PASTE & THICKENED TAILINGS FLOW CONTROL

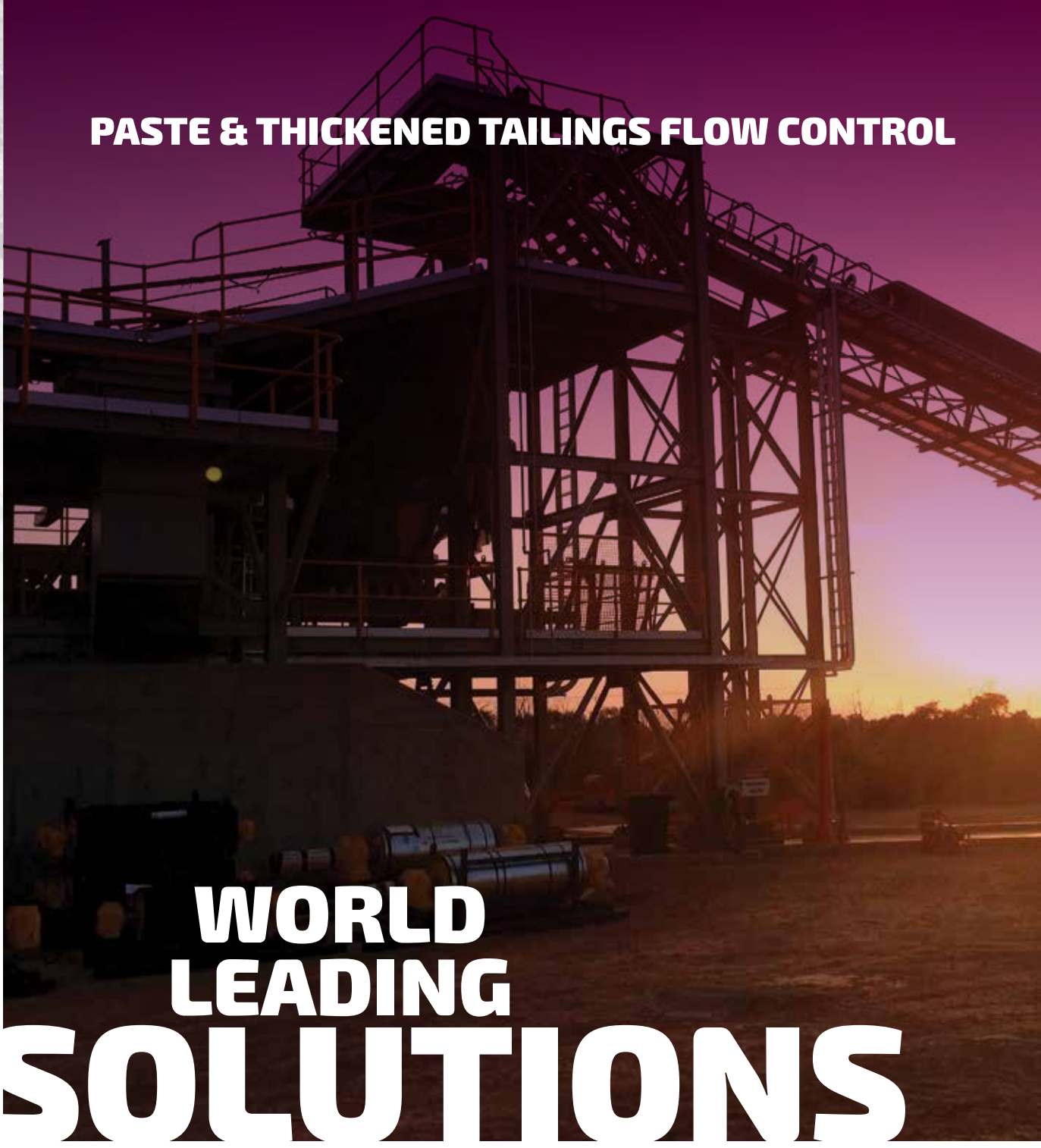

Image courtesy of Stripes Engineering - Gunnedah NSW

WORLD LEADING SOLUTIONS

PROEFLOW

PROEGER
flow solutions

Every point of the delivery process, covered.

