.5mm max capacity) chuck with 3mm, 4mm, 5mm, 6mm and 7mm diameter stainless steel probes each with 1 flat and 1 radius end. Also includes 5/16" and 7/16" traditional Magness Taylor probes for fruit penetrometry and special peeler tool.

**Part no. 432-241**



**GEL RUPTURE OF JAMS**

### TMS Multiple Needle Probe

Set of 9 stainless steel needle probes with 15 degree and taper for the measurement of jams, jellies and other inhomogeneous products

**Part no. 432-249**

### TMS Adaptable Multiple Probe

Set of 4 stainless steel rods of 2mm Ø fixed to an adjustable plate for individual alignment with corresponding base plate facilitating the penetration of samples with varying texture. Ideal for use with small gummy chews and other tablet shaped confectionery.

**Part no. 432-251**



**BISCUIT CRISPNESS**

### TMS Junior Multiple Probe Fixture

Set of 2mm Ø stainless steel rods with corresponding base plate for the measurement of burgers and particulate products such as peas, grains and berries.

**Part no. 432-252**

### TMS Multiple Probe Fixture

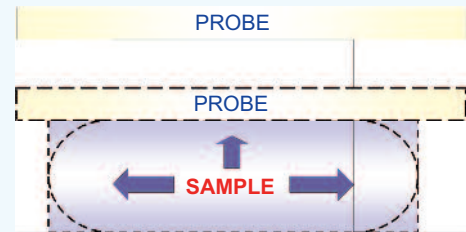
Set of 20 stainless steel rods with corresponding base holder for the measurement of french fries and other baton shaped products. Easily adapted for use with bean and berry-shaped samples at customers request.

**Part no. 432-253**

# Compression

## Test Principles

Compression testing involves squashing a sample in one direction while leaving it unrestrained in the other two. The FTC compression probes are large diameter, flat-bottomed cylinders, or platens, used to squash solid or self-supporting samples. It is important that the surface area of the probe is greater than that of the sample throughout the test if true compressive forces are to be maintained.



Geometry of samples changes as it is squashed. Friction is generated at test interface. The probe area, by definition, should remain greater than the sample surface area.

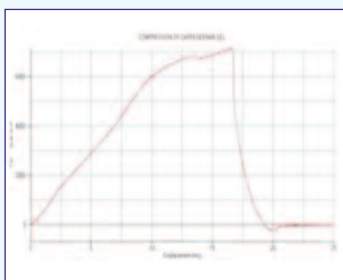
## Typical Products Tested

- **Cakes & breads** during development & manufacture
- **Cheeses, butter & dairy spreads** as a quality indicator
- **Eggs** to measure shell strength
- **Extruded snacks** to improve sensory profile
- **Fruits & vegetables** in the field & factory
- **Gelatine & gels** to quantify strength
- **Low fat sausages** to quantify benefits of fat replacers
- **Packaging** to measure functional strength
- **Sugar confectionery** to optimise formulation
- **Tablets** to quantify consistency for drug release

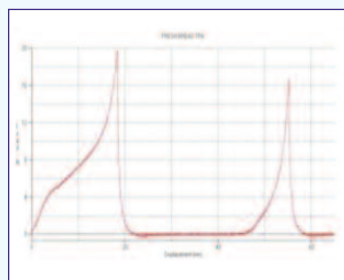
## Characteristics

- **Consistency**
- **Crush force**
- **Elasticity**
- **Failure**
- **Firmness**
- **Hardness**
- **Rigidity**
- **Stickiness**
- **Stringiness**
- **Succulence**

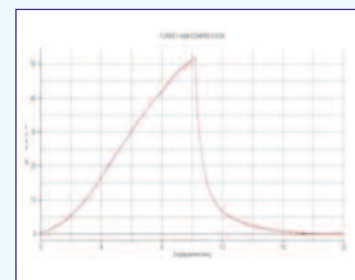
## Test Images



Rigidity testing of carrageenan gel



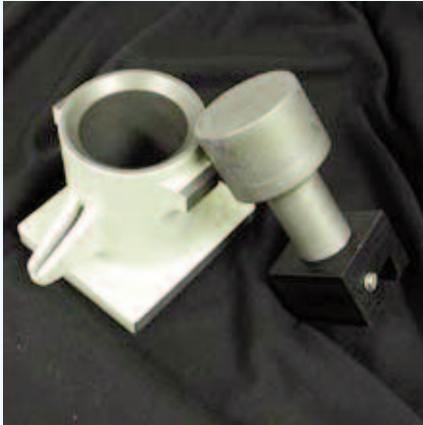
Texture profile analysis of fresh bread



Compression of reformed turkey ham



## Fixtures

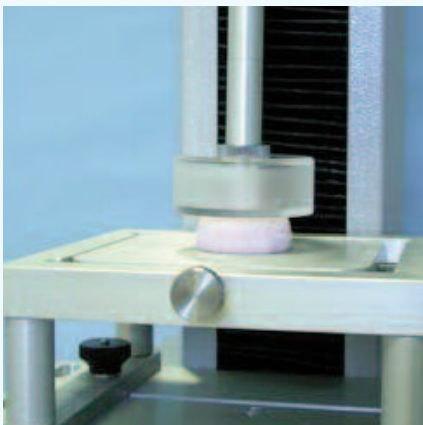


**SWEETCORN SUCCULENCE**

### FTC Succulometer

Heavy duty cylindrical vessel with corresponding plunger. The cylinder part of the fixture is fitted with a spout to allow free water expressed during testing to be expelled and weighed as an indicator of sample succulence. For use with 1000N and 2500N load cells.

**Part no. 432-255**



**MARSHMALLOW ELASTICITY**

### TMS 50mm Diameter Platen

Large 5mm thick aluminium platen with anodised finish for compression testing. Fitted directly to load cell extension piece.

