AMTAS PTY LTD
Mineral Processing & Materials Handling Equipment

56 Dooley Street, Naval Base
Western Australia 6165
Tel: (618) 9410 2300
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Email: sales@amtas.com.au

PRODUCTS LIST FERTILISER HANDLING - P.1

Blending Plants

Shuttle conveyor & bucket elevator

Trace element hoppers and screw conveyors

Fertiliser Blending and Loadout Facilities.

Amtas can design and manufacture fertiliser blending plants to suit most applications and have a number of operational plants in country and Perth metropolitan areas. With 15 years experience working with local fertiliser companies we can supply a reliable and cost efficient plant to suit your needs. Plants range from small micro batch feeder units for blending trace elements up to large scale blending and loadout facilities with multiple primary hoppers (up to 15 tonne capacty each), multiple trace element hoppers, screen deck , blending screw conveyor, bucket elevator and over head shuttle conveyor for loading transport vehicles. Fully automated, computer control packages are available using customised programming tailored to suit each individual plant. The program controls the start-up sequencing, mass flow rate from each hopper, chemical spray flow rate (if fitted), total combined flow rate, shut-down sequencing and stop on target batch weight.

A typical 200 tph blending plant would consist of the following items:-

- Three to four 10 or 15 tonne major ingredient hoppers with oversize grizzly bars. Support stand with loadcells and loss in weight controllers. LED mass total displays in the hopper face.
- Rotary conditioner in each hopper bottom to break up oversize lumps and bypass screens in the hoppers to allow undersize product to bypass the conditioner.
- 750mm wide, troughed belt feeders attached to the hopper with variable speed drives.
- Three to four 2 to 5 tonne trace element hoppers with oversize screens. Common support stand with loadcells and loss in weight controllers for each hopper.
- Screw feeder or belt feeder with variable speed drive fitted to trace element hoppers.
- Transfer conveyor with load points for each primary and trace element hopper.
- Blending screw conveyor with hopper to accept feed from transfer conveyor. Provision for liquid chemical addition.
- Bucket elevator which lifts the feed to a vibrating screen deck. The screen is mounted in a tower structure and directly above a shuttle conveyor with weighbridge below.
- Vibrating screen deck, horizontally mounted with twin out of balance motors.
- Shuttle conveyor, 900mm wide with 10.0m travel that allows loading of all popular truck/ trailer combinations without having to move on the weighbridge (weighbridge length permitting).
- Pump and weighing platform for chemicals addition. Pump is mounted in an enclosed base with weighing platform above and suits 1000 L bulker tanks.
- MCC (motor control cabinet) with manual stop/ start controls, variable speed drives, soft starters and communication modules.
- Computer, batch program, UPS and LED displays showing mass flow rates and accumulated mass total.

This is a typical arrangement but as each client has individual requirements the plant layouts, component make-up and total feed rates are tailored to suit.

Where possible all components are sourced locally otherwise the best quality German, American and Japanese parts are used.

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PRODUCTS LIST FERTILISER HANDLING - P.2

Belt Feeders

Troughed Belt Feeders, Sidewall Feeders, Weigh Feeders.

A diverse range of belt feeders and weigh feeders are available from our standard range or we can custom design and manufacture to customers requirements. Standard feed capacities are from 500kg/hr to 300tph. Amtas recommend and use SEW Eurodrive gear-motors and Van Der Graaf motorised drive pulleys.

Standard features for corrosion resistance:-

- Polyethylene flat carry idlers & polyethylene or stainless slider beds
- Rubber covered, crowned drive and tail pulleys
- Polypropylene brush, secondary skirts
- Stainless steel fasteners
- PBT (polybutylene) bearing housings on small feeders, cast iron on large
- Polyurethane 2 pack paint on drive gearmotor
- Class 2-1/2 abrasive blast cleaning of frame with epoxy primer & top coats

Options for Feeders

- Rubber or PVC side walls
- Cleated or smooth rubber or PVC belts
- Troughed or flat carry idler support
- Automatic belt tensioner (for weigh feeders)
- Rotary shaft encoder (all stainless design)
- Belt weigher (low profile) with stainless loadcell
- Motorised drive pulley or shaft mounted gearmotor
- Variable speed drive (AC or DC)

Bucket Elevators

Bucket Elevators

Amtas design and manufacture a range of bucket elevators to suit the tough environmental conditions found in fertiliser handling facilities and blending plants. Capacities range from as little as 2.0 tph to 250 tph with varying heights as required.

