

PrepQuip



MINERAL PREPARATION TECHNOLOGY AND EQUIPMENT
EFFLUENT AND WASTE WATER TREATMENT

PRODUCT CATALOGUE



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Introduction



The PrepQuip Group is a South African based group of companies, supplying equipment and consumables to the mining, metallurgical, mineral and effluent/waste water treatment industries.

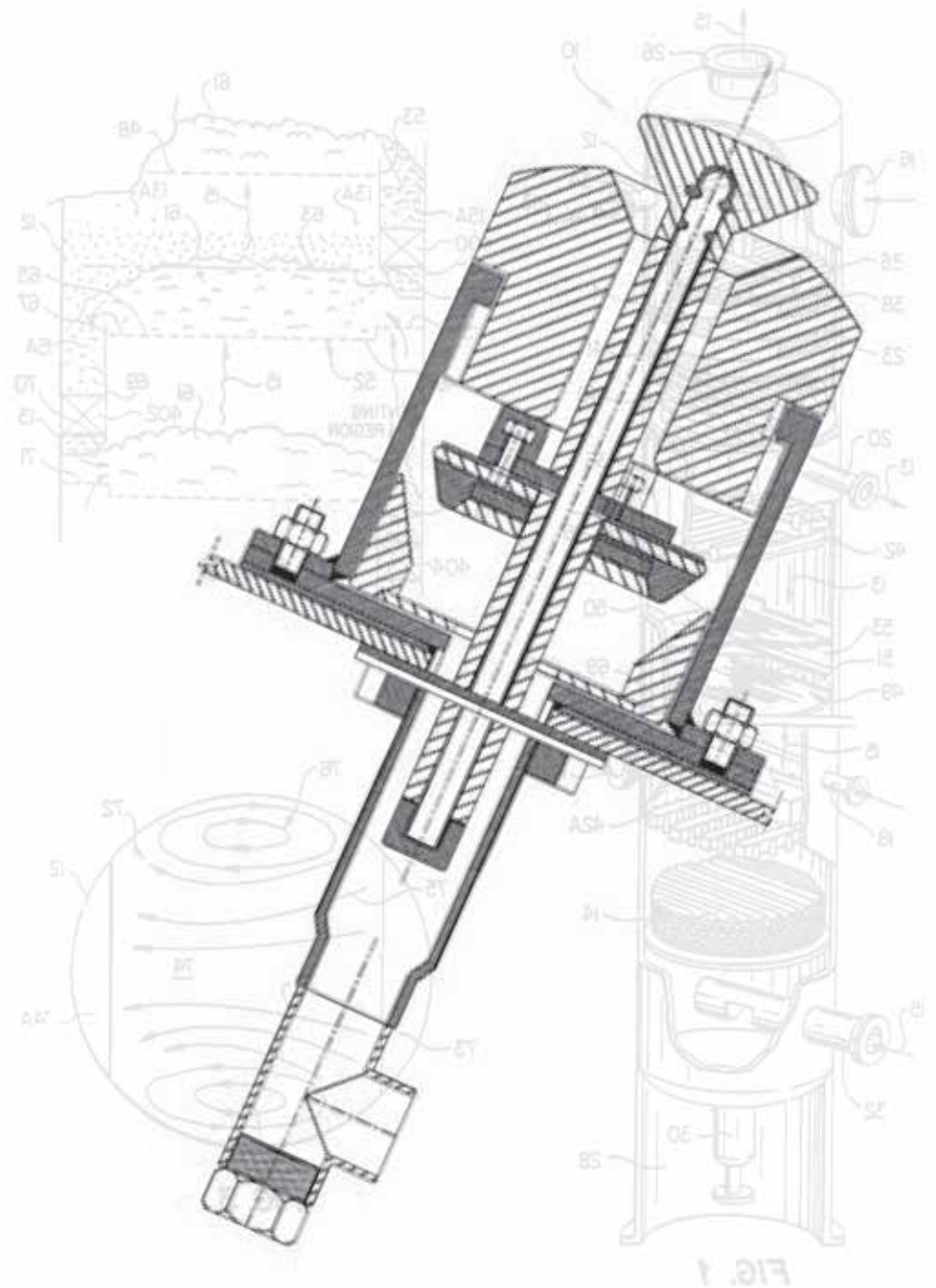
The groups experience in mineral processing dates back to 1989 and offers extensive experience, innovative technology and application knowledge. The quality and performance of its equipment is measured by international standards. PrepQuip is accredited with ISO 9001:2008 (Tüv). (TUV LOGO)

