

QUALITY • INTEGRITY • RELIABILITY

COMPLETE PLANT CAPABILITY

133 Kurnall Road, Welshpool
Western Australia 6106



LIMESYSTEMS.COM.AU

LIME SYSTEMS
BULK STORAGE SOLUTIONS

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Lime Systems

Lime Systems-Bulk Storage Solutions Pty. Ltd. is a locally owned and operated company based in the Perth suburb of Welshpool in Western Australia.

Lime Systems commenced trading in 2005 with a focus on the handling, storage, recovery and mixing of dry powdered bulk materials. Our Principal has in excess of forty years' experience designing and delivering processing facilities to major mining houses worldwide and providing assistance and advice to end users on efficient use of their reagents and reagent plant utilisation.

Lime Systems personnel are dedicated to working with our clients and stakeholders, listening to and understanding their requirements to achieve the common goal of bringing a project to completion that adds value to the client's process. Due to the wide variation in process parameters the majority of facilities are custom designed. Our in-house team of engineers, ensure the specific requirements of our customers are met and the equipment operates reliably under the demanding conditions experienced throughout the mining and mineral processing industry.



By engaging with Lime Systems as your supplier, you will ensure that the product will;

- Be delivered on time and in a manner suitable for the selected mode of transportation
- Achieve nameplate capacity on commissioning
- Operate reliably throughout its service life
- Comply fully with all relevant and applicable codes, standards and client specifications.

The cumulative knowledge and experience of our personnel ensure every conceivable aspect of the plant is designed with safety being paramount and for ease of operation and maintenance throughout its service life. Lime System's intention is to develop mutually beneficial relationships with all clients that last well into the future. Our ultimate goal is to have a better relationship with our clients at the conclusion of a contract than we enjoyed at the commencement of it. Through experience gained and a philosophy of continuous improvement we commit ourselves to supporting our clients post contract to ensure satisfaction with our product and performance is maintained.

Products and services within our range are comprehensively detailed in the following sections of this brochure. Dry bulk powdered products handled include but are not limited to the following:



- | | |
|-----------------------------------|--------------------------------------|
| • Hydrated Lime | • Carbonate) |
| • Quicklime | • Bentonite |
| • Limestone (Grinding circuits) | • Diatomaceous earth |
| • Cement | • Barite |
| • Flocculants | • Magnesium Oxide |
| • Xanthates | • Ferrous Sulphate |
| • SMBS (Sodium Metabisulphite) | • Copper Sulphate |
| • CMC (Carboxymethyl Cellulose) | • Citric Acid |
| • Caustic Soda (Sodium Hydroxide) | • Spodumene (Lithium source mineral) |
| • Sodium Cyanide | • Flour |
| • Guar | • Sugar |
| • Soda Ash (Sodium | • Starch |

Quicklime Slaking Facilities



ANAGOLD MADENCILIK

Copler Sulphide Expansion Project, Turkey

One of the largest quicklime slaking facilities in the world comprising a 2,000 tonne capacity bulk storage silo and parallel slaking circuits utilizing 2.3m diameter by 4.6m EGL packaged roller mounted ball mills. Each mill is capable of slaking pebble lime at a rate of 13TPH or powdered lime at a rate of 26TPH for a total dry throughput rate of 52 TPH



NEWCREST MINING LTD

Lihir Island, Papua New Guinea

The client receives quicklime in standard 20' ISO sea containers and required a container tipping facility with mechanical transfer to a 200T silo and a metering and feeding system to an 8TPH roller slaking mill. Cyclone classification of the output to produce a 20% solids milk of lime with a P80 of 75 microns and delivery to a local 50 cubic metres agitated storage tank for a transfer to a remote plant storage tank





ADITYA BIRLA
Nifty Copper Mine
Great Sandy Desert,
Western Australia

A turn-key design and supply of a 150T capacity silo, 3TPH roller mounted ball mill slaker, cyclone classification and a 150 cubic metres agitated storage tank, plant ring main and milk of lime distribution system. Lime Systems designed and installed the civil works, carried out the site mechanical and piping installation and provided an electrical control package including an MCC installed in a standard 20' ISO container. All works completed on time and on budget.

QUEENSLAND STATE GOVERNMENT
Roadtek, Mt Morgans, Queensland

A 1.0 TPH package roller mounted ball mill slaker integrated into an existing circuit to replace an unreliable paste slaker. The full feed system from the silo discharge to the cyclone overflow and underflow. The facility provides milk of lime for the neutralization of mine drainage acidic water from the disused Mt Morgan copper gold mine.



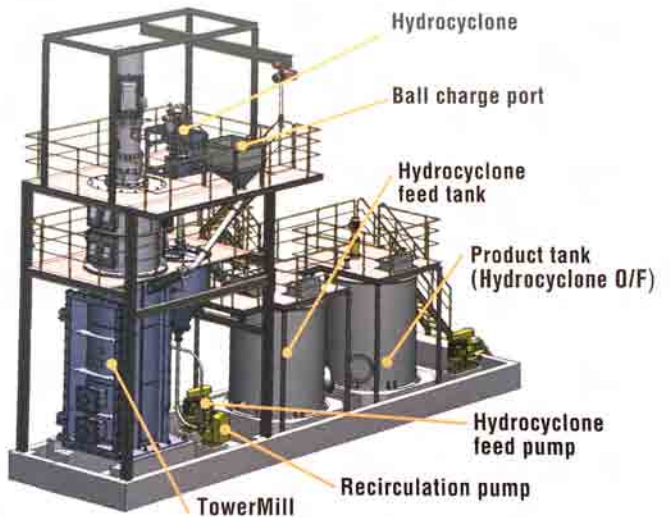
ANGLOGOLD ASHANTI
Tropicana Gold Mine, Western Australia

The design, manufacture and supply of a 300T capacity silo, a 3.0TPH roller mounted, packaged ball mill and a 300 cubic metres agitated storage tank. Subsequent to the original supply an additional 300T capacity silo was designed, supplied and installed under turn-key conditions with full integration into the existing circuit.

