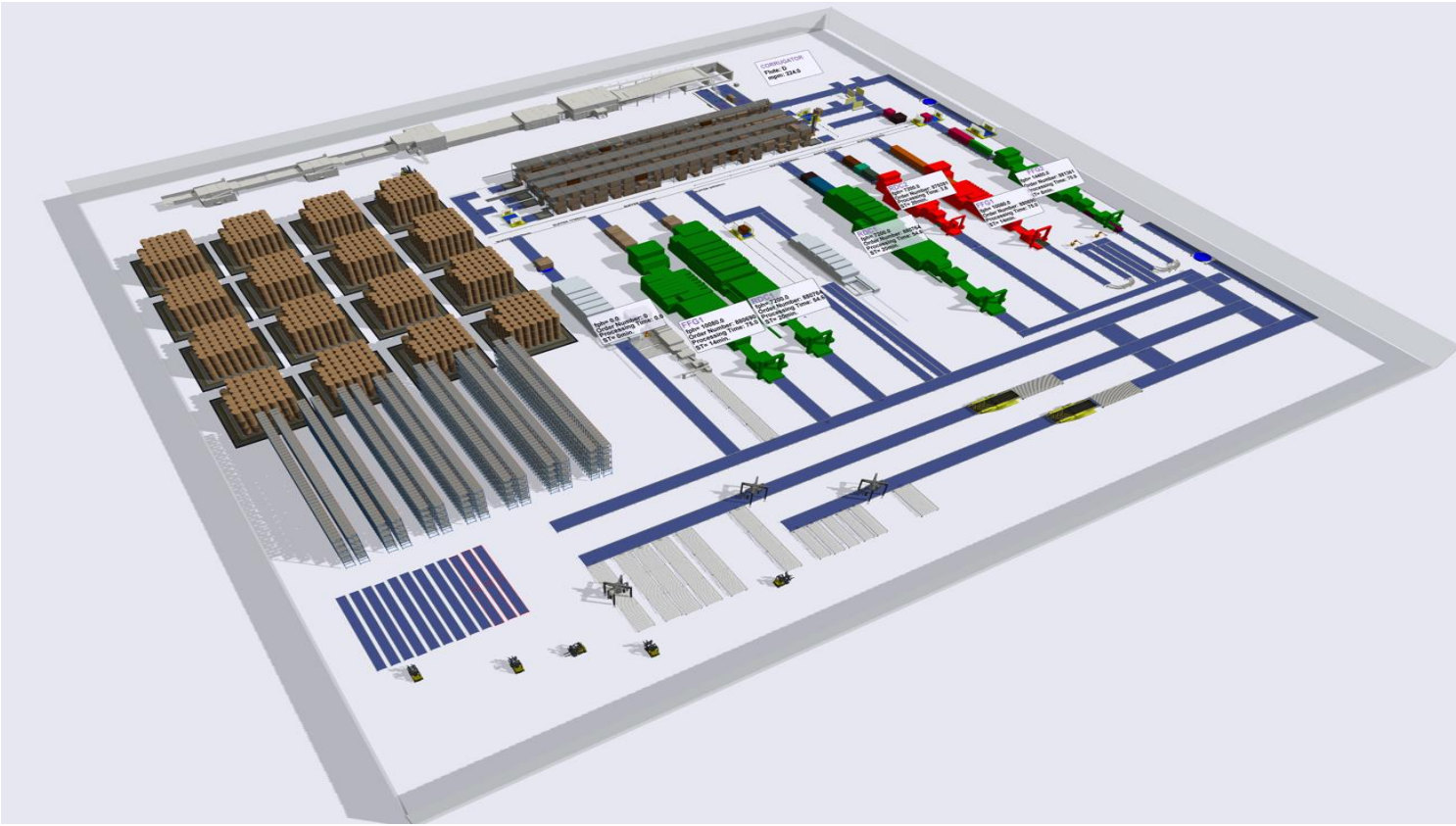




WSA-USA & WARAK GROUP 3D Plant Simulator Module





WSA USA / WARAK 3D Plant Simulator Module

What is our 3D Simulator?

