



**LLOYD** **IK**<sup>™</sup>  
materials testing

- High-Precision Universal Test Machines
- Extensive Range of Grips, Jigs, Probes and Fixtures
- Application Expertise and Customized Solutions
- 1 kN to 100 kN
- Application Software

**MATERIALS**  
TESTING  
EQUIPMENT. ■

MEASURING UP TO **YOUR STANDARDS**  
– EASY AND ACCURATE SOLUTIONS  
TO THE CHALLENGES  
YOU FACE EVERY DAY



# About Us

AMETEK Sensors, Test & Calibration (STC) is one of the world's leading manufacturers and developers of instruments for testing the tensile strength, compressibility, hardness, elasticity, peeling, and adhesion ability of a wide range of materials. Our product portfolio spans from handheld force gauges up to 100 kN universal testing machines.

**Lloyd Instruments** universal testing machines are used to determine the physical and mechanical properties of raw materials and components, as well as for product testing of finished goods.

**Chatillon** is a leading manufacturer and global supplier of force measurement instruments and testers for use in production, quality and R&D in a host of applications and markets.

This brochure covers our range of Lloyd Instruments universal testing machines. For more information about our range of Chatillon force measurement instruments please see the Chatillon brochure.

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**CUSTOMIZED TEST SOLUTIONS**

ARE OUR SPECIALTY

– NO MATTER YOUR TEST NEED,

WE'LL GIVE YOU

THE RIGHT **SOLUTION** ■

# The Benefits of Materials Testing

Your customers demand innovation, reliability and consistently high quality. Your company demands shorter product-to-market cycle times, lower manufacturing costs and improved profitability. Basically, you're expected to do more with less.

Product testing is an integral part of your company's strategy to ensure customer safety, satisfaction and, ultimately, loyalty. Materials testing instruments are important tools in this process. These instruments measure your product's performance, safety, quality and compliance. Ultimately, product testing is key to ensure that your company avoids obstacles that can damage your valuable relationship with your customers.

AMETEK STC materials testing instruments meet these demands. We help you deliver dependable, reliable and quality products that meet your internal requirements as well as international standards. We offer a comprehensive product line engineered to be easy to set up, easy to operate and even easier to maintain.

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## Markets

Our product range is very versatile and our universal test machines combined with dedicated grips and fixtures can be used to solve a variety of specific test applications.

A close-up photograph of a laboratory scale. On the scale's platform sits a small white cup and a bag of Actimel Powerfruit yogurt. The bag is white with purple and blue accents, featuring the Actimel logo and the text 'Powerfruit', 'natural', '+ L Casei', and 'Vitamin C'. The scale is a precision instrument with a circular dial at the top and a vertical column. The background is a blurred laboratory setting with blue lighting. A dark blue diagonal overlay covers the right side of the image, containing white text.

# Applications

- The following section details common applications and key international standards by industry sector.

Our application knowledge and expertise is immense.

If you don't see your application here, please contact us.

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# Products & Components

Testing of products and components often requires test methods that are not based on international standards.

NEXYGEN*Plus* software can be configured for any multi-stage test method that is required. Configurable user access rights and audit trails benefit customers working in the medical device or pharmaceutical industries.

Markets served include:

Medical device, automotive, pipes, building materials, electronics, aerospace, packaging, defence and many more.



Test Type	Standard / Application
Tensile strength, elongation to break, yield strength, modulus, Poisson's ratio	ASTM D638, ASTM D1708, ASTM D2990, ASTM D3291, ASTM D3807, ASTM D3846, ASTM D3914, ASTM D4321, ASTM D4475, ASTM D4476, ISO 527, BS 2782, DIN 53504
Compression	ASTM D695, ASTM D2412, ISO 604, BS 2782
Flexural	ASTM D790, ISO 178, BS 2782
Shear	ASTM D732
Friction	ASTM D1894

The testing of raw materials requires highly accurate and repeatable data to allow preparation of material data sheets. A wide range of grips is available, including pneumatic grips for reducing operator fatigue and constant pressure gripping. Our extensometers enable our customers to accurately measure parameters such as modulus, yield strength and elongation to failure.

For flexural and compression tests, our machines can compensate for load frame and fixture deflection ensuring highly accurate data acquisition.

The LD Series strain rate control accuracy exceeds the requirements of ISO527.

