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RETSCH ZM 200 Laboratory Mill

Ultra centrifugal mill with high speed rotor used for rapid size reduction of soft to medium-hard and fibrous materials



Fine grinding of different types of samples (e.g., biological, agricultural, chemical, plastics, food, feed, etc.).

Size reduction takes place by impact and shearing effects between the rotor and the fixed ring sieve.

- Material feed size: 10 mm
- Final fineness: 50 μ m

Owner institution: Pulp and Paper Institute

Location: Bogišičeva 8, 1000 Ljubljana

Contact: ema.fabjan@icp-lj.si



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VELP SER 158 Automatic Solvent Extractor

Fully-automated solvent extractor according to Randall technique



The automated extractor provides reliable and accurate results using an improved extraction Randall technique that is five times faster compared to the traditional Soxhlet method. The determination of extractable matter is performed with a solid-liquid extraction process that removes soluble components from solids using a liquid solvent.

Owner institution: Pulp and Paper Institute

Location: Bogišičeva 8, 1000 Ljubljana

Contact: ema.fabjan@icp-lj.si

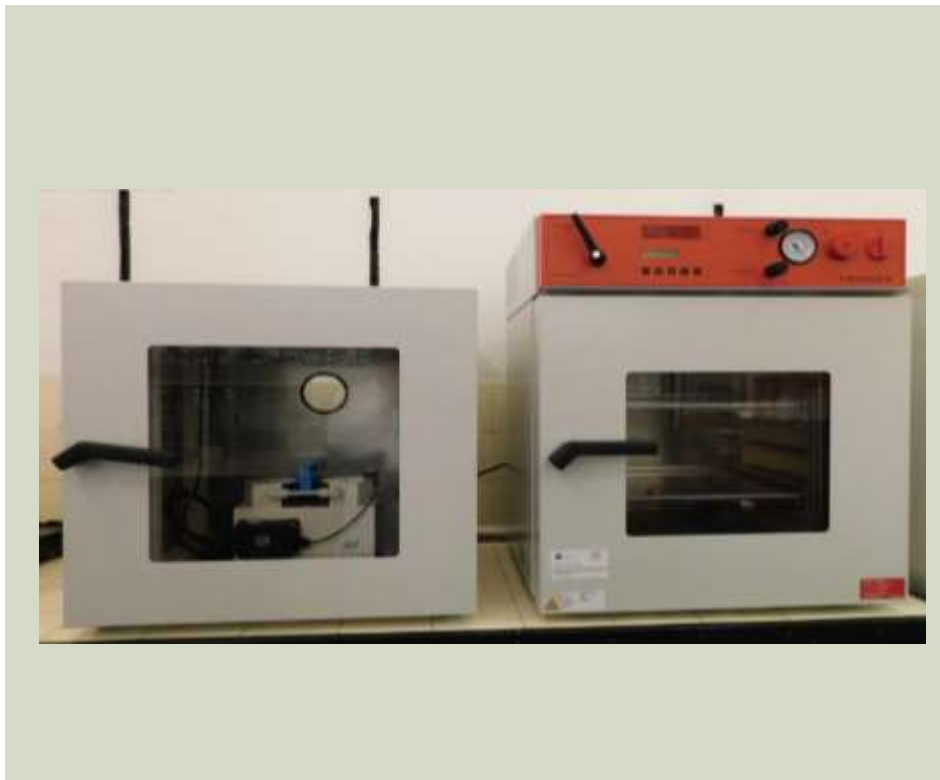


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BINDER VD 53 Vacuum Drying Chamber

Drying oven under vacuum



Drying oven for drying biomass materials and their extracts having temperature-unstable compounds under lower temperature with pressure.

- Volume: 53L
- Temperature range: 15°C above room temperature to 200°C

Owner institution: Pulp and Paper Institute

Location: Bogišičeva 8, 1000 Ljubljana

Contact: ema.fabjan@icp-lj.si



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Rapid-Koethen Laboratory Sheet Former with Equalizer

Laboratory simulation of sheets forming



RK lab sheet former with equalizer is basic equipment in every papermaking laboratory. It is equipped with 4 vacuum driers and white water circulation system. Suitable to make sheets from different fibres, wood, and alternative biomass sources as well as glass wool, synthetic fibres, etc.

Owner institution: Pulp and Paper Institute

Location: Bogišičeva 8, Ljubljana

Contact: andrej.sinkovec@icp-lj.si



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Valmet Fiber Image Analyzer

Comprehensive fibre analysis



The analyser is capable to determine a wide range of fibre characteristics: length (0,01-7,60 mm), width (0,001 – 1 mm), fine particles, coarseness, curl, HW/SW ratio, fibrillation, kink index, cell wall thickness, etc.

