

FEATURE **BULK BLENDING**

Spreading the net wider

While sales of bulk blending equipment to traditional markets continued during 2006, a feature of this sector last year was increased interest in bulk blending from regions where the acceptance of this concept is in its comparative infancy, as is shown by some of the following reports to *Focus* provided by a number of leading bulk blending equipment suppliers.

THE A. J. SACKETT & SONS CO.

Customisation to the fore

A. J. Sackett continues to enjoy great success with the company's custom designed blending systems. One such example is a project they now have in house for a leading Florida fertilizer company. The client requires a blend tower with 16 major bins and 16 micro bins and does not want to handle the micro ingredients by hand, rather using an automatic weighing and feeding system. To accomplish this, Sackett has designed and is building an overhead bank of 16 micro hoppers. Each hopper is loaded via a central bucket elevator and en masse conveyor system. High and low level indicators let the crew know which bin needs filling. A blending computer notes each micro ingredient as it is individually weighed in a Bulk-Toter conveyor mounted on load cells. Once the entire batch of micros has been weighed, the conveyor transfers them directly into the blender, where they are blended along with the major ingredients. Advantages to this micronutrient system include:

- The ability to buy micronutrients in larger packaging, including bulk bags and truck loads;

- Greater accuracy with small quantities and less chance of error;
- Higher speed than hand adding; and
- Lower operating cost than manual labour.

Once the batch is blended, fertilizer passes through a two-deck screen. The customer has the option to send on-size and fines to the end-user or to separate out the fines. Also, a chain mill is included for downsizing oversize material and allowing it to be used after screening.

After leaving the screen, fertilizer is conveyed overhead to a drive-through lane. There, an en masse conveyor loads the truck tender's four compartments without having to move the truck. This is possible because the truck is resting on a scale while it is being loaded, and the computer system switches product flow between hoppers as it receives truck scale feedback.

In a fast paced micronutrient market like Florida, the custom Sackett blending tower serves customers nicely, giving them a leg up on the competition.

However, the Sackett TriTon vertical blend system remains very popular. Its optional built-in Bulk-Conditioner provides a very convenient and fast method of downsizing oversize fertilizer lumps. The Bulk-Conditioner has a 55" (1.397 metres) wide screen with a 14" (0.355 metres)

diameter rotor. The screen is easily accessed through a hinged door for cleaning and can be removed in minutes by releasing four pull pins. This blender style is the most popular in the United States due to its high blend quality, simplicity, small footprint, and moderate initial cost. Many are used in blend towers also, where they are top loaded via an overhead bin. They also are very effective when impregnating nitrogen release inhibitors or herbicides.

The pinnacle of blend quality and speed are incorporated into the Sackett HIM (High Intensity Mixer). The mixer is fed by gravity from a weigh hopper of the same capacity, often a two tonnes batch size. For blending, the HIM has two counter-rotating horizontal shafts with interweaving paddles. These twin shafts provide incredibly fast and accurate blends. When through mixing (15 seconds), twin doors on the mixer bottom open and discharge the entire batch in seconds. This quick unobstructed discharge process virtually eliminates material segregation when exiting the mixer. Sackett designs and supplies the automated computer batching system, and always backs up the automated system with a manual system in case of computer failure. The control can store 60 custom formulas and keeps track of inventory. It even self-checks gate timing against scale results, automatically adjusting gate operation.

The A. J. Sackett & Sons Company was founded in Baltimore in 1897 and specializes in systems design and equipment for the fertilizer and related industries. Sackett continues to see good demand for the company's conveying, blending and granulating systems.

EMT

Continued success for EMT

European Machine Trading (EMT), based in The Netherlands, is a producer of blending and bagging machines for the fertilizer industry. The company was founded in 1910 and thus has a wealth of fertilizer industry experience. The village of 't Zand houses the company's own factory, which produces machinery constructed



A. J. Sackett's popular TriTon vertical blend system in action.

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primarily of stainless steel.

The company's range of bulk blending equipment can be divided into two major systems: the Weighcont line, a fully automatic blender system which operates by continuous weighing, and batch blenders, such as the range of Shamrock and vertical blenders.