## Plastics

Test Type	Standard / Application
Tensile strength, elongation, yield strength	ASTM D882, ISO 527
Static and kinetic coefficients of friction	ASTM D1894, ISO 8295
Tearing strength	ASTM D1004, ASTM D1938, ISO 6383
90° and 180° peeling of heat bonded seals	Seal Strength
Puncture resistance	ASTM D5748, EN 14477
Cardboard compression, flexural, ECT, BCT, FCT, SCT	ISO 5628, ISO 3037, ISO 12048, EN 23035, ISO 9895

The testing of packaging requires an extremely versatile materials testing system due to the varying requirements within industries such as pharmaceutical, cosmetics, food and beverages.

A single system from us will allow you to test in compliance with all standards shown above and many more.



## Packaging

Test Type	Standard / Application
Tensile	ISO 37, ASTM D412, ASTM D413, ASTM D429, ASTM D4482
Tear	ASTM D624

Testing of rubber materials requires machines capable of measuring high strain and testing at temperatures above and below ambient.

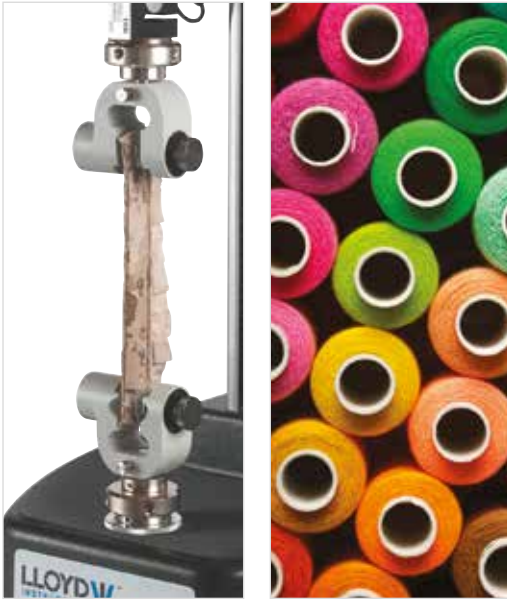
We offer extended column machines ideal for rubber applications that are compatible with long travel contacting and non-contacting extensometers.

Thermal chambers for testing between -70°C and +300°C are also available for the study of material properties at temperatures other than ambient.



## Rubber





# Textiles

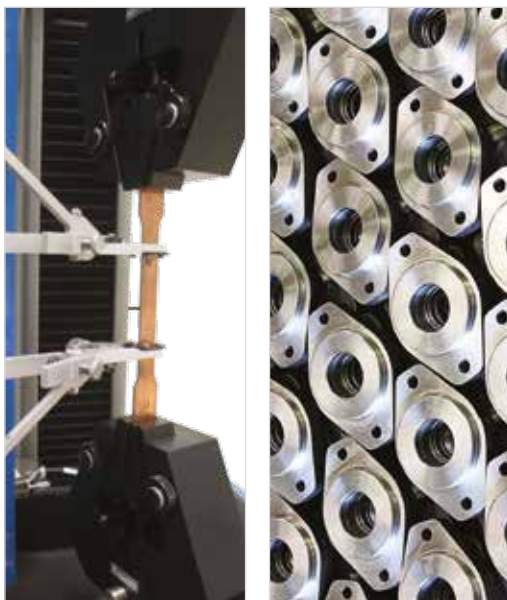
Test Type	Standard / Application
Tensile textiles	ASTM D1682, EN ISO 13934, ASTM D1578, EN ISO 13935, EN 29073, EN ISO 2062
Tensile geo-textiles	ASTM D4884, ASTM D4632, ASTM D4595, EN ISO 10319, EN ISO 10321

Test Typical Products		
Geo-textiles	Knitted products	Ropes
Fibre and yarns	Thermal insulation	Nets
Coated textiles	Non-wovens	Webbing

Test Type		
Seam slippage	Tensile strength	Compressive strength
Puncture resistance	Tear resistance	Trouser tear
Coated textiles	Non-wovens	Webbing

Testing textiles can include testing the strength of woven cloth, slippage in woven fabrics, seam strength, and tests on yarns and attachments such as buttons and poppers.

Some of the most common test types within textile testing are tear resistance, compressive strength, tensile strength, and puncture resistance, all of which are among the many types of tests that can be performed on our high-precision test machines.



