NANOVEA

MECHANICAL TESTER

NANOVEA®

A Better Measure.

Offering More than 25 Years of Material Science Experience

RESEARCH AND CONSULTATION

Extensive range of research content such as brochures, application notes, publications, and videos.

EXPERT ASSISTANCE

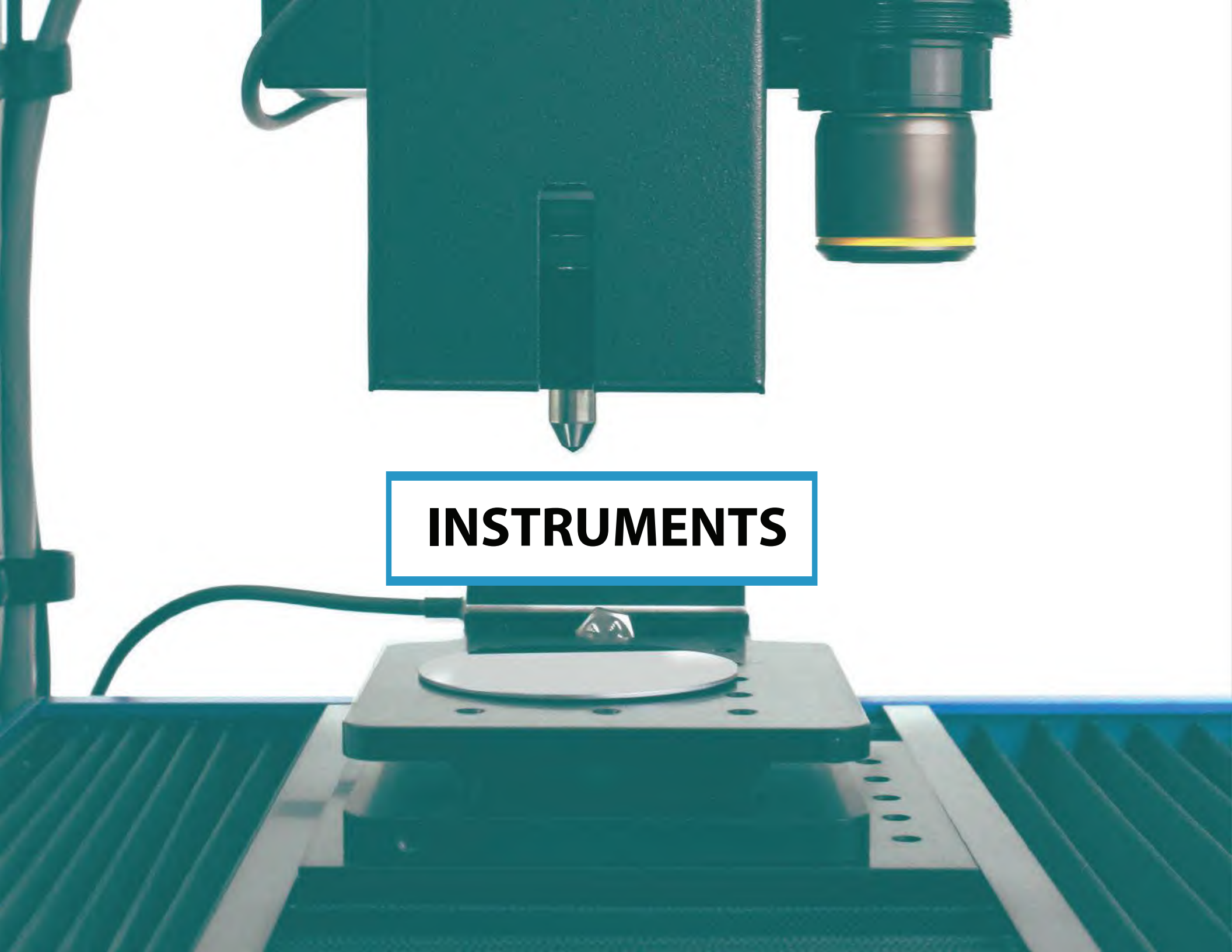
Dedicated Mechanical Tester experts happy to guide you through any question or project request.

CUTTING EDGE INNOVATION

At Nanovea we are always developing cutting edge technologies and standards. We innovate our instruments so that you can innovate your own products.

PRE AND POST INSTALLATION SUPPORT

Full walk-through and guide to make sure the instrument is installed perfectly. Dedicated support team to help you after your instrument has been installed.



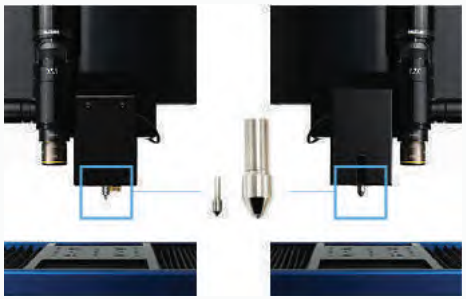
INSTRUMENTS

NANOVEA PB1000

- Dual Modules Mounting Nano and Micro
- Largest observable testing area
- Widest Range of Loads for Indentation/Scratch & Wear
- Excellent lateral accuracy <0.2µm with precision encoder
- Motorized Z motion capable of moving 50mm with video zoom
- Height adjustment capability of 140mm
- AFM and 3D optical profilometer options

TESTING MODULES

Nano Module | Micro Module

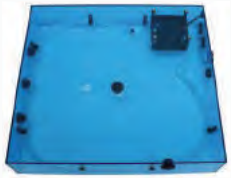


ENVIRONMENTAL MODULES

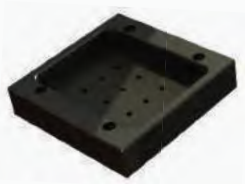
Hot Temperature

Cold Temperature

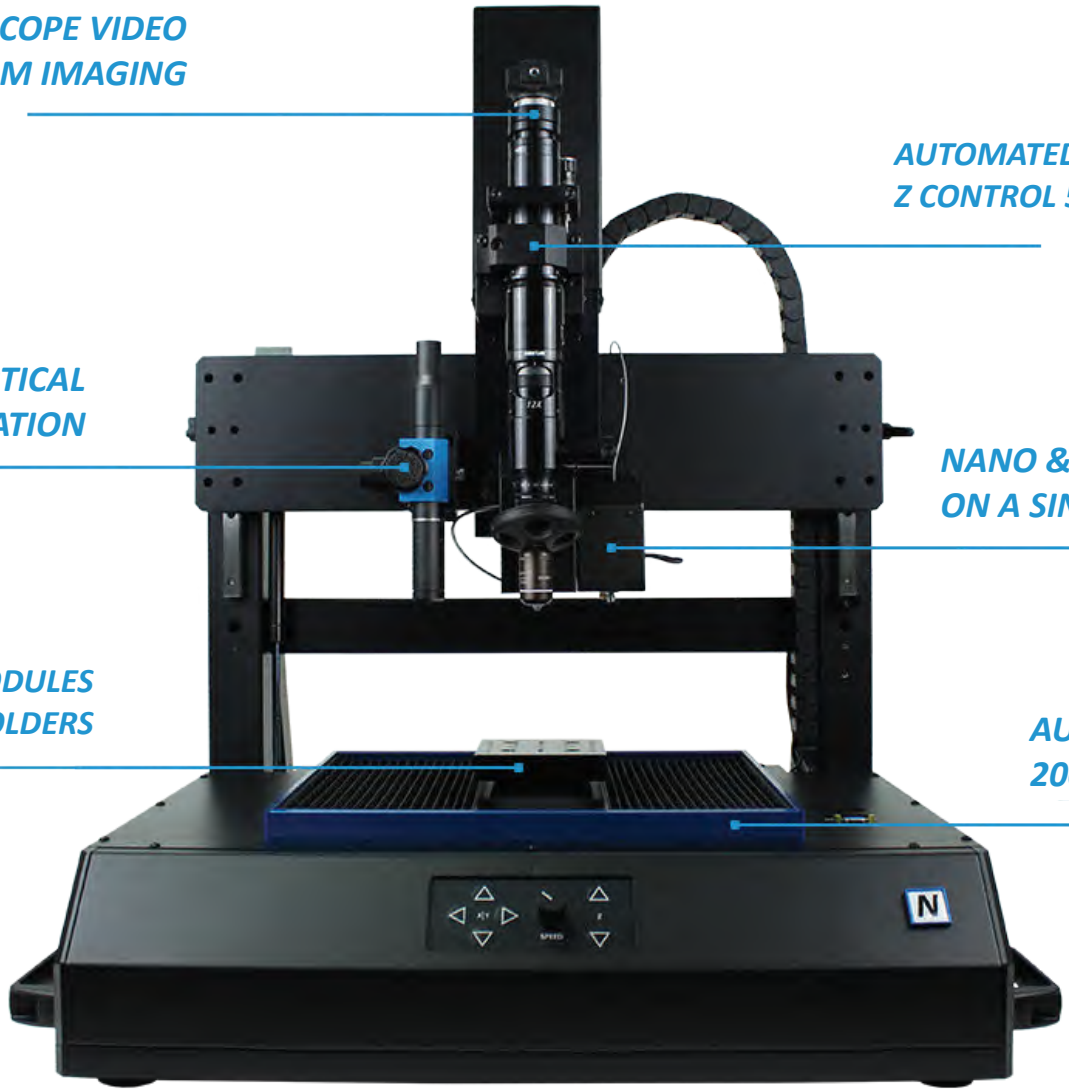
Humidity



Liquid



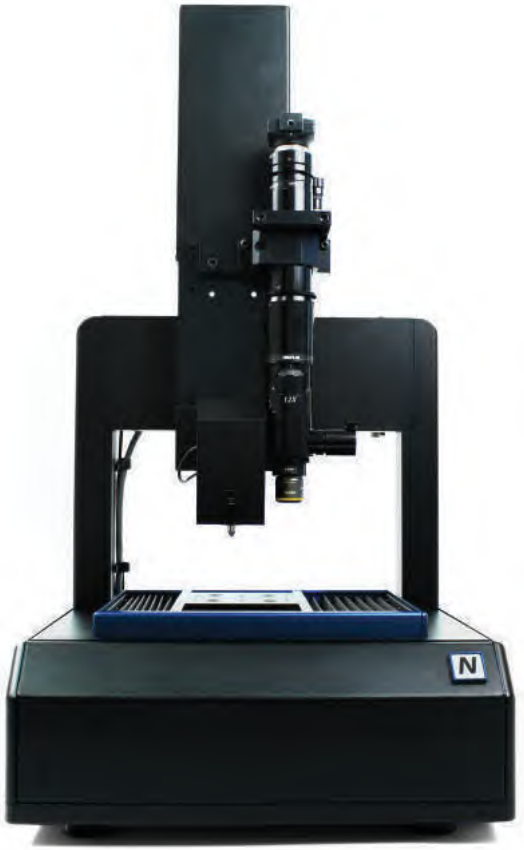
Widest Range of Loads with Best Accuracy



64 x 68 x 82cm

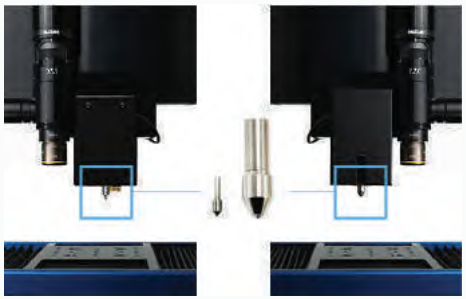
NANOVEA CB500

- Load Modules available: Nano or Micro
- Compact and modern design with full capability
- Full Capability Indentation Scratch and Wear Testing
- Excellent lateral accuracy <0.2µm with precision encoder
- Motorized Z motion capable of moving 50mm with video zoom
- Low maintenance cost



TESTING MODULES

Nano Module | Micro Module



ENVIRONMENTAL MODULES

Hot Temperature

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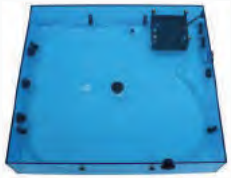
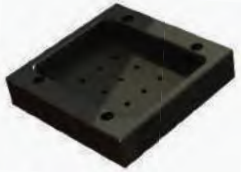


Liquid



Compact and Modern Design

MICROSCOPE VIDEO ZOOM IMAGING

AUTOMATED Z CONTROL 50MM

NANO OR MICRO ON A SINGLE SYSTEM

ENVIRONMENTAL MODULES & CUSTOM SAMPLE HOLDERS

AUTOMATED XY CONTROL 50 X 100mm

38 x 33 x 70cm

NANO-MODULE

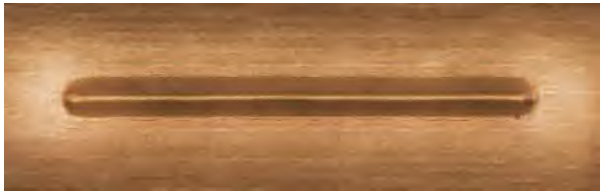
- Precision and fast Piezo Actuator
- Ultra sensitive load cell (independent from actuator)
- True closed loop control depth and load feedback
- Capacitor ring sensor for precision depth
- Optional nano load with depth up to 1500µm
- Optional capacitor driven highest accuracy load cell
- Fast speed mapping
- Fast and reactive scratch testing

TESTING MEASUREMENTS

Instrumented Indentation

Scratch and Adhesion

Wear and Friction



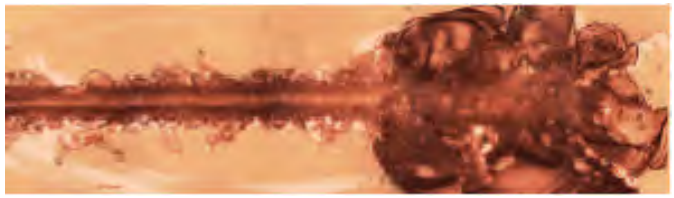
MICRO-MODULE

- World's leading micro mechanical testing with highest sensitivity
- Wide usable range of loads (5 orders of magnitude)
- Capacitor sensor for nano precision depth
- Designed to eliminate inaccurate and slow surface reference
- Direct vertical loading with no cantilever or pivot point
- Most sensitive AE sensor

