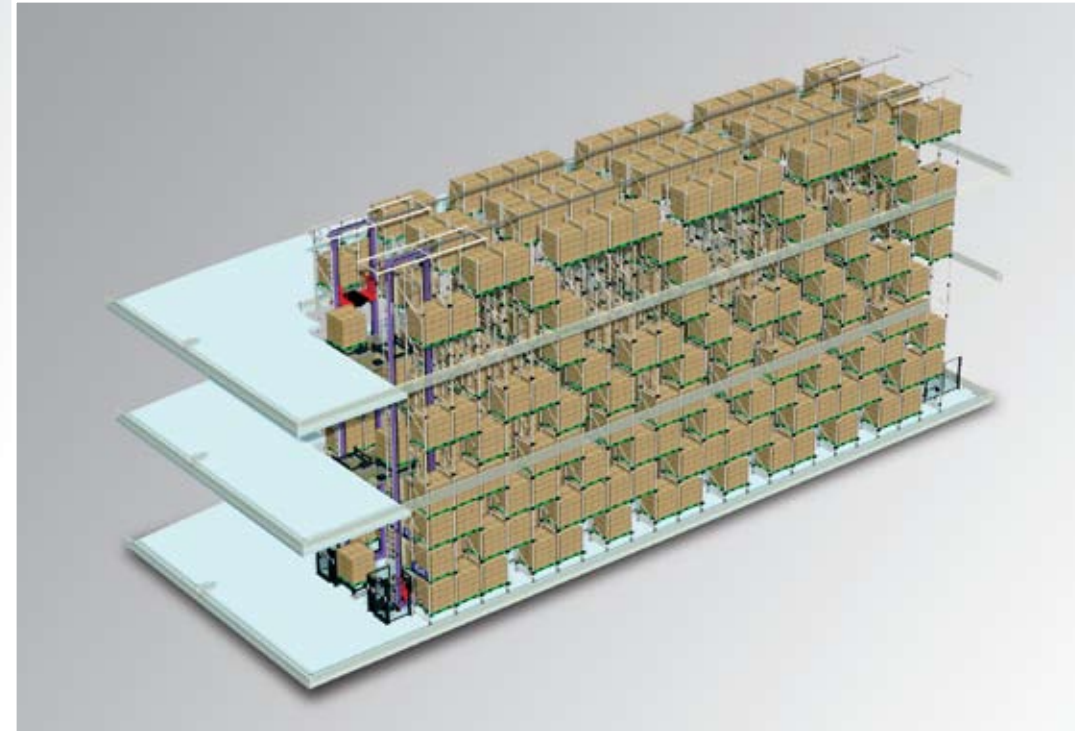
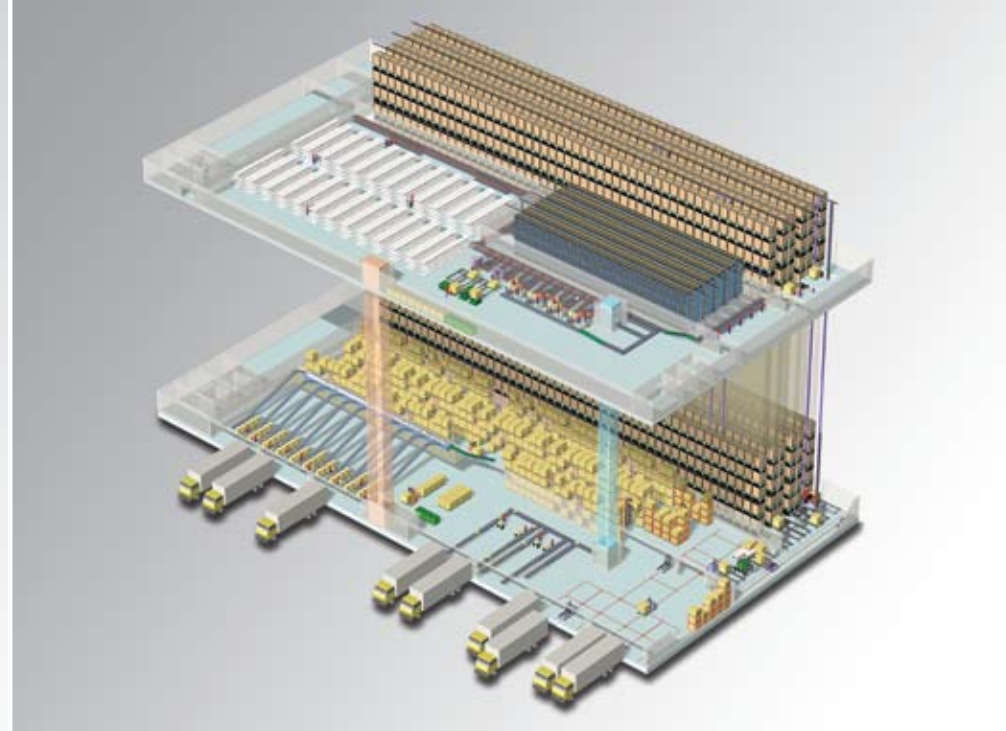
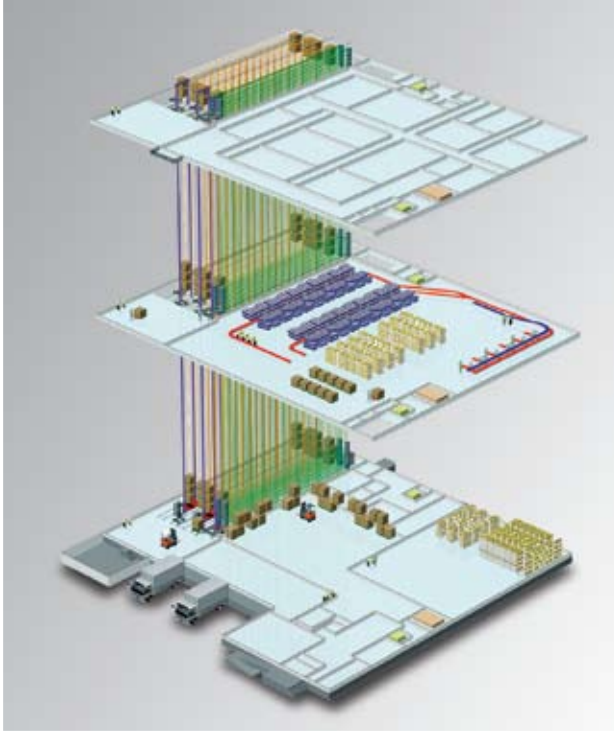


