PRECISE BLENDING

Gustaaf Zeeman, EMT Blending, Bagging and Transport Equipment, the Netherlands, details the company's global operations, including working with Yara in Thailand.

Based in the Netherlands, EMT is a global supplier of blending and bagging equipment for the fertilizer industry, with more than 500 machine line installations in over 60 countries. EMT's customers include producers, exporters, importers, distributors and wholesalers, and the EMT team comprises engineers, 3D CAD designers, technicians, administration and management.

EMT constructs this equipment in its own production factory, producing blending machines with capacities of 20 – 200 tph – including the Weighcont, which is a fully automatic continuous declining blender line. Other batch blenders are available, of which the largest can process 14 t/batch. EMT has an alliance with blending equipment producer Doyle Manufacturing, US. EMT manufactures small and big bag filling machines, either in a fixed or portable set-up.

Portable bagging units are standard made in 10, 20 or 40 ft containers with capacities of 20 – 80 tph. There are approximately 10 different types of small bagging lines available for 20 – 50 kg bags. For the big bag lines, EMT has 12 different machine types.

As is generally required in the fertilizer industry, the company also supplies transport equipment, such as elevators, belt conveyors and chain conveyors. The company's newest developments are coating systems to add micronutrients or inhibitors to the fertilizer.

The conveyor systems and elevators offered are movable, either by wheels (incline conveyor) or in the top, to fill the boxes. Truck/train discharge units and pits are also supplied.

Fertilizer screening forms part of the machine package, covering lump and dust removal from fertilizers. For warehouse filling, the EMT engineers make 3D drawings to present to the customer.

Optiblend

EMT has developed different software packages, for example Optiblend, to make cost-effective calculations for fertilizer blending. Optiblend is an optimisation programme designed to help customers make the correct formulations with the lowest costs. A complete product analysis is calculated, including the NPK value and all required micronutrients.

The programme is available at farmers' level, analysing crops, organic fertilizers, soil quality, manure and mineral fertilizer. From this, a field hectare or acre calculation can be made based on the farmer's information, ensuring that the correct quantities of fertilizer are applied. When using the Optiblend programme in combination with the blender system, the correct quantity of fertilizer can be spread onto the field, which reduces costs and environmental pressure.

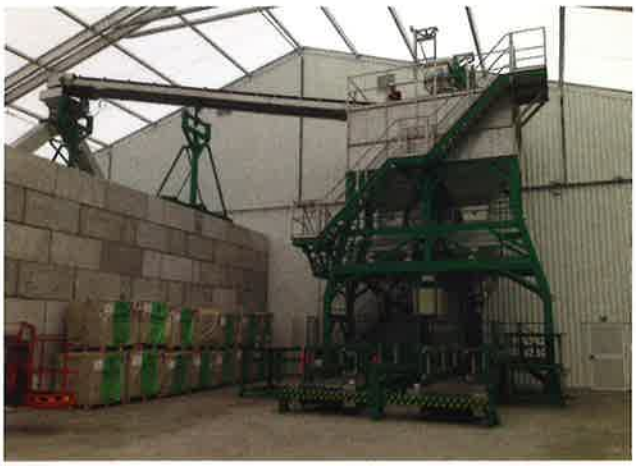


Figure 1. A high-speed twin big bag filling system installed in a Koch factory, France, with a capacity 140 tph for 500 to 1200 kg big bags.

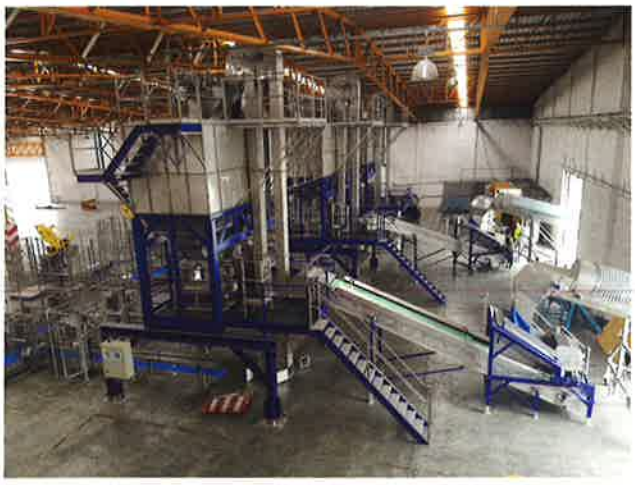


Figure 2. View of the Yara Thailand product intake machines with three elevators and three bagging hoppers with six bagging lines.

