CANTILEVER RACKS

shop talk

Cisco-Eagle

A GUIDE TO BULK STORAGE

cisco-eagle.com/cantilever

WHY CANTILEVER?

IDEAL FOR LONG, HEAVY, UNWIELDY AND BULKY LOADS

Visit **www.cisco-eagle.com/guides** for more guides

"Because they don't have front columns to obstruct loads, cantilever racks are ideal for loads like tube, lumber, pipe furniture and other bulky loads. It lets you store different sizes on different levels—and if decked even allows that on the same level. We can help you with storage tips and specification help."

—Derek, Employee-Owner
Account Executive

shop talk

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CANTILEVER APPLICATIONS

Bulky items

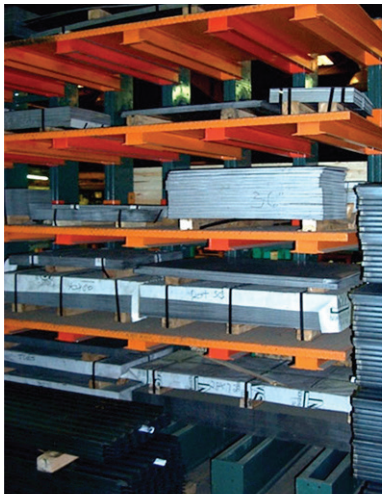
This application was made for order picking where pallet rack wasn't suitable. Cantilever rack's open front shelves make it ideal for boxes and components. Decks add versatility.

Furniture storage

In retail distribution, warehousing, store areas, or work-in-process operation, cantilever is used for sofas and other furniture. It's ideal for these larger, heavy loads that cannot be stacked and don't work in pallet rack.

Lumber, timber and boards

Cantilever is broadly used in lumber yards, where its open fronts allow stacking of heavy boards, sheets and other unwieldy loads. It's ideal for this application and can be installed indoors or outdoors.



Sheet metal

Cantilever is ideal for many sheet metal applications, due to ease of access, high capacities, and vertical storage density. We also recommend specialized sheet metal racks for some applications. These same advantages also make it ideal for wood, stone and other sheets that must be safely stored off the floor and with space efficiency in mind.

Pipe, bar and tube storage

One of the most common cantilever applications is pipe and long parts storage, including steel stock, tubing, and various other long, heavy loads. This is frequently used in energy, construction, warehousing and manufacturing operations.

PIPE & TUBE STORAGE METHODS

"You have lots of ways to store pipe, tubing, bar stock and other long, heavy loads—choices that determine how you access the product, how much space it takes and its safety. There isn't one right answer, but we can help you find the way that works best for you."

—Alex, Employee-Owner Since 2013
Account Executive

shop talk

Cantilever rack

Cantilever is frequently used for pipe storage due to its ability to store product safely and reliably.

- **Cost:** Cantilever rack is cost-effective. It ranges from a few hundred dollars to several thousand per rack, depending on the specifications.
- **Space Consumption:** Cantilever racks allow you to place stock (like steel, aluminum, or iron) into racks and off the floor so you can utilize vertical space, but you'll need space for forklift aisles. Cantilever can utilize vertical space, so you'll be able to take advantage of building height. It's high-density and saves space for many applications, although it usually requires forklift aisles.
- **Ease of access:** Cantilever can be loaded or unloaded with forklifts, stackers, hoists or by hand. Static arm positions may obstruct the lower ones in some hoist handling operations.
- **Safety:** If properly specified, cantilever racks can hold extremely heavy loads. Workers need to be cautious when handling any large, unwieldy, long items, whether racked or not.

Stacking racks

- **Cost:** Inexpensive, but you have to buy multiple units to accommodate greater lengths of stock or tubing.
- **Space Consumption:** Good density. They stack (depending on type) 4-6 layers high. They require aisles.

- **Ease of access:** You must unload the top layers to get at the load in the middle or on the bottom layers, no matter that method you're using for loading or unloading. This results in what amounts to extra picks every time you access anything but the top layer. For a product that is all the same in a given rack, that's not a problem - pick a layer off and go to the next. For mixed stock, it's a disaster.
- **Safety:** Stacking racks are stable if specified and stacked correctly. Don't overfill them or add layers over what the specifications advise.

Floor stacking

These loads are between bollards or in bands and to help prevent them from rolling free of the defined storage area. Floor storage is acceptable for a bundles or slow movers that is near to its processing machinery or otherwise accessed by hand with ease.