The Weighcont system is fully automatic. This machine line can produce up to 250 tph of bulk blends. It is operated by a personal computer, works according to the CWC principle (Continuous Weight Control) and produces very good quality, accurate blends. A standard Weighcont machine has in excess of four hoppers in which to store the raw materials. With this equipment, blending is continuous and micro components and/or anti-caking oil can be added if required.

The batch blenders offered by EMT include the Shamrock drum blender system and the vertical auger blender. For both of these types of unit, the quantities of raw material required for each blend are assessed using a separate weigh scale. This is known as the BWC principle (Batch Weigh Control system).

In addition to these blender lines, EMT produces bagging lines for the filling of FIBC big bags and 25-50 kg bags.

All machines can be shipped in a trailer or a container and are installed by an EMT technician (with local assistance) at the location of the customer. EMT supplies these machines on a turnkey installation basis.

During 2006, EMT enjoyed another busy and profitable year. There are now more than 45 countries all over the world where a machine supplied and installed by EMT is in operation. Last year, blending and bagging lines were installed in: Morocco, Greece, Russia, Mali, France, Ireland, Belgium, Ukraine, Bulgaria, Indonesia, The Netherlands and England.

YARGUS MANUFACTURING

Supplying systems worldwide

Yargus Manufacturing Inc. located in Marshall, Illinois, USA, proudly offers a complete line of high quality built bulk blending machines and material handling equipment. With a history in the fertilizer industry spanning 39 years, the Layco/Yargus name is recognized around the world as an industry leader.

The company has continued to receive orders from customers in all parts of the world. For example, recent shipments abroad have included a 6-Ton Layco Rotary Drum Blender shipped to Indonesia. Yargus also recently shipped two, 14-Ton Layco Open Top Double Auger Blenders to the UK for J&H Bunn, a regular customer of Yargus Manufacturing. These systems were accompanied with Bucket Elevator Legs for unloading blended material.

Soon to be ready for shipment are three



A blender and bagging unit installed by EMT for Kemira Tartarstan in the Russian Federation.

Volumetric Blend Systems for Interfert, located in Australia. These systems consist of four High Capacity Stainless Steel Layco Rotary Valves with underbin conveyors and Gravity Blend Boxes. These systems are to be installed in three different locations in Australia – Melbourne, Adelaide and Portland. These bulk blending systems add to a long list of Layco Blenders installed in Australia with the help of Yargus Agent, Mr. Bruce Hodgson of Multifert Agencies.

Yargus Manufacturing is also very active in its

home market. The company recently installed ten 165 Ton Vertical Tanks for UAP. Each tank was equipped with a Stainless Steel Layco Rotary Valve for metering fertilizer. The system was supplied with a 24 inch wide Conveyor System rated at 200 tph.

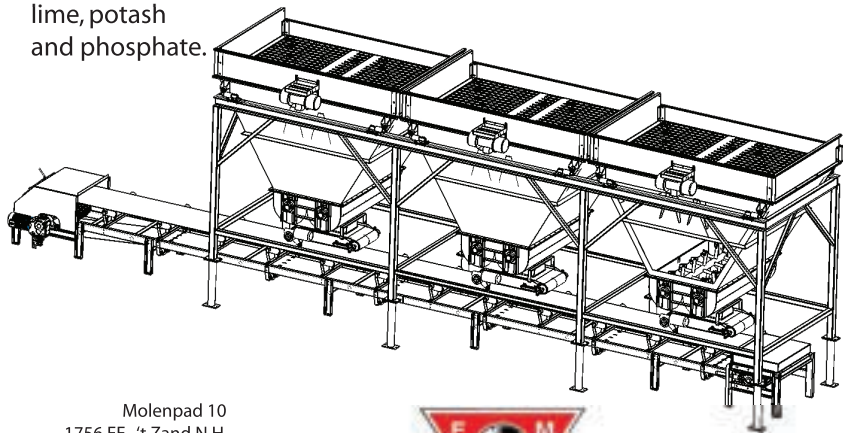
Yargus Manufacturing continues to experience a great deal of success with the Layco Volumetric Blend System, both abroad and domestically. This system can be set up in one of three ways – Gain of Weight, Volumetric or with Declining Weight Technology. With a

European Machine Trading

Producer of Blending- Bagging and Transport Equipment for Fertilizer

Weighcont Industrial Sharp Cone

A weighing continuous blending system with a capacity of 10 tph to 250 tph. Integrated lump crushers within the hoppers and vibrating screens on top of the hoppers. Suitable for powder products such as calcium, lime, potash and phosphate.



