

HMA

SOUTH AFRICA



SINCE 1966



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Introduction

Formed in 1966, The HMA Group represents an impressive list of internationally respected companies and manufactures under licence to a number of these companies. We also manufacture a range of products and equipment developed and designed by our own engineers.

Employee group owned, these shareholders span a diverse section of the company and underwrite the efficient function of the HMA Group.

The HMA Group of Companies manufactures, services and sells a wide range of capital plant and equipment to a diverse range of industries. This includes mining, processing, materials handling, water management, power generation and, oil and gas.

We can provide state-of-the-art industrial equipment and also offer customers sound advice, consultation and technical back-up. A team of qualified engineers, who have extensive product training and experience can offer a complete service, from equipment selection through to installation, commissioning and maintenance.

Offices and service facilities are strategically located in Sydney, Wyong & Singleton in NSW, Morwell & Melbourne in VIC, Brisbane & Mackay, in QLD, Perth in WA, Hamilton in New Zealand, Jakarta in Indonesia and Johannesburg in South Africa. With these locations we stand ready to assist you from the project inception stage through contract engineering to installation, commissioning and full maintenance support.

As we recognise industry works 24 hours around the clock, so do we. We are on call to promptly supply essential parts from our local stock and provide technical back up to ensure maximum availability and efficient operation of customer's equipment.

SERVICES:

- **ABRASION RESISTANT EQUIPMENT**
- **BOILER CLEANING & DIAGNOSTICS**
- **GEOTECHNICAL INSTRUMENTATION**
- **MATERIALS HANDLING**
- **MEASUREMENT INSTRUMENTATION**
- **MECHANICAL, STRUCTURAL & ELECTRICAL ENGINEERING**
- **NUCLEAR INSTRUMENTATION**
- **OPTIMISED ENERGY SOLUTIONS**
- **PIPE SYSTEMS**
- **SENSOR TECHNOLOGY**
- **TRANSMISSION & MOTORS**
- **VALVES & CONTROLS**



Introduction

MATERIALS HANDLING

Solutions designed for efficiency when materials require movement in a processing environment.

WEAR SOLUTIONS

Abrasion, impact and erosion resistant materials and piping systems.

FLOW & INDUSTRIAL

Complete range of valves, controls, motors and gear boxes for industrial applications.

INSTRUMENTATION

Measurement & analytical instrumentation and controls for industrial industries.

POWER GENERATION

Integrated solutions for boiler diagnostics, boiler cleaning, ash handling and sootblower controls.

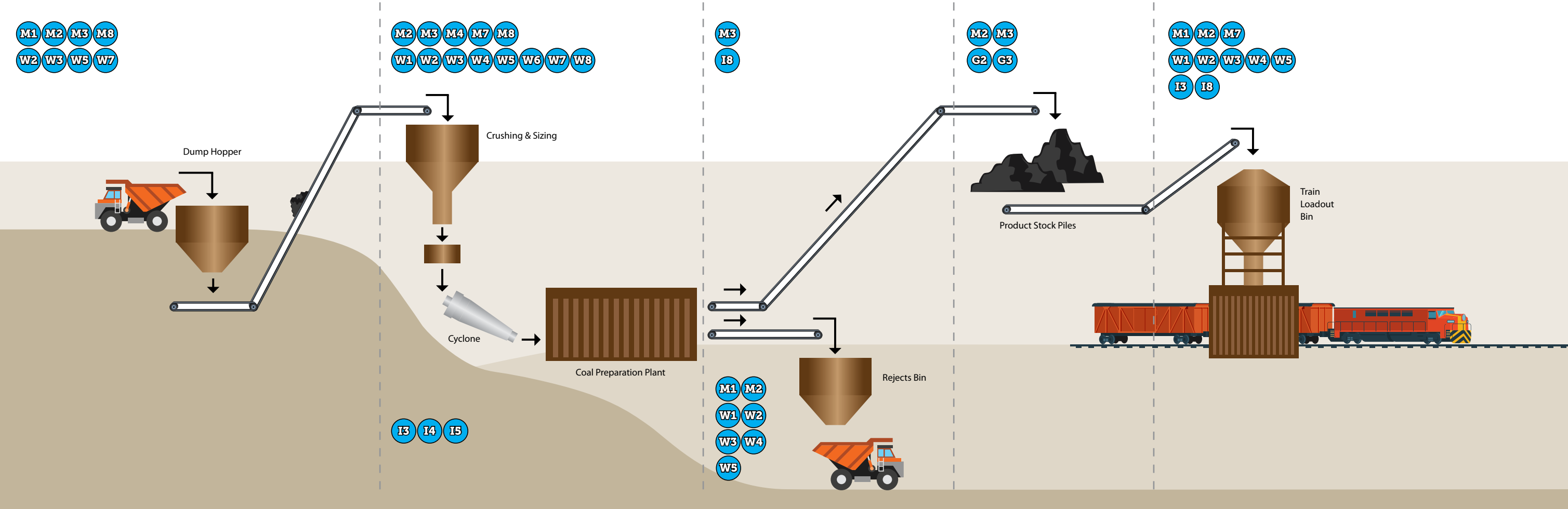
GEOTECHNICAL

A range of Geotechnical Instruments used to measure insitu pressure, displacement, inclination and stress.

INDUSTRIES:

- **WATER & WASTE**
- **CEMENT & QUARRY**
- **POWER GENERATION**
- **OIL & GAS**
- **PROCESS INDUSTRY**
- **PULP & PAPER**
- **MINING & MINERALS**
- **PHARMACEUTICAL, FOOD & BEVERAGE**
- **RAIL & TRANSPORT**
- **CIVIL & INFRASTRUCTURE**
- **MARINE & OFFSHORE**
- **ENVIRONMENTAL**





MATERIALS HANDLING

- M1 Material Loading Systems
- M2 Chutes, Gates & Slingers
- M3 Stockpile Reclaim & Conveying
- M4 Process Equipment
- M5 Overhead Access Equipment
- M6 Hi Rail Equipment
- M7 Rail Fixing & Resurfacing Equipment
- M8 Engineered Products *

WEAR SOLUTIONS

- W1 Wear Resistant Pipe
- W2 Sump, Chutes & Gates
- W3 Specialised Lining Systems
- W4 Ancillary Products **
- W5 Impact Panels
- W6 Polyurethane Products
- W7 Process Equipment *
- W8 Site Services

* Includes: Weighing Systems, Safety Guarding, Wheel Washing Systems, Aluminium Dome Covers, Specialised Products & Prototypes