- **Cost:** Floor storage has no direct cost. Some installations require bollards or posts, or floor striping for organization.
- **Space Consumption:** Very inefficient. The floor is going to host exactly one bundle in a given area.
- **Ease of access:** Most of the time, floor loads are hand picked or by hoist. Forklifts can access some loads or bundles.
- **Safety:** An unsecured bundle isn't safe. But one that sits on the floor isn't going to fall on anyone, although it might slide.

PIPE & TUBE STORAGE TIPS

TIPS FOR PIPE/TUBE STORAGE

- Store pipe indoors (if possible), but always in an organized and stable manner. Choose your facility and storage areas carefully to avoid active traffic aisles.
- Make sure there is visibility down your stock area aisles. If racks or stacks are above head height, use visibility mirrors or warning sensors to ensure forklift drivers can see workers on the ground.
- Don't store steel pipe directly on the floor—or particularly on the ground. Keep it at least 1.5 feet off the ground. Use cradles, racks or blocks to help reduce the chances of rolling and instability.
- Pack the pipe ends with plastic or paper caps to reduce dust, debris, and other environmental contaminants.
- Place steel pipes at intervals on the same level with the pipe ends aligned for maximum stability and easier removal.
- Certain types of pipe and stock should not be stored outdoors, including cold rolled and bright annealed steel types. If you must store these pipes outsides, cover and secure them to avoid precipitation and other issues.
- Pay attention to stacking/putaway methods to ensure safe access when pipe is being pulled from stacks. Use braces, blocks, and racks to ensure stability. The chances of a fall or slip are greater when pipes are not stored correctly.
- Pay attention to your facility's rules on stacking heights. If your stacks are rack-stored, the rack manufacturer can provide a stack limit. Safe heights vary by type of material and weight. Be sure you aren't over-stacking pipes to unsafe heights, and that the stacks are safely blocked and braced.
- Cover or tarp your pipes if feasible. The idea is to keep the steel as clean as possible.

Notes for stainless steel materials

- Stainless pipe has special circumstances. It should be stored in a clean, dry area, separated from dust, product gases or airborne debris.
- Also, be careful stacking certain type of steel in contact with other materials—particularly stainless. Acids, salts, alkali, or cements etc can corrode or damage stainless and some other types of metals.
- Be sure stainless pipes aren't in direct contact with other types of steel or metals that could cause corrosion or damage.
- Different varieties of stainless steel pipes should be stacked separately to prevent confusion and prevent contact with corrosion.

CANTILEVER SPECIFICATION

"Read this guide to get your project started. If you aren't sure of any of the factors—spacing, weights, capacities, or anything else—call us. For some installations, engineering drawings and other assistance may be needed. See our website for a video tutorial or call today for assistance."

—Talisa, Employee-Owner
Account Executive

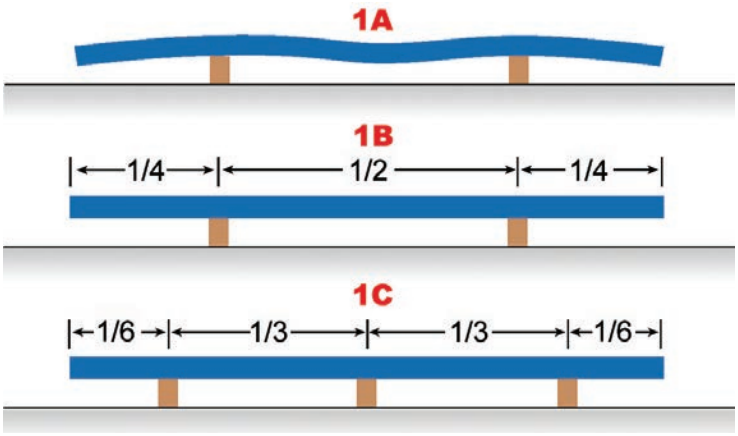
shop talk

(1) Determine your column spacing

To determine the space between upright columns: (1) Measure the length of your load, then (2) divide that length by two. This provides the initial column spacing required to store on cantilever. Final spacing is determined by the number of arms needed to support your load.

Keep in mind that this is a center-to-center dimension.