Global installations

A major project was recently installed for ATA in Ethiopia, which consisted of four production factories for blending and bagging. ATA promotes the agricultural industry and works with local cooperatives and agricultural distribution centres. In these factories, EMT installed a Weighcont blender line, bagging lines and box fill conveyors, including lump breakers. Following the installation, ATA could fill bags at a rate of 50 tph and blend with a capacity of 100 tph.

A similar project has been installed in Rwanda and other African countries, and Agron, in South Africa, has recently installed one Weighcont blender, one Shamrock blender and a few bagging lines for small and big bags, as well as warehouse filling equipment. In 2015, EMT installed a warehouse box filling system and Weighcont blender line at Ekompany in the Netherlands. The company's control system automatically fills the raw material at the factory, where the customer processes slow release coatings for the fertilizer granules.

Case study: Thailand

In September 2015, Yara Thailand signed a contract with EMT for the supply of machines for 25 – 50 kg filling bags, fertilizer coating and a transport system of portable conveyors to fill the bagging line directly from river barges. The project was designed and developed to meet technology, health and safety regulations.

Before the machines were installed by EMT, the bagging process was conducted manually, which required a large workforce. Additionally, the accuracy of the weighing process needed to improve in order to reach Yara's required standards and quality.

EMT constructed, delivered and installed the machine line in 2016. 16 x 40 ft high cube containers were shipped from the EMT factory in the Netherlands to Thailand. EMT has its own design engineers so the machines were modularly built and bolted together in the existing warehouse of the customer. This meant no civil works to the building or concrete floor structure were required.

Eight fully-closed stainless steel conveyors were supplied. These conveyors were mounted on wheels and are used to transport the fertilizer over the quay from the barge to the bagging lines. Two stainless steel harbour intake hoppers were also supplied. When the fertilizer enters the warehouse, three screens with lump breakers

installed are used to eliminate lumpy material. Then three stainless steel elevators, each with a capacity of 120 t, transport the product to quarto bagging lines where a duplex weighing system was installed. Stainless steel air exhausting filters are located on top of these bagging lines and a unique air dryer system is used. The bags are then closed with a four needle sewing system. The product is then transported to a truck/container offloading conveyor system. This line has a weighing belt conveyor to check the product flow and a unique blending scroll auger to coat the fertilizer before bagging.

The factory is operated from a central control room, where complete factory visualisation is possible on two 20 in. computer flat screens. The line is fully controlled by a PLC and PC. All bagging lines are connected to this central control system so that the operator can control the factory from this room. All generated data is stored.

In this machine set up, six lines are placed next to each other, with a total capacity of 300 tph. Two robots are installed in the existing lines, with the possibility of adding another four robots at a later stage, meaning a total of six robots can be installed. Using robot arms for the heavy work creates a safe working environment for Yara's employees.

Outlook

As a supplier of blending, bagging and transport equipment for the fertilizer industry, EMT is constantly improving its machines and plans to work as efficiently as possible when developing new technologies. In the future, EMT expects to extend its network and delivery worldwide. WF

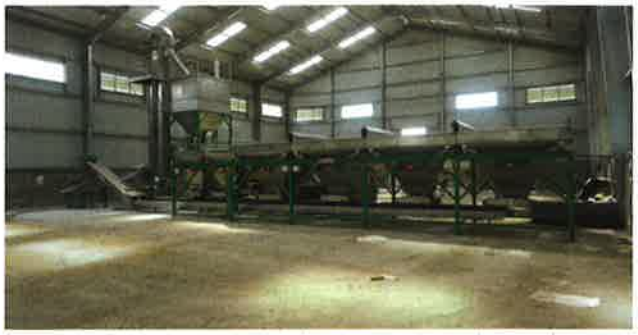


Figure 3. A five hopper Weighcont blender line and bagging line installed for ATA in Ethiopia, with a central capacity of 50 tph.