* Includes: Cyclones, Eriez
** Abrasion & Corrosion Compound

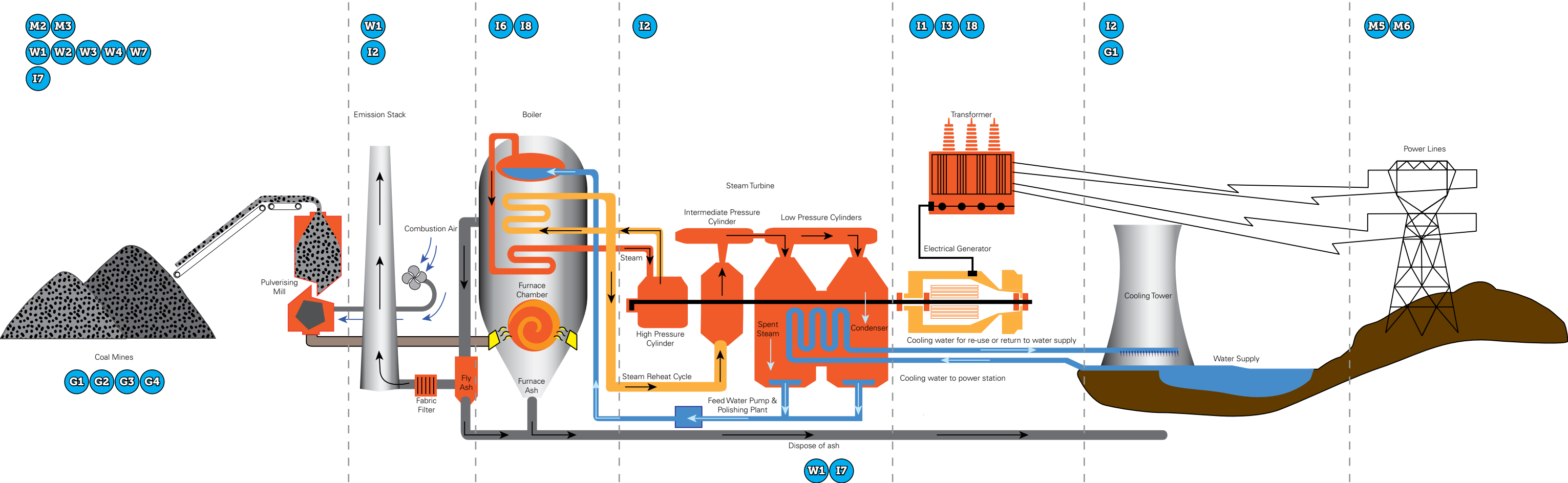
INSTRUMENTATION

- I2 Analytics
- I3 Pressure & Temperature
- I4 Level
- I5 Flow
- I6 Boiler Management
- I7 Nucleonics
- I8 Engineered Products *

* Includes: Expansion Joints, Sodium Hypochlorite Generation, Offshore & Marine Sewage Treatment, Hydrogen Generation, Belt Conveyor Protection & Automation

GEOTECHNICAL

- G1 Water Monitoring
- G2 Inclination Monitoring
- G3 Displacement Monitoring
- G4 Stress & Strength Monitoring
- G5 Field & Workshop Services



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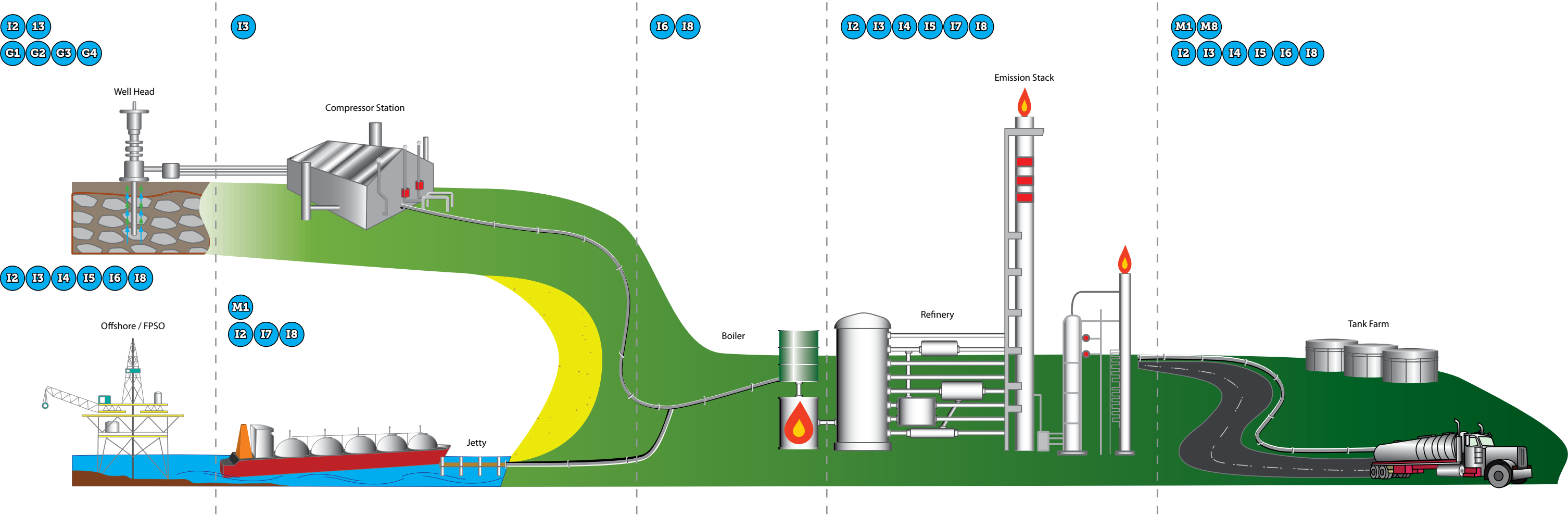
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Precision Loading Systems

HMA Materials Handling holds the patent for the Precision Loading System (PLS) in the Australasian region. The PLS uses a single or multi batch approach to the loading of bulk materials in both trains and trucks, weighing the material before it is placed into the wagon ensuring that each load is maximised for improved efficiency.



System Upgrades

We are able to provide solutions to improve the operation of existing loading facilities. Examples of what can be done to improve throughput and/or reliability include:

- Replacement control gates and chutes
- Improved hydraulic power systems
- Loading automation
- Real time weight loading (VILU)



Truck and Train Loading Systems

Materials such as coal, iron ore, gravel and sand can all be loaded in bulk using our variety of design and operating systems. Loading systems are available to suit applications involving trucks (including oversized and multiple trailers) as well as trains with options including:

- Flood (Volumetric) Loading
- Single or Multiple Batch Weighed Loading
- Automatic or manual operation
- Real time weight loading (VILU)



Feeder Breakers

Feeder breakers in capacities from 500 to 2,500 tph for a range of materials including coal and aggregates. Options for either electric or hydraulic drives with standard designs or designs specific for an application.



