

**PRODUCT
DESIGN
GUIDE**



dexcoTM

**STRUCTURAL STEEL
I-BEAM RACKING SYSTEMS**



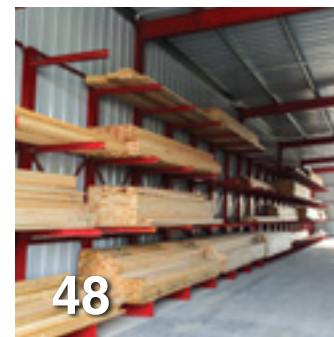
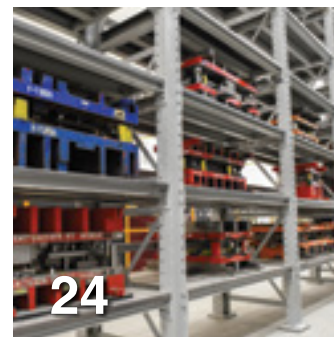
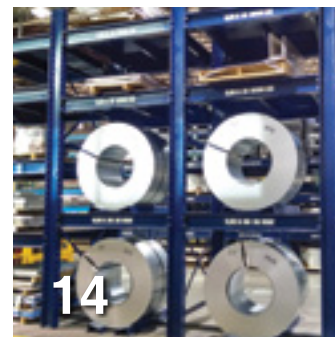
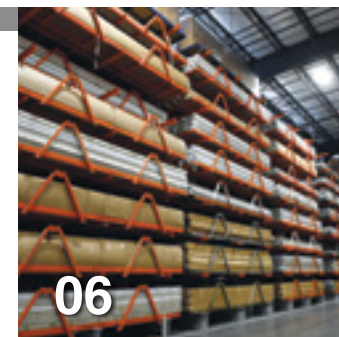
Manufactured by
ROSS
*Technology for
Stronger, Safer Solutions*

Warehouse Racking Solutions Designed for Safety, Durability and Maximum Efficiency

Dexco Industrial Storage products consist of heavy-duty structural racking systems engineered using the American Institute of Steel Construction (AISC) standards for buildings and bridges. Manufactured by Ross Technology, all rack arms, bases, columns and shelves are fabricated using wide flange beams with a 50 KSI minimal yield to offer greater strength and durability compared to roll-formed and tube steel. Pre-drilled holes and heavy hex ASTM A325 bolts with oversized heads are provided to create fully adjustable rack arms and shelves.

Engineered to safely meet almost any weight requirement, Dexco Racks are ideal for storing industrial materials such as lumber, coils, dies, pipe, tubing, bar stock, sheet metal and glass. Typical cantilever systems support loads ranging from 1,000 pounds to 20,000 pounds per individual rack arm. Coil and die racks commonly support loads ranging from 2,000 pounds to 80,000 pounds per shelf. Engineered designs for higher load requirements are also available.

Founded in 1962, Ross operates out of 250,000 square feet of production space in Leola, Pennsylvania and ships Dexco Racks throughout the United States, Canada and Mexico.



06

CANTILEVER RACKS

Flexible Storage for Materials of Practically Any Dimension or Weight

14

COIL RACKS

Maximum Selectivity for Small Pup and Large Master Metal Coils

24

DIE & WIDE SPAN RACKS

Custom Storage of Heavy or Large Forming Dies, Fixtures, Jigs and Molds

34

PIPE & STANCHION RACKS

Horizontal and Vertical Storage for Pipe, Steel Plate, Glass and More

40

CAR & SALVAGE RACKS

Inventory Organization for Salvage Yards and Recycling Centers

48

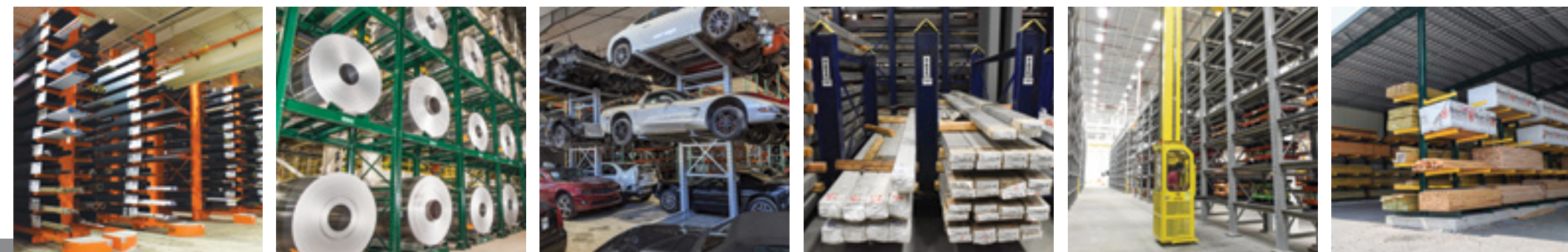
SHED RACKS

Covered Buildings and Canopies for High Density Storage of Building Materials

Checklist – Top Ten Considerations for Planning Your Next Industrial Storage System:

- ☑ **Existing Site Conditions** – Identify column center lines, floor drain locations, floor pitch and any uneven surfaces. Determine concrete strength and condition. Confirm building heights (at the peak and eave) to define site/building constraints and capabilities. Identify overhead doors, loading docks, HVAC system components, and sprinkler systems.
- ☑ **Building Codes** – Check local building codes to determine applicable regulations for your site and to define requirements for permitting, PE stamped drawings, seismic design and rack manufacturer certifications.
- ☑ **Plant Layout** – On a plan view, sketch out site conditions and any other existing constraints. Identify equipment and storage systems that will remain in place. Mark out required safe work zones and free space around existing equipment, electrical boxes, emergency shut off valves and other critical utilities. Determine means of egress for personnel and material handling equipment.
- ☑ **Material Flow** – Map out the entire manufacturing process from the receipt of raw materials through the shipment of finished goods and try to identify the optimal product flow in your facility. Identify potential storage locations, including under-utilized or unused manufacturing space, and try to determine if the methods that are being proposed mitigate extra handling or time it takes to perform the task at hand.
- ☑ **Product Orientation and Packaging** – Factor how your raw materials are (or could be) packaged when they arrive to your facility and try to narrow down the type of racking and transport equipment you need to do each task. For example, wide-span racking accommodates slit coils on pallets shipped “eye-to-the sky” better than traditional coils that are chocked and shipped eye to the aisle.
- ☑ **Transport Equipment Capabilities** – Define how you will move materials to and from each phase of the manufacturing process most efficiently. Establish how fast your manufacturing equipment can process materials to validate the speed at which you need to replenish the storage system. This information will ultimately serve as a guide for selecting the right material handling equipment for optimizing the overall work in process storage solution.

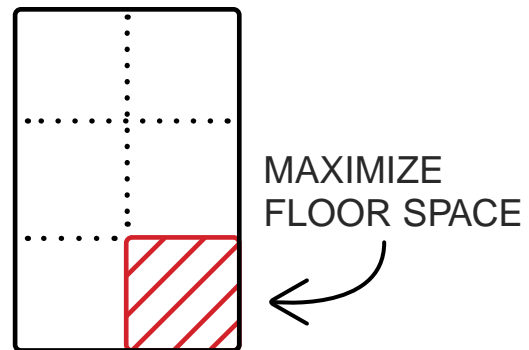
- ☑ **Manufacturing Velocity/Turnover** – Determine the rate at which materials-in-process need to move through the plant in order to achieve your desired throughput goals. Identify the desired number of inventory turns per day, month or year.
- ☑ **Product Mix** – Create a complete list of materials and products to be stored along with their sizes and weights to help determine the correct shelf elevations, bay widths and steel sizes that may be needed. Also try to plan for future growth to minimize the cost of expansion later. If you’ve been storing material on the floor, factor in improved selectivity into your turnover calculations since the material will be much easier to find and select.
- ☑ **Lifting Devices** – Determine if your current material handling equipment is capable of efficiently and safely servicing newly created vertical storage positions or if new equipment is required. For example, an overhead crane with C-hook device cannot load coils into a traditional racking systems, so alternate means of handling must be considered like a fixed mast with probe. In other instances traditional fork trucks may be able to be replaced with narrow aisle loaders that take up less footprint and have a smaller turning radius.
- ☑ **Safety** – When comparing rack manufacturer’s designs, be sure to identify differences in shape of steel, grade of bolts, size and location of welds, total system weight and provisions to accommodate uneven loads. The answers to these questions will have a significant impact on how you can load your new rack system, the storage density you can achieve and how much weight your racks can SAFELY hold.