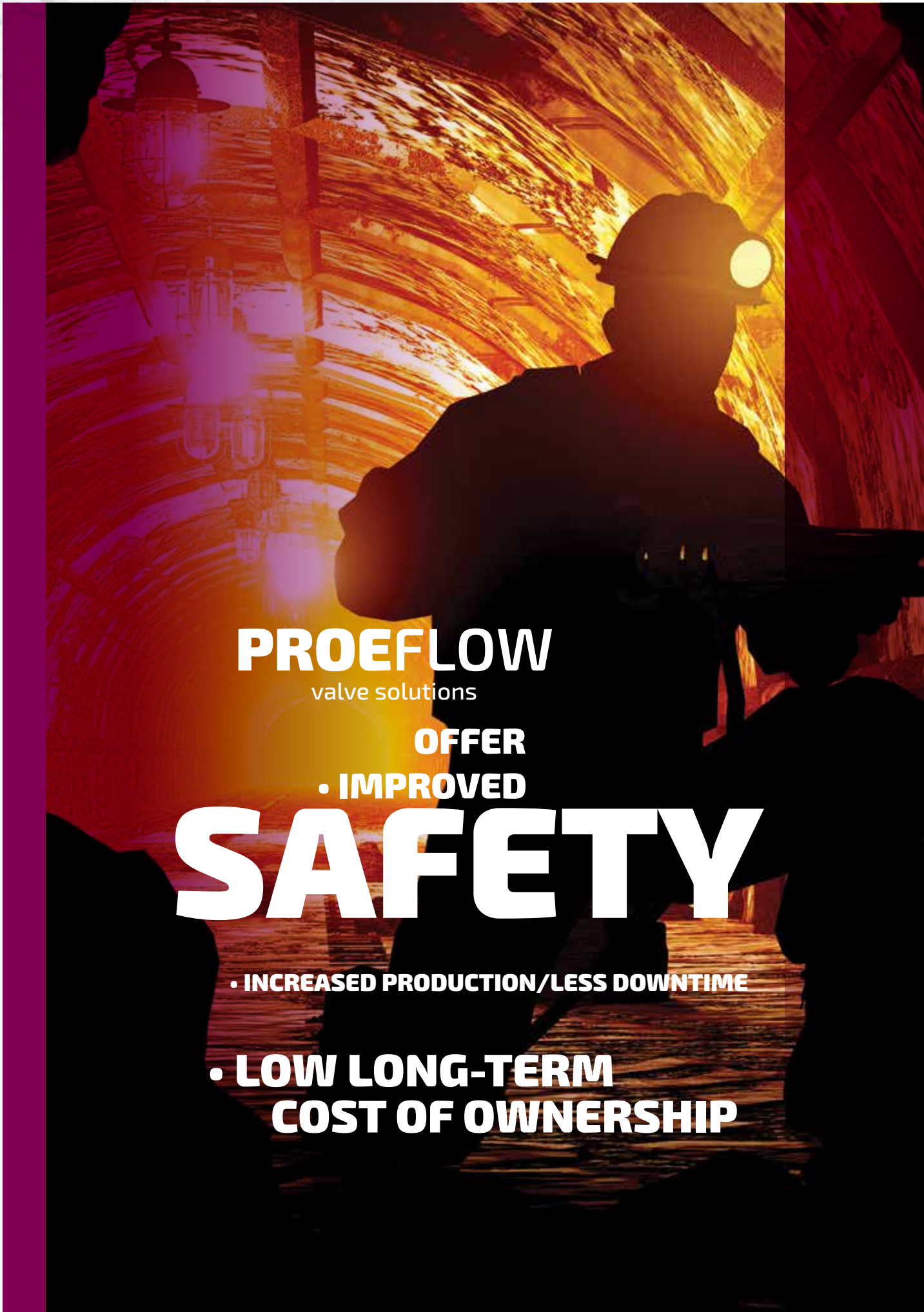
PROEFLOW
valve solutions
OFFER
• IMPROVED
SAFETY
• INCREASED PRODUCTION/LESS DOWNTIME
• LOW LONG-TERM
COST OF OWNERSHIP

