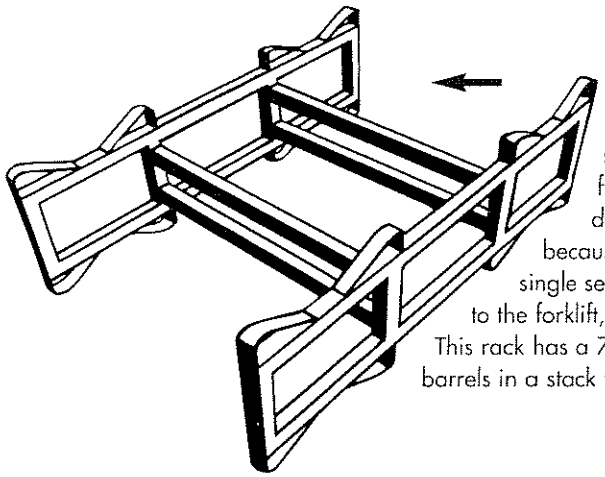
WESTERN SQUARE
INDUSTRIES

Portable Steel Barrel Racks

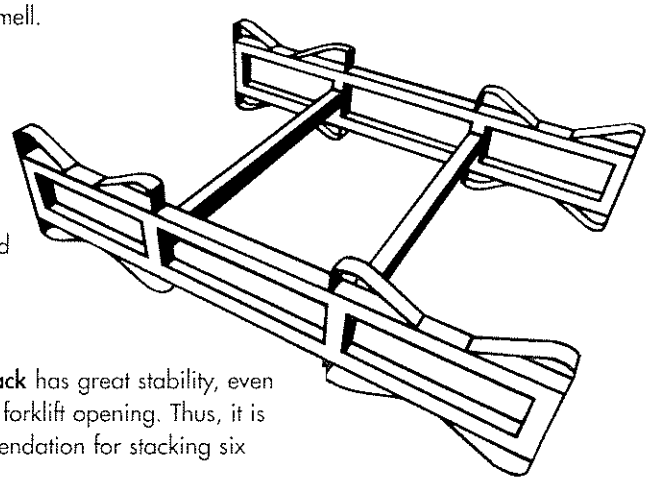
Western Square racks them up

All Western Square racks (WS29 Series) are designed to accommodate all oak barrels from 15 to 70 gallon capacity in both Bordeaux and Burgundy barrel shapes. Pictured here are the wine industry's most popular models. Specifications for these racks and other more specialized racks are listed on the following page.

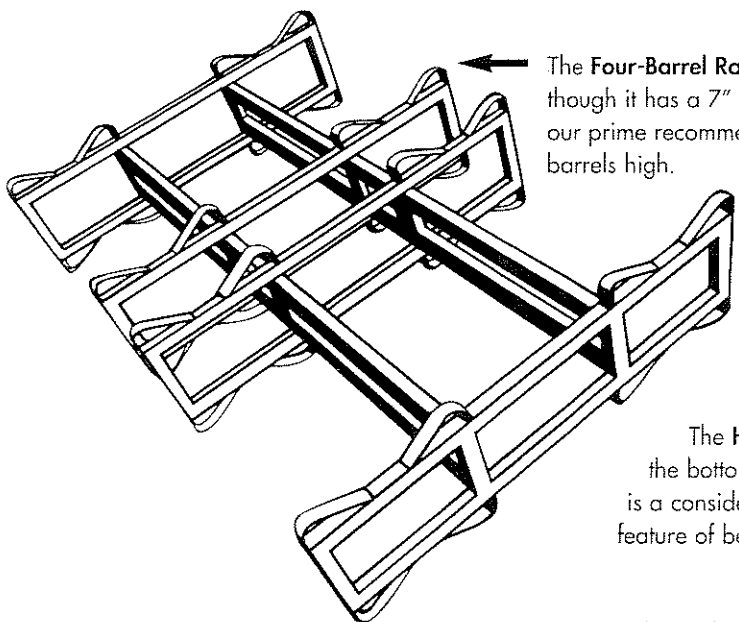


The **Double Bar Rack** with two pairs of connecting bars has replaced the single bar rack (with one pair of connecting bars) as the industry's standard two-barrel topping rack. The double bar rack is stronger, not from the standpoint of compressive strength, but because it better resists "tweaking" when full barrels are inadvertently pushed along the floor with a forklift. Further, the double bar rack provides a safer situation when lifting barrels from the side, because the forks come in between the two sets of bars rather than simply under a single set. Thus, if the outside barrel is, for some reason, heavier than the barrel closer to the forklift, they might tilt but they shouldn't fall.