(2) Determine your support arm numbers & spacing



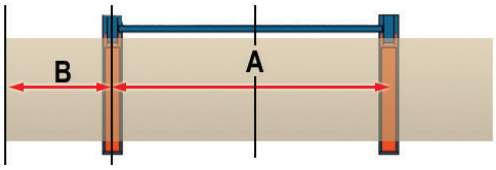
How many arms do you need to eliminate load deflection?

You'll need a sample of your load and some wood blocks. Place two blocks on the floor and have a tape measurer handy. Then, place/center your load on these blocks. If the load sags, you'll need more support arms beneath it. When you determine the load deflection and horizontal arm spacing, you will have the needed upright spacing. Some very heavy loads will require more support arms—and tighter column spacing. Since each arm is mounted on a column, arm spacing dictates column spacing for your rack system.

1A. Use enough arms under a load to prevent load deflection. Deflection causes undesirable side pressure on the arms. Using wood blocks on the floor under the load, test your load for deflection.

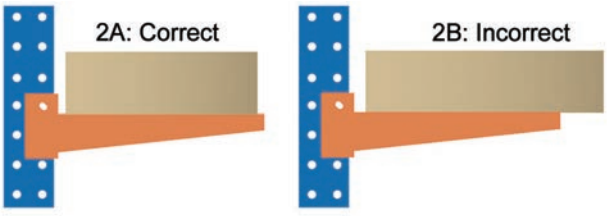
1B. If no deflection, use two arms. Capacity required will be half the load weight, and the upright center line will be half of the load length.

1C. If you notice deflection with two supports, add another. If this system works, arm capacity will be 1/3 of the load weight, and the upright center lines will be 1/3 of load length. If three supports are still not enough, add supports until deflection is eliminated.



A note on correct horizontal load overhang

Your load (B) should not overhang the end of the arms by more than half of the horizontal distance between arms (A). Any more than that, and the ends of the load could deflect or sag.



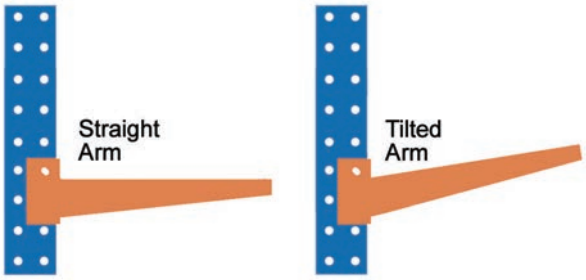
(3) Determine your arm length

Arm length should equal or exceed load depth. (see illustration: 2A is correct, 2B is incorrect). Do not let loads extend beyond the length of your rack arms. This can result in diminished capacities or failure.

Arms are typically available in lengths from 12" to 72" in 6" increments.

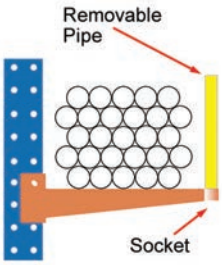
CANTILEVER SPECIFICATION

(4) What type of arms?



Tilted arms are used to keep round items or unstable loads from rolling off the arms. Straight arms are excellent for flat loads and provide more space on the same length of arm.

Sockets & pipes

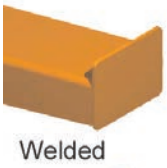


Sockets with removable load stability pipes can be added to either straight or tilted arms for additional load fall protection.

This is ideal for round loads that are often shifted or moved and at risk for falls or spills.

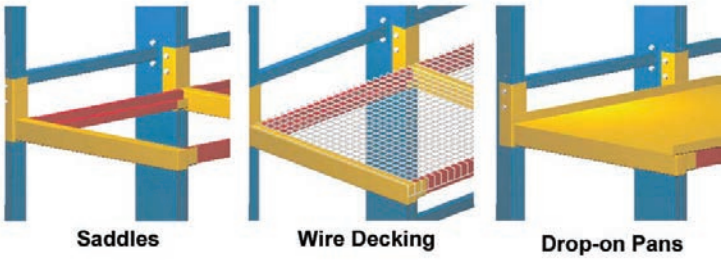
Sockets can be added to straight or tilted arms as desired.

Lips



Lips can be added to the end of cantilever rack arms for additional stability and product protection. Choose welded or bolted styles.

Bolted lips can be removed at any time when not needed, while welded ones are permanent. Lips do not bear any weight and are installed as load security/ control devices.



Decking options

Decking, saddles or drop-in pans can be added to cantilever arms to further add load stability to the rack system. These options allow you to store odd sizes on the same level.

