

## VIGAN offers both pneumatic and mechanical unloaders to suit all volumes

Belgium-based company VIGAN is a major manufacturer of unloading equipment, and it offers both pneumatic and mechanical unloaders.

### PNEUMATIC UNLOADERS

VIGAN's pneumatic equipment works on the principle of conveying by air, which handles the product inside the pipes and thus behaves as the transport medium.

This means that, at the suction nozzle and using the vacuum produced by the turbo blower(s), a certain amount of air is mixed with the free-flowing products. Sufficient air speed in the pipes maintains the products in the air flow, and the cargo is therefore conveyed in the same way as the air.

At the centre of the equipment, when the product arrives inside the receiving cyclone or hopper, the air will be sucked and filtered upwards into the turbine while the products settle down into the hopper bottom or cyclone.

After being conveyed down by an airlock (rotary valve), the products will be transported to their final destination such as into trucks, railway cars, silos and/or storage warehouses.

Due to the inherent flexibility of VIGAN's equipment range, they can be used to unload pneumatically any size vessel, as mobile units can be put on the deck of large size vessels, and large size models can have a boom with a suction pipes of up to 30 metres to unload post-Panamax size vessels.

### MECHANICAL UNLOADER

VIGAN's mechanical unloader, the SIMPORTER, has been designed to meet very high capacity needs. It is able to discharge up to 1,500mtp (metric tonnes per hour), and is particularly suitable for large bulk carriers up to post-Panamax, and when the annual intake usually exceeds three million tonnes.

The twin-belt SIMPORTER system offers major benefits to port authorities and other organizations concerned with the bulk transfer of granular materials.

### CHOOSING THE BEST MODEL

When it comes to choosing the model that is best suited to the application is a complex matter, and is subject to several factors.

First, it is important to consider which products are to be unloaded. Most free flowing products with a density between 0.5 and 1.5 and a natural angle of repose

*Pneumatic unloader  
(and below).*



less than 40° can be handled by VIGAN equipment. Products such as all kinds of cereals (corn, wheat, barleys, etc.), oilseeds,

nuts, animalfeed, certain chemicals such as soda ash, alumina etc., .... but also slightly compacted products such as soy bean meal



(SBM) are also suitable.

The second consideration is how many tonnes will be unloaded each year.

It is important to get the right balance between unloading capacity and financial investment. It is most useful to compute the tonnage of each product and the forecasted figures for the coming years.

For up to 200,000 metric tonnes each year, VIGAN recommends the use of portable grain pumps. For up to 2–3mt (million metric tonnes), a pneumatic tower or NIV on gantry is advised. For over 3mt per year, an NIV on gantry and/or mechanical SIMPORTER is ideal.

VIGAN's expert team is always available to offer advice, and to direct customers to the best solution and cost: benefit ratio.

Next, the target unloading rate should be considered. It should be remembered that maximum unloading capacity applies most when the product is at the top of the hold, and the intake nozzle is in the middle of the opening area of the hold. In this position, the equipment is at its most effective. Average capacity considers the whole-ship-unloading operation, and therefore also the cleaning period at the bottom of the almost-empty hold, when the unloading rate necessarily drops significantly.

Many factors affect the average capacity in practice such as for instance:

- ❖ type and number of machine(s) in operation;
- ❖ size and type of unloaded vessels;
- ❖ manpower;
- ❖ captain's instructions;

- ❖ weather conditions;
- ❖ auxiliary equipment; and
- ❖ others, including maintenance, type of product, and so forth.

For continuous ship-unloaders (CSU), the average 'through the ship' unloading efficiency, including hatch cleaning, varies usually between 50–60% (mechanical) and up to 80% (pneumatic unloaders).

When comparing the average unloading efficiency between equipment and/or experimented unloading operations, close attention should be paid to considering exactly the same parameters such as taking (or not taking) account of any stoppage due to silo or warehouse problems, the lack of trucks for product loading, the time 'lost' for the displacement of the equipment along the ship and so on.

For example:

- ❖ maximum capacity 300mtph: average efficiency 70%;
- ❖ average unloading rate: 210mtph;
- ❖ assuming a working day of 22 hours, then a daily unloading rate of  $\pm 4,620$  tonnes per day will be achieved.

The key figures to define are:

- ❖ average unloading rate; and
- ❖ number of working hours per day.

Users should also remember to ensure that the onward movement/storage of the product can handle the unloaded cargo. So it is vital to ensure:

- ❖ enough trucks to ensure the product transport at maximum unloading rate — this is the most common limiting factor when the maximum unloading capacity

is above 300–400mtph;

- ❖ sufficient capacity (maximum) of the conveying system to the silos and/or warehouse; and
- ❖ other factors such as maximum berth occupancy time and so on.

Once all these factors have been closely examined, the type of equipment can be chosen. VIGAN's main types of equipment and most common maximum capacities are:

#### PNEUMATIC

- ❖ mobile or portable (also called vacuators or grain pumps) — maximum capacity from 120 to 250mtph;
- ❖ barge unloader, mostly for barges or vessel less than 15,000dwt — maximum capacity from 160 to 600mtph; and
- ❖ NIV or gantry type, mostly for all types of vessels up to post-Panamax — maximum capacity from 200 to 800mtph.

#### MECHANICAL

- ❖ SIMPORTER (twin belt technology) — maximum capacity from 800 to 1,500mtph.

Almost all equipment can be either mobile, either self-propelled or stationary. Most of VIGAN's equipment is customized, with many options and accessories available. Unloaders are all designed, manufactured and pre-assembled in VIGAN's factory in Belgium.

*The SIMPORTER in operation.*