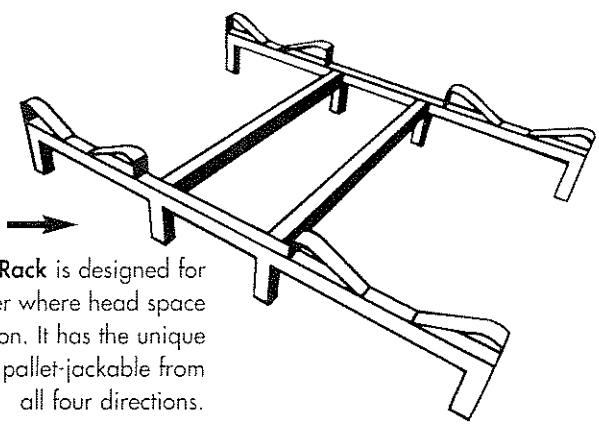
This rack has a 7" forklift opening which allows enough room to get your head between the barrels in a stack to see and smell.



The **Low Profile Rack** has a 4" forklift opening. It is one of our recommendations for stacking six barrels high, because the stack has a lower center of gravity. All you sacrifice is the ability to get your head between the barrels in a stack. The wine can still be worked in place.



The **Four-Barrel Rack** has great stability, even though it has a 7" forklift opening. Thus, it is our prime recommendation for stacking six barrels high.



The **Half Rack** is designed for the bottom tier where head space is a consideration. It has the unique feature of being pallet-jackable from all four directions.

Note: *This rack is not compatible with the Western Square barrel washing system. We can provide a different half rack which is compatible but is not pallet-jackable.*

Specifications:		length	width	cradle center to center	end forklift opening	side forklift opening
for	**52 to 70 gallon barrels**					
	double bar rack	30.5″	44.5″	29.5″	7″	3″
	low profile rack	30.5″	44.5″	29.5″	4″	--
	half rack	30.5″	44.5″	29.5″	4″	4″
	four barrel rack	70.0″	44.5″	29.5″	7″	3″
for	**30 gallon barrels**	24.0″	44.5″	29.5″	7″	3″
for	**15 gallon barrels**	20.0″	44.5″	29.5	7″	3″
for	**300 liter hogsheads**					
	and **350 liter cognac barrels**	35.0″	50.0″	35.0″	7″	3″
for	**500 liter puncheons***	37.0″	57.0″	39.0″	9″	3″

* Puncheon racks are made with 2″ square tubing. All other racks are made with 1.5″ square tubing.

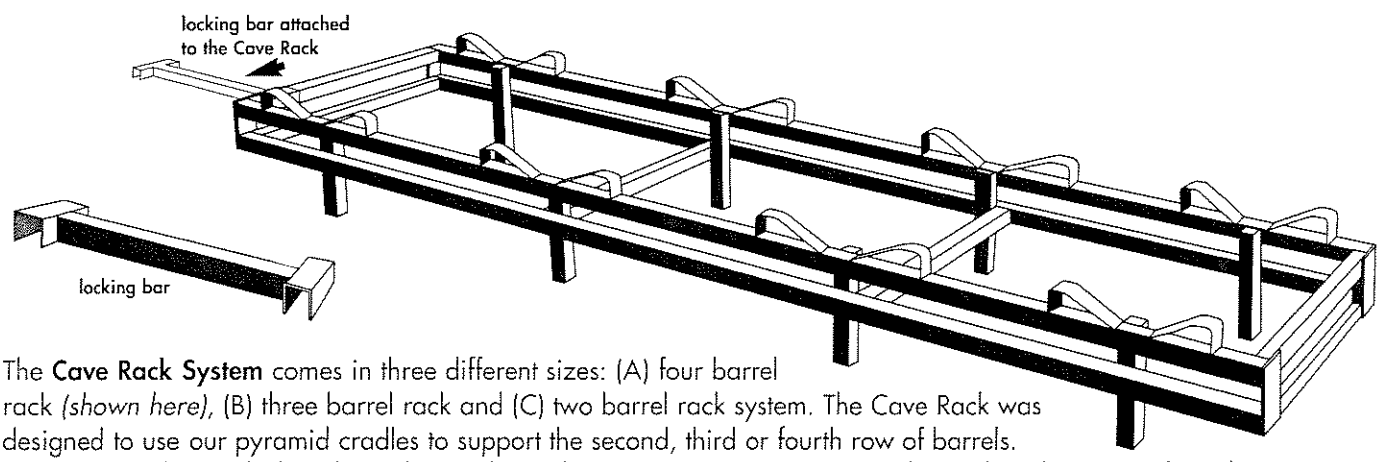
Powder Coating:

