

AROUND THE WORLD



Gustaaf Zeeman, EMT, the Netherlands, provides an overview of the company's blending, bagging and transport projects in Thailand, Ethiopia and South Africa.

Fertilizer is in use all over the world. It is produced in factories and then transported to where it is needed. In order to distribute these products, there are local importers and distributors active.

For handling of these fertilizers, equipment, such as conveyors, crane systems, blenders, bagging lines, etc., is needed. Mainly, these machines are constructed especially for these



Figure 1. EMT Quatro. Three bagging line towers installed at Yara Thailand with two robot stack lines and four conveyors for manual bag stacking. Installed in an existing warehouse with stainless steel hoppers of 20 t each.



Figure 2. Eight hopper Weighcont. Stainless steel Weighcont continuous loss in weight blender with a central production capacity of 100 tph with eight hoppers to blend six raw materials and two micro component products. The machine is in operation at Agron in South Africa.



Figure 3. 3D CAD impression of a fertilizer storage and blending factory with a product intake conveyor system to fill all boxes equally and a weighcont continuous blender line with two bagging lines: one for small bags and one for big bags. Installed at Agron in South Africa.

products because of the product specifications (heavy product, aggressive corrosion, hygroscopic). These machines are installed in a number of different countries, as can be seen in the following practical descriptions.

Distribution in South Africa

EMT has done a lot of work in South Africa. For instance, Agron, located in Marble Hall, has purchased an installation for receiving, distributing, blending and packing fertilizer products.

Agron is a distributor and dealer of fertilizer products and collects grain of existing clients in the neighbourhood of the company. The company also has a large 20 000 ha. farm.

In the summer of 2015, EMT transported these machines in 14 sea containers by truck to the port of Rotterdam and then by ship to South Africa.

Product intake

Agron invested in a truck bulk product receiving hopper. In South Africa, they use sideways tipping bulk lorries instead of backwards tipping lorries.

All installed machines are constructed in stainless steel #304. The hopper has a capacity of 15 t of fertilizer and has been placed above the ground. From this hopper, the product is transported via conveyor systems to the bulk box storage warehouse. In this product intake line, there are two screens that sift out the fertilizer quality at a capacity of 80 tph. One screen sifts out the fine materials under 1.5 mm and the other screen sifts out all particles above 6 mm from the good product. Agron chose these two screens because of the high capacity and the required screen space. The fertilizer products are stored in 12 different boxes, and a mobile conveyor system has also been implemented.

Two blender lines

Agron invested in two blender lines and packing systems for big bags, as well as 25 – 50 kg bags. The fertilizer blender line products are picked up by a forklift with a loader, and are transported to the Weighcont Blender. The Weighcont Blender line is a weight-declining continuous blending process; the weight control in the blending machine secures the good quality. The machine is operated via a computer program that accurately controls the blend process. Via this computer dosing program and factory visualisation, the operator has full control of the whole process at his computer screen.

After blending the fertilizer, the blend is transported in a continuous flow with conveyor and elevator systems to the two packing machines: the big bag filling machine; and the small bagging machine for 25 – 50 kg bags. The

capacity of the Weighcont Blender is adapted to the packing capacity of 60 tph for the big bags and 40 tph for the small bags. In this setup at Agron, the blender can blend 100 – 120 tph. The big bag line is a high speed machine; the weighing process in this type of machine works as a nett weighing and happens in a stainless steel weighing scale with a content of 1300 kg, above the big bag. The client uses one, two or four loop big bags. The small bagging machine operates with the same process of nett weighing, but bags are filled with one filling pipe and two weighing scales.

Internet of things

All machines are digitally connected with each other, so it is easy for the supplier to log in and provide services from a distance. This means that the internet of things (IoT) is commonplace. Despite the distance, the connection possibilities nowadays are a significant advantage for Agron and EMT.

There is hardly any time difference between Europe (the Netherlands) and Africa, meaning that during normal working hours, service can be requested and provided from a distance.

The total machine project for Agron has a value of €1 million.

Thailand terminal

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 out of river barges.

Safety and quality

The project was designed and developed to meet technology, health and safety regulations. Before the machines were installed, 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. Indeed, 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 customer's existing warehouse. This meant that no civil works to the building or concrete floor structure were required.

Conveyor system

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



Figure 4. Picture of a blender and bagging line in Ethiopia, installed at Bahir Dar with a capacity of 50 tph.



Figure 5. Conveyor fertilizer screen with elevator to fill three bagging lines installed at Yara Thailand.



Figure 6. 3D Cad impression of Yara's complete factory in Thailand, including conveyor systems and bagging lines.

the warehouse, three screens with lump breakers are used to eliminate lumpy material. Then, three stainless steel elevators, each with a capacity of 120 t, transport the product to Quatro 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.

Track intake

The third line is 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. flat-screen computers. 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 the computer system.

Bagging lines

In this machine setup, six lines are placed next to each other, with a total capacity of 300 tph. Two robots are installed in two lines, with the possibility of adding another four robots in 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.

Ethiopia

Another major project was installed for the Agricultural Transformation Agency (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, a Weighcont Blender line, bagging lines and box-fill conveyors, including lump breakers, were installed. Following the installation, ATA could fill bags at a rate of 50 tph and blend with a capacity of 100 tph. In this way, it is possible to serve the local farmers with the necessary fertilizers. The machine lines are installed in the major agricultural areas and now the farmers can use the right fertilizer for their different soil quality and crops.

Conclusion

As this article demonstrates, it is obvious that blending of fertilizer is an international business.

The quality of the blended fertilizer is granted by using the right fertilizer type (such as granule size and density). For blending technology, the right machines are available where the fertilizer distributor can grant the quality and proof that the right fertilizer is produced. For the farmer, the benefit is that the costs can be reduced for the distributor in stock saving and storage space, because with five to eight different raw materials, it is possible to make an unlimited amount of different fertilizer compositions. The environmental impact is minimised as much as possible. **WF**



Small Bag Portable Container

- * In two 10 foot/3 meter containers.
- * Capacity 45 ton per hour.
- * 900 bags of 25 or 50 kg per hour.



High Speed Bagging Line

- * For jumbo - big bags 120 to 1250 kg
- * Capacity 50 to 70 ton m³ per hour.
- * For granular and powder materials.
- * Available with dust reducing system.



Weightcont Blender

- * Capacity of 20 to 200 ton per hour
- * Unlimited number of hoppers.
- * Computer controlled.
- * Custom built.

Shamrock Blender

- * Capacity of 25 to 70 ton/m³ per hour.
- * Machine size 4,5-5,4-7-9-11,5-14 ton.
- * Easy and gentle blending process.
- * Blending and weighing are separated.



EMT

Molenpad 10, 1756 EE 't Zand
The Netherlands.

Tel.+31 (0) 224 591213

email: emt@emt.tech www.emt.tech