MINTEK can develop and evaluate flotation procedures for new ores, according to specific product grade and recovery requirements, by applying its expertise on the selection of plant configuration, reagents, and conditions, and by running extended pilot-scale testwork. It also offers a consultancy service to help existing plants.

**Equipment**

Fully equipped flotation laboratories for routine and specialised testwork.

- Denver D-12 laboratory flotation machines;
- Leeds-design flotation system;
- Wemco and Agitair flotation machines;
- Full range of flotation cells from 1 to 10 litres;
- Facility to measure and record parameters such as sulphide ion concentration, redox potential, pH, oxygen levels, xanthate concentration, and temperature; and,
- Procedures for conducting rate flotation tests and fitting to rate models.

An extensive range of modular pilot-scale equipment for use on small (60 kg/h) and large (up to 1 t/h) flotation plant runs for parameter investigations and plant design data-gathering exercises.

- Autogenous mill (a bleed stream is fed directly into the flotation plant);
- A wide range of pilot-scale mills, that can be run in rod or ball mode, with capacities from 250 - 1 000 kg/h;
- Smaller mills, 0.6 m diameter by 1 m long, are used for smaller scale testwork;
- Stirred media detractor;
- Deswik mill;
- High Pressure Grinding Rolls (Laboratory Polysius unit and Pilot Köppern unit);
- A range of classification systems (microscreens, spiral classifiers, sieve bends, and cyclones), conditioner types (Sala and Denver), and peristaltic pumps sizes for reagent delivery;
- Flotation cells for specific on-site applications;
- Modified single Sala 80 l cells with extra-large impellers;
- 180 l tank cells, skid-mounted for on-site testwork; and,
- Multotec column flotation cells (Jameson cells can be hired as required).

Flotation cells, modular, for general work:

- 80 l Sala cells for rougher and scavenger flotation, each bank comprising four or six cells, all equipped with automatic level controllers;
- 30 l Sala cells, usually used for cleaner flotation, each bank consisting of two, four, or six cells;
- Denver 11 l cells;
- A dedicated 100 kg/h milling and flotation plant is available for reagent; and,
- evaluation and comparative testwork.

A full range of in-house analytical facilities is available, with turnaround times of between 3 and 8 hours. Plant runs can be scheduled for periods ranging from a few hours to continuous runs over several days.

A dedicated, experienced team is available to run the pilot plant and to manually confirm all plant...
parameters. The plant is usually sampled every hour, and the data is processed through commercial mass-balancing packages.

The pilot plant is set up so that air flowrates and bubble sizes in the cells can be measured. This is useful for modelling purposes. The plant is controlled via the Mintek StarCS system, which reduces start-up time and allows tight level control at setpoints. This reduces variations in the data due to plant disturbances, and allows study of the effects of small level changes.

Recent projects. Process development for:

**PGM’s**
- Lonmin (Karee, Middelkraal and Akanani);
- Two Rivers;
- Impala Platinum;
- Ridge Mining (Blue Ridge and Sheba’s Ridge);
- Northam (Booyensdal);
- Wesizwe;
- Platinum Group Metals (Ngonyama);
- Barrick (Sedibelo); and,
- Platmin (Grootbook, Mphahlele, Pilanesberg).

**Base metals**
- Minero (Pering);
- Mopex (Ruashi);
- Discovery Metals (Boseto);
- Freeport McMoRan (Kisanfu);
- Norilsk Nickel (Phoenix and Selkirk); and,
- International Base Metals Limited (Omitiomire).

**Other**
- Harmony, Anglogold Ashanti, First Uranium, Rio Tinto, BHP Billiton (Olympic Dam) – (Au and U including recovery from tailings);
- Saphaku Holdings - (fluorspar);
- Sylvania Resources, Tharisa Minerals, Barberton Mines – (PGM recovery from Cr dumps);
- Bulk concentrate production for leaching and roasting testwork; and,
- Independent evaluation of reagents.

**Specialist**
Mike Bryson