All Western Square barrel racks are powder coated. The stock color is beige. Blue, green and bronze are offered at no extra charge. Black, red, burgundy and other colors are also available.

Powder coating is the process in which the coating is applied dry instead of wet. The dry powder, with a consistency like talcum powder, is applied with a special spray gun which charges each particle electrostatically so that it will stick when it hits the metal surface. When the whole item has been coated, it is conveyed into a 400° oven where the powder particles melt, flow and fuse, a process that takes 10 to 15 minutes. The result is a baked enamel, but with some special advantages over conventional baked enamels. First, because the resin does not need to be dissolved in a solvent, higher molecular weight resins can be employed, meaning a tougher film with better impact resistance and scratch resistance. Second, because there are no solvents which are evaporated as the film forms, there are none of the microscopic pinholes that occur in all paint films derived from liquid coatings. This means dramatically better corrosion resistance.

Stainless Steel barrel racks:

Western Square offers all standard models in stainless steel.

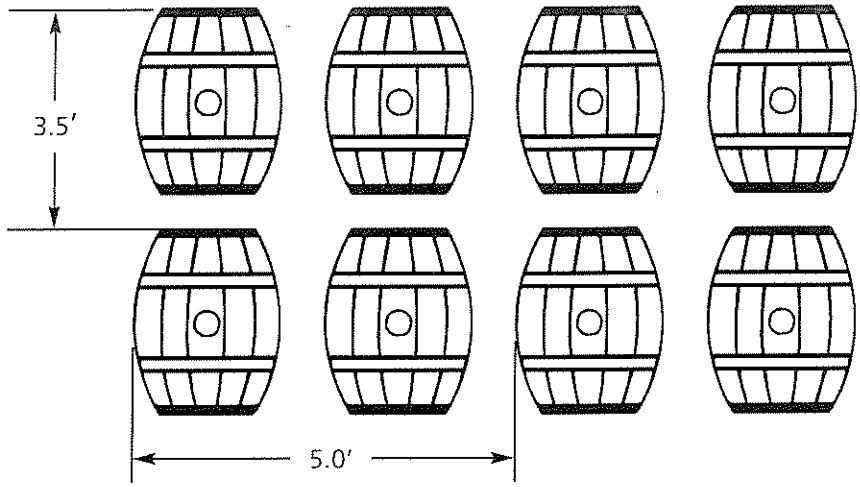


The **Cave Rack System** comes in three different sizes: (A) four barrel rack *(shown here)*, (B) three barrel rack and (C) two barrel rack system. The Cave Rack was designed to use our pyramid cradles to support the second, third or fourth row of barrels. This system utilizes a locking bar *(shown above)* that connects two sections together without losing any barrel space. The Cave Rack was designed in this fashion so that one person can maneuver a single rack. The rack can be removed easily so the cave floor can be cleaned and the rack does not have any flexion over the span or length of the rack.

