VINCI TECHNOLOGIES

GEOLOGY

PRODUCT CATALOG 2024

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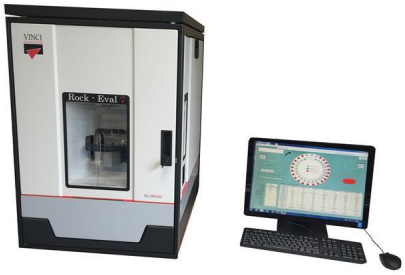

Organic Geochemistry

Thin section

ISO 9001
BUREAU VERITAS
Certification

GEOLOGY

LIST OF INSTRUMENTS

VINCI TECHNOLOGIES

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GEOLOGY

ROCK EVAL 7 ANALYSER

The Rock-Eval 7 is the fully automated Vinci instrument that performs geochemical analysis of kerogen-containing rock samples. The powerful device, determines via high-temperature pyrolysis and subsequent oxidation, the critical kerogen and kinetics parameters which allow for example, the determination of Total Organic Carbon content (TOC), mineral carbon content (MINC), kerogen type, well log correlations and petroleum generation modelling. Specifically, the pyrolysis and oxidation products are measured by a Flame Ionization Detector (for hydrogen containing compounds) and an Infrared cell (for oxygen-containing products). Data from the Rock Eval can be input into the Vinci GEOWORKS software to compute rock characterization parameters, e.g. Hydrogen and Oxygen indices, shape factors etc.

FEATURES

Pyrolysis oven temperature:	40°C to 850°C
Oxidation oven temperature:	200 to 850°C
Oven temperature rates:	Adjustable from 0.1 up to 50°C/mn, with 0.1 °C step
Material of crucible:	Alumina
Auto sampler capacity:	48 samples
Detector:	FID for hydrocarbon, IR for C0/CO2 and UV for SO2
Carrier gases:	Nitrogen (pyrolysis) / Air (oxidation)
Power supply:	110-220 VAC, 50 or 60 Hz

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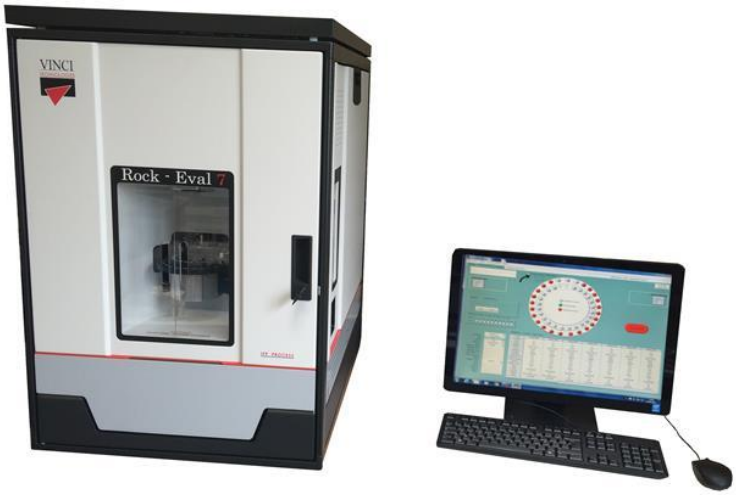
GEOLOGY

SULFUR ROCK EVAL 7S ANALYSER

The Rock-Eval 7S is the latest fully automated Vinci instrument that performs geochemical analysis of kerogen-containing rock samples. The powerful device, determines via high-temperature pyrolysis and subsequent oxidation, the critical kerogen and kinetics parameters which allow for example, the determination of Total Organic Carbon content (TOC), mineral carbon content (MINC), kerogen type, well log correlations and petroleum generation modelling. Specifically, the pyrolysis and oxidation products are measured by a Flame Ionization Detector (for Hydrogen containing compounds) and an Infrared cell (for oxygen-containing products). The feature distinguishing the RE-7S is its ability to evaluate the sulfur content of samples from the byproducts of pyrolysis and oxidation. In addition to the two ovens, a third oven has been implemented to convert all sulfur containing samples into SO2. Moreover, a ceramic oven is utilized for the oxidation vessel due to the high-temperature required to trigger the sulfur products' effluence. Data from the RE-7S can be input into the Vinci GEOWORKS software to compute rock characterization parameters, e.g. Hydrogen and Oxygen indices, shape factors etc.



