



Excellence in Mineral Processing

- Diamond Plants
- Dense Medium Separation Plants
- Scrubbers and Screens
- Coal Washing Plants

- Rotary Screens
- Grizzly Feeders
- Plant Layouts
- Contracting



## Doing it, and doing it right!

From run-of-mine ore to mineral concentrates, unique is the word that epitomises our expertise, execution and most importantly, our ethos as a thriving South African company.

Minerals beneficiation via physical separation techniques is our forte, and providing our clients with customised solutions for their specific mineral beneficiation needs within this domain is what we do, and we do it well!

Innovative and complete mineral processing solutions for the beneficiation of:  
Diamond (Alluvial and Kimberlitic) • Coal Washing • Chrome Oxide • Copper Oxide • Cobalt Oxide

## A proud legacy

With more than 60 years engineering and manufacturing experience, our capability of providing premium mineral processing plants by far exceeds our competitors on every level.

Our head office and the nerve centre of our business is located in a 22 000 square meter manufacturing works in the developing town of Klerksdorp in the Matlosana region of the North West Province of South Africa.

The Bond Equipment engineering office is geared for world-class leading process, equipment and plant designs, whilst our factory is equipped with state of the art manufacturing facilities.

Our manpower complement of approximately 200, includes seasoned managers, engineers, draftsmen, technicians, artisans and skilled labourers that offer a superior blend of skills that provide our clients with unwavering service and dedication to excellence that they expect.

Bond Equipment offers practical mineral beneficiation solutions to junior, mid-tier and corporate mining houses through the application of our process design, plant design, manufacturing, construction and commissioning acumen. We also design, develop and manufacture process plants with throughput capacities of 10 tons/hour to 700 tons/hour.

## A different approach to mineral process engineering

Over the years we have refined the modular plant approach into a fine art, so our clients benefit from reduced design costs and curtailed project timelines.

Our distinctive methodology and approach have achieved the optimum beneficiation results for a list of blue chip companies that include:

- Glencore
- Debswana
- De Beers
- Camec Plc
- Hatch Canada
- Namakwa Diamonds
- Sudor Coal
- Ikwezi Mining
- Assen Iron Ore
- Uitkomst Colliery
- Anjin Investments
- Mutanda Mining
- Trans Hex
- Mokomo Resources
- Gye Nyame
- Huachin Mining Sprl
- Concorde Holdings Sprl
- Zimbabwe Consolidated

# The Bond Equipment plant design advantage

Bond Equipment provides clear and detailed three dimensional drawings that are easy to follow and understand.

Our one-on-one approach ensures that, as a Bond Equipment client, you will be able to take advantage of groundbreaking mineral processing innovations and solutions, including:

- Affordable modular mineral processing plants to meet the requirements of both small, mid-tier and large scale mining houses.
- Economical and professionally engineered solutions to maximise return on investment.
- Investors enjoy peace of mind through our approach of scheduled QC interventions during the manufacturing stage.
- One size does not fit all – Our modularised mineral processing solutions are customised to suit your needs.
- Full-house service – Our complete and cost effective design, drafting, fabrication, erection and plant commissioning services ensure controlled costs and negate unforeseen expenditure.
- We offer innovative metallurgical solutions.

## Make Bond Equipment your partner

Bond Equipment's worldwide success is based on our custom-built plants that have been specifically designed to suit the specific needs of each client.