TESTING MEASUREMENTS

Instrumented Indentation

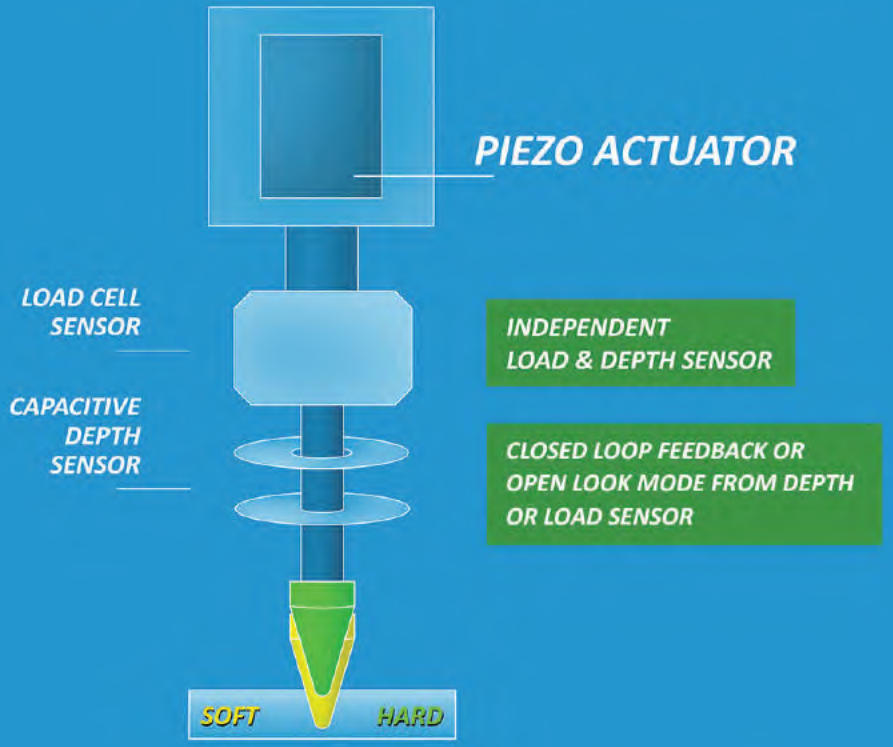
Scratch and Adhesion



Wear and Friction

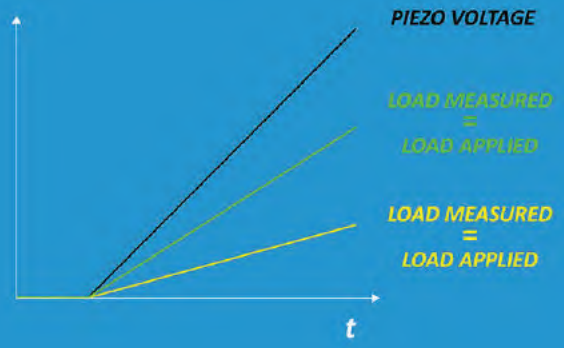
NANOVEA SUPERIOR TECHNIQUE

CASE FOR BETTER INDENTATION ACCURACY



INDEPENDENT LOAD & DEPTH SENSOR

CLOSED LOOP FEEDBACK OR OPEN LOOK MODE FROM DEPTH OR LOAD SENSOR



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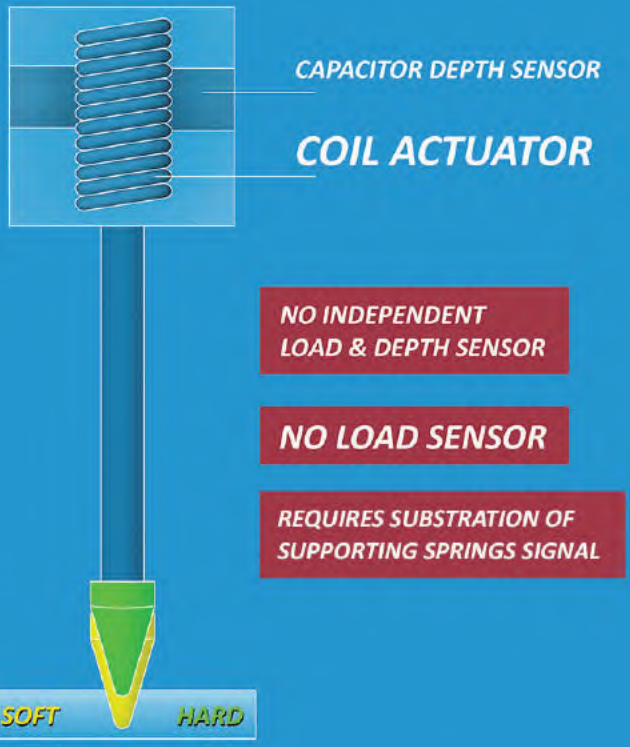
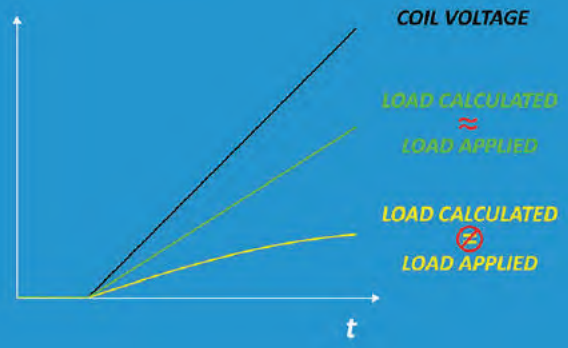


NO INDEPENDENT LOAD & DEPTH SENSOR

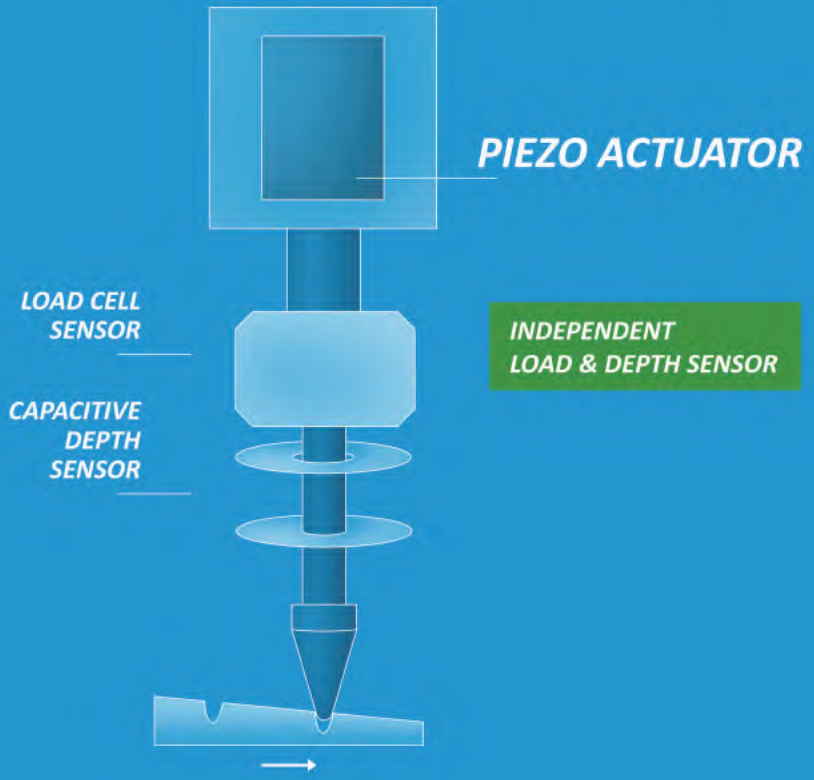
NO LOAD SENSOR

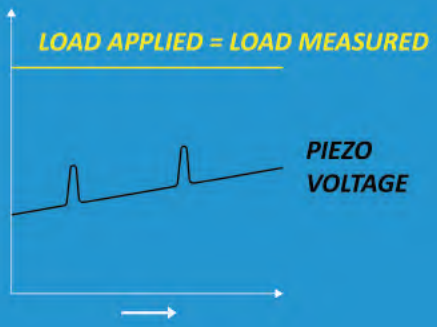
REQUIRES SUBSTRATION OF SUPPORTING SPRINGS SIGNAL

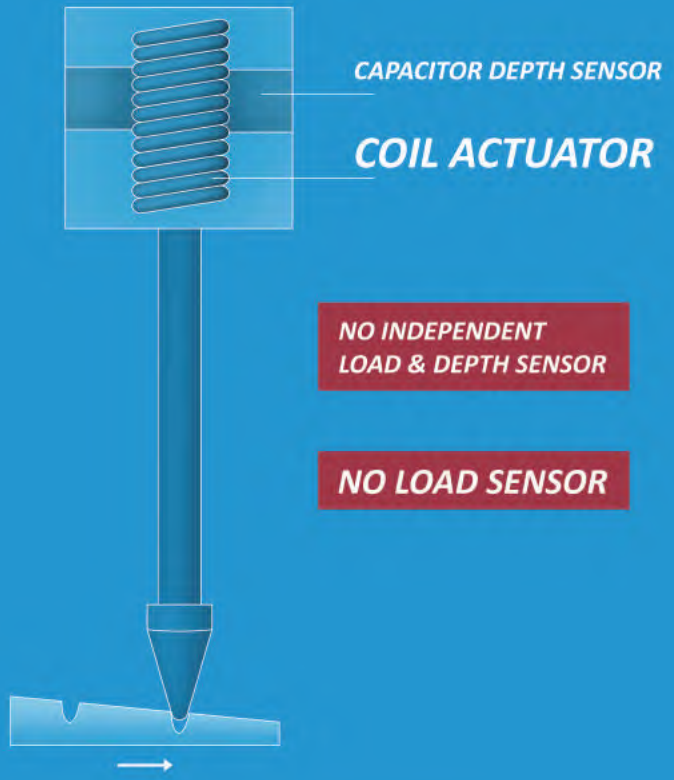


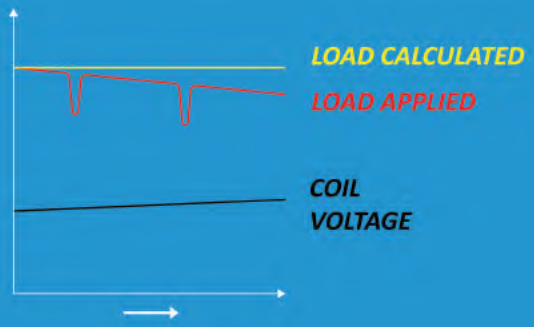
OTHERS

CASE FOR BETTER SCRATCH & WEAR









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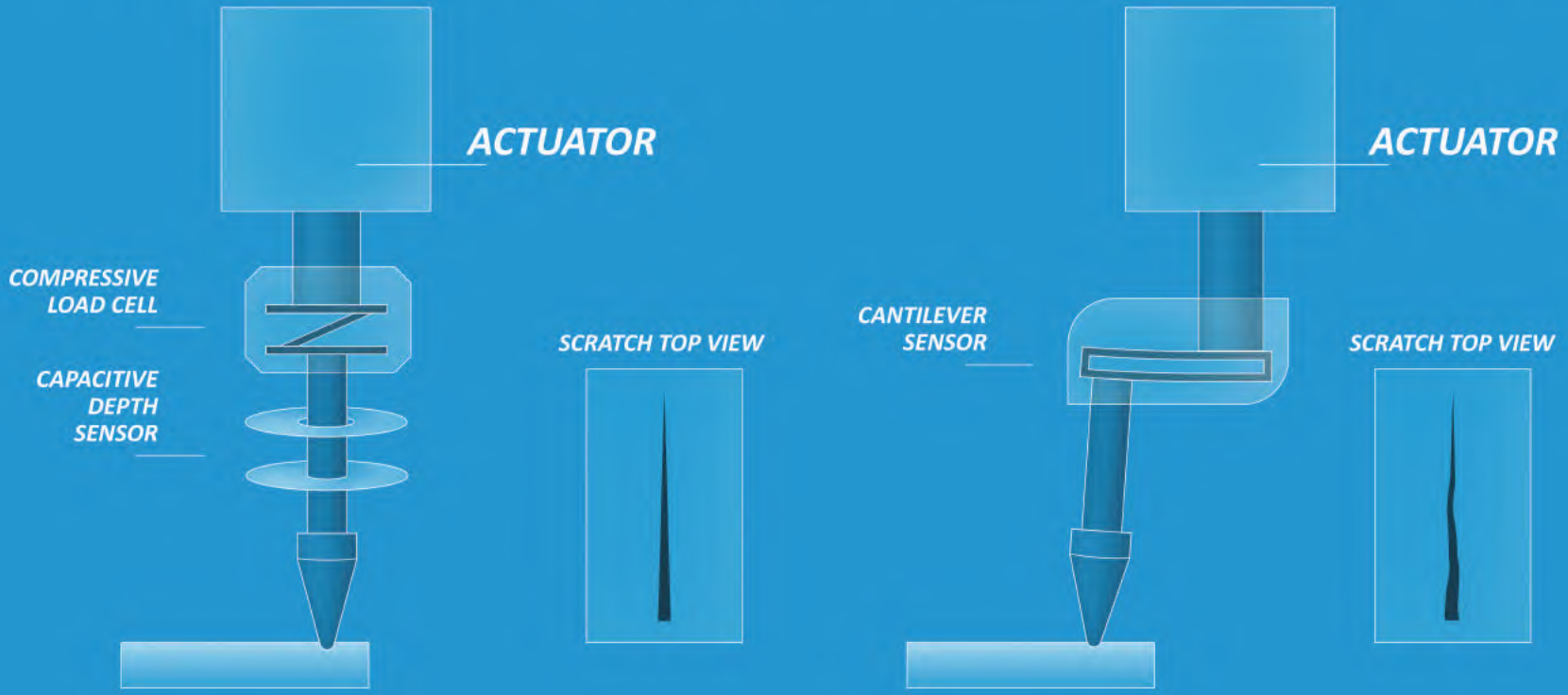
OTHERS