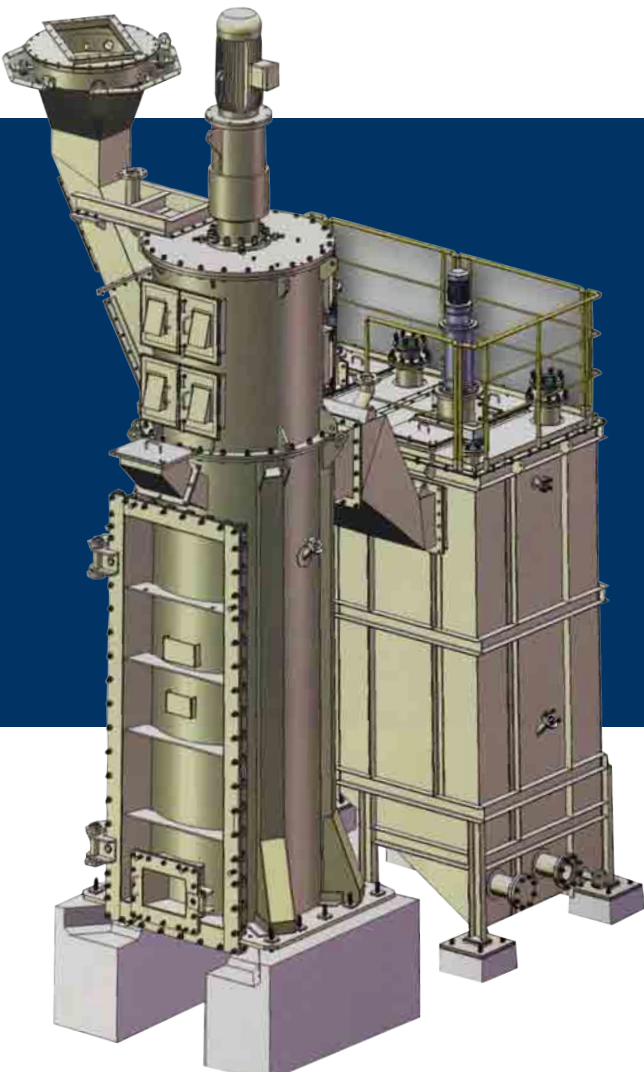
Quicklime Slaking + Regrind Mills

Lime Systems

Lime Systems manufactures a range of packaged roller mounted ball mills suitable for quicklime slaking and regrind applications. The mills range from 600mm diameter for laboratory batch testing applications through to the largest mill currently available of 2.3m diameter with an effective grinding length of 4.6m. SEW Eurodrive geared reducers are used exclusively on Lime Systems mills and all units have fully automated grease lubrication systems for the drive and idler shaft bearings.



**TowerMill Limeslaker system outline
(Closed circuit grinding for fine product)**



Nippon Eirich

Through an association with Nippon Eirich, Lime Systems has access to their range of the original Kubota Tower mill for slaking and limestone grinding applications. These units have the ability to produce a very fine grind at a much lower power consumption for the same throughput as conventional mills with a range of units from 0.4kw to 1,120kw installed power. Lime Systems are able to engineer modular slaking plants minimizing both the facility footprint and installation times from contract award through to commissioning.

GOLD RIDGE Solomon Islands

A 1.2M diameter unit with an effective grinding length of 2.3 metres with an installed power of 37.0 kW to slake at a rate of 1TPH.



ANAGOLD MADENCILIK Copler Gold Mine, Turkey

Two of the largest packaged mills constructed capable of slaking 26TPH of powdered quicklime. 2.3 meters in diameter with a 4.6M EGL with a 250kW drive motor and 110kW idler drive.



TALISON LITHIUM Greenbushes, Western Australia

A 600mm diameter by 900mm EGL pilot plant mill with an integral feed hopper and VVVF screw to batch process Spodumene ore. A single 5.5kW drive installed.



AUSTPAC Newcastle, New South Wales

One only 900mm diameter with a 1.8 EGL mill with an installed power of 15.0kW to fine grind mill scale is part of a metals recovery program. The unit was supplied with specialized feeder and discharge conveyor under the mesh trommel. This system employed a dry grinding process.

Hydrated Lime Processing

PREMIER COAL

Collie, Western Australia

A 55 tonne capacity hydrated lime silo with a 25 cubic metres agitated mixing tank and primary and secondary positive displacement dosing pumps delivering milk of lime to a coal mine and drainage water neutralization facility.



SOUTHERN SEAWATER JOINT VENTURE

Binningup Desalination Plant, Western Australia

Lime Systems designed and supplied four identical hydrated lime silos with Loss-In-Weight product metering to produce 2% lime water solution for pH control of the Perth drinking water supply at the Binningup desalination plant.