THE PREPQUIP GROUP'S MAJOR PRODUCTS INCLUDE:

- Flotation column
- T.H. Filter Press
- In-Line Guard Screen (Automatic flushing in-line strainer)
- SpringSparge Sparger (Oxygen and Air/water lance)
- Ceramic Valve (Highly durable slurry control valve)
- Atomix (In-line Mixer/Oxygen and air reactor)
- Pachuka Valves (Multi Aerators)
- Dissolved Air Flotation (DAF) units
- Trickling Filter Systems (Waste water treatment – sewage)
- Containerized Sewage Plants (5 - 120m³/day per unit)
- A variety of enzymatic and bacterial based products for cleaning and waste water treatment purposes (Biodegradable cleaning consumables)

The PrepQuip Group's products focus on the mineral beneficiation and water purification industries. It is also envisaged that there will be a growing market in the treatment of ultra-fines that will eliminate the need for slime dams/ponds. The PrepQuip Group is focused on keeping the environment clean and therefore additionally offer a variety of biodegradable and environmentally friendly solutions to our customers.

The PrepQuip Group also offers turn-key solutions in the above mentioned industries.



01/ Fully Automated Filter Press

The TH fully automatic Filter Press (manufactured in Spain) offers a cost effective and robust solution for the demanding operating conditions found in the mining and metallurgical processing industries. There is a great need in the industry to dewater mineral processing plant fines, either concentrate or tails as water licenses are more difficult to acquire for slurry/slime dams.

An added benefit is that less water is transported in the case of concentrates, which increases overall operation profitability. The TH filter press is the solution to your fines dewatering problem on a wide variety of ore fines.

**PREPQUIP HAS THE SOLE RIGHT TO
DISTRIBUTE THE FULLY AUTOMATIC
TH HYDRAULIC FILTER PRESS IN AFRICA.**



Filter Press Applications:

- Metal concentrate fines: copper, zinc, lead, nickel, platinum group metals, iron ore, chrome etc.
- Mineral fines: Coal, fluorite, rare earth minerals etc.
- Metallurgical applications: refineries, leach residues, precipitates, gypsum etc.
- Effluents: tailings, scrubber slurry, hydroxide precipitate etc.



Features:

- Fully automatic and hydraulic driven
- Equipped with steel or polypropylene plates depending on client specification
- Unique design ensures effective discharge of all cakes
- Individual chamber feed ports decrease filling time and increase filter cloth life
- Replaceable rubber seals prevent leakages and ensure ease of press maintenance
- Hydraulic slurry pump is included with the filter press
- Hydraulic pack is used for both slurry pump operation and press opening/closing operation
- Uniform press filling eliminates the formation of blockages and the risk of filter plate damage
- Consistent low cake moistures controlled via a water effluent measurement system
- Lower capital cost
- Lower energy consumption
- Lower operating cost