**Part no. 432-009**

### TMS 75mm Diameter Platen

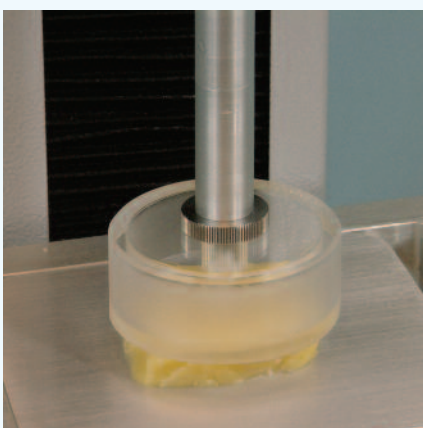
Large 5mm thick aluminium platen with anodised finish for compression testing. Fitted directly to load cell extension piece.

**Part no. 432-010**

### TMS 100mm Diameter Platen

Large 5mm thick aluminium platen with anodised finish for compression testing. Fitted directly to load cell extension piece.

**Part no. 432-011**



**CHEESE FIRMNESS**

### TMS Compression Top Plate

100mm x 150mm rectangular plate for crush testing of large samples. Should be used with 'S' Beam type load cells only due to high forces generated. Ideal for packaging, whole loaves of bread, cross-section samples of vegetables.

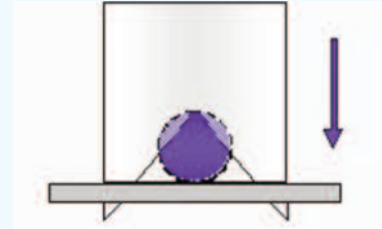
**Part no. 432-013**



# Shearing

## Technique

Precision blades and wires are used to cut through a sample creating a combination of shearing, tearing and compression forces depending upon blade geometry. The blade passes through the sample evaluating its cross-section and accommodating variations in homogeneity. FTC shearing fixtures range from heavy-duty blades developed in conjunction with the USDA to highly sensitive wires for the ISO butter shear test.



Sample is located beneath the shear blade. Stress increases as blade moves down until sample yields and blade starts to cut through.

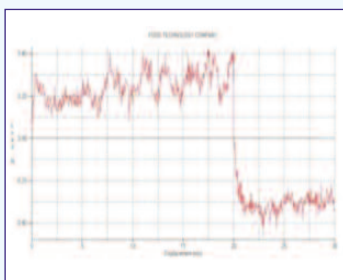
## Typical Products Tested

- **Butter** to measure process quality
- **Cheese** to optimise ripening
- **Chewing gum tablet** hardness and crispness
- **Chicken breast & other meats** to optimise muscle texture
- **Confectionery bars** to measure bite profile
- **Pasta** for cooking profile
- **Pastry** to measure toughness at different formulations
- **Sausages** as an indicator of shear toughness
- **Snack bars** to measure cross-section
- **Vegetable** to optimise heat treatment

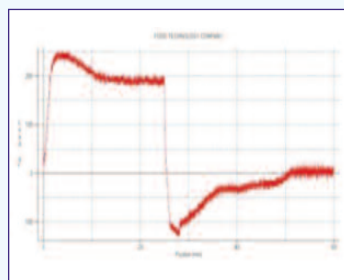
## Characteristics

- **Bite Strength**
- **Consistency**
- **Cook Quality**
- **Resistance**
- **Rigidity**
- **Shear Force**
- **Skin Break**
- **Softness**
- **Tenderness**
- **Toughness**

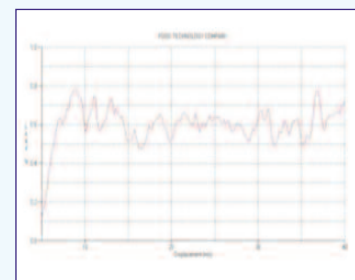
## Test Images



Shear profile of fish gel using lightweight blade



Cutting test of Hot Dog using Warner-Bratzler blade

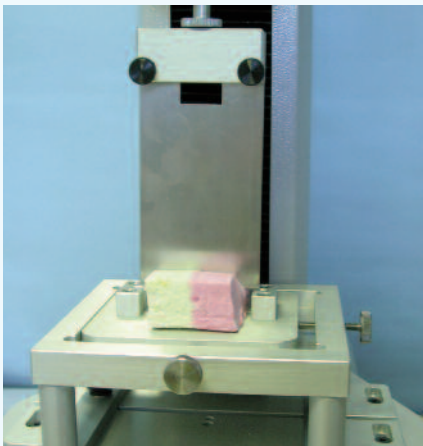


Cut profile of butter sample following ISO method

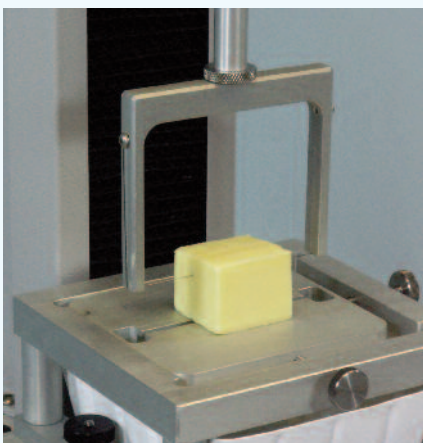
## Fixtures



**HARDNESS TO BITE OF HOTDOG**



**CROSS-SECTIONAL FIRMNESS IN NOUGAT**



**ISO 16035 BUTTER FIRMNESS**

### FTC Heavy Duty Blade Set

USDA design, Warner-Bratzler type and flat ended 3.2mm thick aluminium blades for use in high force applications with 1000N and 2500N load cells. Includes base plate for easy alignment and complete shearing through sample.