(5) Determine your column height

Formula:

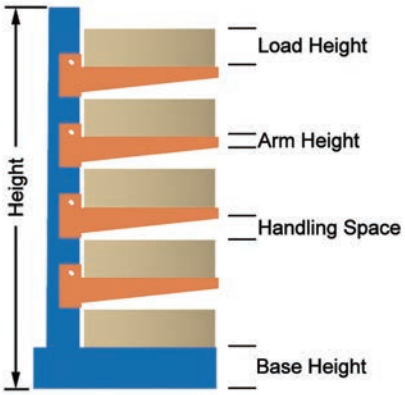
Add: Base height

+Number of storage levels x load height

+ Handling clearance [4"to 6"] x number of levels

+ Number of arm levels x arm thickness

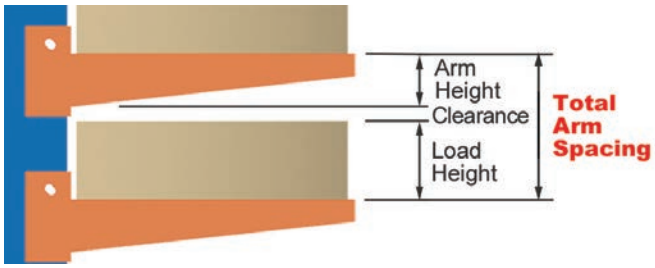
= **Column height.** Top of column must extend above the top arm by a distance of at least the base height.



Base height

Base heights are a simple measure from the floor to top of the base. These heights vary based on rack depth and load weight. Typical heights are 8", 10", 12" and 14".

How to set arm spacing:



Arm spacing is the sum of (1) load height, (2) clearance, and (3) arm height. This should measure from the base of the lower arm to the top of the arm above it. Leave enough handling space to lift loads clear of the rack without touching another arm. Once established, arm spacing helps dictate column heights.

Notes for upright height specification

Check limitations such as ceiling clearance (see right).

Since arms are thicker for heavier loads, clearance will be less with high-capacity arms.

Lips count when measuring arm height. Top arm level must be below the top of the column.

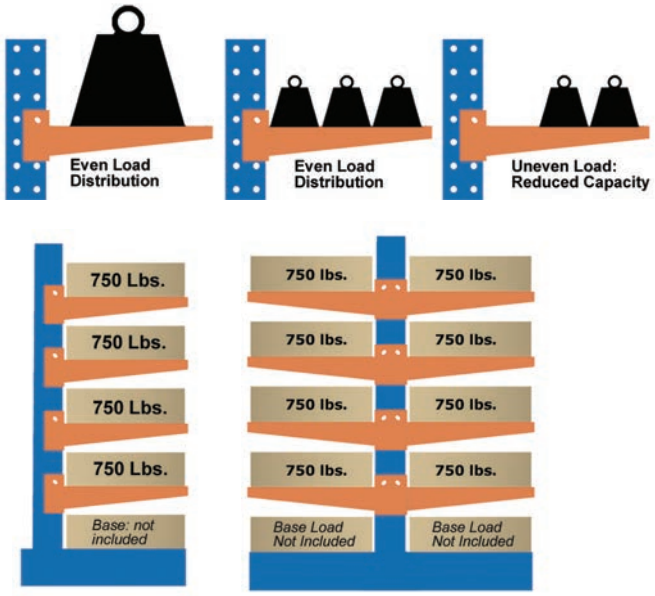
CANTILEVER SPECIFICATION

(6) Calculate your capacities

The capacity of a cantilever rack relies on two aspects: the column capacity and the arm capacity. The lesser of these capacities is the functional limit of your rack.

Arm capacity

Arm capacity is total load weight divided by number of arms per level, assuming each arm supports an equal amount of the load. Divide the load per level by number of support arms to arrive at this figure.

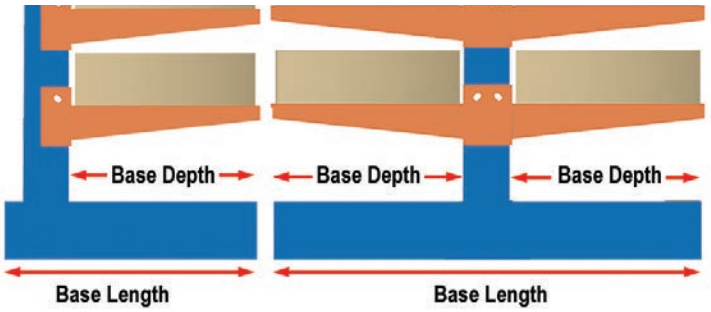


- Base loads don't count in arm capacity calculations
- Adding support arms (per level) means each arm will require lower capacity rating, but will also require a column.
- Uneven loading reduces arm load ratings by at least 50%. All loads should be uniform and even to ensure stability and safety.

