

FISCHERSCOPE® ST200

Automated Scratch Testing System for Analyzing the Adhesion and Cohesion Strength of Coatings



Description

The FISCHERSCOPE® ST200 is a progressive load scratch tester for analyzing the adhesion and cohesion strength of coatings according to ASTM C1624, ISO 20502, and DIN EN 1071-3. The instrument is perfectly suitable for measurement in development, quality assurance, incoming inspection and process control.

Typical fields of application

- Hard material coatings (PVD, CVD)
- Automotive engine and drive train components
- Electroplated coatings (decorative, functional)
- Characterisation of hard anodic coatings
- Materials used specifically in medical technology applications
- Electronic components, connectors, bond wires, etc.
- Plasma-applied coating systems

Design

Features

- Various measurement modes: constant load, progressive load, incremental load
- Three analyzing methods: optical microscopy, friction force measurement and acoustic emission measurement
- Motor driven XY-stage and Z-axis
- Measurements on curved surfaces with motion feed-back control
- Automatic image scan of the whole scratch
- Diamond indenters of various geometries
- Optical filters for contrast improvement
- Integrated electronics, no external control unit necessary
- Two microscope objectives, optional: four additional objectives
- Easy-to-use software WIN-SCU based on Windows®
- Data and image capturing over the whole scratch length
- Data storage in ASCII format
- Easy creation of test reports
- Optional: customized sample holders

General Specification

Intended use	Scratch tester instrument for characterizing hard coated materials, with a typical coating thickness exceeding 1 µm
Design	Bench top unit with PC, measuring head, positioning device made of natural hard stone, programmable XY-stage, motorised z-axis

Measuring Head

Normal load range	500 mN to 200 N
Load resolution	3.3 µN
Minimum contact load	0.5 N

Friction measurement module

Maximum load	500 mN to 200 N
Resolution	3.3 µN

Depth sensor

Depth range	1600 µm
Depth resolution	0.01 nm

Acoustic emission sensor

Resonance frequency	100 kHz ±20 %	Maximum amplification 1,000,000 x
Dynamic range	73 dB ± 3 dB	

Microscope-/ Camera magnification

Objective	5x, 20x
Video picture (field of vision)	2688 x 2150 µm, 672 x 538 µm
Camera	Color 1280 x 1024 pixels
Light source	LED

Sample Stage

Design	Programmable XY-stage, motorized z-axis
Stage dimensions	100 x 100 mm
Repeatability precision X/Y	≤ 1 µm (direction-independent)
Stage speed (Scratch speed)	0.4 – 600 mm/min
Maximum travel	45 x 190 mm
Maximum specimen height	100 mm

Indenters

Design	Standard: Spherical diamond-tipped cone with 120° angle (R = 0.05 mm, 0.1 mm, 0.2 mm) others on request
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Options

Additional microscope objectives	2.5x, 10x and 50x with video picture
Sample holders	Custom specific sample holders on request

Electrical Data

Main voltage, mains frequency	100 to 240 V $\pm$ 10 % 47 – 63 Hz
Power consumption	max. 130 W (without evaluation PC)
Protection class	IP20

Dimensions

External dimensions (Height x width x depth)	630 mm x 650 mm x 610 mm
Weight	100 kg

Environmental Conditions

Operating temperature	Climatic chamber class 3: 15 °C – 40 °C / 59 °F – 104 °F
Storage/Transport temperature	Climatic chamber class 2: -20 °C – 55 °C / -4 °F – 131 °F
Admissible air humidity	$\leq$ 80 %, non-condensing

Evaluation Unit

Software	WIN-SCU
Operating system	Windows®

Standards

CE approval	EN 55011, EN 61326, EN 61010
Standards	ASTM C1624, ISO 20502, DIN EN 1071-3

Order

FISCHERSCOPE® ST200	605-812
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