Loading, Isolation & Flow Control Gates

We have a range of gate designs to suit a variety of applications such as rejects systems, equipment isolation and material flow control or we can design a gate and actuation system to suit a particular need.

- Single, double or multi blade gates
- Clamshells
- Water capture designs



In Pit Crushing

Static or mobile In Pit Crushing systems designed to suit your specific needs and able to process up to 1000 tph.



Ship / Barge Loading

We have a range of Jet Slingers and Loading Spouts for accessing and loading the holds of ships or barges.

We have supplied units for a range of materials including grain, sugar, coal, wood chip and mineral sands.



Mobile Equipment

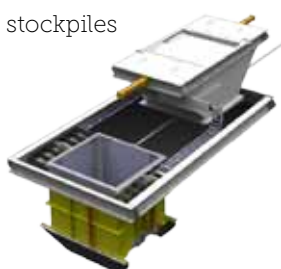
We can supply tracked vehicles such as feeders, conveyors, stackers and reclaimers or work and carry platforms.



Chutes - Telescopic / Transfer / Traversing

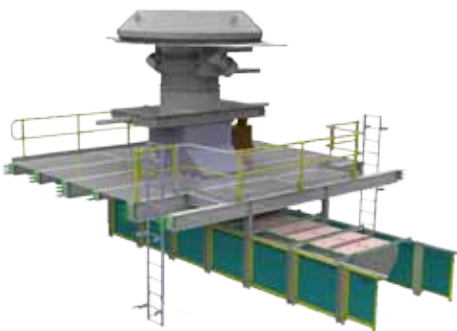
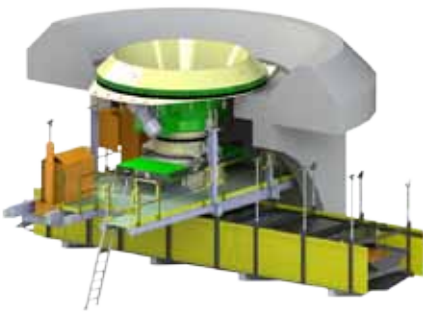
From simple in line chutes through to complex transfer tower design, our designs are based around promoting the natural angle of movement of material. All designs feature a full range choice of wear resistant liner options available through HMA Wear Solutions.

Telescopic loading chutes which enable complete flexibility for accessing and loading the holds of ships/barges and for dust control and environmental management on product stockpiles



Drawdown Hopper

Our range of Carman Drawdown Hopper eliminates outdoor stockpile storage and reclaim problems including coring, bridging, and minimal active reclaim by using vibratory action to transmit energy directly into the stockpile, encouraging sloughing into the flow stream and maximizing active reclaim.



Belt Feeders

We can supply Belt Feeders up to 2500 mm wide to suit most bulk materials. Low head designs to suit tight spaces with options for drive types and feed conditions.



Stackers

Range of standard and non-standard stackers including features such as luffing, slewing, and telescoping.



Chain Feeder / Reclaimer

Chain Feeders for the reclaim of material from stockpiles or fed via trucks/front end loaders to efficiently move material. Standard sizes with capacities from 500 to 2,500 tph with options for electric or hydraulic drive.



Jet Slingers

Proven solution for stockpiling and ship loading applications. Have been used successfully on the following bulk material:

- Coal - washed and raw (Capacity up to 3000 tph)
- Woodchips – hardwood and soft wood (Capacity up to 1500 tph)
- Grains – Wheat, barley, Maize (Capacity up to 1000 tph)
- Sugar (Capacity up to 3000 tph)
- Mineral sands – ilmenite etc (Capacity up to 1000 tph)



Trippers & Ploughs

We have designs for travelling trippers and belt ploughs to suit a variety of material types and belt configurations or can design a system to suit a particular need.



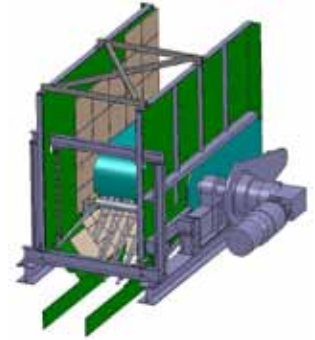
Sampling Systems

We are partnered with one of the leaders in the design and supply of samplers for the coal industry. From simple single stage cross belt samplers through to complex three stage and auger samplers we can supply a system complying with international sampling standards.



Divergators

Patented high capacity non-binding and self-cleaning static grizzly. Contains no moving parts and the individual bars are easily replaceable. Sized to suit most applications for separation above 20 mm in widths from 0.5 to 5m. Uses include crusher bypass, belt protection and misplaced material removal.



Engineered Products

Safety Guarding

GuardianCoil® works as a protective screen around all types of machinery, including mills, routers, spar mills, lathes, grinders, forges, testing equipment, etc. It is used as a machine guard to protect personnel and property from high-velocity flying debris or shrapnel.



Belt Tracking & Cleaning

Belt alignment problems can be resolved using HMA Halley & Mellowes (MHD) supplied Hallitrak and Tru-track belt equipment.

The Hallitrak is a fully assembled idler frame style Belt Tracker that is designed to accept stock rollers making maintenance easy.

The Tru-Track belt tracker is a simple to install yet highly effective it maintaining belt alignment. The unique design is particularly effective as a retrofit into existing conveyor structures.



Wheel Wash

A perfect solution to your problem of dirty and contaminated roads no matter what the site conditions. Eight base models with an extensive range of design variations to meet individual customer needs.



Weighing Systems

Our designs are based on latest technology load cell modules that are capable of producing accurate and repeatable results in a wide range of applications.

These include:

- Bin weighing systems
- In-motion train weighing systems
- Conveyor Belt Scales
- Weigh feeders





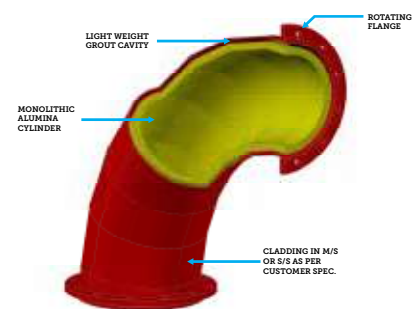
Wearthech



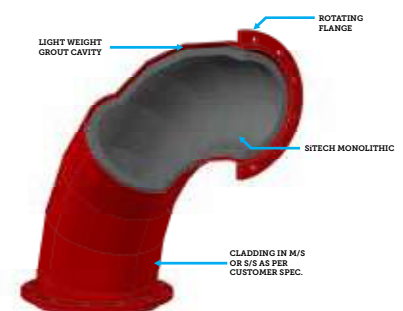
Basalt



Alumina Tiles



Alumina Monolithics



SiTech Monolithics

Wear Resistant Technologies

With over 35 years' experience solving wear problems within varying processes using a vast range of materials, design philosophies and manufacturing techniques, we can supply a cost effective solution that delivers on reliability and return on investment.

