



NORBAC

STORAGE & MATERIAL HANDLING SOLUTIONS

AGENDA

- 1. WHO WE ARE**
- 2. WHAT WE DO**
- 3. OUR CUSTOMERS**
- 4. WAREHOUSE 4.0 SOLUTIONS**
- 5. WHY PARTNER WITH NORBAC**



WHO WE ARE

Norbac is a minority-owned business founded in 1995 and headquartered in Austin, Texas. For 30 years, we have provided innovative, and comprehensive warehousing, material handling, and order fulfillment solutions to customers in every vertical market worldwide.

Vision Statement:

Leading with innovative, sustainable material handling solutions, setting the standard for excellence and customer satisfaction.

Mission Statement:

Creating shared success for clients, vendors, and employee-owners through exceptional material handling solutions driven by integrity, innovation, and collaboration.

Value Proposition:

Norbac customizes solutions that best suit the objectives of our customers. Applying our technical knowledge and expertise we integrate the right technologies in an agnostic manner while keeping costs in check and projects on schedule.

WHAT WE DO

Static Storage & Material Handling Solutions:

Norbac offers the most extensive portfolio of static storage and material handling equipment and accessories to meet the needs of customers from any industry, environment or location.



WHAT WE DO



Automated Storage & Material Handling Solutions:

Norbac is partnered with leading warehouse & material handling automation OEMs, this synergy enables us to custom-engineer and deliver holistic, turnkey solutions that empower our customers' success.

OUR CUSTOMERS



TESLA



SPACEX



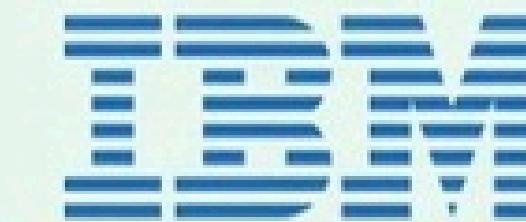
Mercedes-Benz



HONDA



JOHN DEERE



Webasto
Feel the Drive



MAGNA

WAREHOUSE 4.0 SOLUTIONS

High Density Automated Storage Systems

Powered Conveyors & Sorters

eCommerce/Order Fulfillment Systems

AMRs / AGVs

Customer's ERP

Customer's WMS

Customer's MRO System

Customer's Vendor Data



NORBAC

Holistic Assessment Of Customer's Needs

Agnostic & Cost-Efficient Solution Design

Safe & On Schedule Implementation

Improved Overall Operational Efficiency

Reduction of Fixed Costs

Compliance With Safety Standards

Leveraging Business Growth

Meeting Customer Deadlines

Increased Sustainability

End To End Custom-Engineered & Future-Proofed Solutions

Improved Floor Space Utilization

- Maximized Storage Capacity
- Reduced Warehouse Footprint



Enhanced Inventory Management

- Increased Inventory Accuracy
- Reduced Inventory Attrition
- Reduced Stockouts



Optimized KPIs

- Higher Number of Processed Orders
- Lower Labor Dependency
- Higher Order Accuracy



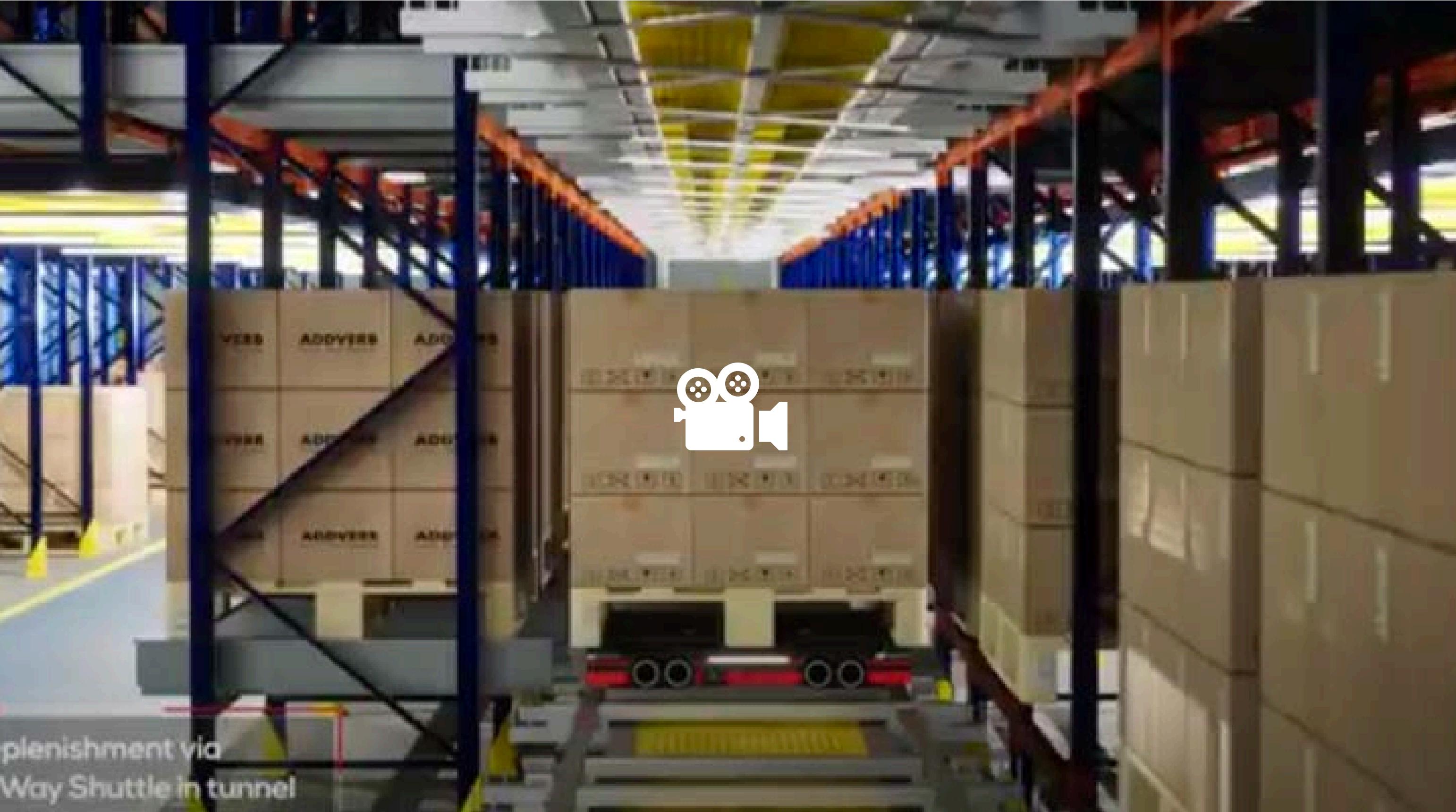
WAREHOUSE 4.0 SOLUTIONS

Agnostic integration of automated technologies to deliver holistic solutions



WAREHOUSE 4.0 SOLUTIONS

HIGH DENSITY PALLET STORAGE & RETRIEVAL SYSTEM



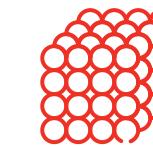
WAREHOUSE 4.0 SOLUTIONS

HIGH DENSITY PALLET STORAGE & RETRIEVAL SYSTEM

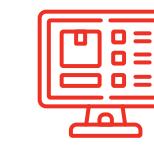


Cruiser 360
Pallet shuttle that enables vertical and horizontal space utilization and facilitates FIFO and LIFO operations for safe and fast load movements.

Payload: Up to 1,500 kg / 3,307 lbs.