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A recent installation for The Andersons in the USA by Yargus Manufacturing.

variety of optional add-ons, Yargus can customize the Layco Volumetric Blender to meet the exact requirements of each client. This system can be adapted from a Volumetric to Declining Weight mode of operation with ease. Hoppers can be added in the future to meet an unexpected growth in demand. Also, Yargus software can be customized to meet individual customer requirements and can be linked to other accounting software in the fertilizer

blending market, such as Agvance Software. This helps to provide a more streamlined process at the plant.

The Layco Volumetric assures faster, more accurate fertilizer blending and, according to Yargus, is superior to other multi-feed Volumetric Blender systems because of two unique features. The stainless steel rotary valves used by Yargus in this equipment are claimed to more accurately meter the product and are

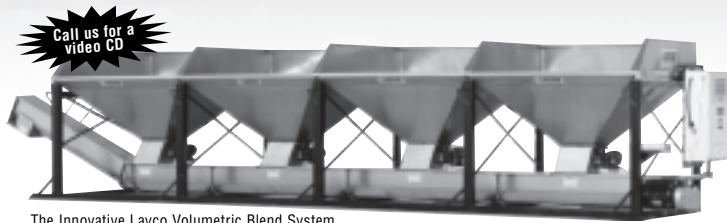
easier to clean and service. In addition, the PLC Software that controls the NPK's and monitors RPM's enables this equipment to produce a better fertilizer blend, according to the company.

For further information, please contact the Yargus Manufacturing office in Marshall, IL, USA or one of the company's Sales Agents throughout the world. (Contact details can be found in the advertisement below).

“WE PURCHASED A LAYCO 4 HOPPER VOLUMETRIC BLENDER AND BUCKET LEG FOR THE SUPERIOR ACCURACY AND INCREASED PRODUCTIVITY. THE WORKMANSHIP, RELIABILITY AND CONSTRUCTION TAILORED TO OUR NEEDS MEANS OUR ONLY CHOICE IS LAYCO.”



Owen Chivell and Andrew Chivell
*Webber and Chivell Pty.Ltd
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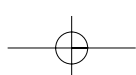
Portable Conveyors

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LAYCO
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RS TRADING

A many faceted company

RS Trading has been supplying cost-effective equipment to the fertilizer industry for over 30 years. Headquartered in Pfaffenhofen in Germany, the company is associated primarily with the FERT-TEC line of volumetric blenders and weigh-controlled blenders. These machines are custom-built, large capacity systems that can produce between 50 tph and 250 tph of bulk blends. However, this equipment is just one of the product offerings from RS Trading.

RS Trading's FERT-TEC blenders consist of a row of stainless steel hoppers; each bin is designed to hold an individual component of the blend that the producer wishes to manufacture for the customer. Capacities per hopper can be altered to meet the requirements of the customer, up to a maximum of 12 tonnes of product. The number of hoppers included in a system can also be tailored to meet the needs of each client; these are likely to vary with intended total capacity and the complexity of the grades required by the end-user. The requirements of the client in terms of special equipment or remote monitoring equipment can be accommodated during the design phase of a project; these may include the adding of micronutrients and the spraying of colorants to ensure a uniform blend colour. The installation of remote monitoring equipment will allow the blender operator to oversee blending operations via data lines and modem, enabling costly errors and plant downtime to be avoided.

High fertilizer raw material costs and squeezed profit margins at the farm level make blend accuracy particularly important. The SCT Terminal produced by Siemens of Germany and supplied with the FERT-TEC blender system has a proven record in many industries throughout the world as an accurate metering and control device. Not only can this equipment be used to oversee the entire blending process, subsequent processes, such as product handling and bagging, also can be monitored using this technology.