- The simulator uses real customer production data and combines it with the plant layout and machine speeds to create what we call a digital twin of the customer's existing or future operation.
- Customers can view their plant running in real time assuming real life operational situations.
- The simulator is a verification and vetting tool for new plant layouts.
- The simulator can be applied to existing layouts to determine what changes and upgrades could be applied to achieve additional volume and proper plant balance.





WSA USA / WARAK 3D Plant Simulator Module

How we build the configurator module:

- **Minimum 6 months production data from Plants ERP System showing all order data run on the corrugator, converting and finishing machines including when the order was run and the run time**
- **Set corrugator run speeds for all grades.**
- **Set Converting machine run speeds and setup times.**
- **Set Finished Goods Line throughput rates for all devices such as unitizers, stretch wrappers, pallet inserter, etc.**
- **Set running hours for the corrugator, converting and finishing machines.**
- **Set minimum buffer from corrugator to converting and from converting to finishing.**
- **Set unplanned downtime % for all machines.**
- **Set planned PM's for all machines.**





WSA-USA / WARAK 3D Plant Simulator Module

What the Simulator Model will Validate:

1. Potential Bottlenecks

- Actual cycle rates for all devices including Transfer Cars, Roll Cars, Turn Tables, Pallet Inserter, Load Tiering Devices, Stacker Cranes for our vertical systems, etc.
- % of time converting machines are waiting on product to be delivered or waiting on product to be discharged.
- Bottlenecks are clearly visible in the simulation which will drive modifications to operational parameters and layout design.

2. Balance

- How well a plant is balanced from corrugator to converting and through finishing?
- Minimum amount of WIP Storage Space needed to balance the corrugator and converting with the specified order mix.

3. Performance

- Corrugator – MSF per hour, # of flute changes, number of roll changes, % downtime, avg. run speeds per order, etc.
- Converting - MSF per hour, number of setups, % run time, % setup time, % downtime and % time waiting for product.
Total Productivity of the Corrugator and each Converting Line



WSA USA / WARAK 3D Plant Simulator Module

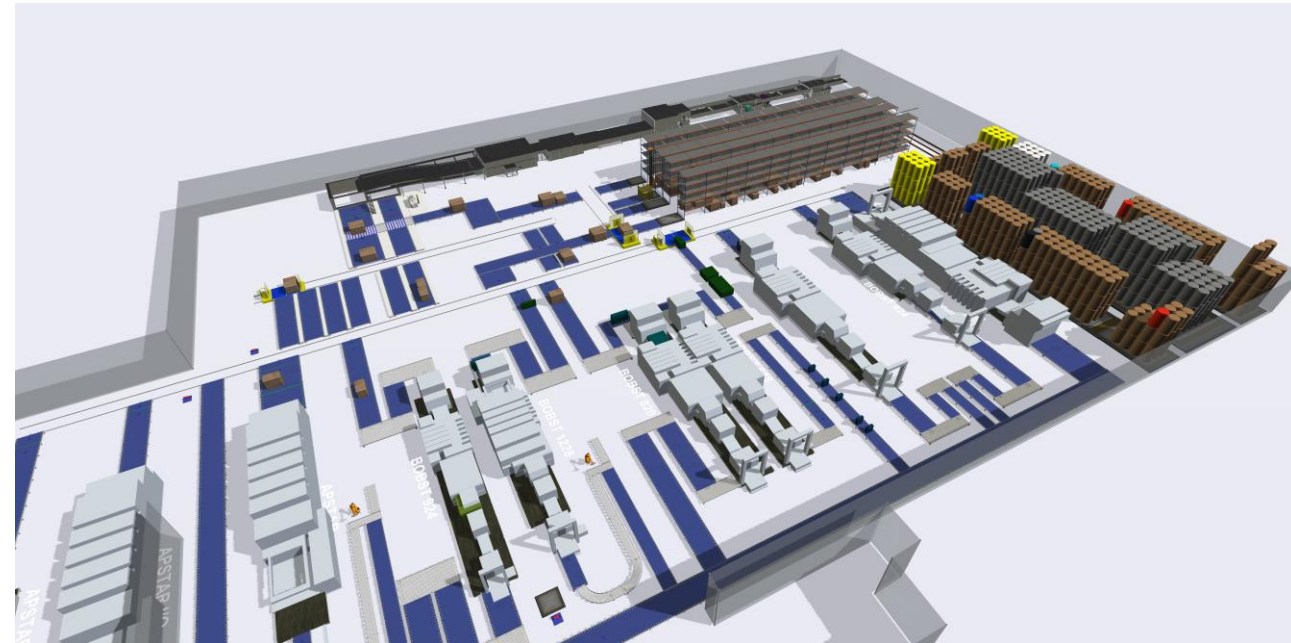
What the Simulator Model will Validate (cont.):