SUPERIORITY OF COMPRESSIVE LOAD CELL



INDENTATION

LOAD IS APPLIED EVENLY

FORWARD MOVEMENT OF TIP DURING LOADING

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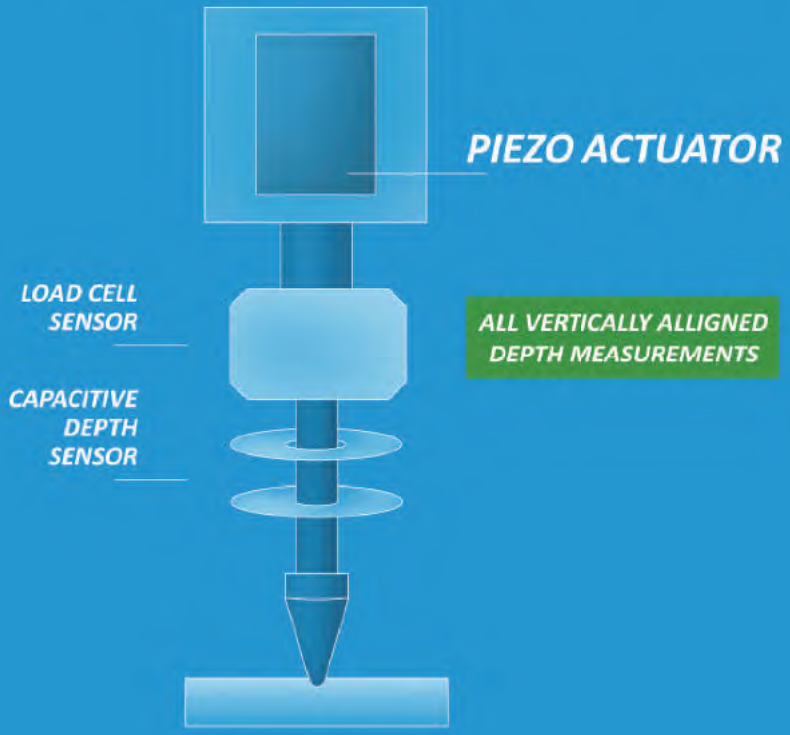
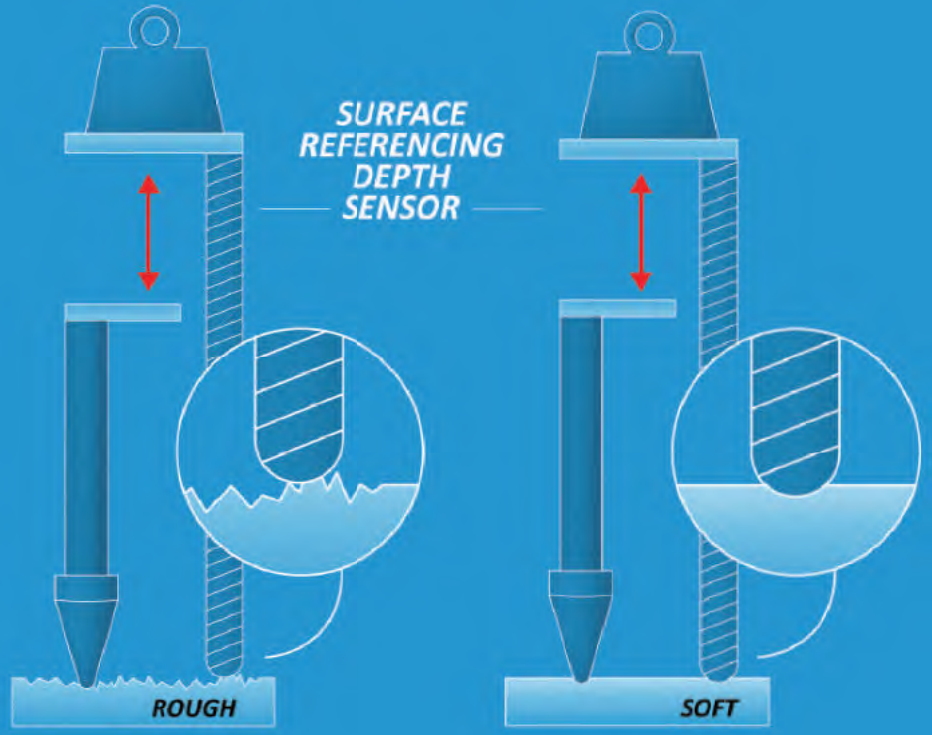
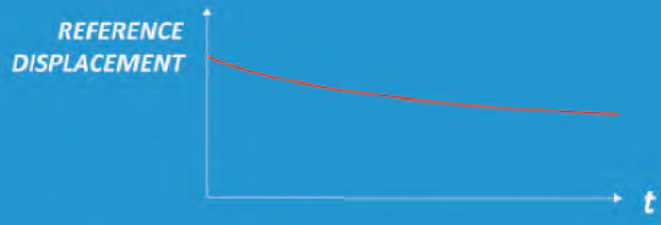
OTHERS

CASE AGAINST SURFACE REFERENCING TECHNOLOGY







NO EFFECT FROM SURFACE REFERENCING

EVEN NANOMETER MOVEMENT EFFECTS DATA ACCURACY

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OTHERS

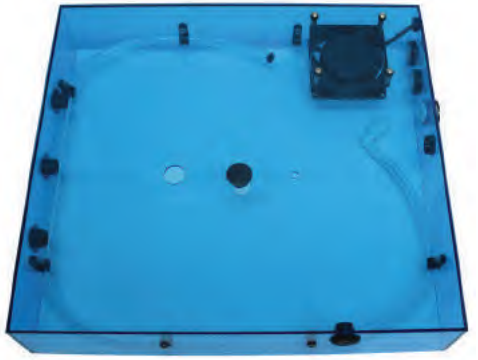
ENVIRONMENTAL MODULES

HOT TEMPERATURE

- Temperatures up to 400°C (600°C custom)
- Tip and sample inside oven for increased accuracy
- Designed with MACOR with low thermal expansion coefficient of material of<10^{-6}/ °C

HUMIDITY

- Chamber encloses indenter and sample
- Humidity control down to below 5% and up to dew point

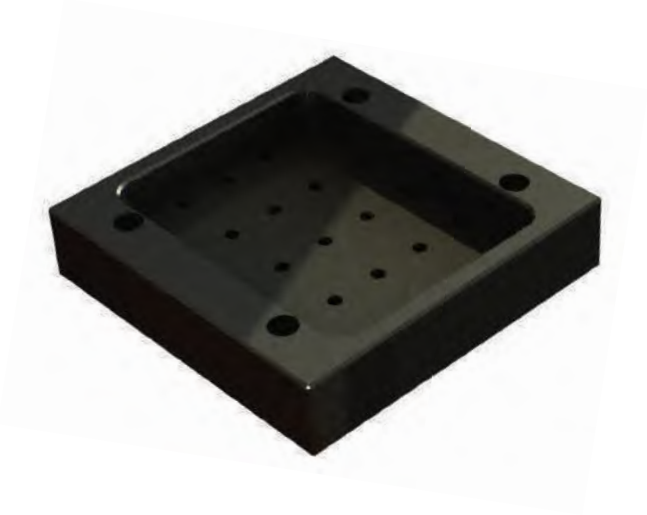


COLD TEMPERATURE

- Enclosed peltier cooling system for increased accuracy
- Temperatures lower than -40°C
- Tip and sample in the enclosed environment

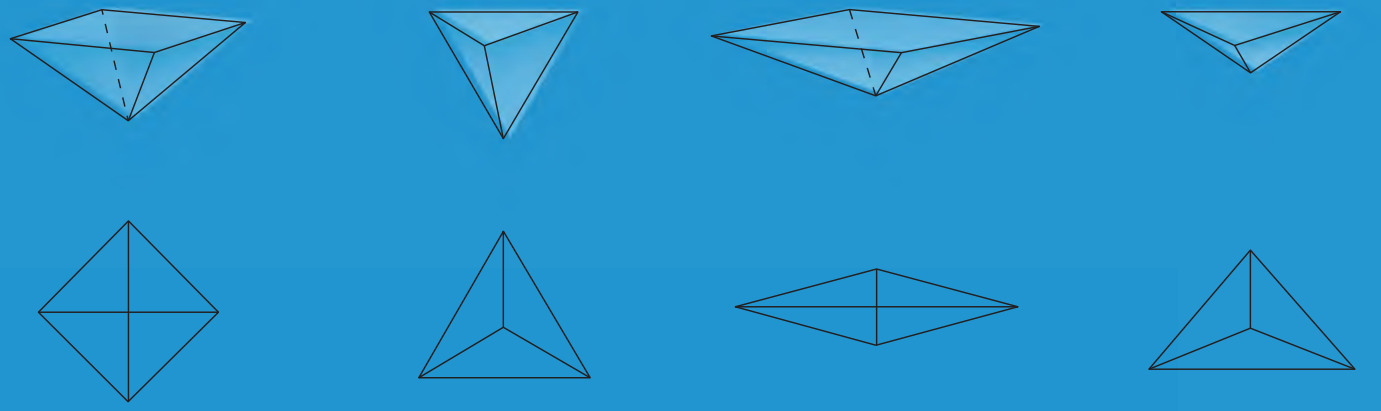
LIQUID

- Custom height
- Heating option




CONSUMABLES

INDENTER TYPES

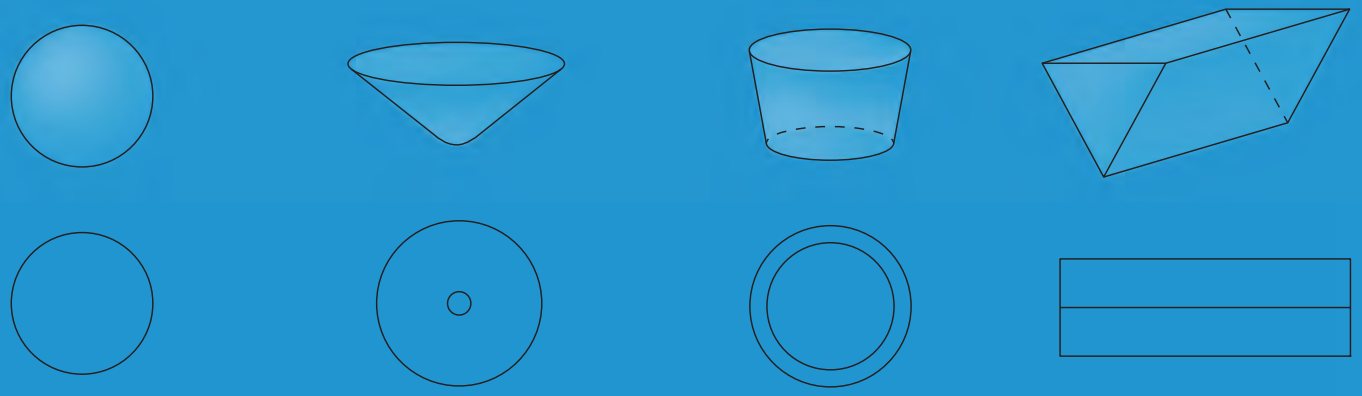


VICKERS

BERKOVICH

KNOOP

CUBE CORNER



BALL

CONICO-SPHERICAL
(60°, 90° & 120°)

FLAT

KNIFE

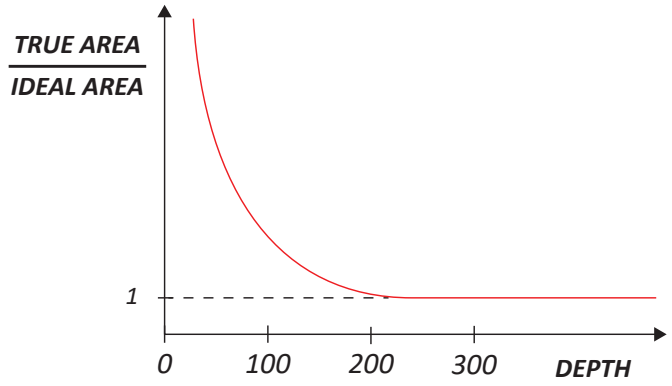
QUALITY & ACCURACY

DIAMOND AREA FUNCTION

NANOVEA
A Better Measure.

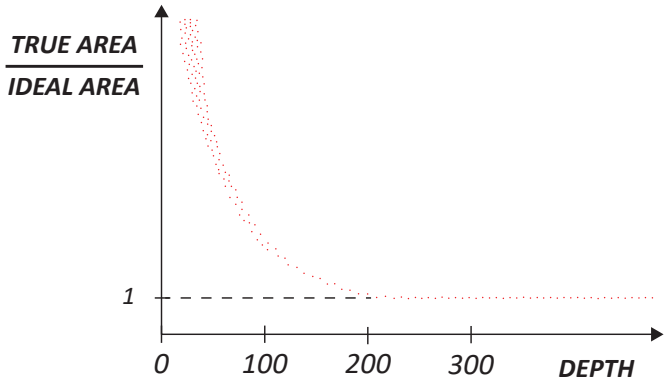
Patent EP3076153

SINGLE INDENT | ONE MINUTE | HIGH ACCURACY

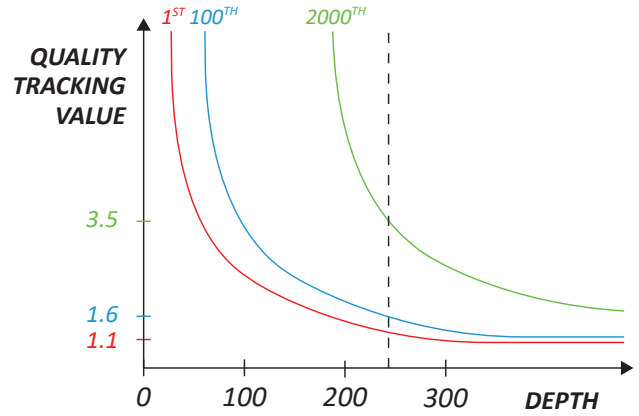


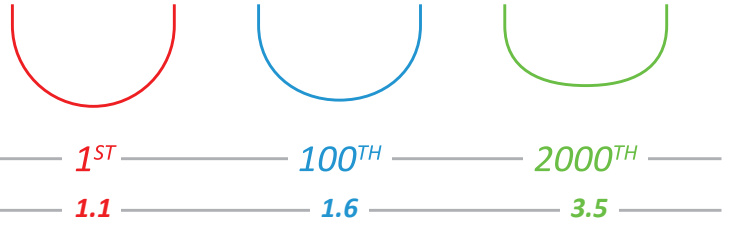
OTHERS

> 100 INDENTS | > 120 MINUTES | QUANTITY OF INDENTS ON SILICA LIMITS ACCURACY



QUANTIFIABLE QUALITY CHECK FOR DIAMONDS





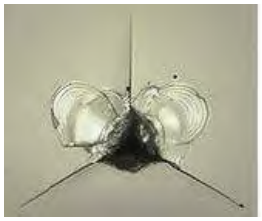
- GOOD FOR ANY TYPE OF INDENTERS INCLUDING SPHERO-CONICAL
- LONG-TERM TRACKING & RECORDING OF DIAMOND QUALITY
- QUICK SINGLE INDENT CHECK