# Metals

Test Type	Standard / Application
Tensile	EN 10002, EN ISO 8496, ISO 6892, ASTM E8, ASTM A370
N value	ISO 10275
Bending	ASTM E290, ASTM E1012, EN 13523, EN ISO 7438, EN ISO 8491
Erichsen cupping test	DIN 50101

The key to accurately measuring the properties of metals is highly accurate strain rate control. The LD Series exceeds the strain rate accuracy requirements of all relevant international standards.

For metals testing, we offer a wide range of extensometers including video extensometers to measure such parameters as Young's modulus and proof stress.

Standard test methods within NEXYGEN*Plus* software allow simple and fast test creation to international standards.

Test Type	Standard / Application
180° peel	FTM1
90° peel	FTM2
Low speed release	FTM3
Loop tack	FTM9
Dynamic shear	FTM18

Our LS Series can be configured to test in accordance with the FINAT methods.



## Adhesive Tapes

Test Type	Standard / Application
Compression	IASTM D3574, ISO 3386, BS 4098
Tensile	ASTM D3574

Several compression/relaxation tests can be performed on foam samples, measuring the forces at various percentages of compression to international standards.



## Foams



Test Type	Standard / Application
Tensile wet & dry	EN 1607, EN 1608, ASTM C203
Flexural	EN 12089, ASTM C446, ASTM C203
Compression	EN 826, ASTM C165, EN 1605, EN 12089
Friction	TAPPI

Tests such as Z direction fibre strength, bending, friction and compressibility can be easily performed using NEXYGEN*Plus* software.

Data from all tests can be combined into a single material properties data sheet.

## Paper and Board



Test Types		
TPA	Consistency	Gumminess
Adhesiveness	Crispness	Hardness
Chewiness	Firmness	Springiness
Cohensiveness	Gel strength	Stickiness

We also supply the dedicated food texture analyser TA1 which features all the benefits of the LS Series and NEXYGEN*Plus*.

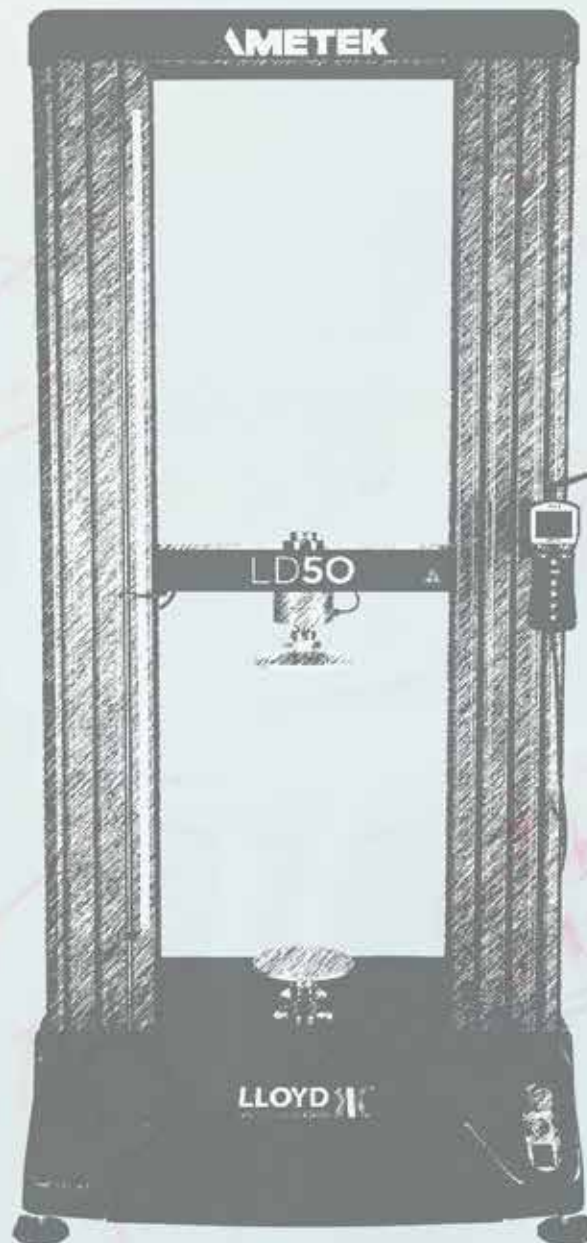
## Food





# QUALITY AND INTEGRITY

ARE A PART OF OUR DNA, AND WE WOULD LIKE TO HELP MAKE IT PART OF YOURS AS WELL. ■



# MATERIAL TEST AND DATA ANALYSIS SOFTWARE



Analysis Software

## NEXYGEN *PLUS*

The flexible and easy-to-use software allows the operator to control and monitor all aspects of the system from a single intuitive user interface. This ensures fast, reliable, and powerful testing in addition to fingertip control of data analysis features.