**Part no. 432-014**

### TMS Light Weight Blade Set

Precision stainless 1.2mm thick steel blades accurate testing of low force applications. Set consists of 2 Warner-Bratzler type options, Notched and Flat end configurations for maximised test flexibility. Recommended for use with 'S' Beam type load cells in applications below 1000N.

**Part no. 432-245**

### TMS Wire Shear Probe & Plate

Rigid 80mm frame support supplied with 0.3mm diameter wire conforming to ISO 16305:2005 Butter Firmness standard method. Base plate is included for easy alignment and complete shearing of sample. Recommended for applications below 100N.

**Part no. 432-242**

### TMS Volodkovitch Bite Jaws

Established test technique used to imitate biting action of front incisors. Consists of upper and lower 3mm diameter knife edges generating compression and shear forces. 1cm sq samples are fitted between knife edges and tested via guillotine action.

**Part no. 432-016**

### TMS Large Knife Edge

Stainless steel blunt knife edge probe for creation of shear forces in sample. Wide angle creates wedge effect in biscuits, hard cheeses, confectionery and pulses.

**Part no. 432-017**

### TMS Perspex Knife Edge

Perspex light weight knife edge for low force shear tests in soft foods (less than 250N) such as nougat and mallow.

**Part no. 432-018**

### TMS Craft Knife

Rigid support frame holding sharpened steel craft blade. Designed to pass completely through sample and measure entire cross-section.

**Part no. 432-019**

### TMS Large Craft Knife

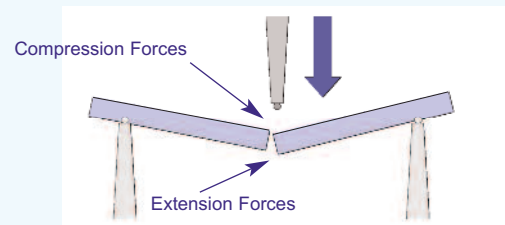
Large-scale craft blade to cut through samples too hard for the wire or too large for the standard craft blade. Ideal for vegetable florets, meats, pastries and expanded extrusions.

**Part no. 432-020**

# Snapping

## Test Principles

Bending, or snap tests are used to measure the fracture properties of bar or sheet type food products. Samples should be brittle solids with an homogeneous structure. The most popular FTC fixture used for snap testing is the Three-Point Bend assembly. The sample is supported at either end and deformed in its centre causing it to fracture and break at its weakest point.



Significant stress is created within the sample to the point where failure occurs and the sample breaks.

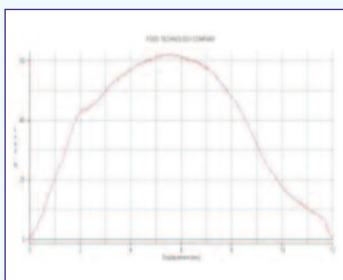
## Typical Products Tested

- **Celery sticks** to quantify crispness
- **Chocolate bars** to measure break strength
- **Potato chips** to determine shelf-life crispness & staling
- **Digestive biscuits** to measure effect of oven heating
- **Dry spaghetti & other pastas** to standardise production
- **Potatoes** to compare different varieties
- **Sliced almonds** to compare toasting profiles
- **Snack bars** during development for break strength
- **Tablets** as an indicator of hardness
- **Tortilla** to optimise manufacturing process

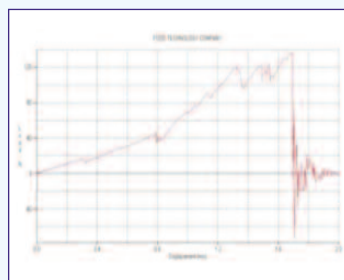
## Characteristics

- **Break**
- **Brittleness**
- **Crispness**
- **Crunchiness**
- **Failure**
- **Flexure**
- **Fracture**
- **Hardness**
- **Snap**
- **Work at break**

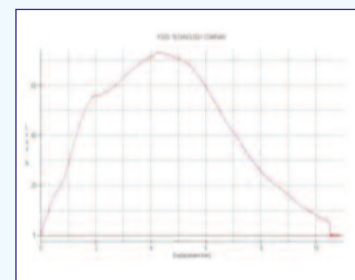
## Test Images



*Bend profile of soft cookie*

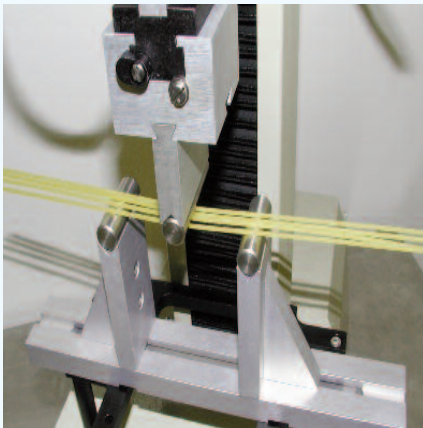


*Break strength of spaghetti*



*Snap force of celery sticks*

## Fixtures

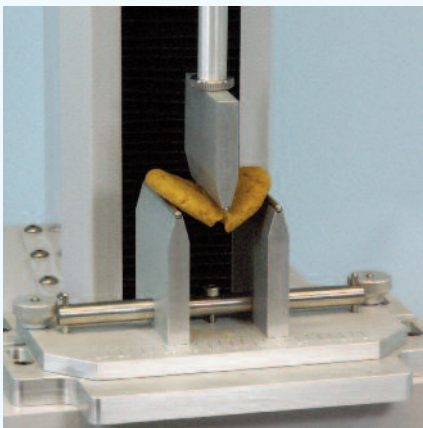


**RESILIENCE OF SPAGHETTI**

### FTC Heavy Duty Three-Point Bend

Large scale three-point bend assembly with 85mm high arms and 200mm support span. Ideal for large samples, such as bananas, which are tested whole and generate higher forces. Use with 1000N and 2500N load cells.