RS Trading has perfected top-quality proprietary software for use with its FERT-TEC blending system. This software, known as "NPK-Planer", automatically calculates the appropriate settings for the blending unit, taking into account key variables, such as the raw materials available and the end-product formulation ordered by the farmer. This results in the efficient production of on-specification blends at minimum cost. Flexibility has been built into "NPK-Planer" software, which can be used in conjunction with other blender designs, can access data from other computer programmes and is available in several European languages.

In addition to the FERT-TEC blending system, RS Trading offers customers other blending machine options plus associated add-on equipment. Recently, a vertical blender with an integral bagging unit became part of the company's product range. An earlier addition was the batch fertilizer blending unit Blender MV 5000. At capacity, assuming a 5 tonne batch per operation, this unit can produce up to 30 tph of blended fertilizer. The MV 5000, which is built of 304 L stainless steel, rests on four stainless steel load cells, connected to a digital display providing data to the operator on dosage requirements. While mounted on the blending machine, the switch cabinet can be set, if required, using remote control; also, it

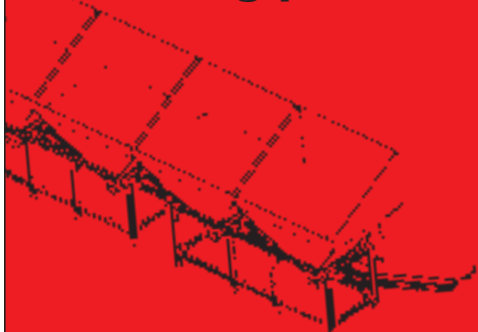
can be provided with production programs. RS Trading can also supply liquid fertilizer blending units built of stainless steel.

Other equipment forming part of the RS Trading product range includes FIBC weighing/packing equipment, capable of filling "big bags" of up to 1,500 kg; packaging equipment for smaller packages, including 50 kg bags; weighing scales, including floor scales with capacities of from 1,000 kg to 10,000 kg and portable plate scales with capacities of from 600 kg to 3,000 kg; conveying equipment, notably modern belt elevators, constructed of zinc-coated steel and with capacities of from 90 tph to 150 tph, specifically designed with fertilizer sector applications in mind; and portable conveyor belts. RS Trading can also source a range of bulk blending ingredients, notably micronutrients.

According to Executive Director, Mr. Richard Sandbichler, "...our most popular line is our FERT-TEC blender. The ease and reliability of operation, durability and blend accuracy of this equipment has made it particularly popular in Europe. However, I believe that the other products in our range will play a considerable part in the company's development in the future."

For further details, please contact RS Trading directly (see advertisement below for contact details).

Increasing profits with profitable blends



Fertilizer blending equipment – for high volume blends!

- continuously filling, weighing and blending, results in high volume output 35-250 t/h
- stainless steel – corrosion proof materials
- accurate SIEMENS weighing and controlling devices
- state of the art software NPK-Planer

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FERTIPLANT ENGINEERING

An alternative approach

Fertiplant Engineering, based in Mumbai, India, can trace its history back to 1967. Since its inception, this company has been involved in establishing NPK granulation plants based on the steam granulation process. The company's technology has been particularly well received in India and has also built up a strong plant reference list elsewhere within Asia, such as in China, Malaysia, Indonesia and Thailand. To date, the company has installed over 70 plants for the production of multi-nutrient NPK products and single nutrient fertilizers in India and overseas.

The popularity of this technology has its roots back in time. In some quarters, the rise in bulk blending in the past was greeted with considerable scepticism. Some bulk blends entering the market were of indifferent quality, the result of factors such as the use of poor quality and size incompatible raw materials, poor blender design, ill-trained staff, and inadequate blender operating, handling and storage procedures. Upon reaching the end-user, the blend was often segregated, resulting in the farmer suffering through reduced yields and thus lower income. The production of NPK compounds using chemical granulation processes was an obvious and popular alternative yet such a solution involved high investment costs, very large production capacities and a reduction in end-product flexibility.