### THE PACKAGE INCLUDES:

- + Integrated Standards library featuring common ISO, EN and ASTM methods
- + Comprehensive multi-stage test wizard
- + SPC trend and histogram charts
- + Video and still picture capture system
- + Compatible with Windows® packages
- + Data export utility for connection to LIMS and SPC packages
- + Seamless integration with Microsoft Office®

### Test Library

Getting started with NEXYGEN*Plus* could not be simpler thanks to the extensive built-in library of test methods covering food, cosmetics and packaging tests to AACC, ASTM, DIN, EN, ISO, and other international standards.

Our philosophy is to offer an advanced test library covering all available modules to every customer, in addition to complete test wizards for tension, compression, tearing, peeling, friction and flexural tests.

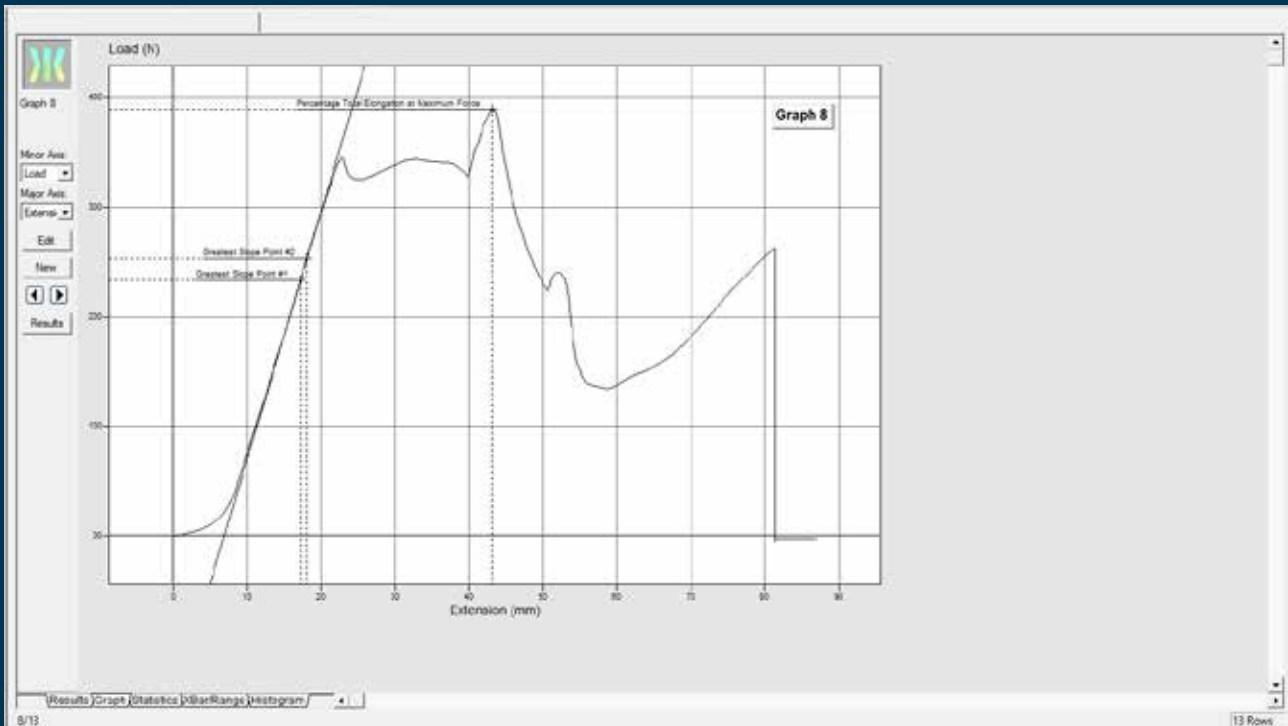
The standard user configurable test can be used to create specialist multi-stage tests and is particularly beneficial for testing springs, plastics, rubber, and medical devices.



## Video and Still Picture Capture

Whether for advanced texture analysis or presentation of test results, video and stills capture is a unique convincing feature. Entire tests can be videoed and replayed for detailed post-test analysis.

