

Current Trends and Technology in Storage & Inventory Management



PROMAT 2015

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March 23-26, 2015
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Sponsored by:



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Increased Sizes & Capacities



Increased Sizes & Capacities

Larger Tray & Carrier Sizes Available:

VLM's:

- Max. Tray Widths of Up To 161" Wide
- Max. Tray Depth of Up To 50" Deep

Vertical Carousels:

- Max. Carrier Widths of Up To 144" Wide
- Max. Carrier Depth of Up To 26" Deep

Increased Sizes & Capacities

Key Benefits:

- Larger trays and carriers have been present for some time, but recently seem to be gaining acceptance by clients.
- More storage provided per tray/carrier.
- Increased number of lines picked per tray / carrier.
- Fewer units required, when compared to multiple narrower units.
- More product in fewer machines under control by less labor.

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Increased Sizes & Capacities



Increased Sizes & Capacities

Increased Tray & Carrier Weight Capacities Available

VLM's:

- Max. Tray Load Capacities Up To 2,200 Lbs. per Tray

Vertical Carousels:

- Max. Carrier Load Capacities Up To 1,650 Lbs. per Carrier

Increased Sizes & Capacities

Key Benefits:

- VLM units with capacity to 2,200 Lb. trays are readily available.
- More storage capacity provided per tray/carrier.
- Wider range of products able to be stored, allowing for these technologies to be applied to more applications.
- Ability to store heavy items, previously not able to be stored in VLM or Vertical Carousel technologies.
- More product in fewer machines under control by less labor.

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Increased Sizes & Capacities

3-Axis VLMs Give More Access To More Storage From One Access Point





Item Presentation

How Items Are Presented To Users

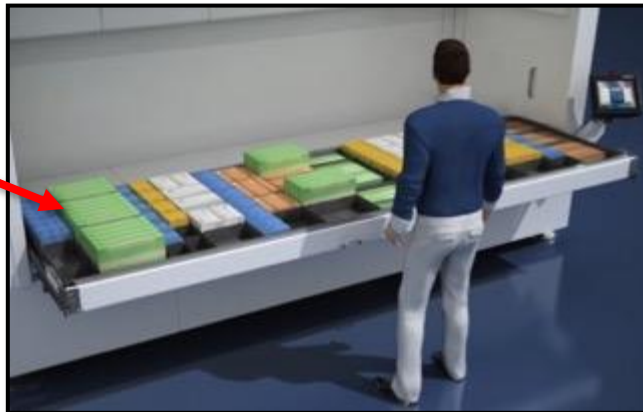
Key Points:

- Several Different Technologies Now Available.
- Has Evolved from a Basic, Manual Presentation to an Advanced and Fully Automatic Presentation.
- Faster and More Accurate Item Picking and Placing.
- Ergonomic Benefits for Heavier Items.
- Able to Accommodate a Variety of Operators.

Item Presentation

Manual Tray Extraction / Delivery

Telescopic Tray Extraction



Hinged Tables To Pull Trays Out Onto For Picking

Item Presentation

Multiple Level Tray Delivery / Presentation



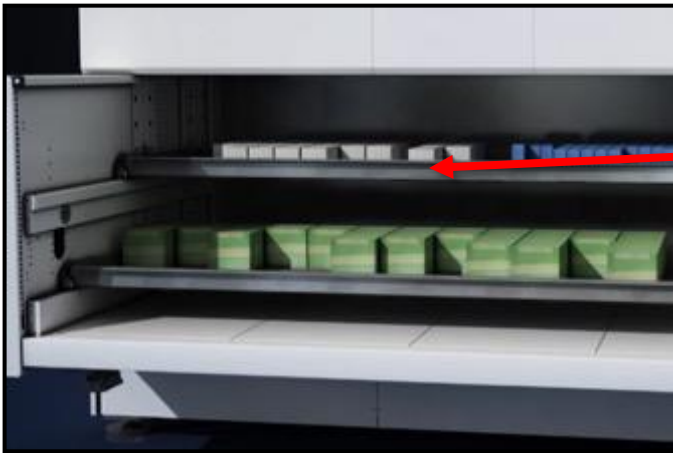
- Multiple Trays can be Delivered to an Operator Nearly Simultaneously.
- Ideal for Applications with Shorter Product Heights.
- When a Taller Tray is Requested, Single Tray Delivery Takes Place.