High-Density Storage



Speed up to 1.1 m/s



Energy Efficiency

Advanced Battery
Equipped with replaceable Li-Ion-Phosphate battery for 8 hrs. operating time, longer lifespan and lower discharge rate

Versatile
Can be customized for varied weights and sizes and operate between -13°F to 113°F

Integration
Wi-Fi enabled and Seamless Integration interface with any ERP/WMS/WCS

WAREHOUSE 4.0 SOLUTIONS

HIGH DENSITY / HIGH SPEED UNIT LOAD STORAGE SYSTEM



WAREHOUSE 4.0 SOLUTIONS

HIGH DENSITY / HIGH SPEED UNIT LOAD STORAGE SYSTEM



Types

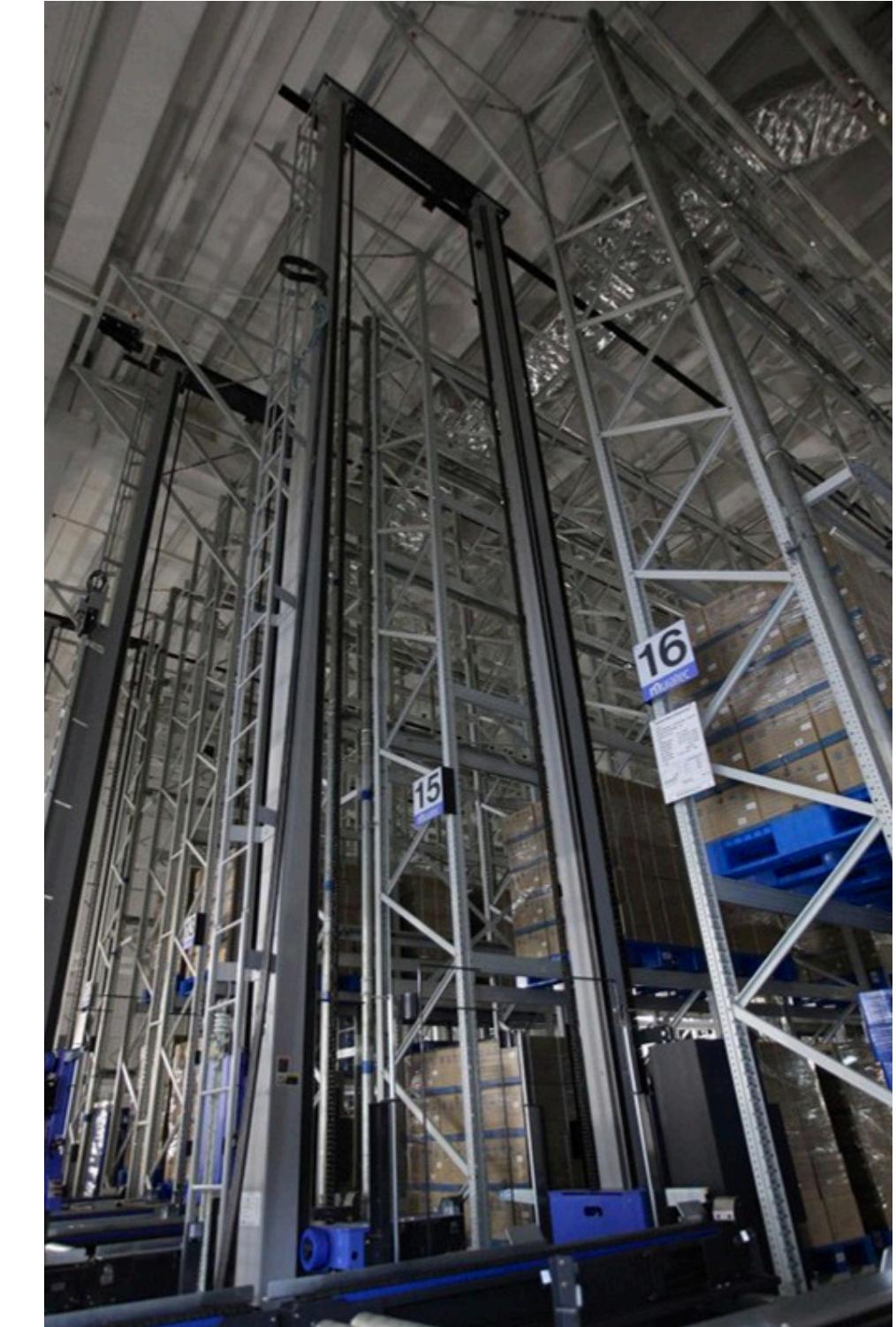
- Single & double-deep
- Multiple Carriage Configurations
- Free standing & rack supported
- -22°F to 104°F environment

Capacity

- 1,000kg to 3,300kg / 2,205 – 7,275 lbs.
- 19 ft to 131 ft+ heights
- Oversize up to 8,000kg / 17,637 lbs.

Rates

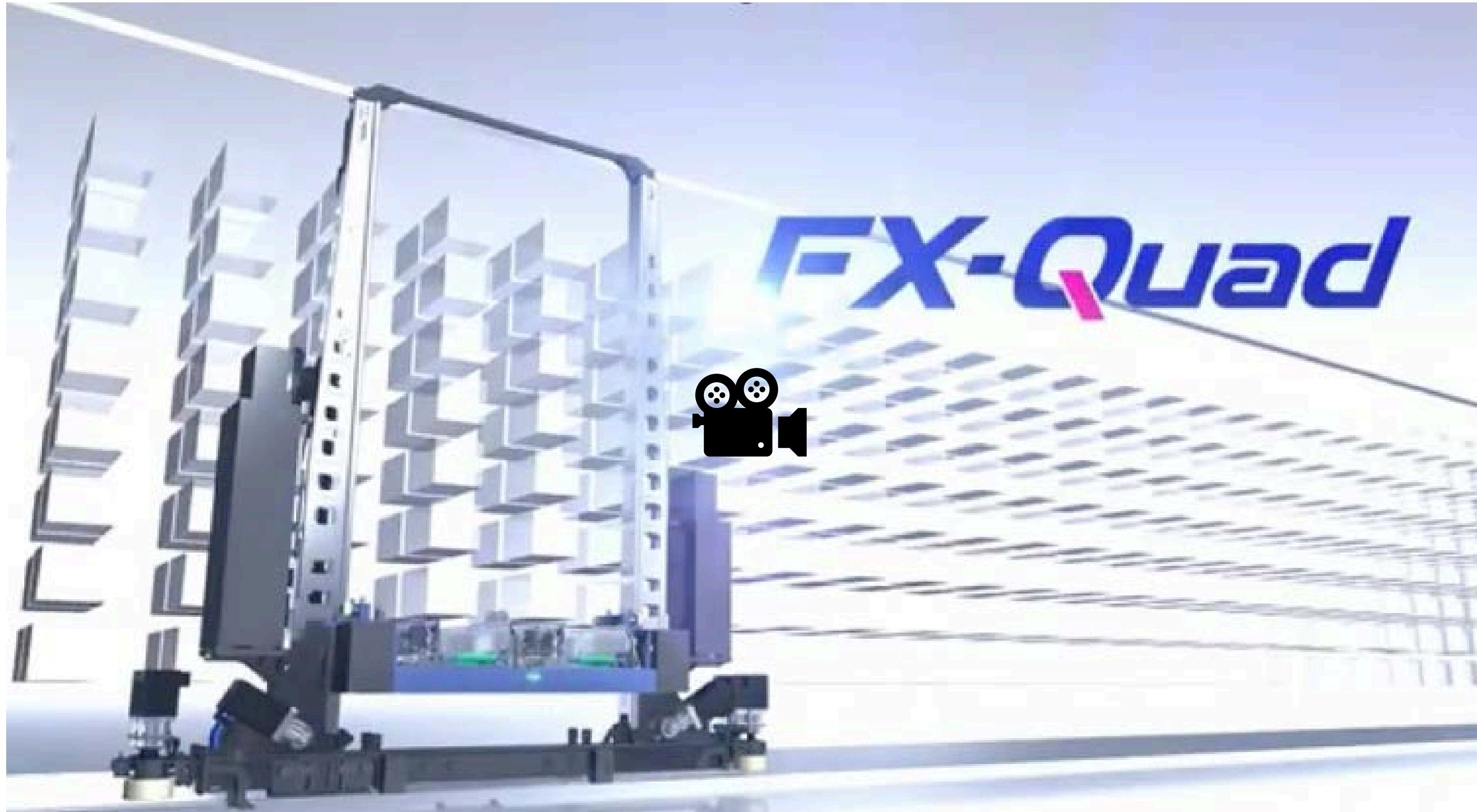
- 40 - 70 dual cycles per hour
- Specification dependent





