



the mining value chain

Technologies and services developed by Mintek

1. Exploration

- Geochemical sample analysis;
- Mineral/ore characterisation;
- Certified Reference Materials; and,
- Artisanal and small-scale mining (ASSM).



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2. Mining

- ASSM technology;
- ASSM training assistance; and,
- Mining inputs economic studies.



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3. Concentration

a. Comminution/Flotation

- Flowsheet design and optimisation, and piloting;
- Plant audits;
- Ultrafine milling; and,
- Control and optimisation strategies.



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b. Physical separation

- Bulk sample preparation;
- Gravity, magnetic, electrostatic and dense-media separation; and,
- Pneumatic jigging, and Mineral Density Separation.



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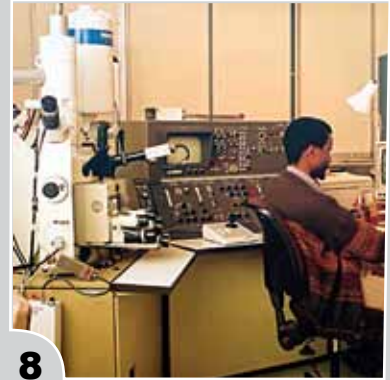
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4. Pyrometallurgy

- Pelletisation and briquetting;
- Pre-heating and pre-reduction;
- DC arc process development and piloting;
- Modelling and simulation;
- Submerged-arc furnace (SAF) control strategy;
- Fluidised bed and condenser technologies;
- Refractories performance investigations;
- High-temperature solid state and phase equilibrium investigations;
- Ore, slag, matte and alloy characterisation.

5. Hydrometallurgy and Biotechnology

- Atmospheric and pressure leaching;
- Bioleaching (refractory gold and base metals);
- Solvent extraction and ion exchange;
- Electrowinning;
- Process simulation;
- Reagent development and evaluation;
- Gold recovery by CIP/RIP;
- Activated carbon regeneration;
- Uranium processing expertise, U_3O_8 recovery;
- Cyanide measurement, monitoring and auditing; and,
- Leach circuit control.

6. Refining

- Gold refining and value-added products/chemicals;
- Pyrometallurgical refining of: zinc (PWG to SHG), and off-grade ferro-alloy fines; and,
- Titanium chlorination technology.

7. Value addition

- New industrial applications for gold: Catalysis; Biomedical; and Nanotechnology;
- "Smart" materials and sensors;
- PGM-based superalloys;
- Low-nickel stainless alloys;
- Jewellery fabrication;
- Gold and platinum jewellery alloys; and,
- Identification of downstream, metals-based.

8. General

- Ore characterisation, analytical and process mineralogy;
- Certified Reference Materials;
- Materials characterisation, testing and development;
- Engineering design, manufacturing, installation and commissioning;
- Project management services; and,
- Regional minerals-based studies.