Benefits:

- Greatly Increased Throughput
- Decreased Picking Time

Item Presentation

Ergonomic, Varied Height Tray Delivery / Presentation



**Variable Tray Height
Presentation For
Ergonomic
Picking**

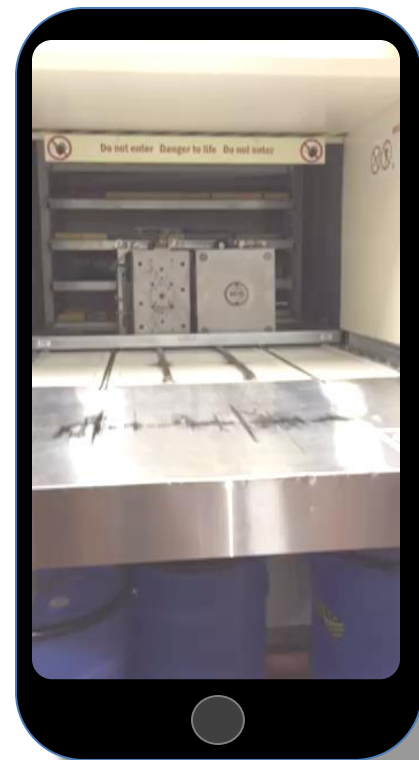


Benefits:

- Reduced Risk of Injury
- Accommodate a Wider Range of Operators
- Better Visibility

Item Presentation

Semi and Fully Automatic Tray Delivery / Presentation

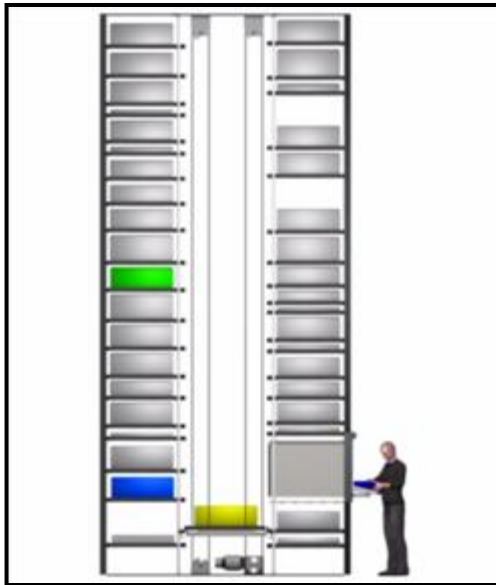


Benefits:

- Ability to delivery trays out of units automatically for picking and overhead manipulation.
- Provides the ability to have true top picking of items.
- Able to be used with overhead cranes and lifting devices.
- Provides improved operator ergonomics and safety when compared to manual tray extraction.

Item Presentation

Tray Delivery / Presentation Strategies for Added Speed



- Priority Management
- Pre-Store Buffering
- Dual Extractors

Benefits:

- Greatly Increased Throughput
- Decreased Picking Time

Item Presentation

Tray Transport Carts



- Ability To Transport Trays And Product To Secondary Point Of Use Locations.
- Multiple Carts May Be Used.



Benefits:

- Reduced Risk of Injury
- Flexible Inventory Control

Restricted Access Picking

Ability To Limit Access To A Machine, Carrier/Pan, or Individual Items

Key Points:

- Large Scale Versions on Industrial Vending Machine.
- Low Volume, High Value, High Security and Control.
- Adds Traceability and Accountability.
- Avoid Intentional Theft as well as Over Picking “Just in Case”.
- Avoids Cross-Contamination and Misplaced Items.