**Part no. 432-024**



**BISCUIT HARDNESS**

### TMS Lightweight Three-Point Bend

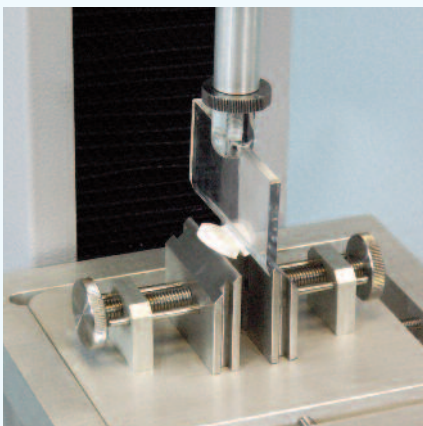
Mid-scale three-point bend assembly with 60mm high arms and 120mm support span. Ideal for most snapping applications including biscuits, crackers and snack foods. Recommended for use with 'S' Beam type load cells where forces are below 1000N.

**Part no. 432-248**

### TMS Mini Vice & Three-Point Bend

Small scale three-point bend assembly with 1-40mm span for precision fracture of small samples such as tablets. Includes Perspex knife edge and is ideally suited for applications below 250N.

**Part no. 432-247**



**TABLET BREAK STRENGTH**

### TMS Spaghetti Snap Fixture

Top and bottom fixing used to hold prepared pieces of uncooked spaghetti. Flexure properties can be quantified and used as an indication of durum wheat quality used in the production of the spaghetti. This fixture provides interesting information relating to the potential resilience of the product during packing and transportation i.e. its brittleness.

**Part no. 432-025**

### TMS Friable Food Support

All sided support fixture for "crisp and potato chip" type products. Use with hemispherical probes to replicate punching through with finger.

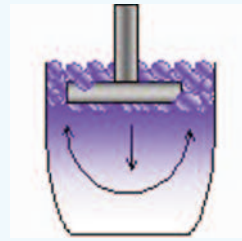
**Part no. 432-042**



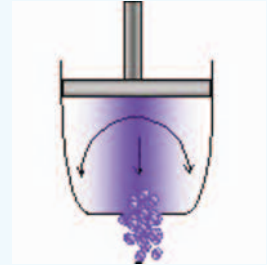
# Extrusion

## Technique

Extrusion tests are used to displace viscous liquids or semi-solid products not suitable for traditional viscometry. Samples are either extruded in a forward direction through a holding container base or in a backward direction up and around a loosely fitting probe. The FTC product range includes shallow discs to extrude samples in factory type containers, or precision test cells for enhanced manipulation.



Displaced sample flows up and around probe



Displaced sample flows through aperture in base

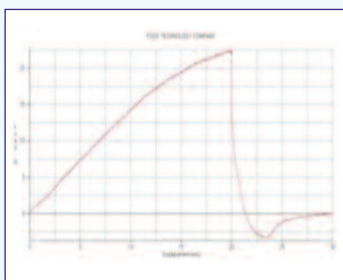
## Typical Products Tested

- **Fruit purees** to assess pumpability
- **Fruit topping** with particulates to optimise viscosity
- **Mayonnaise and thick sauces** to correlate with mouthfeel
- **Personal care products** to quantify functional structure
- **Pumpable fats** to measure shear thinning
- **Starch pastes** to assess thickening
- **Thick soups & sauces** for ready prepared foods
- **Weak hydrocolloid gels** to assess thickening
- **Whipped creams** to measure stability
- **Yogurts** to measure affect of formulation changes

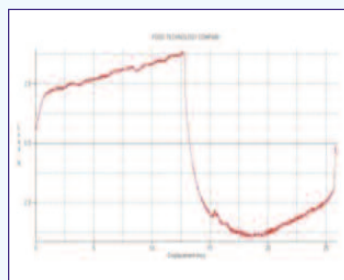
## Characteristics

- **Adhesiveness**
- **Consistency**
- **Flow**
- **Internal Structure**
- **Mouthfeel**
- **Stringiness**
- **Thickness**
- **Thinning**
- **Viscosity**
- **Yield Point**

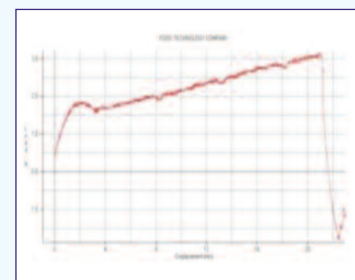
## Test Images



Back extrusion of confectionery frosting



Back extrusion of a low fat yogurt



Forward extrusion of hydrogenated baking fat

## Fixtures

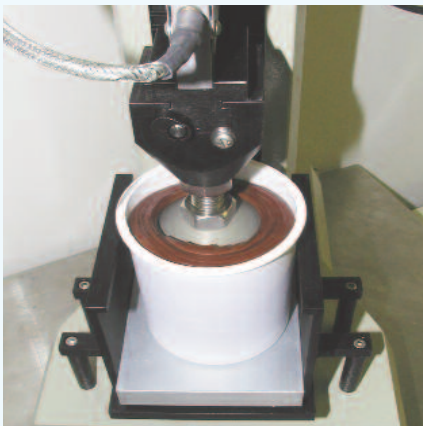


**UNIVERSAL TEST CELL FOR HEAVY DUTY EXTRUSION**

### FTC Universal Cell

Universal testing cell for back and forward extrusion testing. The test cell consists of a 195ml capacity sample chamber and is supplied with slotted and drilled base plates for forward extrusion with a 57mm diameter piston plunger. A solid plate for back extrusion is supplied for use with a 51mm diameter plunger. The cell is used with a wide range of semi-solid and viscous fluids from rehydrated potato flakes to sugar syrups.

**Part no. 432-032**



**CONSISTENCY OF CONFECTIONERY CREAM**

### TMS Dual Extrusion Cell

Set of 3 cylindrical pots with changeable bottom plates for backward and forward extrusion testing. Includes 4 extrusion plates to accommodate different sizes of sample particulates, ideal for fruit purees and yogurt products.