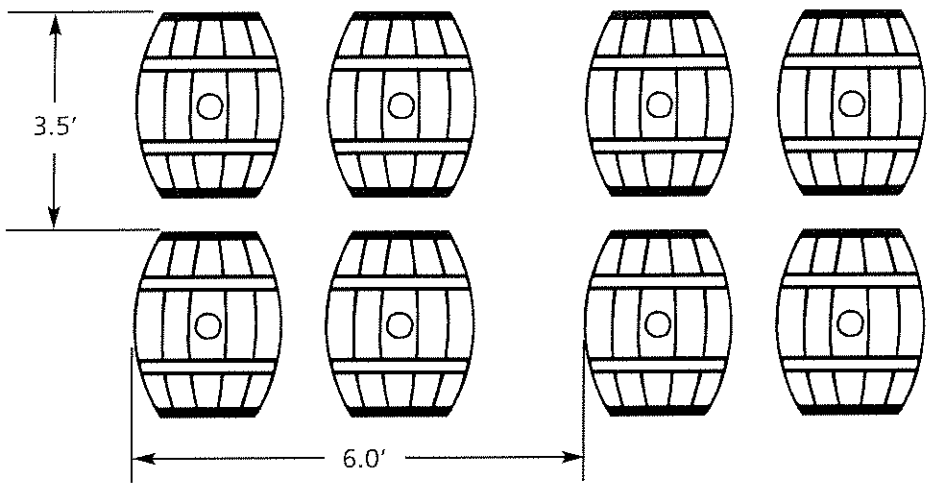
The stainless steel Cave Rack comes with foot pegs or variable height rubber feet. The barrels rest on the standard Western Square cradles and each barrel is about 5″ apart (depending on the cooper) allowing the cellar crews the ability to work the barrels in place. This is an alternative solution to the Western Square traditional barrel racks.

Floor Plans:

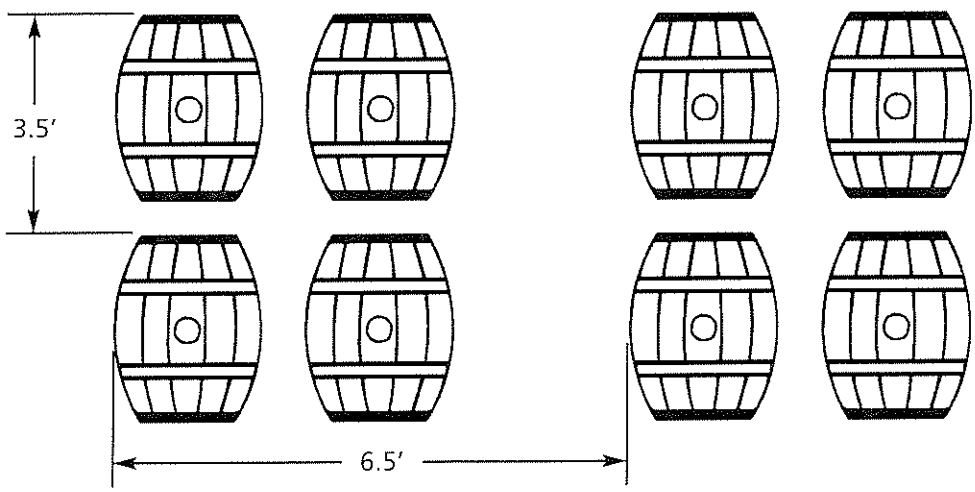
In the close-pack senario depicted here, some space between barrels is accounted for. Thus, barrel density figures are conservative.



If space is available to have aisles so the wine can be worked in place, the aisles should ideally be wide enough to accommodate a ladder. Climbing between the stacks is not recommended, but it is done, particularly with stacks only 3 or 4 barrels high. An additional 12″ space over that for the close-pack senario is adequate for climbing the stacks. Barrel density for this case is shown in the table in the rows marked "12+inch aisles".



In the situation shown here, an additional 6″ of aisle space is adequate to use a narrow ladder. Fortunately, there is now on the market a ladder *(see drawing on opposite page)* which is only 18″ wide but has a base 28″ wide for stability. The wheels roll underneath the barrels but clear the racks. When racks are set on 6.5′ centers the ladder clears even 70 gallon barrels by at least 2″ on both sides and the base clears the racks by at least 2″ on both sides. Barrel density for this case is shown in the table in the rows marked "18+ inch aisles".