Owner institution: Pulp and Paper Institute

Location: Bogišičeva 8, Ljubljana

Contact: andrej.sinkovec@icp-lj.si



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PPS Tester

Determination of roughness according to Print-surf method



PPS tester to determinate roughness and compressibility of paper/board according to the Print-surf method. Measuring range is 0,5 – 8 μm . Contact pressure is 500 – 2000 kPa.

Owner institution: Pulp and Paper Institute

Location: Bogišičeva 8, Ljubljana

Contact: andrej.sinkovec@icp-lj.si



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Bendtsen Tester

Testing machine to determine air permeability and roughness



All-in-one Bendtsen tester to determine air permeability and roughness in mL/min and Gurley permeability in s. Measuring range is from 0 to 5000 mL/min. All measured data are recorded and statistically processed.

Owner institution: Pulp and Paper Institute

Location: Bogišičeva 8, Ljubljana

Contact: andrej.sinkovec@icp-lj.si



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Universal Micrometer

Digital universal micrometer with measuring range 0 – 2 cm



Universal digital micrometer for determination of thickness on paper, tissue paper, board, solid board, corrugated board, and other flat materials.

Owner institution: Pulp and Paper Institute

Location: Bogišičeva 8, Ljubljana

Contact: andrej.sinkovec@icp-lj.si



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Perkin Elmer Spectrum Two FTIR Spectrometer

IR analysis of different materials



For infrared analysis of sample identity, composition, quality, and consistency. Standard optical system with KBr windows for data collection over a spectral range of $8300 - 350 \text{ cm}^{-1}$.

- Resolution of 0.5 cm^{-1}
- SNR of 14500:1
- Standard sample holder for measurement of different samples in transmission technique
- UATR sample accessory with diamond crystal
- Easy operating, compact, robust, and portable.

Owner institution: Pulp and Paper Institute

Location: Bogišičeva 8, 1000 Ljubljana

Contact: maja.frelj@icp-lj.si



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Perkin Elmer Frontier MIR/NIR Spectrometer

IR analysis of different materials in MIR and NIR



For infrared analysis of sample identity, composition, quality, and consistency.

- Standard optical system with KBr windows for data collection over a spectral range of $14700 - 350 \text{ cm}^{-1}$
- Resolution of 0.5 cm^{-1}
- SNR of 15000:1
- Standard sample holder for measurement of different samples in transmission technique
- ATR sample accessory KRS-5 (1 reflection) for measurement in reflection
- NIR sample accessories for measurements in NIR area
- Option to be upgraded with IR microscope

Owner institution: Pulp and Paper Institute

Location: Bogišičeva 8, 1000 Ljubljana

Contact: maja.frelih@icp-lj.si



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Shimadzu GC-FID-MS Chromatograph

Gas chromatograph with flame ionization detector and mass spectrometry detector



- FID 2010 Plus detector
- GCMS-QP2010 SE EI detector

For chemical characterization of process chemicals, stickies, and other materials, identification and quantification of compounds in extracts (e.g., antioxidants, phenols, natural polymers, fatty acids), analysis of toxic materials (PAH, PAA, PCB, PCP, mineral oils, etc.) in different media (e.g., food packaging, waste water).

Owner institution: Pulp and Paper Institute

Location: Bogišičeva 8, 1000 Ljubljana

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Analytik Jena SPECORD 210 PLUS UV-VIS Spectrophotometer

Double beam UV-VIS spectrophotometer with variable spectral resolution



- Wavelength range: 190-1100 nm

- Variable bandwidth: 0,2/0,5/1/2/4 nm

For quantitative analysis of sugars, starch, lignin soluble in water, enzymatic activity and different environmental parameters such as Cr(VI), ammonia, phosphates, nitrates, etc. It is also intended for analysis of glyoxal and formaldehyde in paper and packaging intended for food contact.

Owner institution: Pulp and Paper Institute

Location: Bogišičeva 8, 1000 Ljubljana

Contact: lorna.flajsman@icp-lj.si



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Shimadzu HPLC Chromatograph - Prominence

Integrated system for high-pressure liquid chromatography with RID (refraction index detector)



- UV detector (190 - 700 nm) with dual-wavelength mode
- RI detector (1 - 1.75 RIU)
- Quaternary gradient unit
- Thermostatic column oven

For chemical characterization of compounds present in biomass like sugars, carbohydrate monomers, antioxidants, vitamins, etc. and analysis of toxic materials in different media (e.g., paper and food packaging, environmental samples).

Owner institution: Pulp and Paper Institute

Location: Bogišičeva 8, 1000 Ljubljana

Contact: lorna.flajsman@icp-lj.si



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Mechanical Testing Machine (10 kN)

Mechanical testing of materials



Tools and equipment for largest number of tensile and other tests on paper, cardboard, and corrugated board, as well as lightweight board materials in the region. Tensile, crush, burst, 2,3,4 point flexure test, BCT, ECT, FINAT tests.

