The unique Ventomatic® CARICAMAT®, automatic truck loading system, was introduced in 1969. The large number of installations successfully performing all over the world confirms the optimal conceptual design of the CARICAMAT automatic truck loader. The compact design and the flexibility of the equipment assure fast and smooth installation and commissioning either in new packing buildings or in existing structures, as replacement of manual loaders.

The truck loader palletises full bags directly onto truck platforms (with or without pallet). It operates with the widest possible typology of trucks (flat type with fixed or removable side and rear panels, dumper trucks, trucks with trailers etc...) always achieving the highest trucks reliability and availability for this kind of application, specifically designed for working in the toughest climatic and working conditions.

The patented suction disc system allows the loading of all kinds of paper and plastic bags onto all types of open top trucks and trailers. The high capacity (over 3000 bags/hour) combined with easy and fast positioning of the equipment (also in case the truck is not aligned into the loading bay) guarantees to the end-user a high overall capacity of the packing line, eliminating all the typical bottle necks of the traditional loading systems and reducing dramatically manpower required.

One of the first truck loader (Year 1969)

The vacuum system is surely the “heart” of the CARICAMAT® automatic truck loader and it is the main reason for the unique performance of the equipment. It is a proven technology which has been tuned over the years reaching nowadays a trouble-free status. The vacuum is generated by a set of pumps (the number and type of the units depends on the operational and climatic conditions) with always one unit in hot stand-by.

The type of the vacuum pump could be:
- Liquid ring pump (with or without water cooling system);
- Dry vacuum pump.

The vacuum piping network connects the set of pumps, via a filter, to the loading heads that are loading bags onto the truck platform. Each loading head is equipped with specially designed suction cups (one for each bag to be loaded). The exclusive design of the suction cups guarantees a gentle pressure over the entire surface of the bag, assuring a smooth handling. Furthermore the process of picking-up bags by suction cups will not extract cement from the bag itself.
Working process

**Phase 1**  
**Bag turning device**  
Incoming bags are orientated according to the layer to be formed.

**Phase 2**  
**Semi-layer forming group**  
The bags are alternatively grouped in two part-layers:  
- No. 2 - straight bags/layer  
- No. 3 - 90° turned bags/layer

**Phase 3**  
**Semi-layer transferring unit**  
Each part-layer is transferred onto a roller way under the loading heads to form two complete bag layers.

**Phase 4**  
The loading head picks up the bag layers and places them onto the truck platform. The bag layers are interlocked for ensuring stability to the stack.

Bag pacing system  
for a continuous and controlled flow of bags.

This special shape of the suction cup uniformly distributes the vacuum over the bag surface, assuring a soft and effective pick-up of the bag, totally avoiding the bag breakage and fall during the handling operation. The load on the bag (during the handling by vacuum cups) is approx. half of the load pressure during the bag filling, with consequently no risk of breakage.
Operator interface

The Operator panel is an IP65 Industrial Graphic Terminal. It displays the dynamic mimic of the automatic loader and provides both a clear and detailed overview and a close monitoring of all operations. Additionally, it is possible to have an on-board camera system connected to a pair of monitors installed close to the operator panel.

With a set of cameras and with the flexibility of the machine, the operator panels can be re-located in a remote control unit to allow an operator to control a multiple number of CARICAMAT® automatic truck loaders.

The setting of loading recipes, in accordance to the different type of trucks to be loaded, is easy and operator friendly. Among the main functions available, there is the possibility to change in “real time” the number of layers for each row of pallets and the number of rows per truck. The panel also provides alarm and warning lists for a proper trouble shooting and preventative maintenance. Several pages of the HMI operator panel are available for the control of the single actuator (i.e. motor and pneumatic-hydraulic cylinders) to allow the maintenance team to safely check and quickly test each single part of the machine.

Loading advantages

Trucks with fixed side panels can be loaded without problems. Minimum width 2000 mm

The vertical movement of the heads press the new bag layers against the previous layer, ensuring a better compacted and stable load.

No space between the bags ensures a better stability.

Trucks with rear fixed side panels and with trailer can be loaded without problems, filling the complete platform with bags.

No space between the bags ensures a better stability.
The steps 4, 5 and 6 in the previous page highlight the “change-over time” between trucks or, in other words, the time required to re-start the bag loading cycle after the first truck is completely loaded.

Traditionally, in order to overcome the production stoppage due to this change-over time, the packer was always coupled with two loaders (manual or automatic) so that the production could be diverted to the second loading bay after the truck in the first bay was fully loaded. This solution - two loaders per packer - could be necessary for countries where the limit load per truck, as average on the truck fleet, is between 10 and 20 tons.

More production with less investment

Ventomatic® solutions consists of one high capacity packer (typically a 10-spout rotary packer for 150 tons per hour), one automatic bag applicator and one CARICAMAT® automatic truck loader having an expected capacity of over 3000 bags/h for the whole line during loading time and with fast change-over between trucks. This is an efficient solution in terms of production and invested capital, assuring a good average production using only one loading bay.

The main advantages of the Ventomatic® solution are:
- Less equipment installed;
- Smaller building;
- Less man-power required;
- Less maintenance costs.

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### Change-over time

<table>
<thead>
<tr>
<th>Number of bags to be loaded per truck</th>
<th>Capacity during loading (b/h)</th>
<th>Loading time (minutes)</th>
<th>Expected truck change-over time (minutes)</th>
<th>Actual loaded bags in one hour</th>
<th>Number of operators per shift (minimum)</th>
<th>Amount of bags/tons (actually loaded in 8 hour shift)</th>
</tr>
</thead>
<tbody>
<tr>
<td>400 (20 tons)</td>
<td>3000</td>
<td>8</td>
<td>1</td>
<td>2667</td>
<td>1</td>
<td>21336 bags = 1067 tons</td>
</tr>
<tr>
<td>600 (30 tons)</td>
<td>3000</td>
<td>12</td>
<td>1</td>
<td>2770</td>
<td>1</td>
<td>22160 bags = 1108 tons</td>
</tr>
<tr>
<td>800 (40 tons)</td>
<td>3000</td>
<td>16</td>
<td>1</td>
<td>2824</td>
<td>1</td>
<td>22592 bags = 1130 tons</td>
</tr>
</tbody>
</table>

Important note: 1 minute of change-over is a conservative figure for the CARICAMAT automatic truck loader (typically it is less than 1 minute) but is a figure not possible to achieve for the other automatic loaders (mechanical) available on the market.
Typical bag layer configuration

5X2 LOADING CONFIGURATION

<table>
<thead>
<tr>
<th>Layer</th>
<th>Width (mm)</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base layer</td>
<td>2000</td>
<td>600x400</td>
</tr>
<tr>
<td>Interlock layer</td>
<td>2000</td>
<td></td>
</tr>
</tbody>
</table>

Minimum truck width clearance required: 2000 mm
(50 kg bags 600x400 mm)

6X2 LOADING CONFIGURATION

<table>
<thead>
<tr>
<th>Layer</th>
<th>Width (mm)</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base layer</td>
<td>2400</td>
<td>600x400</td>
</tr>
<tr>
<td>Interlock layer</td>
<td>2400</td>
<td></td>
</tr>
</tbody>
</table>

Minimum truck width clearance required: 2400 mm
(50 kg bags 600x400 mm)

Layout of multi-line plant

- Manual truck loading
- CARICAMAT® automatic truck loading
- Packing plant with ten spout rotary packer
- Capacity up to 3000 bags/hour

- Configuration with 5x2 bags per layer or 6x2 bags per layer

- High efficiency and reliability

1969 - 1600 bags/hour

Today - 3000 bags/hour