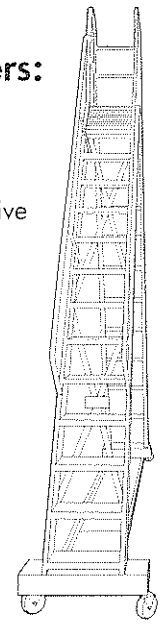
Barrel Density:

In the table below, **Square feet per barrel** accounts for the area of the barrels and the area of the aisles. It does not account for the area of the forklift avenues, i.e., areas where the forklift needs to turn 90°. Forklift avenues should be at least 13 feet wide for two-barrel racks and 17 feet wide for four-barrel racks. (This information should be confirmed with your forklift specifications.)

The area for forklift avenues needs to be considered when calculating the total area required to store a given number of barrels. Conversely, the area for forklift avenues should be subtracted from the total size of a barrel storage area before **Gallons per square foot** can be calculated.

Rolling Ladders:

Call your Western Square representative for information on our rolling ladder product line.



Square feet per barrel

	3 bbls. high	4 bbls. high	5 bbls. high	6 bbls. high
Close pack (racks on 5' centers)	2.92	2.19	1.75	1.46
12+inch aisles along bilges (racks on 6' centers)	3.50	2.63	2.10	1.75
12+inch aisles along heads	3.33	2.50	2.00	1.67
18+inch aisles along bilges (racks on 6.5' centers)	3.79	2.84	2.28	1.90
18+inch aisles along heads	3.54	2.66	2.13	1.77

Gallons per square foot

(assumes 60 gallon barrels)

	3 bbls. high	4 bbls. high	5 bbls. high	6 bbls. high
Close pack (racks on 5' centers)	20.57	27.43	34.29	41.14
12+inch aisles along bilges (racks on 6' centers)	17.14	22.86	28.57	34.29
12+inch aisles along heads	18.00	24.00	30.00	36.00
18+inch aisles along bilges (racks on 6.5' centers)	15.82	21.10	26.37	31.65
18+inch aisles along heads	16.94	22.59	28.24	33.88

Note that barrel density is slightly better if aisles are along the heads of the barrels compared to aisles along the bilges of the barrels. However, if space is available, aisles along the bilges are recommended because bung access is so much better.

Stack Heights:

Bordeaux Barrels

no. of bbls high ↓	Size of forklift opening in rack			
	7″	7″*	4″	4″*
1	3′2″	2′7″	2′11″	2′7″
2	6′1″	5′6″	5′7″	5′3″
3	9′0″	8′5″	8′3″	7′11″
4	11′11″	11′4″	10′11″	10′7″
5	14′10″	14′3″	13′7″	13′3″
6	17′9″	17′2″	16′3″	15′11″

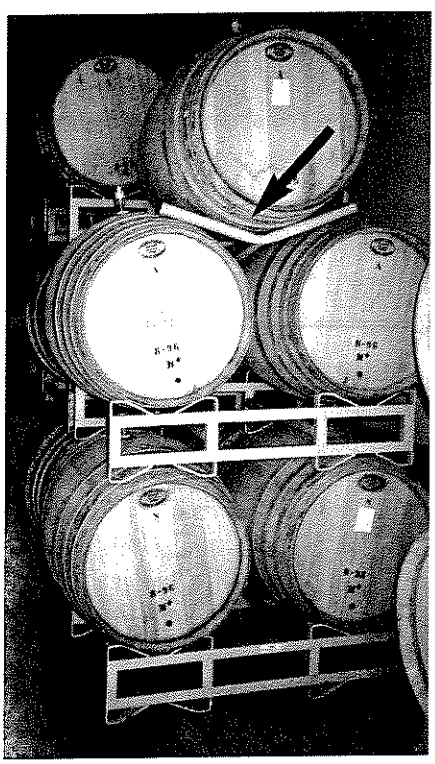
* using half rack at bottom

Burgundy Barrels

no. of bbls high ↓	Size of forklift opening in rack			
	7″	7″*	4″	4″*
1	3′3″	2′8″	3′0″	2′8″
2	6′3″	5′8″	5′9″	5′5″
3	9′3″	8′8″	8′6″	8′2″
4	12′3″	11′8″	11′3″	10′11″
5	15′3″	14′8″	14′0″	13′8″
6	18′3″	17′8″	16′9″	16′5″