Fertiplant's solution was to chart a middle course, using some of the best features of bulk blending and chemical granulation, taking on board the principles of steam granulation and amending the mix with in-house innovations, often inspired by customer feedback. The result was a different technological solution, known as the Fusion Blend Granulation Process (FBG). Initially, the FBG process involves the mixing of solid raw materials as required by the formulation requirements of the end-user. Water, steam and heat are added to the mixture to act as granulation vectors; as the granulation process is merely a physical process, binders or urea solutions are not required.

The Director of Fertiplant, Mr. Sanjeev Doshi, claims that the granules produced by FBG are very similar in characteristic to those produced by the chemical granulation process. Yet investment cost and plant sizes are much lower than those associated with chemical granulators, with overall costs more comparable to those of bulk blending operations. As FBG requires no liquid chemical inputs, the capital and infrastructural costs associated with ammonia and acid production, storage and transportation do not apply, cutting costs considerably below those of chemical

granulation facilities to levels usually associated with bulk blending operations. However, the requirements of FBG plants with regard to raw materials are less exacting than for the production of good quality bulk blends, which need top quality, equally sized granular ingredients to produce a premium-quality end-product. According to Mr. Doshi, FBG can produce high calibre, on-spec finished NPK granules from a range of materials including off grade or damaged ingredients and even (a proportion of) organic material.

A recent addition to the Fertiplant plant reference list is a 120,000 tpa FBG plant in Indonesia. This "state-of-the-art" plant produces FBGs in a series of stages. The initial phase comprises the blending system, which features a highly accurate "loss in weight" system, incorporating proportional as well as integral correction, resulting in the cumulative error approaching zero within a few minutes. This section of the plant also includes mass flow hoppers, a choice of weigh-belt feeders, a hydraulic cutter/pre-feeder system and a highly interactive P. C. interface. The hydraulic cutter/pre-feeder system is activated automatically whenever material flow out of the hopper is below the required level; when, for example, a build-up of product causes a blockage, as might occur in conditions of high humidity. The process can be accurately controlled and monitored using the P.C. interface, which can also access an exhaustive range of recipes for fertilizer formulations.

Other plant sections fulfil granulation, drying and cooling, screening and re-cycling, and product conditioning functions. Each has its own control scheme and a highly interactive P.C. interface. Each plant sub-section is controlled by an independent plc, making it a

truly "distributed control system", providing greater plant operational flexibility and enabling easier integration with newer systems in the future. Plant operations can be viewed in real time, from anywhere in the world, simply by dialling the main P.C.

Fertiplant designed and supplied much of the materials handling system used by the client in Indonesia. This system includes an impressive conveyor belt system; a total of 1.6 kilometres in length from port to warehouse, this system comprises six conveyors, including the final tripper conveyor.

Fertiplant is currently working on another similar project in this region – watch this space for further details in the future.

DOYLE EQUIPMENT MANUFACTURING

Sales in Latin America more than double

Doyle Equipment Manufacturing, located in Quincy, Illinois, U.S.A., recently celebrated its 55TH year in business and is the largest supplier of bulk blending equipment in the market. Under the leadership of President Monty Doyle, the company continues expanding in international markets.

Australia Pacific Fertilizers (APF), Doyle's agent for Australia and New Zealand, had a very productive 2006, obtaining purchase orders for eight 10-ton vertical systems from loyal customers. Doyle's commitment in Australia is well represented by APF who, besides providing the required quotes, also gives the customer a complete service by supplying technical assistance and the necessary spare parts.

The equipment of Doyle Manufacturing is built to withstand the harshest of environments, from the winter cold of the Midwest of the USA (above) to the heat and humidity of the tropics.



Sales by Doyle in Latin America also flourished during 2006, totaling over \$3.5 million. This represents a considerable increase on the sales revenues generated in the region during 2005 (of over \$1.5 million). During the year, bulk blending systems were shipped to Mexico, Argentina, Venezuela, Paraguay and Peru, strengthening Doyle's position as a leading supplier of such systems to fertilizer retailers in the area. The company's sales push in the region will be assisted in the future following the appointment, at the beginning of 2006, of a new agent for Argentina. Maria Elena Camozzi is now Doyle's representative for this nation, which has considerable potential as a growing market for fertilizer products. Maria Elena's background as an agronomy engineer and her strong familiarity with the Argentine market is of great benefit to Doyle. After a successful career at I.N.T.A. and at Profertil, Maria Elena chose to join Doyle due to the company's strong reputation throughout the world. To date, Maria Elena has been very successful in promoting Doyle's line of products. During 2006, she successfully obtained a number of orders. These included orders for three complete receiving systems, incorporating 120 tph paddle conveyors and 120 tph overhead belt conveyors with gravity trippers. Also, she was able to import into Argentina three complete 8-ton vertical systems and two 8-ton rotary blenders, the first U.S. made blenders to be introduced into the Argentina market since 2001.