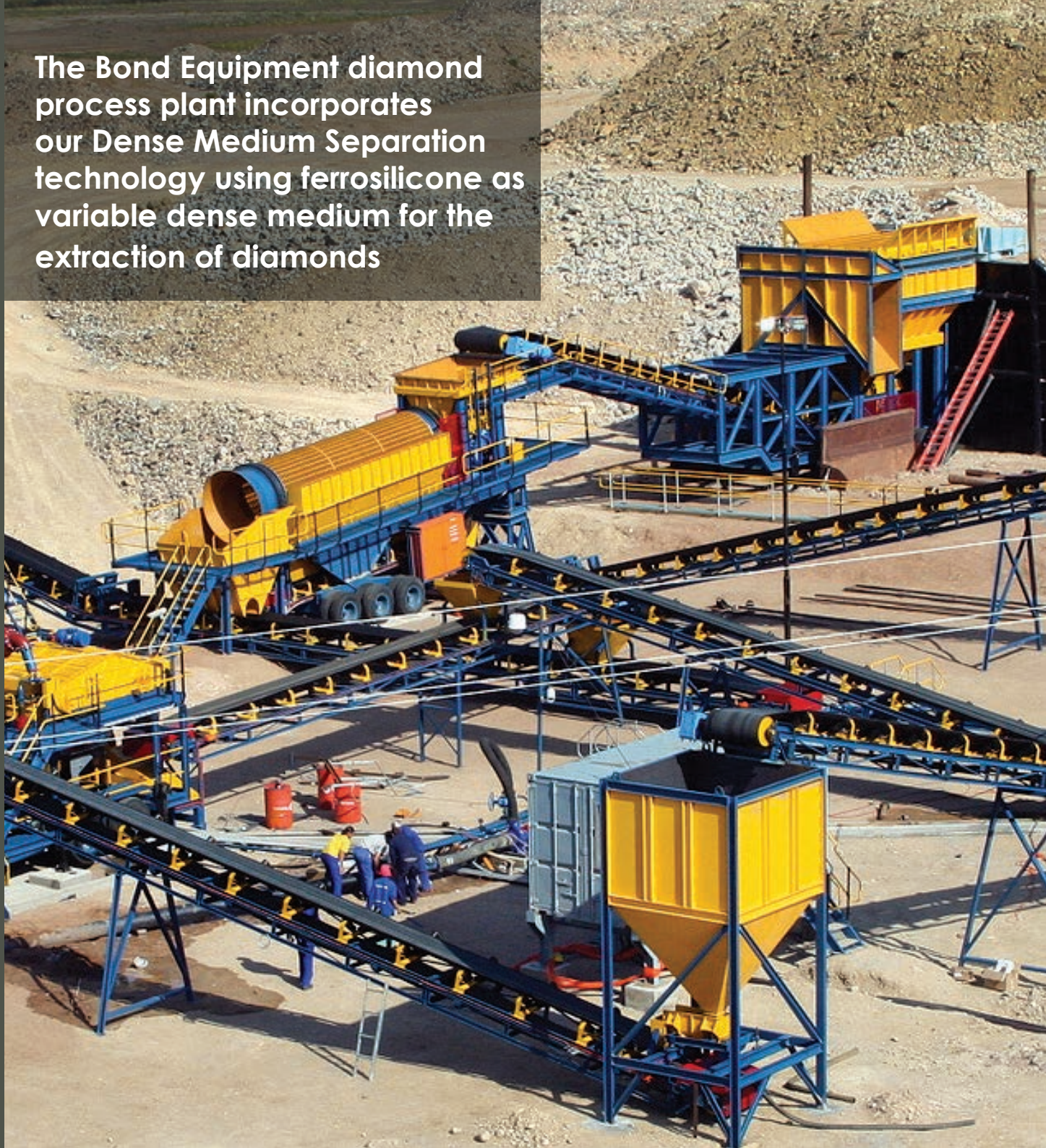
We create, consult, and innovate to provide customised solutions that increase productivity and profitability.

## *The benefits of Bond Equipment modular plants are evident*



The Bond Equipment diamond process plant incorporates our Dense Medium Separation technology using ferrosilicone as variable dense medium for the extraction of diamonds

DIAMOND PLANTS





## Diamond ore processing

A typical process route for alluvial diamond ores embraces scalping of oversize rubble from the run-of-mine ore, scrubbing and screening of the scalped ore stream, extracting a heavy mineral concentrate from a targeted size fraction via dense medium separation (DMS), X-ray sorting of the DMS concentrate stream and final hand sorting system.

Kimberlitic-type material requires the inclusion of a crushing circuit for primary and secondary size reductions and the recycling of arising 'tails'.

Security of the concentrate stream developing from the process is given utmost importance in plant design, from mined material receipts to final recovery of the product.



## Bond Equipment diamond process plants


Our impressive plant reference list boasts installations all over Africa and other countries as far afield as, Australia and Canada with plant throughput capacities of 20 - 500 tons/hour.

### Features:

- Designed to achieve maximum recovery efficiency.
- Compliance with all relevant safety regulations applicable to the country where the plant is installed.



## DENSE MEDIUM SEPARATION PLANTS



The DMS process is employed for the pre-concentration of suitable ores upstream from expensive downstream metallurgical processes, and also employs the separation of heavy waste particles (such as metals) from light waste particles

# Process description - DMS cyclone plants

The DMS process involves the mixing of a pre-prepared ore stream with a dense medium or selected specific gravity (SG) in a mixing box and passing this mixture through a dense medium cyclone (DM cyclone). It is here that the separation of the high and low SG fractions of the ore occurs.

Our latest generation modular cyclone DMS plants offer improvement in the following areas:

- Enhanced dense medium SG control.
- Improved dense medium pulse ore mixing.
- Economical dense medium recovery.
- A separate drain and rise screen for each of the sinks and floats streams for applications with high concentrate mass yields
- Deployment of first-class proprietary equipment in our plants e.g. Warman pumps and densifiers, Eriez Magnetics drum magnetic separators, Multotec cyclones and screens, Debex SG controllers and Siemens electrical switchgear.



