Möllers presents innovative Packaging Solutions

By: Sebahattin Akbas, Moellers Maschinenfabrik GmbH, Germany

Abstract

The new stretch-wrap packaging system according to the Möllers reverse hood method (see photo) produces palletless dispatch units weighing up to more than 2 t. By the discontinuance of the pallets packaging cost savings are obtained to considerably more than 50%. Further advantages are the high strength and the complete waterproofness of the packages which can therefore be stored in the open and transported on open vehicles. The recyclable package wrap consists only of the pollutant free polyethylene and is thus environmentally friendly. The heatless working stretch process additionally reduces the energy consumption by 90%. Bags are an original application field, but in principle, the method is also suitable for other dispatch goods. The palletless dispatch units are produced fully automatically by stacking the goods on a palletizing machine, wrap the stack with the first stretch film hood, turn the stack through 180° and wrap it with the second hood, the so called reverse hood. Inserted reinforcement sheets ensure high ruggedness of the package base which is formed likewise from the dispatch goods. On palletless stretch-packaging lines, also pallet loads can be produced.
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As MÖLLERS Area Sales Manager I am responsible for all sales and marketing activities in Middle East. This position is geared towards more individual support of our customers and guaranteeing the effective supply of the target market with quality, high-end MÖLLERS products both now and in the future.
Möllers presents innovative Packaging Solutions
Introduction

Palletless Reverse Hood Package

A cost-saving transport unit with multiple benefits for both consignor and consignee

- 1 kg plastic packs 1 t cement
- double capacity for half a price
- storage at any place
- high transport stability
- perfect load unit for export
- absolute water tightness
- no pallet costs
- wrapping material recyclable
- positive carbon footprint
Introduction

Material Handling part of the Supply Chain

- **Process**
  - Conveyors and silo systems
- **Grinding**
  - FIBC
    - Big bag: 1,500 - 2,000 kg
      - Capacity up to 120 t / h
- **Material Handling**
  - Bagging, palletizing and load wrapping
    - 25, 35 or 50 kg paper valve bags
      - Capacity up to 180 t / h
      - 3,600 - 5,000 bags / h
      - Up to 100 packages / h
  - Packaging
- **Warehouse and Despatch**
  - Bulk loading
    - Road and rail tankers
      - Capacity up to 200 t / h
Introduction

Material Handling part of the Supply Chain

typical packaging line in building material industry
Introduction

History of the Palletless System

Old situation:

Technology has existed for almost 20 years
- used in cement and building material industry with more than 100 references

Existing technology uses shrink film
Disadvantage:
- inconsistent quality of wrapping over the time
- requires additional energy source
- high investment costs, initially
- film consumption

Therefore technology up till now not widely used in cement industry.
Palletless Stretch-Wrapped Load

A 5-step production flow

1. goods stacked up to 9 layers, last layer in a reduced stacking pattern

2. application of base film sheet

3. wrapping of inner hood

4. stack pressing and turning by 180°, the top layer now forms the base of the load

5. wrapping of reverse hood

palletless package is ready for removal
## Technology

### Load Unit Configuration

<table>
<thead>
<tr>
<th></th>
<th>50 kg</th>
<th>35 kg</th>
<th>25 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic configuration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bag dimensions (L x W)</td>
<td>600 mm x 400 mm</td>
<td>500 mm x 330 mm</td>
<td>450 mm x 300 mm</td>
</tr>
<tr>
<td>Number of layer</td>
<td>8 + 1</td>
<td>8 + 1</td>
<td>8 + 1</td>
</tr>
<tr>
<td>Pattern</td>
<td>5</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Special layer</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Total number of bags</td>
<td>44</td>
<td>61</td>
<td>69</td>
</tr>
<tr>
<td>Total weight</td>
<td>2,200 kg</td>
<td>2,135 kg</td>
<td>1,725 kg</td>
</tr>
<tr>
<td>Other configurations</td>
<td>1,700 kg - 2,200 kg</td>
<td>1,645 kg - 2,135 kg</td>
<td>1,325 kg - 1,725 kg</td>
</tr>
</tbody>
</table>
The PSH Range

PSH-1  40 units / h
PSH-K  60 units / h
PSH-2  100 units / h

1. stretch hooder
HSA-Vario

base sheet applicator

load pressing and turning station

2. stretch hooder
HSA-Vario

side gusseted tubular film

laminated woven fabric
Technology

Plant Operation

1. wrapping of inner hood

2. stack pressing and turning - by 180°

3. wrapping of reverse hood

4. film underwrap at FLT step back recess
Handling of Palletless Load Units
by fork lift truck with fork adjusting device, crane fork and belt slings

1. enter with space
2. fork adjusting to close the gap
3. lift one / two load units for safe handling
Reverse Hood Packages can be stored outdoors

