

## TAPlus Texture Analyser for Food Testing Applications

The TAPlus texture analyser is a cost effective, easy to use solution for performing rapid, detailed texture analysis tests on applications up to 102 kgf (1 kN, 225 lbf).

The machine uses interchangeable XLC Series loadcells as the measurement device. Tension and compression testing with cycling to load and extension limits are standard features. The machine can be fitted with a selection of specially engineered food texture fixtures, jigs and probes, as well as a range of multi-purpose grips for general applications such as evaluating the strength and integrity of food packaging.

The TAPlus features an innovative design that maximises working space and simplifies operation and maintenance. The large work surface accommodates a broad range of specimen sizes and can be specified with additional optional work platforms for specialised applications.

The TAPlus displays load and extension information on a highly legible LCD console with integral membrane keypad. The machine's control console displays prompts and menus, which guide the user through machine operations. Users can choose from a range of display languages and units.

The machine's performance can be further enhanced when combined with Lloyd Instruments' NEXYGEN™ MT data analysis software. This Windows® based software is easy to use and allows detailed, fully customisable texture analysis tests to be performed, storing and displaying results in graphical and tabular formats.

NEXYGEN™ MT software contains an extensive library of pre-programmed texture analysis test set-ups based on international standards. Results data can be manipulated to produce detailed analytical reports, with the ability to integrate with popular Windows® software packages including Microsoft® Excel and Outlook®.

### Features

- Large working area
  - Flexible work surface configurations
  - 175 mm (6.9 in) throat for large specimens
- Accurate load measurements with XLC Series loadcells
- Intuitive operator interface
  - Menu driven with intelligent prompts
  - Membrane keypad with tactile feedback
  - Highly legible, backlit LCD display
- Integral cabling
- Motor servo control system
- Flash memory upgradeable
- Full PC integration with NEXYGEN™ MT data analysis software
- Load rate control
- Multi-unit and multi-lingual display options
- Extensive range of texture analysis grips, jigs and probes

### Specifications

Force Capacity:	102 kgf (1 kN, 225 lbf)
Crosshead Speed:	0.001-21mm/sec (0.05-1270 mm/min, 0.002 -50 in/min)
Speed Accuracy:	< 0.2%
Load Cell Accuracy:	± 0.5% of reading
Load Resolution:	<0.005% of load cell used (max)
Extension Resolution:	<1.3 microns (0.0013 mm)
Travel:	500 mm (19.7 in)
Data Sampling Rate:	8 kHz
Display:	40 character x 4 line backlit LCD
Data Outputs:	Digital - RS232, Analogue 10V dc max (optional)
Supply Voltage:	115/230V ac ±10%, 50-60 Hz
Load Measuring System:	Exceeds the requirements of BS EN ISO 7500: 1999, Class 0.5 or Class-1, ASTM E4, DIN 51221
Analysis Software:	NEXYGEN™ MT Data Analysis Software and Ondio™ Applications Builder Software (optional)
Weight:	46 kg (101lb)
Operating Temperature:	5° to 35° C (40° to 95° F)



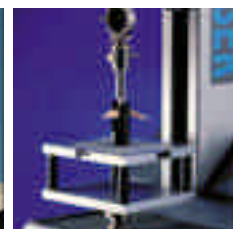
Crisp fracture test



Dough stickiness test



Chocolate egg shear test



Volodkevkevitch bite test



Butter cutting shear test

## Standard Accessories supplied with TA Plus Texture Analyser

Item	Part No	Item	Part No
Base Table Stainless Steel Drip Tray	01/2757 SPK/LFM/0010	12 mm (1/2 in) cylinder probe	01/2667

