

Process Test Plant Capabilities



Metso Minerals Services

Metso Minerals Engineering offers specialized test plant capabilities to the mining industry for use in equipment sizing and/or process determination.

Our test plant capabilities include ...

Bench scale tests

- Screen analysis of "as received" materials:
 - Tyler Standard Series—DRY
 - Tyler Standard Series—WET/DRY
- Specific Gravity
- Percent Moisture determination
- Blaine Specific Surface determination
- Bulk Density (loose or packed)
- Angle of Repose (static or dynamic) estimate
- Malvern Mastersizer Particle Size Analyzer test (near one micron sizing)
- Blending components for test
- Precrushing samples

Bond work index tests

- Standardized Tests
- Ball or Rod Mill

Hardgrove grindability index tests

- Standardized Tests

Wet or dry ball mill test

- Equipment—8" x 10" Jar Mill (tumbling grinding mill)
- Calculations for indicated energy requirements typically tendered in HP/Ton
- Calculations to arrive at an operating work index for commercial size plants
- Preliminary order of magnitude recommendations of equipment sizing based upon customer application specifications
- Ceramic Jar Mill, with ceramic media for limiting steel contamination

Wet or dry jar rod mill tests

- Equipment - 8" x 10" Rod Mill
- Calculations for indicated energy requirements typically tendered in HP/Ton
- Calculations to arrive at an operating work index for commercial size plants
- Recommendations for commercial size rod mills based upon customer application specifications.



Batch cascade mill tests autogenous or semi-autogenous

- Equipment - 6' x 1' Hardinge Batch Cascade Mill
- Batch mode of operation with various percentages of grinding media
- Scale-up, with approximate 20% scale-up factor required for SAG tests only
- Energy indications for autogenous test work

Continuous autogenous or semi-autogenous grinding tests

- Equipment - 6' x 2' Hardinge Cascade Mill
- Requires 25-100 tons of minus 10" material
- Either customer or Svedala must separate feed into three size fractions
- Feed rate to mill is from 500 to 6000 lb./hr.
- Continuous operation in open or closed circuit is available
- Continuous operation in closed circuit with vibrating screen, rake classifier, or trommel screen is available
- Continuous operation in closed circuit with a jaw crusher for ABC test work is available
- Continuous operation in wet or dry mode
- Various ball charges are typically tested
- Development of commercial size scale-up recommendations based upon customer application specifications

Continuous ball mill tests (pilot plant size)

- Mills available:
 - 2' x 8" Hardinge Conical Ball Mill
 - 19" x 35" Cylindrical Ball Mill
- 2' x 4' Cylindrical Ball Mill
- Can be operated in open or closed circuit
- Can be operated in wet or dry mode
- Air classifiers available for use in closed circuit dry mode

Continuous pebble mill test

- Mills available:
 - 2' x 8" Hardinge Conical Pebble Mill
 - 19" x 35" Cylindrical Pebble Mill
 - 2' x 4' Cylindrical Pebble Mill
- Can be operated in open or closed circuit
- Can be operated in wet or dry mode
- Air classifiers available for use in closed circuit dry mode.

Continuous rod mill test

- Mills available:
 - 19" x 35" Cylindrical Rod Mill
 - 2' x 4' Cylindrical Rod Mill
- Can be operated in open or closed circuit
- Can be operated in wet or dry mode
- Air classifiers available for use in closed circuit dry mode





Vibrating ball mills

- 1515D Vibrating Ball Mill
- Can be operated in open or closed circuit

Miscellaneous test

- Vacuum Filtration, small scale
- Screening, large size
- Jaw Crushing, material preparation
- Miscellaneous lab equipment for physical test-ing of samples
- Abrasion index test

Additional equipment

- Density Gauge
- Flowmeters
- Hydrocyclones
- Closed circuit pumping
- Rotex Screens
- Rotary Dryer
- Stirred Mill Detritor (SMD)
- Svedala Agitated Mill (SAM)

VERTIMILL™ tests

- Equipment - VTM-3 VERTIMILL™
- Open circuit operation utilizing top feed - bottom discharge
- Open circuit operation utilizing top feed - top discharge – recycle loop
- Closed circuit operation utilizing top feed - cyclone discharge
- Closed circuit operation utilizing top feed - settling classifier (VTM-3)
- Operation demonstrating lime slaking
- Open or closed circuit operation utilizing sump feed, integral classifier feed

Air classifier

- Equipment available:
- 12" Hardinge G.A.C. System
- 18" Hardinge G.A.C. System
- DS2 DELTA SIZER System
- A stand alone G.A.C. can be made to classify approximately 99% minus 325 mesh, or as coarse as 80% minus 100 mesh, dependent upon materials, rotation speed, air stream velocity, etc.
- A stand alone DELTA SIZER System can be made to classify to minus 10 micron
- Typically, test is performed in conjunction with a dry grinding ball mill circuit



Minerals Processing

Our ranges: **Flotation Machines**
Reactor Cell Systems

Flotation Columns
Classifiers
Spiral Classifier
Agitators
Mixers

Magnetic Separators
Low Intensity Magnetic
DR Flotation Machines
High Gradient Magnetic
Separators

Sedimentation Equipment
Inclined Plate Settlers
Separators
Spiral Dewaterers

Filtration Equipment
Vertical Plate Pressure
Thickeners & Clarifiers
Tube Presses

Thermal Equipment
Holo-Flite® Process
Filters

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