Alternatively, still images can be taken at specific points during the test. The still images are recorded on the graph for easy analysis. These powerful features can be utilised by simply connecting a webcam or analogue video camera to a PC.



## Test Data Integrity and Audit Trails

The security and audit trail feature enables supervisors to manage user access and data traceability. NEXYGEN<sup>Plus</sup> utilizes Windows Active Directory users allowing system administrators to manage user access.

Electronic signatures and the ability to restrict user access rights increase security and avoid costly errors. Integrated audit trails covering operator usage and test results ensure critical changes to test procedures are recorded in a simple retrievable format.

## Reporting and Exporting Data

NEXYGEN<sup>Plus</sup> features a simple to use report designer linked to Microsoft Word.

Layouts, fonts and images can all be manipulated using the full power of Microsoft Word<sup>®</sup>.

Microsoft Office<sup>®</sup> integration allows seamless

transfer of data to familiar Windows<sup>®</sup> packages such as Word<sup>®</sup> and Excel<sup>®</sup> for further analysis.

Data can also be exported to your favourite LIMS, SPC or data management systems by using our versatile data export facility.

# A FLEXIBLE SYSTEM TO FIT YOUR SPECIFIC NEEDS

## Your Complete Testing Solution

– For material test today and in the future

The modular design of Lloyd Instruments test machines allows you the flexibility to customize your testing experience, ensuring that your test machine will meet your needs today and into the future.

Combined with the NEXYGEN*Plus* analysis software you have a powerful test system capable of providing reliable, high quality testing for many years to come.

With the availability of thousands of interchangeable test fixtures and an extensive range of accessories, the test machines from Lloyd Instruments can virtually perform any type of test quickly, safely, and accurately.



## CHOOSE THE RIGHT UNIVERSAL TESTING MACHINE

All Lloyd Instruments machines are universal testing machines that can be used as is or coupled with the powerful NEXYGEN*Plus* software for advanced analysis. The machine can be used stand-alone or be connected to robots for automated testing, helping to reduce costs and save time.

Standard NEXYGEN*Plus* features:

- All available test methods
- Facility to build your own methods
- Powerful reporting engine compatible with Microsoft® Excel® and Word®
- Data export engine for use with LIMS and SPC systems





## TAILOR TO YOUR NEEDS

Every application is unique. Lloyd Instruments' wide range of accessories give you the most effective and accurate test system. When a universal testing machine is chosen, a Lloyd Instruments Application Engineer will support you in selecting the load cell, grips and additional accessories needed for your specific test solution.

- Interchangeable grips and fixtures for any application.
- Wide range of easily interchangeable load cells of different capacities to give you the highest accuracy measurements.
- Contact and non-contact extensometers for precision strain measurement on materials such as plastic, metal and rubber.
- Safety shields for protection when testing brittle materials.
- Thermal chambers for testing material properties both above and below ambient temperatures.



## FAST AND EASY ANALYSIS

The flexible NEXYGENPlus analysis software boosts your testing solution and offers fast analysis that is easy to read, process or even pass on to others for further analysis.

- Complete standards library for a wide range of applications.
- Video and still picture capture system for post observation and -analysis.
- Seamless integration with Excel and other Microsoft® Office programs.
- Data export utility for connection to LIMS and SPC packages.



## AUTOMATE YOUR TESTING

Take your testing to new levels of flexibility and productivity. The materials testers from Lloyd Instruments are designed to automate your workflow, helping to reduce costs and save time, while providing high precision, accuracy, and reliability.



# APPLICATION SPECIFIC TESTING MACHINES

## Specific Needs, Unique Solutions

– Experts in designing test solutions that work for you



up to 1 kN



Traceability



Mountable



Digital



Analysis Software



Ready for Use

## Friction Tester

The FT1 friction tester is a perfect choice to easily measure static and kinetic coefficients of friction.

It conforms to international standards for friction testing including ASTM D1894, ISO 8295 and TAPPI T549.

## Texture Analyser

The TA1 texture analyser is a cost effective, easy to use solution for performing rapid, detailed texture analysis tests. An extensive range of jigs, probes and fixtures designed from years of experience is available. In addition, the machine can be fitted with multi-purpose grips for testing the strength and integrity of food packaging.