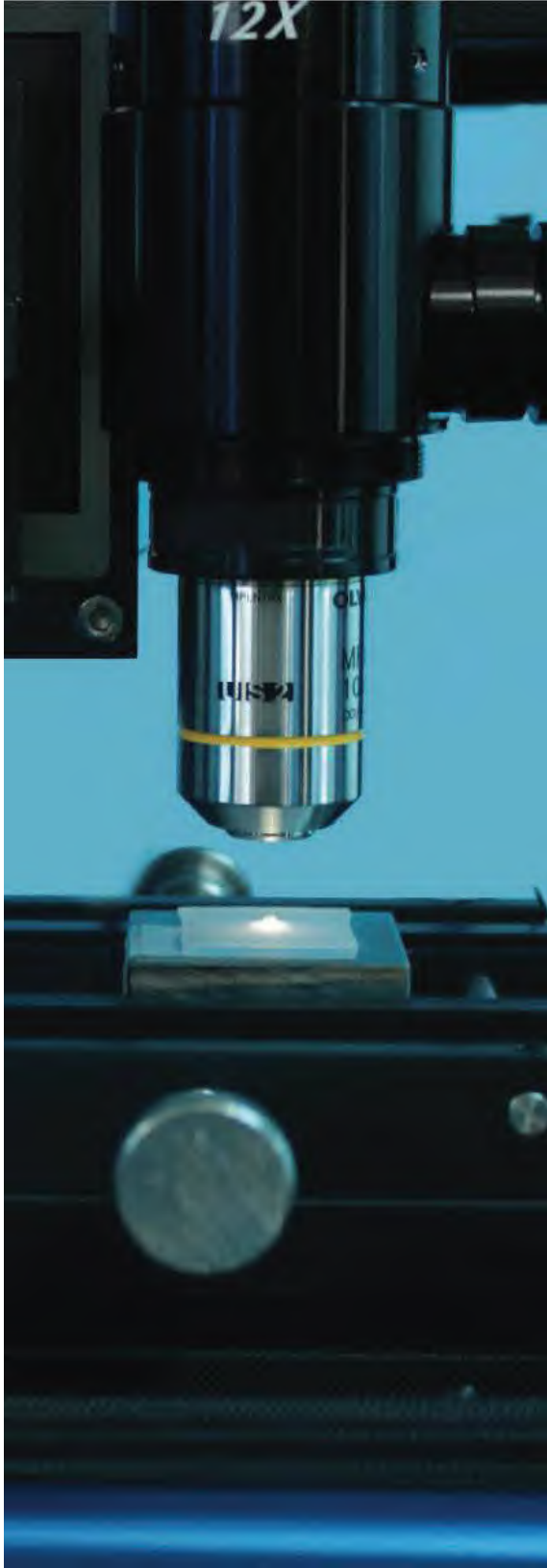
Patent EP3076153

IMAGING TOOLS

MICROSCOPE VIDEO IMAGING | PB1000 & CB500

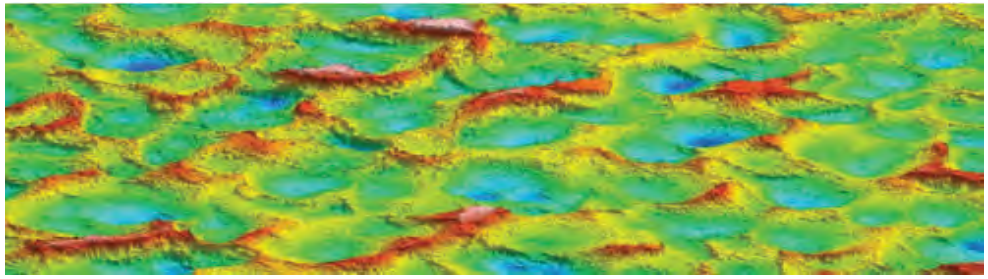
- Objective magnification up to 100x
- Large area stitching capability
- Color Video Camera (1200x1600)
- Three position turret (optional)
- Video Microscope to/from Indenter position with encoder accuracy of <0.2µN

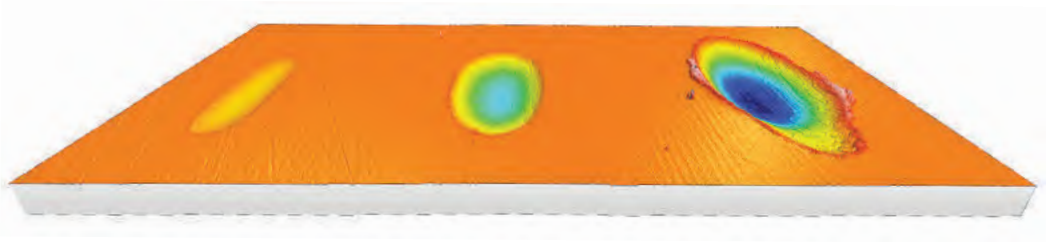


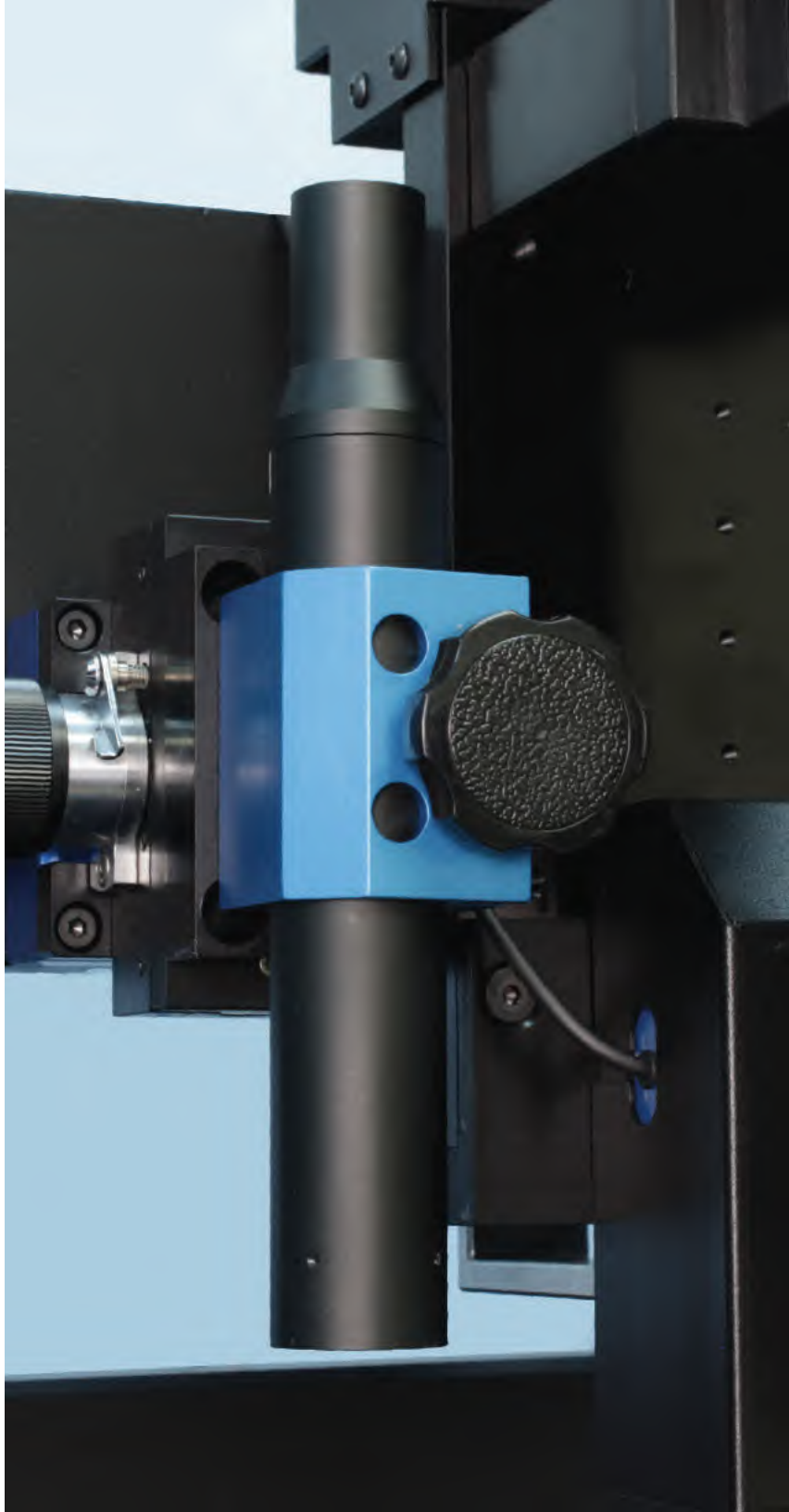


3D OPTICAL PROFILER | PB1000

- Chromatic Confocal technique
- Max Z range up to 3mm
- Best angular capability
- Large surface scan
- Full 3D Profilometry capability
- Optical Profiler to/from Indenter position video imaging with accuracy of <0.2µm

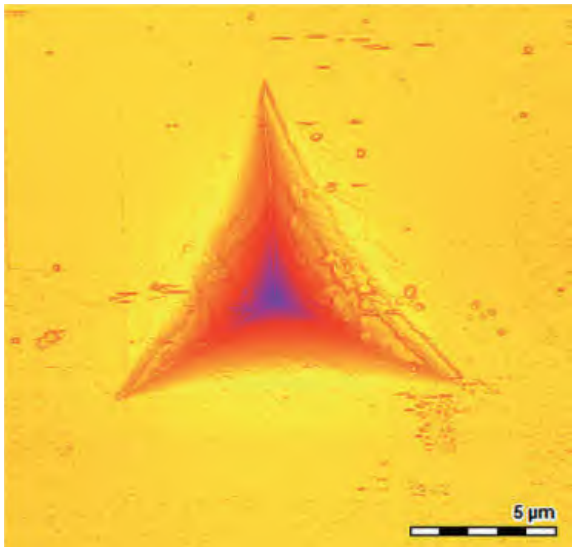


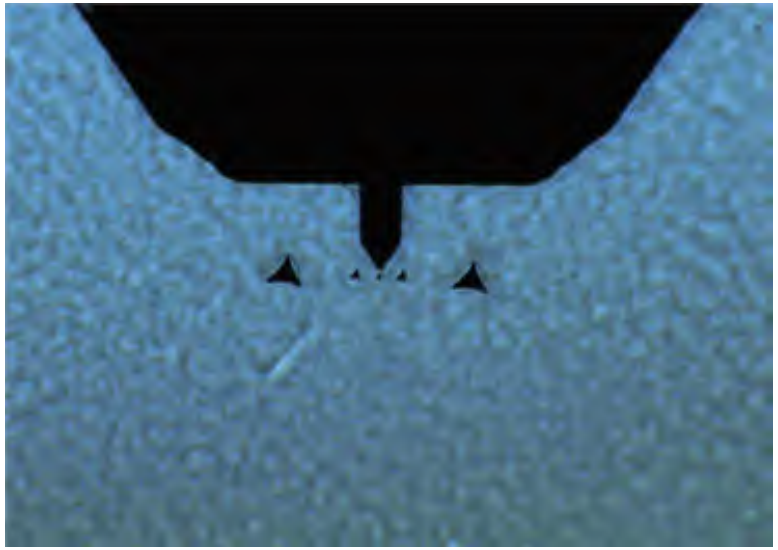


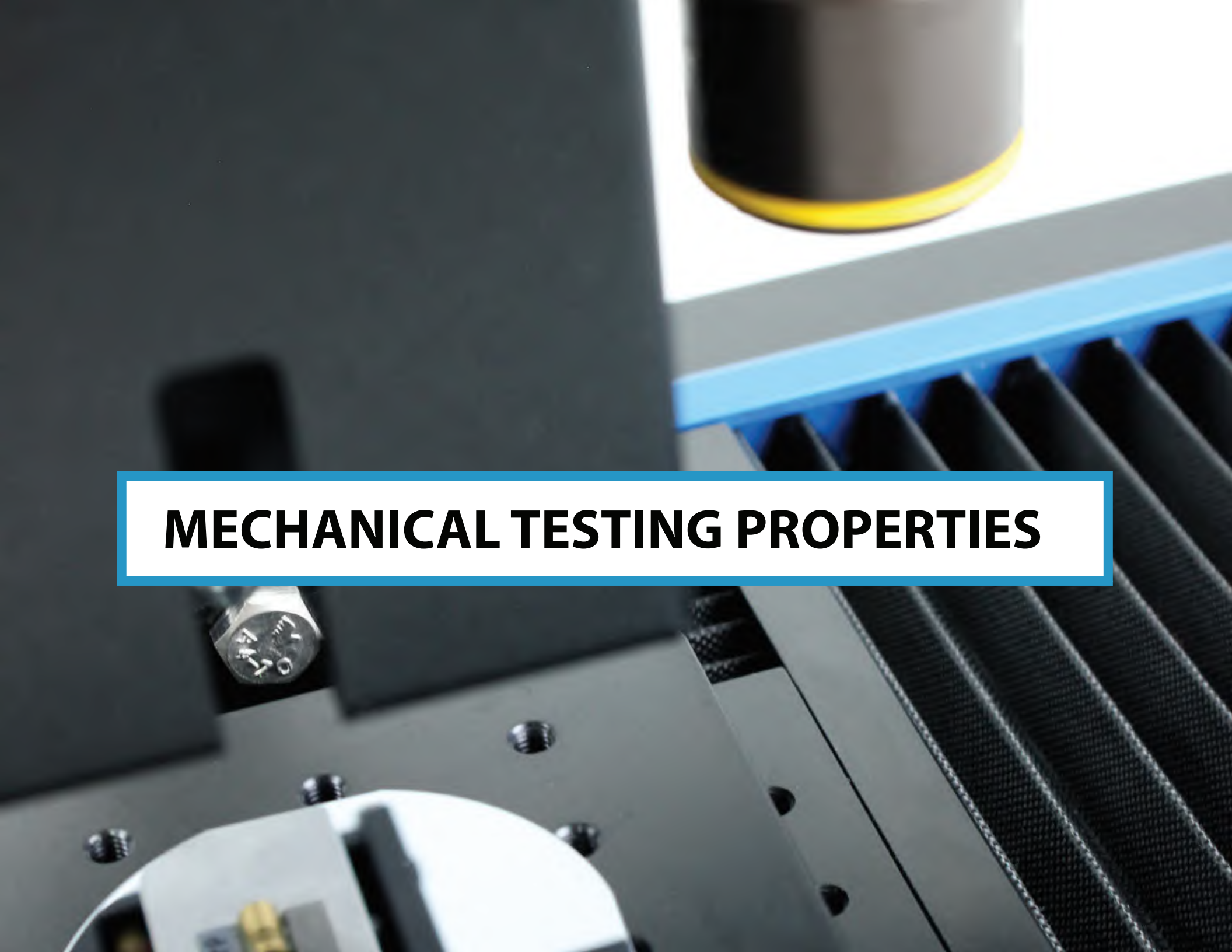


ATOMIC FORCE MICROSCOPE | PB1000

- Scan of XY 110µm | high resolution XY 25µm
- Lateral resolution 1.7nm
- Static, dynamic and extended modes
- Max Z range 22µm | 5µm
- Height resolution 0.4nm | 0.13nm
- Integrated video camera
- AFM to/from indenter position or video imaging with accuracy of < 0.2µm