FEATURES

Pyrolysis oven temperature:	40°C to 850°C
Pyrolysis SO oven temperature:	up to 900°C
Oxidation oven temperature:	200 to 1200°C
Oven temperature rates:	Adjustable from 0.1 up to 50°C/mn, with 0.1 °C step
Material of crucible:	Alumina
Auto sampler capacity:	48 samples
Detector:	FID for hydrocarbon, IR for C0/CO2 and UV for SO2
Carrier gases:	Nitrogen (pyrolysis) / Air (oxidation)
Power supply:	110-220 VAC, 50 or 60 Hz

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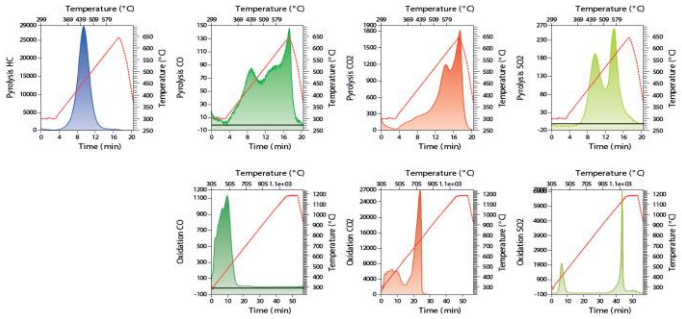
GEOCHEMICAL CALCULATION SOFTWARE (GEOWORKS)

GEOWORKS is Vinci's most advanced geochemical analysis software, building on the enhanced features of its predecessor, Rockint. It adds new modules such as sulfur quantification, kinetics studies, shale gas interpretation, solvent extraction simulation, curve shape factor quantification, among others. The core module focuses on raw data collection, visualization, and potential adjustments via an interactive cursor. To accommodate different sample types, seven distinct analysis methods are available: bulk rock, pure kerogen, reservoir, pure oil, coal, gas shale, and multi-heating rate.

Results generated by GEOWORKS offer immediate utility in well-to-well correlations and data comparisons. Distinguishing features compared to Rockint include a flexible and user-friendly search engine, enhanced file storage capabilities, compatibility with 64-bit Windows operating systems, visualization options for sulfur dioxide parameters like pyrolysis, oxidation, and sulfate, automatic window resizing, a broader range of comprehensive functions, and access to online assistance from our qualified engineers.



Geoworks® encompasses a range of analysis methods tailored to different sample types, facilitated by computational software that automates the determination of:

- ✓ The type, quality, and quantity of kerogen,
- ✓ Quantities of light oil, heavy oil, and NSO compounds in reservoirs,
- ✓ Quantification of both organic and mineral sulfur (SO2 peaks),
- ✓ Interpretation of shale gas, including the total amounts of generated gas and oil (both free and adsorbed),
- ✓ Numerous additional parameters available through various software modules.
- ✓ HTML reports module

As an option, the software can be enhanced with the following modules:

- Study management module
- Quick-kinetics module
- CleanSim module
- Multi-kinetics module
- Quick modeling module
- Simulated distillation module
- HTML reports module

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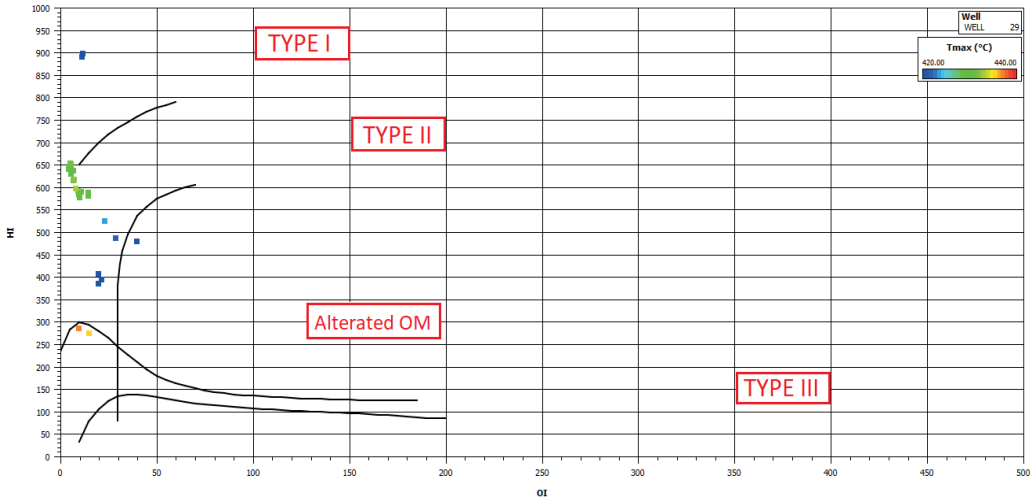
STUDY MANAGEMENT MODULE

The Study Management Module offers more than just basic result viewing; it enables users to interact with data by adding, deleting, and merging wells and parameters, as well as customizing tables. This module expands upon the analytical capabilities, allowing for enhanced data visualization through either predefined diagrams like the Van Krevelen plot, or user-customized graphs. It also accommodates the generation of geochemical logs and reports, available in either SI or Imperial units, as part of its comprehensive offerings. The Study Management Module also covers the generation of geochemical logs, litho-stratigraphic columns, and reports, available in either metric or imperial units.