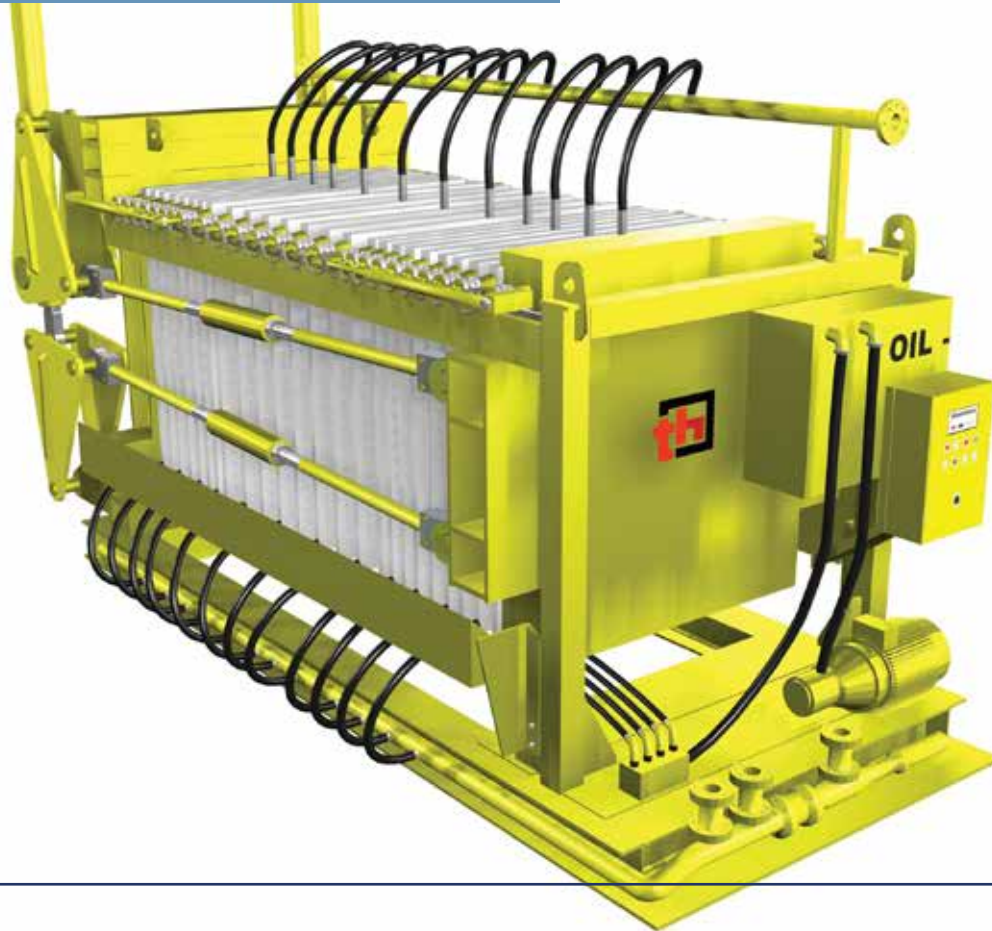
A cycle normally takes 15 to 20 minutes and consists of:

1. Chamber filling
2. Filtration
3. Cake pressing
4. Air drying
5. Cloth washing
6. Next Cycle



Technical Specifications

- Sizes range from 1.41 m² to 594 m²
- Dewatering capacity of up to 85-tons dry solids per hour per filter press
- The filter press's onboard PLC has the ability of incorporating up to 12 different steps during the filtering process
- The Fulcrum Design facilitates an additional 340-ton press action, similar to membrane filtration



02/ Flotation Column

The PrepQuip Flotation Column has found a valuable place in the mineral flotation industry over the past 30 years. It is the leading flotation column in the platinum industry with more than 28 years of experience on column flotation. The PrepQuip flotation column is entirely in-house designed and locally manufactured.

THE PREPQUIP FLOTATION COLUMN ENSURES:



1.

Improved metallurgical performance as a result of:

- Independent control of operating variables
- Engineering designs that eliminate froth lip loading constraints
- Flotation of coarse particles, ultra-fines and slimes in the same unit

2.

Reduced operational costs as a result of:

- No moving parts
- Lower reagent consumption
- Overall lower energy consumption
- Reduced downtime

3.

Reduced capital costs as a result of:

- Reduced column heights
- Unique internal froth discharge system
- Lower residence times required
- Higher gas hold-up
- Substantial reduction in floor area required

4.

Interface Level Controller (I.L.C.) Three Types:

- Ultrasonic float level controller
- Bubbler Tube System
- Conductivity probe interface controller

All three types of I.L.C. ensure optimum performance by the accurate measurement and control of the froth interface level, despite changing variables e.g. flow-rate, pH, froth density etc.

5.

Internal froth launders:

The uniquely designed Internal Froth Launderers prevent any dead froth zones and ensure sufficient discharge lip length for improved metallurgical performance.

A design that requires no external froth collection launder is available upon request.

6.