## Optional Accessories

Item	Part No	Item	Part No
<b>XLC Series Load Cells</b>		<b>Texture Analysis Fixtures and Test Accessory Kits</b>	
5 N (1.12 lbf)	01/2946	Back Extrusion Cell	01/2760
10 N (2.25 lbf)	01/2360	Butter Cutting Jig	01/2664
20 N (4.5 lbf)	01/2950	Kramer Type Shear Cell	01/2754
50 N (11.25 lbf)	01/2361	Ottawa Forward Extrusion Cell	01/2758
100 N (22.5 lbf)	01/2480	Warner Bratzler Shear Blade Set	01/2767
250 N (56.25 lbf)	01/3048	Spaghetti/Noodle Test Fixture	01/2659
500 N (112.5 lbf)	01/2362	Three Point Bend Food Jig	01/2756
1000 N (225 lbf)	01/2419	Volodkevitch Bite Set	01/2663
<b>Work Tables:</b>		Magnus Taylor Puncture Probe Set	01/3108
Expanded work table (350 x 400 mm) with M6 tapped holes for custom fixings	SPK/LFM/0007	Comparative Dough Stickiness Jig	01/2657
Expanded work table (350 x 400 mm) with 10-32 tapped holes for custom fixings	SPK/LFM/0008	Dough Preparation Set	01/2656
Aluminium T-Slot Table (180 x 340 mm) for adjustable fixings	SPK/LFM/009	Gluten Dough Extensibility Jig	01/2759
<b>Application Software</b>		Crisp Fracture Support Jig	01/2658
NEXYGEN™ MT	40/0658	Knife Edge Probe Set	01/2693
Ondio™ Application Builder Software	40/0683	18-Position Pea/Berry/Bean Test Fixture	01/3195
<b>Texture Analysis Probes</b>		Texture Probe Set	01/1114
Ball Probes (Diameter range 1/4"-1")		Bakery Accessories Kit	01/2696
Cone Probes (Cone angles 15°-90°)		Confectionery Accessories Kit	01/2698
Cylinder Probes (Diameter range 1/4"-4")		Dairy Accessories Kit	01/2697
		General Food Probe Kit	01/2695

For further information on any of our fixtures or our special fixture design service, please contact Lloyd Instruments.

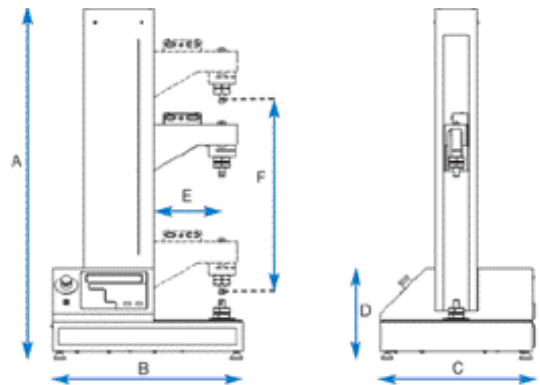
## Ordering Information

Order No. Description

01/TAL	BASE Model Number - 1st to 6th characters Lloyd Instruments TA Plus Texture Analyser			
	S	Travel Length - 7th character Standard, 500 mm (19.7 in)		
		/LX	Measurement Adapter - 8th to 10th characters XLC Load Cell Adapter	
			E	Work Surface - 11th character Stainless Steel Drip Tray
				/US 120V ac Mains Power /UK 230V ac Mains Power /EU 230V ac Mains Power
01/TAL	S	/LX	E	/EU Sample Order No. (01/TALS/LXE/EU)

Lloyd Instruments TA Plus Texture Analyser with 500 mm 19.7 in) travel and load cell adapter, base table, drip tray and 12 mm (1/2 in) cylinder probe. 220V ac power.

## Machine Dimensions



		mm	in
A	Machine Height	913	35.9
B	Machine Width	500	19.7
C	Machine Depth	400	15.8
D	Base Height	240	09.5
E	Throat	175	06.9
F	Max Travel (Standard machine)	500	19.7
F	Max Travel (Extended machine)	750	29.5



www.ametek.com

**UK**  
Lloyd Instruments Ltd  
12 Barnes Wallis Road  
Segensworth East, Fareham  
Hants, PO15 5TT

Tel +44 (0)1489 486 399  
Fax +44 (0)1489 885 118  
E-mail general@lloyd-instruments.co.uk  
Web www.lloyd-instruments.co.uk

**USA**  
AMETEK TCI Division  
8600 Somerset Drive  
Largo  
Florida 33773

Tel +1 (727) 536 7831  
Fax +1 (727) 539 6882  
E-mail chaillon.fl-lar@ametek.com  
Web www.lloyd-instruments.co.uk