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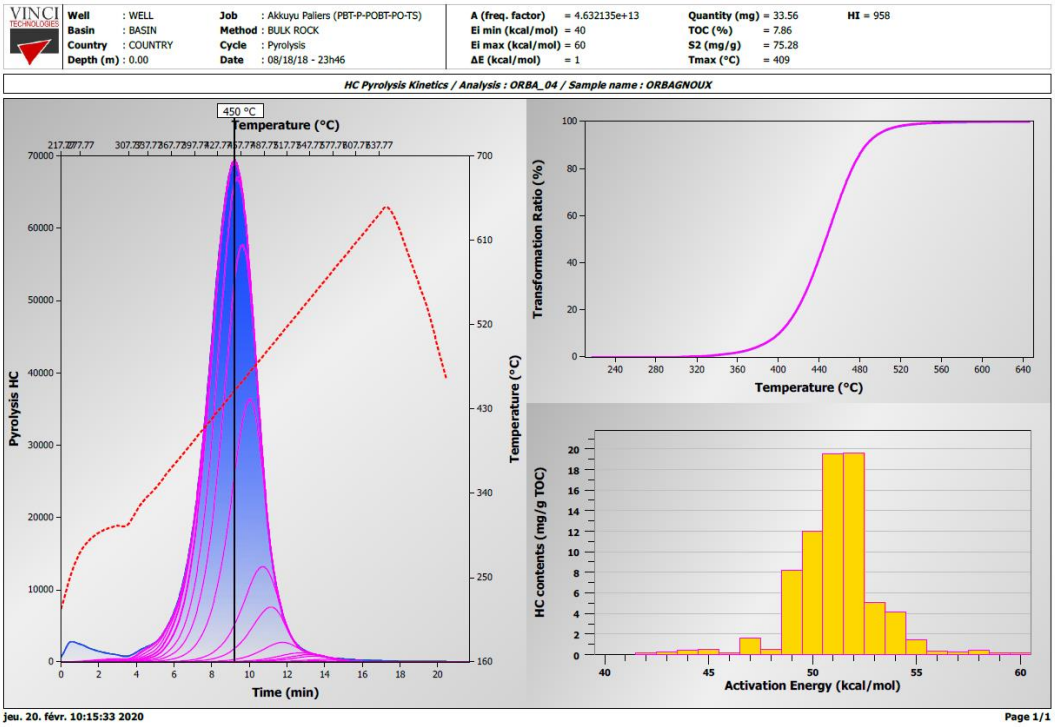
QUICK KINETICS MODULE

Utilizing the Tissot-Espitalié model, this module facilitates the quick calculation of activation energy distributions for both S2 and sulfur SO2 peaks, derived from a single pyrolysis heating rate measured in degrees Celsius per minute.



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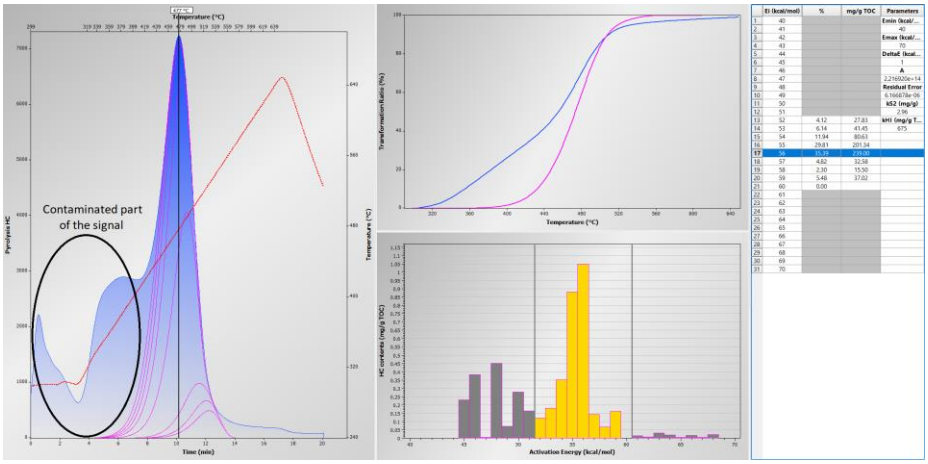
CLEAN-SIM MODULE

The module emulates solvent extraction processes on cutting samples contaminated by Oil Based Mud or other free hydrocarbons, utilizing RE data. It calculates the corrected S2 peak by deconvoluting the initial S2 peak using kinetic parameters. To operate this module, the Quick Kinetics and/or Multi-Kinetics modules are prerequisites.