MECHANICAL TESTING PROPERTIES

INSTRUMENTED INDENTATION | *HARDNESS AND ELASTIC MODULUS*

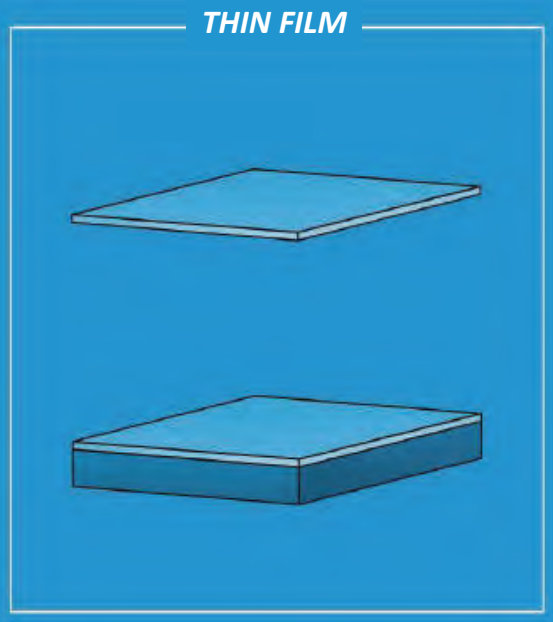
ASTM B578, ASTM E2546, ASTM E384, ASTM D2979, ASTM D2240,
ASTM B933, ISO 14577, ISO 7619, DIN 50359, JIS K7215