Site Services

With an ever increasing demand, our site services are continually expanding. We now offer tiling, condition monitoring and installation of our products.

Process Equipmnet

Supported by process engineers and a team of industry experts we have process equipment for separation, detection, and recovery.



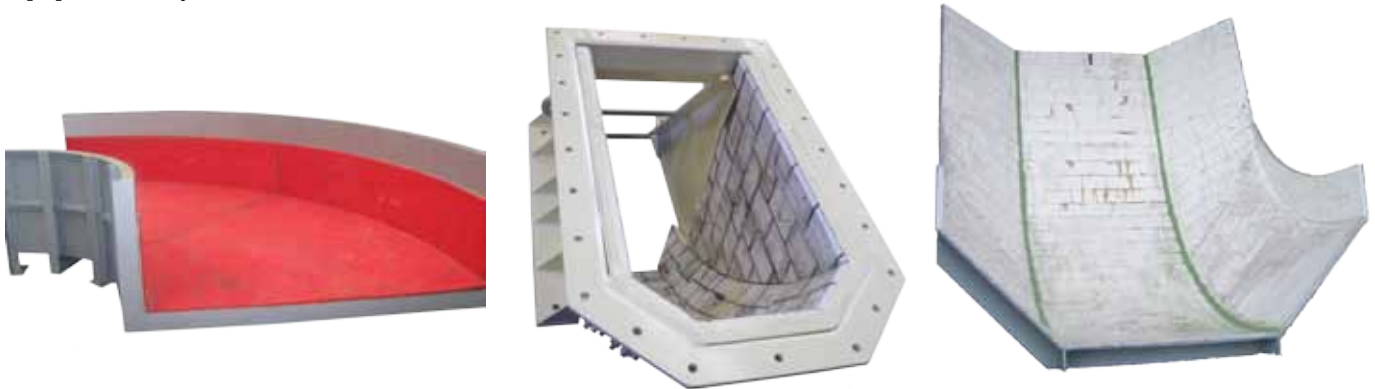
Wear Resistant Lined Pipe

Piping connects some of your most important and expensive process equipment, and with a lined piping system specifically designed for your operation, you will keep them operating at optimal performance. HMA Wear Solutions offers a range of lining materials including basalt, alumina, Weartech, polyurethane and rubber as well as complete design, supply and in some instances installation via our Site Services division.



Sumps, Chutes & Gates

With the movement of materials you will have wear. To reduce the expensive change out of your sumps, chutes and bins we have wear resistant lining materials that will prolong the life of this vital equipment. The main industry linings are basalt, alumina, rubber and polyurethane, we can offer these plus others, through design and manufacture of new equipment or by on site installation via our Site Services division.



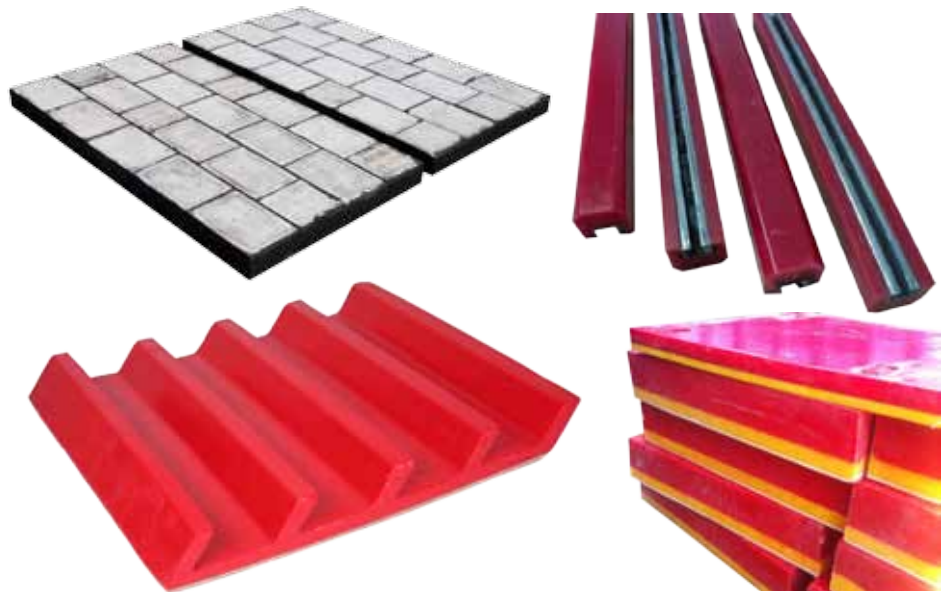
Specialised Lining Systems

In many applications, solving the wear problem requires more than the standard wear lining, which is why we have a wide range of lining systems that while having higher initial costs, delivers substantial savings over its life cycle, and therefore justifies its use. Specialised products like Alumax, Aerotech, SiTech, PSZ, ZTA and ARZ, to name a few. Our experience gives us the unique ability to apply the most cost effective product to solve your wear problems.



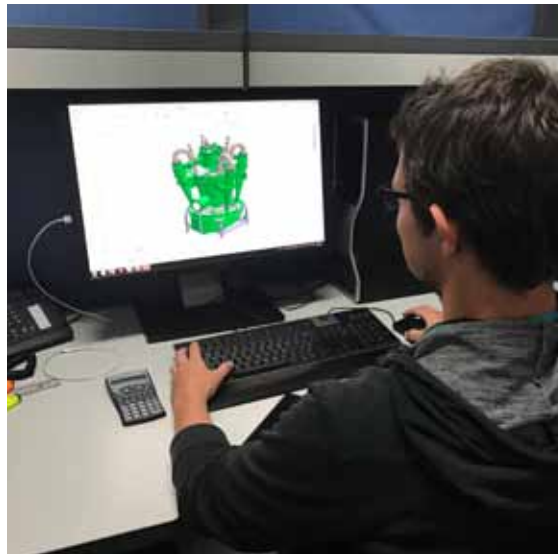
Impact Panels

When impact is a problem and the standard fixing method of epoxy adhesive is not sufficient, then using "Impact Panels" is a cost effective solution. This method allows you to have the lining material prefixed to a panel that can be mechanically fixed into the chute by way of bolts or tracks. It will minimise your down time as it is a quick process to change out the worn area and get your plant running.