***Bond Equipment gives the best aftermarket care in the business***

**DENSE MEDIUM SEPARATION PLANTS**

## SCRUBBERS AND SCREENS



Scrubbing of an ore is required in the front end of the metallurgical process route, when the run-of-mine ore stream contains sticky material such as clay, or for acquiring the removal of high-grade fines for downstream concentration





## Process description - scrubbing and screening

Scrubbing of an ore stream aims to dissipate lumps of sticky material in the ore to facilitate liberation of the minerals that are locked in the lumps.

Scrubbing is effected by wetting the ore and subjecting it to adequate shear and compression forces in a horizontal cylindrical drum such as a drum scrubber. This is combined with the additional efficiency of a correctly sized 'de-watering screen' where the pulp is removed for discard or downstream fines processing.



## Bond Equipment drum scrubbers and screens

### Scrubbers

Bond Equipment designs and manufactures rubber wheel-driven drum scrubbers and screens in our engineering facility with a nominal throughput capacity range of 20-300 tons/hour.

#### Features:

- In the case of extremely sticky ore the scrubber is equipped with a wet feed system comprising a large feed hopper with vibrating grizzly feeder and water canon for blasting the ore through the grizzly and into the scrubber.
- Scrubber support, comprising truck wheels with durable inflated rubber tyres mounted on pedestals that are located down the length of the scrubber drum.


### Screens

#### Features:

- Screens are assembled with huck bolts.
- Equipped with stringers for fitting of polyurethane screen panels.
- Equipped with superior quality vibrating motors.



## COAL WASHING PLANTS



Coal washing plants incorporate our Dense Medium Separation technology where magnetite powder is used as a variable dense medium in coal washing applications

# Bond Equipment coal washing plants

Bond Equipment designs and manufactures a generic process route description as follows:

The raw coal stream is prepared for washing by size reduction via a crushing circuit where it is correctly sized to suit mineral liberalisation and wash plant process throughput limits.

The arising fines fractions are passed through a spiral module for extraction of upgraded fines and water recovery preparation.

The clean coal product stream from the DMS plant is screened to produce specific size fractions as may be required by the market. Centrifuge and filter presses are installed for the removal of surface moisture and water recovery.

Two-stage DMS plants are supplied for beneficiation of complex ore bodies.

## Features:

- Designed to achieve the required clean coal product specifications and sizing.
- Environmental protection is given prime importance in plant design.
- Compliance with all relevant safety regulations applicable to the country of plant installation.



## Recent coal washing plant projects

Client	Plant location	Throughput capacity
Sudor Coal	Bethal - South Africa	300 tons/hour
Ikwezi Mining	Newcastle - South Africa	350 tons/hour
Mokomo Resources	Hwange - Zimbabwe	700 tons/hour

# ROTARY SCREENS



Rotary screens are employed for the scalping and size reduction of run-of-mine materials. The mobility of the rotary screens allows for in-pit screening close to the mining face, reducing the need for costly hauling of return cycles of oversize material.

Rotary screens produce large throughput capacities and are ideally suited for applications such as alluvial diamond, alluvial gold and heavy mineral sand, where target minerals are hosted in smaller particles.

'Diamond bounce' which commonly occurs with grizzly-type scalping, is eliminated. Rotary screens add value by liberating lock-up diamonds in certain ore bodies caused by the effect of the tumbling mechanical action.

## Bond Equipment rotary screens

Our rotary screens are wheel-mounted which renders them relocatable along the width of the mining face.

A throughput capacity of 600-1200 tons/hour is achievable via our 1.8m X 6m rotary screens.

Wet rotary screens feature water sprays mounted inside the screen drum to take care of ores with high clay content.

Various rotary screen sizes are available to suit our clients needs.



# GRIZZLY FEEDERS





A typical plant feed bin features overhead grizzly comprising a series of equally spaced parallel bars for the scalping of oversize barren material from the run-of-mine ore. However, bin and grizzly installations of this configuration lack throughput capacity and take up much height, which necessitates the installation of a high-feed ramp to access the feed bin.



Bond Equipment has developed a low profile grizzly feeder that removes the need for high-ramp construction.

## Bond Equipment low profile grizzly feeders

Our low profile grizzly feeder comprises a low profile feed bin, with underlying heavy-duty belt feeder, that discharges the run-of-mine ore onto a high-capacity scalping grizzly of spiked geometry (also called a 'finger grizzly').

The compact feed bin requires a low-feed ramp and accepts direct feed from dump trucks of up to 40-ton hauling capacity.