Froth washing:

Froth washing is available both as an internal and external system. Continuous washing produces a high-grade concentrate by minimizing entrapment and entrainment of gangue particles. This is achieved by:

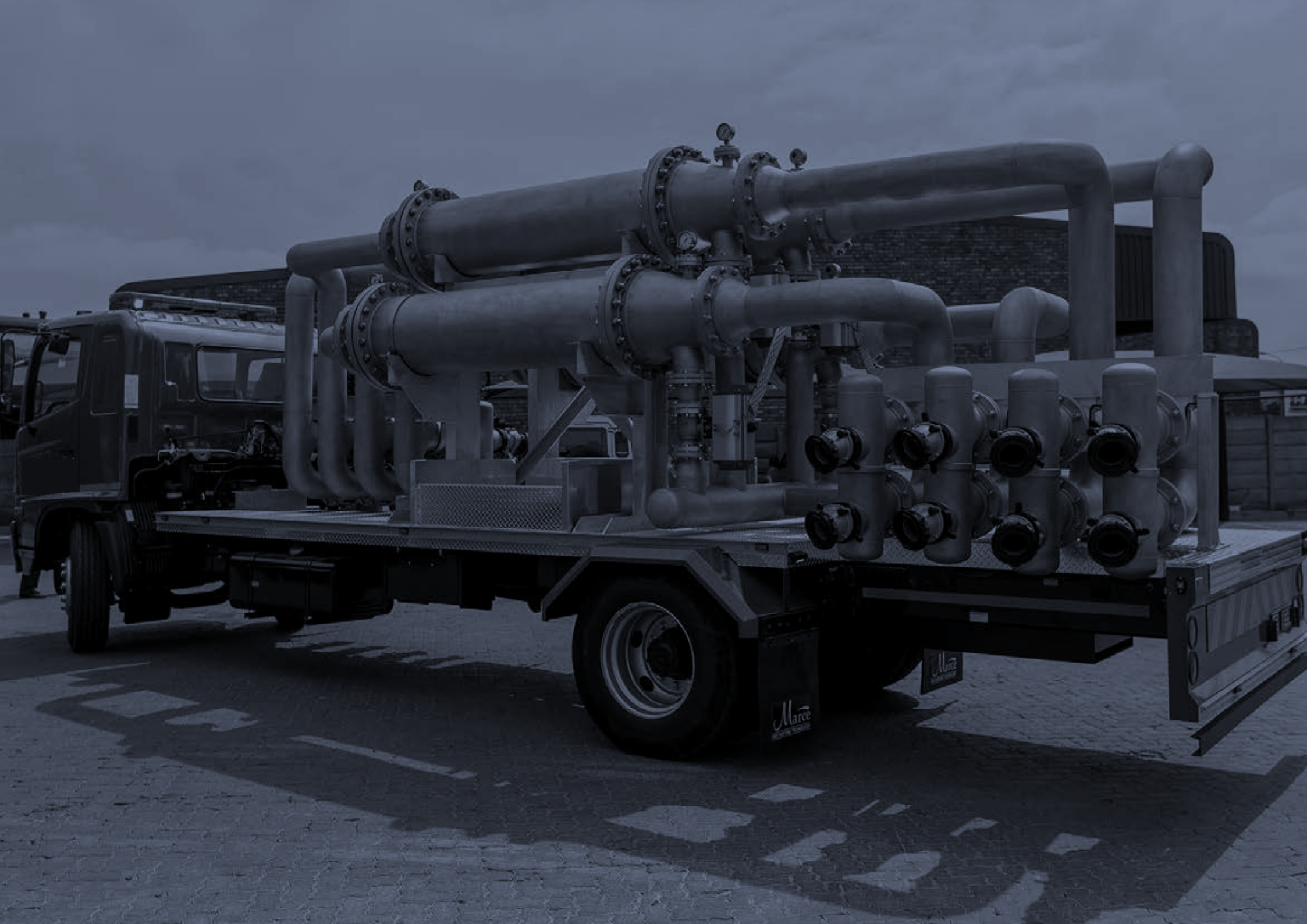
- Preferential wash water distribution that utilizes $\pm 20\%$ less wash water
- Minimum breakage of bubbles
- Stabilizing of the froth phase
- Preventing bubble coalescence

7.