The four facilities have operated at 100% availability since commissioning with routine scheduled replacement of the dust collectors filter media being the only maintenance requirement undertaken.



HARSCO

Whyalla, South Australia

A packaged system enabling receipt of hydrate bulk bags and providing a dust tight enclosure for the rupture of the bags with a metered delivery of hydrate to a mixing tank via an inclined screw conveyor.

This facility replaced an open bulk bag breaking system that delivered the bags contents directly to an agitated mixing tank which was extremely dusty and resulted in a poorly mixed product resulting in frequent pump blockages due to lumps of hydrated lime blocking the pump suction.



BHP BILLITON

Ravensthorpe
Nickel, Western Australia

A 100 cubic metres capacity silo with dual direction feed screw conveyors delivers hydrated lime to the two sulphur conveyors in the acid plant. As per all Lime Systems silo installations this unit is fitted with a correctly sized bin activator, a pressure/vacuum rooftop mounted relief valve and a reverse pulse bin vent filter. The silo also incorporates a Lime Systems Proprietary bin overfilling protection system with a local readout of the bins contents positioned adjacent to the filling line connection point.



PT TAMBANG TONDANO NUSAJAYA

Toka Tindung Mine, Sulawesi

The remote Toka Tindung mine receives its hydrated lime in 1500kg bulk bags. A system comprising a bag breaking station, an agitated mixing tank with transfer to a 125 cubic metres agitated storage tank having plant ring main pumps was supplied. All tanks were of bolt together waterproof construction. Lime Systems mobilised a construction crew to site and carried out the complete site erection and installation of this facility including the electrical control panel with associated wiring and commissioning of the facility.

Cimprogetti – Lime Technologies

Since its inception as a family owned company at Bergamo (Italy) in 1967 Cimprogetti have grown to become the world leader in the design and construction of Lime Production plants.

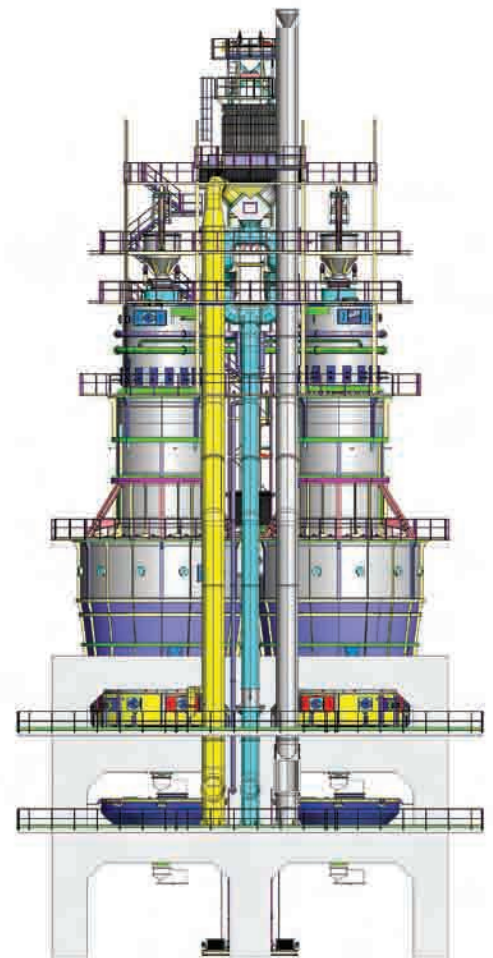
Continual development and comprehensive computer modeling, coupled with advanced laboratory testing of both raw materials and finished products have enabled optimisation of plant design and feed selection. Cimprogetti currently operates in 40 countries on five continents and has in excess of 400 successfully installed facilities in operation.

Quicklime Production



Cimprogetti produce a range of vertical kilns committed to the Kyoto Protocol of "Clean Development Mechanisms" to reduce greenhouse gas emissions. Production capacities ranging from 50 to 600 tonnes per day with a wide choice of fuels including Natural gas, Lean gases, Oil, Waste oil, various coals, Pet coke or sawdust are available.

Cimprogetti's development of the single shaft (counter current) and the "Twin D" twin shaft (regenerative) quicklime kilns have provided the most economic and cost efficient production of calcium oxide while maintaining a commitment to producing high quality lime.



Hydrators - Separators

A subsequent material progression from the production of quicklime was the development of the CIM - Hydrax range of hydrators. From the basic CIM - Hydrax through to the third generation (TG) and highly specialised fourth generation units (4G) these units provide a compact machine capable of converting a given raw material into the required finished product.

The units are robustly constructed for minimum maintenance, have a high degree of flexibility in terms of turn down rates, can accept a wide range of raw materials and can be configured with a fully automated control system for unattended operation.

Hydrate classification is carried out by the CIM - Microsep high efficiency classifier which can be used as a standalone unit or in conjunction with grinding equipment in a closed circuit configuration.



Precipitated Calcium Carbonate



Recent developments in the requirements for fillers and coating agents in various industries have resulted in the production of packaged, standalone PCC Plants.

Whether this is additional to an existing quicklime production facility or incorporated into a paper mill, rubber plant, plastics manufacture or a specific PCC production facility, Cimprogetti have the technical expertise and experience to custom design the finished product and maximize the profitability of the plant while minimising operating costs and capital investment.