Upright column capacity calculation:

- Multiply the number of arms on one column by the load on each arm. Don't include the load that rests on the base.
- Example: 750 pounds load-per-arm with 4 arm levels per side, single sided rack.
- 4 arm levels x 750 = 3,000 pounds per column. This is the necessary column capacity for a single sided rack.
- Double the load weight for 2-sided racks. In this example, 3,000 x 2 = 6,000 pounds minimum per column capacity is required.
- Cantilever columns run from 500 to almost 60,000 pounds capacity.
- Base loads don't affect column capacity.

(8) Calculate your base depth & length



Bases are the foundation for a cantilever rack. Base length is the total length of the base, while base depth is measured from the outside edge of the column to the end of the base (see above). Base depth must be at least equal to the length of your arms.

Use pipe end stops for your base if your load is round or prone to shifts to help prevent loads from rolling off the base.

(7) Anchoring your rack

For stability and to achieve full capacity, racks must be anchored. You will generally need to anchor each column base with 2 anchors for each base. They should be embedded in a level concrete slab floor a minimum of 3/4". Consult manufacturer recommendations on requirements for any particular rack.

Final checklist: what to know

- **The number of columns:** dictated by arms/load deflection
- **Column spacing:** dictated by arms/load deflection
- **Column height:** Adequate space for the right number of arms to hold the load, plus clearance for loading/unloading, and clear ceiling height.
- **Column capacity:** Must meet or exceed cumulative arm capacity.
- **Base depth:** Must be equal or greater than arm lengths.
- **Double or single side:** You can make rows of double side racks, or use single racks against a wall.
- **Number of arms per column:** Be sure you have adequate gaps between arms for load plus handling space.
- **Capacity per arm:** Depends on the number of arms supporting the load.
- **Special notes:** Note any special conditions (seismic, temperature extremes, outdoor installation, or other factors).

CANTILEVER RACK TYPES

"Cantilever racks let you store loads on the arms and the base. This gives you five levels of storage on a four-arm rack and so on. The base can usually be heavier than the arm loads. This gives you a little more storage versatility."

—Don, Employee-Owner Since 2017
Sales Director

shop talk

STEEL KING CANTILEVER RACK FOR THE TOUGHEST LOADS

Cantilever rack allows storage shelves without front obstructions, with solid decking covering the entire length of the rack row. The result is a system where loads of varying lengths can be placed anywhere along the entire storage shelf.

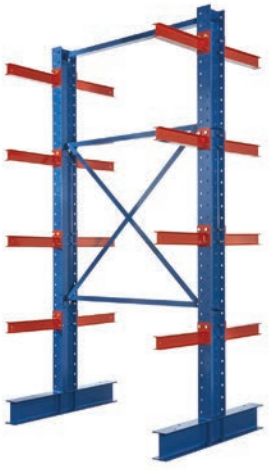
Cantilever systems

We'll help you with cantilever racks for the toughest, heaviest industrial applications, from tubing & pipe to heavy machinery storage, to manufactured solutions.

Ideal for furniture storage

Furniture storage cantilever has storage shelves without front obstructions and solid decking covering the entire length of the rack row. Loads of varying lengths can be placed anywhere along the entire storage shelf.

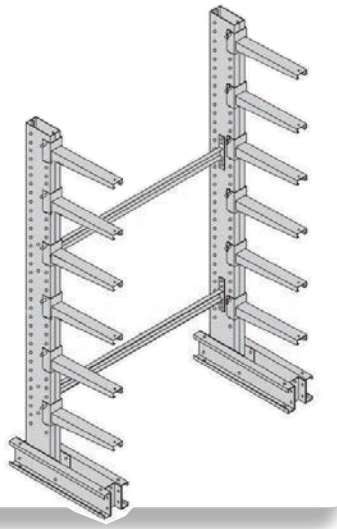
CANTILEVER RACKS FOR—AND ASSISTANCE—FOR EVERY APPLICATION



STEEL KING
BUILT TO DELIVER

WR

MECO



STORE PIPE, STOCK & MORE

Store pipe, tube, bar stock with bar racks

CR-833

CR-834

BSRS

Model Number	Size (Inches)	Rack Type	Cap* (Lbs.)
CR-833	84h x 30w x 30d (base)	Horizontal	1,800
CR-834	84h x 36w x 24d	Vertical	3,000
BSRS	74-3/4"h x 41-1/2"w x 36-1/2"d	Horizontal	16,000
VBR-9	39-3/8"W x 24-1/8"D x 84"H	Vertical	3,000