**Part no. 432-026**

### TMS Extrusion Cone

170 degree 40mm diameter 20mm high Perspex plunger to facilitate air removal during testing.

**Part no. 432-027**

### TMS Extrusion Platen Set

Set of 30mm, 40mm and 50mm diameter aluminium plates each 5mm thick for back extrusion testing in standard factory or consumer packaging.

**Part no. 432-029**



**FLOW CHARACTERISTICS OF MUSTARD**

### TMS Aerated Sample Probe

38.1mm diameter disc made up from a 3mm wire grid for use with aerated and mousse type product.

**Part no. 432-030**

### TMS Butter & Margarine Spreadability Jig

Used to measure the spreadability of margarines, butter, table spreads and waxes. Prepared samples are forced between 90 degree corresponding cones during the compression cycle of testing providing an indication of sample spreadability.

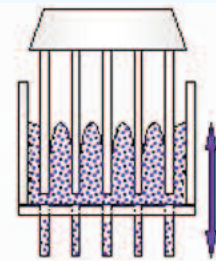
**Part no. 432-309**



# Bulk Analysis

## Technique

Bulk analysis is used to measure particulate products where analysis of individual components is not practical or representative. FTC test fixtures are designed to maximise the contact area between probe and sample surfaces. Multiple blades are used in the Kramer shear cell causing combinations of compression, shear and extrusion forces whilst the Universal test cells follow compression to extrude particulate samples.



Large sample size is representative of treatment and handling by the consumer. Increased sample size provides increased reproducibility in highly variable product.

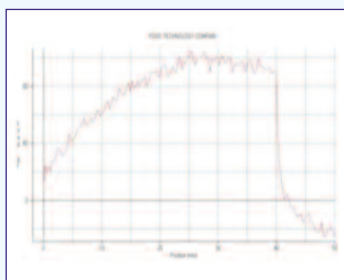
## Typical Products Tested

- **Beans & pulses** to assess heat treatment
- **Breakfast cereals** for bowl life testing
- **Cheese curds** during production
- **Cooked pasta** to identify formulation changes
- **Cooking sauces** to optimise heat treatment
- **Meat patties** for toughness & sensory correlation
- **Peas** for standard testing in the field
- **Pickles & preserves** during process development
- **Raw and processed fruits & vegetables** for firmness
- **Rice** for ready cooked packaging

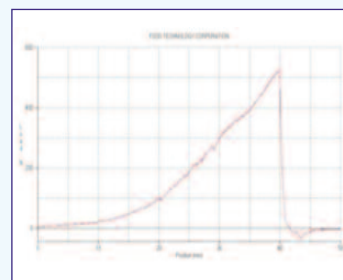
## Characteristics

- **Adhesiveness**
- **Cook Quality**
- **Fibrousness**
- **Flow**
- **Shear Hardness**
- **Softness**
- **Stickiness**
- **Tenderness**
- **Toughness**
- **Viscosity**

## Test Images



*Kramer shear profile of blueberry sample*



*Kramer shear profile of chopped Italian tomato*



## Fixtures

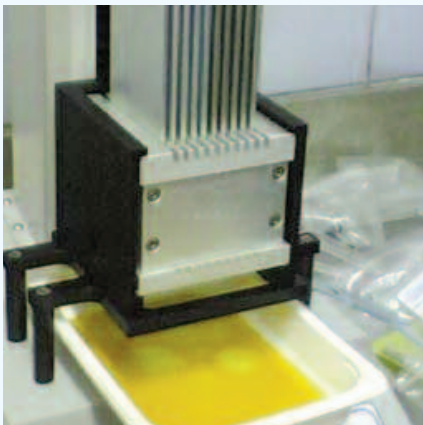


**BULK EVALUATION OF COOKED POTATO**

### FTC Standard Shear Compression Cell

Kramer Shear Cell with ten 3.2mm thick parallel blades and corresponding test cell for compression-extrusion-shear testing of inhomogeneous large particulate samples. Generates high forces and is only suitable for use with 1000N and 2500N load cells.

**Part no. 432-240**



**CHOPPED TOMATO INTEGRITY TESTING**

### FTC Thin Blade Compression Cell

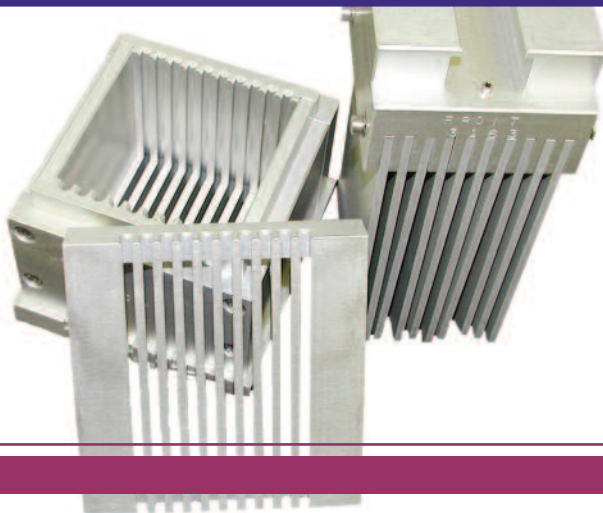
Kramer Shear Cell. Thirteen 1.5mm thick parallel blades and corresponding test cell for compression-extrusion-shear testing of inhomogeneous small particulate samples. Generates high forces and is only suitable for use with 1000N and 2500N load cells.

**Part no. 432-031**

### TMS Crispiness Cell

Based upon proven design of the Kramer shear cell the TMS Crispiness cell uses 5 rigidly positioned blades to shear into the sample. Cell configuration is ideally suited for measuring the crispiness or consistency of small irregular samples such as rice crispies, dried pasta shells, freeze-dried fruit, malted confectionery and other particulate samples. FTC recommend this cell is used with 'S' Beam type load cells only.