Cantilever Rack Systems

Dexco Cantilever Racking Systems offer the strength, durability and layout to store products of practically any dimension or weight. They're particularly ideal for materials that are wide or bulky, and thus difficult to store on traditional pallet racks.

And because we use structural steel, our designs can easily accommodate numerous adjustable arms to maximize your floor space and can be engineered to handle virtually any load.



Cantilever Rack Systems



6

DESIGN DECISIONS WHEN CHOOSING CANTILEVER RACKING

Several design factors make up a cantilever rack, each one as important as the other. To ensure the racking system works as intended, and in an efficient manner, work with an industry expert and consider these design elements for any cantilever system.

CLEAR OPENING BETWEEN ARMS

Factor enough room for personnel to safely maneuver the load with ease.

ARM LENGTH

Determined by the size of materials being stored and strength of a manufacturer's rack components.

COLUMN HEIGHT

Influenced by the forklift's fully extended mast height and ceiling elevation.

ARM UPTILT

Uptilt compensates for arm deflection – 2 degrees is used for standard products and 4 degrees for products that can roll.

UPRIGHT CENTERS

If centers are too close together, product will extend too far over the arms and droop. If the arms are too spread out, product will sag in the middle.

ARM LOAD

Ranging from 1,000 to 20,000 pounds, understanding the type of product that will be stored helps determine the desired arm load capacity.

Cantilever Rack Systems



Design Features

Dexco Cantilever Racks comprise single- or double-sided columns that support vertically adjustable arms. These arms are bolted securely to the columns and can be angled to retain loads. A horizontal base helps stabilize the structure and supports the bottom load. This type of storage system offers many advantages including:

- **Flexibility** – The lack of front columns means no restrictions on the length of items stored. Different-length objects or oddly sized items can be placed within the same rack system
- **Accessibility** – Because there are no vertical obstructions at the face of the rack, loading and unloading product are quick and easy
- **Adjustability** – Bolted connections allow for easy adjustment of arms to accommodate a wide variety of load heights
- **Modularity** – Easy to add onto when needed
- **Efficiency** – Systems make good use of limited space and are cost effective

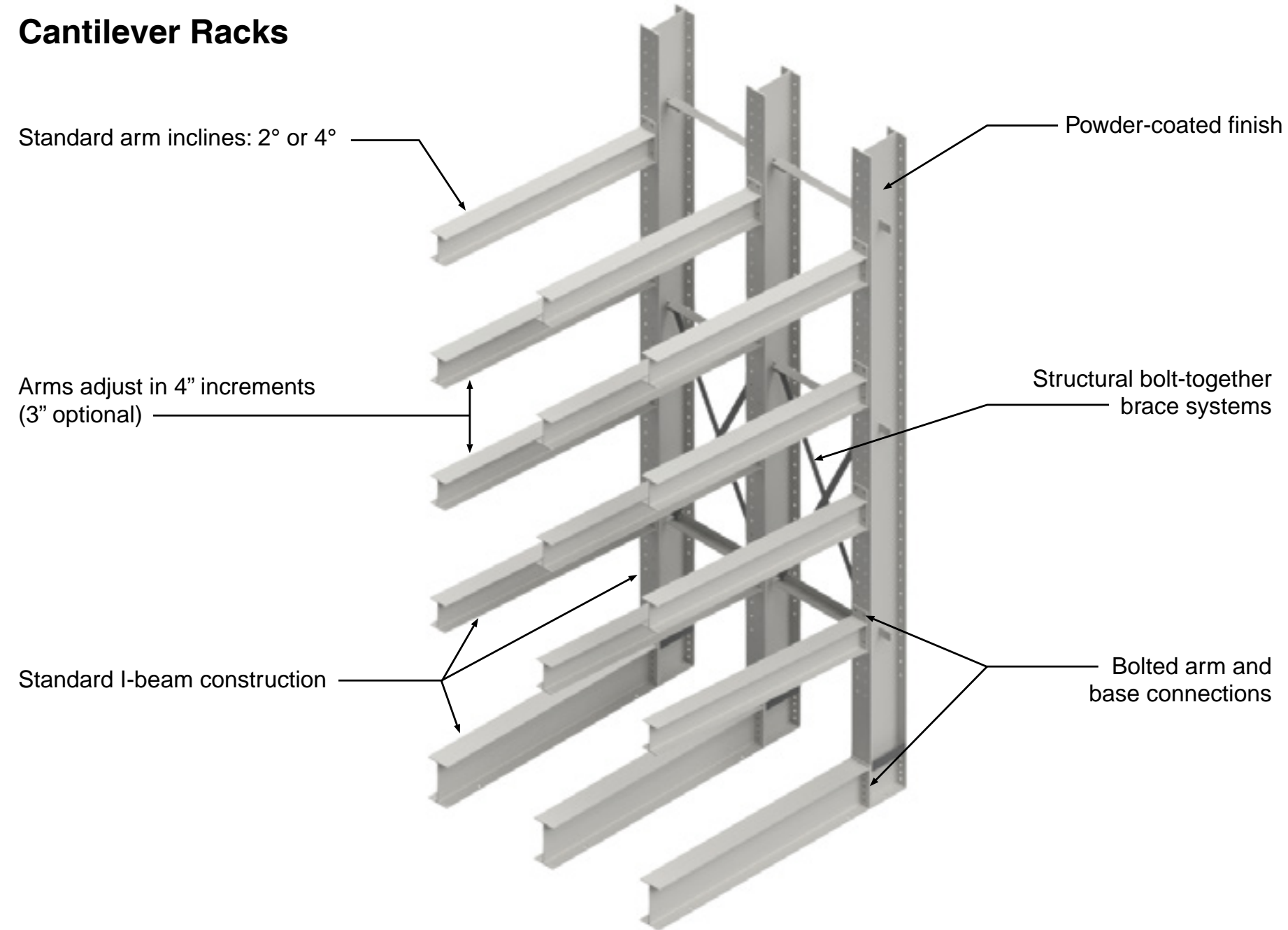
Choose from standard designs or custom engineering. Standard designs offer the best value and shortest lead times.