* using half rack at bottom

Stacking an odd number of barrels:

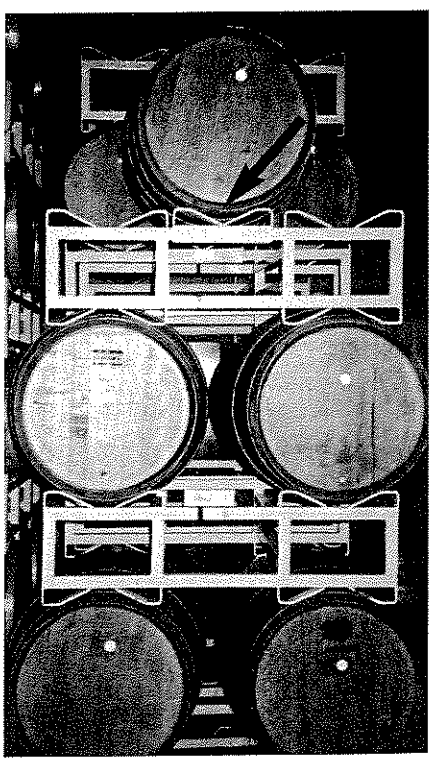


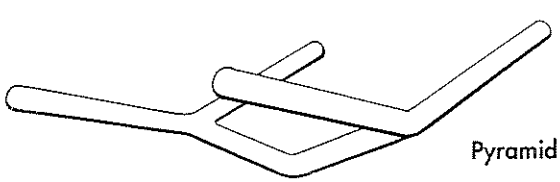
Western Square has two handy devices for stacking a single barrel above tiers of two barrels. One is the pyramid stacking cradle *(pictured left)* and the other is the center cradle *(pictured right)*.

The advantages of the pyramid cradle are: (1) overall stack height is lower; and (2) it doesn't tie up an extra rack.

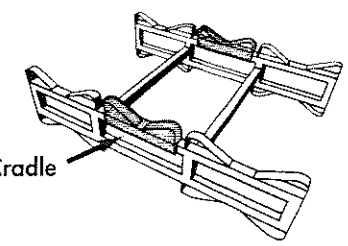
The advantage of the center cradle is that the single barrel can be moved easily with a forklift. The center cradles hold the single barrel safely whether it's on a stack of racks or on the forklift.

Details of these devices are shown below.





Pyramid Stacking Cradle



Removeable Cradle

Save your back! Never lift a barrel again!

Barrel-Washing System:

Western Square's barrel washing system is designed for use with portable steel barrel racks. The rack holding the barrels is forklifted over the frame of the roller, then lowered so each barrel sits on four wheels. The rack drops below and away from the barrels.

The barrels are then turned upside down to dump the lees. Note: there is room on the side of the roller to slide five-gallon buckets in under the bung holes.

Next, the barrels are rotated to the 4 o'clock position so that the spray balls can be inserted without even bending over! The barrels are then rotated back to the 6 o'clock position. The washer wands will sit firmly on the frame of the roller. Turn on the water and walk away.

After the barrels are cleaned, reverse the procedure. To remove the barrels from the wheels, raise the rack with the forklift so that the rack picks up the barrels, perfectly centered.

With the Western Square barrel washing system, the barrels are washed at a convenient working level without the need to actually lift the barrels. The rollers are built of heavy gauge steel tubing and are powder-coated for exceptional corrosion protection. Washer wands are stainless steel with brass ball valves. Western Square offers a stainless steel spray ball that attaches to the wand.

Western Square's barrel washing system, consisting of one roller and two wands, was designed to save your back, not to save time. Labor costs will remain comparable to other barrel washing systems. However, this system can be made much more labor efficient by employing two workers using three rollers but still only two wands.

At Station A, two barrels are being washed; at Station B, two barrels are being drained; at Station C, the forklift driver is removing two washed barrels and replacing them with two barrels to be washed. Then, the workers rotate one station: at Station C, barrels are washed; at Station A, they are drained; and the forklift driver moves to Station B.

Should you desire to use a pressure washer, Western Square has a high pressure, low water volume solution that works with the barrel roller. Please contact your Western Square representative for more information.