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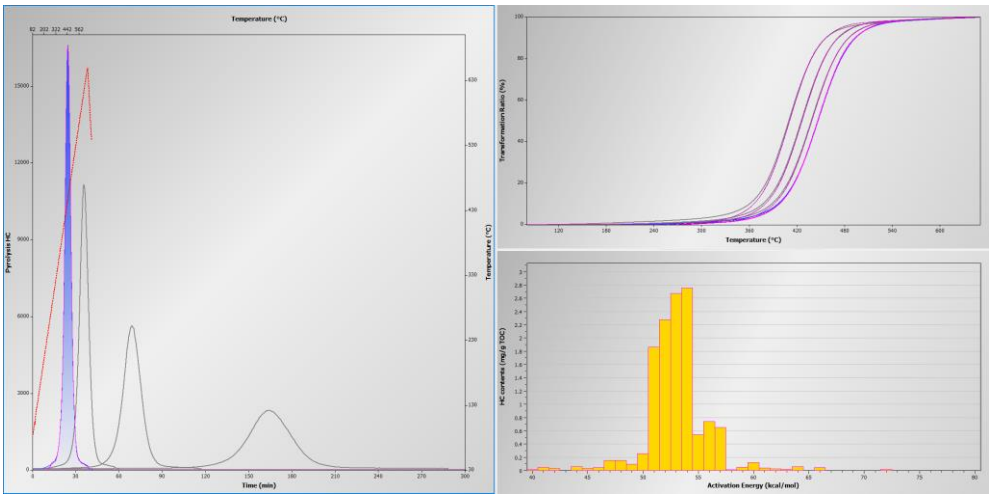
MULTI KINETICS MODULE

This module computes kinetic parameters based on multiple analyses conducted on the same sample, either at identical or different heating rates.



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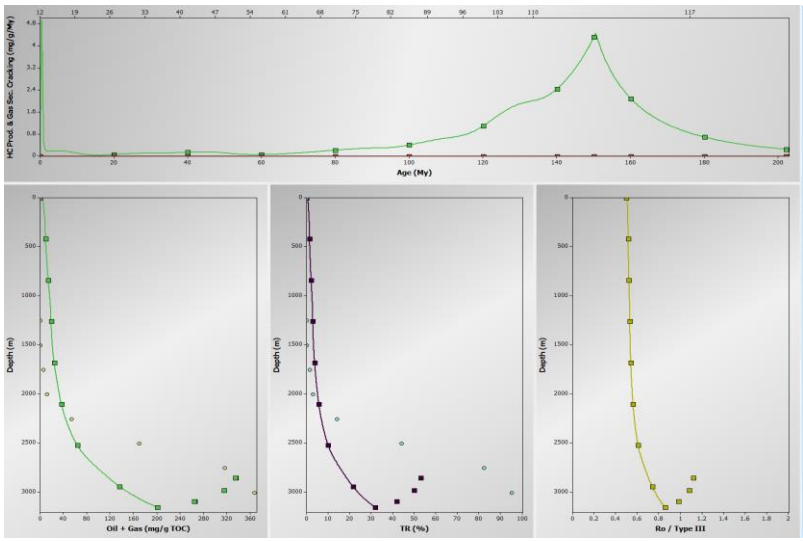
QUICK MODELING MODULE

This module serves as an effective tool for calibrating kinetic parameters derived from either the Quick Kinetics or Multi-Kinetics modules. These parameters are then input into the Quick Modeling module to simulate the client's basin production, which is subsequently compared to actual production data. Multiple sets of kinetic parameters are tested to identify the best fit with real-world production.

If the client provides information on their basin's burial history, including factors like formation depth, geological time, and geothermal gradient, the module can be used to determine the basin's maturity degree (Ro) using simulated Vitrinite reflectance, transformation ratio (TR), and quantities of produced hydrocarbons.

In cases where the client's basin burial law is unavailable, users have the option to use the reference model of the Parisian sedimentary basin included with this module. This model comes with both the burial law (sedimentary data) and actual experimental production data, including transformation ratios and hydrocarbon content in mg/g TOC.

To operate this module, the Quick Kinetics and/or Multi-Kinetics modules are prerequisites.