Image courtesy of Stripes Engineering - Gunnedah NSW

WHY PROEFLOW?

From the hopper, to the final destination underground, **Proeflow** solutions address issues to improve the delivery of the paste backfill process.

Our valve solutions are high-quality, safe and robust, increasing productivity, minimising downtime and providing a low long-term cost of ownership, along with enhanced safety benefits to workers and equipment alike.

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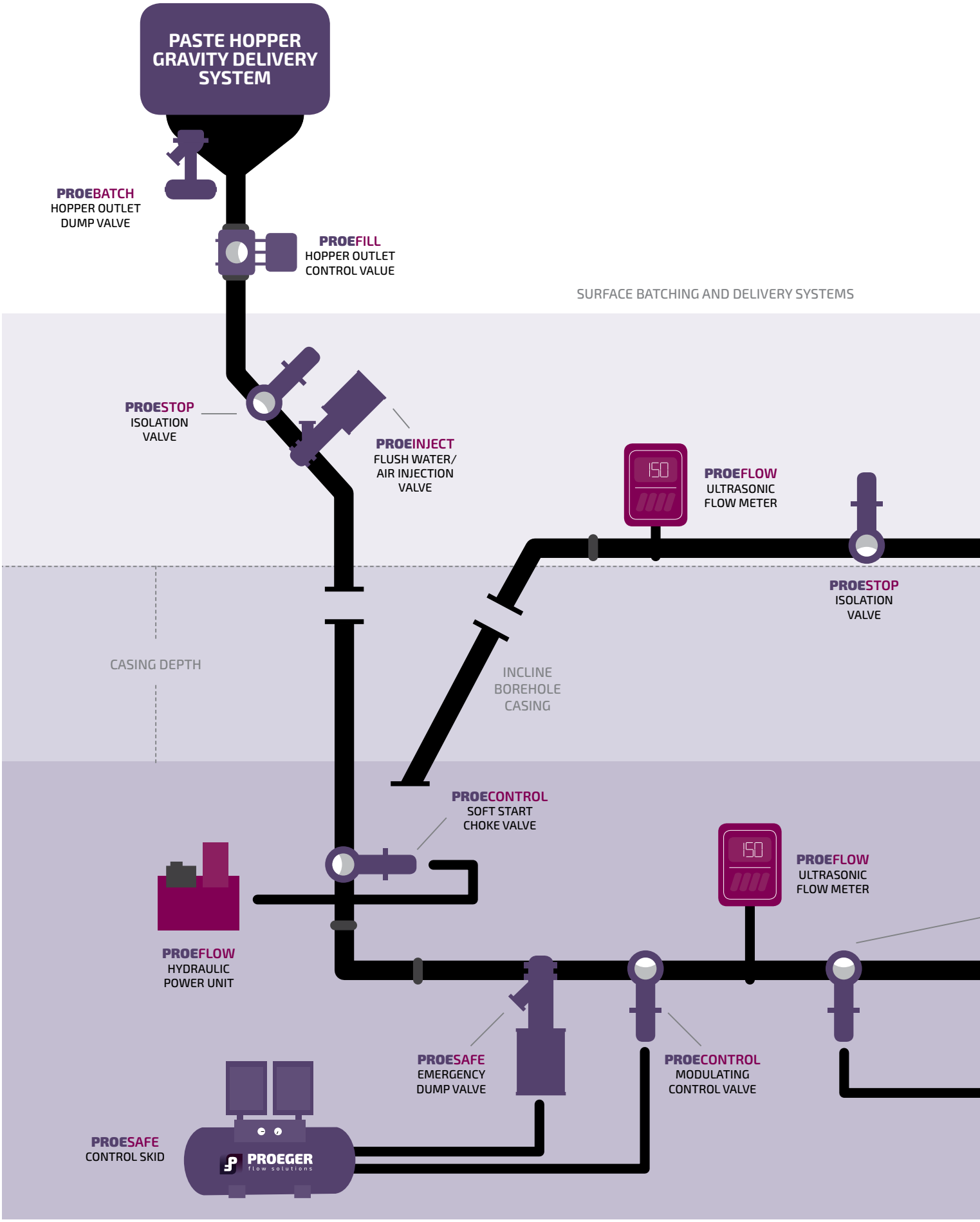
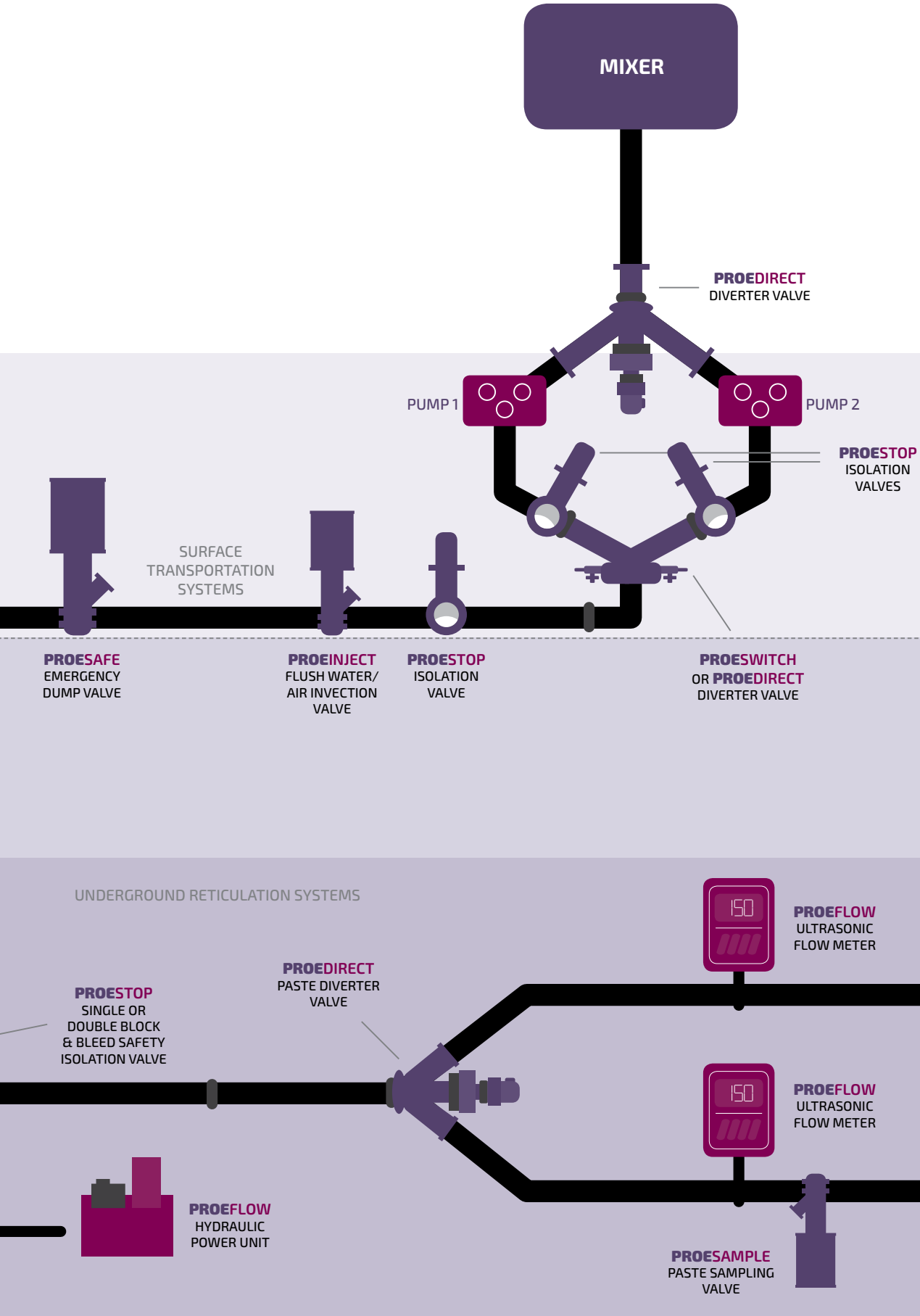
GRAVITY FEED SYSTEM