Air Spargers: Three Systems:

- Air-only SpringSparge Sparger with internal non-return system to eliminate sparger blockages
- Water and Air SpringSparge Sparger
- In-line External Sparger System for ultra-fine bubble generation (PrepQuip's Atomix)





Technical specifications:

- Column sizes range from 0,6 m Ø to 5,5 m Ø diameter
- Can be operated as a rougher, cleaner, scavenger, re-cleaner, re-re cleaner, final cleaner, fast float, flash float, unit depending on client requirements
- 160 mm Ø and 600 mm Ø plants available for onsite test work
- All wetted parts are epoxy painted and all high wearing areas are rubber lined



Modular column flotation plants available

Due to the changing and volatile economy in South Africa, PrepQuip offers modular floatation columns which are available to rent. The client is therefore able to save on capital costs and, if required, the modular unit is capable of being relocated quickly to treat ore at a different location even if the new location has a different floatable ore.



03/ In-line Guard Screen

(Automatic flushing in-line strainer)

The In-line Guard Screen is an In-line automatic flushing strainer which can be installed on most pipe-line sizes and guards your process against downtime due to blockages of nozzles and other downstream equipment and also protects against damage caused by over-sized debris present in your process.

Features:

- Compact and heavy-duty design
- A cost-effective solution to debris problems in slurry and liquid streams
- Custom designed screen apertures to remove only unwanted material
- Low pressure drop across the screen making it possible to retrofit into most existing pipelines
- Design allows for standard screen lengths to keep costs as low as possible
- Should the In-Line Guard Screen be considered for higher operating pressures, please consult PrepQuip

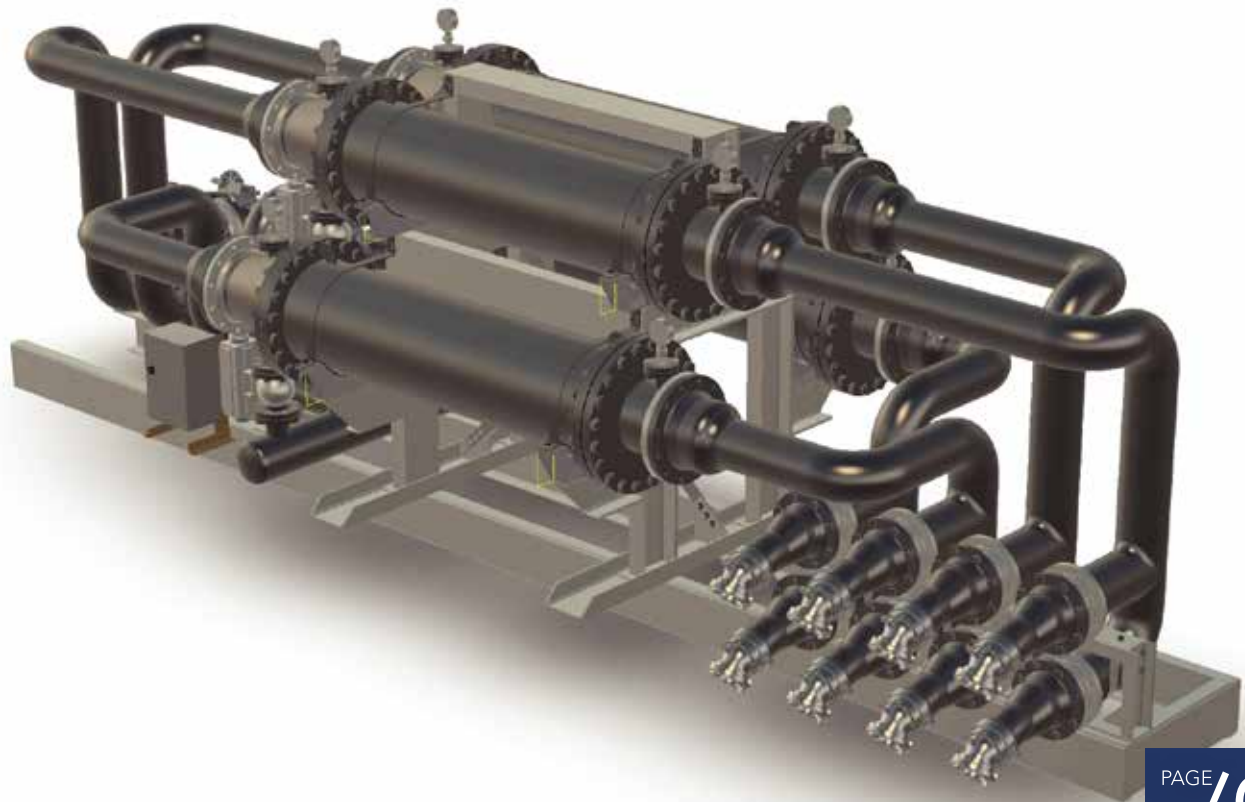


- Separate debris outlet to remove unwanted particles from process stream during equipment operation
- Pressure indicators upstream and downstream for pressure drop calculations (optional)
- Can be fully automated to integrate into your existing control philosophy (optional)
- Vertical strainers are also supplied on request