# Material Handling and Beyond



**DAIFUKU**  
DAIFUKU AMERICA CORPORATION



## SOLVING MATERIAL HANDLING CHALLENGES WITH TAILORED AUTOMATED MATERIAL HANDLING SOLUTIONS

Increased domestic and international competition in today's business environment requires companies to improve material handling operations to stay ahead. Each company's challenges are varied and distinct, requiring innovative solutions to meet an endless variety of needs. That's what Daifuku (pronounced: dye-foo-koo) is about. We use our blend of engineering and material handling products to develop a unique automated material handling system solution that can help you:

- Streamline Processes
- Decrease Cycle Time
- Minimize Errors
- Improve Productivity
- Maximize Floor Space

## PROVEN EXPERIENCE, UNEQUALED PERFORMANCE FOR COMPANIES OF ALL SIZES

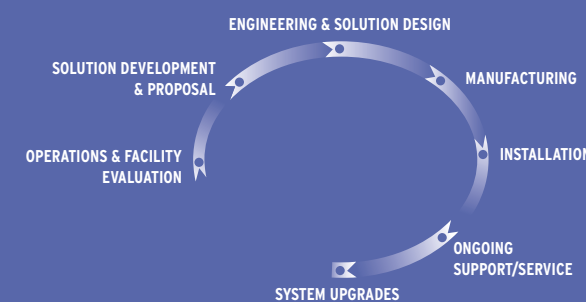
For more than 70 years, companies of all sizes have relied on Daifuku to engineer and recommend automated material handling equipment and system solutions to resolve their most complex material handling challenges. To ensure the highest quality standards and performance, Daifuku designs and manufactures its own products including:

- Automated Storage and Retrieval Systems (AS/RS)
- Sorting & Picking Systems
- Conveyor & Vehicle Systems
- Warehouse Management and Control Software

## HOW WE ARE DIFFERENT

We understand that no two material handling challenges are alike and we don't try to resolve all problems with the same solution. Instead, our approach to improving your operation is to first gain a deep understanding of your challenges by learning about the issues that are causing or contributing to your particular problem and by evaluating your existing operations. Only then can we apply our blend of engineering expertise and automated material handling products to design a unique automated material handling solution that addresses your exact needs.