HIGH PRESSURE PUMPED SYSTEM



PROEFILL

PASTE HOPPER OUTLET CONTROL VALVE

The PROEFILL Paste Batching Plant Hopper Outlet Control Valve's primary purpose is for flow control of paste out of the main hopper and into the gravity fed bore maintaining optimum feed velocity to prevent the segregation of solids and liquid.

It's for this reason why it is important to manage the velocity of the paste out of the batching hopper.

What is also unique in a gravity feed system is that the resultant rapid increase in velocity as the paste falls down the bore hole; it generates a high vacuum that other valve types struggle to hold control against adding to the difficulties of early stage paste management in gravity feed systems.

AT A GLANCE:

- Valve Sizes: 4"x2.5", 4"x3", 5"x3", 5"x4", 6"x4", 6"x5", 8"x6" & 10"x8"
- Pressure ratings to suit 10 & 20 Bar
- Patented double arched self-supporting design with a full vacuum rated tube
- Designed for **A**brasive, **S**caling, **A**ggressive and **P**lugging slurries / pastes
- In-built Wear Sensor wires for early warning replacement
- ZERO cavities for paste or tailings slurries to impact

PROESAFE

BOREHOLE EMERGENCY DUMP VALVE

Paste system borehole blockages resulting from solidification and segregation are a key area of frustration for mining companies operating paste delivery systems as they typically lead to lengthy downtime and expensive remedial works to clear the blockages.

Our PROESAFE design valve provides the ability to dump residual paste and flush fluids away from the stope delivery point on demand or in an operational upset condition.

As an emergency / safety device in pipe burst or over-pressurisation situations you also need absolute confidence that the technology you choose will perform on demand and itself not become a point of blockage like alternate dump valve technologies currently on the market.

AT A GLANCE:

- Valve Size: 4" to suit both 4", 5", 6", 8" & 10" retic systems.
- Pressure ratings to suit 100, 150 & 250 Bar
- ZERO Dead Leg between piston face and pipe bore
- Crust breaking action to quickly open a flow path in partially impacted systems
- Pneumatically actuated configurations preferred for safe operation in remote control situations
- Simple mounting into overhead reticulation systems

PROESAFE

DUMP VALVE CONTROL SYSTEMS

The PROESAFE Dump Valve Control System end ables end users to control the PROESAFE Dump Valve remotely from the surface control room or locally at the valve when needed.

Our fully mobile and stable base skid provides the perfect platform for mounting our modularised panels and equipment. All your air, power and comms taken care of in simple and cost effective solution.