Dry Bulk Materials Storage Silos

COCKBURN CEMENT LTD

Port Hedland, Western Australia

Three 200 tonne capacity cement silos on a common support structure wind rated for severe cyclones positioned over a weigh bridge for the accurate loading of delivery tankers. Each silo fitted with a bin activator, pneumatic isolation gate and a Mecal telescopic dust less loading chute.



BARRICK

Osborne Copper, Queensland

A one piece 200 tonne capacity cement silo with a fabricated support structure, caged and staged roof access ladders, a reverse pulse bin vent filter, bin activator with metered discharge through a rotary valve to a weight belt feeder.





COPLER ANANGOLD Turkey

A 2000 tonne capacity bolted silo of rolled tapered panel construction. Supplied through our association with Tank Connection of Parsons, Kansas, USA. A wide range of capacities, roof access configurations and discharge options are available.

Two similar sized silos have subsequently been erected for the Tianqi Lithium Hydroxide plant at Kwinana, Western Australia to receive raw Spodumene ore and discharge this via bin activators to pneumatic transfer systems delivering the product to process.

ANGLO GOLD ASHANTI Tropicana Gold Mine, Western Australia

Subsequent to the supply of the original slaking facility AGA required an additional 400 tonne capacity quicklime silo to enable plant operation with access roads closed due to wet weather.

Lime Systems undertook the total design insisting integration with the existing feed system and carried out the structural, mechanical and electrical installation.

The silo design and integration with the original plant allows Tropicana flexibility with its supply contract for Quicklime as the varying products can be efficiently received and discharged with minimal adjustment to the installed mechanicals.



Bin Activators

Lime Systems-Bulk Storage Solutions have developed a full range of hard metric, heavy duty, bolted seal ring bin activators designed to enhance the material discharge from either new or existing storage silos or stockpiles.

Designed utilising the latest CAD/CAM software to ensure the gyrator force acts through the unit's centroid to provide a uniform amplitude in all directions.



The low headroom design enables savings in bin design and access as well as ensuring a positive discharge of the product while eliminating "rat-holing", bridging, segregation or consolidation of product with discharge to downstream process on a "first in first out" basis.

The activators are noiseless in operation, most commonly using a single out-of-balance URAS gyrator with a very low power draw.

Each unit is supplied with an integral manually operated emergency sliding shut off gate for the isolation of product flow to downstream equipment when maintenance schedules require this.

Vibrating Conveyors

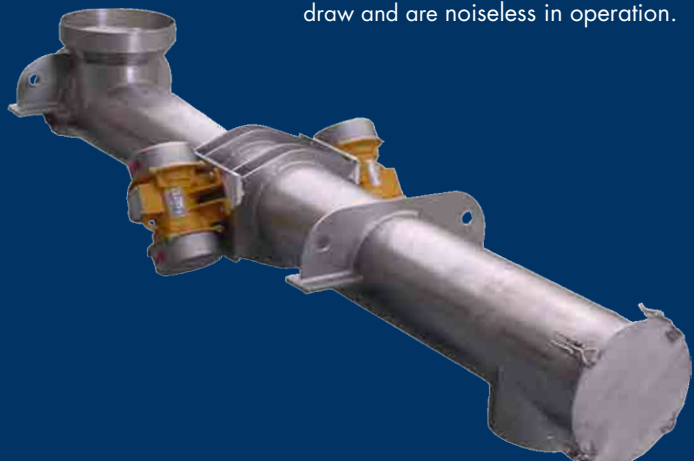


Lime Systems - Bulk Storage Solutions manufacture a range of vibratory conveyors in tubular configuration utilising pipe, square hollow sections or rectangular hollow sections.

Optional overhead suspension or foot mounted units up to approximately 7.0m length are available in a single unit. Extended lengths can be achieved by "piggy backing" single units or the incorporation of "countermass" style units.

Due to the units having no internal parts and the motion of the material within the units, they offer a viable alternative for the transfer of very sticky, very hot or abrasive materials. Inlet and discharge ports can be made dust tight to comply with H&S requirements for dusty or toxic powders.

The units are driven by twin contra rotating URAS gyrators with low power draw and are noiseless in operation.



Silo Bin Vent Filters & Dust Collectors

Lime Systems have designed and manufactured a range of reverse pulse bin vent filters particularly suited to specific applications.

SVF-18

Suited to silos recovering product pneumatically from pressured road delivery tankers.



SVF-12

Suited to silos and bulk bag breaking stations for the control of dust generated on filling or bag rupture.

All units are circular in construction to withstand higher operating pressures with mild steel bodies and tube sheets. All components have all industrial powder coating applied inside and outside.

Reverse pulse cleaning of the filter media is regulated by an integral solid state controller mounted in a poly carbonate enclosure which also houses the actuating solenoids 24 VDC, 110 – 240 VAC inputs are available with both having 24Vdc output allowing for safer operation and maintenance.

The SVF-18 and SVF-12 have two piece lids allowing ease of opening with both units having locking pins to prevent accidental closing by wind while servicing is being carried out.

The use of bulkhead fittings and wingnuts negates the requirement for tools to carry out most servicing activities. All units are supplied with a roof adapter containing a mesh base to prevent the accidental entry of bags or contaminants into the silo.



SVF-3

To be mounted on hoppers being gravity fed dusty product from a metered source upstream.