Cantilever Rack Systems



Cantilever Racks



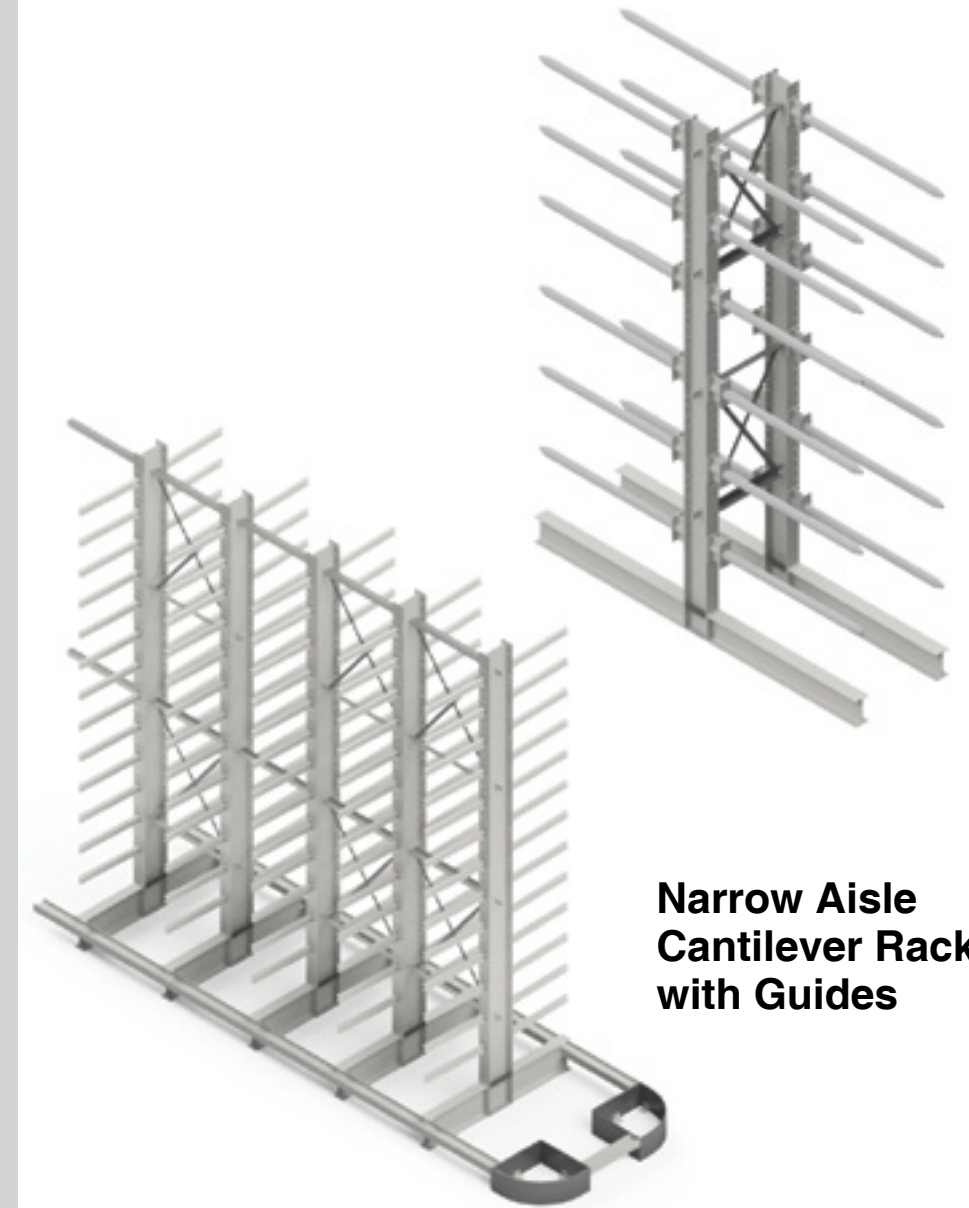
Standard Features

- Structural I-beam construction
- Adjustable, bolted shelf beams accommodate changing storage needs
- Arms adjust in 4-inch increments
- Arms slope at a 2-degree standard or 4-degree heavy up-tilt
- Arms and bases attach to columns using A325 structural bolts or GR 5 plated structural hardware
- Structural bolt-together brace systems offer lateral rigidity
- Modular design makes it easy to add more bays
- Columns and shelf beams are bundled for easy installation and cost-effective shipping
- Load capacities: Ross engineers racking systems to meet virtually any weight requirement. Typical systems support loads ranging from 1,000 pounds per individual arm up to 20,000 pounds per individual arm and higher

Standard Finish

- Factory-applied powder-coated finish

Pin Arm Rack

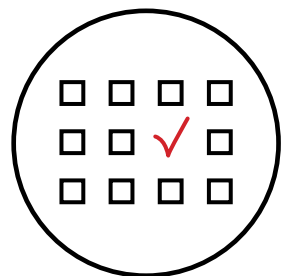




Coil Rack Systems

Safely storing and accessing metal coils can pose a real challenge. Ross engineers and manufactures giant, structural coil racking systems capable of handling massive loads. And like all of our storage solutions, Dexco Coil Racks are built with structural steel components for superior quality, strength and durability.

So if you've been tasked with sourcing a rack system to store 80,000 pound coils stacked four units high, then look to Ross to engineer a solution that meets your needs.



INCREASE
PRODUCT
SELECTIVITY



Coil Rack Systems



5 Critical Design Elements

That Define True Structural Racking

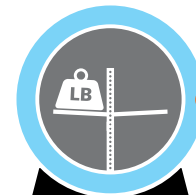
Not all racking is created equal—different manufacturers design racks using various engineering methods and materials. Consider these important engineering factors to reduce the risk of injury and property damage.



I-BEAMS: All rack arms, columns, bases and shelf beams should be manufactured using wide flange or standard shape I-beams with a 50 KSI minimum yield.



ASTM A325 BOLTS: Columns, beams, bases and rack arms should be connected with heavy hex structural ASTM A325 bolts, which are the same bolts frequently used for bridges and buildings.



100% LOAD UTILIZATION: Cantilever racks should be designed by factoring a 100 percent load utilization, meaning it should be assumed that all arms will be loaded with a maximum capacity. Column and base design engineered using “average loading” (less than 100 percent) should not be used in an attempt to economize a column and base design.



FULLY LOAD-BEARING: Coil cradles and die rack decks should be engineered to support the coil or die's full load, even if the coil or die is not as deep as the shelf, and therefore not sitting over one or both shelf beams. Coil cradles should also be designed so that the coils always rest on a flat surface, as opposed to the edges of the cradles, which can lead to severe creasing or flattening.



FULLY WELDED ARMS: All rack arms should be fully welded around the entire perimeter of the I-beam at the connector plate to increase support and provide protection from uplift loads caused by material handling equipment.

Coil Rack Systems



Design Features

Traditional floor storage of sheet coil takes up space on the manufacturing floor, can lead to costly material damage and can pose a safety hazard to workers. Dexco Coil Racks provide vertical storage capacity on high-strength shelves, where coils rest securely in customized cradles. This type of storage system offers many advantages including:

- **Organized, easy access** – A forklift with boom attachment is used to easily load and unload coils. When coils are needed, they can be quickly located and pulled, then loaded into machinery without having to change their orientation or be removed from pallets
- **Increased floor space** – Coil racks free up valuable space for manufacturing
- **Reduced material damage** – Coils are protected from creasing and flattening
- **Improved worker safety** – There is less risk of falls and injuries

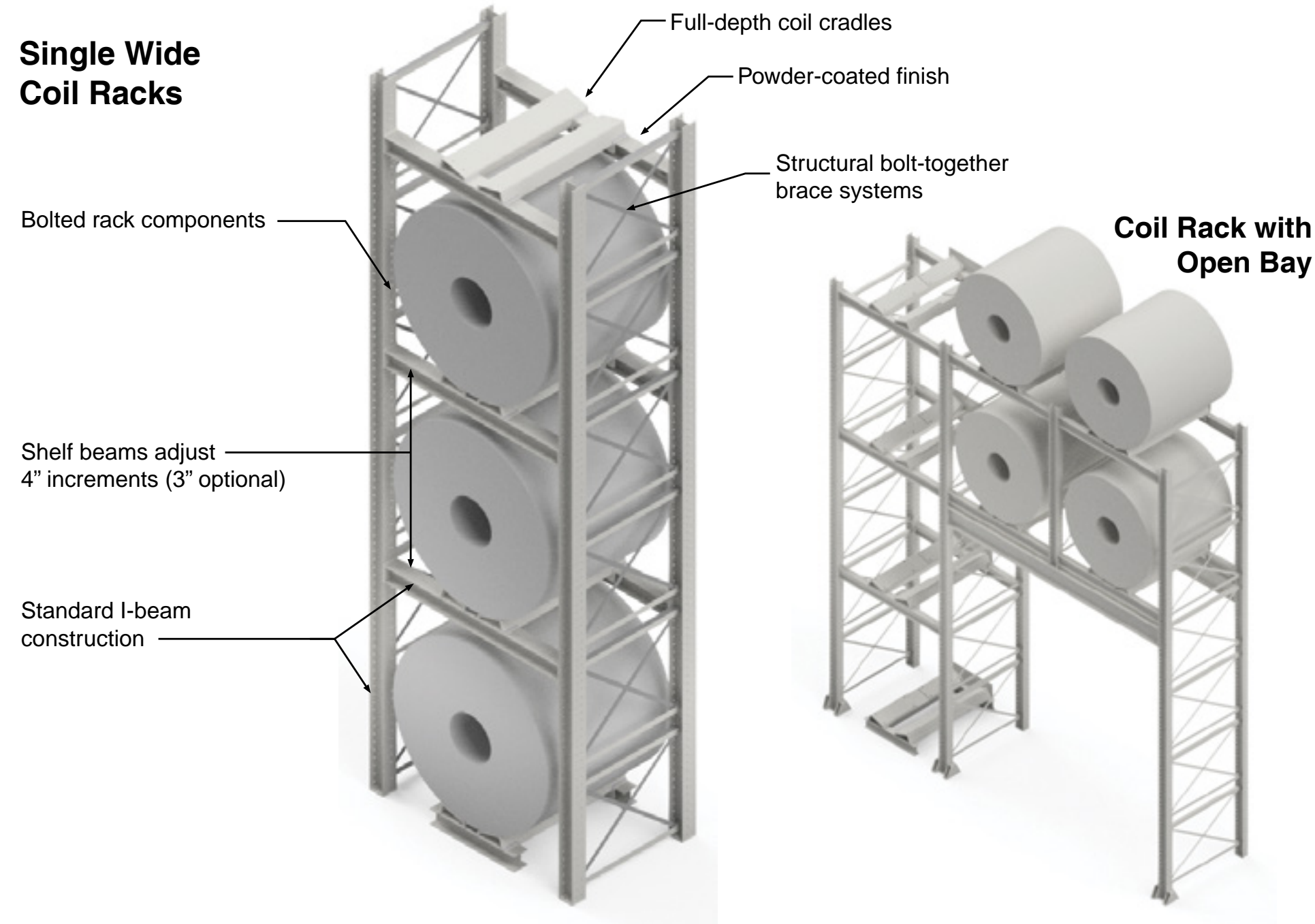
Choose from standard designs or custom engineering. Standard designs offer the best value and shortest lead times.