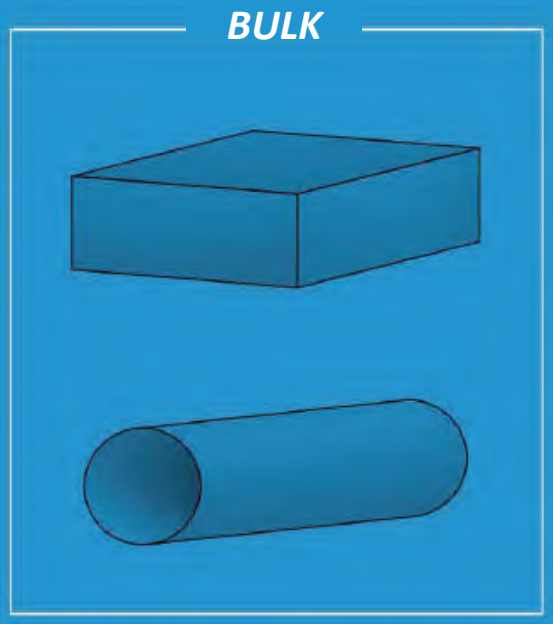
BERKOVICH

VICKERS

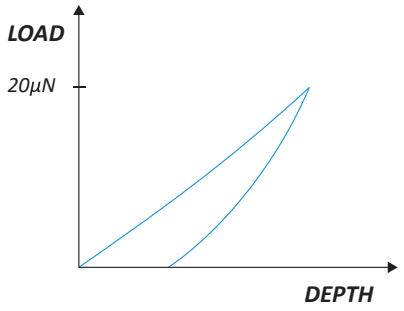
KNOOP

CONICAL

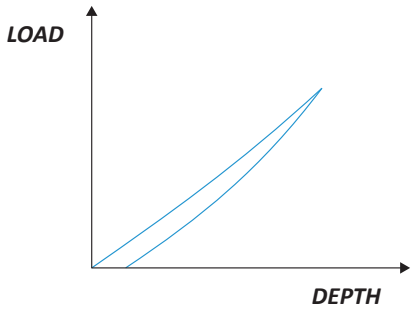




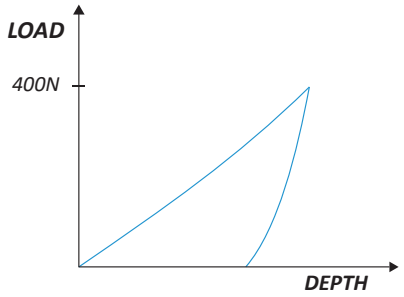
LOW LOAD



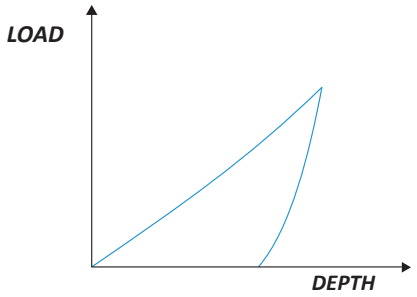
ELASTIC MATERIALS



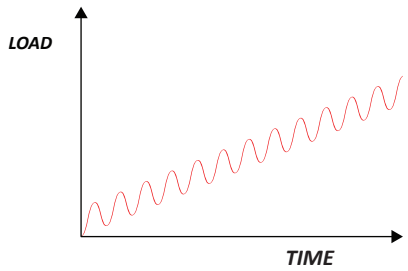
HIGH LOAD

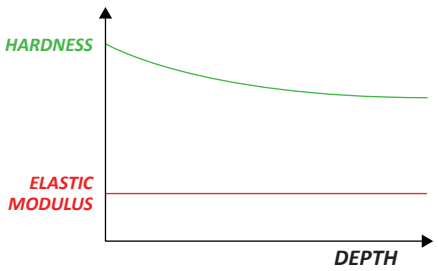


PLASTIC MATERIALS



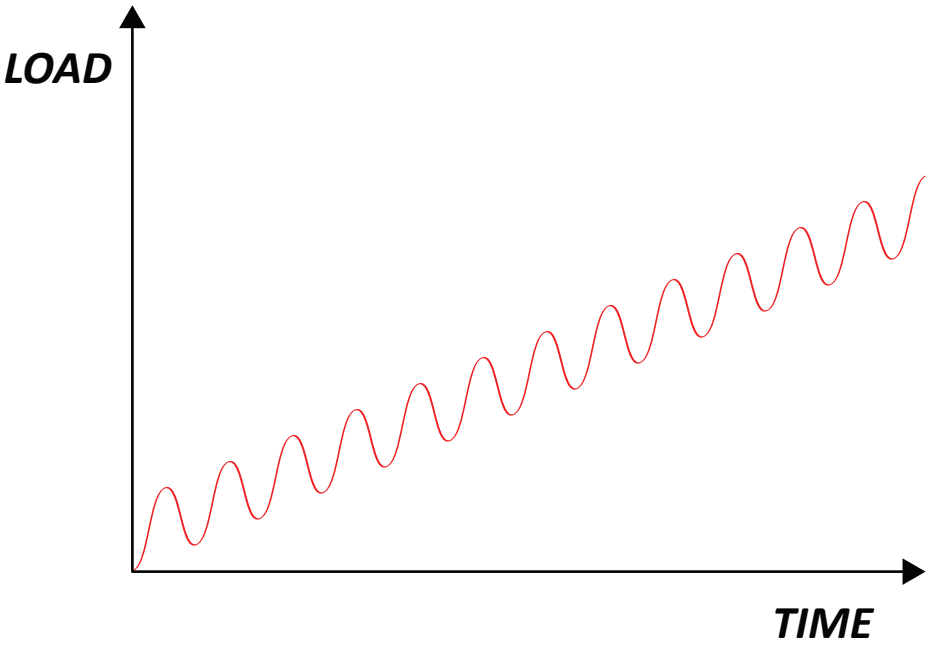
HARDNESS / ELASTIC MODULUS vs DEPTH

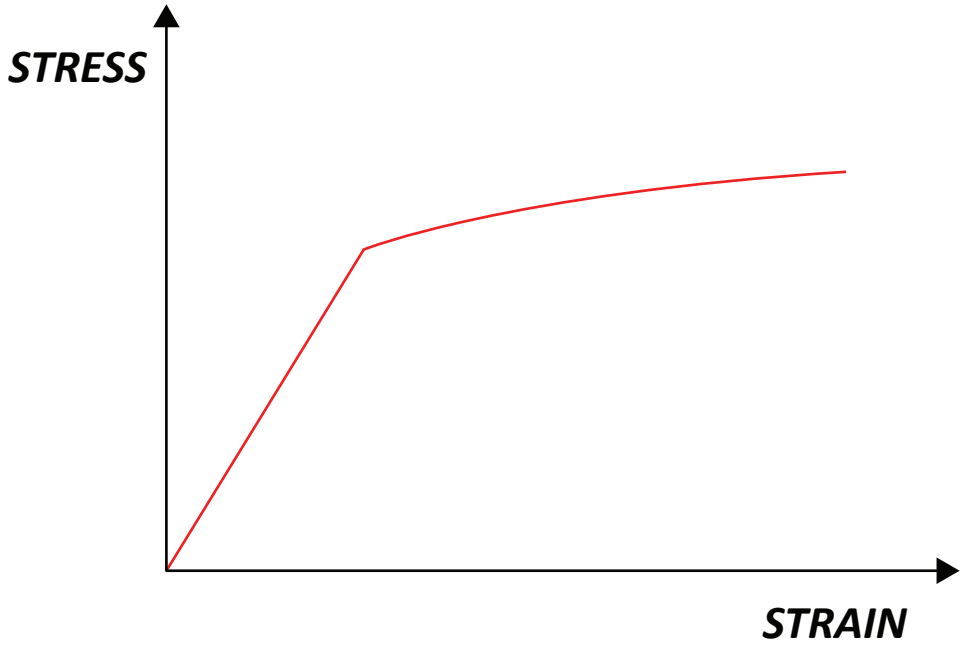




ASTM E2546, ASTM D2979, ISO 14577

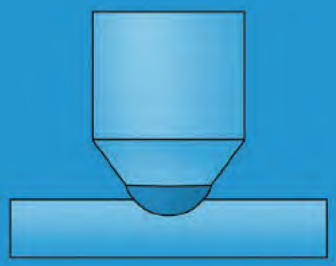
STRESS vs STRAIN



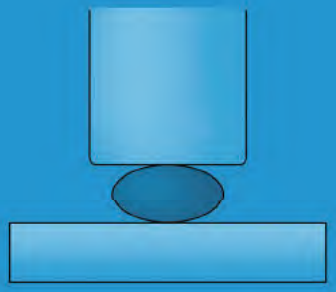


ASTM E2546, ISO 14577

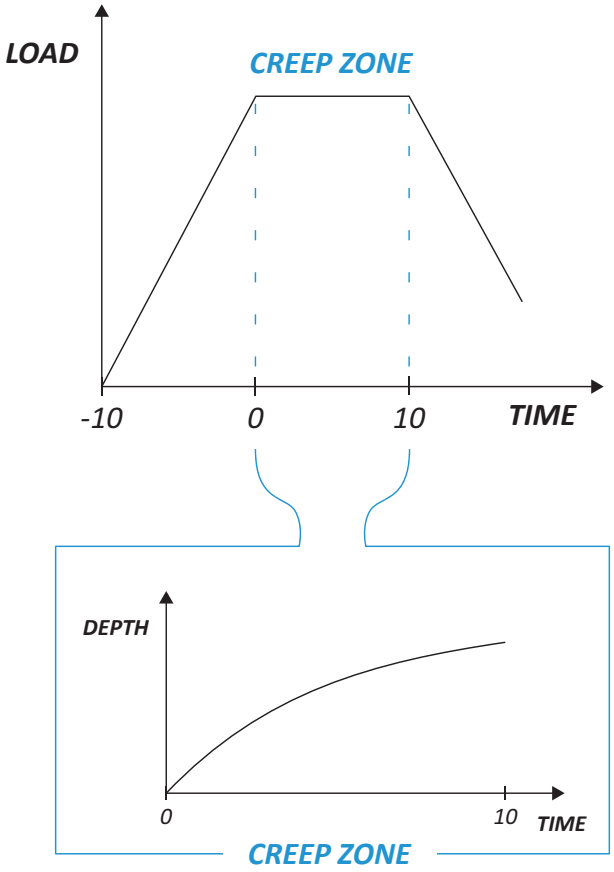
INDENT



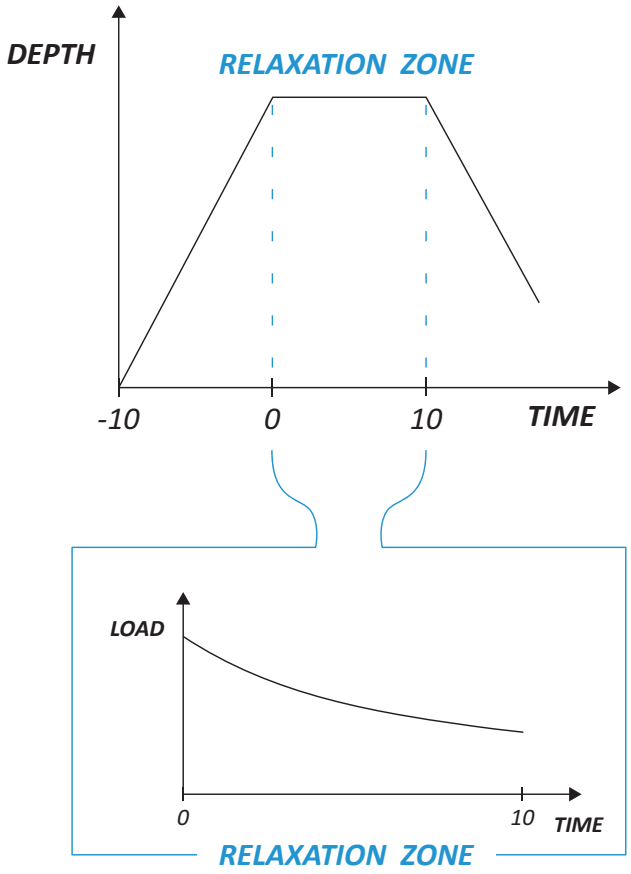
COMPRESSION



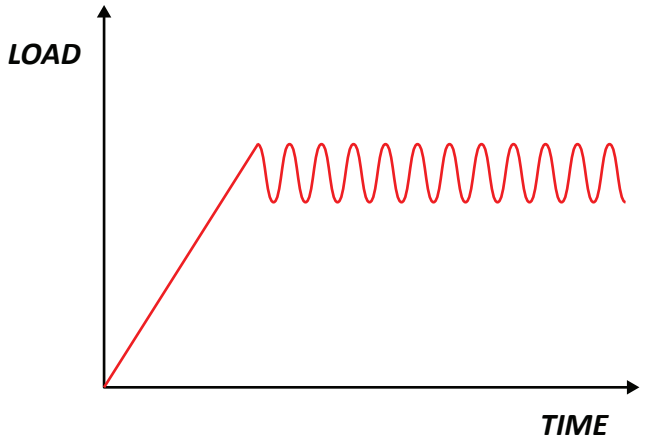
CREEP

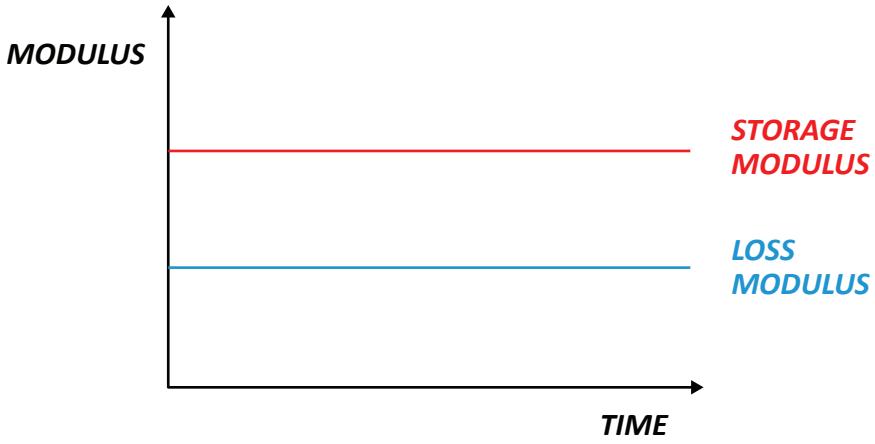


RELAXATION

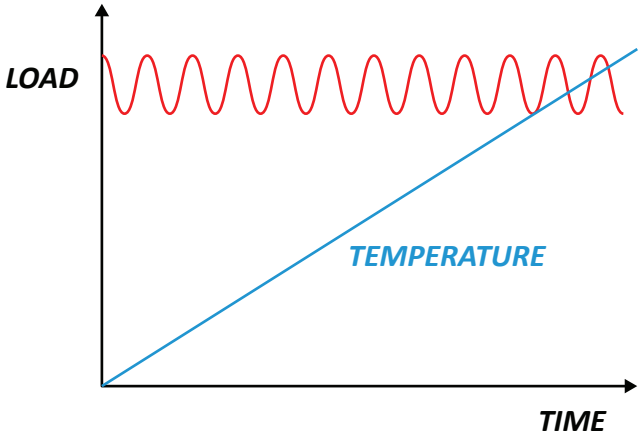


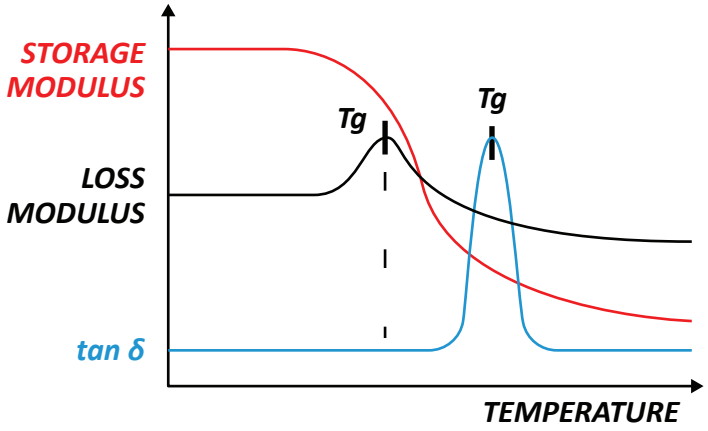
DYNAMIC MACHANICAL ANALYSIS (DMA)