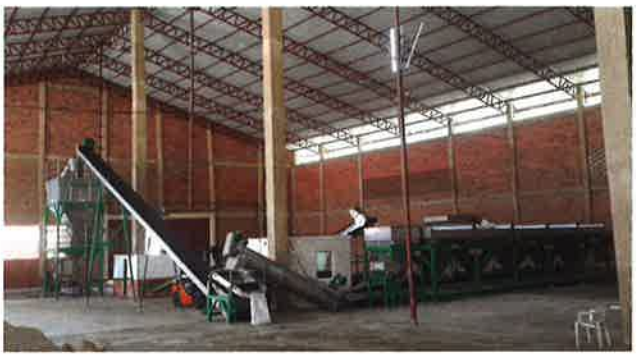
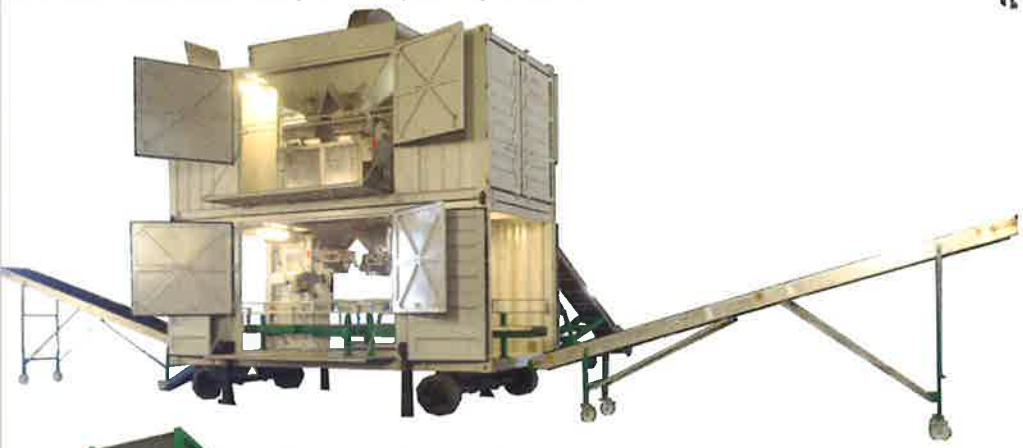
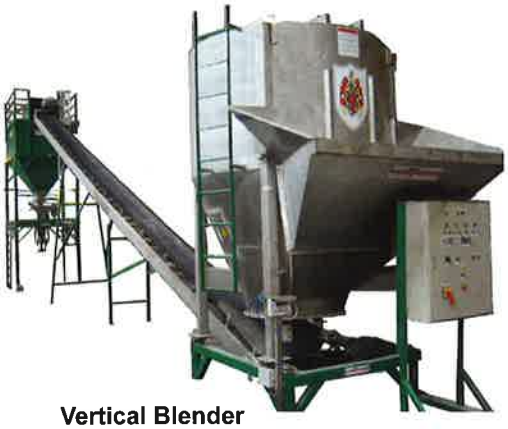


Figure 4. A five hopper Weighcont continuous blender line, which adds micronutrients, and a bagging line for 50 kg bags, installed in Rwanda.

Manufacturer of Blending, Bagging and Transport equipment

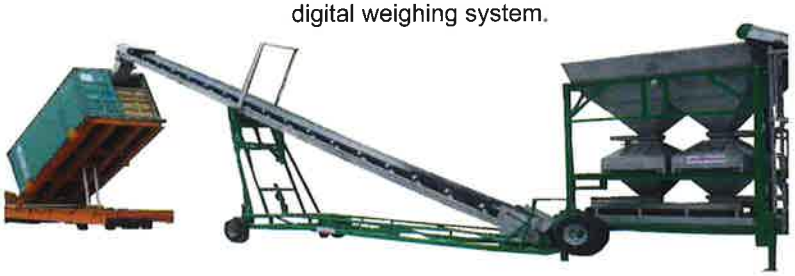
Portable container for filling of small bags
The system consists of two containers 20ft (6 meter) on top of each other. For weighing the product, there are 4 weighing scales installed in the containers. The product is directly discharged into the bags by two bag fill pipes. The container has door openings so that it is possible to transport the bags by two conveyor units. The capacity for 50 bags is 1800 till 2000 bags per hour, for 25 kg bags the capacity is 900 till 1000 bags per hour. Assembly of the container line is easy. The line is portable and can be moved to every desired place by truck, forklift or ship.