Engineering

With over 35 years' experience solving wear problems in a wide range of industries, we can solve your wear problems to give you higher plant reliability and less downtime. HMA Wear Solutions can partner with our clients to successfully achieve their desired outcomes through engineered solutions and take a project from initial concept through to completion.



Ancillary Products

Complementing our range of equipment and services is the ancillary products, like our Greenbank Couplings, WrapTech repair bandages, WearTech trowelable ceramic, alumina & basalt tiles, adhesives and specialised gaskets.



Cyclones

Cyclones are an extremely fast and efficient way of separating materials based on density and size. HMA Wear Solutions specialises in the design and manufacture of superior ceramic lined equipment. Utilising our unique manufacturing equipment and processes ensures that our product exceeds industry expectations. The GTech range of Dense Medium (GTD) and Classification (GTC) Cyclones is the accumulation of such experience, offering superior cyclone performance throughout its operating life with process guarantees to support this.



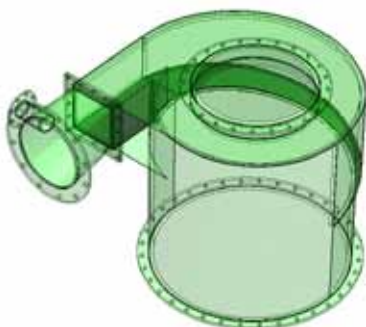
The advantages of the GTech range of cyclones include:

- Ongoing Technical Support
- Optimal Ceramic Selection
- Superior Lining Design
- High Separation Efficiency
- Reduced Operating Costs
- Engineered Tiles and Monolithics



HMA Wear Solutions supplies cyclone components in a range of abrasion resistant materials such as Alumina Tiles, Alumax Monolithics, SiTech and 27% Chrome. We can also offer Aerotech, a ceramic bonding that provides a more consistent and predictable operating life where tramp is present.

HMA Wear Solutions can provide you with your complete cyclone solution.



Eriez

The world authority in advanced technology for magnetic, vibratory and inspection systems. We also specialise in flotation and separation systems.

The product range includes;

- **Suspended Magnetic Separators**

Safely and automatically remove damaging tramp iron from heavy product flows such as coal, rock, iron ore, minerals and wood chip being conveyed on belts, vibratory feeders or chutes. Available in both permanent and electro models.

- **Eriez Flotation Column**

Eriez Flotation Columns are ideal for efficient high volume recovery of fine coal (0.3 mm) particles. State of the art column flotation design, using a variety of air sparging techniques. High-capacity columns with low operating and maintenance costs.



- **Wet Drum Separators**

Eriez offer a wide range of wet drum magnetic separators for a variety of separation and direct recovery applications. Recover magnetite or ferrosilicon in heavy media operations or concentrate magnetic ores. Varying magnetic strengths and pole configurations to suit most applications is available.

- **Metal Detectors**

Eriez have a comprehensive range of metal detectors available for industrial, aggregate and mining applications.



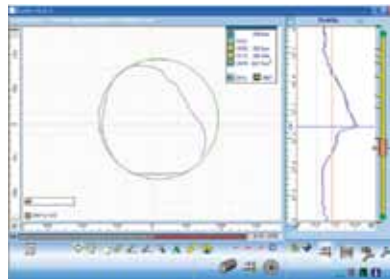
Site Maintenance and Installation

- Safe and effective work crews available for installation and maintenance work
- Specialised in the installation of our equipment
- Ability to undertake projects from conception through to commissioning



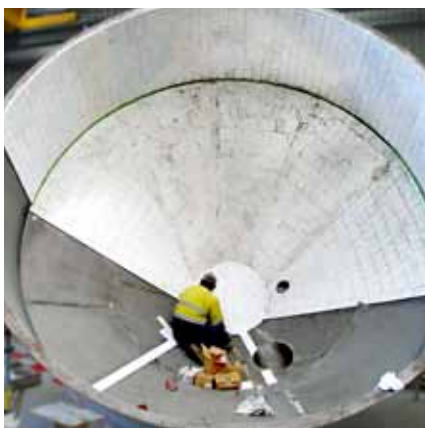
Pipe Scan Inspection

- Maximise pipe life through condition monitoring inspections.
- Developed as a measuring tool for internal monitoring of lined pipework.
- Ability for visual and or light line measurements
- Used to determine wear patterns and nominate effective life and maintenance practices.
- Allows preventative maintenance planning accuracy.
- Decreases breakdowns while maximising pipe life opportunities.
- Specialised in-house service providers



Industrial Tiling

- Specialised crews and equipment for maximising client tiling opportunities
- Ability to recommend improvements
- Multiple work crews available for large scope activities and support
- Ability to utilise in-house trades support when required for extensive repairs



Cyclone Condition Monitoring

- Internal inspection and measuring of cyclone components
- Detailed reporting with tonnages and wear life predictions
- Allows preventative maintenance planning accuracy
- Ability to provide installation and maintenance support for cyclones
- Safe and effective work crews available for installations on large and small projects

Magnetic Separation Inspections

- Regular and or one-off audits to inspect condition, set up and overall performance
- Recommendations and maintenance strategy options available for increased productivity of magnetite recovery systems
- Specialised in-house service providers

Chute & Wear Liner Inspection

- Detailed reports generated from inspections
- General chute condition prioritised to assist in preventative maintenance schedule
- Optional in-house maintenance support capability



Flame Detection

Specifically designed for areas where the risk to personnel is high and where fire might result in a catastrophic loss of assets.

Det-Tronics are the market leader when it comes to Flame Detection. Possessing industry leading false alarm rejection, fast response times and a wider cone of vision, the X Series provides a reduced cost of coverage.



Ancillary Warning Devices

Extensive range of manual, visual and audible alarms, as well as loudspeakers have been developed in close collaboration with customers to deliver the best combination of performance and safety. Manual Alarm Call Points, Status Lights, Beacons/ Strobes and Speakers.



Fire Protection

High quality fire fighting equipment and systems for high-value asset protection that can be relied upon whenever danger strikes. Foam Proportioner, Monitors, Hydrant Valves, Mobile & Fixed Foam Skids, Deluge Valves.