**Far East**  
AMETEK Singapore Pte Ltd  
10 Ang Mo Kio Street 65  
#05-12 Techpoint  
SINGAPORE 569059

Tel +65 6484 2388  
Fax +65 6481 6588  
E-mail aspl@ametek.com.sg  
Web www.lloyd-instruments.co.uk

**France**  
Lloyd Instruments S.A.S.  
3, Avenue des Coudriers  
Zone d'activité de l'observatoire  
78180 Montigny Le Bretonneux

Tel +33 (0)1 30 57 47 74  
Fax +33 (0)1 30 57 50 33  
E-mail general@lloyd-instruments.com  
Web www.lloyd-instruments.fr

**Germany**  
AMETEK GmbH  
Rudolf-Diesel-Straße 16  
D-40670 Meerbusch

Tel +49 (0)2159 9136-70  
Fax +49 (0)2159 9136-80  
E-mail info@ametek.de  
Web www.ametek.de

# FOOD TEXTURE



**SPECIFICATION**  
SS-MT-6420-0101  
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**INTERNET**  
[www.ametek.com](http://www.ametek.com)  
[www.chatillon.com](http://www.chatillon.com)  
[www.lloyd-instruments.co.uk](http://www.lloyd-instruments.co.uk)

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## FG/BEC: Back Extrusion Food Cell

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### Description

The Back Extrusion Food Cell consists of a circular plunger which is driven into a larger cylinder to compress the food sample and force it through the gap between the plunger and the container. This results in a peak compression force and then a fluctuating compression force. The kit is supplied with three different diameter plungers to compress the sample.

### Specification

Maximum Capacity	500 N	112 lbf
Minimum Load Cell	100 N	22.5 lbf
Cylinder Length	125 mm	5.0 in
Disc Diameters	35 mm	1.4 in
	40 mm	1.6 in
	45 mm	1.8 in
Weight	0.25 Kg	0.6 lb
Temperature Limits	Ambient or Food Temperature	

### Applications

The jig acts in compression for texture testing of fruit and vegetables. Software is available to allow complete texture profile analysis to be performed



## FGBCJ: Butter Cutting Jig

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### Description

The frame of the butter cutter supports a standard size cutting wire.

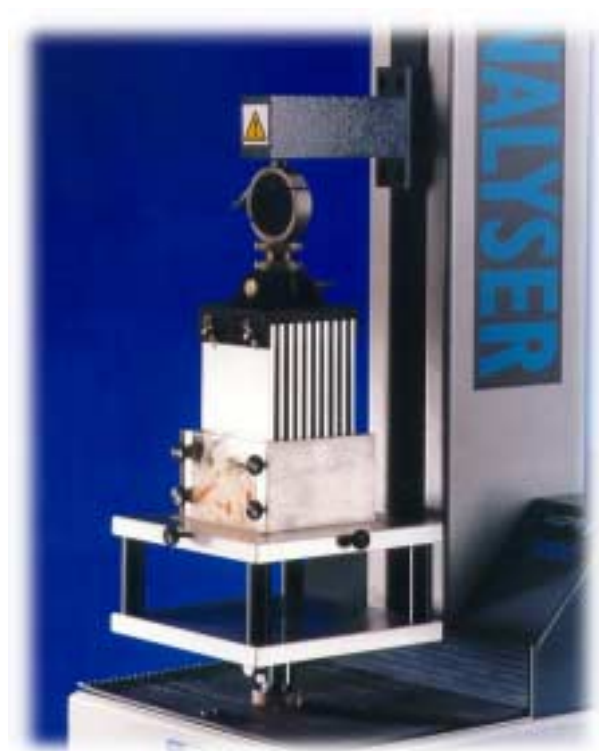
### Specification

Maximum Capacity	500 N	112 lbf
Minimum Load Cell	100 N	22.5 lbf
Eye End Diameter	15.85 mm	5/8 in
Width	95 mm	3.7 in
Height	65 mm	2.6 in
Weight	0.25 Kg	0.6 lb
Temperature Limits	-10°C to 100°C	

### Applications

This fixture is suitable for measuring consistency, spreadability, and firmness of rectangular fat samples up to 500gm size, and similar sized cheese, margarine and butter samples.