**Multi Bay
Coil Rack**

Coil Rack Systems

Single Wide Coil Racks



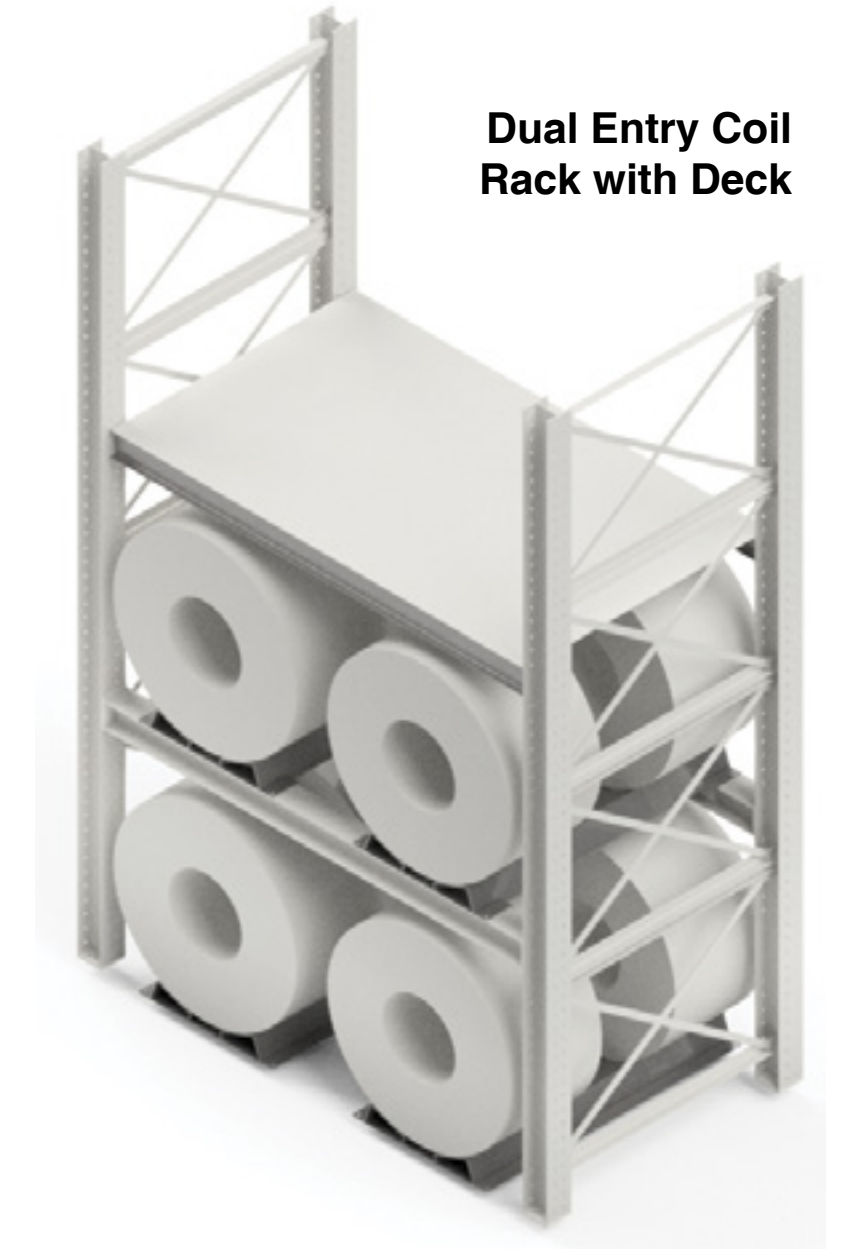
Standard Features

- Structural I-beam construction
- Full-depth coil cradles handle any coil size and weight
- Adjustable bolted shelf beam construction accommodates changing storage needs
- Shelf beams attach to the columns using A325 structural bolts. Predrilled holes are provided in upright baseplates for anchor bolt connections to the floor
- Shelf beams adjust in 4-inch increments
- Structural bolt-together brace systems offer lateral rigidity
- Modular design makes it easy to add more bays
- Columns and shelf beams are bundled for easy installation and cost-effective shipping
- Load capacities: Ross engineers racking systems to meet virtually any weight requirement. Typical systems support loads ranging from 2,000 pounds per tier up to 80,000 pounds per tier and higher

