

FLOTATION PILOT PLANT

SGS MINERALS SERVICES

SGS Lakefield Orestest Pty Ltd (SGS) was originally founded in 1993 as Orestest Pty Ltd. SGS has since developed into a major metallurgical services organisation located in a purpose-built laboratory in Perth, Western Australia.

The laboratory is dedicated to providing high quality metallurgical testing across the broad spectrum of the minerals industry including:

- Gold ores
- Nickel laterites
- Base metal
- Iron ore
- Mineral sands
- PGM ores
- Rare-earths and other exotics
- Diamond ores
- Environmental services

SGS provides a comprehensive range of test work capabilities including bacterial leaching, crushing, screening, grinding, ultra fine grinding, gravity, magnetic & electrostatic separation, solvent extraction, electrowinning, flotation, pressure leaching, pressure oxidation, pressure acid leach and cyanide speciation. Pre-feasibility studies, on-site diagnostic metallurgical services, environmental testing and analytical services are also included in our range of capabilities.

Introduction

The new flotation pilot plant is located in a purpose built shed and is capable of processing ore samples at the rate of 100 to 500 kg/h depending on the physical characteristics of the ore, the complexity of the flotation circuit used and the requisite flotation residence times.

Our extensive flotation equipment inventory allows single metal or complex polymetallic flotation circuits to be configured.



Pilot Plant Equipment

The pilot plant equipment inventory includes:

- A ball mill feed hopper equipped with a variable speed discharge conveyor.
- A 550 mm dia' (inside liners) by 1500 mm EGL rod mill.
- A 900 mm dia' (inside liners) by 900 mm EGL rubber lined, trunnion overflow primary ball mill.
- A Hardinge 640 mm dia' (inside liners) by 720 mm belly length, trunnion overflow conical ball mill.
- A 150 mm dia' (inside liners) by 250 mm EGL trunnion overflow mill.
- A 280 mm dia' (inside liners) by 320 mm EGL trunnion overflow mill.
- A 25 L Metprotech stirred mill (for ultrafine grinding of intermediate product streams).
- Owing to the ore feed rates typically processed the mill is generally operated in closed circuit with a DSM screen classifier fitted with the appropriate wedge wire screen panel required to meet the client's flotation feed P80 specification. If necessary the grinding circuit can be closed with a hydrocyclone (Warman, Krebs, Concord or Mozley).
- A range of mechanically agitated conditioning tanks.
- A range of attritioning cells (manufactured by Quinn equipment in Denver USA).
- Iwaki reagent metering pumps (26 units).
- Slurry pH control systems (four).
- 10 Sala SPV 181 vertical spindle slurry pumps.
- A range of Bredel hose pumps and air actuated diaphragm pumps.
- The extensive flotation cell inventory held at SGS is presented in the following table:

SGS Lakefield Orestest Flotation Equipment Inventory

Manufacturer	Cell Model	Effective Cell Volume (L) ⁽¹⁾	No. Banks	No. Cells/Bank	No. Cells
Agitair	8	8	2	8	16
Agitair	8	8	1	10	10
Agitair	8	8	1	16	16
Agitair	8	8	1	6	6
Essa	8	8	2	4	8
Essa	8	8	1	2	2
Agitair	12	28	2	2	4
Agitair	12	28	2	4	8
Agitair	15	40	1	6	6
Agitair	15	40	2	4	8
Denver	8	78	2	2	4

⁽¹⁾ Does not include allowance for air hold-up

- Conventional, high rate or paste thickening unit operations can be included if requested by the client.
- All flotation tailings are held on-site in 5, 10 or 20 m³ storage tanks.
- A vacuum belt filter is available for dewatering of flotation concentrates.

Testwork Completed

Some of the pilot flotation campaigns conducted by SGS are listed below:

- Seven nickel sulphide ore flotation campaigns for a South American nickel producer.
- Five bulk copper/pyrite ore flotation campaigns for a Bulgarian copper producer.



- Four flotation campaigns on samples of Yakabindie nickel ore for North Limited.
- Roseby copper flotation campaign for Bolnisi Gold.
- Palmarejo silver gold ore flotation campaign for Bolnisi Gold.
- Triton copper flotation campaign.
- Mt Weld rare earth oxide flotation campaigns.

Flotation circuit metallurgical balances are produced using JKSimMet V5.1.43.

SGS's metallurgists have extensive experience concerning:

- The design and execution of bench and pilot scale metallurgical testwork programs together with data interpretation and reporting.
- Process flowsheet development and plant design.
- Process plant commissioning; and
- Process plant management and operation (nickel, copper, lead and zinc concentrators).

Please contact Paul Appleby, Greg Jones or Gary Lonsdale concerning your pilot flotation requirements.

For more information, please contact us:

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