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Restricted Access Picking

Ability To Limit Access To A Single Item or Location



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Restricted Access Picking

Ability To Limit Access To A Single Item or Location



Advanced Picking Aides

Picking Aide Availability and Uses In C/VLM Technology

Key Points:

- **Pick-to-Light technology assists operators with four basic functions:**
 - Picking a specific or active item.
 - Putting an item in an active order or location.
 - Communicating a message such as a quantity, description, etc.
 - Completing the task and moving to the next task.

Advanced Picking Aides

Item Location Indication

LED Bar Location Indicators

- Displays The Location Of The Items To Pick.



Benefits:

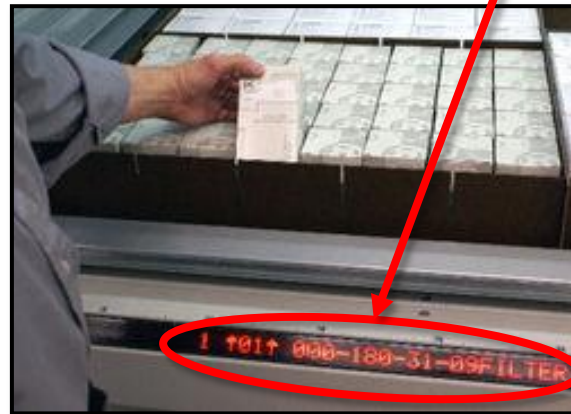
- Faster Pick Times
- Greatly Increased Accuracy



Advanced Picking Aides

Text & Location Information

LED Bar Text & Location Indicators



- Displays the location of the items to pick left to right and front to back.
- Able to display other information useful to users.
 - Quantity of items to pick or put
 - Item Description
 - Item number
 - Lot and other information



Advanced Picking Aides

Put-To-Light Batch Order Processing



Benefits:

- Increased Accuracy
- Less Walking = Time Savings

Advanced Picking Aides

Laser / Light Indicators For Location

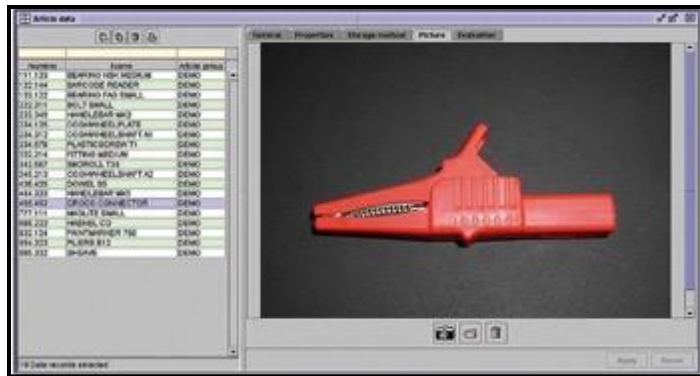


Benefits:

- Increased picking accuracy.
- Increased picking speed.
- Better operator direction that is paper and hands free.

Advanced Picking Aides

Item Photo Identification and Camera Cross-Check



Benefits:

- Increased Picking Accuracy
- Faster Item Identification
- Faster Pick Times
- Immediate Error Checking



Eco-Friendly Options

Reduce Energy Consumption and Environmental Impact

Key Points:

- Manufactured and designed to be as energy-efficient as possible.
- VLMs are available with energy-return systems.
- Carousels guide operator during loading to ensure balanced operation.
- Energy-efficient LED lighting is becoming a popular upgrade.
- Energy-saver modes growing in popularity.
- Transition to C/VLM technology saves environmental costs such as HVAC, lighting, safety and janitorial compared to open-shelving warehouses.

How Orders Are Processed

Flexible Batch Order Processing, Using C/VLM Technology

Key Points:

- Traditional batching, but groups of machines with multiple operators working within a work zone.
- The difference with VLM's is that it is possible to utilize devices within a group to present picks and then any operator can complete and place (dedicated pick indicators, put indicators with color, etc.)
- This solves the peak capacity problem – also material handling problem and continuous batching by a non-picking operator. Can also be done with other technologies such as horizontal and vertical carousels.
- Higher throughput , wider range, ability to handle peaks and seasonality.
- Flexible labor and staffing – low training threshold.