Standard Finish

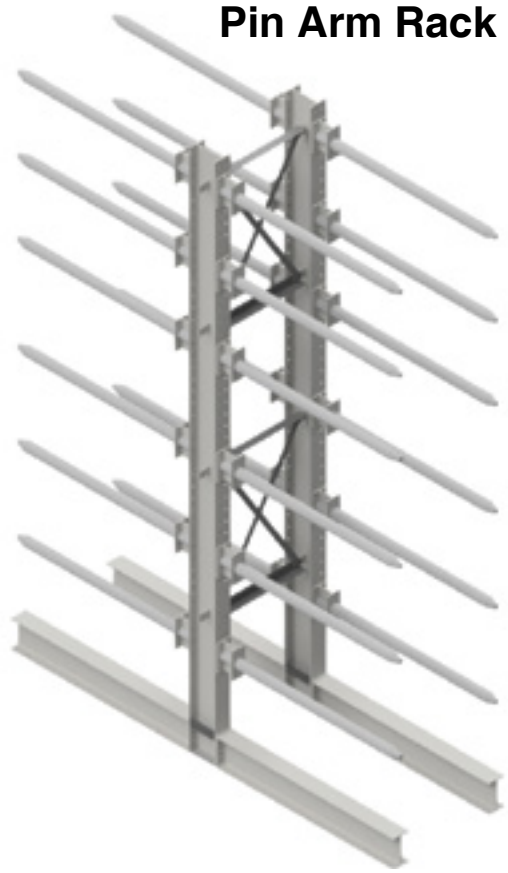
- Factory-applied powder-coated finish

Dual Entry Coil Rack with Deck

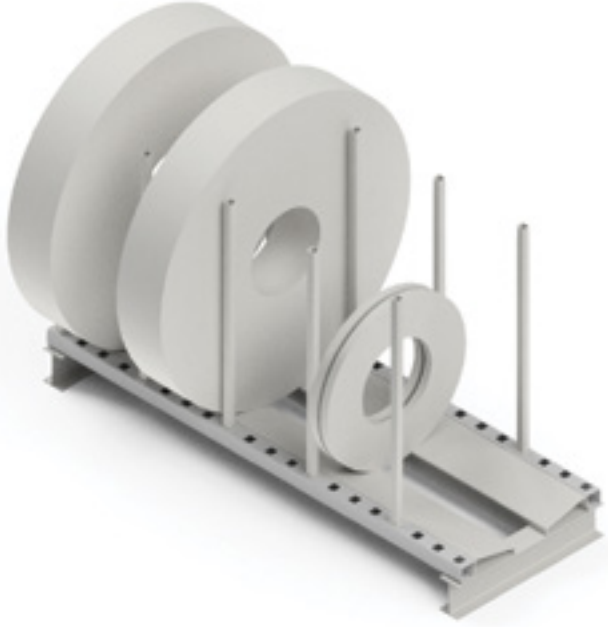


Coil Rack Systems

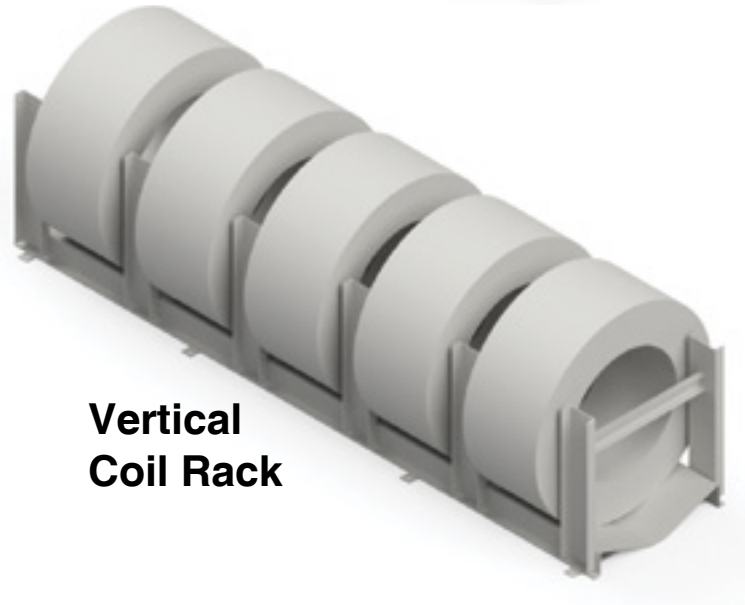
Pin Arm Rack



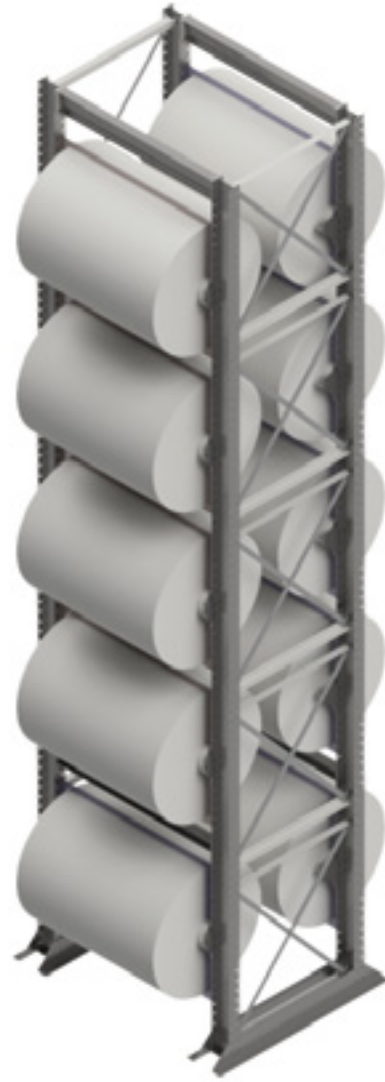
Slit Coil Floor Cradle Rack



**Vertical
Coil Rack**



Spindle Rack



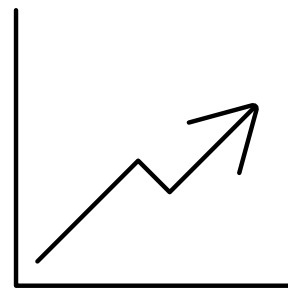
**Coil Rack with
Upper Deck**



Tool, Die & Widespan Rack Systems

Because tools and dies are vital components of your manufacturing process, we think it makes a lot of sense to carefully consider how they're stored. Suitable storage of heavy or large forming dies, fixtures, jigs and molds requires more than standard pallet racks or spare floor space.

Ross can design and manufacture an efficient, robust racking system to meet your unique needs. And like all of our racking solutions, Ross Tool and Die Racks are built with structural steel components for superior quality, strength and durability.



BOOST
MANUFACTURING
THROUGHOUT



Tool, Die & Widespan Rack Systems



Design Features

Tooling, dies and other manufacturing equipment can be tricky to store because of their size, weight and inability to be stacked. As a result, these indispensable tools are often stored on the manufacturing floor, where they take up space, are susceptible to damage and can endanger workers. Dexco Tool and Die Racks provide vertical storage capacity on high-strength shelves designed to accommodate the unique characteristics of manufacturing equipment. This type of storage system offers many advantages including:

- **Organized storage** – Items can be stored either on removable deck plates, open beams or fork entry bars for easy location and access

- **Maximized floor space** – Tool and die racks free up valuable floor space for manufacturing
- **Reduced damage to critical fabrication equipment** – Items are protected from material handling equipment
- **Greater safety** – Engineered racks store tooling in a safe manner and reduce the risk of worker injuries

Choose from standard designs or custom engineering. Standard designs offer the best value and shortest lead times.