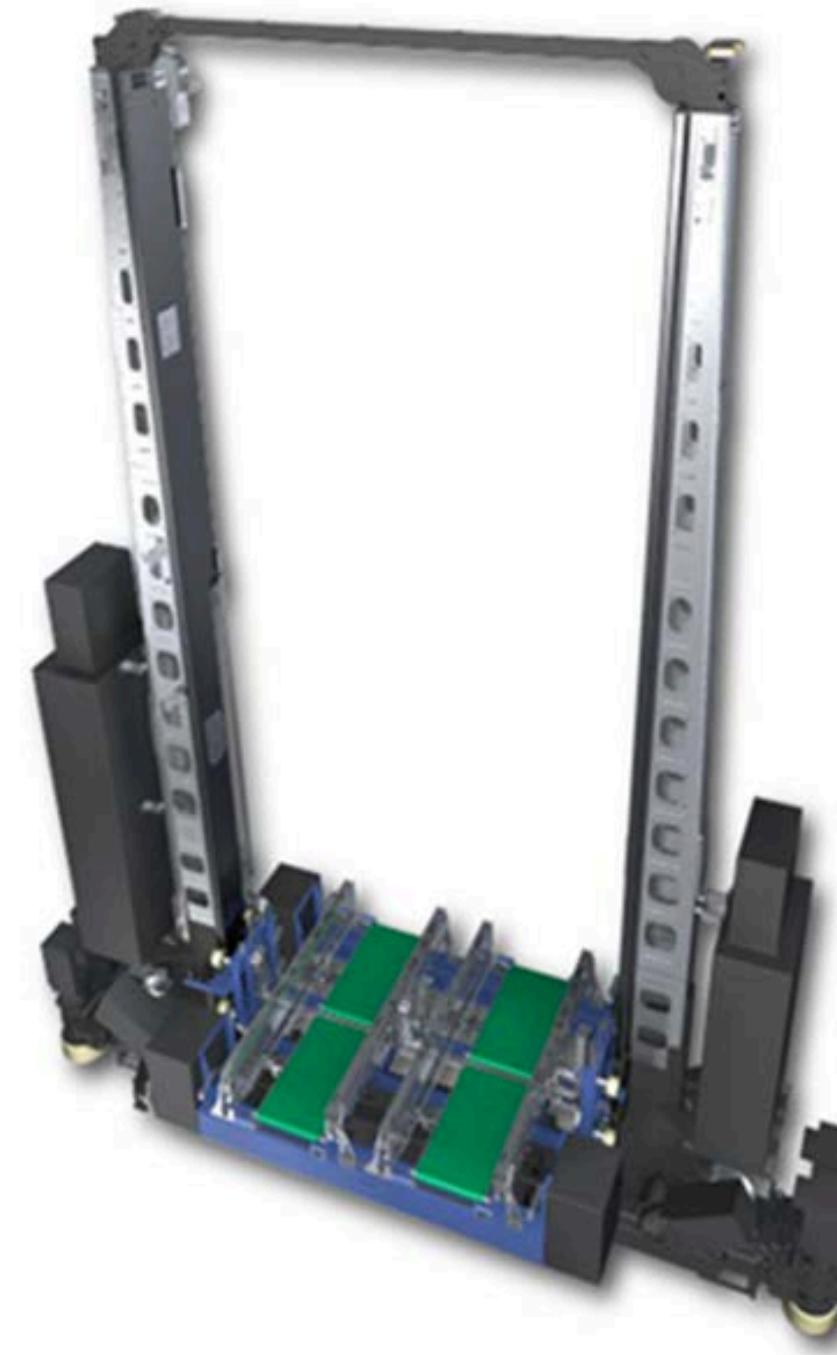
WAREHOUSE 4.0 SOLUTIONS

HIGH THROUGHPUT MULTI-SIZE CASE & TOTE STORAGE



WAREHOUSE 4.0 SOLUTIONS

HIGH THROUGHPUT MULTI-SIZE CASE & TOTE STORAGE



Types

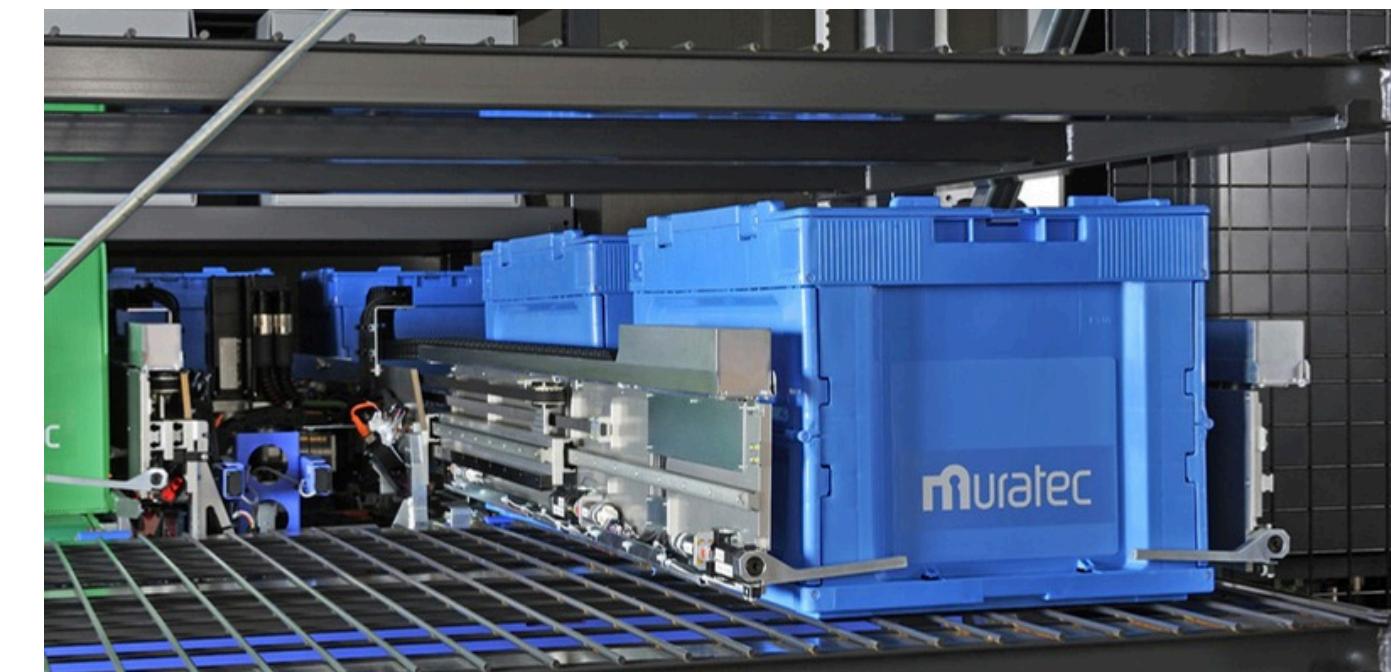
- Single & twin mast configurations
- Single & multi-shuttles
- Fixed load & free-size handling
- Free standing rack structure
- -13°F to 104°F environment
- Configurations from 19 ft. to 59 ft.