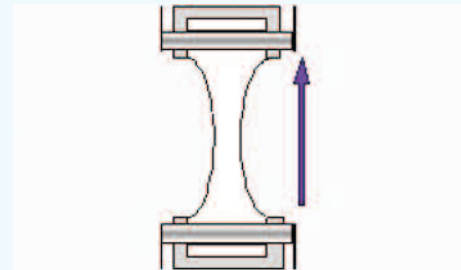
**Part no. 432-296**



# Tension

## Technique

Tension tests are used to measure the break or extension properties of a sample. Products are held firmly at each end and stretched until they break at their weakest point. The irregular geometries of food make it very difficult to grip samples. The FTC tension grips accommodate the widest range of sample shapes, imitating handling by the consumer.



Sample is fixed at base. Top jaw moves up and sample is extended until a break is caused at the weakest point.

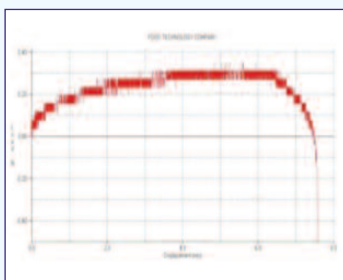
## Typical Products Tested

- **Cherry stalks** as a ripeness indicator
- **Chewing gum sticks** for break properties
- **Gummy sweets** extension properties for sensory correlation
- **Meat loaves & bologna** quality assessment
- **Noodles & pasta** for cooked tensile strength
- **Packaging films** for snap evaluation
- **Packaging seals** for integrity & strength
- **Pizza base** tear testing in product development
- **Processed cheese strings** for extensibility in development
- **Salami skin** peel profile for process optimization

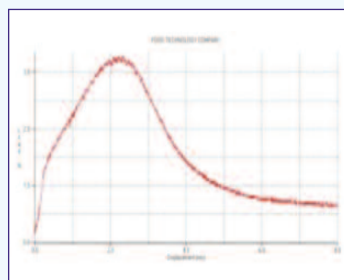
## Characteristics

- **Break Load**
- **Deflection**
- **Deformation at Break**
- **Extension**
- **Modulus/Stiffness**
- **Peel Strength**
- **Seal Integrity**
- **Snap**
- **Stretch**
- **Work at Break**

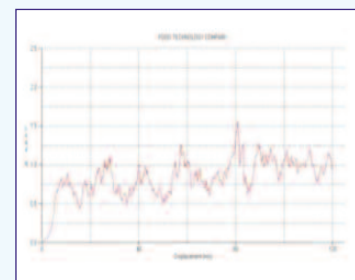
## Test Images



Tensile strength of gummy sweet

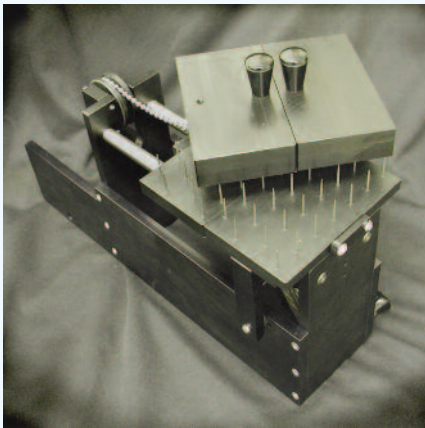


Break profile of chewing gum strip



Peel properties of sausage skin

## Fixtures



**TENSILE TEST CELL FOR STRETCHING**

### FTC Thin Slice Tensile Test Cell

Specialist spiked cell for horizontal tension testing of comminated meats and pastry products. Unique configuration allows horizontal positioning of sample.

**Part no. 432-045**

### TMS Extensibility Fixture

Large and small aluminium lower plate with radiused hole with corresponding top plate for gripping sample. Purchase test probe to burst sample separately.

**Part no. 432-046**

### Lever Grip Set

Self-tightening 30mm wide serrated roller grip set for top and bottom holding. Can accommodate samples up to 5mm thick and is rated to a maximum of 500N. Configuration is ideal for flat and thin samples such as packaging films. Self-locking mechanisms can damage some soft food samples such as pasta creating a weak point during testing.

**Part no. 432-047**



**BREAK STRENGTH OF CHEWING GUM**

### Film Grips

50mm wide drums each 20mm in diameter. samples such as spaghetti are wrapped around drums to prevent weak points. This fixture is rated to 500N.

**Part no. 432-157**

### Multi Jaw Grip Fixture

10mm diameter test grip for holding round irregular geometries such as gummy sweets. Top fixing only. Order 2 grips if top and bottom fixing is required.

**Part no. 432-215**

### Spring Loaded Roller Grip

40mm wide roller to grip sample and minimise risk of slippage during testing. For use with 'S' Beam type load cells only.

**Part no. 432-156**

### Wire Grip Fixture

Used to hold small cylindrical samples where it is critical for the specimen to be in perfect alignment during testing. very useful with confectionery products, pasta etc up to 1.5mm diameter.

**Part no. 432-049**

### TMS Large Wedge Grip Kit

Heavy duty wedge grips used to hold sheeted samples up to 10mm thick with a maximum width of 30mm. Ideal for reconstituted meats, confectionery, pastry etc. Rated to 5kN.

**Part no. 432-297**

### TMS Small Wedge Grip Kit

Light duty wedge grips used to hold sheeted samples up to 5mm thick with a maximum width of 15mm. Ideal for chewing gum, confectionery fibres, meats etc. Rated to 1kN.

**Part no. 432-298**



**PEEL STRENGTH OF FOIL LID**

### Pin Vice

General purpose small scale vice ideal for gripping the lids of plastic and foil sealed containers. 7mm maximum sample thickness with 20mm jaw depth. Top fixing only, Order 2 grips if both top and bottom fixing is required.

