

# Optical Contact Angle Surface Energy Analyzer

**FY-CAT-9600**



## High-Precision Surface Wetting, Energy, and Interfacial Analysis System

### Product Overview

The **FYTRONIX Contact Angle & Surface Tensiometry Analyzer** is an advanced optical testing platform engineered to evaluate surface wetting, contact angles, surface free energy, and liquid surface tension with extreme scientific accuracy.

By utilizing precise optical imaging, high-magnification optics, and robust fitting models, the system delivers critical insights into solid-liquid interactions. Whether evaluating superhydrophobic coatings, measuring complete wetting dynamics, or performing pendant drop optical tensiometry via needle-suspended droplets, the FYTRONIX analyzer provides reliable and reproducible results for advanced material research and quality control.

## Key Technical Capabilities

- **Precise Contact Angle Measurement:** Rapid and precise determination of surface wetting behaviors (hydrophobicity, hydrophilicity, and complete spreading).
- **Surface Free Energy (SFE) Analysis:** Automated calculation of solid surface energy components using multi-liquid contact angle evaluations.
- **Surface Roughness Assessment:** Interfacial roughness influence modeling for enhanced wetting interpretation.
- **Advanced Fitting Algorithms:** Integrated **3-Point** and **4-Point** geometric analysis methods for high-accuracy contact angle determination across symmetric and asymmetric droplets.

## Hardware & Software Architecture

- **High-Resolution Optical Imaging System:** Features a specialized high-resolution camera paired with up to **130x optical magnification** for crisp droplet profile capture.
- **Precision Mechanical Optics Stand:** Heavy-duty, vibration-stable optical bench providing micro-positioning and exact alignment between lighting, droplet, and optics.
- **Fluid Delivery System:** Includes precision syringe, micro-nozzles, and chemical-resistant connectors for precise droplet volume control.
- **Analytical Software Suite:** Purpose-built software for automated edge detection, contact angle fitting (3-point/4-point), surface free energy evaluation, and surface tension calculations.

## Technical Specifications

| Parameter             | Specification / Feature                                                                                 |
|-----------------------|---------------------------------------------------------------------------------------------------------|
| Optical System        | High-resolution camera with up to <b>130x magnification</b>                                             |
| Analysis Methods      | <b>3-Point</b> and <b>4-Point</b> Contact Angle Determination Methods                                   |
| Measurement Modes     | Contact Angle, Surface Free Energy (SFE), Surface Roughness Analysis                                    |
| Droplet Mechanics     | Sessile drop method, Pendant drop method                                                                |
| Dosing Hardware       | High-precision syringe, custom micro-nozzle tips, fluidic connectors                                    |
| Mounting              | Adjustable optical stand with precision positioning controls                                            |
| Software Capabilities | Automated drop profile extraction, real-time angle calculation, multi-liquid SFE solver, data reporting |

### Complete System Package Includes

- **FYTRONIX Main Contact Angle Analyzer Unit**
- **High-Resolution Camera & 130x Optical System**
- **Precision Optics & Alignment Stand**
- **Fluid Dosing Kit** (Syringe, precision nozzles, and fluidic connectors)
- **FYTRONIX Contact Angle & Surface Energy Analysis Software**



## SURFACE FREE ENERGY MEASUREMENT

|                      |   |                                 |           |
|----------------------|---|---------------------------------|-----------|
| Theta DIM            | : | <input type="text" value="63"/> | CALCULATE |
| Theta Water          | : | <input type="text" value="46"/> |           |
| Surface Free Energy  | : | 52,453 mN/m                     |           |
| Polar Component      | : | 33,879 mN/m                     |           |
| Dispersive Component | : | 18,574 mN/m                     |           |