Casings can be supplied in varying, flanged segment lengths and constructed of mild steel or stainless steel as required. All mild steel casings are abrasive blast cleaned, primed with two pack epoxy primers and top coated with high build two pack epoxy paint. All seams are sealed and painted over to prevent chemical penetration and the resulting corrosion. Stainless steel casings can be supplied acid passivated and left un-painted or abrasive blast cleaned and painted with epoxy primers and top coats.

Internal lining of the casing to prevent corrosion and build up due to condensation can be optioned with 3mm rubber and 2mm sprayed, polyurethane or poly-urea being the common choices. Varying types of rubber are used depending upon the chemical composition of the feed material and other additives that may attack natural rubber.

Drive pulleys are supplied crowned with rubber or ceramic lagging and have replaceable shafts of quality carbon steel or optional stainless steel. Tail pulleys are crowned and designed to shed product to the sides, away from belt contact. These pulleys are precision fabricated from laser cut components.

Amtas recommend and fit SEW Eurodrive shaft mounted gear-motors as standard fitment. Other drive arrangements can be supplied as a matter of choice.

Bearings for the drive pulleys are double spherical roller in cast iron housings.

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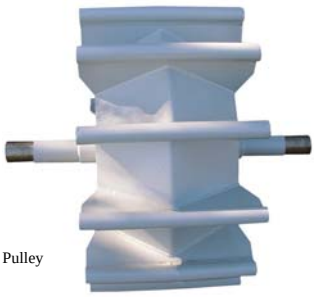
PRODUCTS LIST FERTILISER HANDLING - P.3



Tail Pulley

Digger Bucket

Clam shell gates

Conditioners

Bucket Elevators

Taconite seals are used to seal both drive and tail pulleys and are mounted in stainless steel housings. Take-up unit is stainless steel with all stainless steel fasteners.
Standard top covers are supplied hinged and flanged to allow easy access.
Discharge chutes are supplied with an adjustable UHMWPE liner and are either flanged or have a retaining ring to suit Victaulic couplings. Amtas manufacture discharge pipes of poly-ethylene or stainless steel, as required.
Standard buckets used are Maxi-Lift, Tiger tough in HD Polyethylene or Urethane. Steel "Digger " buckets (2 or 4 off per elevator, depending on length) with hardened reinforced edges are available as an extra. These buckets project approximately 5-6mm further than the standard buckets and help reduce wear on the standard buckets.
Elevator belts are available in rubber or solid woven PVC and are joined using "Maxi-Splice" mechanical clamps.

Options for Elevators

- Standard or "Scavenger" style feed into boot section
- Working access platforms and ladders
- Shaft mount drive or Gearbox with pulleys and belts
- Stainless steel pulley shafts
- Rubber, polyurethane or polyurea casing liners
- Rubber or ceramic lagging on drive pulley

Clam Shell Gates

Amtas manufacture a range of mild steel and stainless steel clam shell gates in the following sizes:- 200mm (8"), 305mm (12"), 356mm (14") and 406mm (16"). Pneumatic rams are available in aluminium or stainless steel and have removable (taperlock bushed) crank arms as standard. Pivot shafts are stainless steel as standard and supported on heavy duty ball bearings. Internal liners are of UHMWPE (polyethylene).
Standard paint treatment on mild steel gates is class 2-1/2 abrasive blast clean, two pack epoxy primer and top coat of two pack polyurethane. All fasteners are stainless steel.

