STACK ASSIST TOOL

OPTIMIZE YOUR LOGISTICS

PATENT PENDING
Mixed Palletizing specialist RSW has designed a tool that makes stack by instruction possible: the Stack Assist tool. This Stack Assist tool consists of a software program (IPS) this stands for Intelligent Palletizing Software, a terminal & a special laser pointer on the orderpick truck that guides the orderpicker where to stack according pre-calculated algorithms.

RE-STACKING

An underrated aspect of manual order picking processes is the stacking of packages on pallets and roll containers. It is estimated that approximately 80 % of order pickers must regularly re-stack packages because the pallet or roll cages are unstable or could potentially become unstable.

OPTIMIZED STACKING

With smart stacking instructions cargo carriers can not only be more stable, but can be more efficiently stacked. Decrease of damage during transportation and have a better optimized truckload.

The IPS software program calculates the optimal stacking pattern based on the pick list and the pick route. The stacking pattern is then translated into stacking instructions for the order picker and presented step-by-step via a laserpointer. Also the route can be optimized according each order structure.
STACK ASSIST TOOL

SPATIAL AWARENESS

The lack of spatial awareness can be largely compensated with stacking instructions. If an order picker does not have the capacity to build an optimized stack, it is important to explain how he should do so. This can be done step-by-step with a tool that indicates which product must be placed on which location = stack by instruction.

For each order line, the IPS Stack Assistant presents **two different screens** on the terminal (supported by the laser on the truck):

STACK INSTRUCTION SCREEN

This screen shows the top view of the pallet, including the already stacked products. With a sign, the location is indicated where the new product must be placed. Also, the location number, a photograph of the product, and the number of pick units is shown so that the chance of picking errors is minimized.

NAVIGATION SCREEN

The navigation screen shows visually which corridor he needs to drive to and where the pallet must be parked.
STACK ASSIST TOOL

CONNECTIVITY

For stack by instruction, the optimal stacking pattern for the entire pallet or roll container must first be calculated. This is the starting point for the pick list and the pick route generated by the WMS. Based on this data, with the help of new algorithms, it is calculated how the products must be stacked for an efficient, stable, and safely stacked pallet that is not overloaded.

One condition for stack by instruction is that the product characteristics of all products are known. This means that for every product at least its dimensions and weight are recorded, ideally by the WMS. Often this is already the case.

BASIC CONFIGURATION
The basic configuration is suitable for smaller warehouses with only an orderpick system (ERP) available.

ADVANCED CONFIGURATION
The advanced configuration consists of the basic configuration including a WMS system (more advanced warehouses).

Stack Assist Tool - Man to Goods can be used in a traditional manual warehouse where WMS and Voice Picking are not in use. In (semi-) automated warehouses IPS Goods to Man is installed, and is then linked to the WMS or WCS.
STACK ASSIST TOOL

BENEFITS

Use of the IPS Stack Assistant leads to a minimum of 20-50% increase in the productivity of order pickers. Stack by instruction ensures a fluent process where order pickers build stable stacks in one flow, no longer needing to stop halfway through to re-stacking.

In addition, using the IPS Stack Assistant results in higher load factors and less transportation costs. A more efficiently stacked pallet means a better use of available space, and that can lead to a decrease of several pallets at the end of the day. This is followed by a decrease in transportation costs, and several customers being able to be served by one truck.

Practical experience shows that twenty percent of order pickers already perform at such a high level that using the IPS Stack Assistant has little impact on their productivity levels. Because of this tool the rest (80 percent) will become more productive. In other words, the productivity differences between efficient and inefficient order pickers will decrease, while the average productivity will increase.
STACK ASSIST TOOL

IPS GENERAL

IPS Intelligent Palletizing Software integrated in our Stack Assist Tool quickly calculates the optimal carrier in every warehouse process. This is done based on order data, product specifications and configurable business rules. The optimal result is used in the warehouse process and leads to an improvement in staff productivity. And it also improves the quality and stability of full carriers. Through the use of IPS in combination with the Stack Assist Tool the average number of carriers needed is decreased, often leading to a reduction in transport costs.

