# IRON ORE IN-PLANT SERVICES

## SGS MINERALS SERVICES' IN-PLANT EXPERTISE FOR IRON ORE

For the iron ore exploration and mining industries, SGS Minerals Services provides a comprehensive range of in-plant services. From technical auditing to troubleshooting to complete on-site daily metallurgical management,

SGS Minerals Services can support on-site operations. SGS is able to provide world-class technical support to ensure constant optimal mill throughput and metallurgy. SGS Minerals Services can support your operation in a way that best suits your needs and budget.

At the broadest level, our in-plant services include:

- In-plant support:
- Audit and optimization
- Metallurgical accounting
- Production forecasting

### IN-PLANT SUPPORT

Operational improvements can improve grade, recovery or create maintenance or other time efficiencies. SGS Minerals Services can work with you to:

- Thoroughly evaluate your on-site operations without bias or special interest so you can access the best available technology
- Give you innovative workable alternatives to bottlenecks in your plant
- Provide short-term metallurgical commissioning assistance during start-up
- Assist with training or provide resources to assist with transitions.

From periodic technical auditing to troubleshooting to complete on-site daily metallurgical management, SGS Minerals Services can support on-site operations.

Whether it's initiating a new project, re-starting an old mill or maximizing your performance from an existing mill, we are able to provide world-class technical support to ensure constant optimal mill throughput and metallurgy. SGS Minerals Services can support your operation in a way that best suits your needs and budget.

### AUDITS & OPTIMIZATION

SGS routinely provides audit and optimization programs for existing grinding circuits to ensure maximum efficiency. Working directly with your plant staff to understand the practical aspects of your operation, we will review of your mine plan and historical data analysis and perform on-site testing and evaluation. The scope of each project is different and tailored to the owner's request. SGS can support:

- Materials Handling and Product Testing
  Treatment of many iron ores is straightforward - crush and screen. Sometimes this is extended to include scrubbing, grinding and pelletising. Quality control is the main concern in most plants, and SGS can assist with sampling, size analyses, chemical analysis, and other standard tests. When slurry or material flow is critical, thickening and filtration studies and rheology assessments can be performed, on in-plant streams or samples shipped to our facilities.

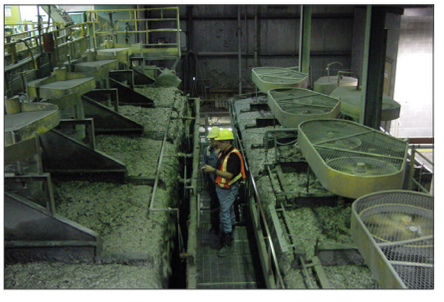
- Audit to Improve Metallurgical Performance
  In more complex plants, a metallurgical audit can often indicate where improvements in plant performance can be achieved. For instance, a mineralogical study of various plant streams using techniques such as high definition mineralogy or image analysis can highlight liberation problems, or areas with poor recovery. Improvement studies can then be focused in these areas. If necessary, samples can be taken and metallurgical studies performed on-site and at our facilities. We use the equipment and reagents in the plant, or assess alternative reagents or techniques. If necessary, we can make improvements in an on-site pilot plant using a small feed stream taken from the critical part of the operation.
- Audit to Increase Plant Throughput
  Increasing plant throughput often improves profitability. Audits of the grinding and flotation areas can help address this. Throughputs in the flotation area can be improved by reducing recycle loads, flotation rates or magnetic or gravity separation performance. This may be achieved by changing reagent regimes, improvement of feed particle size, and better control of pulp densities.
- Grinding Studies
  Grinding is usually one of the more prominent bottlenecks in plant activities. SGS Minerals Services can perform detailed grinding studies, using both power-based methods, and simulation-based methods to help yield increased throughput, and/or improve fineness-of-grind.
- Pelletizing
  A one-meter disc pellitizer is available for pellitizing testwork of fine iron ore products.

## METALLURGICAL ACCOUNTING

Metallurgical accounting is an ongoing process that involves sampling, analyzing and accounting for the metal that enters and exits your metallurgical plant. Just as monetary accounting provides the necessary framework for financial decisions, met accounting provides the diagnostic information required for effective metallurgical decisions, and informed marketing, sales and corporate planning. Properly designed met accounting procedures are a powerful tool that can provide insight and remedial measures for:

- Production variability
- Unexplained material losses and gains
- Process inefficiencies
- Production forecasting problems.

Our staff are independent process experts with extensive testing and plant expertise. They have the ability to establish and optimize your met accounting process to ensure your metal throughputs meet corporate requirements.



## PRODUCTION FORECASTING USING CEET

SGS Minerals Services has extensive experience using geometallurgical technology for production forecasting applications. The application of geometallurgical technology to production forecasting results in a more rigorous and reliable forecast. Geometallurgical production forecasts consider geological, metallurgical, mineralogical and chemical influences on recovery, instead of simply relying on chemical assays.

Data is entered into Process Access, an electronic data platform, and then cross linked with processing models such as CEET® (Comminution Economic Evaluation Tool) and FLEET® (Flotation Economic Evaluation Tool).

The orebody is then virtually mined in a block-by-block fashion using the computer models. The data highlights times of smooth operation and periods when production will experience challenges, giving operational staff time to address these challenges and minimize the effects on productivity and profitability.

Since 1999, SGS has completed over 300 CEET® comminution benchmarking projects. CEET® is an internet-based software tool that enables accurate design and forecasting of plant throughputs, operating costs and grind quality. Capital investment and production planning decisions can thus be based on well-defined representative data sets representing the block model.

CEET® links the grinding circuit design model with the mine resource block model to:

- Ensure throughput tonnage targets are consistently achieved
- Determine best circuit design for the ore body and mine plan
- Improve revenue-stream predictions for both budgeting and metal sales
- Optimize the mine plan for throughput and grind quality
- Minimize capital investment & operating costs for desired production rates
- Trade off capital investment with variance in throughput
- Quantify uncertainty arising from throughput predictions
- Increased revenues.

## IN SUMMARY

SGS offers you the unique advantage of combined skill sets and industry expertise that you won't find anywhere else. The wide range of metallurgical services we offer to the iron ore industry help to maximize the economics of your operation, ensuring higher product quality, improved recovery, reduced costs and greater revenue.

### CONTACT INFORMATION

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