Capacity

- Standard totes, cases, boxes
- Standard up to 220 lbs. (100kg) load weight

Rates

- 70 - 250 dual cycles per hour
- Specification dependent



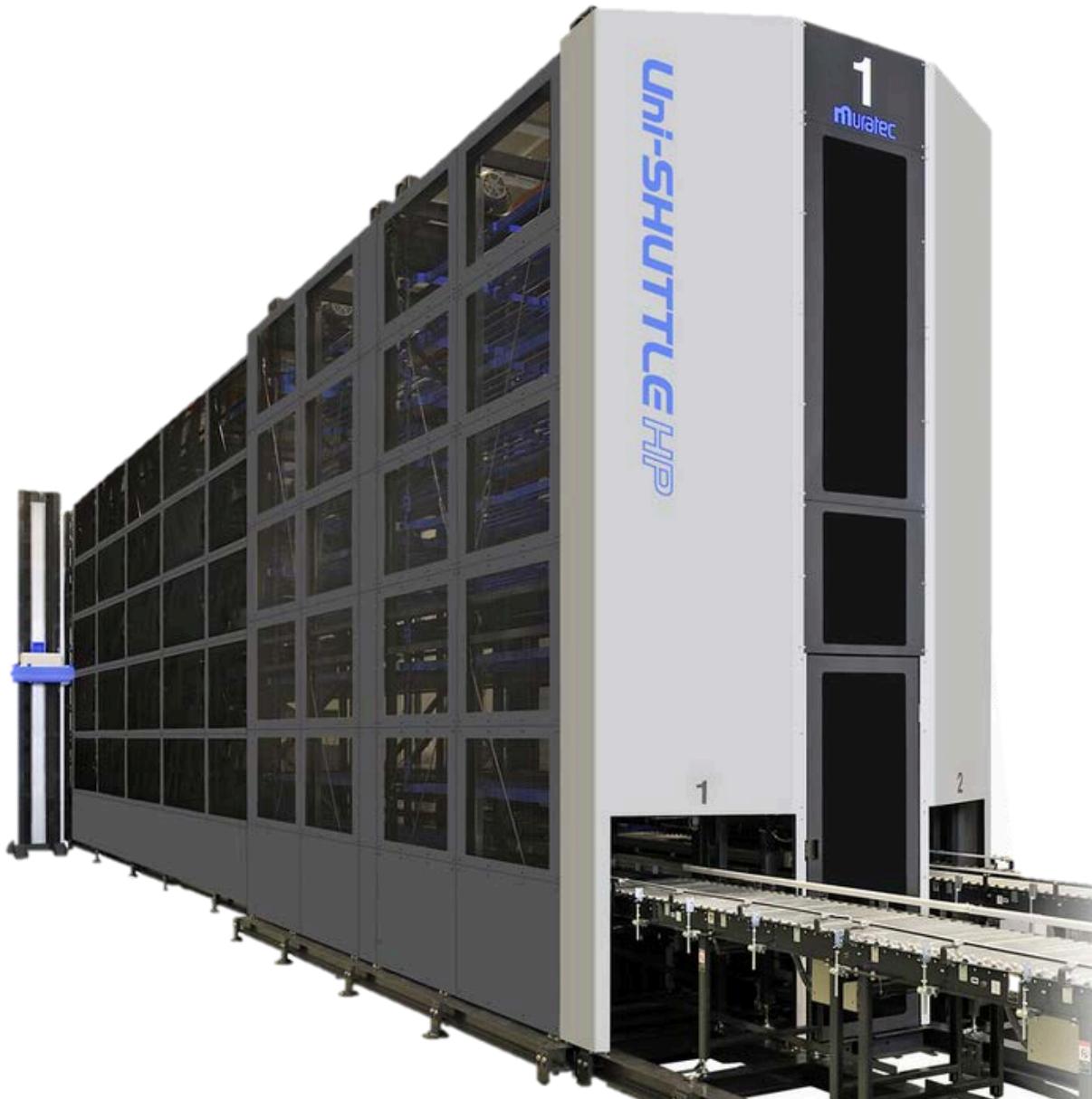
WAREHOUSE 4.0 SOLUTIONS

HIGH SPEED MULTI-SIZE CASE & TOTE SEQUENCING - SORTING

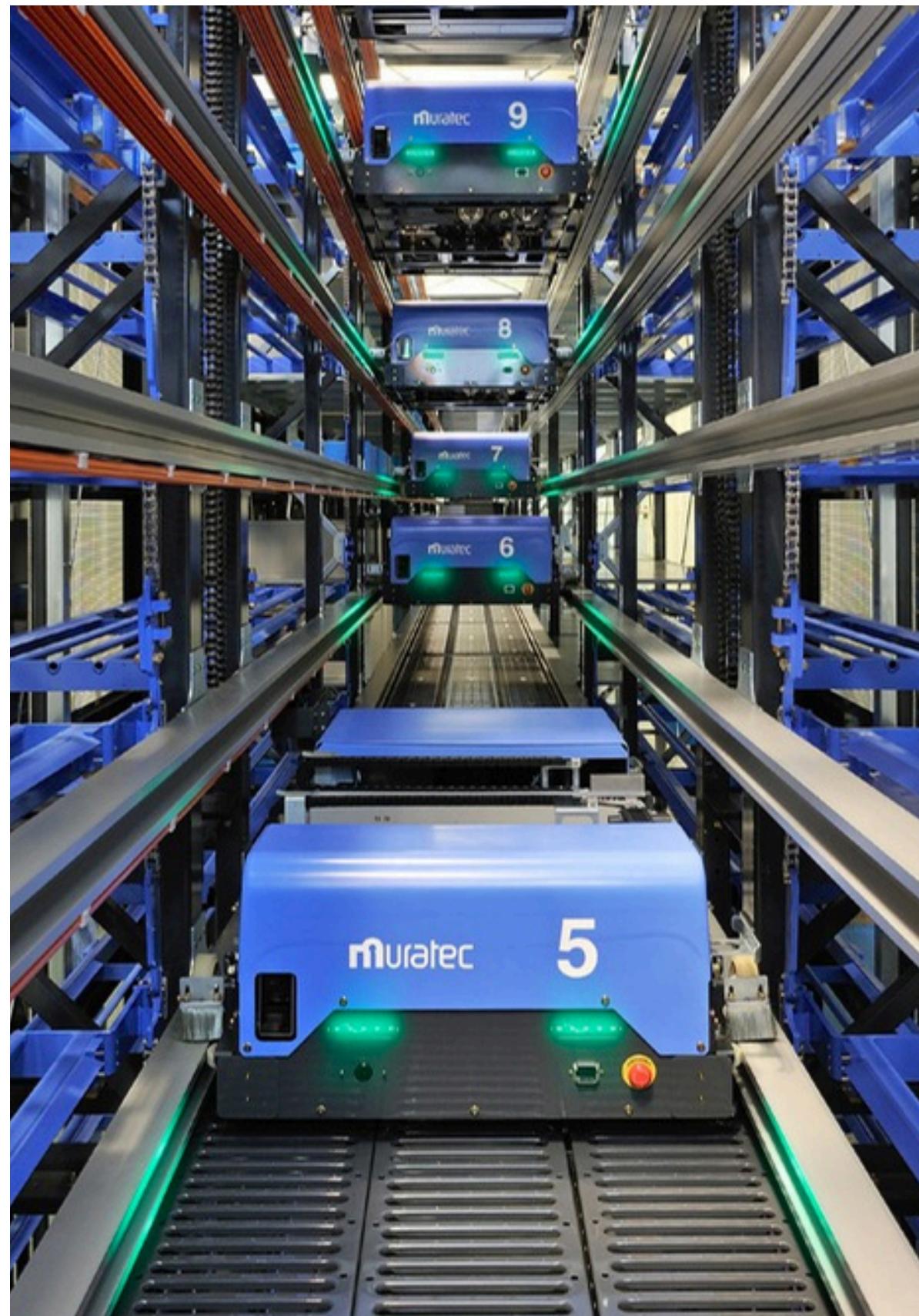


WAREHOUSE 4.0 SOLUTIONS

HIGH SPEED MULTI-SIZE CASE & TOTE SEQUENCING - SORTING



- **High speed sequencing and sorting shuttles**
- **Vertical lift modules**
- **Shuttle travel Speed up to 1,312 ft/min**
- **Shuttle lift speed up to 393 ft/min**
- **Single, double and triple deep racking.**
Max load capacity 77 lbs.
- **Height between 7 ft and 30 ft**
- **Single or twin lifters**
- **32°F to 104°F environment**
- **Up to 3,000 combined loads/hr.**



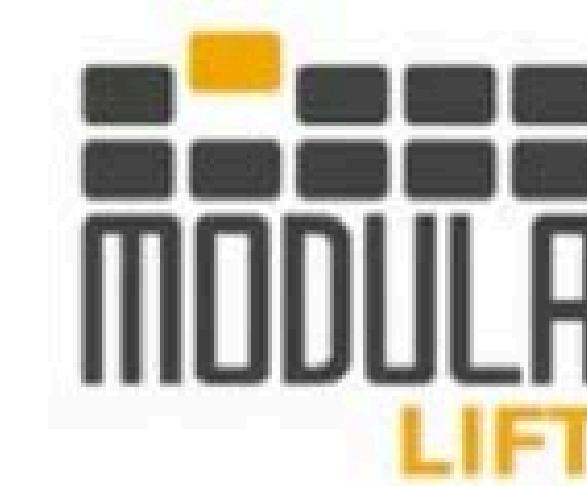
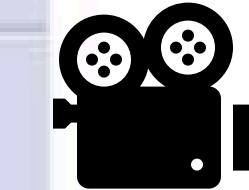


WAREHOUSE 4.0 SOLUTIONS

BROKEN CASE / SMALL PARTS STORAGE & RETRIEVAL



TAKE YOUR MATERIAL HANDLING
TO THE NEXT LEVEL



WAREHOUSE 4.0 SOLUTIONS

BROKEN CASE / SMALL PARTS STORAGE & RETRIEVAL



IMPROVES EFFICIENCY

Fulfill orders efficiently without picking errors



MANAGES INVENTORY

Monitor stock levels and inventory transactions with just one click



RECOVERS SPACE

Saves up to 90% of valuable floor space compared to traditional storage methods



SAVES TIME

Retrieve the parts and products you need instantly



INCREASES SECURITY

Enclosed storage that keeps your spare parts secure



REDUCES RISKS

No more climbing stairs or mezzanines to retrieve your goods



Think it's a big investment?