**Part no. 432-196**

# Industry Specific Fixtures

## Gelatine & Gels

FTC Console and Pro texture analysers conform directly to ISO 9665 and BS757:1975 or AOAC 23.007 recommendations for gelatine Bloom strength measurement. The FTC product range includes all equipment for the preparation, calibration and analysis of Bloom strength. High-level processing power of the TMS Lab Pro software makes detailed analysis of a wide range of other gelled ingredients and products possible. FTC provide a range of cylinders, ball probes and blades specifically for gel investigations.



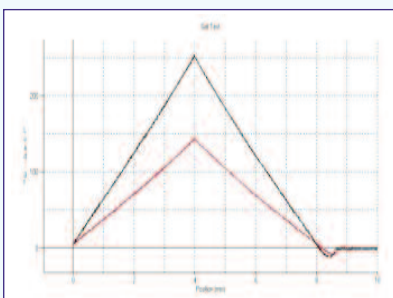
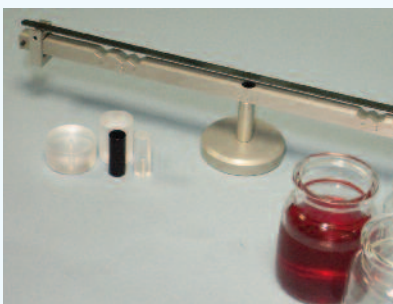
## Typical Products Tested

- Agar
- Alginate
- Carrageenan
- Gelatin
- Mixed Polysaccharides
- Pectin
- Starch Gels
- Surimi
- Tara Gum
- Xanthan Gum

## Characteristics

- Adhesiveness
- Bloom Strength
- Break
- Deformation
- Elastic Modulus
- Hardness
- Rigidity
- Rupture Point
- Stress Relaxation
- Yield Point

## Gelatine Fixtures



### Bloom Sample Bottles

Conforms to ISO 9665, GME, AOAC 1985 and BS757 standards.  
Pack of 10.

**Part no. 432-053**

### Bloom Sample Bottle Stoppers

Conforms to ISO 9665, GME, AOAC 1985 and BS757 standards.  
Pack of 10.

**Part no. 432-054**

### Dummy Bloom Strip

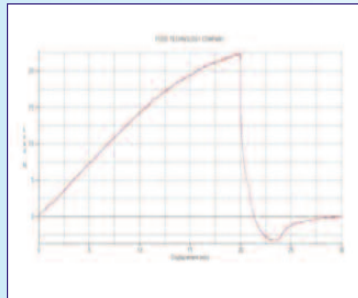
Conforms to ISO 9665, GME, AOAC 1985 and BS757 standards.

**Part no. 432-055**

### Water Baths

Please contact FTC on 00 44 1403 7999 79 for up to date information.

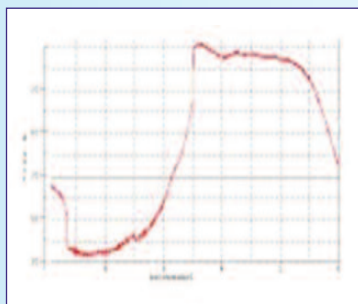
## Dough And Bakery



### TMS FMBRA Dough Pots

For controlled preparation of soft biscuit dough. Includes aerator and compressing plunger. For a sample penetration test it is recommended to use the 6mm Ø probe.

**Part no. 432-034**



### TMS Dough Stickiness Fixture

For controlled extrusion of prepared dough following principles established within the Chen/Hoseney technique. For a stickiness test it is recommended to use the 25.4mm Perspex probe.

**Part no. 432-035**

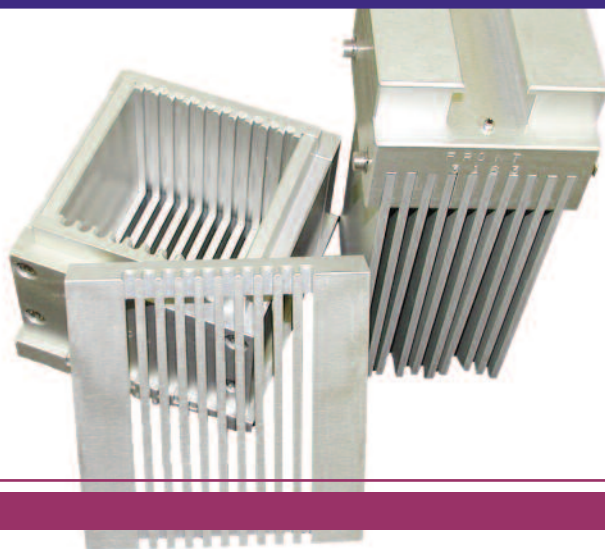
### AACC 36mm Ø Cylinder

**Part no. 432-036**

### AACC 21mm Ø Cylinder

**Part no. 432-037**

Standardised aluminium cylinders developed by the American Association of Cereal Chemists (AACC) for the measurement of breadcrumb and other bakery products.

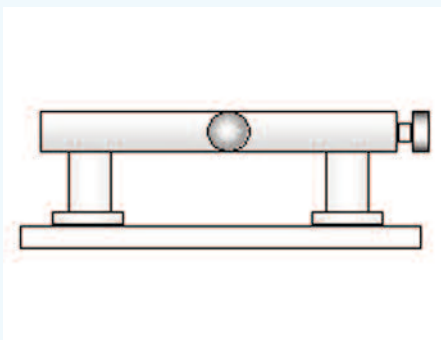


# Sample Presentation

## Technique

The way in which a sample is held or presented will directly influence the accuracy of results generated. Forces are commonly manipulated with test accessories to replicate consumer handling or consumption. It is also important to secure or present the sample to the instrument as reproducibly as possible. The FTC sample presentation fixtures are specifically designed to accommodate irregular shaped samples or containers. These fixtures prevent sample movement during testing, allowing accurate calculation of characteristics, such as adhesiveness, where it is critical that the sample remains firmly in place during the return stroke of the texture analyser. Once set up, the technologist can simply test sample after sample with the guarantee of central alignment between test probe and product.