STACK ASSIST TOOL & WAREHOUSES

The Stack Assist Tool is suitable for any type of warehouse where several (mixed) goods are collected.

HARDWARE - EPT

The stack assistant laser, screen and optional labelprinter, can be mounted on every existing Electric Pallet or orderpicktruck. For every brand of Electric Pallet Truck we will supply the SAT screen, laser and proper installation guide.
STACK ASSIST TOOL

BENEFITS

Through the deployment and use of IPS in combination with our Stack Assist Tool you achieve the following objectives:

- Quick, powerful calculation of optimal carriers
- Increased productivity of order pickers. Re-stacking is never needed.
- Optimally filled carriers, according to your logistical needs and those of your customers (e.g. family grouping, weight, height and weight up to pallet, Roll container, etc.)
- Increased level of service to your customers through improved quality carriers
- Less carriers means less transportation costs
- Determination of the optimal sequence of products
- Optimal capacity of (semi-) automated warehouse concepts
- Optimal control of stacking robots and stack instructions for manual packing stations

STACK ASSIST TOOL IS SCALABLE

Our Stack Assist Tool makes few demands, despite the enormous computing power and fast computation times, on the necessary server and configuration. The various computing tasks are performed and divided into several computational agents (easily implemented calculation server). If desired, the number of agents can be increased without re-installation of the IPS software. IPS is therefore suitable for any type of warehouse operation.
STACK ASSIST TOOL

BUSINESS RULES STACK ASSIST TOOL

To determine the optimal results, SAT uses business rules. These are adjustable parameters related to:

- Product specific characteristics (e.g. length, width, height, weight, packaging type, stackability)
- Order specific characteristics
- Functional / process specific characteristics
- Quality aspects e.g. Contribute content
- Customer delivery specific address wishes (ex. Store Shelves Plan)
- Carrier specific features (such as carrier type, max height, max weight, yes / no fences)
- Properties of stacking robots (only for automatic AGV version)

HOW THE STACK ASSIST TOOL WORKS

IPS quickly calculates, with intelligent algorithms, the optimal carrier. The result is determined by using adjustable values that are dependant on the needs in the process. The core of Stack Assist Tool with IPS consists of:

- Calculation Module
- Visualisation Module
- Instruction Module (Stack by Instruction) and 2 color laser
- Simulation Module
- Interfaces with ERP, WMS, WCS, EPT, Robot and Manual Packing station
- Analysis and Reporting
For this businesscase we have taken a DC operation in the Netherlands, in this DC there are 60 FTE’s active in manual orderpicking during a 2 shift operation. Re-stacking is a here common activity during orderpicking. *(source data given by customer: NL Feb 2013)*

**CURRENT SITUATION NL (EXAMPLE)**

<table>
<thead>
<tr>
<th>Nr. of FTE</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr. of Electrick orderpick trucks (EPT)</td>
<td>30</td>
</tr>
<tr>
<td>Nr. of shifts</td>
<td>2</td>
</tr>
<tr>
<td>Nr. hours per shift</td>
<td>8</td>
</tr>
<tr>
<td>Salary FTE</td>
<td>€ 38,000,–</td>
</tr>
<tr>
<td>Value EPT (rent p/year)</td>
<td>€ 30,000,–</td>
</tr>
</tbody>
</table>

Needed time for orderpicking of 1 pallet in minutes | av. 27 |
Proportion re-stacking (pallet 1 to) | 6 |
Required time for re-stacking of 1 pallet in minutes | av. 27 |

| Nr. pallets per FTE ready for customer p/day (incl re-stacking) | 15 |
| Nr. pallets total for customers p/day (incl re-stacking) | 889 |

**SITUATION IN COMBINATION WITH STACK ASSIST TOOL**

| Nr. pallets per FTE ready for customer p/day (No re-stacking) | 18 |
| Nr. pallets total for customer p/day (No re-stacking) | 1067 |

**CONCLUSION**

*To orderpick & stack 889 pallets p/day we need less FTE’ers & EPT’s*

| Nr. FTE less needed for orderpicking | 10 |
| Savings per year | € 530,000,– |