	Age (My)	Depth (m)	Grad. (°C/km)	T (°C)	Oil (mg/g TOC)	Gas (mg/g TOC)	TR (%)	Ro
1	0	0	35	12	0.00	0.00	0.00	0.50
2	20	420	35	26.7	9.97	0.00	1.58	0.52
3	40	840	35	41.4	14.58	0.00	2.31	0.52
4	60	1260	35	56.1	19.44	0.00	3.08	0.53
5	80	1680	35	70.8	24.75	0.00	3.92	0.54
6	100	2100	35	85.5	36.84	0.00	5.84	0.56
7	120	2520	35	100.2	63.91	0.00	10.12	0.61
8	140	2940	35	114.9	136.42	0.01	21.61	0.74
9	150	3150	35	122.25	200.79	0.07	31.82	0.86
10	160	3092	35	120.22	264.14	0.21	41.87	0.98
11	180	2977	35	116.195	314.15	0.41	49.83	1.08
12	202	2850	35	111.75	333.81	0.53	52.96	1.12

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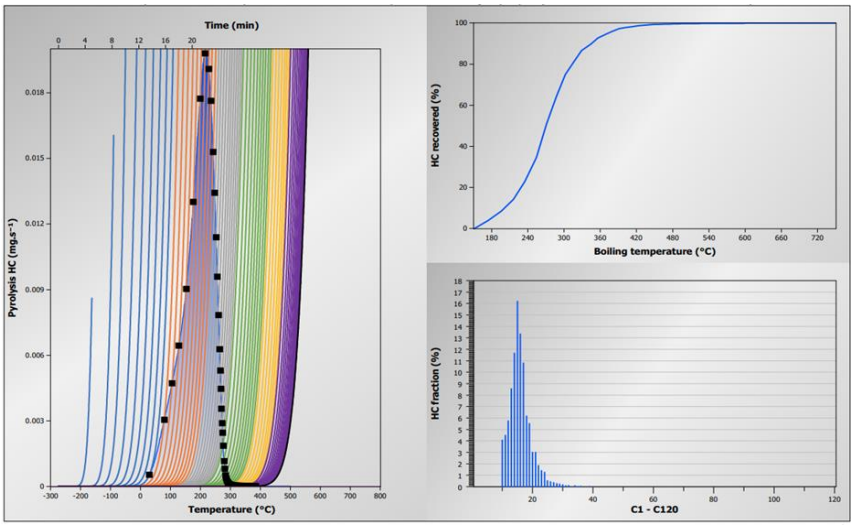
SIMULATED DISTILLATION MODULE

This feature enables the identification of various alkanes (ranging from C1 to C120) present in oil within a reservoir. It displays both the distribution chart and the simulated distillation curve for the oil sample in question. The calculations rely on Antoine's equation curves, which model the state changes of n-alkane hydrocarbons (from C1 to C120) at a uniform heating rate, measured in degrees Celsius per minute. Additionally, the module offers insights into characteristics of the oil content, such as average molecular weight, initial boiling point (IBP), and final boiling point (FBP).



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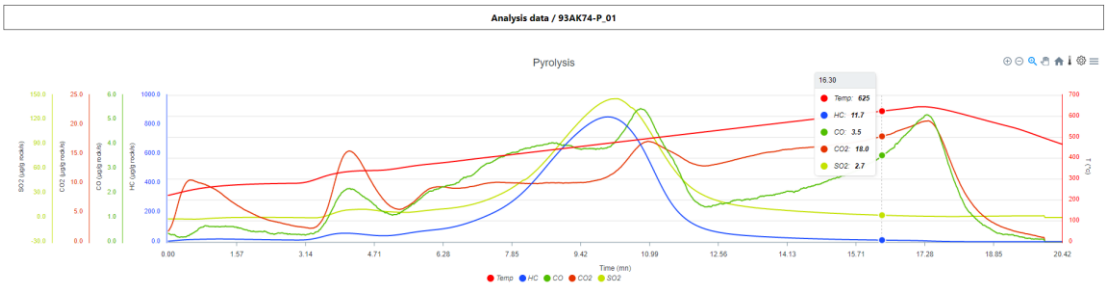
HTML REPORTS MODULE

This module supports exporting results in .html format for lightweight data sharing and offers rapid result reviews through preset tables or interactive charts. It is also optimized for use on both smartphones and tablets.



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VACUUM OVEN

The portable vacuum oven DR 3003 incorporates all the advantages of the conventional vacuum oven at a small scale. Its small dimensions make it an efficient and convenient laboratory accessory. Furthermore the glass bell provides a total (360°) visibility of the products being dried.The main components of the portable oven are a machined stainless steel heating plate and a glass bell, designed to withstand the internal and external pressure difference. The sealing is secured by a Viton O-ring between the heating plate and the bell. The total volume is approximately 5 litres and the maximum usable volume is 0.6 litres. The required temperature is easily adjusted by a digital display electronic regulator. Heat is transferred from the heating plate via conduction. A small volume and compact design guarantee a fast heating process. The portable vacuum oven is safe, user-friendly, and extremely durable.