# SINGLE COLUMN TESTING MACHINES

## LS SERIES

### Powerful Material Test Machines

– For advanced material testing up to 5 kN



up to 5 kN



Traceability



Mountable



Digital



Analysis Software



Ready for Use

■ Accuracy +/- 0.5% of reading down to 1% of cell capacity

■ For quality control, education and R&D

■ Modern linear guide technology

High-precision solutions that, when combined with our extensive range of grips, fixtures, extensometers and software, create a powerful materials testing system. Suitable for a wide range of applications and test types, including medical devices, plastics, packaging, textiles, rubber, and electronics to name a few.

The series features an integral control console with a multi-function keypad and an easy-to-read backlit LCD to display load and extension information. The control console displays prompts and menus, which guide you through machine operations. It can work as a standalone system but when used in collaboration with NEXYGENPlus software it allows the operator to control and monitor all aspects of the system from a single front end.

# TWIN COLUMN BENCH MOUNTED

## LD SERIES

**Designed to Perform. Built to Last.**

– For flexible materials testing up to 100 kN



up to 100 kN



Traceability



Mountable



Digital



Analysis Software



Ready for Use

■ Data sampling rate 1000Hz

■ For simple to complex multi-stage tests

■ Extended models available

The modular design of the Lloyd Instruments test machines allows you the flexibility to customize your testing experience, ensuring that your test machine will meet your needs today and into the future.

With the availability of thousands of highly accurate, interchangeable grips and fixtures as well as an extensive range of accessories, the test machines from Lloyd Instruments can virtually perform any type of test quickly, safely, easily, and accurately. Match it with the NEXYGENPlus analysis software and you have a powerful machine capable of providing powerful, high quality testing for many years to come.

# A WORLD OF KNOWLEDGE

At AMETEK STC we have decades of experience with materials testing. We share our knowledge with testing professionals all over the world on a daily basis through seminars, exhibitions and training sessions.

Our website, [AmetekTest.com](http://AmetekTest.com), functions as a digital portal packed with application notes, case stories, articles, product information, industrial solutions, videos, standards overview, answers to frequently asked questions and much more. The information is available for you to use at any time, just like our technical experts are just one call away if you need guidance when looking for a testing solution that fits your specific application.

Join the AMETEK STC community on LinkedIn and be first in line for news, articles, application notes, and tips and tricks for materials testing professionals.





# Accessories

## GRIPS, JIGS, FIXTURES AND PROBES



### Bending / Flexural Jigs

Bending grips / flexural grips for 3-point and 4-point bending.



### Compression Plates

Compression plates for compression testing.



### Eccentric Roller Grips

Eccentric roller grips for flat samples such as rubber, plastic film and paper.



### Hydraulic Grips

Hydraulic grips with single or double actuator.



### Peel and Friction Grips

The peel and friction grips come in different designs and are ideal for peeling samples at 90°, 180°, performing T-peel and COF.



### Pincer Grips

Pincer grips for small component parts.