AT A GLANCE:

- Manual and remote override capabilities on loss of both air and power from the surface
- 800L air storage capacity instrument grade dry filtered air supply to 5µm absolute
- Mine SCADA system integration
- UPS – Un-interruptible Power Supply battery backup system
- High voltage to low voltage inverter
- Robust skid mounted design for easy transport and placement by U/G support vehicles

PROEDIRECT

MULTIPORT DIVERTER / SWITCHING VALVE

Primary purpose is for flow diversion of paste or tailings in both above ground and below ground reticulation systems, but can also be used in any high pressure abrasive slurry system to divert flow from one pipeline to another without costly and continual pipework disconnection and reconnection to change diversion of flow.

Depending on the direction the valve is installed, it can be easily switched between a Diverter Valve to a Switching Valve simply by installing in reverse.

AT A GLANCE:

- Valve sizes: 4”, 5”, 6”, 8” & 10”
- Outlet port configurations: 2, 3 & 4 port designs.
- Pressure ratings to suit 100, 150 & 250 Bar systems
- 60.0° degree Y pattern design to minimise change of direction and potential wear problems
- Smooth passages for unrestricted flow and low frictional losses
- Valve can be operated at full line or pump pressure avoiding the need to disconnect pipework and or shut down the system to operate
- Simple pneumatic or electric actuator options

PROEGER flow solutions

PROECONTROL

BOREHOLE CHOKE & RETIC CONTROL VALVE

Designed for Paste Backfill and Tailings flow control applications where precise control is required to maintain pressures, level or most importantly reduce velocities and start-up cavitation.

These valves are designed with the most severe abuse a choke / control valve could be subjected to in respect to abrasive media where velocities typically result in high seat and trim erosion.

The bullet-proof design has made this the valve of choice for long vertical drop velocity control and cavitation / vibration control in start-up phases within paste delivery pipelines below ground. Reduced media segregation also helps control blockages, but also as a back pressure controller for atmospheric discharge of tailings in dewatering and batching systems.

AT A GLANCE:

- Valve sizes: 4”, 5”, 6”, 8” & 10”
- Pressure ratings to suit 20, 50, 100, 150 & 250 Bar
- Fixed orifice or Class IV shut-off
- Full bore opening when needed
- Can serve as an Anti-Cavitation Start-Up Choke Valve
- Flow centering designs to reduce velocity related wear of valve body and downstream pipework
- Integral positioner to guard against damage in service
- Borehole & Retic Velocity Control Valve
- Atmospheric Discharge Control

PROESTOP

HIGH PRESSURE PASTE & SLURRY ISOLATION VALVE

Designed for types of high solids abrasive Slurries, Pastes and Tailings isolation applications where precise isolation is required for process and safety requirements. These valves are designed with the most severe abuse and isolation valve can face. In abrasive solidifying media where velocities and or high building up in seating areas are a challenge.

The robust design has made this the valve of choice for paste system operators on High pressure applications for repetitive cycling on abrasive and media. Whether on the surface or underground these isolation valves solve issues that other valve types only bring on-going expensive maintenance. With Single Block and Double Block & Bleed designs, this is a true safety isolation valve in high solids abrasive slurry and paste services.

AT A GLANCE:

- Valve sizes: 3” to 24”
- Pressure ratings to suit 20, 50, 100, 150 & 250 Bar
- Class VI shut-off
- Single & Double Block & Bleed designs available
- Full bore opening
- Designed for **A**brasive, **S**caling, **A**ggressive and **P**lugging slurries / pastes
- Flow centering designs to reduce velocity related wear of valve body and downstream pipework
- Pneumatic, Hydraulic and Electric actuation options available

PROEFLOW

HYDRAULIC POWER UNITS & CONTROL SYSTEMS

The PROEFLOW Hydraulic Control System are compact, robust and simple, offering end users of our PROESTOP Isolation Slurry Knife Gate Valves & PROECONTROL Soft Start Choke Valves a tailored and functional hydraulic control system suited to a mining environement. These units are fully designed and made by PROEGER FLOW SOLUTIONS in Australia.