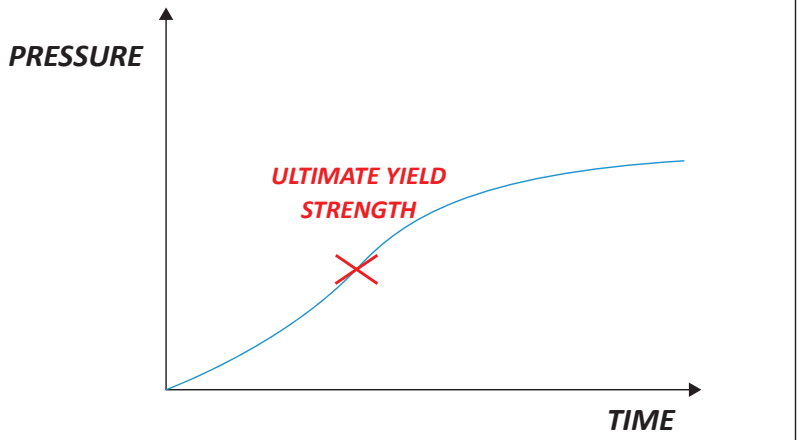


GLASS TRANSITION TEMPERATURE

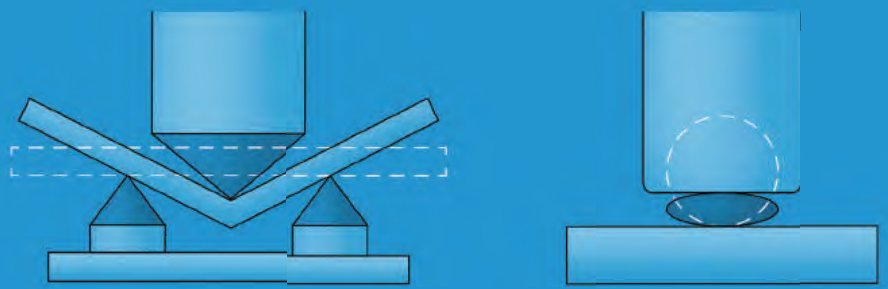


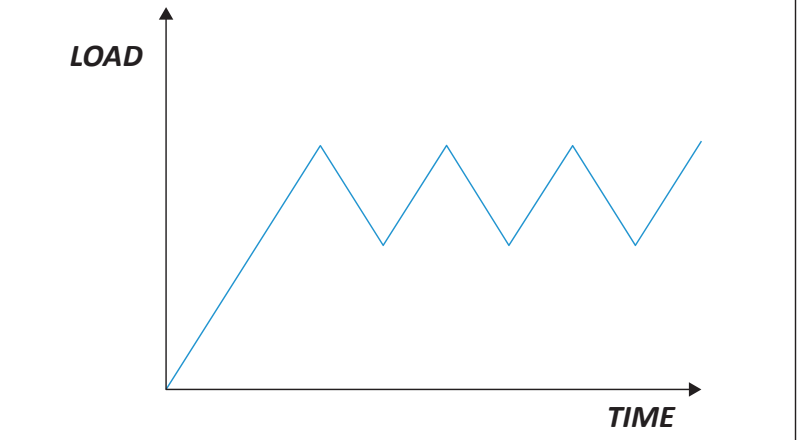


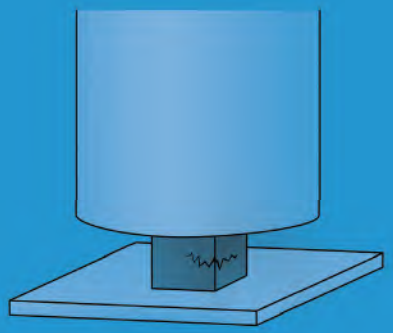
YIELD STRENGTH

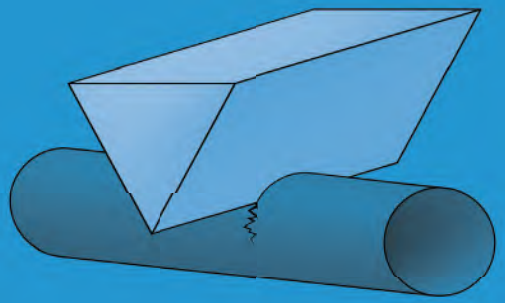


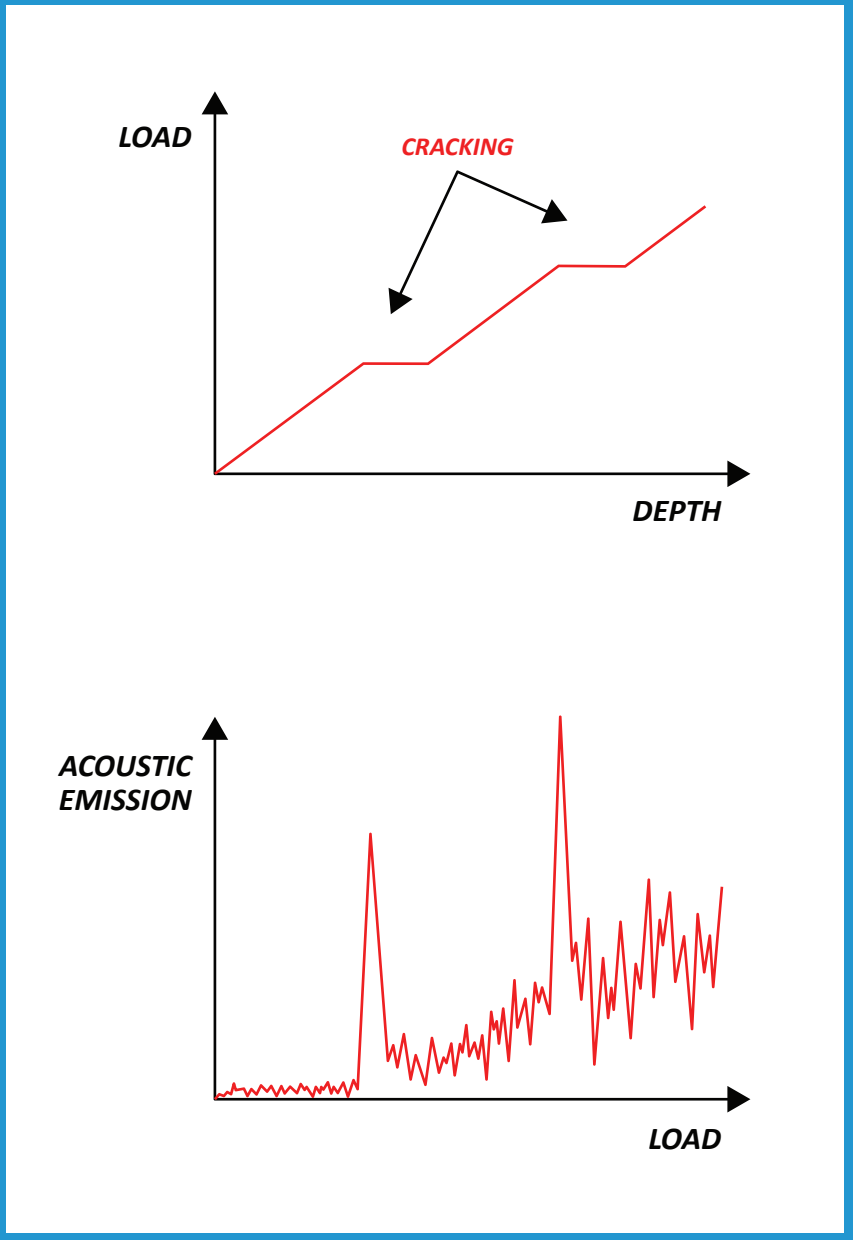
FATIGUE





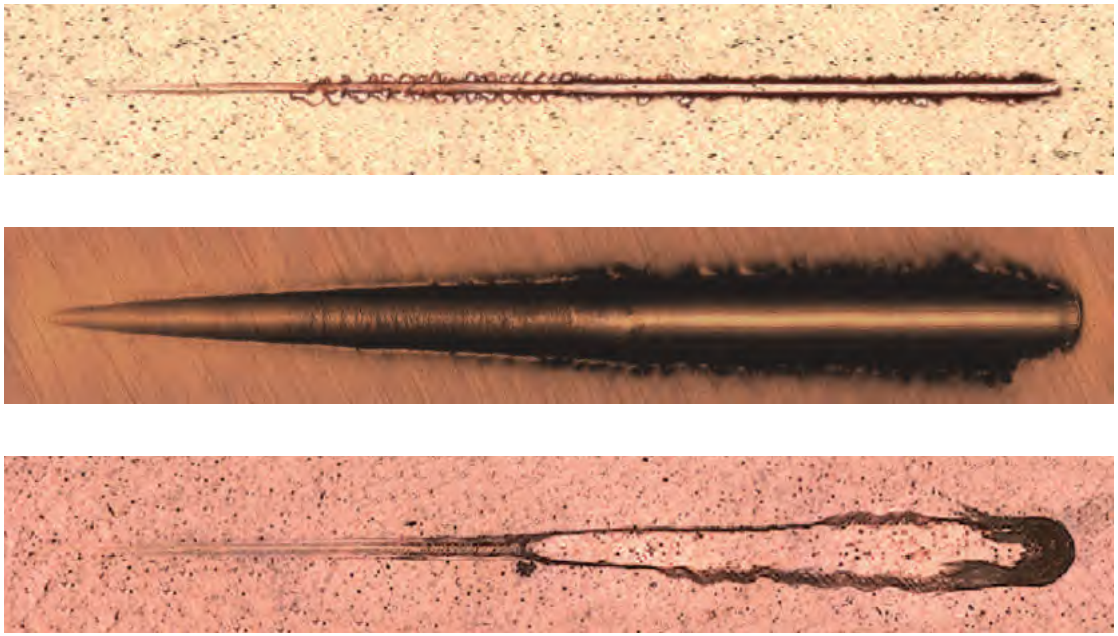


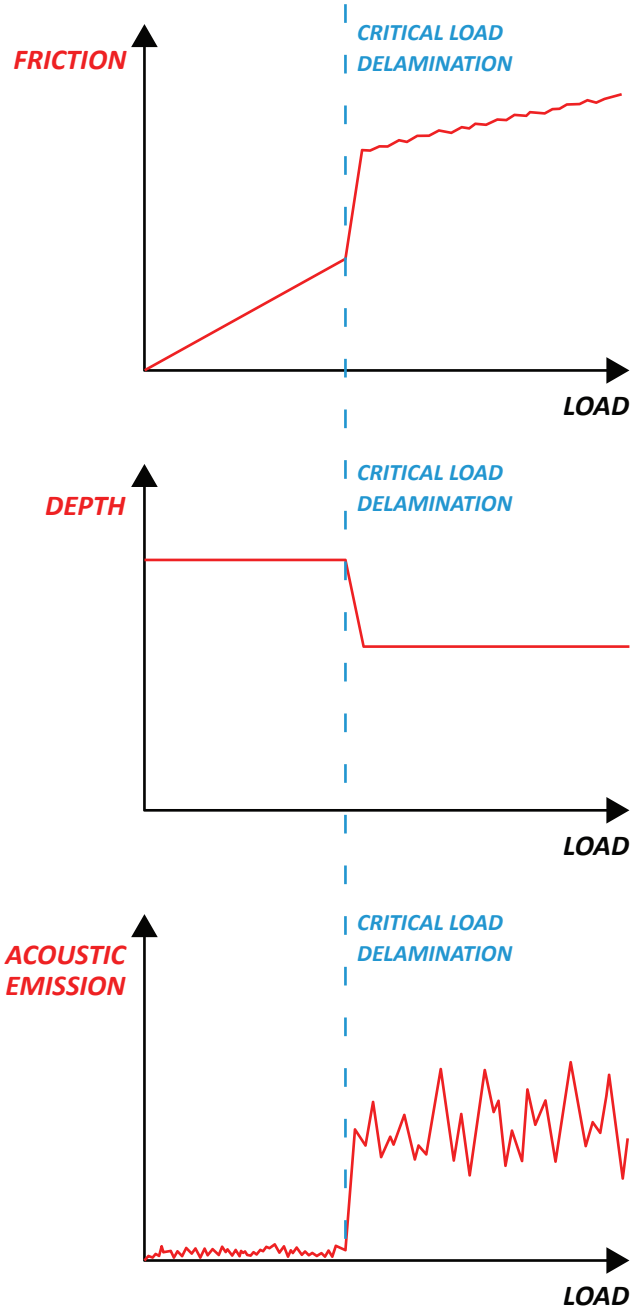



LOAD
CRACKING
DEPTH
ACOUSTIC EMISSION
LOAD

INSTRUMENTED SCRATCH | *ADHESIVE FAILURE*

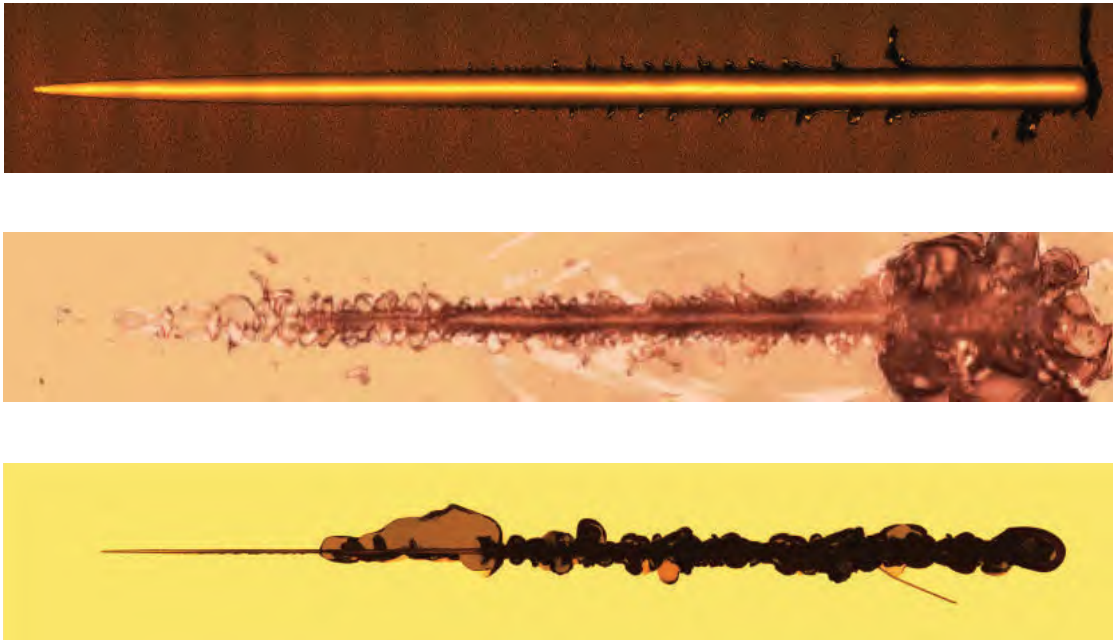
ASTM C1624, ASTM F2496, ASTM D2197, ASTM D7027
ISO 20502, ISO 1518

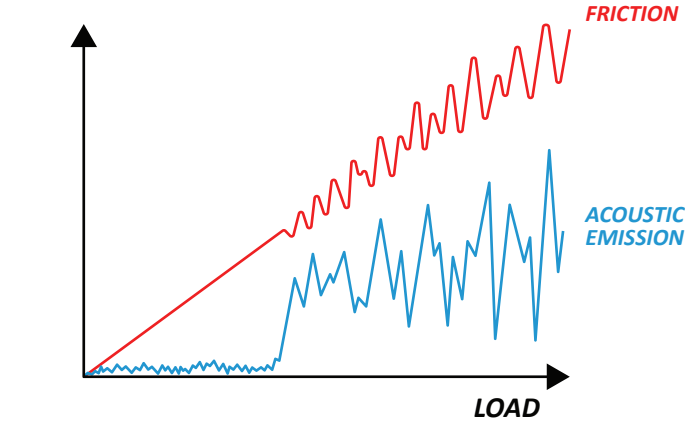


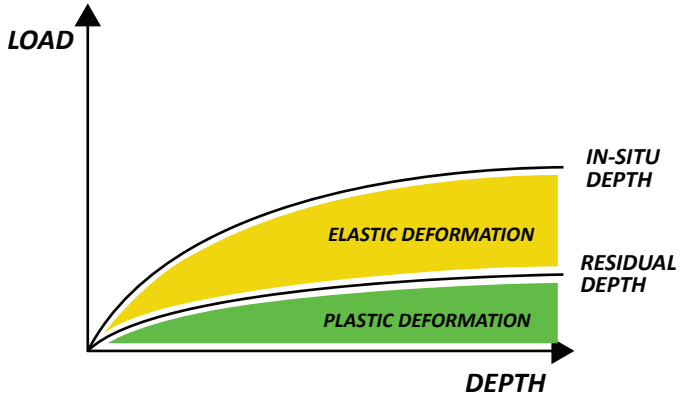


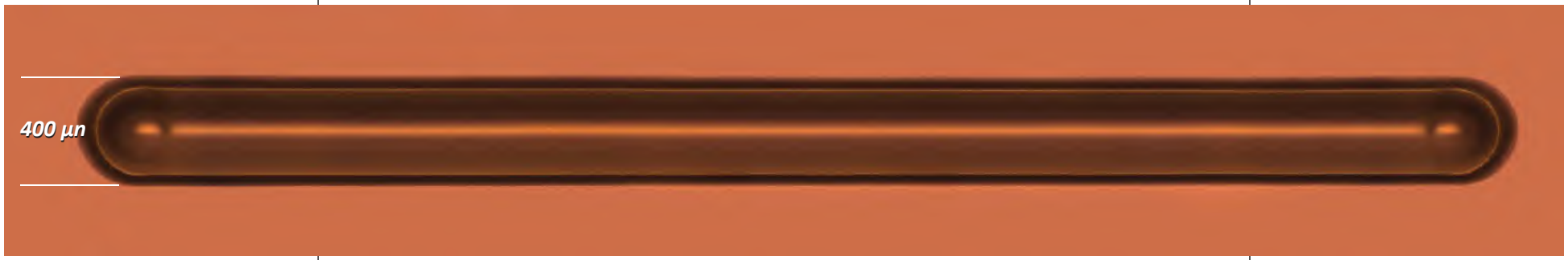
INSTRUMENTED SCRATCH | *COHESIVE FAILURE*