Advanced Operator Interfaces

Human-Machine Interface (HMI) with Advanced Functionalities

Graphical Color Touch Screen HMI's:

- Ability To Display Graphical Information Of Items To Pick And The Items Location.
- Ability To Execute Item Requests And Orders At The HMI.
- Some HMI's Feature The Ability To Store Item Information On The HMI For Stand Alone Applications.



Built-In Inventory Management

Controllers Contain Advanced Inventory Management Functionalities

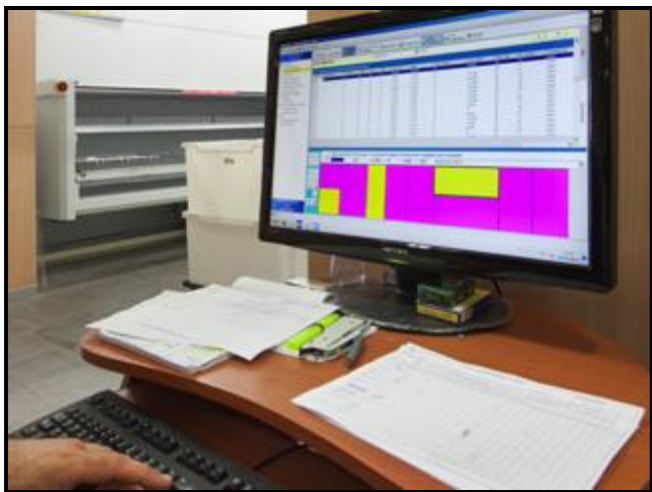
- No need for a third-party software platform
- Ability to handle even advanced tasks at the operator station
- Manage inventory even outside of the C/CLM
- Reporting and Accounting Functions included



Specialized Inventory Management Software

Manufacturers Offer Turn-Key Inventory Management Software Packages

- No need for a third-party software platform
- Ability to handle even advanced tasks at the operator station
- Manage inventory even outside of the C/CLM
- Reporting and Accounting Functions included



Integration To Clients

Greatly Expanded Integration Capabilities

Key Points:

- Software integration capability – greatly expanded due to open platform developments.
- C/VLM equipment must be smart-enabled.
 - High graphic content
 - Touch screen enabled
 - Highly configurable
 - Multilingual
 - Remote support and upgrades possible

Integration To Clients

Other Integration Trends & Methodologies

Key Points:

- Large scale integration – C/VLM equipment performing large volume, high speed picking in conjunction with other zones and equipment types.
- Integration of forward pick from C/VLM equipment to down line Put Wall applications.
- Right equipment for the right product as integrated components.
- C/VLM equipment can be integrated to varying degrees, allowing for everything from simple reporting to complete control.
- Integrating with conveyor systems, cranes and robotics through MHI collaboration.