Technical specifications:

- Cylindrical screen manufactured from stainless steel wedge wire to reduce wear and consequent maintenance
- Replacement screen cartridge manufactured with the following screen apertures to give desired flexibility: 0.5 mm, 1mm, 3 mm, 5 mm and 10 mm
- Capacities range from 41 to 1590 m³/hr (180 to 7000 gpm (USA))
- Can operate at line pressures of up to 12 bar (G) (174 psig)
- Line size ranges from 80 to 500 mm (3" to 20")
- All wetted parts rubber lined or manufactured out of stainless steel
- Range of screen diameters to suit standard pipelines

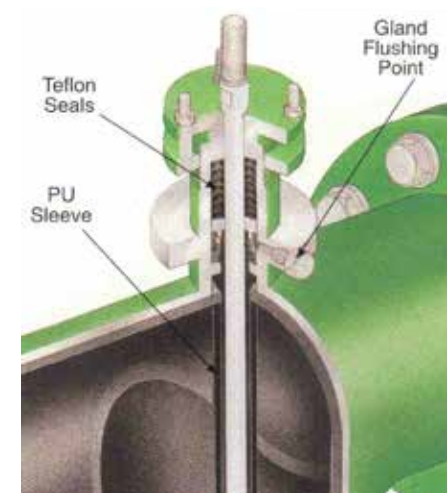
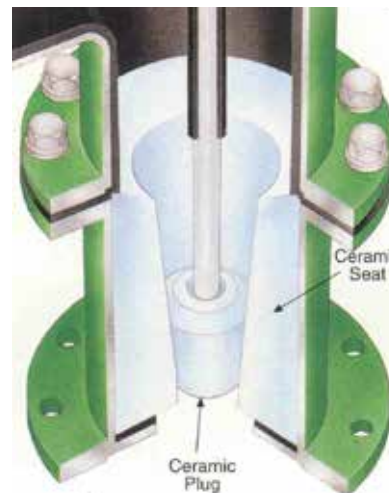


04/ Ceramic Plug and Seat Valve

The Ceramic Plug and Seat Valve was developed in order to reduce excessive downtime and maintenance costs incurred through the frequent replacement of worn pinch valve sleeves. It is an extremely durable slurry control valve.

The Ceramic Plug and Seat Valve is used to control abrasive slurries with a maximum particle size of 3 mm and is capable of being automated with an actuator to suit customer applications. Ceramic Plug and Seat Valves have at least ten times the life of conventional slurry control valves, eliminating the need to inspect and replace valves and reducing process downtime.

The average lifetime of the PrepQuip Ceramic Valve is 5-7 years.



Valve applications:

The PrepQuip Ceramic Plug and Seat Valve can be used on any abrasive liquid/slurry stream of which the flow rate needs to be controlled. The valve is extensively used in all the major industries mainly on the flow control of abrasive

Valve Features:

- Linear stroke to flow rate relationship to simplify flow control within a required flow range
- Valve inserts manufactured from ceramics for extended life
- Shaft sealing arrangement consists of PTFE seals and a gland flushing port
- Shaft protected from wear via a polyurethane sleeve
- Most types of linear actuators can be fitted to the valve

Technical specifications:

- Size ranges from 50 to 400 mm (2" to 15,7")
- Line pressures above 3 bar (G) (45 psig) are not recommended
- All wetted parts are rubber lined

Recommended Operating CV's:

$$CV = \frac{(1,156 \times Q \times \sqrt{SG})}{(\sqrt{DP})}$$

Q = m³/h slurry

SG = slurry SG

DP = pressure drop over valve (bar)