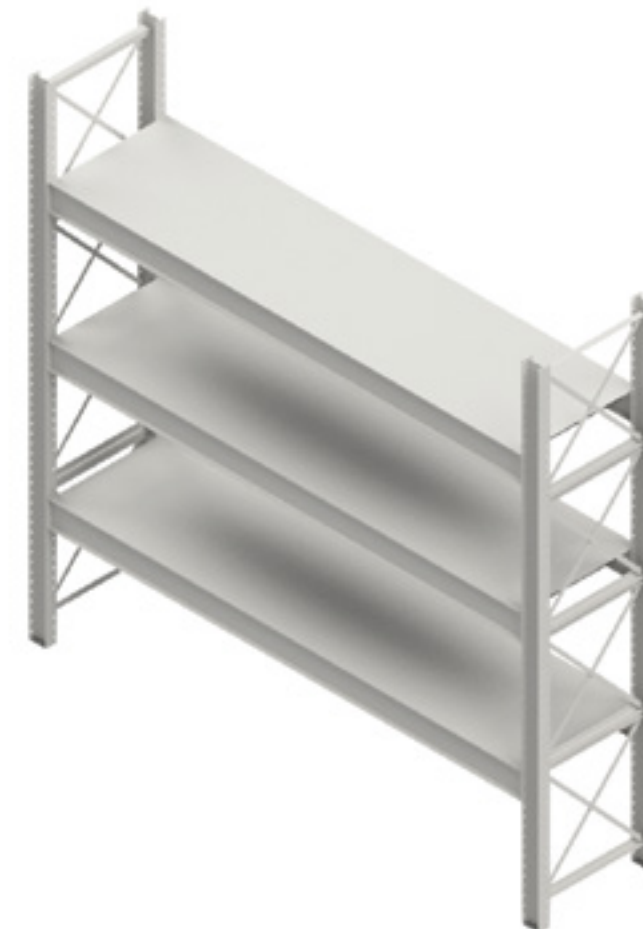
Tool, Die & Widespan Rack Systems



**Die Rack –
Fork Entry Bars**



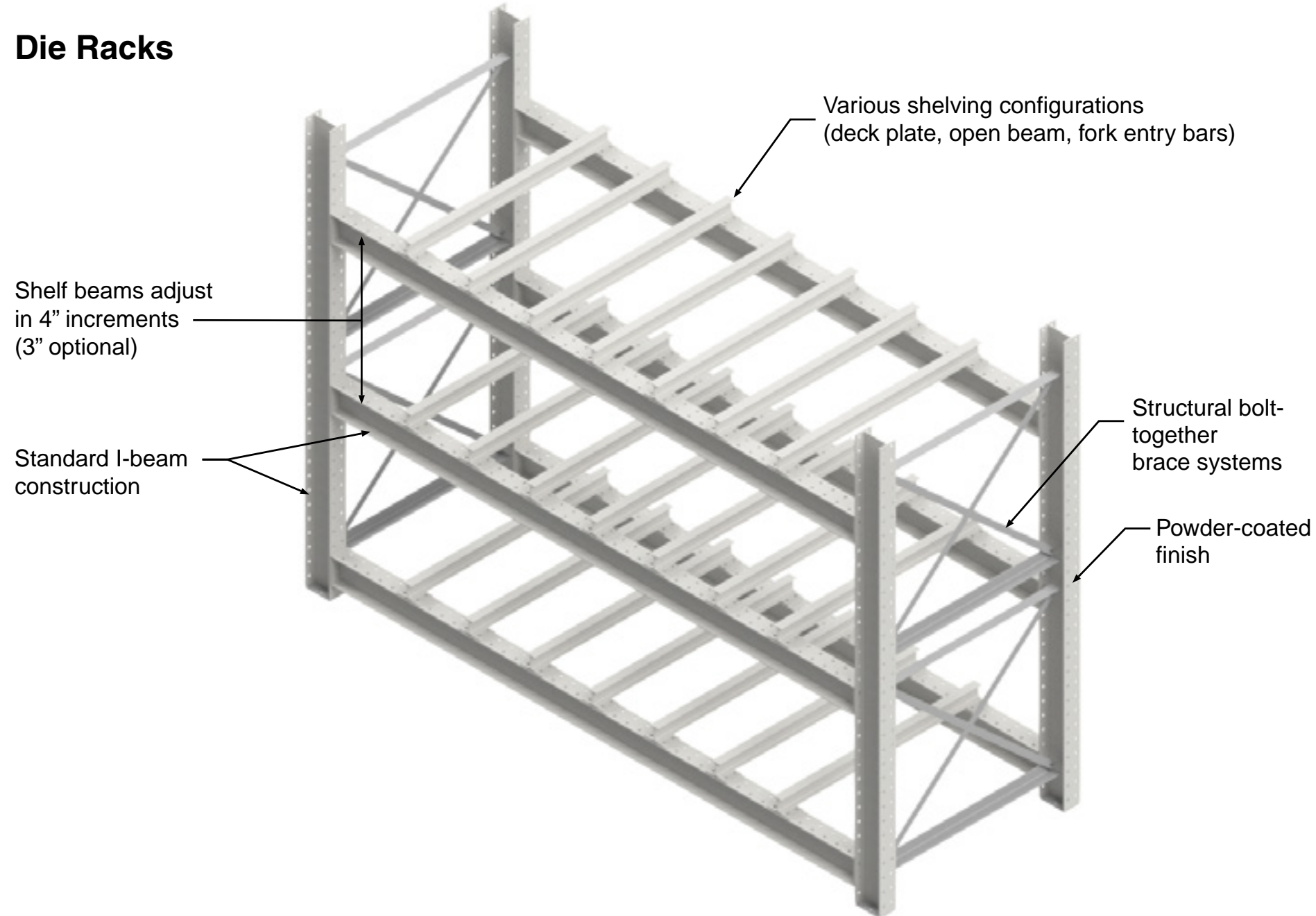
**Die Rack –
Removable Deck Plate**



**Die Rack –
Open Beam**



Die Racks



Standard Features

- Structural I-beam construction
- Shelving configurations include removable deck plate, open beam and fork entry bars to accommodate your specific storage needs
- Adjustable bolted shelf beam construction accommodates changing storage needs
- Shelf beams attach to the columns using A325 structural bolts. Predrilled holes are provided in upright baseplates for anchor bolt connections to the floor
- Shelf beams adjust in 4-inch increments
- Structural bolt-together brace systems offer lateral rigidity
- Modular design makes it easy to add more bays
- Columns and shelf beams are bundled for easy installation and cost-effective shipping
- Load capacities: Ross engineers racking systems to meet virtually any weight requirement. Typical systems support loads ranging from 2,000 pounds per tier up to 80,000 pounds per tier and higher

Standard Finish

- Factory-applied powder-coated finish



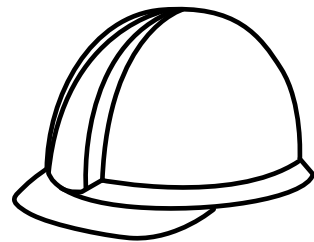
Tool, Die & Widespan Rack Systems



Specialized Rack Systems

No matter how uncommon or detailed your storage requirements, Ross can deliver a rack system to store practically any load, of any length, weight or size. Our Specialized Racking Systems include Stanchion Racks, which allow for vertical positioning of materials such as sheet metal, steel plate, glass and granite.

Ross also custom designs and fabricates cantilever and other rack styles for bulky and oddly shaped building materials. And like all our rack solutions, Ross Specialized Racks are built with structural steel components for superior quality, strength and durability.



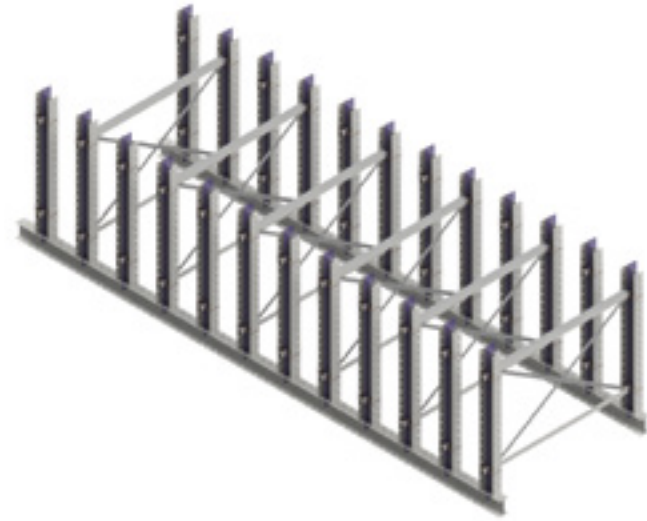
OPTIMIZE
PLANT SAFETY



Specialized Rack Systems



Granite Rack



Metal Plate Rack

Design Features

Dexco Specialized Racks are designed to accommodate specific storage requirements for a host of unique products. A variety of column, arm and shelf configurations are available to provide you with a safe and organized storage solution. Simply tell us the size and weight of your materials. Our engineers will design a system that meets your requirements for both storage capacity and workplace safety. Regardless of the style, all of our specialized racks offer the following benefits:

- **Maximized storage space** – Customers can potentially quadruple capacity in their existing space