CR-833: Handles up to 10' angles, bars, pipes, & other long items. 9 arm levels extend 9" on 6" spacing.

CR-834: Handles loads up to 12'. All-welded steel components bolt together for quick assembly. Arms act as dividers.

BSRS: Made for bar ends, saw drops and pipe plus many more uses. Grid is a convenient way to organize materials.

Store pipe, tubing and long parts with Mini-Module bar racks

High density storage stores items like pipe, tubing, structurals, extrusions, and more. Cut-off lengths can be conveniently returned to storage and easily identified. Stable when stacked and easy to handle.

AIRector stacking racks load like pallets, protect like racks

AIRector stacking racks combine the unit load capabilities of a pallet with the product protection and positive stack alignment of stacking posts. Welded tubular steel construction ensures dependable load carrying strength. Designed for fork truck handling. Select wood or open deck. Options include channel collars for side panels, or end & side frames. Posts available in 1" height increments from 16" to 48". Many other base sizes, materials, configurations available. Do not stack these racks over 4 high.

W x L x H (Inches)	Cap. (Lbs.)	Open Deck Model No.	Wood Deck Model No.
42 x 48 x 36	2,000	AOD-2-4248-36P	AWD-2-4248-36P
42 x 48 x 42		AOD-2-4248-42P	AWD-2-4248-42P
42 x 48 x 48		AOD-2-4248-48P	AWD-2-4248-48P
42 x 60 x 36		AOD-2-4260-36P	AWD-2-4260-36P
42 x 60 x 42		AOD-2-4260-42P	AWD-2-4260-42P
42 x 60 x 48		AOD-2-4260-48P	AWD-2-4260-48P
48 x 48 x 36		AOD-2-4848-36P	AWD-2-4848-36P
48 x 48 x 42		AOD-2-4848-42P	AWD-2-4848-42P
48 x 48 x 48		AOD-2-4848-48P	AWD-2-4848-48P
48 x 60 x 36		AOD-2-4860-36P	AWD-2-4860-36P
48 x 60 x 42		AOD-2-4860-42P	AWD-2-4860-42P
48 x 60 x 48		AOD-2-4860-48P	AWD-2-4860-48P
42 x 48 x 36	4,000	AOD-4-4248-36P	AWD-4-4248-36P
42 x 48 x 42		AOD-4-4248-42P	AWD-4-4248-42P
42 x 48 x 48		AOD-4-4248-48P	AWD-4-4248-48P
42 x 60 x 36		AOD-4-4260-36P	AWD-4-4260-36P
42 x 60 x 42		AOD-4-4260-42P	AWD-4-4260-42P
42 x 60 x 48		AOD-4-4260-48P	AWD-4-4260-48P
48 x 48 x 36		AOD-4-4848-36P	AWD-4-4848-36P
48 x 48 x 42		AOD-4-4848-42P	AWD-4-4848-42P
48 x 48 x 48		AOD-4-4848-48P	AWD-4-4848-48P
48 x 60 x 36		AOD-4-4860-36P	AWD-4-4860-36P
48 x 60 x 42		AOD-4-4860-42P	AWD-4-4860-42P
48 x 60 x 48		AOD-4-4860-48P	AWD-4-4860-48P

shop talk

"When your loads are variable, stacking racks are a great way to go. Since they're modular, you can just add racks to handle loads of various lengths and types when you need to. Aside from long parts, they can help you balance pallet loads in any system, and most types can be transported by forklift for easy portability. They can be set up and removed by hand."