## FG/KSC: Kramer Type Shear Cell

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### Description

The Kramer Type Shear Cell comprises ten parallel steel blades which are driven down through guide slots into a rectangular container with corresponding slots in the base. The sample is sheared, compressed and extruded through the bottom openings.

### Specification

Maximum Capacity	1 kN	225 lbf
Minimum Load Cell	100 N	22.5 lbf
Eye End Diameter	15.85 mm	5/8 in
Weight	1 Kg	2.2 lb
Temperature Limits	Ambient to 100°C	

### Applications

Used for the texture testing of food products such as fruit, pie fillings, baked beans, coleslaw, etc. State of the art software is available to allow complete texture profile analysis to be performed.

## FG/FEC: Ottawa Forward Extrusion Testing Cell

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### Description

The Ottawa Test jig consists of a square test cell with solid walls and an open base which can be fitted with one of a variety of plates which are included in the kit. A square plunger is fitted to the machine crosshead and provides the compression. The test method involves weighing a suitable quantity of sample which is placed in the cell with either a slotted or a perforated plate fitted. In either case the result is determined by measuring the resulting force required to extrude the sample.

### Specification

Maximum Capacity	1 kN	225 lbf
Minimum Load Cell	100 N	22.5 lbf
Extrusion Plates	4 mm (0.2 in) diameter holes	
	3 mm (0.1 in) diameter bars	
Eye End Diameter	15.85 mm	5/8 in
Weight	1 kg	2.2 lb
Temperature Limits	Ambient to 100°C	

### Applications

This jig can be used to obtain useful data for food products where an extrusion process is used in its manufacture. Ideally suited for testing beans, fruit fillings, pulses, soft vegetables and snack products.





## FG/SBS: Warner Bratzler Shear Blade Set

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### Description

The Jig consists of a rigid frame supporting a shear bar. Interchangeable shear blades fit into the frame. The kit is supplied with three blades: A square cut blade, a 'V' blade, and a 'V' blade with a hole in the apex.

### Specification

Maximum Capacity	1 kN	225 lbf
Minimum Load Cell	100 N	22.5 lbf
Eye End Diameter	15.85 mm	5/8 in
Weight	0.25 Kg	0.6 in
Temperature Limits	-10°C to 100°C	

### Applications

The jig acts in direct compression for slicing/ shearing tests on meat products and vegetables. Software is available to allow complete texture profile analysis to be performed.

## FG/SPAG: Spaghetti / Noodle Testing Fixture

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### Description

The set consists of two roller grips, designed for tensile testing of food products such as spaghetti and noodles.

### Specification

Maximum Capacity	500 N	112 lbf
Minimum Load Cell		
Eye End Diameter	15.85 mm	5/8 in
Weight	0.25 Kg	0.6 lb
Temperature Limits	-10°C to 100°C	



## FG/TPB: Food 3 Point Bend Jig

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### Description

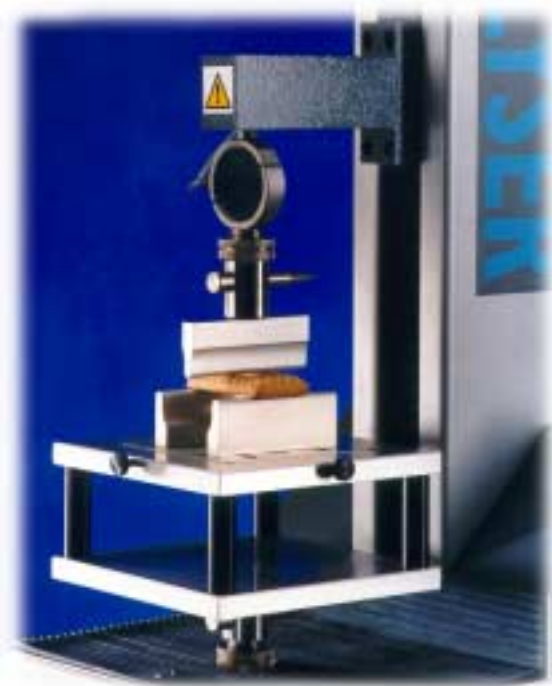
Three Point Bend Jig for general purpose food sample fracture testing.