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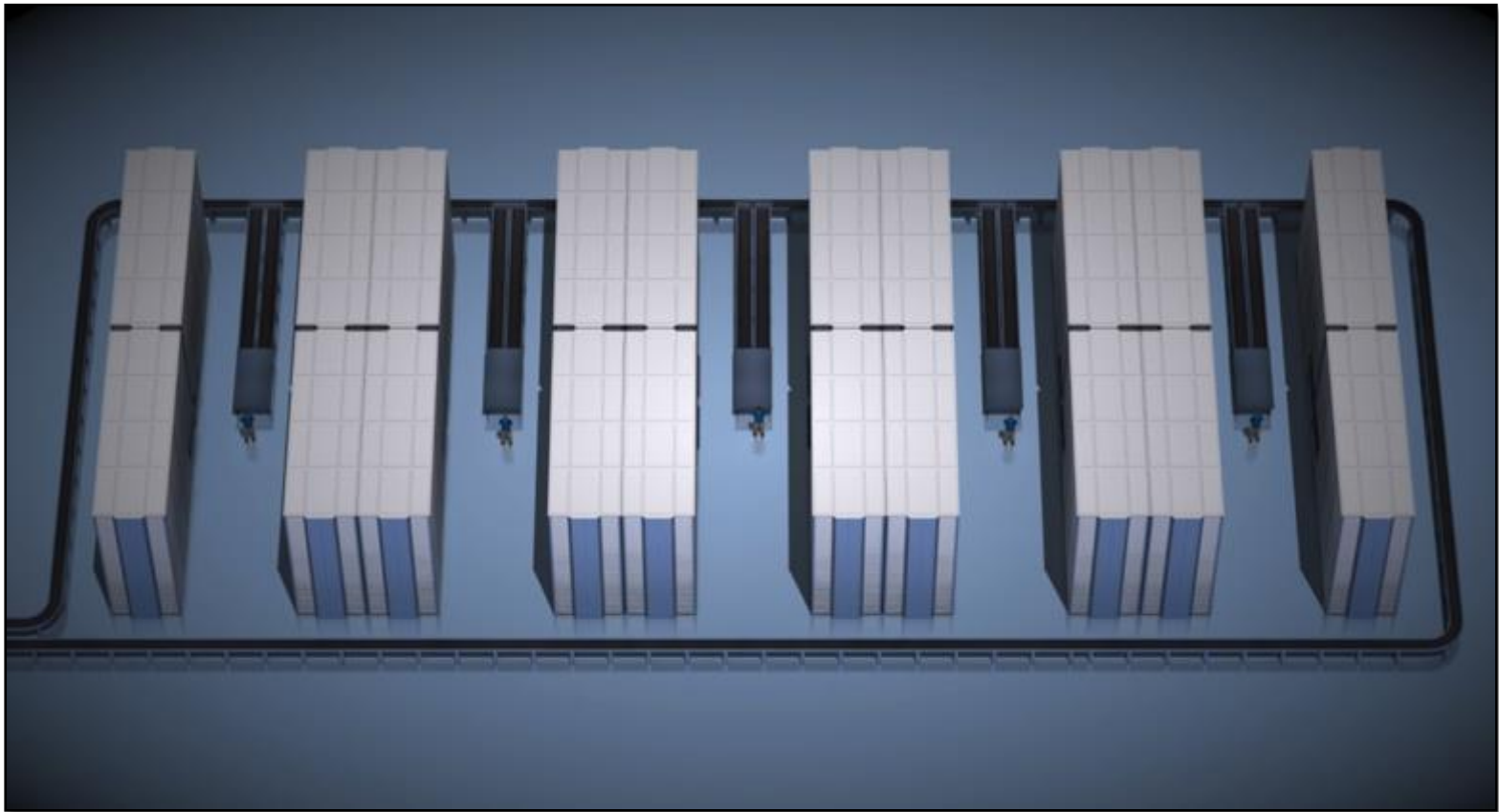
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Integration with other Material Handling Systems

Combining Multiple Types of Equipment for Increased Throughput



Real-World Application

Integrated solution with Vertical Lift Modules, conveyor, narrow-aisle rack and flow rack.

- 3 horizontal carousels grouped to hold 3,800 SKU's
- One operator pulls outbound orders
- Software and pick-to-light technology improved pick accuracy to 99.9%
- Former system required 5 operators



Real-World Application

Vertical Lift Module in Oil & Gas Industry

- Parts distribution to a manufacturing facility
- Plant capacity grew and the requirement for parts grew also
- Lean 5 Sigma operation
- Need to improve warehouse operations and improve parts picking



Real-World Application

3 Vertical Lift Modules combined with inventory management software solved the problem.

- 44% productivity improvement
- Labor reduced by 27%
- Recovered 70% of previously occupied floor space
- Improved ergonomics



Real-World Application

Vertical Carousel in Manufacturing

- Buffer storage for parts in production
- Ceiling height under 10 feet
- Multiple parts of various heights
- Replaced racks and shelving



Real-World Application

Vertical Carousel maximizes space and provides ergonomic picking.

- 301 square feet of storage with a footprint of only 53 square feet
- All parts are accessed from an ergonomically correct position
- Carriers in the carousel can be fitted with intermediate shelves to accommodate smaller height totes



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