100% ROI

12-18 months on average



WAREHOUSE 4.0 SOLUTIONS

FULLY AUTOMATED ACCUMULATION CONVEYING



WAREHOUSE 4.0 SOLUTIONS

FULLY AUTOMATED ACCUMULATION CONVEYING

END DRIVE



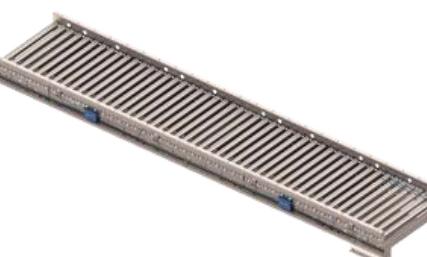
- 12' bed – factory assembled
- Full skew bed available
- Pneumatic tensioner with maintenance monitoring
- Controller power supply included

INTERMEDIATE



- 3', 6', 9', or 12' beds
- Rollers and modules factory installed
- Touch up skew compatible

END IDLER



- 12' bed – factory assembled
- Pneumatic brake option
- End pulley tracking features
- Dual 24V & 120V interface module ships standard

BENEFITS

- Handles totes, cartons, parcels and more
- 3' zones maximize accumulation density
- Universal Photo eye, same as used with Series 1500 MDR
- Pneumatically controlled zone brakes available
- Modular design, factory readied quick connect installation
- Release efficiency up to:
50% Singulation, 75% Auto-Slug, 95% Slug Release
- Across-The-Line Start, Soft Start, or VFD compatible
- Easy installation & maintenance



FEATURES

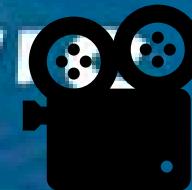
- Belt Pull: 500 lbs.
- Speeds: Up to 300 FPM*
- BFs: 15", 21", 27", 33" & 36"
- Intermediates: 3', 6', 9', or 12'
- Zone Length: 3'
- Horsepower: Up to 5 HP
- Operating Temp: 32° to 104°F
- Bottom Guard/Dust cover compatible

* Typical accumulation is 180 FPM or less



WAREHOUSE 4.0 SOLUTIONS

HIGH SPEED LINEAR SORTATION



REWIND LINEAR
SORTATION

A large, high-speed linear sortation system is shown in the background, featuring a long conveyor belt with various packages. In the foreground, a large blue graphic element contains the text 'REWIND LINEAR SORTATION'. A black video camera icon is positioned between the word 'REWIND' and 'LINEAR'.

WAREHOUSE 4.0 SOLUTIONS

HIGH SPEED LINEAR SORTATION

Rates	300 CPM
Speeds	700 FPM
Divert Angles	20°, 30°
MTBH	Cartons, Totes, Polybags, Jiffy Mailers
Min. Product (LxWxH)	6" x 2" x 0.2"
Max. Product (LxWxH)	78" x 34" x After sort Dependent
Min Weight	0.4 lbs.
Max Weight	100 lbs. / ft
Sided	Single / Dual
Switch Type	Electric
Switch Location	Moveable Infinite Adjustability
Min Divert Centers	4'
Shoe Pitch	5"
Slat Gap	Closed Deck
Effective Widths	27", 36"
Top of Sorter Elevation	32"
Divert Control	24v Non-Proprietary Control Module
Chain Oiling	Yes
Max Length	750'
Temperature	20° - 120°F
Noise Levels	<77dB @600fpm





WAREHOUSE 4.0 SOLUTIONS

FULLY AUTONOMOUS MATERIAL HANDLING SOLUTIONS



WAREHOUSE 4.0 SOLUTIONS

FULLY AUTONOMOUS MATERIAL HANDLING SOLUTIONS



600kg

KMP 600P

Differential drive



1500kg

KMP 1500P

Differential drive



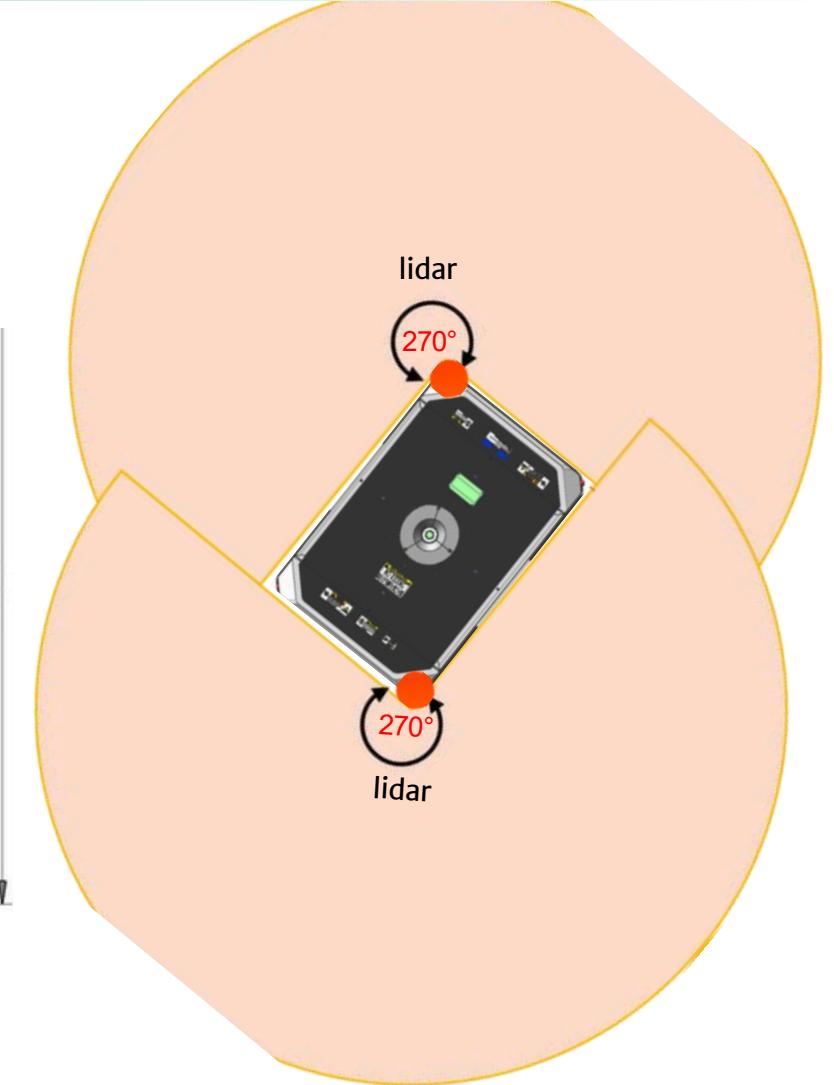
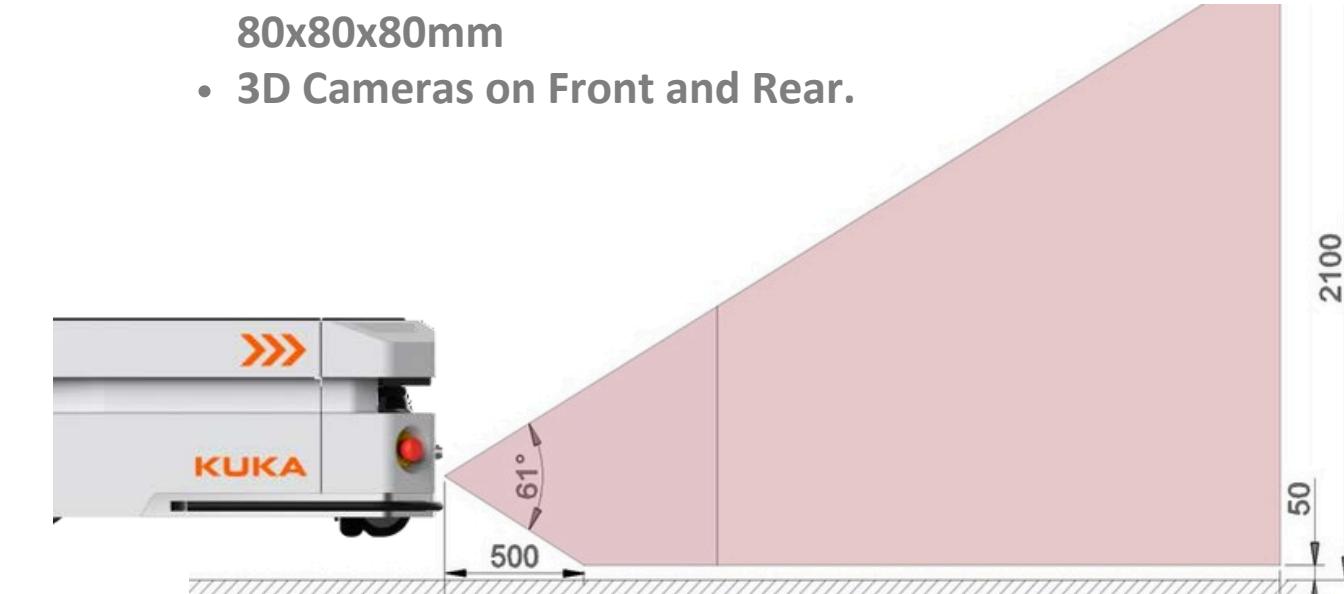
3000kg