Flocculant Plants

ILUKA RESOURCES

Jacinth Ambrosia Project
Ceduna, South Australia

One of the largest flocculant production facilities manufactured in Australia comprising a 100 cubic metre bulk flocculant storage silo with parallel mixing tanks delivering product to two 35 cubic metre mixing tanks and transfer to a 76 cubic metre storage/aging tank. All plant positive displacement dosing pumps were also supplied.



KARARA MINING LTD

Karara Magnetite Project, Western Australia

A 120 cubic metre flocculant receive and storage tank together with an insulated 120 cubic metre coagulant storage tank. Installed with Coagulant unloading pumps and the total plant variable speed dosing pumps. Done on a Turn-key basis including the design and installation of the civils, mechanical design, supply and install with full electrical design supply and install.

RESOLUTE MINING

Syama Mine, Mali, West Africa

A fully portable sled mounted flocculant preparation package comprising a 4 cubic metre mixing tank situated over a 10 cubic metre storage tank with gravity transfer. A 200 litre dry powder hopper and operating and stand by 1.5 cubic metre/hour. variable speed dosing pumps. Full on board PLC based control cabinet with HMI.



MSP ENGINEERING

Rio Tinto Brockman 4,
Pilbara, Western Australia

A skid mounted system comprising a 130 litre dry powder hopper, a 500 litre (live) mixing tank with gravity transfer to a 1200 litre storage tank and operating and stand-by variable speed dosing pumps. Full on board electrical control package.

Reagents - Xanthate

Lime Systems have carried out the design and construction of Potassium Amyl Xanthate and Sodium Ethyl Xanthate plants. The plants have the highest hazardous area rating of Exd. IIC T6 and require full fume ventilation with non-sparking fans, remote operation of the reverse pulse filters and T6 class electrics on the hoist and trolley, fans, agitator, pumps and instruments.

The facility consists of a bulk bag receipt and breaking station situated over an agitated mixing tank. The mixed solution is transferred to an adjacent storage tank which has the plant positive displacement dosing pumps. A separate fully ventilated storage building for bulk bags has been included. The systems have the building structural design carried out to AS4100 and AS1170.1, Mixing and storage tanks to API650, pressure piping to AS4041 and ventilation to the complete facility to AS/N25 60079.10.1:2009



Anti-sparking induced draught, ventilation fans fitted with Exd. IIC.T6 electric motors installed on the mixing tank dust collector.



Xanthate preparation building and bulk bag storage shed.



The Xanthate plant positive displacement dosing pumps and sump ventilation fan.



The Xanthate preparation building storage tank and bulk bag ventilated storage facility.

Reagents - SMB CMC - Soda Ash

Lime Systems have carried out the design and supply of numerous reagent processing facilities. The units are designed to accept product in 200 litre drums, FIBC's (Bulk Bags) or pressurised road delivery tankers. The facilities incorporate a receival system, pneumatic loading or monorail with hoist and trolley, storage compartment with a metered withdrawal to

a mixing system, transfer to plant storage and variable speed dosing to process. Products handled include Carbon Methyl Cellulose (CMC), Sodium Meta Bi Sulphide, SMBS, Guar, Caustic Soda, Soda Ash, Ammonium Sulphate, Aluminium Sulphate and Ferrous Sulphate.



SIR SAMUEL MINES

Sinclair Nickel Project, Western Australia

The complete reagents facility supplied to the Sir Samuel Mines, Sinclair Nickel Project incorporating Guar, CMC, Flocculant and Xanthate.



TALISON LITHIUM

Soda Ash
Greenbushes, Western Australia

A skid mounted soda ash bulk bag receival and breaking station situated over an agitated mixing tank with transfer to an adjacent storage tank.



SANDFIRE RESOURCES

DeGrussa Copper Mine
The Murchison, Western Australia

The product metering screw delivering product into the pneumatic transfer line to the system wetting head.

SANDFIRE RESOURCES

DeGrussa Copper Mine
The Murchison, Western Australia

A bulk bag receipt and breaking station utilizing a common monorail for individual CMC and SMBS mixing and dosing facilities.



MAGGIE HAYS CMC

Norilsk Nickel – Maggie Hays Nickel Mine

A CMC bulk bag receipt and breaking station with pneumatic transfer to a 25 cubic metre mixing tank, transfer to a 50 cubic metre storage tank with an operating and stand-by dosing pump.



A manually operated drum tipper with a gravity roller feed conveyor designed to accommodate PAX or SEX delivered in 200 litre capacity sealed drums.

Reagents Cyanide

Newcrest Mining engaged Lime Systems to carry out the design and supply of the cyanide mixing and preparation facility as part of the Lihir million ounce per annum upgrade. The complete facility was designed in full accordance and compliance with the International Cyanide Management Code



The 120 cubic metre cyanide mixing tank at the Lihir Gold mine



The bag breaking station atop the mixing tank with its dynamic scrubber viewed from the top of the plant storage tank.

Old's Elevator

The Old's Elevator is a revolutionary new concept for vertically elevating numerous types of bulk materials. With only one moving part – the outer rotating casing – the material is collected and efficiently elevated to the discharge point. Smooth and quiet in operation, the unit is able to infinitely vary the product delivery rate across the total speed range and is therefore able to become a very accurate metering device.