The Bond Equipment low profile grizzly feeder is able to handle wet and complex run-of-mine ore streams and boasts a throughput capacity of up to 800 tons/hour.



Outsourced  
operational and  
maintenance  
service for mineral  
processing

CONTRACTING





# Bond Equipment operational maintenance services include:

- Commissioning services.
- Outsourced operation and maintenance.
- HSEC (health, safety, environmental control) management.
- Assets management.
- Store control.
- Purchasing control.
- Metallurgical and processing accounting.
- Contract management, including administration.
- Cost control.
- Quality control.
- Human Resources management.
- Operational and infrastructure maintenance.
- Laboratory services.



# Outsourcing benefits:

- Improve productivity and efficiency - with a service agreement in place, the client can focus on other core business functions.
- Reduce business risk through competent contract outsourcing.
- No Human Resources requirements, reduced labour costs.
- Training and skills transfer function of operation and maintenance.



PLANT LAYOUTS

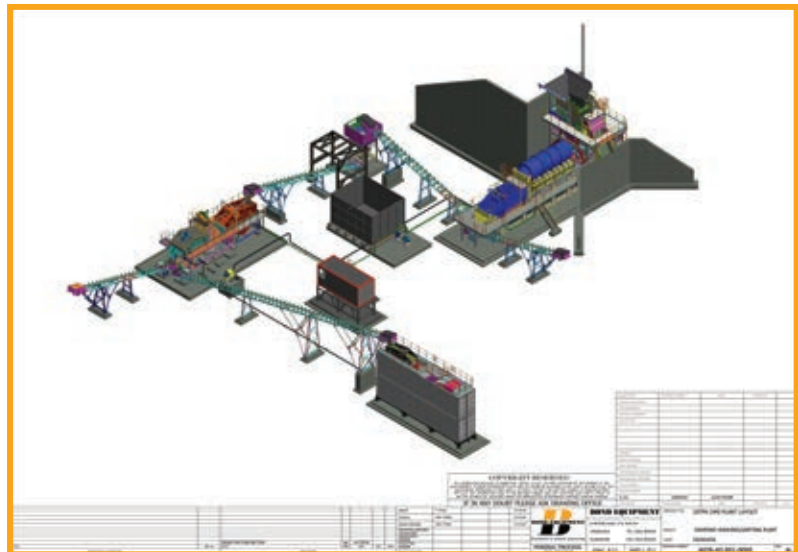
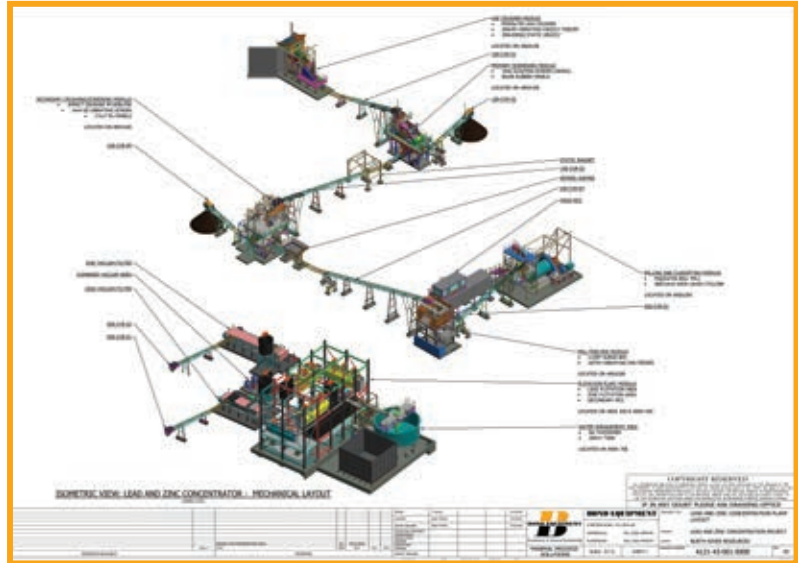


Bond Equipment undertakes thorough consultations with our clients to attain clarity on the ore characteristics, the available services on site, as well as our clients technical specifications, plus their plant capacity and product quality requirements.

A detailed three-dimensional layout drawing is generated and supplied to the clients in order to obtain agreement concerning the plant to be supplied.

In the case of modular plants, three-dimensional drawings for certain process steps already exist on our database, which allow quick presentation and reduce design costs.

In order to reduce our client project implementation costs, our plant modules have already matching civil designs, the details of which are supplied with our plants, complete with re-bar bending schedules, concrete volumes and ground preparation specifications.





## Contact

### Bond Equipment

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**BOND EQUIPMENT**

Excellence in Mineral Processing



**MORE THAN 60 YEARS OF EXCELLENCE**