KMP 3000P

Omni-Directional

[+] 3D Camera Detection

- Detects objects from 50mm to 2000mm
- Detects object size from 80x80x80mm
- 3D Cameras on Front and Rear.



[+] Safety Bumper

- Physical E-stop safety bumper
- Coverage on all sides



[+] Safety Lidar Detection

- 360-degree safety field
- Multiple scan fields(Speed defined)
- 3000mm scan radius



[+] E-stop Circuit

- Located on all 4 corners
- Physical E-stop circuit

WAREHOUSE 4.0 SOLUTIONS

CUSTOM-BUILT AUTONOMOUS GUIDED VEHICLES (AGVs)



WAREHOUSE 4.0 SOLUTIONS

CUSTOM-BUILT AUTONOMOUS GUIDED VEHICLES (AGVs)



M100-ST – Tunnel/Tugger

885 kg Max Towing Capacity

Weight / with batteries: 122 kg / 147 kg

Dimensions: W: 511 mm L: 991 mm H: 292 mm

Traction Power: 18 kg constant, 36+ kg starting

Safety – Front/rear: CE/UKCA rated safety bumper

Speed – Laser Bumper: 4.6 to 48.8 MPM - 6 speeds, 0.3 MPM increments

Maximum 9.1 MPM (if equipped)

Rated Trailer: 885 kg @ 30.5 MPM

476 kg @ 48.8 MPM

With 2% friction factor trailer wheels

Capacity reduced by 10% when reversing

1% Incline/Decline 499 kg @ 30.5 MPM

Battery : AGM/TPPL 45AH 24VDC battery pack

Automatic Charge 48-amp charge rate (if equipped)

Manual Charge Up to 25-amp charge rate, via manual plug



M300-CF – Counterbalance Fork

635 kg at 508 mm I.c.

558 kg at 610 mm I.c.

Weight / with batteries: 1173 kg

Dimensions: W: 1041 mm L: 2819 mm H: 2134 mm

Maximum Load: 635 kg at 508 mm load center / 558 kg at 610 mm load center

Lift Range: Floor to 1219 mm

Safety: Front/Rear Laser Bumper CE/UKCA rated safety bumper (16 Pattern)

Speed: 4.6 to 73.2 MPM, (48.8 MPM with laser guidance)
6 speeds, 0.3 MPM increments

Battery Options: AGM 210 AH 24 VDC Battery Pack

AGM/TPPL 204 AH 24 VDC Battery Pack

Lithium 180AH 24VDC battery Pack

Automatic Charge: 80-amp charge rate

Fast Automatic Charge: 140-amp charge rate

Manual Charge: Up to 25-amp charge rate



M300-SC – Single Conveyor

1,451 kg Capacity

Weight / with batteries 1070 kg / 1179 kg

Dimensions: W: 1448 mm L: 2311 mm H: 1295 mm

Maximum Load: 1451 kg Minimum 1016 mm x 1016 mm distributed load

Maximum Pallet: 1200 mm x 1200 mm

Roller Conveyor: 64 mm dia., 11 GA wall 83 mm on center

Effective Widths: 1041/1092/1168/1245 mm- width of pallet in direction of transfer

Top of Roll: 457 mm to 813 mm in 25.4 mm increments

Transfer Speed: 13.7 to 3.1 MPM, soft start

Load Sensing: Yes, using cross conveyor optic

Transfer: Left and Right side

Transfer: Interface Optical with emitter and receiver pair on each side

Safety – Front: CE/UKCA rated safety bumper

Speed – Laser Bumper: 4.6 to 73.2 MPM, (73.2 MPM with laser guidance)
6 speeds, 0.3 MPM increments

Battery Options: AGM 210 AH 24VDC battery pack

AGM/TPPL 204 AH 24VDC battery pack Lithium 180AH 24VDC battery pack

Automatic Charge: 80-amp charge rate (if equipped)

Fast Automatic Charge: 140-amp charge rate (if equipped)