### Vice Grips

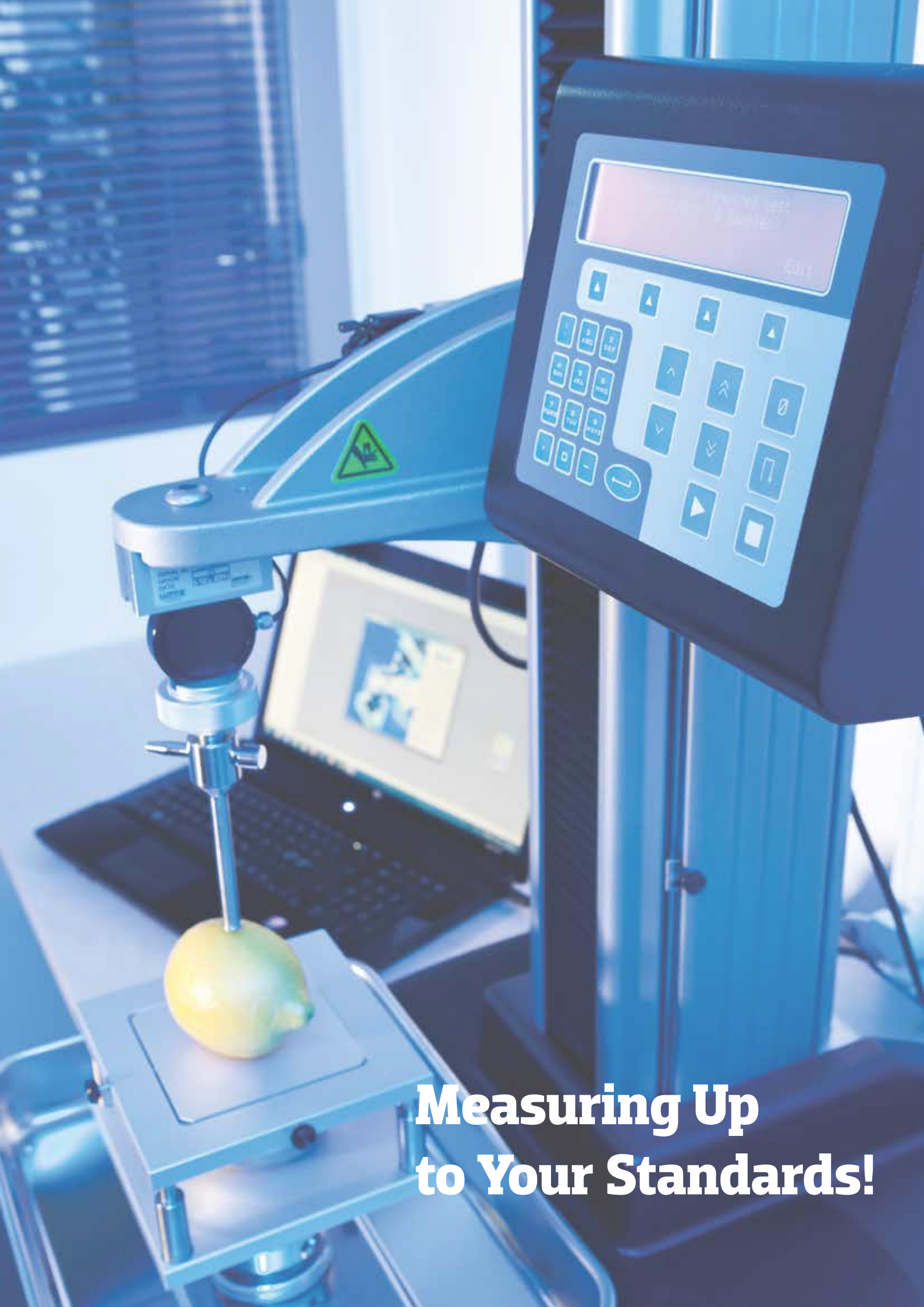
Vice grips for all types of samples.



### Wedge Grips

Wedge grips for testing the tension of plastic and metals.

We also offer scissor grips, bollard grips, thread head grips and more. If we don't have it, we can probably make it. Please contact us for more details and custom solutions.



**Measuring Up  
to Your Standards!**

# LOAD CELLS

## XLC/YLC Load Cells

Compatible with the LS Series, LD Series, TA texture analysers, and FT1 friction tester. The load cells are S-Beam designed with anti-rotation collars to keep the load train from twisting. Easy adjustment for better axial alignment.

Capacity:

max 10 kN. Accuracy: +/- 0.5% from 1% to 100% of the stated load cell range.

## OLC (Pancake) Load Cells

Compatible with the LD Series. The load cells improve accuracy at the cross axis and due to its compact shape it helps increase work area.

Capacity:

max 100 kN. Accuracy: +/- 0.5% from 1% to 100% of the stated load cell range.





# EXTENSOMETERS

## Video Extensometers

The VE1 is a high precision video extensometer that uses a non-contacting optical measurement based on a digital camera and real time image processing to measure longitudinal and transversal strain during tensile tests.