4. Optimization

- Changes in plant shift schedules.
- Additions of new machines
- Changes in planned PM's
- Optimization of Block Types to suit a particular order mix
- Changes to any inputs will immediately show outcomes

5. Validation of a plant layout

- Ensures the layout is sound and meets customer's expectations





WSA USA / WARAK 3D Plant Simulator Module

Optimization of Block Type & Cell Size for Vertical WIP Solutions

Technical drawings showing the layout and details of the WIP solution. The drawings include a main floor plan, a cross-section view, and two detail views labeled 'DETAIL LEVEL 4750 mm - 2500 kg' and 'DETAIL LEVEL 5700 mm - 3500 kg'. A 'TOP HAT' detail is also shown. A table provides specifications for different block types:

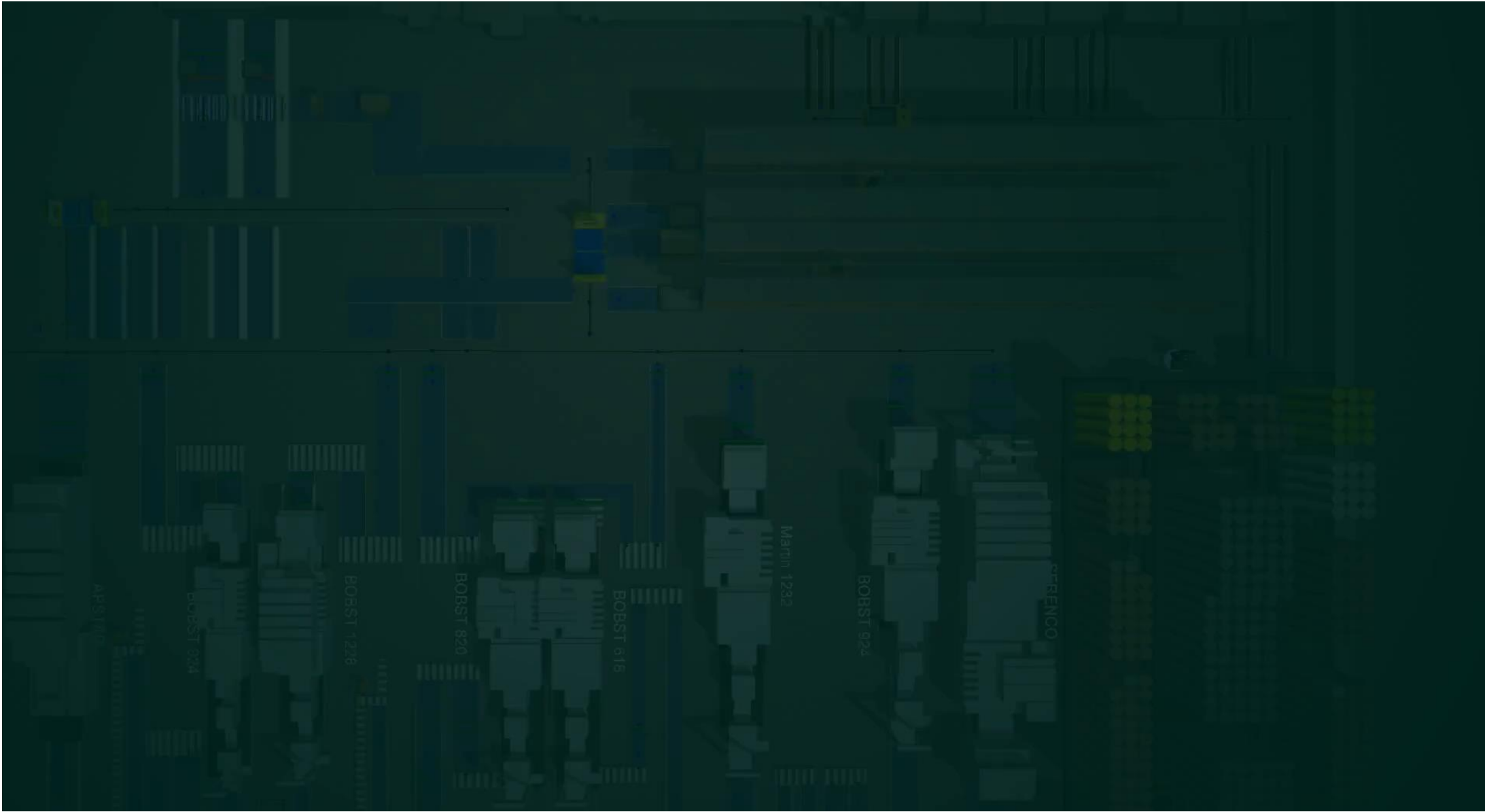
WIDTH	DEPTH	HEIGHT	NET WEIGHT	CAPACITY
4000	2000	1800	2000	250
4000	2000	1800	2000	400
3000	2000	1800	2000	400
3000	2000	1800	2000	400
3000	2000	1800	2000	400
TOTAL				828