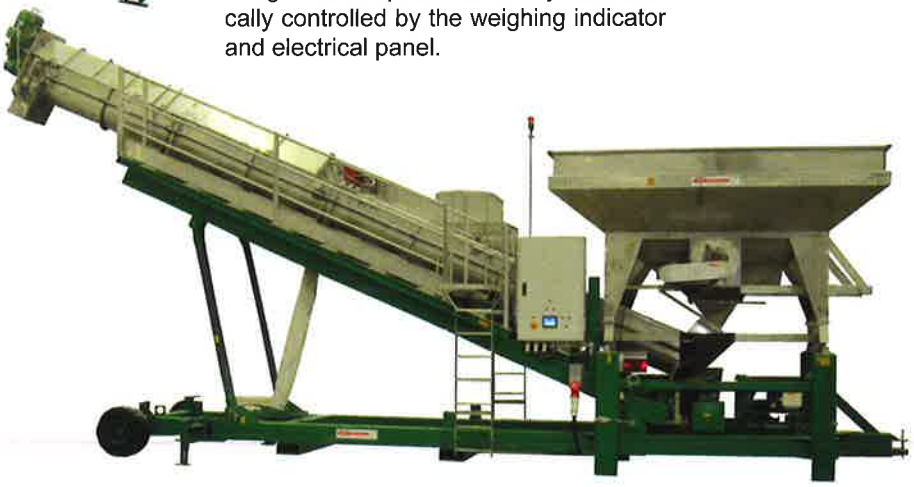


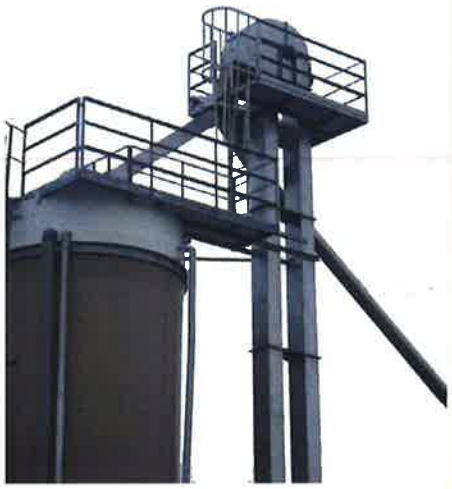
Vertical Blender
The Vertical Blender is suitable for powder and granular fertilizer production.
The blending principle of this blender is absolutely unique. A conical screw blends the raw materials in a wave motion. This to ensure accurate weighing of the product without suspending any product.
The machine can reach a capacity from 25 till 60 ton/m³ per hour with different machine sizes of 5,5 – 7 – 9 – 11,5 and 14,5 ton per batch. The complete system is mounted on a digital weighing system.

Small Bag Single Compact
The Small Bag Unit Compact is especially designed to fill small bags from 25 till 50 kg. The frame is portable and can be placed under any storage hopper.
The machine has a stainless steel scale with a capacity of 100 liter.
This scale under the fill hopper is placed on 3 load cells that are connected to a digital display.
The machine can operate with an open mouth or valve filling pipe. Both types have a clamp system that holds the bag around the mouth of the filling pipe during filling. The complete unit is fully automatically controlled by the weighing indicator and electrical panel.



Portable Discontinue Weigher
This Portable Discontinue Weigher can be moved by forklift, ship or truck to every decided place.
The machine capacity is up to 300 to 400 tons per hour by continuous discharge and filling.
The complete weigh operation is fully automatic and suitable for weight and messures controll.
Assembly is easy to do. The hopper needs to be placed on top of the frame by a forklift.
The machine in operation will be 4500 mm high.
The machine can be installed on wheels or in two containers or in a fixed support steel frame.





Fertilizer Treating Unit
EMT has developed a treating unit for fertilizers, like Urea or blended product.
The fertilizer can be treated with liquid inhibitor or dry inhibitor powder.
This process is controlled by a computerized weighing system.
The unit is including filling hopper with conditioner. The capacity is 120 m³/hour.

Elevator
The stainless steel elevator has been designed for vertical transport of materials from ground level to different heights. The height of the elevator is variable from floor up to 35 meter.
An intake hopper is used to fill the elevator.
The capacity of the elevator is 20 till 350 ton per hour with a density of 1 ton/m³.

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