Daifuku provides evaluation, engineering and manufacturing so we are actively involved with your company through every step of the project:



It is through this approach that we are able to gain a deep understanding of your challenges, then design and tailor a unique automated material handling system to help you realize your goals.

## OUR PRODUCT

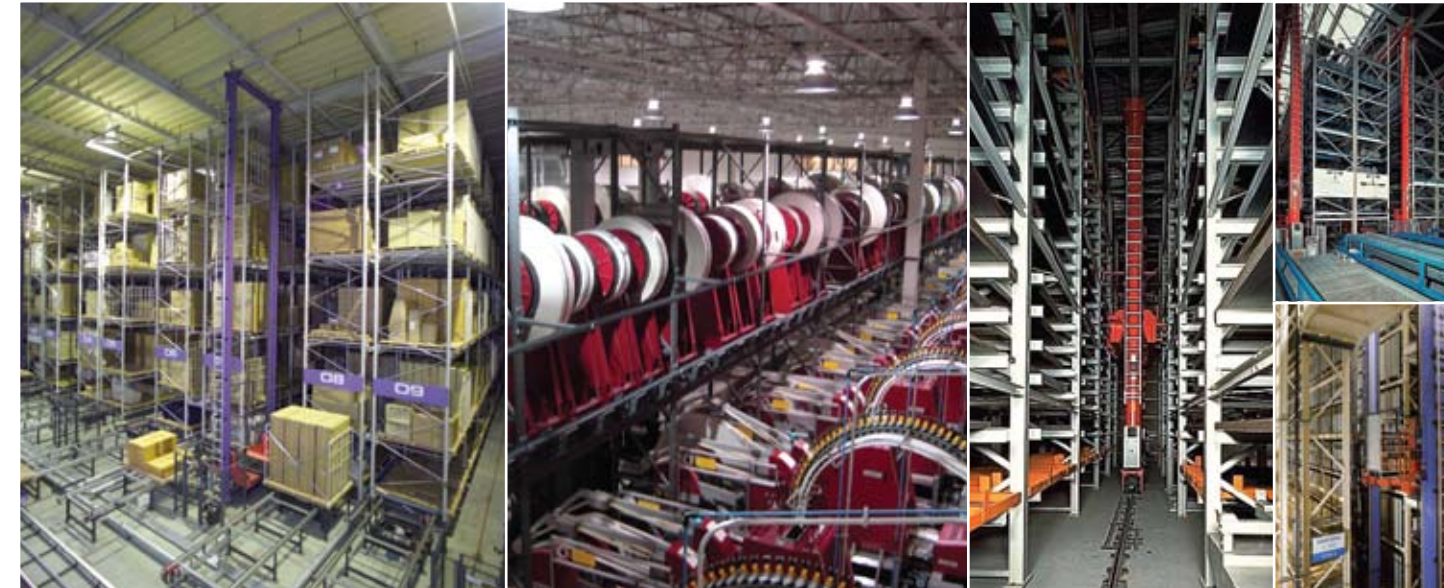
Daifuku's automated material handling equipment is engineered and manufactured following Japan's long-standing tradition of superior quality and precision. Our innovative solutions are designed to operate quietly, work reliably and deliver years of unequalled performance for your facility.

## DAIFUKU'S LEGACY OF FIRSTS

- 1966 | Installed Japan's first AS/RS
- 1969 | Developed one of the world's first computer-controlled AS/RS
- 1972 | Designed the first standard, pre-engineered AS/RS package
- 2006 | Engineered the first two-crane synchronized AS/RS

# PROVEN EXPERIENCE IN SOLVING MATERIAL HANDLING CHALLENGES WITH UNIQUE, TAILORED SOLUTIONS

Daifuku's products are designed and engineered to work together, and integrate with other vendors' systems, to configure a seamless, integrated material handling system that is unique to your facility.