NOTE: viscosity of water was used in calculation

| Valve Size (mm) | 80 | 100 | 150 | 200 | 250 | 300 | 350 | 400 |
|-----------------|----|-----|-----|-----|-----|------|------|------|
| Valve CV (min) | 4 | 14 | 42 | 119 | 206 | 313 | 465 | 566 |
| Valve CV (max) | 29 | 79 | 212 | 503 | 895 | 1133 | 1469 | 2186 |



05/ SpringSparge Sparger

(Oxygen and air/water lance)

PrepQuip's proven SpringSparge Sparger ensures the equal distribution of evenly sized bubbles and incorporates a non-clogging/non-choking design.

The PrepQuip SpringSparge sparger is capable of increasing mineral recovery due to the increased contact surface area between bubbles and the minerals. Bubble sizes vary depending on flow-rate and pressure which can be changed according to client requirements.

Applications:

- Oxygen injection (CIL or CIP gold)
- Flotation application
- Agitation in mechanical flotation cells
- Prevention of solids build-up



Gas Injection Equipment

Features:

- The system requires no sparger water, however in some specific applications sparger water might be required
- Independent control of bubble size and air rate
- Narrow bubble size distribution for better particle/bubble contact
- Fail safe design to prevent sparger clogging/choking, should gas line pressure fall away
- Downtime is minimized by allowing maintenance while the unit is in operation, this is made possible by the PrepQuip unique sealing port arrangement
- Reduced maintenance cost via long lasting replaceable tungsten carbide and/or ceramic tips
- The Sparger tip is designed to be easily replaced by changing the end ceramic nozzle to optimize the application in terms of maintenance time

Sparger Sealing Port Arrangement

- PrepQuip's unique sealing port arrangement allows for the removal of the sparger pipe without any spillage while the unit is in operation
- The compression fitting is equipped with a triple seal arrangement to prevent any leakage or sparger pipe creeping under high internal pressure (up to 2.5 bar (G) (35 psig))
- Stainless steel compression fitting (optional)
- Stainless steel isolation valve for durability
- Sparger protectors available for agitated tanks



Sparger maintenance:

- All wetted parts are manufactured from stainless steel to ensure durability
- Easily replaceable tungsten carbide and/or ceramic tips for extended sparger life
- Indication marks on sparger pipe to prevent any slurry spillage during removal
- External pressure adjustment system to set tip shut-off pressure
- Pressure indicator on each sparger for abnormality detection
- Split nozzle ceramic sparger tip for sparger optimization



06/ Atomix

(In-line Mixer/Oxygen or Air reactor)

PrepQuip's Atomix (In-line Mixer) has been designed to produce ultra-fine gas bubbles in liquid streams, resulting in excellent gas dispersion and utilization efficiency.

The Atomix has the ability to increase minerals recovery due to increased surface area created.

Applications:

- Gold (CIL or CIP with oxygen)
- Chemical Plants (gas mixing)
- Liquid Mixing (general)
- Flotation columns
(External sparger system)
- Pre-aeration on any flotation circuit
(before rougher, cleaner, scavenger cells etc.)

Features:

- Excellent gas dispersion and utilization efficiency
- High mass transfer efficiency
- No moving parts
- Compact design
- Low energy consumption
- Low operational cost
- Longer service life
- Minimal maintenance
- Installation options
- Fresh feed transfer
- Fresh feed recycled