Doyle Equipment aims to continue to expand its presence throughout the world during 2007. Supplying the best quality products for the fertilizer retailer will continue to be the company's goal during the current year.

RANCO FERTISERVICE

The latest in continuous blending

The newest development in fertilizer blending from Ranco Fertiservice is Ranco's DW blender. The DW (declining weigh) blender continues the high speed blending of the volumetric unit, but with a much higher degree of accuracy and ease of operation. With the high price of raw materials, it becomes more important to control inventory to assure there is no product loss. All Ranco blend systems are customized for each particular location, which allows the blender to meet specific blend ratios.

The DW blender is a continuous flow system, which means any size load can be blended at one time; batch mixers are limited by the cubic foot capacity of the mixer and the density of the products being used and require several batch cycles to complete one truckload. The Ranco system can blend any size load, from a small spreader to a full semi-trailer in minutes.

Ranco claims that end-loader efficiency is

maximized with the company's continuous flow blenders. The end-loader operator simply brings a full bucket to the bin and keeps the bins full. There is no time-consuming work such as dribble feeding of product to meet a scale weight and no return trips to the storage bays with partial buckets of product.

Ranco's DW blend system provides accuracies never before seen in the dry fertilizer industry, the company believes. Ranco's digital control panel is one of the most advanced blending control systems available in the fertilizer industry, the company contends. The operator simply enters the desired amount of each product required for the blend and the control panel automatically sets the most efficient blend time for the desired ratio, as well as continually monitoring and adjusting the output of each meter unit. Ranco's declining weigh technology compensates for the changes in material density and flowability during the continuous flow blending operation. The end result is fast, precise blending.

Additive bins accurately incorporate micronutrients into the blend. Positioning the additive bins towards the end of the blend system ensures that the micronutrients are incorporated evenly throughout the entire load. These bins can be designed with declining weigh technology or as basic volumetric units. Both DW and volumetric bins can be included in the same system.

Liquid products are accurately impregnated on the fertilizer blend using positive displacement gear type pumps and stainless steel drip bars. Due to the system's unique design, product viscosity changes do not affect the rate of output, a common problem with some other systems. Flow valves, pressure gauges, pressure regulators, and nozzles have

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been eliminated, making the unit more accurate and trouble free.

The entire blending operation can be controlled in a number of ways. The most basic is manually scrolling, using the digital touch controls. An optional keypad can be added to the control panel, which speeds up the indexing of pounds. This feature saves time with a blender that is designed to handle many products. The digital control panel can also be interfaced with a PC, allowing the entire blend system to be controlled from a nearby office.

Ranco DW blend systems can be upgraded with ease. If the customer decides to produce a new product and/or needs to increase throughput capacity, one or more extra bins can be added to the system.

According to Ranco, the newest innovation in blender controls is the addition of the company's touch screen. This device is programmed to remotely operate and monitor Ranco's digital control panel. Not only does the new touch screen allow product factors to be changed with ease when switching products, it allows the time delay sequence to be altered swiftly. This feature is especially attractive for plants that blend for both bulk and bagging operations. Bulk blends can be discharged in one direction and bag blends in the opposite direction, enabling a single blender to service two separate load-out areas.

Ranco Fertiservice, Inc. manufactures a complete line of fertilizer blending and handling equipment. The company takes pride in providing customers with accurate, high speed blending. Ranco's continuous flow blenders have been boosting productivity and profits for customers for over 40 years. Experienced Ranco installation crews install and service the equipment sold by the company. ■



Ranco's DW blender.