FEATURES

Vacuum:	10^{-3} mm Hg (0.13 Pa)
Temperature:	30°C to 170°C (precision 0.3%)
Material:	stainless steel 316L
Seal:	Viton O-ring
Overall dimensions:	340 x 320 x 270 mm
Weight:	13 kg
Inside diameter of bell:	230 mm
Inside height of bell:	130 mm
Glass bell volume:	5 l
Power supply:	220V / 50Hz or 110 V / 60 Hz

BENEFITS

- User friendly and reliable.
- Light and small
- Accurate temperature control.
- Allow to work under inert atmosphere.
  Visual control during drying operation.

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RADIAL SLABBING SAW (RSS 400)

The RSS 400 is a versatile diamond impregnated radial blade used for sectioning large specimens down to a manageable size. It comes with a worktable, blade guard, motor to power the saw, core clamp assembly for holding core, sample trolley on ball bearing guide, coolant feeding system, coolant recovery pan and diamond impregnated saw blade.

SPECIFICATIONS

Saw blade diameter	400 mm (16'')
Maximum cutting depth	125 mm (5 inches)
Max core length	300 mm,
Compatible coolants	water
Power supply	220 VAC 1 ph 50/60 Hz
Power	4000 watts
Weight	100 kg
Volume	1500x1100x1700 mm

BENEFITS

- Simple and robust
- Ideal to cut from small to big samples
- Can be used with or without sample holder

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CUTTING SAW (CS 200)

The CS 200 is a bench top diamond cutting saw designed to manually cut with impressive precision, bulky rock to a manageable size. The unit is ideal for both production and research environments in all geology sectors. The device is perfectly suited for versatile rock cutting (hard and soft) and voluminous thin section production. The bulk material is manually fed through the blade while a splash shield and blade coolant deflector contain the coolant specks. All wetted components are composed of high grade stainless steel to eliminate the risk of corrosion wear. A lamp located on top of the assembly provides a clearer resolution of the cutting area.

FEATURES

Saw blade	200 mm (8'')
Saw blade thickness	2 mm
Lubricants	water
Power supply	220 VAC, 50/60 Hz
Motor power	550 W, 3,000 RPM
Weight	70 kg
Dimension	765x750x660 mm

BENEFITS

- Compact, simple and robust
- Easy to operate and clean
- Excellent cut quality

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VACUUM EMBEDDING UNIT (VEU)

The vacuum embedding unit has been developed for impregnating porous and fragile specimens with an adequate bonding material that fills pores, cracks and prevents fracture. Up to 10 specimens can be processed sequentially without disrupting the vacuum. The former are placed on a rotating plate in individual moulds inside the vacuum chamber. A silent electrical vacuum pump, a pressure gauge and a vacuum regulating valve generate and maintain the vacuum. Once the latter condition established, the moulds are successively brought under the resin's feeding nozzle and filled using a resin dispenser. This component consists of a disposable plastic cup which contains the resin, a disposable plastic tube that channels the resin, a rubber stopper ensuring effective sealing and a ball joint allowing the tube to be manipulated and orientated inside the chamber. A lamp helps to monitor the extraction of bubbles from the resin. The glass chamber prevents strong resin adhesion, therefore facilitating maintenance and cleaning.

SPECIFICATIONS:

Weight	20 kg
Overall dimensions	440x300x450 mm
Chamber dimensions	200 Ø x 150 mm (Height)
Turntable plate diameter	200 mm
Max standard moulds	10
Power supply	220 VAC, 50/60 Hz

BENEFITS:

- ✓ Simple operation and effortless cleaning
- ✓ Ideal for soft, porous and friable specimens
- ✓ Up to 10 specimens can be impregnated together
- ✓ Compact, bench top unit with integral vacuum pump
- ✓ Specimen impregnation is performed isothermally (up to 80°C)

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BONDING JIGS (BJ 12)

The bonding jig is designed to provide a uniform bonding material thickness between specimens and glass slides. Bonding a sample to its glass slide is a crucial step in thin section preparation. Successful grinding, lapping and polishing relies heavily on bonding quality, i.e. minimizing the layer of glue's thickness. First, a thin layer of epoxy resin is applied on both slides and specimen. Each slide is then meticulously adhered to the specimen. To increase bonding efficiency, the assembly is placed on a heated bonding press allowing bondage under pressure and temperature. The specimen is pressed against its glass slide with variable weight while the temperature is set between 20°C to 130°C +/- 2°C to ensure perfect bonding. A maximum of either 12 samples of small dimensions (26x46, 27x47, 28x48, 30x45), 6 large samples (50x75) or a combination of 6 small and 3 large specimens can simultaneously be processed.