—David, Employee-Owner Since 1982
Operations Manager

CRANK-OUT RACKS & MORE

CRANK-OUT CANTILEVER FOR HEAVY-DUTY, HIGH-DENSITY STORAGE

Detailed information & video: visit **www.cisco-eagle.com/crankcantilever**

With crank-out arm levels that extend to 100% of the arm length, you can easily reach your load with a hoist or other overhead lifting equipment—no more reaching, twisting and struggling to move heavy stock. Just crank out the level you want and easily reach the goods you need with a crane, manually, or by other lifting methods.

- Features a locking mechanism that prevents over-balancing by preventing more than one level being cranked out at a time.
- Reduce downtime with high-density storage within easy reach next to a laser, saw or other machinery.
- Increase storage efficiency. Easy access to vertically stored stock of various types.
- You may not need a forklift driver for a correctly-positioned rack unit

Heavy-duty 100% extension roll-out racks for dies, sheets, heavy loads

Glide-out racks

Gliding shelves make access to expensive and heavy machinery tools and die safer and more ergonomic with extendable shelves. Equipment can be lifted overhead for safe transport.

Crank-out racks

Crank-Out storage racks provide versatile, heavy-duty shelving that extends out to 75% so that items can be easily loaded and unloaded with an overhead crane or forklift. Each level has a capacity of 5,000 lbs. and a cranking handle point at an ergonomic height.

SHEET METAL RACKS

cisco-eagle.com/sheetmetal

Heavy duty roll out sheet metal racks

Roll-out sheet rack is an ergonomic way to store sheet metal or flat stock loads up to 10,000 pounds. Accommodates sizes up to 72' x 144'. Drawers fully extend for easy loading and retrieval. Manual roll-out or crank options are available, along with custom sizes. Capacities up to 5,500 lbs. per shelf. Various sizes with 4 to 8 drawers. Custom configuration requests welcome.

Static sheet metal storage

Vertical: Standing sheet goods up to save floor space is a good idea, but putting them in vertical rack is even better.

Horizontal: Storing sheet stock horizontally takes a smaller footprint and is more ergonomic. Multiple levels allow quicker picking, prevent damage and let workers handle sheets more safely.

SPECIFICATION WORKSHEET

Fax: 972-406-9577 • Email: 24hours@cisco-eagle.com • Call: 888-877-3861

Ignore any question you can't answer - we will walk you through the process and make it as easy as possible

About you

Name: _____

Company: _____

Phone: _____

Email: _____

Load information

Load width (left to right): _____ (inches)

Load depth (front to back): _____

Load height: _____

Load supports on _____ (inch) centerlines to prevent deflection

Load weight: (maximum): _____ (average): _____

Forklift information

Maximum lift-off height: _____ (inches) off the floor

Lift capacity: _____ (pounds)

Preferred aisle width: _____ (feet)

Facility information

Building status: circle - **New** or **Existing**

Building dimensions

Width: _____ (feet) • Length: _____ (feet)

Clear ceiling height: _____ (feet) *height below lowest obstruction

Building columns

Outside dimensions: _____ (inches)

Column centers: _____ (feet)

Column bumper size: _____ (inches)

Describe any other obstructions below:

Rack configuration

Columns

Rack type: ☐ Single or ☐ Double

Column height: _____ (inches). Column quantity: _____

Capacity: _____ (lbs.) Arms per column: _____

Arms

Arm levels: _____ ☐ Straight or ☐ Tilted

Arm length: _____ (inches) Arm cap.: _____ (pounds)

Arm quantities: _____ (total)

Bracing: length: _____ (center-to-center between columns; inches)

List your configurations

Add as many as desired; attach additional sheets if necessary.

Single or Double	*Starter Bay Length*	*# Adder Bays*	*Notes*

Accessories & options:

Bolted End Lips: (Arm) ☐ (Base) ☐ (Both) ☐

Welded End Lips: (Arm) ☐ (Base) ☐ (Both) ☐

Brackets for 2x4 End Stops: (Arm) ☐ (Base) ☐ (Both) ☐

Bolted Pipe End Stops: (Arm) ☐ (Base) ☐ (Both) ☐ Size: _____

Welded Pipe End Stops: (Arm) ☐ (Base) ☐ (Both) ☐ Size: _____

Roof Brackets: ☐

Decking: ☐ Wire ☐ Wood ☐ Sheet Metal

More details:

To add information, attach a sheet, call us, or visit our website and **complete our cantilever request form** for fast, friendly service.

SKETCH A RACK & ADD NOTES

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Submit inquiry

Name: _____ Company: _____

Phone:_____ Email: _____

Comments:

Sketch if needed:

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