Conditioners

Fitted to 5 tonne hoppers and larger. Our rotary conditioners have been tried and proven over many years of hard service in the fertiliser industry. Used for conditioning fertilisers by removing lumps these machines are gentle on the product to reduce degradation. Four heavy round bars on a rotating shaft massage the product over a curved stainless steel, punched plate screen. A range of screen apertures are available from 8mm to 38mm. Drive for the rotating shaft is via a shaft mounted SEW Eurodrive gear-motor. Shaft seals are 'taconite' type and bearings are double spherical roller in cast iron housings.

Bypass Screens

A relatively new addition to our conditioning hoppers, the bypass screen, allows a large per-centage of product to literally 'by-pass' the conditioner through side screens and be dis-charged from the hopper. Screen apertures are matched to the conditioner screen to ensure a uniform final product size.

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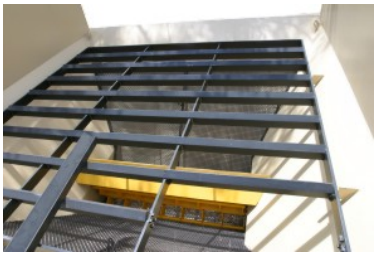
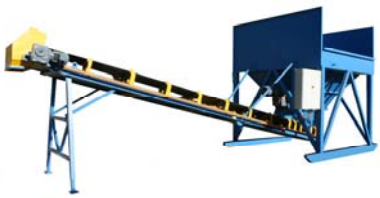
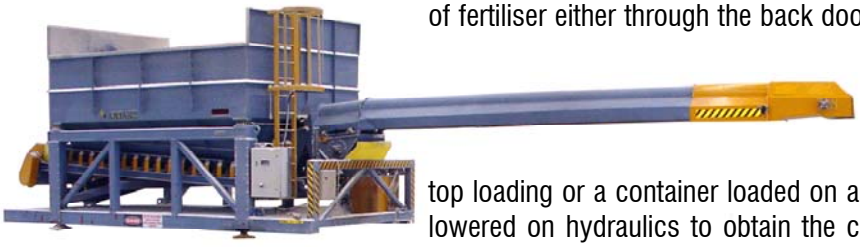


Conveyors



Container Loaders



Bypass Screens (contd.)

The by-pass screens are mounted in four (4) drop in panels, two (2) each side of the hopper and can be easily removed for cleaning or other maintenance. Small aperture screen cloth is stainless steel with the larger being high tensile steel. Mild steel frames are abrasive blast cleaned and two pack epoxy primed and top coated as per our hoppers.

Conveyors

Conveyors are the one item that is common to almost all fertiliser blending plants and load-out facilities and Amtas can design and supply almost any configuration required. Some of the styles manufactured for various clients include 200 tph overhead shuttle conveyors, 22m long mobile, slewing, radial stacking conveyors, tube conveyors, high speed throwers, transfer conveyors as well as all types of standard troughed conveyors.

Standard conveyors range in belt widths from 300mm to 1200mm with a range of options for belts including rubber and PVC. Troughed conveyors are supplied with the option of two rollers or three and standard configuration or cantilevered design. The cantilevered trough sets are also optioned with PVC covered rollers which help reduce build up on the rollers. Polyethylene rollers are available as an option on all conveyors.

Common to all conveyors are crowned, rubber covered drive and tail pulleys (diamond grooved on drive pulleys), shaft mounted SEW Eurodrive gear-motors or optional Van Der Graaf motorised drive pulleys, cast iron bearing housings with double spherical roller bearings, stainless steel fasteners and protective paint treatment comprising abrasive blast clean, two pack epoxy primed and top coated.