Owner institution: Pulp and Paper Institute

Location: Bogišičeva 8, 1000 Ljubljana

Contact: igor.karlovits@icp-lj.si



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Laboratory Coating Unit CU8/250

Laboratory coating unit enables testing of various coatings in different coating techniques and materials (paper, board, other fibre, and composite materials)



- The coating unit offers different application techniques: size press, film press, blade, rod, and 3 roll system.
- Single sheet coating unit is A4 format, either single-sided or double sided with controlled coating parameters.
- It allows applications on a roll of paper or board up to 250 mm width.
- IR and hot air drying with adjustable intensity, temperature, and drying time to simulate industrial processes.

Owner institution: Pulp and Paper Institute

Location: Bogišičeva ul. 8, Ljubljana

Contact: janja.juhant-grkman@icp-lj.si



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Apex UV-LED Inkjet Printer

Prints and enhances surfaces



UV-LED inkjet printer with CMYK+2 colour option (plus white and varnish).

Printing area 100 x 160 cm.

Printing on all materials (paper, board, wood, panels, ceramics, etc.) up to 10 cm in height.

RIP (raster image processor) for colour correction.

Owner institution: Pulp and Paper Institute

Location: Bogišičeva 8, 1000 Ljubljana

Contact: gregor.lavric@icp-lj.si



InnoRenew CoE



GTO Screen Printing Machine

Prints and enhances surfaces



Printing area of 50 x 70 cm.

Printing up to height of 30 cm.

Semiautomatic version.

Can print with all type of inks (water-based, UV, solvent) and functional inks for printed electronics.

Coating of plies or glue application on boards.

Owner institution: Pulp and Paper Institute

Location: Bogišičeva 8, 1000 Ljubljana

Contact: urska.kavcic@icp-lj.si

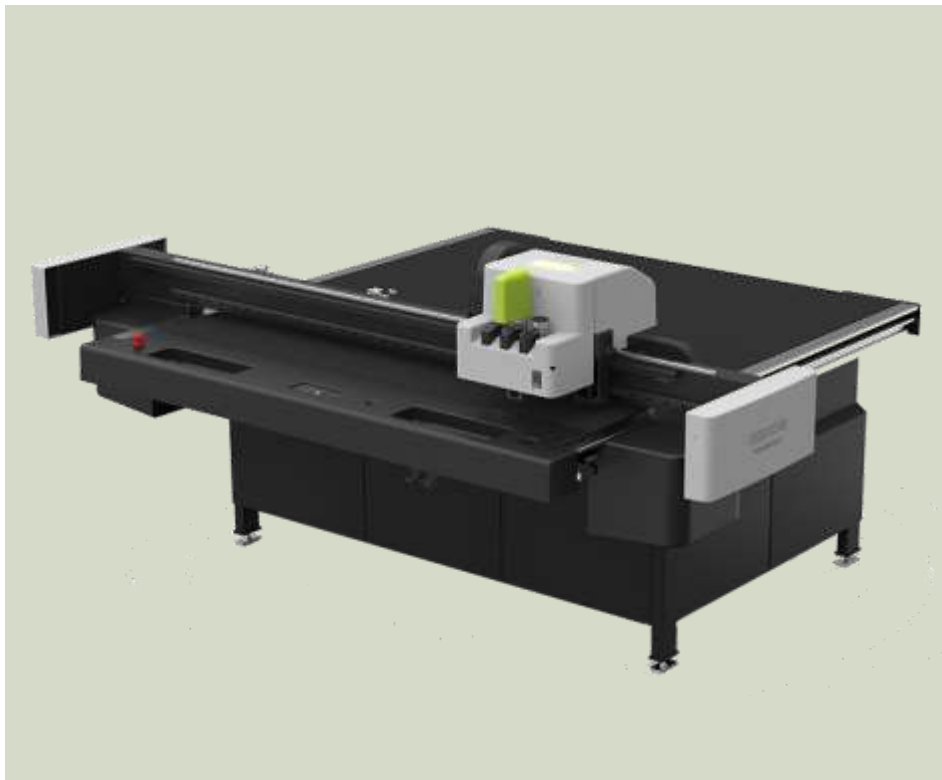


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Esko X Starter Cutting Table

Cuts and creases materials



CAD cutting and prototyping system.
Cut, crease, and drill all materials up to 2 cm high.

Working area 120 x 160 cm.

Ideal for light material, irregular cut for interior materials, or prototype designs.

Owner institution: Pulp and Paper Institute

Location: Bogišičeva 8, 1000 Ljubljana

Contact: gregor.lavric@icp-lj.si