AT A GLANCE:

- 70L to 200L tank capacities.
- 210 Bar maximumum output pressures
- Comprehensive range of pump motor options
- Comes complete with 24v DC or 240v AC direction control valves
- Integral filtration and low lever oil alarms
- PLC Controller with mine SCADA system integration
- High voltage to low voltage inverter panels
- Robust skid mounted design for easy transport and placement by U/G support vehicles

PROEINJECT

AIR / WATER INJECTION / FLUSH VALVE

Piston Type Injection Valves have simplified paste batching plants and underground retic systems allowing plant operators to inject air and water for flushing and blockage control without the valve itself becoming a point of blockage in itself.

No longer do plant operators need to unsafely “rod” back through intlet valves to remove blocked inlet deadleg areas associated with other valve types used for water flush injection that have been a constant issue around the world.

These valves seal tightly and the piston sits flush with the inside bore of the pipe eliminating paste solids blocking the inlet to the reticulation system.

AT A GLANCE:

- Pipe spool Connection sizes: 4”, 5”, 6”, 8” & 10”
- Valve Inlet Port Sizes: 1-1/2”, 2”, 3 & 4”
- Pressure ratings to suit 20, 50, 100, 150 & 250 Bar
- Single & Double Inlet Versions
- Customised body configurations
- Fully automated or manual options

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PROESAMPLE

PASTE BATCHING SAMPLING VALVE

Sampling Valves have only recently made their way into paste batching plants and underground retic systems enabling plant operators to take samples of the paste mix for testing and verification the batch is in accordance to the process engineering requirements.

The piston valve design replaces problematic ball and gate valves typically used but prone to plugging and blockage.

These valves seal tightly and the piston sits flush with the inside bore of the pipe eliminating paste solids blocking the outlet to the sampling system container.

AT A GLANCE:

- Spool connection sizes To Suit : 4”, 5”, 6”, 8” & 10”
- Valve Outlet Port Sizes: 3/4”, 1”, 1-1/2” & 2”
- Pressure ratings to suit 20, 50, 100, 150 & 250 Bar
- Customised body configurations
- Fully automated or manual options

PROEBATCH

TANK BOTTOM OUTLET VALVE

Piston Type Tank Bottom Outlet Valves have revolutionised paste batching plants by allowing end users to utilise the integral piston ram to break through solidification or sediment formed in the base of mixing tanks hoppers and digesters.

No longer do plant operators need to unsafely “rod” back through outlet valves and drain valves to remove blocked outlet ports.

These valves seal tightly also against the paste and tailings solids preventing the unwanted loss of process media and fluids.

AT A GLANCE:

- Valve Sizes: 2” thru to 12” Options
- Pressure ratings to suit 20, 50 & 100 Bar
- Customised body configurations
- Bottom or side wall mounting
- Crust breaking extension piston
- Fully automated or manual options

PROEVENT

RETIC VENT / DRAIN VALVE

The Zero Dead-Leg PROEVENT Drain / Vent Valve is equally supportive on the surface in the Paste Plant as it is underground when strategically placed through out the reticulation system as a simple and cost effective vent / drain valve for residual paste and flush water.

Wheather installed vertically above the pipeline or below, the same valve can be utilised for blockage mitigation, low point drains at the bottom of short decents or along long horizontal runs.

In fact, we have also found it revolutionary as a simple air / vacuum release valve in system start ups to rid the retic system of air and vacuum locks that upset the balance of paste flow in uneven horizontal runs.

AT A GLANCE:

- Pipe Mounting Spool Sizes: 4”, 5”, 6”, 8” & 10”
- Valve Body / Outlet Sizes: 2”, 3” & 4”
- Pressure ratings to suit 20, 50, 100, 150 & 250 Bar
- Customised mounting spool configurations
- Absolute Zero Dead-Leg blockage free connections
- Top, Underneath and horizontal install orientation
- Radial sealed crust breaking extension piston options
- Metal seated options flush sealing options
- Fully automated or manual options

PROESWITCH

TAILINGS SWITCHING / DIVERTER VALVE

Primary purpose is for flow diversion / switching of paste or tailings slurry from one delivery pump and switch to a second delivery pump in high demand applications without the disconnection of pipework or interruption to the batching plant production.