NOTES:
 - CHANNEL CLASSED (S16)
 - CHANNEL PAGES 1
 - LONGITUDINAL 90/10
 - CEILING 90/10
 - CEILING FRAMING 100/100
 - CONCRETE (CROSS) CROSSLING (MINIMUM)
 - UPPER WALL INCLUDED (THIS IS NOT)
 - SHEET PILING (THIS IS NOT) CONCRETE/ALUMINUM SHEET PILING FIRST 2 CM
 - SHEET PILING FOR OTHER LEVELS
 - SPRINKLER NOT INCLUDED

3D simulation of the warehouse layout. The simulation shows a large stack of blocks in a warehouse. A forklift is visible in the foreground. The simulation interface includes a 'Run Speed' dropdown and a 'Stock on Racks' table.

	Pasillo 1	Pasillo 2
Num Bloques	472	472
m2	901303.86	936225.50
Num Bloques tipo 1	188	210
Num Bloques tipo 2	84	88
Num Bloques tipo 3	71	65
Num Bloques tipo 4	129	109
Num Bloques tipo 5	0	0
m2 tipo 1	513888.93	571665.31
m2 tipo 2	105331.09	108355.71
m2 tipo 3	52775.62	50779.47
m2 tipo 4	220308.22	205425.00
m2 tipo 5	0	0
m2 por canal C	259777.49	257784.84
m2 por canal D	0	0
m2 por canal E	425575.43	426206.04
m2 por canal BC	4086.42	4499.27
m2 por canal BD	0	0
m2 por canal E	171535.99	202543.73
m2 por canal EB	40328.53	45191.61
m2 bloques a 1800	687986.16	758841.06
m2 bloques a 1200	213317.70	177384.44







THANK YOU!

**COME SEE US IN BOOTH 325 TO LEARN HOW WSA-USA
CAN MAXIMIZE YOUR PLANT EFFICIENCIES!**