Fixed Gas Detection

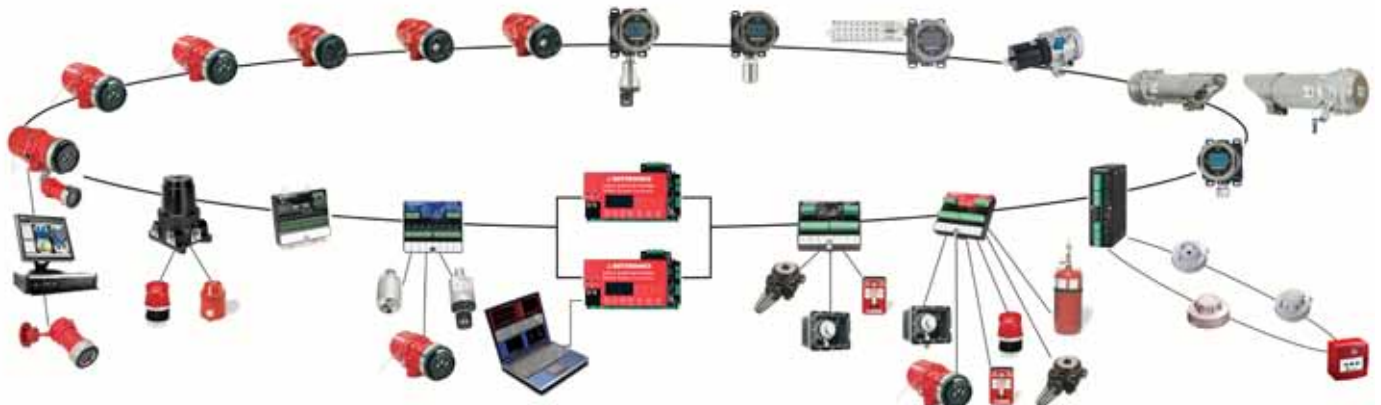
Hazardous area flammable Gas Detection, with multiple layers of protection. Point, Line of Sight (Open Path) & Acoustic Gas Detectors; offering multiple detection technologies from Catalytic to Infrared for Hydrocarbons and Electrochemical for measuring Toxic Gases.

With a range of Transmitter options, from a simple faceplate display, to a Gas Control Panel.



Certified Fire & Gas Detection Systems

Addressable and point-to-point systems allow complete design and configuration to meet your safety system requirements. Approved by Exida as a SIL 2 certified Safety Instrumented System (SIS), the Eagle Quantum Premier (EQP) network meets both NFPA & FM standards as a Fire & Gas Control system.



Flame Scanners

UV and IR flame scanners for detecting presence or absence of flame in a combustion chamber. Scanners include advanced sensors and algorithms for discrimination of the target burner in multi-burner applications. Used with all fuel types and burner configurations.

Integrated Scanners

Detections and amplification in one compact unit.

Models: Insight, Insight II, Phoenix, Paragon & Simplicity

Discrete Scanners

Used with flame safeguard controls or separate amplifier.

Models: 45UV5, 55UV5, UV90L, UV1A & 48PT2



Ignition & Pilot Equipment

- Surefire Igniter - High Energy Spark Igniters (HESI) for direct spark ignition of oil or gas burners.
- Surefire Gas Pilot - Gas pilot with 15KW to 30KW capacity available in natural draught or force draught.



Burner Controls & Flame SafeGuard

- BurnerPRO - LFL backward compatible replacement
- BurnerLogix - Latest Flame Monitor
- Nexus - Parallel positioning system for liquid or gas fuel fired combustion
- NXM2G - Non-intrusive prevention of boiler dry cycling.

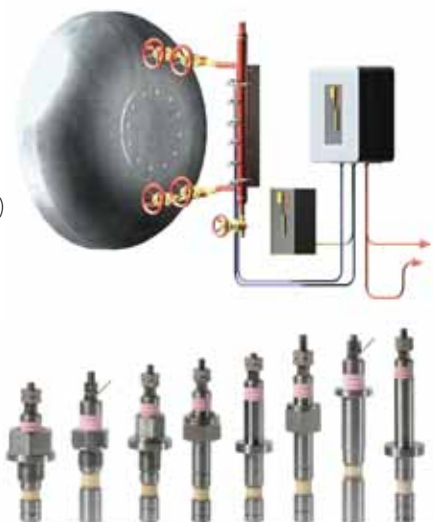


Boiler Drum Level & Replacement OEM Probes

A range of products to meet regulatory, safety and boiler control requirements offering complete redundancy and fault tolerance.

- Electronic Drum Level Indicators (EDLI)
- Electronic Level Switches
- Gauge Glasses
- Magnetic Level Gauges
- Bypass Gauges

- Replacement electrodes/conductivity probes 100% compatible with Hydrastep, Clark Reliance, Narvik, Yarway, Fossil, Bonetti, Levelstate, Diamond Power, Emerson/Solartron.



Thermal Expansion Joints

Bespoke fabric and metal joints for boilers, turbines and ducts on gas fire plants and coal fired plants.



Rupture Discs

BS&B Safety Systems is the originator and industry leader for reverse buckling, tension loaded, graphite and custom engineered rupture disc devices.

BS&B Safety Systems, since inventing the first rupture disc in 1934, has been at the forefront of the industry. With over 70 registered patents covering reverse buckling, tension loaded, graphite, sanitary and custom engineered rupture disc devices you can be assured BS&B has the right rupture disc to suit your application.

Our standard range covers sizes from 1/8" (3mm) to 72" (1,828mm) and pressures from 4" WC (10 mBarg) to 100,000 psi (6,900 Barg).



A complete range of pressure and temperature instrumentation for general purpose, marine and military applications. Local assembly and manufacturing of select items.

Pressure Instruments

- Pressure Gauges - Gauge, Absolute, Differential
- Pressure Switches
- Pressure Transmitters - OEM & DP Type
- Pressure Recorders & Controllers
- Fit and manufacture of Isolating Diaphragm Seals
- NATA Calibration



Temperature Instruments

- Temperature Gauges - Bi-metal and Gas Filled
- Exhaust Gas Thermometers
- Temperature Switches
- Temperature Transmitters
- Temperature Recorders & Controllers
- RTD's & Thermocouples
- Thermowells
- Temperature Calibrators



Explosion Vents

BS&B's range of explosion vents offer an economic solution for protecting your plant from dust explosions. BS&B's VSP vent has been tested to over 1,000,000 pressure cycles from vacuum to light positive pressure, while retaining its burst accuracy.



Explosion Suppression

BS&B's chemical explosion suppression systems are the best way to protect your plant and equipment by suppressing a dust explosion before it happens. We can offer a complete protection and prevention solution consisting of chemical suppression, chemical and mechanical isolation, venting and flameless venting.



Flame Arrestors

BS&B FlameSaf manufacture inline and end of line flame arresters for deflagration, detonation and endurance burning applications, as well as pressure/vacuum breather vents with and without flame arrester elements.



Buckling Pin

BS&B's buckling pin valves have been designed as a fast acting non-reclosing pressure relief device. After activation the valve can be easily reset in minutes without the need to remove the valve from service. Buckling pin valves are available as inline or angle type, with sizes ranging from 2" (50mm) to 60" (1,500mm).