The rotating casing has two pick up scoops at the base which collect the product and admit it to the static screw inside the casing with centrifugal force keeping the product against the inner wall and the material is elevated as more product is admitted to the base. Adjustable guides centralize the rotating casing which is mounted in a bearing situated in close proximity to the drive.



MATERIALS HANDLED

Foundry Sand, Casting Sand, Sugar, Coal, Flocculant, Fertilizer, Beans, Rice, Plastic pellets, Stock feed pellets, Iron Ore lump and fines, Nickel concentrate, Hydrated lime, Quicklime, Flour, Wheat, Cement, SMBS, CMC and viscous slurries such as molasses.



ADVANTAGES

Simple design with only one moving part requires a low spares inventory and low maintenance costs. Differing materials can be elevated without segregation. Noiseless in operation. The elevators have metering capability if driven by a VVVF controller. A very small footprint enables an easy retrofit in existing plants. All bearings are external and have no contact with the product. There is no dust generation due to the method of operation.



Screw Feeders & Screw Conveyors



Lime Systems have developed a range of heavy duty, mining industry construction screw feeders and screw conveyors for the metered delivery or transfer of powdered products. Units can be designed with variable speed control for metering applications or variations in design to accommodate mixing, blending, heating, cooling and drying with manufacture in mild steel, stainless steel or abrasion resistant materials.

Lime Systems have standardized on SEW Eurodrive geared reducers on all our screws. Attention has been given to ensuring positive sealing of the end plates with an internal hydraulic seal on the stub shafts, a grease purged labyrinth external to the end casing and gland packings with compression ring back-up with the bearings mounted outboard on heavy duty stud mountings.



HELIX RESOURCES

Well Ops – North Sea

Dual compartmentalized screw feeders with one screw delivering 9 parts garnet blasting grit to the other 7 parts granulated copper furnace slag to have a high pressure water system for the abrasive cutting of disused sub-sea well heads. Designed and manufactured to DNV 2.7



ANAGOLD MADENCILIK

Copler, Turkey

A quicklime slaker feed hopper with independently driven screws each capable of feed rates between 7TPH and 26TPH. The feed hopper is fitted with an overwrap to ensure an even distribution of product discharged from the storage silo into the feed hopper enabling adequate feed to both screws at all times.

BHP NICKEL WEST

Kwinana, Western Australia

Four nickel concentrate cooler screws receiving powdered nickel concentrate at up to 400°C and transferring it against an induced airflow of ambient temperature air to achieve a temperature reduction. Two parallel streams of two screws in series operating successfully since 2012.



MSP ENGINEERING

Tianqi Lithium Kwinana, Western Australia

A 30 tonne capacity crushed limestone feed hopper with a variable speed screw feeder operating in Loss-In-Weight mode delivering product to a mill feed belt. The hopper is fitted with an overwrap and fully lined with TIVAR 88 UHMWPE abrasion resistant, low surface friction polyethylene.

PANORAMIC RESOURCES

Savannah Nickel Mine,
Western Australia

A 12 tonne Loss-In-Weight feed hopper and variable speed screw feeder metering cement from a 600 T capacity bulk storage silo into a transfer screw conveyor for delivery to a pug mill in the mine paste backfill plant. Operating successfully since 2007.

TRONOX MANAGEMENT

Tronox Kwinana, Western Australia

Two Titanium Dioxide micronizer feed screw conveyors with an 8.0m unsupported length between the conveyor end plates. Tronox had experienced severe ongoing reliability issues with the previously supplied screw conveyors due to the installation of hanger bearings to support the screw shaft. The Lime System design has totally eliminated this problem.

FLOCCULANT DELIVERY SCREWS

Two only high capacity flocculant delivery screw feeders capable of metering 800kg/hr of flocculant to the pneumatic transfer Venturi and a single open wrap pigtail flocculant for feed rates between 10kg/hr and 130kg/hr. All Lime System flocculant screws are fully manufactured in grade 316 stainless steel.

SAG and Ball Charging Machines

Lime Systems have designed a range of ball feeders for the metered admission of grinding media to SAG, Ball or Vertimills. The units can accept ball delivery in 200 litre drums, bulk bag, bulk from a front end loader or via magnet. Operation can be via a local control panel or from the plant DCS. Loss-In-Weight discharge mode available to provide a total weight or number of balls discharged.



ANAGOLD MADENCILIK Copler, Turkey

A 25 tonne capacity hopper fed by a 988 Caterpillar front end loader delivering 125mm diameter balls to the SAG mill feed belt. Operating in Loss-In-Weight mode via control from the DCS

PENOLES, MINERA PENMONT S De RI De Cv. – Mina De Herradura, Mexico

Carrying out Factory Acceptance Testing on one of two 30 tonne capacity SAG mill ball chargers. Units installed on shear beam load cells.



CONDUMEX INCORPORATED Texas, USA

Six ball charging units 2 x 125mm diameter balls, 2 x 80mm diameter balls and 1 x 25mm diameter balls all with local control panels and manually adjustable timer discharge.



PT TAMBANG TONDANO NUSAJAYA Sulawesi, Indonesia

One of two ball mill charging units fed by overhead crane and kibble discharging 65mm and 45mm diameter balls direct to the ball mill feed chute. Controlled from the plant DCS.

Rotary Valves - TBMA

TBMA has a wealth of experience and manufacture the most extensive range of high quality rotary valves and blowing seals available. TBMA, through Lime Systems - Bulk Storage Solutions can supply rotary valves to suit your requirements. All units can be supplied with circular or rectangular inlet and discharge flanges or a combination of both.