Depending on the direction the valve is installed, it can easily be convert between a Diverter Valve to a Switching Valve simply by installing in reverse.

AT A GLANCE:

- Valve Sizes: 3”, 4”, 5”, 6” & 8”
- Pressure ratings to suit 20, 50, 100, 150 & 250 Bar
- Diversion under full operating pressure
- No pipework dismantling to redirect flow
- Bi-directional flow for diversion & switching
- Integral flush water injection valves

PROEGER flow solutions

PROEBALL

HIGH PRESSURE SLURRY, AIR & WATER ISOLATION VALVE

The PROEBALL provides in line isolation for high solids non cemented slurries, air injection isolation and high pressure water injection isolation in the harsh environment of paste batching plants and tailings distribution systems. These valves offer cost effective secondary isolation back-up within flush water injection systems with positive sealing against small fines found in process water supply.

AT A GLANCE:

- Valve Sizes: 2”, 3”, 4”, 5”, 6”, 8”, 10” & 12”
- Pressure ratings to suit 20, 50, 100, 150 & 250 Bar
- Bi-directional sealing
- Metal to metal ball and seats with tungsten carbide coatings
- Manual or fully automated options available

PROEFLOW

SLURRY FLOW METER

The PROEFLOW SFM6.1 Slurry Flow Meter which uses dopler non-contact ultrasonic technology has been specifically adapted for non-contact flow monitoring specifically designed for ore slurry concentrates, paste backfill, tailings slurry, fly ash slurry, cement slurry and many other viscous high-density medias.

Requires solids or bubbles minimum size of 100 microns, and provides velocity and mass flow values, as well a high and low flow alarms relays. The 16 digit totalizer provides end users a variety of functions and control capabilities.

Sensitivity is also adjustable to dampen pulsations from positive displacement slurry pumps.

AT A GLANCE:

- Flow rate range: (± 0.03 to 12.2 m/sec) in most applications
- Pipe size: any pipe Ø from ½” to 180” (12.7 mm to 4500 mm)
- Accuracy: ±2% of reading or 0.1 ft/sec (0.03 m/sec)
- Minimum concentration 75 ppm.
- Calibration: in-built 5-key calibrator
- Output signal: 4-20mA
- Control relays: Qty 2, rated 5 amp SPDT, programmable flow alarm and/or proportional pulse

HOW WE HELP

Proeger Flow Solutions helps protect their critical paste borehole from expensive blockages at **Barricks Kibali Gold Mine** in Democratic Republic of Congo in Africa.

The borehole is a key asset linking the paste batching plant on the surface to the underground reticulation system 450 metres below ground.

*PROESAFE valve in operation

ONSITE SUPPORT SERVICES

Whether it be valve optimisation advice through to problem solving with new valve designs or simply installation and commissioning instructions.

Proeger Flow Solutions are able to offer a range of onsite services to help clients achieve the most from their paste and tailing reticulation systems.

ABOUT PROEGER FLOW SOLUTIONS

Since 2011 we have focused on solutions for specialised areas of the mining/minerals and upstream oil and gas sectors.

The relationships developed with the key manufacturers bring together a unique range of specialist manual and automated flow control products targeting known application challenges identified within each of these sectors.

More specifically Paste/Backfill and Wellhead Control operations are where our main expertise lies offering genuine solutions with proven results.

By focusing in on some of the more difficult severe service flow control applications in Australia and internationally, we have been able to overcome historical valve wear and functional issues, positioning **Proeger Flow Solutions** as an industry leader in valve solutions for Paste/Backfill and Wellhead Control.

NOTES

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