### Specification

Maximum Capacity	1 kN	225 lbf
Minimum Load Cell	50 N	11.2 lbf
Span Range	40 - 80 mm	1.6 - 3.1 in
Eye End Diameter	15.85 mm	5/8 in
Weight	0.25 Kg	0.6 lb
Temperature Limits	-10°C to 100°C	

### Applications

The Three Point Bend Jig enables snap testing of various products such as fruit, biscuits, snack products and chocolate. It provides variable spans up to 80mm with graduated marks for easy setting. The supports are 6mm in diameter. Testing using this jig can enable measurements for snap strength and crispness.



## FG/VBS: Volodkevitch Bite Set

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### Description

Designed to imitate incisor teeth shearing through a food sample. The set comprises upper and lower 'teeth' which, during the test, are brought together until nearly touching. The sample is positioned on the lower 'tooth' and the result is measured as the peak force required to bite through the sample.

### Specification

Maximum Capacity	500 N	112 lbf
Minimum Load Cell	50 N	11.2 lbf
Eye End Diameter	15.85 mm	5/8 in
Weight	0.25 Kg	0.6 lb
Temperature Limits	-10°C to 100°C	

### Applications

Typically used to test meat products, vegetables, fruit and crispy or crunchy products. Results correlate with tenderness, toughness and firmness of the sample.



## TG82: Magnus Taylor Puncture Probe Set

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### Description

This jig consists of two sets of cylindrical probes of different sizes. Each pair has one flat end and one hemispherical end. A twist action clamping chuck fitting directly to the load cell is included together with a flat 150mm<sup>2</sup> specimen support plate

### Specification

Maximum Capacity	2 kN	450 lbf
Minimum Load Cell	50 N	11.2 lbf
Probe Diameters	7.94 mm	5/16 in
	11.11 mm	7/16 in
Temperature Limits	-10°C +100°C	

### Applications

Puncture/penetration tests on fruit, vegetables and food products. Software is available to allow complete texture profile analysis to be performed.



## TG83: Texture Probe Set - 2kN Max

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### Description

This Jig consists of a range of flat ended cylindrical probes of various sizes together with a twist action clamping chuck fitting directly to the load cell shaft. A flat 150mm<sup>2</sup> specimen support plate and splash tray are provided.

### Specification

Maximum Capacity	2 kN	450 lbf
Minimum Load Cell	50 N	11.2 lbf
Probe Diameters	1.59 mm	0.06 in
	3.18 mm	0.13 in
	4.77 mm	0.19 in
	6.36 mm	0.25 in
	7.95 mm	0.31 in
	9.54 mm	0.38 in
	11.13 mm	0.44 in
	12.72 mm	0.50 in
Temperature Limits	-10°C +100°C	

### Applications

Puncture/penetration tests on fruit, vegetables and food products. Software is available to allow complete texture profile analysis to be performed.





## Ball Probes

### Description

Two fundamental criteria for a good test are repeatability and resolution for comparison between results. In many cases where specimen hardness/ softness is required, a ball probe can provide both repeatability and resolution. The principle of the ball probe is that uniform compression force is distributed at a normal angle to the surface area of the ball. This gives an averaging effect over the local area being tested.

### Specification

Probe No.	Diameter of Ball	Max Load	Screw Fitting	Part No
FG/BA1	1/4 in	500N (112 lbf) ↓	6mm (0.24 in) ↓	01/2679
FG/BA2	2mm			01/2683
FG/BA3	1/2 in			01/2680
FG/BA4	4mm			01/2684
FG/BA5	3/4 in			01/2681
FG/BA6	6mm			01/2685
FG/BA7	1.0 in			01/2682
FG/BA8	8mm			01/2686
FG/BA9	10mm			01/2687
FG/BA10	10mm			

### Applications

The Three Point Bend Jig enables snap testing of various products such as fruit, biscuits, snack products and chocolate. It provides variable spans up to 80mm with graduated marks for easy setting. The supports are 6mm in diameter. Testing using this jig can enable measurements for snap strength and crispness.

## Cone Probes

### Description

Cone Probes are supplied with a range of angles, from 15° to 90°. The selection of the appropriate cone is, in some cases, dependent upon the testing standard, or alternatively can be selected appropriately for the consistency of the material being tested.