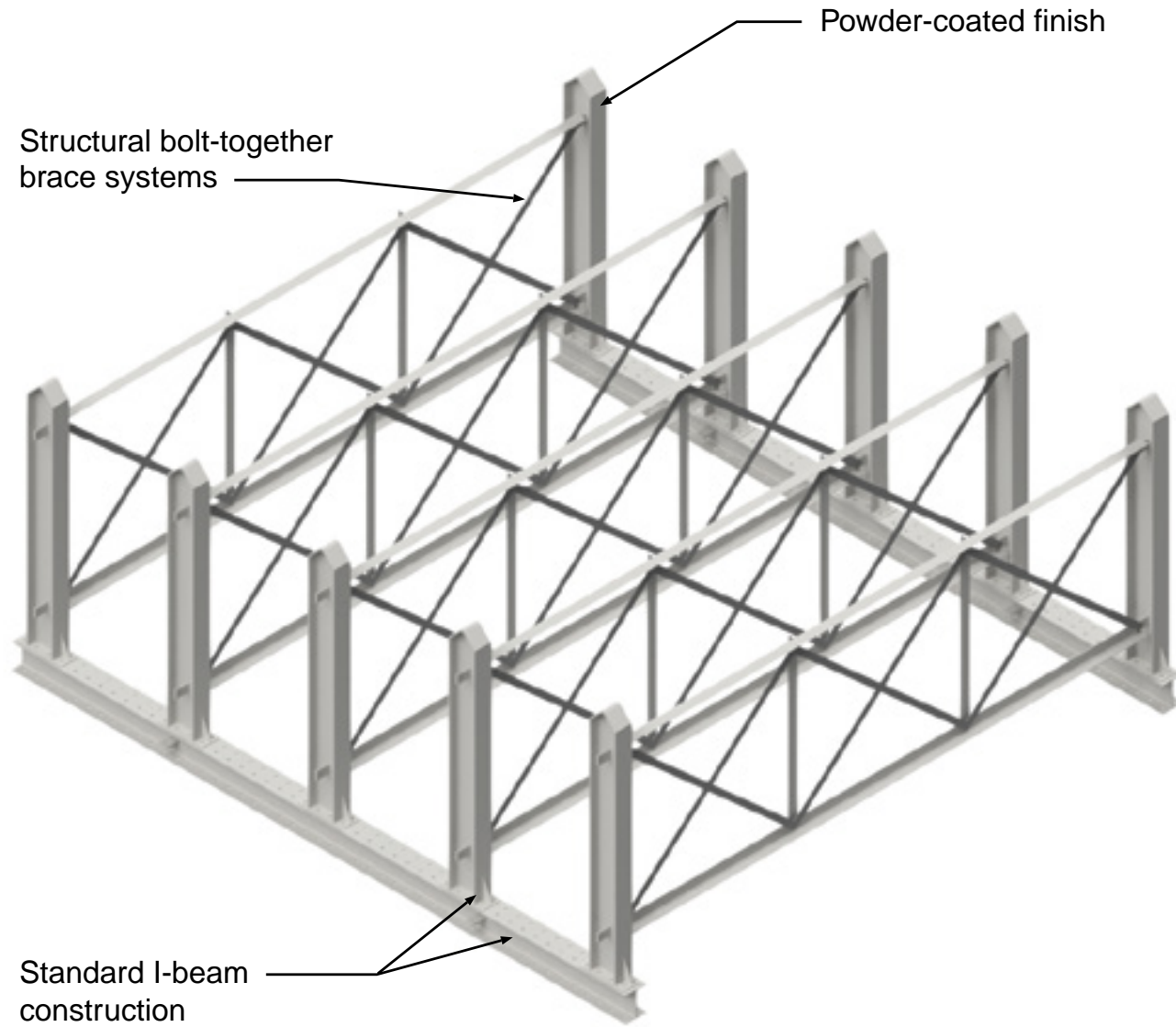
- **Efficient, organized storage** – Bulky, oversized items such as building materials, furniture, appliances and textiles are easy to store and retrieve
- **Flexibility** – Adjustable / stackable shelf designs offer highly flexible storage space
- **Lower operating costs** – Wide, open rows ease the loading and unloading of products, saving valuable time
- **Reduced product damage** – Inventory is protected from material handling equipment
- **Increased safety** – Workers retrieve parts easily and safely, so there is less risk of injury



Specialized Rack Systems



Stanchion Racks



Patio Door Rack



Boat Rack

Standard Features

- Structural I-beam construction
- Shelving and arm configurations are engineered to accommodate the specific material being stored
- Structural bolt-together brace systems offer lateral rigidity
- Modular design makes it easy to add more bays
- Components are bundled for easy installation and cost-effective shipping
- Load capacities: Ross engineers racking systems to meet virtually any weight requirement. Typical systems support loads ranging from 1,000 pounds per individual arm up to 40,000 pounds per individual arm and higher

Standard Finish

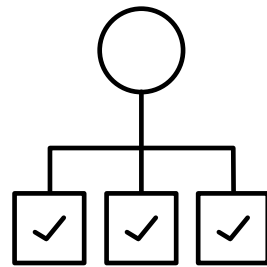
- Factory-applied powder-coated finish



Salvage Yard Rack Systems

Having the ability to store and access inventory efficiently can be a significant factor in profitability for salvage yards and recycling centers. Ross can help by designing and manufacturing a cost-effective rack system capable of storing more stock in less space, while providing increased organization and inventory control.

And like all of our racking solutions, Ross Salvage Yard Racks are built with structural steel components for superior quality, strength and durability.



INCREASED
ORGANIZATION
& INVENTORY
CONTROL



Salvage Yard Rack Systems

Design Features

Dexco Salvage Yard Racks provide vertical storage capacity on high-strength arms designed to accommodate recycled automobiles and scrap metal materials on single- or double-sided columns. A horizontal base helps stabilize the structure and supports the bottom load. Cars can be stored up to four levels high, yielding four times the storage capacity in the same available space. This type of storage system offers many advantages including:

- **Increased profits** – Expanding storage capacity leads to more sales opportunities
- **Efficient, organized storage** – Vehicles of all makes, models and sizes can be easily stored and located
- **Easy access** – Wide open rows allow easy loading and unloading by fork lift trucks
- **Lower operating costs** – Parts can be retrieved faster, requiring less time and labor
- **Reduced damage and theft** – Because cars are stored at higher levels, there is less chance for parts to be damaged or stolen
- **Increased safety** – Workers retrieve parts easily and safely, so there is less risk of injury

Choose from standard designs or custom engineering. Standard designs offer the best value and shortest lead times.



Salvage Yard Rack Systems



Salvage Yard Rack Systems



Standard Features

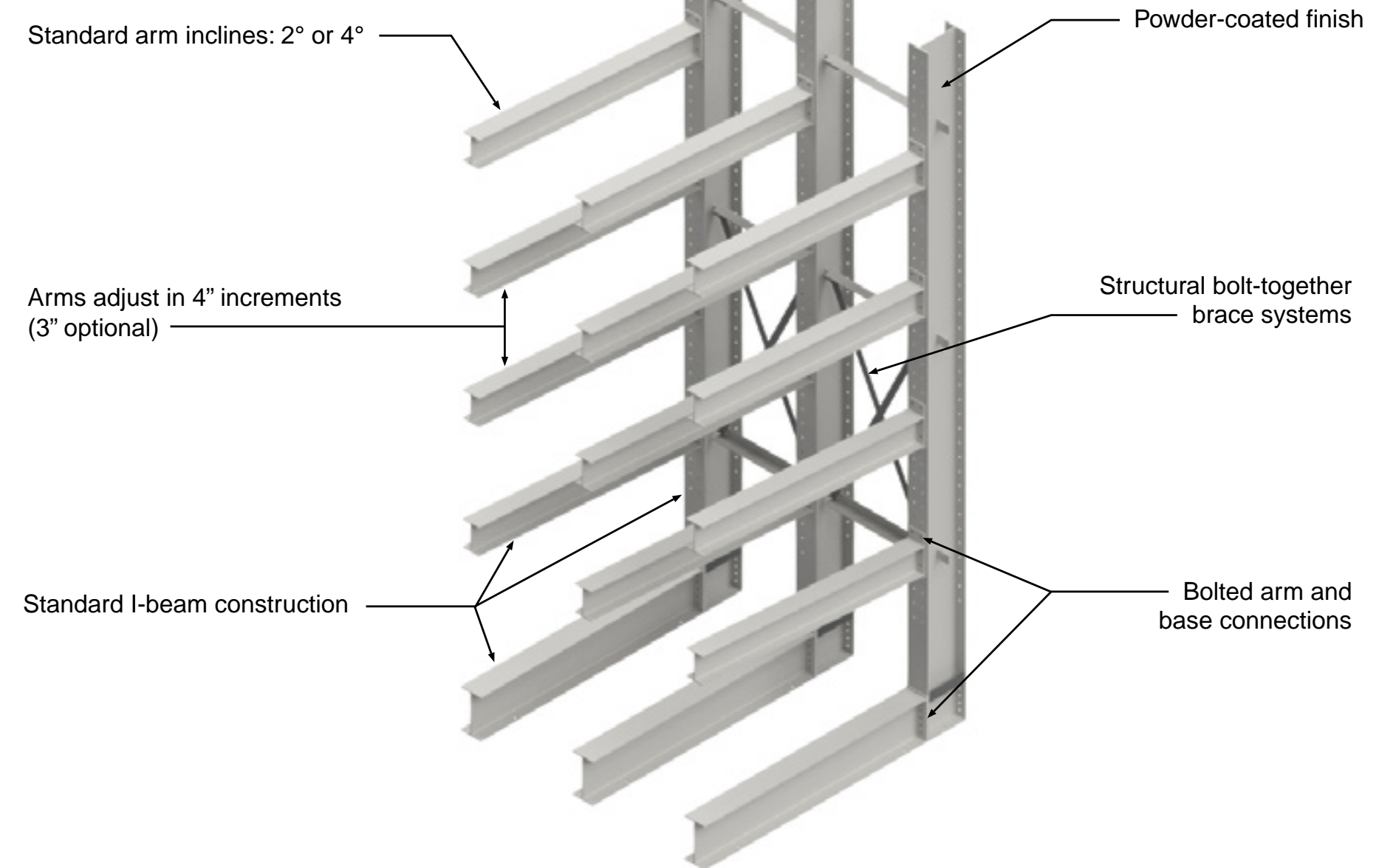
- Structural I-beam construction
- Adjustable, bolted shelf beams accommodate changing storage needs
- Arms and bases attach to columns using A325 structural bolts or GR 5 plated structural hardware
- Arms adjust in 4-inch increments
- Arms slope at a 2-degree standard or 4-degree heavy up-tilt
- Structural bolt-together brace systems offer lateral rigidity
- Modular design makes it easy to add more bays
- Columns and shelf beams are bundled for easy installation and cost-effective shipping
- Load capacities: Ross engineers racking systems to meet virtually any weight requirement. Typical systems support loads ranging from 1,000 pounds per individual arm up to 20,000 pounds per individual arm and higher