Reverse hood loads with contents resistant to pressure can be stacked two or more high, providing extensive storage capacity. Open-air storage for reverse hooded loads is variable in size, pattern and position, and rapidly available as required.
Handling

Traditional handling of Palletless Packages

Open vehicles are well suited to transporting reversehooded packages, and ease of access speeds up loading with forklifts and cranes. Loading from just one side of the vehicle, with the forklift taking two loads at a time, makes for especially rapid loading.
Handling

Traditional handling of Palletless Packages

Reverse hood packages get sea freight going. They can be handled by crane fork and shackle harnesses, and also in belt slings, supporting cooperation between forklifts and cranes.
# Economics

## 1 kg Plastic pack 1 t Cement (50 kg Bags)

<table>
<thead>
<tr>
<th></th>
<th>Reverse Hood Stretch System</th>
<th>Reverse Hood Shrink System</th>
<th>Flat Film System (for comparison only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stack weight</td>
<td>2,200 kg</td>
<td>2,200 kg</td>
<td>2,200 kg</td>
</tr>
<tr>
<td>Film dimension</td>
<td>800 mm x 550 mm</td>
<td>1300 mm x 1100 mm</td>
<td>1300 mm x 1100 mm</td>
</tr>
<tr>
<td>Film thickness</td>
<td>140 $\mu$m</td>
<td>120 $\mu$m</td>
<td>160 $\mu$m - 200 $\mu$m</td>
</tr>
<tr>
<td>Base sheet density / thickness</td>
<td>130 g / $m^2$</td>
<td>-</td>
<td>200 $\mu$m</td>
</tr>
<tr>
<td>Flat film thickness</td>
<td>-</td>
<td>-</td>
<td>120 $\mu$m (top sheet)</td>
</tr>
<tr>
<td>Packing weight / package</td>
<td>1.75 kg</td>
<td>2.53 kg</td>
<td>2.62 kg</td>
</tr>
<tr>
<td>Packing weight / t</td>
<td>0.79 kg</td>
<td>1.15 kg</td>
<td>1.19 kg</td>
</tr>
<tr>
<td>Costs / package</td>
<td>2.81 Euro</td>
<td>3.29 Euro</td>
<td>3.40 Euro</td>
</tr>
<tr>
<td>Costs / t</td>
<td>1.28 Euro</td>
<td>1.49 Euro</td>
<td>1.55 Euro</td>
</tr>
</tbody>
</table>

Prices for consumables to be checked at time of application
Economics

Double Capacity for half a Price (50 kg Bags)

<table>
<thead>
<tr>
<th>RTP</th>
<th>Capacity</th>
<th>Palletizer</th>
<th>Packages</th>
<th>Wrapping Systems</th>
<th>Cost proportion* (Stretch : Shrink)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 spouts</td>
<td>90 t / h</td>
<td>1,800 bags / h</td>
<td>40 / h</td>
<td>PKS-K</td>
<td>PSH-1</td>
</tr>
<tr>
<td>8 spouts</td>
<td>120 t / h</td>
<td>2,400 bags / h</td>
<td>54 / h</td>
<td>PKS-2</td>
<td>PSH-K</td>
</tr>
<tr>
<td>10 spouts</td>
<td>150 t / h</td>
<td>3,000 bags / h</td>
<td>68 / h</td>
<td>PKS-2-HC</td>
<td>PSH-2</td>
</tr>
<tr>
<td>12 spouts</td>
<td>180 t / h</td>
<td>3,600 bags / h</td>
<td>92 / h</td>
<td>PSH-2</td>
<td></td>
</tr>
</tbody>
</table>

* investments and consumables
Conclusion

It started with a visionary idea - eliminating the transport pallet - the idea of a self-supporting despatch unit - wrapped in shrink film.

The palletless stretch-wrapped load unit provides even more benefits suitable for the time we are facing.

<table>
<thead>
<tr>
<th>the Process</th>
<th>the Stability</th>
<th>the Economics</th>
</tr>
</thead>
<tbody>
<tr>
<td>- proven machine concept</td>
<td>- superior by double wrap</td>
<td>- extremely cost-saving</td>
</tr>
<tr>
<td>- flexible in operation with pallets, slip sheets or palletless</td>
<td>- easy handling by FLT or cranes</td>
<td>- lowest film consumption</td>
</tr>
<tr>
<td>- readily available consumables</td>
<td>- watertight package</td>
<td>- energy saving</td>
</tr>
<tr>
<td>- no empty pallet handling</td>
<td>- storable outside</td>
<td>- wrapping material recyclable</td>
</tr>
<tr>
<td></td>
<td>- repeatedly handleable</td>
<td>- positive carbon footprint</td>
</tr>
</tbody>
</table>