Manual Charge: Up to 25-amp charge rate

WAREHOUSE 4.0 SOLUTIONS

ROBOTIC DEPALLETIZING SYSTEM



Layer Depalletizing



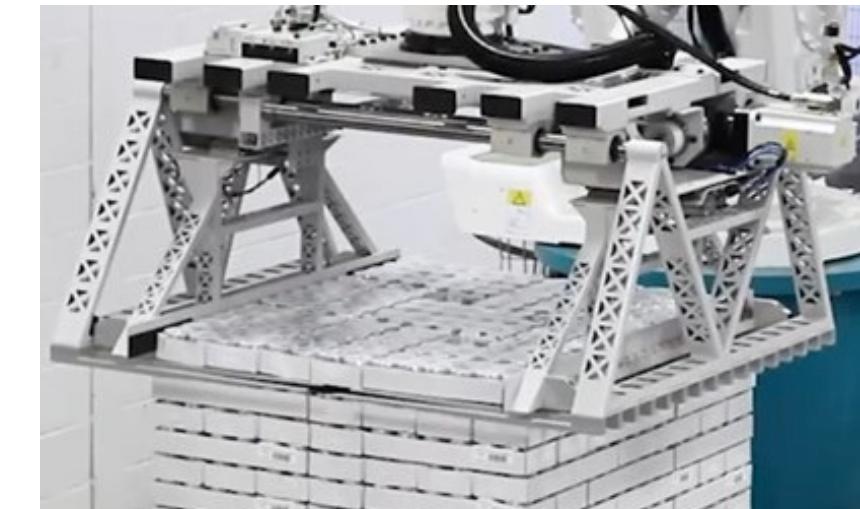
Row Depalletizing



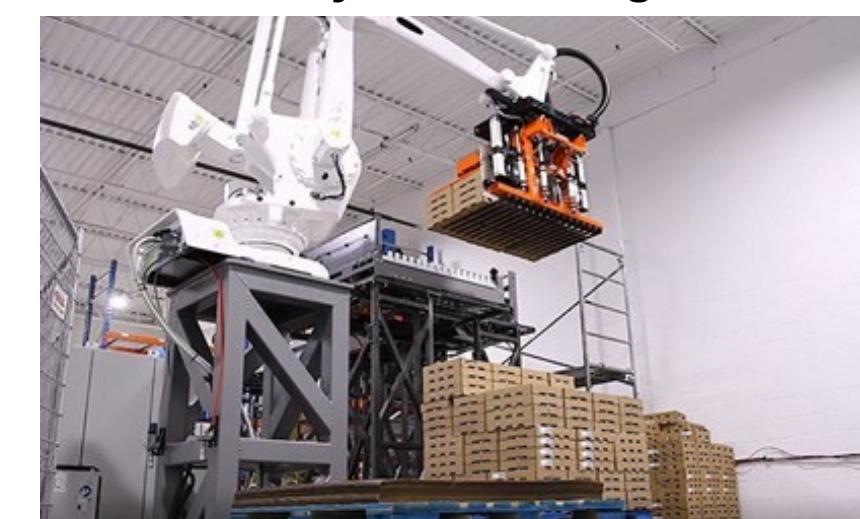
Assorted SKU Depalletizing

WAREHOUSE 4.0 SOLUTIONS

ROBOTIC PALLETIZING SYSTEM



Layer Palletizing



Row Palletizing



Assorted SKU Palletizing



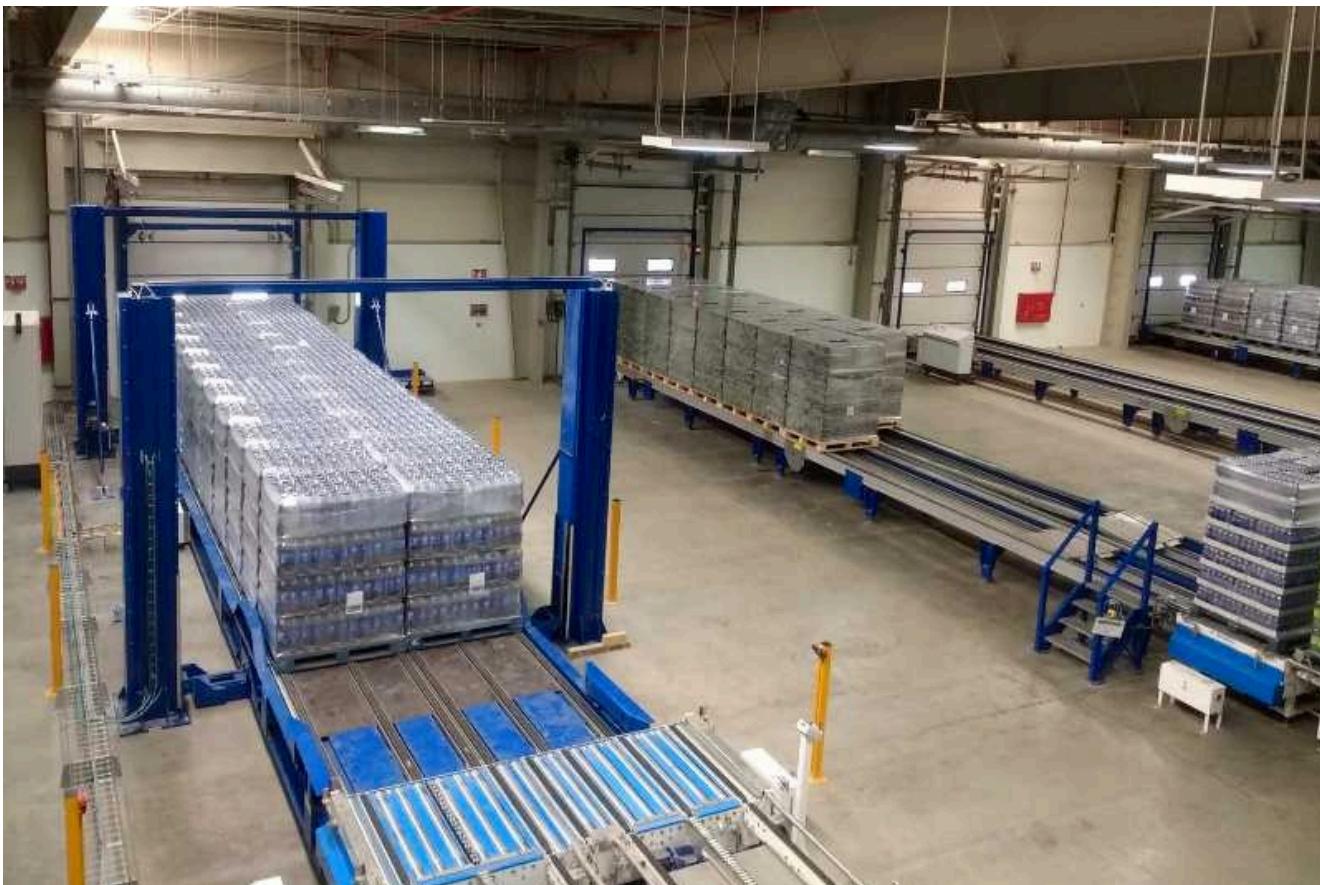
WAREHOUSE 4.0 SOLUTIONS

AUTOMATIC TRAILER PALLET LOADING



WAREHOUSE 4.0 SOLUTIONS

AUTOMATIC TRAILER PALLET LOADING



The Skateloader has been developed and engineered for the automated loading of non-modified trailers. This means that no trailer modifications are required making the Skateloader the ultimate solution for one-shot loading of standard pallets for outbound transport. The loading process takes approximately 6-8 minutes (depending on the required height adjustment and alignment).

Advantages of the Skateloader system:

- 400% efficiency increase compared to traditional forklift truck loading
- Automated loading of regular, non-modified trailers or containers; no alterations required
- Short loading cycle (< 8 min.)
- Shorter truck time at the dock
- Improve employee working conditions
- Protect the integrity of your products





WAREHOUSE 4.0 SOLUTIONS

HIGH SKU VOLUME / MID-THROUGHPUT STORAGE & RETRIEVAL



HIGH SKU VOLUME / MID-THROUGHPUT STORAGE & RETRIEVAL

 SIMPLICITY

- Limited moving parts on the Infinity iBOT mean less mechanical breakdown
- Operators can be up and running in minutes
- Ergonomic, self-tilting bot at presentation station creates ease of use for operator

 EFFICIENCY

- Single bot can access the entire array of storage, as well as each presentation station
- Fewer operators are required for operation since two Infinity iBOTs can shuttle simultaneously rather than having separate aisles

 PRODUCTIVITY

- High storage density with 3 tote deep storage design
- Configurable tote height from 8", 10", 12" and 14" height
- Up to 325 tote deliveries per hour per workstation





WAREHOUSE 4.0 SOLUTIONS

MID SKU VOLUME / HIGH THROUGHPUT STORAGE & RETRIEVAL



SCALABLE

- System is scalable and customizable
- As volume grows, more iBOTs can be added to increase throughput

EFFICIENCY

- iBOTs are not required to leave the system to dock and charge, they continually recharge as they travel through the system
- Traffic control software to monitor the position of all iBOTs to ensure full resource optimization and operational efficiency

PRODUCTIVITY

- Up to 450 tote deliveries per hour per workstation
- Can hold up to 12,228 totes securely storing thousands of items
- Perfect Pick: 15,019 ft³ (425.29 m³) of storage within 1,968 ft² (182.83 m²) of space
- Perfect Pick HD: 30,038 ft³ (850.58 m³) storage 2,869 ft² (266.54 m²)



**ROBOTIC
SORTER**

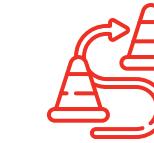
**Zippy**

Our ultra-fast robotic sorter, that performs SKU-wise intelligent sortation through grid-based ground markers.

Payload: 6, 10, 30, 40 kg



Speed up to
2m/s



Obstacle
Detection &
Avoidance



Run-Time up to
4 hours

Scalable

Can be scaled on one platform from 50 to 1000 with easy addition and removal of Zippy robots

High Throughput

Performs up to 30,000 sorts/hour with 100% positional accuracy

Safety

Proprietary safety control board enables critical hardware monitoring, wireless emergency stop, and Plc level safety