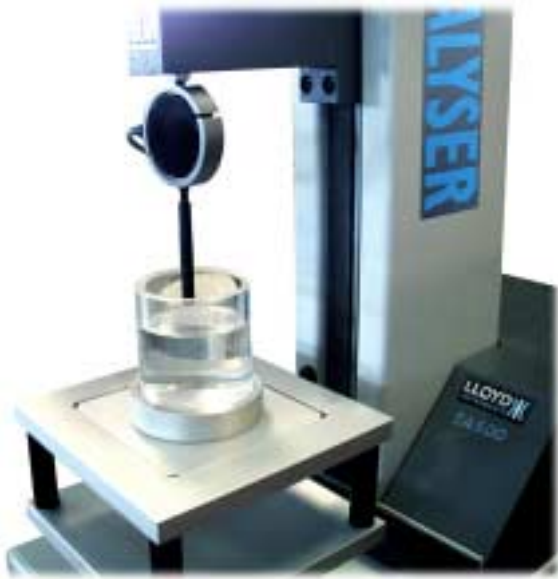
### Applications

Cone Probes have been used for many years, particularly on penetrometers, for testing building industry products such as sealants and mastics, and the cosmetics and pharmaceutical industries for testing creams and pastes. Cone Probes are useful for determining the spreadability of dairy products such as margarine, butter and spreads.



### Specification

Model	FG/CO15	FG/CO30	FG/CO45	FG/CO60	FG/CO90
Part No	01/2688	01/2689	01/2690	01/2691	01/2692
Maximum Load	500N	500N	500N	500N	500N (112 lbf)
Thread Size	6mm	6mm	6mm	6mm	6mm (0.24 in)
Cone Angle	15°	30°	45°	60°	90°



## Applications

Cylindrical probes have traditionally been used as general purpose compression probes for a wide range of applications, primarily for applying a deformation to a gel structure to determine the gel strength and elasticity. They are also useful for applying a shearing force to a gel to determine its breaking strength and elasticity. Many standards quote cylindrical probes for gel testing. The Bloom value is a recognised standard for quoting the strength of a gel structure, particularly gelatine.

## Cylinder Probes

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### Description

The principle of the cylindrical probe is that as the probe is forced into the specimen, a shearing force acts which causes the sample to deform or rupture. This produces a curve showing load resulting from deformation.

### Specification

Probe No.	Diameter of Ball	Max Load	Screw Fitting	Part No
FG/CY1	1/4 in	500N (112 lbf) ↓	6mm (0.24 in) thread ↓	01/2666
FG/CY2	2mm			01/2674
FG/CY3	1/2 in			01/2667
FG/CY4	4mm			01/2675
FG/CY5	3/4 in			01/2668
FG/CY6	6mm			01/2676
FG/CY7	1 in			01/2669
FG/CY8	8mm			01/2677
FG/CY9	1/2 in			01/2670
FG/CY10	10mm			01/2678
FG/CY11	2 in			01/2671
FG/CY13	3 in			01/2672
FG/CY15	4 in			01/2673

## TA500 Base Table

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### Description

The Base table is an essential part of the TA500 Texture Analyser. It is supplied with two inserts, one blank and one with a central locator hole. The blank insert provides a flat and solid base for positioning specimens for testing. The holed plate provides location for a number of test fixtures such as the back extrusion cell and Volodkevitch Bite Set. Other fixtures such as the Kramer Shear Cell, Ottawa Cell and Warner Bratzler are located in the cut-out section (without an insert plate) and are secured using the two thumb screws. This helps ensure accurate central positioning.



## Texture Analysis Accessories Kits

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A range of Texture Analysis Accessories Kits are available from Lloyd Instruments. Each kit consists of specially selected jigs and probes for analysis of specific food types.

Application of a texture analysis system in an organisation can highlight numerous quality improvement opportunities and other benefits through operations, typically research and development, production/process control, and quality assurance/control.