## AUTOMATED STORAGE & RETRIEVAL SYSTEMS (AS/RS)

AS/RS combines equipment and controls to handle, store, and retrieve materials with precision, accuracy and speed. A system enables companies to recapture floor space, improve efficiency and ensure inventory control. Loads are moved vertically and/or horizontally in the aisle and then laterally to place the load in a storage location. Daifuku's automated storage and retrieval systems vary in sophistication from simple order-picking machines operating in small storage structures to fully-automated, systems that are integrated into complex manufacturing, distribution or warehousing processes. AS/RS is effective for staging in a lean inventory operation.

The key benefits realized from the implementation of an Automated Storage and Retrieval System are:

- Regained floor space
- Streamlined, high-speed storage/retrieval
- Improved throughput
- Inventory accuracy and control
- Increased productivity

Daifuku's AS/RS offerings have the capability to manage standard and long-load storage and retrieval requirements. Our lines of AS/RS equipment include:

### Unit Load

Daifuku's unit load is a high-density pallet buffer designed to maximize vertical storage space while maintaining a compact footprint. Several models are available to handle pallet loads from 1,100 to 6,600 lbs. and rack heights up to 118 ft. The unit load can also be used to store long or bulky items, hazardous materials and it is also ideal for freezer and low-noise applications. In addition to a standard unit load, Daifuku also offers double deep rack configuration.

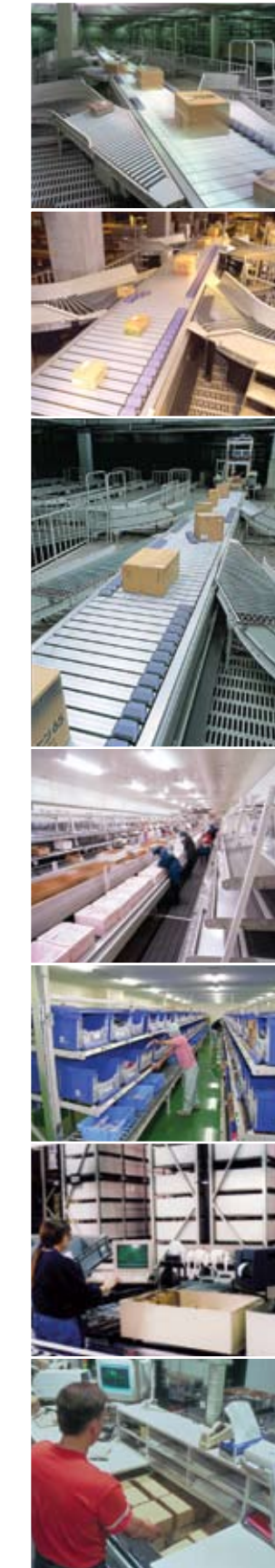
### Mini Load

Daifuku's mini load is a high-speed, high-density buffer that can replace conventional static rack to maximize vertical storage space within a compact footprint. The mini load moves and stores irregularly shaped goods or parts placed in: stacking totes, collapsible totes, nesting containers, case/cardboard boxes and bins. The system handles containers that weight up to 662 lbs. Rack height ranges from 10-66 ft.

A mini load is effective in forward pick operations and in applications that include the buffering and storage of small raw materials and/or finished goods. It is also a good buffering system for small items that represent work-in-process. Another use for the mini load is putting loads in a random state into an ordered state, or vice versa for short-term staging.

### Rack-Supported Building

Daifuku's rack-supported building AS/RS is a multilevel automated warehouse in which the rack is integrated into the building. The unit load storage rack serves as the basic structural system and integrates material handling and information systems together to form an optimum storage option.



## SORTING & PICKING SYSTEMS

Daifuku's sorting and picking systems enable electronic communication to workers or equipment regarding the location and amount of inventory to be distributed or stored. Our systems can be implemented into manual, semi-automated or fully-automated operations.