WAREHOUSE 4.0 SOLUTIONS

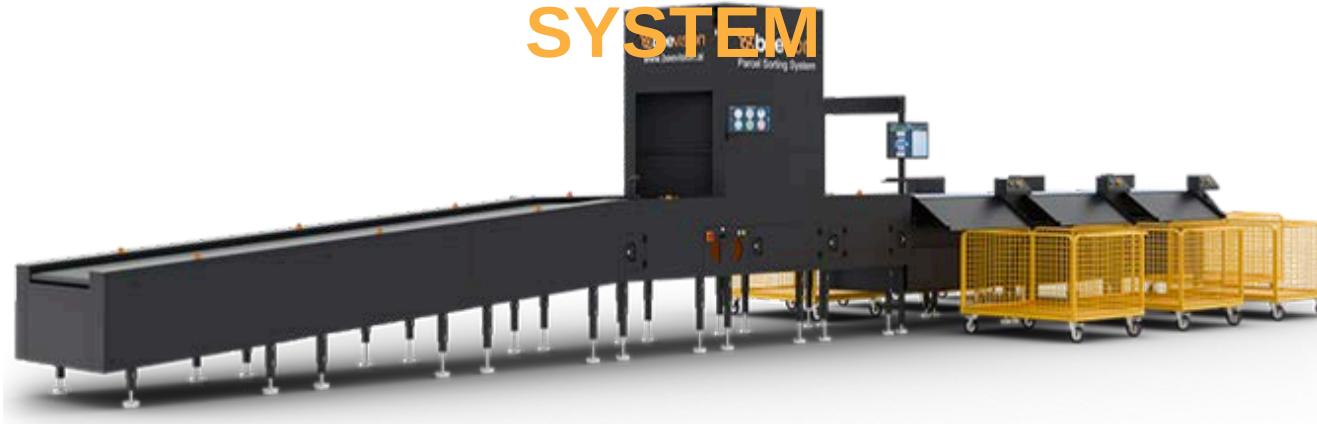
BARCODE/DATA & CUBIC SCANNING SYSTEMS



WAREHOUSE 4.0 SOLUTIONS

BARCODE/DATA & CUBIC SCANNING SYSTEMS

PARCEL SORTING SYSTEM



- Up to 5K boxes sorted per hour
- OCR address extraction from labels
- Dynamic programmable sorting functions
- Software integration

STATIC PALLET DIMENSIONING SYSTEM



- 2 second measuring process
- 2cm accuracy dimensioning
- 3 3D camera system
- Touchscreen & scale monitoring
- Integrated scale
- Seamless integration

MASTER DATA ANALYSER



- 3D light curtain image processing
- 0.5cm accuracy dimensioning
- 1K objects per hour
- Software integration
- Integrated scale
- Touchscreen user interface

WAREHOUSE 4.0 SOLUTIONS

AGNOSTIC TECHNOLOGY ORCHESTRATION

Traditional Model



- ✗ **Multi-OEM Hardware and Software, leads to upgrade and integration challenges**
- ✗ **Multiple Silos, redundant operations and lack of accountability**
- ✗ **No useful data collection**
- ✗ **Scattered inventory & minimal operational visibility**

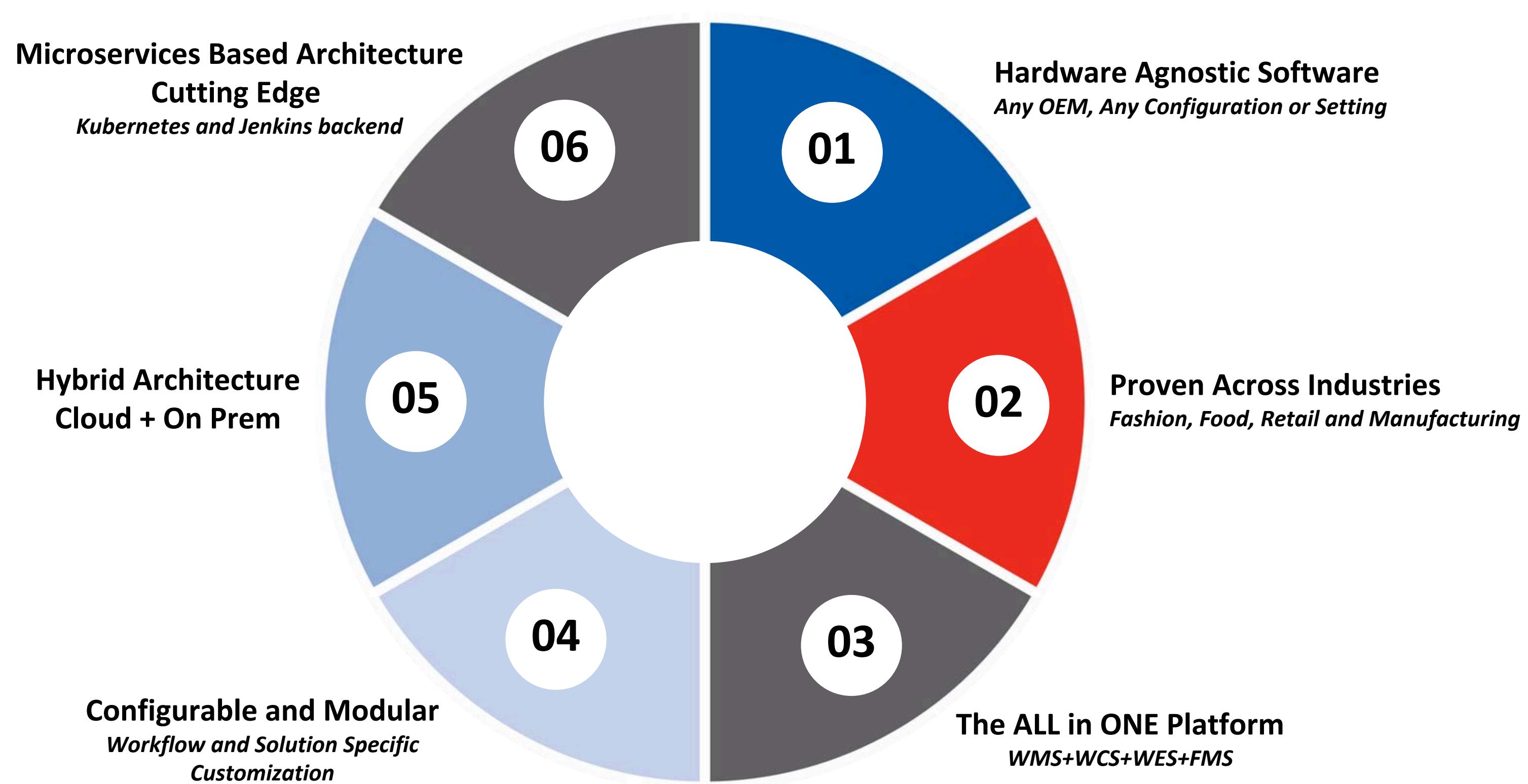
Norbac's Approach



- **Multi-OEM Hardware & Single Core Software Platform**
- **Fully flexible and functional WMS, WES and WCS – All in One.**
- **Reconfigurable, modular and scalable**
- **Single vendor responsibility, across Process, Optimization and Hardware**
- **Real-time visibility and management of entire operation**
- **Data collection and analytics**
- **Future-proofed technology investment**

WAREHOUSE 4.0 SOLUTIONS

AGNOSTIC TECHNOLOGY ORCHESTRATION



WAREHOUSE 4.0 SOLUTIONS

AGNOSTIC TECHNOLOGY ORCHESTRATION

Warehouse Execution System

Executes, monitors, and reports every task performed by all fixed and mobile automated hardware

Warehouse Management System

Manages all inventory at every stage of the intralogistics operation

Hardware Agnostic, Robust & Scalable Software Platform



Orchestrating all automated hardware independent of manufacturer to create intelligent intralogistics ecosystems with decision-making capabilities.

Warehouse Control System

Controls, coordinates, and monitors the operation of all automated hardware

Fleet Management System

Creates, executes, and monitors all tasks for every automated mobile hardware

WHY PARTNER WITH US?



Dedicated Support

- Qualified Professionals
- Documentation
- Ramp Up Support
- PM Monitoring



Discover

- Product
- Process
- People
- Challenges
- Objectives



Deliver

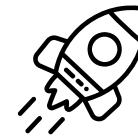
- Project Management
- Configurable Software
- Digital Twin
- World-Class OEM Partners



Design

- Technology Selection
- Layout Engineering
- Simulation
- Process Re-engineering

WHY PARTNER WITH US?



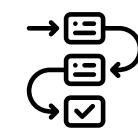
Inception

- Scope management
- I-KOM/E-KOM
- DAP (Design Acceptance Package)



Plan

- Cost and SOW visibility
- Dynamic project schedule
- Risk identification and mitigation



Implement

- Resource deployment
- Daily, monthly, weekly reporting with S-curve
- Virtual commissioning
- FAT
- Effective conflict and crisis management



Adapt

- Change management and knowledge management



Closure

- Sign-off and handover
- Unit & Integrated testing
- Documentation



Customer-centric approach



Advanced scheduling tools and platforms



Agile team



Safety Compliance



NORBAC

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