Level Gauges

Local and remote tank gauging solutions via Hydrostatic, Float, Magnetic Bypass or Glass level gauge technologies. Self Powered Contents Gauges manufactured locally in Australia. Level solutions for hazardous areas, marine environments and safety or pressure related approvals.



Level Switches

Solutions for both liquids and solids, we have the following technologies for pump control, alarm duties, and overflow prevention;

- Float Level Switches (Vertical & Horizontal)
- Capacitance Level Switches
- Conductivity Level for conductive fluids
- Vibrating fork and rod
- Rotary paddle and tilt switches for solids.



Bulk Material Level Measurement

Solid Material Level Measurement Radar Level Transmitter designed for medium/long range measurement of powders, particles and bulk solids including applications such as flyash and cement.

This can be integrated into an IMS that can profile usage and send alerts when product levels reach set points.



Liquid Level Transmitters

Whether your application is for a mobile tank, marine tanks, has foaming, high temperature or even interface level, we have the right solution from our extensive suite of level technologies.

- Hydrostatic
- Float Level
- Ultrasonic
- Radar
- Capacitance
- Magnetostrictive



Tank Gauge Solutions

Complete tank monitoring solutions available from our range of level transmitters and process indicators.

- Float switches for tank high and low alarms or bilge / flood warning
- Local self powered contents gauges and sight glasses
- Submersible electronic level transmitters
- Local indicators for one or more tanks
- Centralised display systems for multiple tanks
- Complete networked solutions with multiple displays and output data to platform management systems.



Ultrasonic Flow Meters

A complete range of transit time and doppler flow technologies for clean fluids and slurries in full and partially filled pipes through to open channels.



Flow Switches, Meters & Indicators

For liquids, gases and slurries we have technologies from simple paddle flow switches through to thermal mass and doppler/microphone devices.

In addition to our suite of Magflow products we offer Vortex, Oval Gear, Turbine and Coriolis Flow Solutions.

Variable Area (Rotameter) flowmeters with optional flow alarms and transmitters, offer a clear local indications of fluid flow.



Magnetic Flow Meters (Includes Slurries)

HMA Specialises in the manufacture and supply of magnetic flowmeter tubes with ceramic/basalt liners for simple integration into our Wear Solutions piping solutions. In addition we can manufacture tubes with custom ID's and lay lengths using traditional rubber and PFA liners. Flexibility in our design allows flowtubes to be supplied so that they are compatible with the majority of electronics on the market.



Thermal Mass Flow

Kurz thermal mass flowmeters incorporate advanced microprocessor electronics technology and constant delta T mode of operation to provide accurate and real time flow measurement. Response time is critical with this type of device with Kurz offering one of the fastest response times available, especially when compared against Constant Power technologies. Ideally suited to aeration, combustion air, flare gas and digester gas applications the following solutions are available to meet your needs:

- Single Point insertion flowmeters
- Multipoint insertion flowmeters
- Chlorine Meter
- World first Wet Gas Flow Meter using this technology

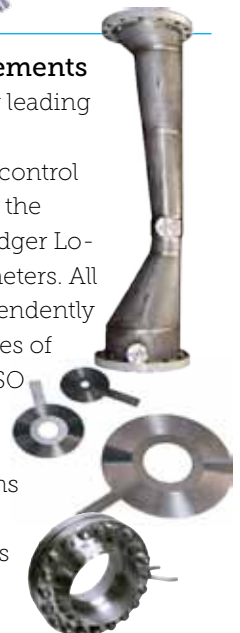


Primary Flow Elements

We supply industry leading differential flow measurement and control products including the highly regarded Badger Lo-Loss and Venturi meters. All products are independently verified to accuracies of or better than the ISO standard.

Key solutions are;

- Orifice Meter Runs
- Venturi's
- Insertion Venturis
- Flow Nozzles
- Pitot Tubes



Oil in Water Detection

Hydrocarbon analysers for oil detection monitoring using fluorescence technology when sensitivity and reliability counts.

TD-500D -

Portable Grab Sample Analyser for analysing Oil in Water and Soil.

TD-3100 -

Laboratory Fluorometer for detection of Oil in Water and Soil.

TD-4100XD & TD-120 -

Online Oil in Water Monitor.



Oil on Water Detection

Floating oil on water detectors provide an easy to install, low maintenance solution to the detection of oil and hydrocarbon pollutants in retention pits and ponds.



Waste Water Treatment

Complex waste water treatment, utilising a patented dosing and floatation system. The technology provides mixing rates in the order of + 20 000 Reynolds numbers from which additional benefits are derived. The technology utilises an elevated pressure environment of + 2 kPa to increase the rate of reaction to achieve the end point required rapidly for the particular function required within the process.

The process is capable of removing hydrocarbon contaminants as well as break and separate any Emulsions contained within the waste water.

The system removes 99,9% of 10 -2 micron oil droplets. The process is able to cost effectively and efficiently remove various organic and inorganic suspended solids to produce a clean clear treated water with a separated reduced moisture solids.



Oil & Water Separation

Oil and water separation utilising hydro-cyclone technology. Hydro-cyclones can be used to separate oils, fats, grease and solids from contaminated water.

An hydro-cyclone separator relies on centrifugal force rather than gravitational forces for separation. The centrifugal force generated inside the vortex of the hydro-cyclone separator is in the order of 2,000 times the force of gravity. With such force even emulsified oil droplets can be separated. Under normal circumstances, 95% of 10-15 micron oil droplets can be removed, using recycling techniques. A process decant tank provides 97-98% dry oil for reprocessing.



Level Measurement for Harsh Environments

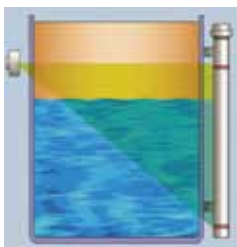
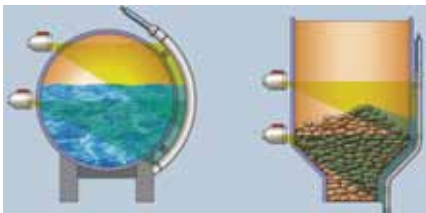
Whether continuous or point level control, our radiometric products are perfect solutions for solids and liquids applications.