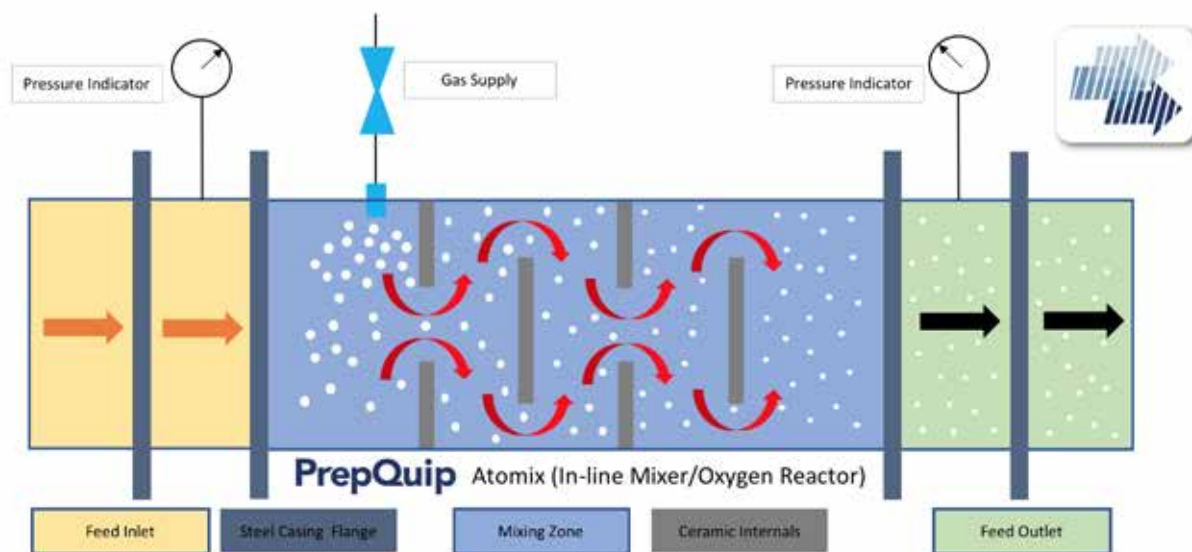
Gas Injection Equipment



Technical specifications:

- Line size ranges from 100 to 350 mm (NB)
- High wear areas are made from abrasive resistant material
- Capacity ranges from 30 to 1,080 m³/hr (135 to 4750 gpm (USA))

All Atomix units are available on a rental option to reduce capital outlay.



07/ Pachuka Valve

(Multi Aerator)

PrepQuip's Pachuka Valve (Multi Aerator - manufactured by Multotec SA) has substantial advantages over existing designs used for air agitation in Pachuka tanks, leaching tanks and dense medium tanks.

Applications:

- Aeration (leaching purposes)
- Mechanical mixing of slurry tanks

Features:

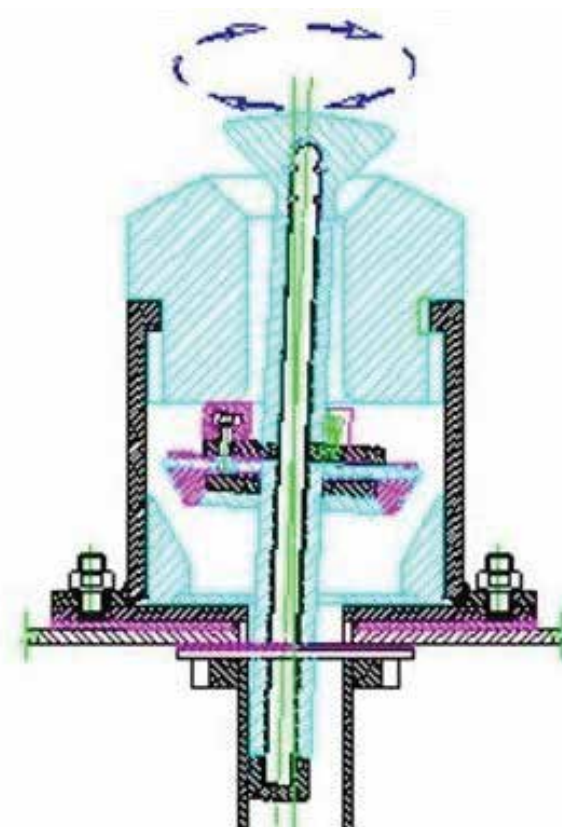
- Air consumption is substantially lower
- Improved air utilization in the leaching process
- Longer operating life through the use of wear resistant ceramic materials
- Reduces operating, maintenance, labour costs and downtime in the long run due to mechanical agitator failure
- Valve prevents built-up of solids in the tank (maximum residence time)
- Operate after long settling periods, removing the need to empty the tank after each power failure
- For mechanically agitated tanks, the Pachuka Valve can also be used to start tank agitation, eliminating damages to the mechanical mixers installed due to high torque



Gas Injection Equipment

Technical specifications:

- Minimum pressure of 4 bar (G) (55 psig)
- Automatic closure if pressure is below 1 bar (G) (15 psig)



Thank You!



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