SPECIFICATIONS

Temperature	20 to 130°C
Weight	10 kg
Dimensions	217x124x708 mm
Power supply	220 VAC, 50/60 Hz

BENEFITS

- Heating system
- No springs
- Individual weight
- Up to 12 samples prepared in a row

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SLICING/GRINDING MACHINE (SG 200)

The SG200 is a semi-automatic device able to concomitantly prepare two thin sections rapidly and with great accuracy. The apparatus consists of a diamond-cutting blade, a diamond-grinding wheel and a versatile vacuum chuck for various slide sizes. The latter grasps the thin section during slicing and grinding operations. The sample is directly transferred from the cutting blade to the grinding wheel, by virtue of a manually rotated wheel, thereby facilitating the procedure and saving time. An adjustable screw controls the slicing thickness while a precision micrometer monitors grinding thickness of thin section.

SPECIFICATIONS:

Specimen size	two specimens of 30x45mm or 1"x1.5" one specimen of 60x45 mm or 1"x 3" (other upon request)
Slicing Blade	Ø200mm
Grinding wheel	Straight cup-wheel, Ø200. Grit 46
lubricants	water
Motor speed	3,000 rpm
Weight	48 kg
Dimensions:	640x340x350 mm
Power supply	220 VAC, 50/60 Hz

BENEFITS

- Compact, simple and robust
- Fast and very accurate slicing and grinding operations
- Two instruments in one

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SLICING/GRINDING/LAPPING MACHINE (SGL 200)

The multi-purpose SGL200 can slice, grind and lap specimens using only one instrument. A high grade steel lapping disc, diamond-cutting blade, diamond-grinding wheel, and versatile vacuum chuck for various slide sizes are the key components of the machine. The latter grasps the thin section during slicing and grinding operations. The sample is directly transferred from the cutting blade to the grinding wheel, by virtue of a manually rotated wheel, thereby facilitating the procedure and saving time. An adjustable screw controls the slicing thickness while a precision micrometer monitors grinding thickness of thin section. Sample lapping consists of first manually holding the sample in place while a silicon carbide solution is periodically poured over the disc.

SPECIFICATIONS:

Specimen size	two specimens of 30x45mm or 1"x1.5" one specimen of 60x45 mm or 1"x 3" (other upon request)
Blade for slicing	Ø200mm, for miscellaneous stones
Grinding wheel	Straight cup-wheel, Ø200. Grit 46
Lapping disc diameter	200 mm
Lapping Plate speed	150 rpm
Lubricants	water
Motor speed	3,000 rpm
Weight	50 kg
Dimensions:	640x340x350 mm
Power supply	220 VAC, 50/60 Hz

BENEFITS

- Three functions in one instrument
- Compact, simple and robust
- Fast and very accurate slicing grinding and lapping operations

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MANUAL LAPPING, GRINDING AND POLISHING MACHINE (LGP 250)

The LGP 250 is a complete apparatus specifically designed for small-scale lapping, grinding and polishing operations. In low production volume applications, the device is an ideal educational tool for practical laboratory modules, where the goal is to familiarize students with the final thin section preparation steps. The robust, simple to use system provides high quality polished finish for a minimum investment. The disc speed can be varied from 10-600 rpm, during manual grinding, lapping and polishing processes and the final oxide suspension polishing. The LGP 250 allows for lapping on cast iron discs with SiC lapping powder, grinding with magnetic diamond grinding disc available in different grades and polishing with polishing cloths or magnetic polishing disc.

SPECIFICATIONS

Variable plate speed	10 to 600 rpm
Plate diameter	250 mm
Dimensions	526 x 589 x 380 mm
Weight	50 kg
Power supply	220 VAC, 50/60 Hz

BENEFITS

- Vibration-free at low speeds
- Easy accessibility for fast cleaning
- Manual lapping and grinding

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SEMI-AUTOMATED POLISHING MACHINE (LGP 250-P)

The LGP 250-P is a single purpose apparatus specifically designed for small-scale polishing operations. The robust, simple to use system provides high quality polished chips and thin sections with the minimum capital investment. The disc speed can be varied from 10-600 rpm. Polishing is achieved by means of polishing cloths or magnetic polishing discs. A polishing head with four holders for the chip or thin section production is supplied. The former allows efficient, simultaneous polishing of up to 4 samples. Variable up to 200 gram weights apply a force to hold the sample's position on the disc. Two sets of four specimen holders are supplied to suit either 30x45mm or 1 x 1.5 inch samples.

