

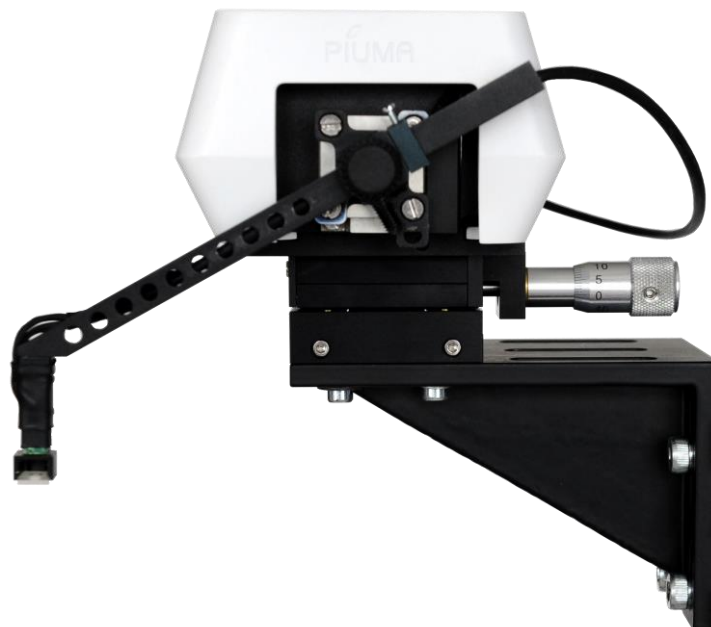
OPTICS11 LIFE CHIARO V3

Technology

The Optics11 Life Chiaro Nanoindenter is purposely built to explore soft materials down to cell-length scales, providing true insights in the mechanics of native and engineered materials. These unique capabilities are enabled by the Optics11 Life patented micro-machined fiber-optic sensors.

This indentation instrument uses the sensor to gently push a spherical glass tip on the surface of the sample. By closely monitoring the resulting sample deformation, the Chiaro Nanoindenter can rapidly provide all mechanical details of the indented spot.

In addition, all Optics11 Life probes are pre-calibrated making them plug-and-play design which streamlines experiments. This ensures fast measurements which is critical for time-sensitive biology-related experiments. Last, being small and portable yet powerful, the Chiaro nanoindenter will fit any lab.



Characterize mechanical properties of:

- Single cells
- Biological tissues
- Engineered tissues
- Spheroids
- Cell scaffolds
- Hydrogels
- 3D printed biomaterials
- Particles/capsules

Key features:

- Match with any inverted microscope or alternative setup
- Easy to learn and master
- Pre-calibrated probes
- Reliably measure even the softest samples
- Direct data & result output
- Customizable displacement/load/indentation profiles
- Micro-DMA (dynamic mechanical analysis) capability
- Automatic find-surface function
- Small footprint
- Little to no maintenance require



Technical specifications

Indentation capabilities

Probe force range
Stiffness range

20 pN – 2 mN
5 Pa – 1 GPa

Indentation stroke
Tip size and geometry
Contact size diameter
Coarse X-Y stage travel
Coarse Z stage travel
Minimum lateral pitch

Up to 100 μm @0.5 nm resolution
3 μm – 250 μm , spherical
1 μm – 100 μm
Closed-loop, 12 x 12 mm @80nm resolution
Closed-loop, 12 mm
0.2 μm

Compatible formats

All common dishes
Well plates (up to 96 wells)

Minimum sample volume

>0.4 μL for 96-well plate (thickness 3 μm)

Indentation speed

~0 – 5×10^4 $\mu\text{m/s}$

Modes of interrogation

Manual change between wells/sample dishes
Automated mapping
Quasi-static indentation (E , G)
Step-response (Creep / Stress-Relaxation)
Dynamic/oscillatory (DMA: E' , E'' , G' , G'')
Adhesion mode

Frequency range

0.1 – 20 Hz

Control modes
Test environments

Load/depth/piezo-displacement
Air or liquid (water, culture medium)

Compatibility

Mounting

Breadboard