The heavy duty models, designated "H" have an optional Tungsten Carbide bore lining with replaceable hardened steel rotor blades and air purged lantern ring shaft sealing. For less arduous duties the "R" & "M" range's offer lower cost whilst retaining the quality TBMA is renowned for. For light duty, the model "S" is available where low pressure differential sealing is required that does not warrant the cost of heavier and more expensive units.



Type H-AR

- Mounted below powder hoppers or as dust explosion barrier.
- Dosing and pneumatic conveying.



Type H-GR

- Pneumatic



Type H-AX

- Mounted below powder hoppers for abrasive and/or mildly cohesive products.
- Dosing and pneumatic conveying.



Type R-AX

- Mounted below powder hoppers for abrasive and/or mildly sticky products.
- Dosing, pneumatic conveying of non-abrasive products.



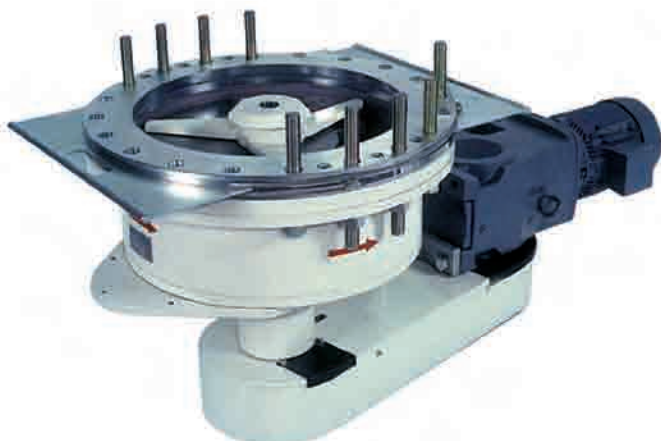
Type M-AX

- Mounted below powder hoppers for abrasive and/or mildly sticky products.
- Dosing, pneumatic conveying of non-abrasive products.



Type S-AX

- To be used in conjunction with filter and cyclone applications.



Horizontal Metering Valve Type HZ - Special Duty

A Totally Different Rotary Valve

Horizontal metering valves can be used for continuous, controlled discharge and dosing of virtually all products stored in silos or hoppers. Horizontal rotary valves combine a large inlet area with a relatively small rotor volume. Even poor flowing products susceptible to bridging and rat holes can be discharged accurately and at high rates by fitting specially designed agitators to the vertical rotor shaft.

Bulk Bag Discharging - TBMA

Specifically designed for the discharge of dry powdered bulk materials from a range of FIBC's (Bulk Bags) again employing the modular concept which allows for a basic unit to have options added to match the degree of automation required in your plant. The following options can be added to the basic model LB-1 or LB-2 bag discharger.

- Customised top or bottom lifting frames.
- Multi function lifting frame for hoist or fork lift
- Three edged cutting knife for more complete release of material
- Dust free discharge by means of rubber sealing membrane
- Vibratory motor for more efficient discharge of product
- Liner tensioner for the clamping of bag internal liners
- Containment enclosures for toxic or hazardous products
- Sanitary "food grade" manufacture
- Safety entry for the tie off of partly emptied bags

The big bag dischargers can be coupled to your choice of downstream metering or conveying systems such as rotary valves, screw conveyors, blowing seals for pneumatic transfer, dense phase transfer pressure pots or weighing systems



Bulk Bag Filling - TBMA

TBMA offers a modular range of Flexible Intermediate Bulk Container (FIBC) filling systems which range from a basic unit which can have options added, to a fully automated system for filling and weighing bulk bags at a capacity of up to seventy (70) bags per hour for bags with individual weights between 500kg and 2000kg.

With features such as:

- Pneumatically operated bag loop retainers
- Double walled filling head with aspiration connection
- Inflatable bag spout with clamping ring
- An inflation system for the bag and liner
- Suspended three (3) point load cell weighing system
- Conical vibrating support table
- Rotating suspension bag support frame

Systems can be supplied with a pallet loader and feed-drive out shuttle loader, filled bag motorised take away conveyor and all weighing mechanisms Weights and Measures certified.



TBMA have adopted a simple concept that utilises the principles of hanging, stretching and vibrating the bulk bag during the filling cycle to eliminate unstable, poorly filled and unstackable bags.



Pneumatic Conveying - TBMA

TBMA via Lime Systems – Bulk Storage Solutions are able to provide both dilute phase and dense phase pneumatic transfer options for most dry powdered material movement applications. The TBMA factory in Noordwijkerhout has an extensive testing facility for the evaluation of product suitability in either transfer mode.

LEAN PHASE

Used as a lower cost alternative to the Dilute or Dense phase. Lime Systems-Bulk Storage Solutions incorporate TBMA rotary valves, blowing seals, inlet adapters and Venturi adapters in conjunction with PDA Hibon "Rootes" style blower packages.

Most dry powders and pellets are amenable to lean phase transfer with a distance limitation of 150 metres. A full range of TBMA fill vent valves, flap and plug diverter valves and multi directional diverter valves are available for incorporation into the delivery line.



BLOWERS

The PDA range of Hibon blower packages are supplied with an integral inlet filter silencer combination and discharge silencer. All components are assembled on a fabricated mild steel base and contained within a demountable acoustic enclosure for reduced operating noise levels.