SPECIFICATIONS

Variable plate speed	10 to 600 rpm
Plate diameter	250 mm
Specimen size	30x45mm or 1 x 1.5 inches
Dimensions	526 x 589 x 380 mm
Weight	50 kg
Power supply	220 VAC, 50/60 Hz

BENEFITS

- Vibration-free at low speeds
- Polishs chips and thin sections
- Easy access for rapid and effortless cleaning
- Simultaneous polishing up to four samples

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GEOLOGY

AUTOMATED POLISHING MACHINE (AP 250)

The AP-250 performs simultaneous flawless polishing of up to 4 thin sections. With the variable speed motor (50-600 rpm), various polishing processes can be carried out, including final polishing with oxide polishing suspensions. The device functions with both polishing cloths and magnetic polishing discs. The robust polishing head is composed of corrosion-proof materials. The former is driven by a powerful, low voltage DC motor that can provide sufficient torque to rotate the fully loaded carousel at speeds of up to 8 rpm, enabling a synchronous specimen rotation. The force is evenly applied to the thin section via individually adjustable (up to 800g) weights. Four sets of four specimen holders are supplied to suit either 30x45mm slides, 1 inch x 1.5 inch slides, 60 x 45mm or 1 inch x 3 inch.

SPECIFICATIONS

Variable plate speed	10 to 600 rpm
Plate diameter	250 mm
Specimen size	30x45mm, 1 inch x 1.5 inch, 60 x 45mm or 1 inch x 3 inches
Dimensions	526 x 589 x 380 mm
Weight	60 kg
Power supply	220 VAC, 50/60 Hz

BENEFITS

- Vibration-free at low speeds
- for rapid and effortless cleaning
- Motorized sample holder arm for 1 to 4 samples with 4 sets of 200g weights each
- 4 standard sample holders adaptable to various specimen geometries.
- Adjustable cycle time and plate speed

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GEOLOGY

AUTOMATED LAPPING MACHINE (LM 500)

The LM 500 is a bench floor single-plate lapping machine, utilized to flatten the chip face which will be glued to a slide and to perform the final thin section sample thickness reduction. The powerful apparatus can simultaneously process up to 6 chips or 24 thin sections, with an exceptionally high degree of surface finish. By removing subsurface damage caused by sawing and grinding, the desired specimen thickness and evenness are achieved. The device is mainly composed of a rotating grooved cast iron plate, a chip lapping jig, a precision thin section lapping jig, a lapping thickness tuning tool, an unevenness correction rim and an abrasive fluid (e.g. silicon carbide) dispensing and recycling system. Via a control panel, the operator can manually control the apparatus or run it in the automatic mode.

SPECIFICATIONS

Specimen size	30x45mm or 1”x1.5” (small size) 60x45 mm or 1”x 3” (large size)
Jig capacity	according to the model
Variable plate speed	20 to 75 rpm
Plate diameter	500 mm
Timer	0-10 hours
Dimensions	700x 700 x 1,400 mm
Weight	250 kg
Power supply	220 VAC, 50/60 Hz

BENEFITS

- Vibration-free at low speeds
- Laps chips and thin sections
- Easy access for rapid and effortless cleaning
- High simultaneous sample processing rate
- Automated operation

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GEOLOGY

HIGH PRECISION SLICING SAW (SS 150)

The SS 150 machine allows to thin slide-mounted rock chips as low as 200-µm prior to final lapping with an extreme precision. The compact bench-top unit is made of a heavy duty frame that provides stable and vibration free base. The 150-mm-diameter diamond cutting blade, powered by an AC motor, rotates at fixed speed of 4,000 RPM. A sliding weight arm enables the end user to exert constant force on specimen while cutting. The saw blade passes parallel to the slide holder at an adjustable distance, from 0.2 mm to 20 mm. The distance can be accurately set using a digital micrometer that precisely controls specimen thickness with a resolution of 5 µm. A versatile vacuum chuck allows various slide sizes to be used. A cutting compartment with transparent hood collects the coolant, thus reducing splashing and reducing noise. The device sits on a cabinet that includes a coolant recirculation unit made of a 10-litre capacity coolant tank and induction pump. A single stage rotary vacuum pump provides the specimen holder with vacuum source.

SPECIFICATIONS

Specimen size	30x45mm or 1"x1.5" (small size) 60x45 mm or 1"x 3" (large size)
Minimum specimen thickness	200 µm
Cutting with resolution	5 µm
Cutting speed	4,000 RPM
Saw blade	150 mm
Saw blade thickness	1 mm
Lubricants	water
Motor power	550 W, 3,000 RPM
Weight	150 kg
Dimension	700x700x1300 mm
Power supply	220 VAC, 50/60 Hz

BENEFITS

- Vibration-free operations
- Excellent cut quality and uniformity
- Produces ultra-thin specimen reducing subsequent lapping time
- Easy access for rapid and effortless cleaning
- Multiple slides of varying sizes

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