ASTM C1624, ASTM D7187, ASTM D7027, ASTM D5178
ISO 20502, ISO 1518, DVM-0058-PA

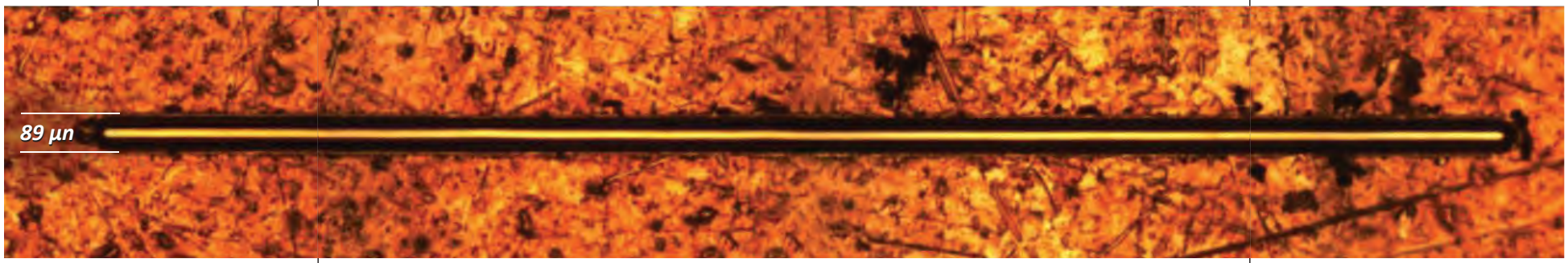








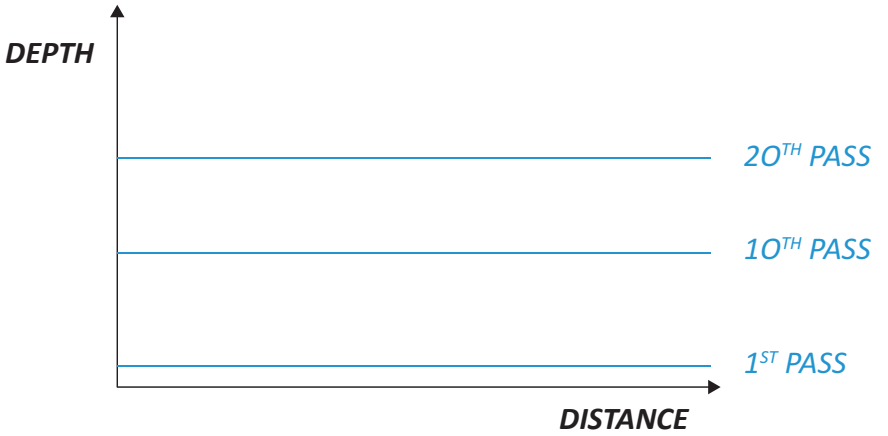
POLYMER *HSp = 0.16 GPa*

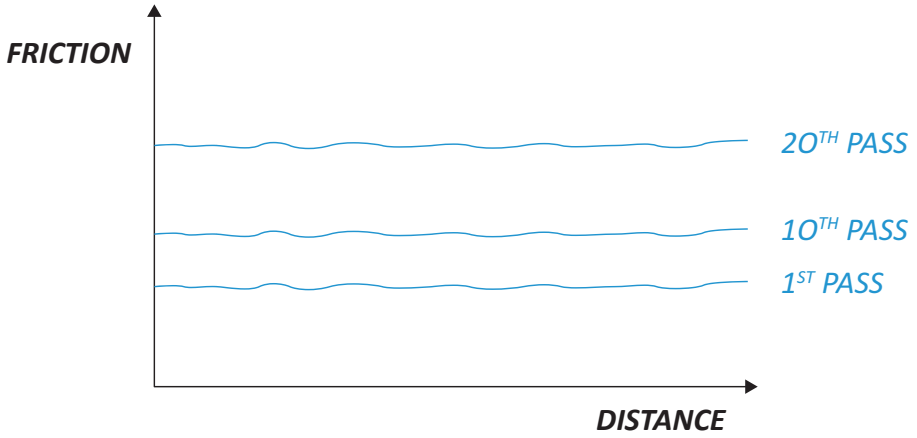


METAL *HSp = 3.20 GPa*

INSTRUMENTED SCRATCH | *MULTI-PASS WEAR*

DIN EN 1071

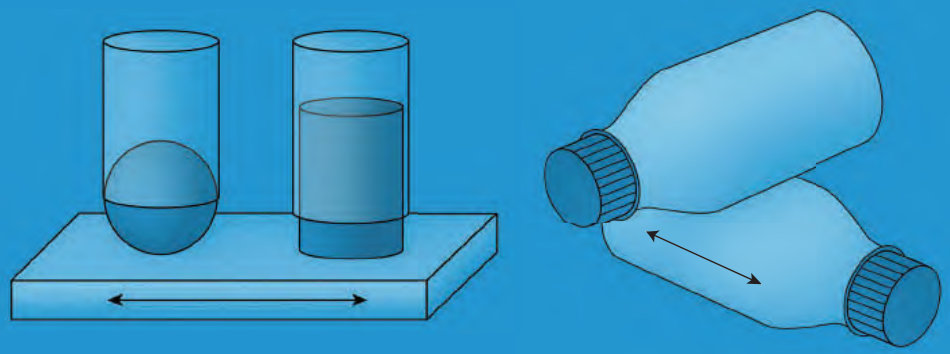




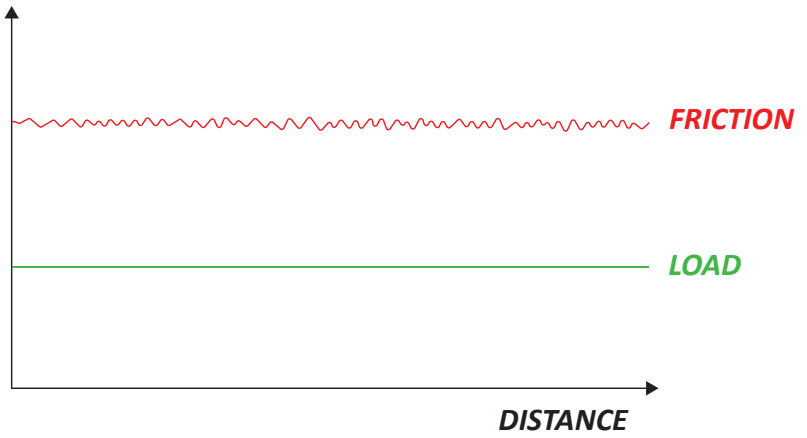
VARIETY OF MATERIALS

- METALS
- POLYMERS
- CERAMICS
- BIOMATERIALS
- GLASS
- COMPOSITES

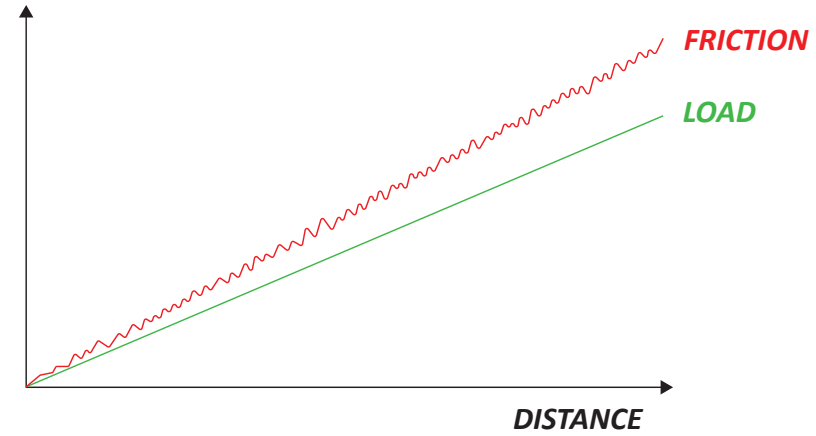
VARIETY OF GEOMETRIES



CONSTANT LOAD



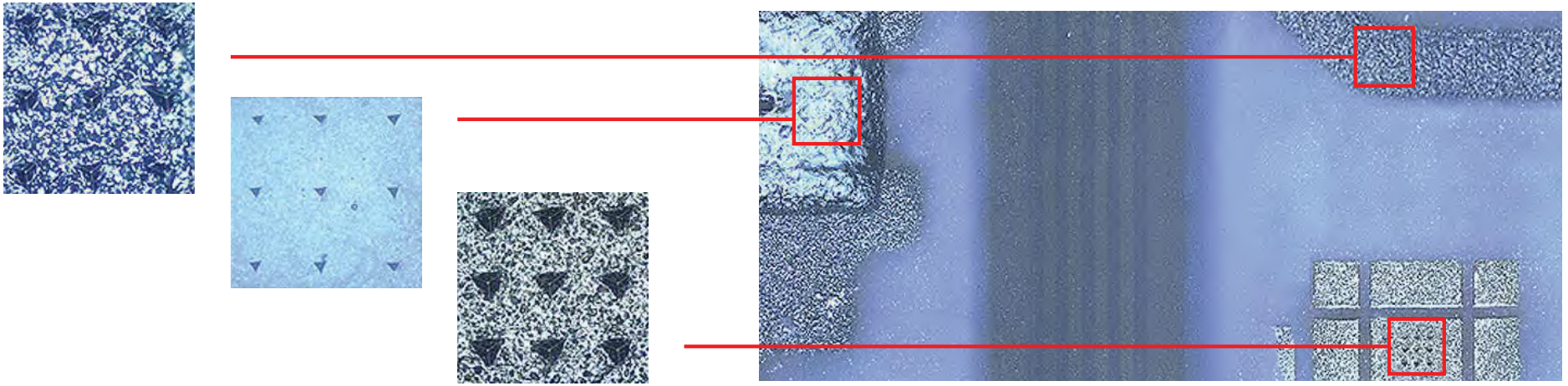
PROGRESSIVE LOAD



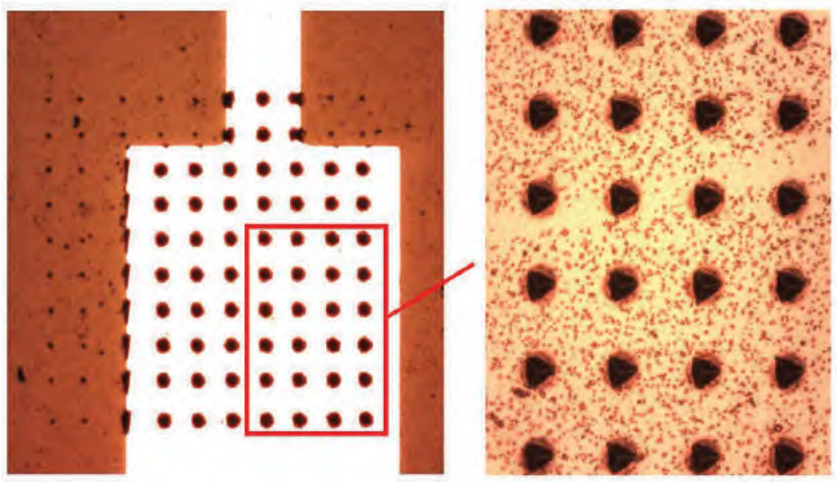
ADVANCED AUTOMATION

ADVANCED AUTOMATION

BROADVIEW MAP SECTION TOOL



FAST MAPPING



WIZARD ASSISTANT

GENERATE AUTOMATICALLY BEST TEST PARAMETERS

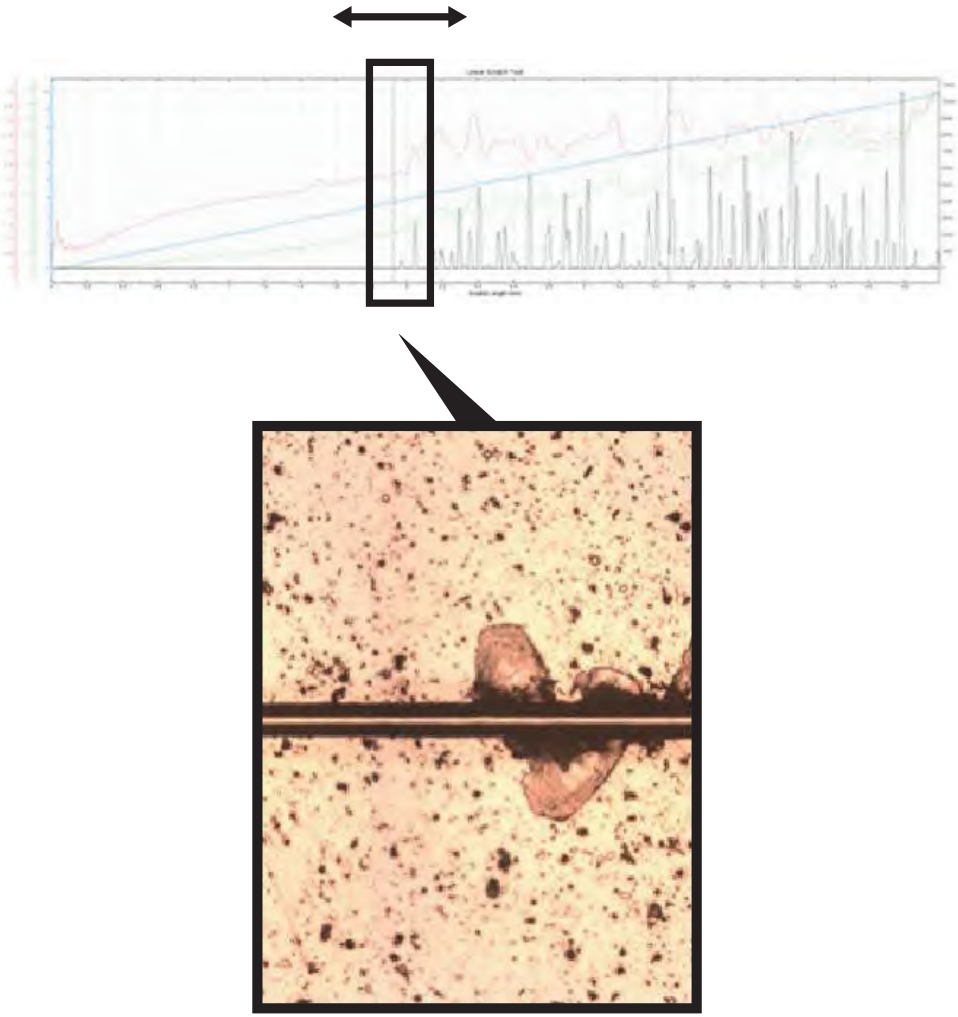
ANY MATERIALS / ANY THICKNESS

RECOMMEND BEST DIAMOND TYPE AND SIZES

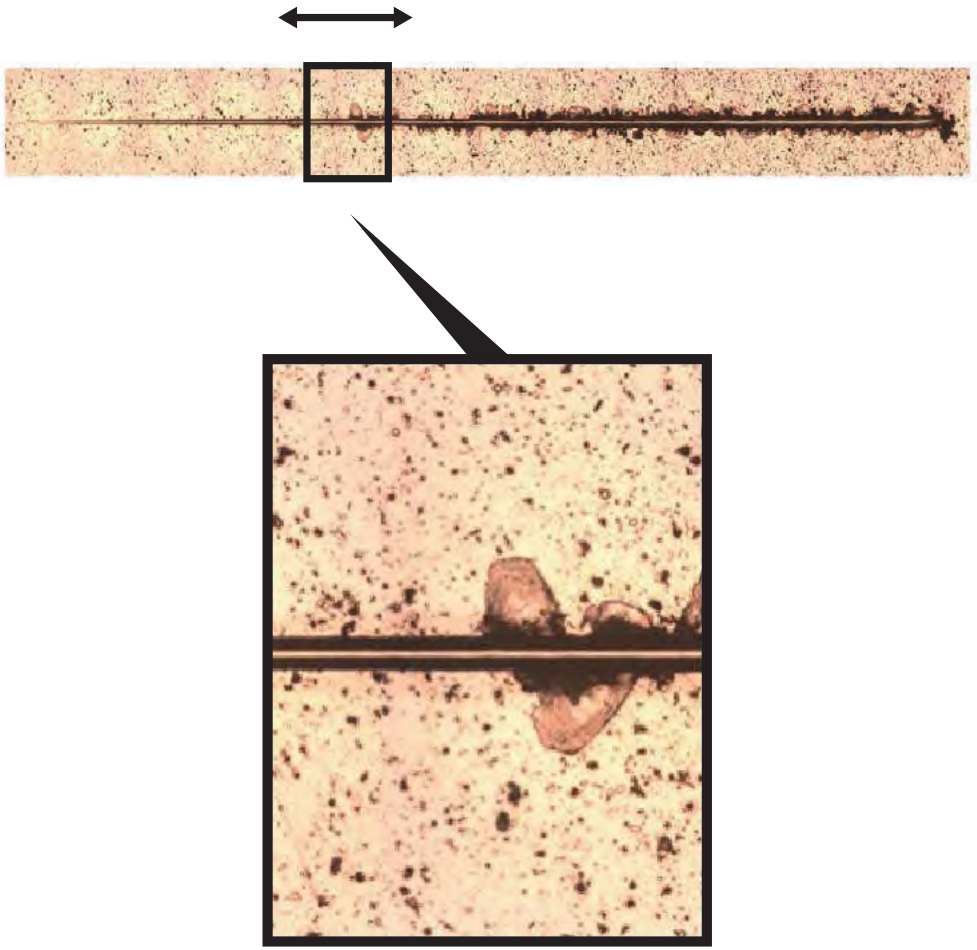
AUTOMATICALLY TEST ANY SAMPLES

ADVANCED AUTOMATION

TRACKING ZOOMED VIEW



W/ AE, FRICTION, AND DEPTH DATA



W/ FULL SCRATCH IMAGE

BASE	CB500	PB1000
Maximum # of Modules	1 (Nano or Micro)	2 (Nano & Micro)
X&Y Motorized Stages	100 x 50mm	200 x 150mm
XY Lateral Resolution	0.1µm	0.1µm
Z Motorized Approach (range)	50mm	50mm (+ 140mm manual extra slide)
Base Type	Desktop	Desktop or Stand Alone
Desktop Dimensions	38 x 33 x 70cm	64 x 68 x 82cm
Stand-Alone Dimensions	N/A	92 x 92 x 183cm
Zoom Video Microscope	1600 x 1200 Camera	1600 x 1200 Camera
3D Optical Profiler	N/A	Optional
AFM	N/A	Optional
High Speed Fretting Wear	N/A	Custom up to 40 Hz

MODULES	NANO	MICRO
Acquisition Rate	24bit	24bit
Modes of Testing	Indentation, Scratch & Wear	Indentation, Scratch & Wear
Loading System	Piezo Electric	Ball Screw Servo Motor
Load Sensor (independent from depth sensor)	Utra Sensitive Compressive Load Cell	Compressive Load Cell
Force Range	80 | 400 | 1800 | 4800mN	20 | 40 | 200 | 400N
Force Resolution	0.004 | .03 | 0.14 | 0.28µN	1.2 | 2.4 | 12 | 24µN
Force Noise Floor rms	0.12 | 1 | 4 |12µN	50 | 100 | 500 | 1000µN
FastMap	5min (100 indents)	12min (100 indents)
Depth Sensor	Capacitor Ring	Large Area Capacitor
Range	250 | 1500µm	1mm w/ 50mm motor encoder
Displacement Resolution	0.003nm	0.01nm
Displacement Noise Floor rms	0.04nm	0.15nm
Indenter Geometries Including Flat or Balls Up To*	6mm	25mm
Friction Range	40 | 400 |1800mN	20 | 200N
Force Resolution	0.004 | 0.14 | 0.28µN	1.2| 12µN
Friction Noise Floor RMS	0.3 | 6 | 12µN	1.2 | 2mN
Acoustic Emission Frequencies**	150 - 400kHz	150 - 400kHz
Sensitivity of AE Absolute Energy	0.005aJ	0.005aJ
DMA / CSM Frequencies	0.1 to 100Hz	N/A
Frequency & Temperature Sweep at Constant Load	Yes	N/A
Temperature Oven***	275° | 450°C	275° | 450° | 600°C
Humidity	5% to Dew Point	5% to Dew Point
Cold Temperature	Down to -10°C | <-40°C	Down to -10°C | <-40°C

*Larger balls or geometries with lighter materials are available **Other frequency range available, Nano only available under sample***Specifications subject to change, please contact Nanovea for latest.

Today's Standard For Tomorrow's Materials.

Firmly aligned with our vision, Nanovea aims to simplify advanced measurement technologies to stimulate materials engineering for the common good. Ease of use, advanced automation and the dedication to superior accuracy are the driving forces behind its full range of precision instruments.

As a Trusted Quality Manufacturer, our Profilometers, Mechanical Testers & Tribometers can be found internationally in distinguished educational and industrial organizations ranging from automotive to cosmetic, biotechnology to medical devices and from microelectronics to space applications. Thousands of clients rely on our accurate & honest solutions, superior instruments and experienced laboratory and consulting services.