### Sliding-Shoe Sorter

Daifuku's sliding-shoe sorter, named the Jet Surfing Sorter, is a high-speed automated sortation system for channeling and sorting medium size items, totes, and cartons. Operating at speeds up to 475 ft./min. Daifuku's Jet Surfing Sorter can process as many as 13,500 pieces per hour for a 17.7 in. load length. Bi-directional shoes allow items to be off loaded to both sides of the sorter, improving space efficiency while providing greater design flexibility. Loads are tracked on the sorter using pulse mode tracking and are then diverted using mechanical or magnetic actuators. Daifuku's Jet Surfing Sorter for input uses a high-speed merge conveyor, sorting shoes for diverting loads, and a variety of sort lane conveyors to maximize sorting efficiency. This product can be installed on floor or mezzanines - to preserve floor space for operations. Surfing sorters are recommended for:

- Case and tray sortation in distribution centers
- Sortation within a conveyor system to other conveyors or storage devices
- Sortation to dock doors
- Simple to complex sortation within an automated system

### Pick-To-Light / Put-To-Light



Daifuku's pick-to-light digital pick system queues workers to pick items in accordance with the digital indicator on a rack or shelf. The put-to-light system queues workers of where to put items on a rack or shelf. Designed as a space-efficient, economical method for consolidating orders for small parts, it supports high-speed manual sortation with near 100% accuracy.

## WAREHOUSE SOFTWARE

Daifuku's warehouse software empowers you to optimize workflow and gain real-time control of your inventory. We offer software products that meet the needs of the large, high-volume fully-automated warehouse and the small, traditional warehouse.

### Warehouse Management System

Daifuku's warehouse management system (WMS) is inventory management software that provides real-time control of inventory, labor, and equipment in a warehouse. WMS guides the receipt, storage, picking, cycle counting of inventory and shipping of goods. It efficiently schedules equipment and resources, requires barcodes for inventory accuracy, keeps productivity measurements and is user-friendly.

### Warehouse Control System

Daifuku's warehouse control system (WCS) controls any kind of material handling equipment. It manages all routing control by tracking movement of inventory with established operational rules. It can be used as a stand-alone system or can be interfaced with a WMS system.



## CONVEYOR & VEHICLE SYSTEMS

Daifuku's conveyor and vehicle systems quickly and efficiently transport materials, packages or objects. When integrated with an AS/RS, our conveyor and vehicle systems create a complete material handling system. Manufacturing facilities and distribution centers, of all sizes, have implemented these systems to enhance and streamline the transport of items through their facilities.

### Conveyor

Daifuku's Conveying Flow System transports raw materials and finished goods in a predetermined path. Daifuku's unique conveyor systems achieve zero-pressure accumulation through an indirect drive system to ensure that items do not come into contact with each other.

Available in roller, belt and chain configurations, Daifuku's conveyor transports small packages and cartons or heavy pallet loads. Daifuku conveyor provides versatility for a broad range of material movement applications and is readily integrated with storage, sorting, palletizing and picking systems.

### Automatic Guided Vehicle



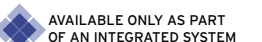
Daifuku's Automatic Guided Vehicle (AGV) is a safe, reliable and efficient material transport vehicle that can be used to move loads of all sizes. AGVs can travel forward, backward

and sideways with 90 degree crabbing to save floor space.

Daifuku's AGV does not require charging/discharging maintenance. Its real-time spread spectrum wireless communication and laser guides for autonomous travel facilitate efficient dispatching. Other AGV guidance options include inertial, wire and magnetic tape, which can be used for maximum layout flexibility. Models are available to transport loads of various weights and sizes.

AGVs are recommended for operations that need to transport raw materials, work-in-process and/or finished goods between storage buffers and workstations. AGVs are also helpful in transporting finished goods from order-picking workstations to consolidation and shipping. AGVs can replace conveyors, forklift trucks and handcars.

### Sorting Transfer Vehicle



Daifuku's Sorting Transfer Vehicle (STV) is a fast, flexible and easily installed material transport system. STVs can be used to move loads of all sizes. Advantages of STVs include: fewer motors, no single point of failure, high-speed, high-throughput and expansion flexibility to handle future growth. Daifuku's STVs are designed for seamless integration with mini load and unit load AS/RS to effectively transport raw materials, work-in-process and/or finished goods. STVs can also integrate with conveyor or ergonomic workstations to facilitate efficient order picking for consolidation and shipping.