## Long Travel Extensometers

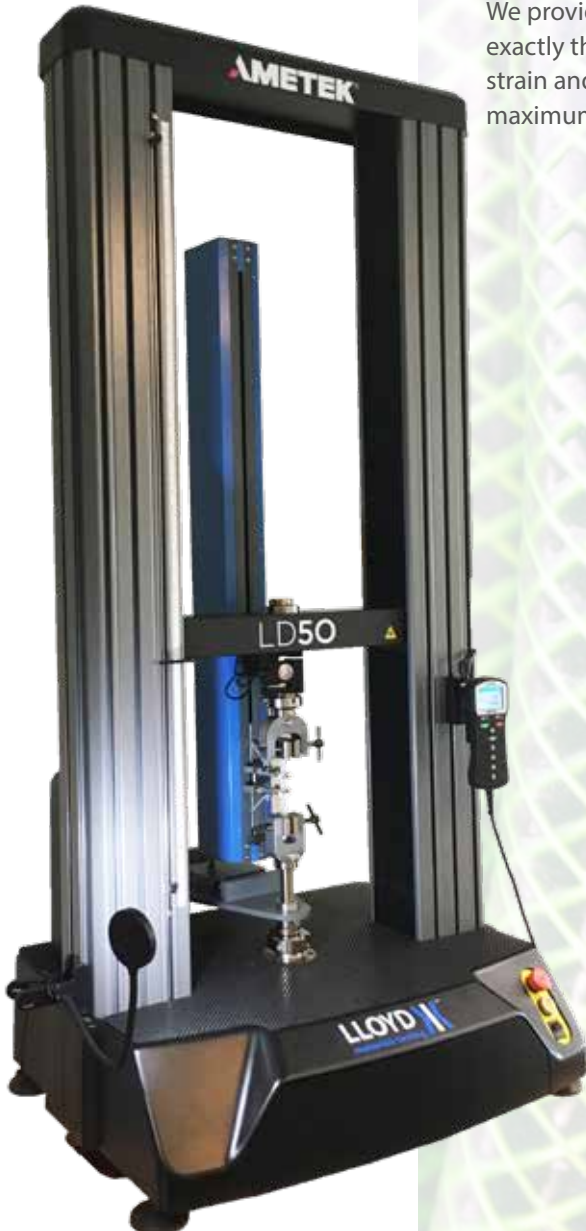
Long travel extensometers are ideal for use when testing high-elongation materials. We supply two different long travel extensometers; one for plastic and rubber and one for rigid, semi-rigid and ductile materials.

## Deflection Gauge Extensometers

A wide range of deflection gauge extensometers are ideal to measure deformation in three- and four-point bend tests and in compression testing applications. We offer a wide range in many shapes and sizes.

## Contacting Extensometers

We provide a wide variety of general purpose contacting extensometers in exactly the size you need. These extensometers are designed for accurate strain and extension measurement of a wide range of materials up to a maximum sample thickness of 25 mm.





# SPLINTER SHIELDS

Splinter shields are available to protect the user when testing brittle samples which are liable to fragment. These shields help prevent sample splinters from leaving the test area when performing a test.

Sliding shields are lowered onto the test area once the sample is mounted. Hinged shields can be easily opened, allowing full access to the test area from the front or back of the machine.

Splinter shields are available for single-column and twin-column test machines.

POGO test frames are unique to AMETEK STC. By fitting the POGO frame below the machine base it becomes possible to test very large samples. Please contact AMETEK STC for more information.



# THERMAL CABINETS

Designed for testing samples under predefined temperature conditions, we offer a range of thermal cabinets, providing a temperature range from -70 to 300°C within a large general purpose test area.

The cabinets have a glass observation panel in the front door that allows the specimen to be inspected during test. The cabinet is mounted on a rail system which allows for the thermal chamber to be pushed to the rear, clear of the crosshead so normal ambient tests are possible.

Thermal cabinets can be used with all of our twin-column test machines.





# ABOUT AMETEK STC

## **AMETEK Sensors, Test & Calibration**

A business unit of AMETEK Measurement & Calibration Technologies offering the following industry leading brands for test and calibration instrumentation.

### **LLOYD Instruments Materials Testing**

Materials testing machines and software from Lloyd guarantee the highest level of performance and capability for production testing, quality control, laboratory testing, research and education to provide expert materials testing solutions.

### **Chatillon Force Measurement**

Chatillon has been a hallmark in the industry since 1835. The handheld gauges and motorized testers have earned their reputation for quality, reliability and accuracy and they represent the de facto standard for force measurement.

### **Newage Hardness Testing**

Newage offers a comprehensive range of hardness testers, optical systems and software for measurement, data acquisition and analysis.

### **JOFRA Calibration**

The inventor of the portable high precision dry-block temperature calibrators. The calibration instruments program also covers precision thermometers and temperature baths, temperature sensors, handheld instruments for pressure calibration and process signal calibrators for easy control loop calibration, measurements and simulation.

### **Crystal Pressure**

Digital pressure gauges and calibrators that are accurate, easy-to-use and reliable. Designed for use in the harshest environments; most products carry an IS, IP67 and DNV rating.

### **M&G Calibration**

Pneumatic floating-ball or hydraulic piston dead weight testers with accuracies to 0.015% of reading.

**AMETEK**<sup>®</sup>  
SENSORS, TEST & CALIBRATION

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