Container Loaders

Loading containers can be a difficult and time consuming job unless you have an Amtas container loader. The unit shown in the adjacent photograph is capable of loading 27 tonne of fertiliser either through the back doors or overhead through top load hatches. The hopper is mounted on loadcells to accurately weigh the required amount with a large LED display in the side facing the loader. After filling the hopper it is raised by four hydraulic legs to a height suitable for top loading or a container loaded on a truck. The discharge conveyor can also be raised or lowered on hydraulics to obtain the correct angle. Containers mounted on a truck are reversed onto the discharge conveyor and positioned by a set of indicator lights visible to the driver. These lights are controlled by ultra sound sensors on the conveyor head. As loading proceeds the truck driver is prompted to move forward incrementally by the light system. A sensor on the top of the conveyor controls the hydraulics and automatically lowers the head as the truck settles on its suspension. This avoids the possibility of damage to the conveyor. Once full the system stops automatically.

Major design features:-

- Capacity of 27 tonnes at 1000kg/m^3 with accurate weighing
- Can be loaded at ground level by a standard front end loader
- Able to load containers on a truck and top loaders
- Can load itself onto a semi trailer using hydraulic jacking legs

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Drag Conveyors

Drag Conveyors

Used as stand alone loadout machines or as part of a larger blending plant, drag conveyors are a space efficient option where product needs to be elevated or just for general transfer.
Amtas can design and manufacture a range of machines to suit individual requirements in both fixed and mobile machines. Capacities range up to 180 tph with varying configurations of discharge height and horizontal feed hopper lengths.
Conveyor casings are of stainless steel with mild steel support structure and skid base. Drive options include shaft mounted SEW Eurodrive gear-motor or shaft mounted gearbox with pulley and belt drive from motor. Double spherical roller bearings in cast iron housings are used exclusively. Imported US heavy duty chain and locally manufactured polyurethane flights with stainless steel fasteners are used.
Optional extras include varying styles of hopper, product conditioners to break up lumps with a range of screen apertures and a mobile base frame for limited transport.

Micro batch feeders

Micro Batch feeders

A small range of micro feeders are manufactured by Amtas and have been field proven over many years of operation. These can be supplied with stainless steel or polyethylene hoppers of 0.016m^3 and 0.032m^3 capacities. All units are supplied with a counter rotating conditioner, stainless steel screw flights, Amtas manufactured dual output gearbox and Baldor DC variable speed drive motor. 1ph or 3ph ac VSD drives are also available as an option.

Discharge capacities

Size	Maximum output m^3/hr
A3	0.03
A5	0.20
A7	0.70
A9	3.00

Pump Modules

Pump base with weighing platform

Pump Modules

Most blending plants or fertiliser handling facilities require some liquids added either as fungicides, coating agents or for dust suppression. Amtas offer a range of pumping and spraying solutions designed to suit our customers specific requirements including specialised loss in weight weighing systems that combine a weigh platform and pump base module as shown opposite.
A range of standard pumping modules are offered which comprise a stainless steel pump box, floor mounted, with provision for mounting a bulk 1000 lit tank on top, thus saving floor space. The pump unit, usually Mono helical rotor or centrifugal is mounted on a slide base compartment that fits inside the base and can be locked. The electrical control box (IP65) is also mounted in a similar compartment or can be remote located. Space in the base unit is also available for stowing hoses, fittings and electrical cables when not in use. The whole unit can be easily lifted and moved by forklift. Heater tanks can also be fitted for wax based product spraying. Larger units with multiple pumps, solenoid control valves, non return valves, flow meters, air receivers for fogger dust suppression nozzles and electrical MCC have been supplied for specialised applications.

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PRODUCTS LIST FERTILISER HANDLING - P.6

Screen decks

Screen Decks

Vibrating screen decks in a number of sizes and designed for use in fertiliser plants are available in horizontal or inclined configurations. All units feature removable, adjustable cross balance pipes with sealed out of balance motors, removable feed trays and discharge chutes, adjustable isolation spring mounts and spring loaded screen clamp bars.
A range of stainless steel woven wire screens and punched rubber screens are used for various applications and are fitted in multiple panels for easier maintenance.
Inclined screens feature a single out of balance motor with two units being fitted to the horizontal screen decks. Featured opposite is our largest screen, 1800 x 4800mm, horizontal design capable of 250 tph.
Screens are manufactured of mild steel and are all abrasive blast cleaned and coated with two pack epoxy primers and top coats.
A number of options for mounting including support beams and stands can be supplied and can be utilised to accommodate undersize and oversize conveyors or bulker bag stands.
Dust covers and dust extractors are other options that may be required and are available.