DILUTE PHASE

Best utilised when the material being transferred does not have a high abrasion index. The motive air requirement can be supplied by either a "Rootes" style blower or a low pressure (2 Bar) reciprocating or screw compressor. Conveying distances up to 400 metres can be accommodated.



DENSE PHASE

The ideal applications for dense phase transfer occur when the material to be transferred is either highly abrasive or product degradation is a concern. The pressure vessel is inserted between the product bin and the conveying line. Motive air requirements are provided by a high pressure (6 Bar) reciprocating or screw compressor. Very high transfer rates can be achieved by engineering systems with pressure vessels in series or parallel with transfer distances of up to 1000 metres.

Paste Backfill Plants Binder Storage & Delivery Silos

Lime Systems have designed and supplied a number of robustly designed and constructed dry bulk powder storage silos fitted with bin activators or discharge cone aeration ensuring product discharge with product to downstream Loss-In-Weight metering of the binder material (cement, minecem, hydrated lime or granulated blast furnace slag) to the system pug mixer. All silos are designed to AS 3774 and AS 4100 with all manufacture carried out in Australia. Lime Systems have carried out the installation of a number of these systems and commissioned all.



ST BARBARA MINES – GWALIA DEEPS MINE Leonora, Western Australia

A 500 tonne capacity ground level bulk storage silo with lean phase transfer to an elevated 35 tonne capacity day bin fitted with a reverse pulse bin vent filter, rotary valve and Loss-In-Weight screw feeder. Installed in 2008 and operating continuously since.



SPOTTED QUOLL, WESTERN AREAS NL Spotted Quoll, Forresteria Western Australia

A 250 tonne capacity Minecem silo positioned on an elevated support structure incorporating the plant control room and having a reverse pulse bin vent filter, bin activator, rotary valve and LIW screw feeder.



BHP NICKEL WEST Cliffs Nickel Mine, Leinster, WA

A 250 tonne capacity elevated cement silo on an open support structure accepting pneumatic delivery of product with discharge via a bin activator, rotary valve and a Loss-In-Weight metering screw feeder to the facility pug mill.



PANORAMA NICKEL Savannah Nickel Mine Kimberly Region, WA

An elevated 600tonne capacity cement silo with a roof mounted davit hoist, bin activator, rotary valve and LIW screw feeder delivering cement to a transfer conveyor and final delivery onto filter cake for admission to the pug mill.

Turn Key Capability

All packaged flocculant and depressant systems supplied by Lime Systems are supplied with full instrumentation and an integral PLC based control panel. All control panels are designed in accordance with the relevant Australian standards and client specifications and standards as applicable with their preferred electrical equipment and instrumentation.

Large bulk storage facilities, slaking packages and more complex plant with independent metering, feeding or dosing systems can be supplied with stand-alone motor control centres typically incorporating a HMI, PLC, all indicators, motor starters, overloads etc.

Additionally operational parameters and levels are conveyed back to the plant DCS via 4-20 mA analogue signals (continuous level) or plant wide communication.



The information transmitted generally relates to:

- The system operational status
- Process liquid levels in mixing and storage tanks
- Product levels in the storage silos
- Motor status, (Ready, Run or Fault)
- All panels undergo full Factory Acceptance Testing prior to dispatch from our premises.



Structural Fabrication

Lime Systems produces the steel detailed manufacturing drawings for all equipment of our supply and structural steel fabrication is carried out under Lime Systems supervision to the latest relevant Australian Standards by sub contract steel fabricators with whom long term business relationships exist.

Fabrication will comply with all nominated specifications and standards forwarded by the client and nominated in the contract documentation. QA/QC regimes implemented by Lime Systems or following the client's specific requirements will be adhered to for each phase of manufacture.



Fabrication is available in mild steel, stainless steel, aluminum or abrasion resistant steels. Mill certificates, welders qualifications and full MDR compliance will be supplied on request. Full surface treatment to the relevant Australian or Project Standard is applied to all fabricated steelwork. Full rights of access for both quality verification and project expediting are extended to all clients.

Civil

The civil design for any facility of our supply can be provided. Alternately, all column loadings and holding down bolt footprints can be supplied on certified drawings for your own in-house civil design. The civil design often varies according to region and conditions. Lime Systems can accommodate your requirements utilising our engineers and draftsmen carrying out the complete civil design or should this be undertaken in-house then provide all information required by the clients civil design engineer in certified form.



Lime Systems can implement the complete site civil installation for any storage facility we provide, including but not limited to the excavation of the necessary area, supply and placing of formwork, reinforcing and holding down bolts, concrete delivery, placement and finishing, stripping out and site clean-up. Lime Systems will work with your personnel to ensure a quality installation with minimum disruption to existing operations.

Mechanical

Lime Systems has a professional and experienced team of construction personnel to offer a full site installation service for all supplied equipment.

Ticketed riggers, dogmen and scaffolders working in conjunction with our mechanical fitters, welders and boilermakers along with sub contracted lifting services will safely and efficiently carry out the installation of your plant and equipment on foundations within the designated area.



Our licensed electrical personnel will carry out all terminations from motors and instrumentation to the system control box/ MCC or within agreed battery limits.



“You must pay a fair price for good quality oats, however the same oats can be obtained at a much lower price once they have been through the horse”



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