### Bakery Accessories Kit

A Bakery Kit containing the following items:-

TPB - 3 point bend jig

DPS - Dough firmness testing set

DSJ - Comparative dough stickiness measurements jig

CRISP - Crisp fracture support jig

CY7 - 1 in (25.4 mm) diameter cylinder probe



### Confectionery Accessories Kit

A Confectionery Kit containing the following items:-

TPB - 3 point bend jig

CY2 - 2 mm (0.08 in) diameter cylinder probe

CY7 - 1 in (25.4 mm) diameter cylinder probe

BA2 - 2 mm (0.08 in) diameter ball probe

BA3 - 1/2 in (12.7 mm) diameter ball probe



### Dairy Accessories Kit

A Dairy Kit consisting of the following items:-

ICE - Ice cream scoopability testing jig

BCJ - Butter cutting jig

CY11 - 2 in (50.8 mm) diameter cylinder probe

CY2 - 2 mm (0.08 in) diameter cylinder probe

CY4 - 4 mm (0.16 in) diameter cylinder probe

### General Food Probe Kit

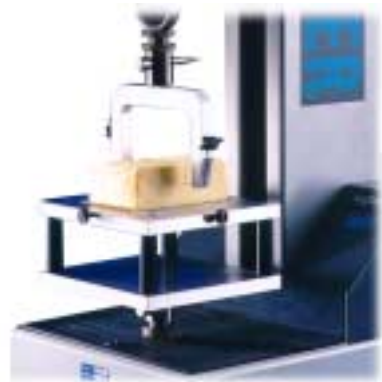
This probe set contains the following items:-

CY1 - 1/4 in (6.35 mm) diameter cylinder probe

CY7 - 1 in (25.4 mm) diameter cylinder probe

BA3 - 1/2 in (12.7 mm) diameter ball probe

BA7 - 1 in (25.4 mm) diameter ball probe



## ORDERING INFORMATION

Model	Part No.	Description
FG/BEC	01/2760	Back Extrusion Food Cell
FG/BCJ	01/2664	Butter Cutting Jig
FG/KSC	01/2754	Kramer Type Shear Cell
FG/FEC	01/2758	Ottawa Forward Extrusion Cell
FG/SBS	01/2767	Warner Bratzler Shear Blade Set
FG/SPAG	01/2659	Spaghetti / Noodle Testing Fixture
FG/TPB	01/2756	Food Three Point Bend Jig
FG/VBS	01/2663	Volodkevitch Bite Set
TG82	01/1134	Magnus Taylor Puncture Probe Set
TG83	01/1114	Texture Probe Set
FG/BA1 - FG/BA10	See Above	Texture Analysis Ball Probes
FG/CO15 - FG/CO90	See Above	Texture Analysis Cone Probes
FG/CY1 - FG/CY15	See Above	Texture Analysis Cylinder Probes
FG/BAKERY	01/2696	Bakery Accessories Kit
FG/CONFECT	01/2698	Confectionary Accessories Kit
FG/DAIRY	01/2697	Dairy Accessories Kit
FG/GENERAL	01/2695	General Food Probe Kit



## TEST AND CALIBRATION INSTRUMENTS

### UK

Lloyd Instruments Ltd  
Forum House,  
12 Barnes Wallis Rd  
Segensworth East, Fareham,  
Hampshire, UK  
PO15 5TT  
Tel: +44 (0)1489 486 399  
Fax: +44 (0)1489 885 118

### America

AMETEK TCI Division  
8600 Somerset Drive  
Largo,  
Florida 33773  
USA  
Tel: +1 (727) 536 7831  
Fax: +1(727) 539 6882

### Far East

Lloyd Instruments  
Far East Representative Office  
No7 Sherwood Place  
Alexander Heights  
6064 Perth  
Western Australia  
Tel: +61 8 9343 5725  
Fax: +61 8 9343 5723

### France

Lloyd Instruments SA  
3 avenue des Coudriers,  
Zone d'activite de l'observatoire,  
78180 Montigny-Le-Bretonneux  
FRANCE  
Tel: +33 (1) 30 57 47 74  
Fax: +33 (1) 30 57 50 33

### Germany

Erichsen Wuppertal  
Ametek Precision Instruments  
Europe GmbH  
Rudolf-Diesel-Strasse 16  
D-40670 Meerbusch  
Germany  
Tel: +49 (0)2159 9136-70  
Fax: +49 (0)2159 9136-80

email: [general@lloyd-instruments.co.uk](mailto:general@lloyd-instruments.co.uk)  
[www.lloyd-instruments.co.uk](http://www.lloyd-instruments.co.uk)

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Manufacturer**