Standard Finish

- Factory-applied powder-coated finish



Salvage Yard Racks





Provided by Krauter Auto-Stak

dexcoTM
STRUCTURAL STEEL
I-BEAM RACKING SYSTEMS

Shed Rack Systems

Dexco Shed Racks provide the structural foundation for high-density, covered buildings used to store expansive construction materials such as lumber, roofing and siding. Extremely space efficient, they allow for easy storage, organization and access, while reducing material damage and loss due to weather exposure. Shed Racks can easily be utilized for a wide range of products and are available in T-shed, L-shed and drive-thru configurations.



REDUCE
WEATHER
DAMAGE



Provided by Krauter Auto-Stak



Provided by Krauter Auto-Stak

Shed Rack Systems



Provided by Krauter Auto-Stak

Design Features

Dexco Shed Racks are designed and manufactured for select distributors, who incorporate them into their own turnkey canopy systems. These systems are typically comprised of structural steel racking, truss beams and metal roof decking. Truss widths are engineered to meet site-specific requirements and arm configurations are available with 3, 4, or 5 levels of storage or more. Contact Ross for information on a distributor in your area.

Shed Rack Systems offer many advantages including:

- **Protection** – Excellent solution for protecting valuable inventory susceptible to weather damage
- **Efficiency** – Systems make good use of limited space and are cost effective, particularly when used along property and building lines, or anywhere drive-thru buildings won't fit

- **Flexibility** – The lack of front columns means no restrictions on the length of items stored. Different-length objects or oddly sized items can be placed within the same rack system
- **Accessibility** – Because there are no vertical obstructions at the face of the rack, loading and unloading product is quick and easy
- **Adjustability** – Bolted connections allow for easy adjustment of arms to accommodate a wide variety of load heights
- **Modularity** – Easy to add onto when needed and can be installed in stages if desired (racks first, then canopies)

Shed Rack Systems



Shed Rack Systems



Standard Features

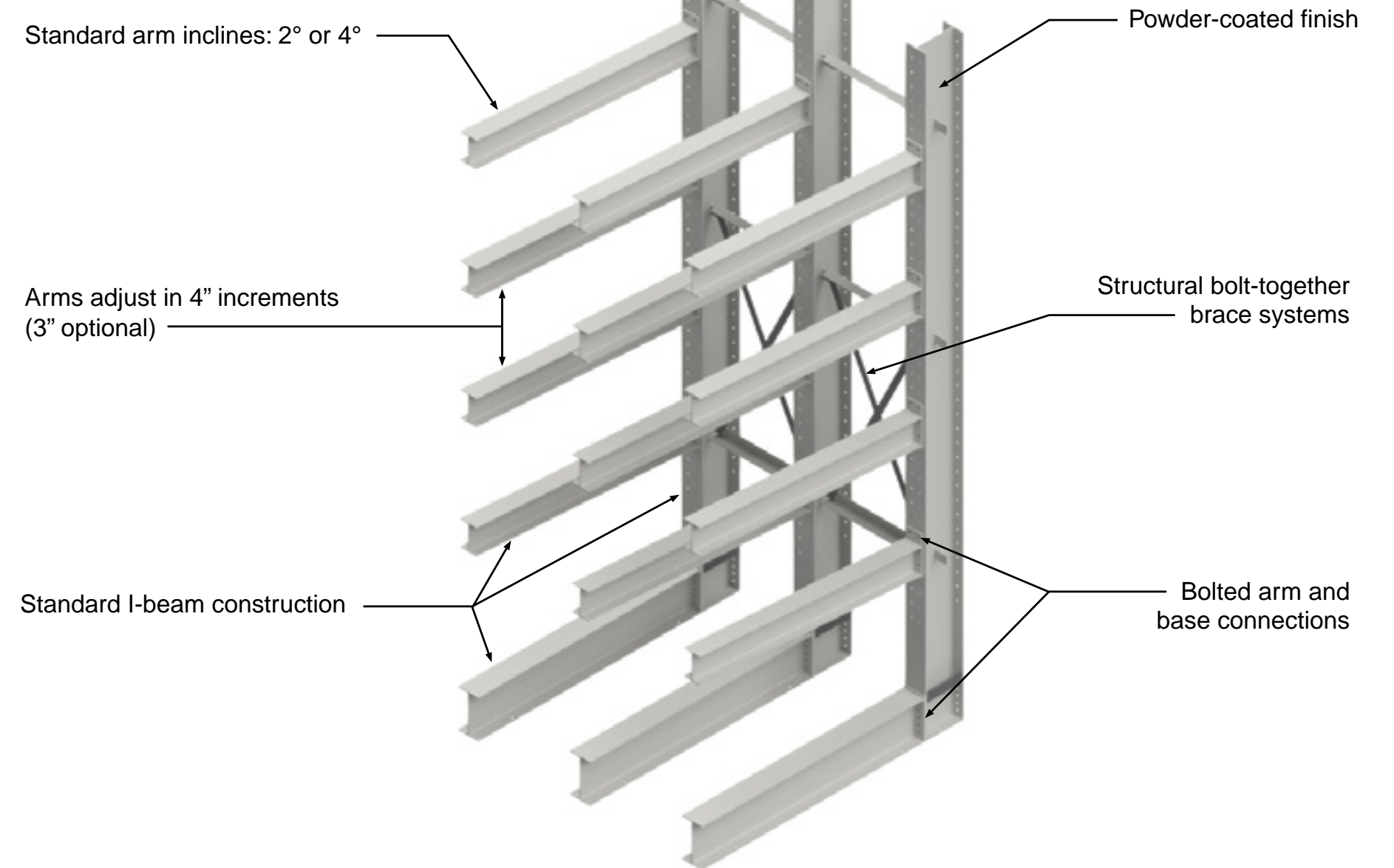
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- Structural bolt-together brace systems offer lateral rigidity
- Modular design makes it easy to add more bays
- Columns and shelf beams are bundled for easy installation and cost-efficient shipping
- Load capacities: Ross engineers racking systems to meet virtually any weight requirement. Typical systems support loads ranging from 1,000 pounds per individual arm up to 14,000 pounds per individual arm and higher

Standard Finish

- Factory-applied powder-coated finish



Shed Racks



dexco™

STRUCTURAL STEEL
I-BEAM RACKING SYSTEMS

Manufactured by
ROSS
*Technology for
Stronger, Safer Solutions*

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