Screw Conveyors

Screw Conveyors

A large range of screw conveyors are designed and manufactured by Amtas for handling trace elements and most fertilisers. Sizes range from 20mm micro batch feeder screws up to 500mm 220tph screws used in blending plants. Materials of construction include mild steel, stainless steel and polyethylene. Screw types include variable pitch, tapered flight, standard flights with paddles and tapered centre pipe.
All flights incorporate Amtas designed drive and bearing arrangements that allow the flight and drive to be removed without disturbing bearings at either end. SEW Eurodrive gear-motors are used as standard fitment. Drive shaft and tail end shaft are replaceable stainless steel with stand off bearing design and special polymer lip sealing arrangement. For some trace elements an all polyethylene casing is available as an option.

Slide Gates

Slide Gates

Amtas manufacture a small range of slide gates in mild steel and stainless steel with pneumatic actuators. Gates feature ultra high molecular weight polyethylene (UHMWPE) slide rollers and seal plates with stainless steel fasteners. Pneumatic rams can be supplied with proximity switches for controlling gate open, gate closed and partial opening.
Sizes available:- 150, 200, 250, 300, 350 and 450mm. Various discharge opening types available as required.

Switchboards

Switchboards

Motor control cabinets (MCC), where required, can be supplied by Amtas. These may be single starters or complex units requiring sequential starting, soft starters, variable frequency drives, communication modules for computer control and interface with weighing systems.
Custom programming for batching and blending written by a local Australian company is supplied where required and can be upgraded or modified to suit.
Quality Moeller switchgear is used for most starters, push buttons, main and selector switches. Available options include LED displays, console mounting, PC and UPS.

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PRODUCTS LIST FERTILISER HANDLING - P.7

Weigh hoppers

Weigh Hoppers, Straight Product Hoppers, Trace Element Hoppers.

Select from a wide range of capacities and shapes ranging from 20kg to 30,000kg. Fixed installation or mobile with or without weighing systems. All weigh hoppers are fitted with stainless steel 'button' type precision load cells and heavy duty stainless steel mounting kits with built in restraints. Fully adjustable mounting kits that do not require shimming are available as an option.

Weigh hoppers are fitted with a large (75mm) integral LED display that is clearly visible from 20m away. Weighing head is mounted in a GRP or stainless steel enclosure, (IP66 rated) to prevent corrosion. In most cases permanent wiring is routed through the support structure using nylon glands. This eliminates the need for external conduits and fasteners and gives better protection for the cables

Hoppers can be mounted on skid bases or flanged feet. In most cases rectangular hollow steel section (RHS) is used for the support frames and skids. Where possible vertical diagonal bracing is used so that floor level cross bracing is not required leaving the area under the hopper clear and easy to clean. All steel work is Class 2-1/2 abrasive blast cleaned and primed with two pack epoxy primers. A top coat of two pack epoxy or two pack polyurethane (depending upon the surface finish required) is then applied to provide superior corrosion resistance. All stitch welded seams are seam sealed and painted over with top coat. All fasteners used in the assembly of our hoppers are stainless steel and coated with an anti-seize compound.

Options for Hoppers

Oversize grizzlies, bolt on and fixed hungry boards, bolt on dust covers, roll tarp type dust covers and conditioners are offered on all of our larger capacity hoppers. Belt feeders and screw conveyors can also be supplied and are flange mounted.

Smaller hoppers including trace element hoppers can be supplied with oversize screens and dust covers if required. Flange mounted belt feeders and screw conveyors are also available for these hoppers.

Miscellaneous

Pump module

Wax coating drum

Drag conveyor flight

Throwing conveyor

Conveyor weigh frame

Pneumatic pipe cleaner

Adjustable load cell mounting kit