Clear & Clean Research Laboratory / List of Available Test-Equipment

	No.	Equipment	Application
Mechanical Parameters	1	Thickness Gauge	Thickness determination of porous sheet materials
	2	Submonolayer-Ellipsometer	Layer thickness of thin film impurities in the sub-monolayer range
	3	Tensiometer for Liquids	Surfactant content of liquids, according to Ludwig Wilhelmy (Wilhelmy Plate), 1863
	4	Maximum Tensile Force / Strain Gauge	Breaking load and elongation to force
	5	Drop Absorption Analyzer	Determination of surfactant loads of textile materials
	6	2 Precision Balances	Mass determination / capillary liquid uptake, range 1 µg - 20 g, 1 mg - 190 g
	7	Quartz Crystal Micro-Balance	Balancing of masses at nanogram and microgram level
Particles	8	Liquid Particle Counter	Number of particles in liquids to Feret-Ø (0.5 to 10 µm)
	9	Air Particle Analyzer in the nm range	Nano-particles distribution in air
	10	Air Particle Analyzer	Number of airborne particles per cubic-foot (or cubic meter) of air
	11	Particle Release Simulator, small angle-type, modified Gelboflex-Tester	Determination of particle release of textile materials by small angle agitation
	12	Particle Release Simulator by Labuda	Particle release of textile materials in air with defined mechanical walk loads
	13	Particle Analyzer	Nano-particle distribution in transparent and dark liquids
	14	Electronic Counter for Particles on Surfaces	Number and Feret diameter of particles on surfaces in the size of 2 - 100 µm
	15	Rotation Wiping Simulator Mark I by Labuda	Particle abrasion of textile materials on various rough surfaces
	16	Rotation Wiping Simulator Mark II by Labuda	Particle abrasion from various object surfaces
	17	Particle and Film Transfer Test Unit using a Pneumatic Press	Particle and film-transfer from flat objects to collector plates for microscopical observation

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Chemical Content	18	Critical-Point Extractor	Hypercritical CO_2-extraction system for the ultra-cleaning of porous materials
	19	ATR-FTIR Spectrometer	Analysis of chemicals in liquids, gases and solids
	20	GC-MS Head-Space Gas-Chromatograph for Gases and Liquids	Chemical analysis of the outgassing by solids and liquids
	21	Ion Meters Based on Selective Electrodes	Measuring ion concentration using ion-selective electrodes
	22	Capillary Electrophoresis Analyzer (CE)	Ion concentration, real-time electropherograms, for anions and cations
	23	Microwave Extraction System	Extraction of chemical substances on inner and outer object-surfaces
	24	Soxhlet Extraction Apparatus	Extraction of chemical substances on inner and outer solid surfaces
	25	TOC - Total Organic Carbon Analyzer Station	Total organic carbon with a detection limit of 4 µg / l (4 ppb)
	26	UV/VIS Spectrometer	Purity of extraction agents
Surfaces	27	Laser Fluorescence Analyzer for Thin Film Residue	on object surfaces, measuring molecules-equivalent counts
	28	O_2-Plasma Cleaning System	Preparation of molecularly pure object surfaces in O_2 plasma
	29	Surface Roughness Profilometer	Surface topography Rz, Ra, Ry
	30	Droplet Contour Measuring Instrument	Determination of the wetting properties of various materials surfaces
	31	Vacuum Metall Sputtering System	Sample preparation for SEM microscopy
	32	Centrifugal Adhesion Rupture Analyzer	Adhesion force analysis for the determination of impurities on bondable surfaces
Simulators	33	Linear Wiping Simulator Mark II by Labuda and Schoettle	Dynamic liquid absorption of wiping fabrics
	34	Rotation Wiping Simulator Mark III by Labuda and Schoettle	Cleaning effectiveness of wiping agents, laser fluorescence analysis

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Visualization	35	Various Incident Light and Zoom Microscopes, Standard	General visualization of objects
	36	Macroscope Column and Multi-Sector Incident Light	Visualization of macroscopic surfaces
	37	Optical Universal Microscope	Object visualization: reflected light, transmitted light, fluorescence and polarization contrast
	38	Automated Optical Universal Microscope	Object visualization polarization contrast, transmitted light
	39	Photomicroscope, DIC	Incident differential Interference Contrast (Nomarski), DIC
	40	Photomicroscope, Fluorescence	Object visualization using reflected light fluorescence
	41	Scanning Electron Microscope with EDS-Particle Analyser for Metal Ions	Visualization of microstructures, realistic magnification up to 20,000x
	42	Atomic Force Microscope (AFM)	Surface structures in the nanometer scale
Electrostatics	43	Electrical-Discharge-Analyzer	Measuring electrostatic properties of porous fabrics
	44	Falling Sledge Analyzer by Ehrler	Testing triboelectric charge / discharge of textile fabrics
	45	Measuring Gauge for High-Impedance Load-Resistors	Surface resistance of textile fabrics