This technology is ideally suited to the most difficult of applications and is not affected by;

- Internal obstructions such as agitators
- Extreme process temperatures
- Highly Alkaline or Acidic processes
- Sticky applications

In addition the microprocessor based technology provides automatic compensation for;

- Vapour density changes
- Foam and Gases
- Process Buildup



Process Density Measurement

Nucleonic technology is ideally suited for liquid processes where traditional contact technologies cannot and should not be used. These density measurement solutions are not affected by;

- Extreme process temperatures
- Highly Alkaline or Acidic processes
- Abrasive applications such as slurries
- Violent and/or erratic product flow
- Pipe Materials
- Liner Materials



Material Composition

Ash Determination

Combined Ash & Moisture Full

Stream Elemental Analysis

Determination



Non-Contact Material Weighing

Mounts externally to conveyor with no modifications required. Works on flat or trough belt, bucket and screw. Can be mounted to inclined conveyors and suitable for variable or fixed speed conveyors.



Service, Commissioning, and Disposal

- Start-up & Troubleshooting
- Source Life Calculations
- Disposal back to approved disposal facilities in USA or Europe
- All documentation as required by local authorities, including notice of final disposal



Pore Water

Standpipe or Casagrande Piezometers are economical systems allowing manual water level reading and water sampling if required.

Pneumatic Piezometers are suited to short term monitoring of low pore pressures.

Vibrating Wire Piezometers, simple to read, instant response. Ideal for where automatic data acquisition is required.

Fibre Optic Piezometers for hazardous environments.



Ground Water

Large range of equipment for monitoring and physically protecting monitoring wells.

Data loggers are also available for use in monitoring water levels either above ground or in-hole systems.

Water level indicators and whistles also available to manually record static water levels.



Borehole Cameras

Small diameter colour cameras can inspect, visually view and electronically record the conditions of a borehole or casing. Simple to use and available for purchase or hire.



ShapeAccelArray (SAA)

Comprises of continuous strand inclination monitoring segments each consisting of 3 MEMS (micro electrical mechanical sensors) that can be further resolved to measure displacements. Used vertically to track magnitude and direction of lateral deformation in 2 dimensions, and horizontally to monitor vertical deformation. Can also be configured to monitor tunnel perimeter cross sectional displacements.



Biaxial Inclinometer

Monitors the inclination of embankments and structures. The Inclinator Probe is passed along the length of a grooved Inclinator Casing, which is placed in the borehole or attached to the structure. Uses digital servo accelerometers to provide precise data on the magnitude and location of lateral displacements. Readings are displayed and automatically stored for data processing using a PDA that utilises Bluetooth Communication between the Inclinator Probe/cable reel and PDA unit.



Tilt Sensor

Designed to be externally mounted to a structure allowing the structure to be monitored for inclination deviation which in turn can be used to determine horizontal and vertical displacements.



Inclinometer Casing

ABS polymer Inclinator Casing is self-aligning and has self-coupling connections. Quick and simple assembly with accurately machined grooves allows for ease of installation resulting in quality Inclinator monitoring results.



Inplace Inclinator

Utilises a series of inclination monitoring accelerometers permanently housed within Inclinator Casing and linked together to continually monitor, via the use of a Datalogger, the inclination of a particular inclinometer.



Data Loggers and Readouts

Used to monitor instruments remotely or to provide instantaneous readings, the Dataloggers and Readouts are constructed to withstand the harsh environments found on site. Datalogger enclosures are specifically designed and constructed to meet clients' requirements. Dataloggers allow data to be accessed, displayed and alarmed online or via radio networks. Can be mains, battery or solar powered.



Extensometer

Specialising in a diverse range of multiple point Extensometers to suit most displacement monitoring requirements in addition to open and underground mining projects. Easily installed and connected to Datalogging Systems. Our deep hole range is ideal for subsidence monitoring and have been installed down to 900m in depth with up to 24 anchors.



Displacement Detector System

These behave as an early warning system consisting of a series of tensioned stainless steel wire continually monitoring real time embankment displacement. The wires are connected to a switch system which when a pre-set displacement is exceeded or the wire is broken create an audible/visual alarm to be activated. Up to six sensors monitored continually.



Convergence Monitor

Based on a spring loaded wire mechanism. Measuring a displacement range of 1m but can monitor up to 20m with extension wires. When used with a Readout has an output resolution of 0.1mm. Suitable for remote reading and data logging. Light, small and simple to install.



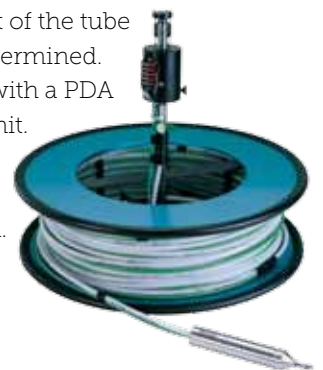
Tell-Tale Crack Monitors

Consists of two plates that overlap for part of their length allowing 2 dimensional monitoring of surface cracks. One plate is calibrated in millimetres and the other is transparent, marked with a hairline cursor. Relationship of the cursor to the scale represents the amount of movement. Range +25mm. Various positional applications are easily monitored.



Hydrostatic Profiler System

Designed to measure horizontal settlement profiles at intervals along a buried/backfilled semi-rigid access tube. By comparing profiles taken at different times, the displacement settlement of the tube can be determined. Supplied with a PDA readout unit. Operating range is +1 to -17m.



Point Load

Portable machine suitable for use in the field or laboratory to determine the point load strength index of rocks specimens. Uses a hand operated hydraulic jack for load application, and a strain-gauged load cell with digital readout for load monitoring. Features include peak load function, protective perspex safety screen, platen separation indicator and smooth platen retracting system. Readout range 0 – 50kN, core size up to 75mm diameter. Incorporates a micro-processor for superior load measurement with increased accuracy. Hydraulic version also available.



Rock Stress

Two types of Rock Stress Meters for borehole application are available. Hydraulic type Rock Stress Meters are best suited for coal and soft rock applications these can be read using a bourdon tube pressure gauge or an electronic pressure sensor. Vibrating wire Rock Stress Meter which works on a proving ring principle and are best suited to hard rock applications. Both are installed in specially drilled boreholes and can be read remotely.



Structural Monitoring

Load Cells can be used in tunnels and excavations to monitor rock bolts, tunnel linings and structural beams.

Available in different dimensions, shapes, reading technologies and load ranges.

Load Cells can be used for both dynamic and static applications and can be easily connected to Datalogging systems.



Earth Pressure Monitoring

Measurement of earth pressure in embankments, dams, retaining walls and abutments. Consisting of two flat plates of various sizes, welded together around their periphery and filled with an incompressible fluid. Ideal for long term monitoring and easily connected to automatic data acquisition systems.



Strain Gauges

Vibrating Wire Surface Strain Gauges used in any application to monitor strain in concrete, steel or masonry structures. These can be affixed by spot welding, arc welding or bolting.

Vibrating Wire Embedment Strain Gauge used for measurement of internal strains in prefabricated concrete panels, massed concrete or within shotcrete lined structures.





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HMA GROUP

MATERIALS HANDLING

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