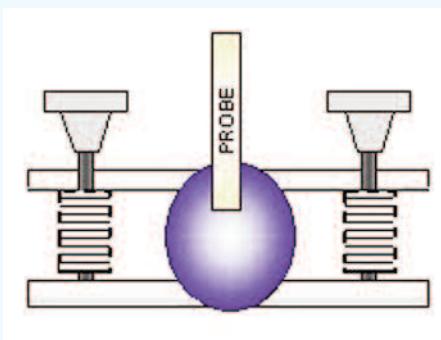
## Fixtures



### TMS Standard Fixture Table

Standard fixture table is used for easy configuration and alignment of TMS test fixtures. This fixture forms the cornerstone to the TMS-Pro and TMS-Console product range, the unique design facilitates the rapid configuration of tests using our wide range of TMS fixtures. In addition, the table is designed to accept competitor fixtures and accessories maintaining consistent test conditions and facilitating cross-correlations between different instruments so you can have complete confidence when transferring texture methods between testing locations.

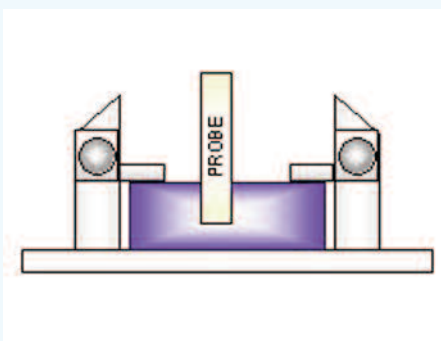
**Part no. 432-243**



### TMS Small Sample Holder

The Small Sample Holder has been designed to accommodate spherical or irregular samples. Three sizes of holding plate are supplied which are fitted above and below samples, maximising test flexibility. The small sample holder is a must for clumsy puncture tests where it is difficult to hold individual samples.

**Part no. 432-244**

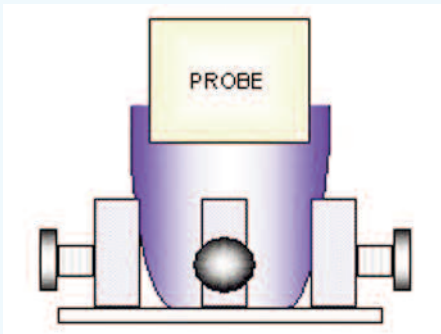


### TMS Mini Sample Vice (& Three-Point Bend)

The mini sample vice consists of two adjustable vice jaws that move horizontally to grip the sides of regular shaped samples. 'V' slots in the jaws accommodate tablet type products and prevent movement during puncture and penetration tests. Top jaws with vertical travel are used to firmly fix samples in place increasing result accuracy during decompression of the sample.

**Part no. 432-247**

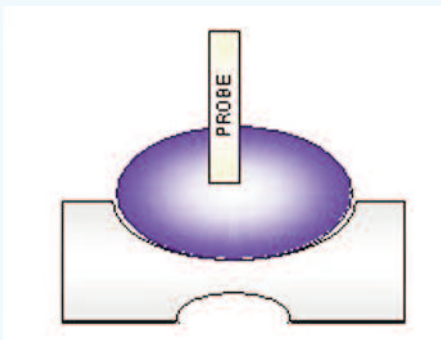
## Fixtures Cont'd



### TMS Container Grips

This fixture is used in extrusion tests where semi-solid or liquid samples are tested in their consumer packaging or other collection vessel. Soft grip rubber arms hold containers from 10mm to 70mm in diameter firmly. This is critical in measuring adhesion properties of viscous liquids during the return cycle of testing.

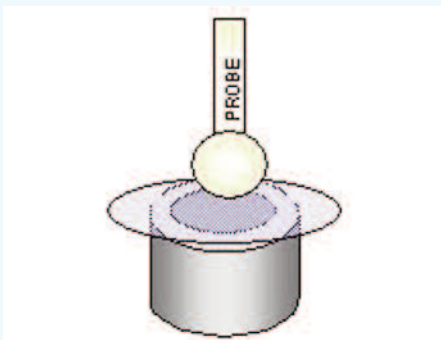
**Part no. 432-038**



### TMS Spherical Sample Holder

This fixture is used to support large diameter spherical samples that do not require holding in place during the return cycle of testing. It is ideal for holding eggs for shell hardness testing or fruits such as pears and avocado from which only compression data is required.

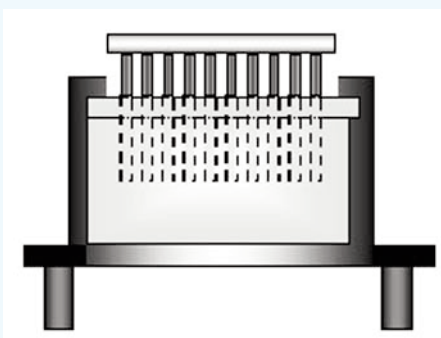
**Part no. 432-039**



### TMS Friable Food Support

The friable food support consists of a hollow ring used to provide 360° support to brittle foods with roughly circular geometries such as potato chips. Based upon original research from the 1960's this fixture is used in conjunction with small diameter ball probes to punch through and measure sample fracture.

**Part no. 432-042**



### FTC Large Scale Accessory Table

This heavy-duty table is used to support FTC prefix Kramer shear cells. The table is designed to hold the cells in accurate alignment during testing and prevent the automatic cleaning plate from rising up with the blades during the return stroke of the TMS-Pro and Console units.

**Part no. 432-043**





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