



Source: www.worldofstock.com

Barrel Aging Beers: Handling and Storage Safety

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Agenda

- Barrel Hazards Overview
- Safe Barrel Handling
- Safe Barrel Storage
- Seismic Hazards and Controls
- Additional Quick Tips



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Barrel Hazards Overview

- Barrels are HEAVY!
 - Up to 100 lb. when empty
 - Up to 600 lb. when full
- Stacks of 2-barrel racks can be unstable, especially if hit (e.g., by a forklift) or during an earthquake
- Ergonomics – moving/lifting barrels
- Barrel washing – hot water and chemical usage
- Pressure – pressure can build up during fermentation



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Safely Handling Barrels

BEST Method

- Use a powered industrial truck (e.g., forklift or powered pallet jack) and move the barrels on a rack



Source: www.winebusiness.com



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Safely Handling Barrels

BEST Method

- Use a powered industrial truck (e.g., forklift or powered pallet jack) and move the barrels on a rack

WORST Method

- Carry on your shoulder



Source: www.kegconditioning.com

Powered Industrial Trucks – DOs

- Written program & training per OSHA requirements
 - Training should include practical portion with an evaluation
- Daily inspections (each shift if 24-hour facility)
- Maintain trucks per manufacturers' requirements
- Limit access to PIT areas
- Wear high-visibility vests in PIT areas
- Follow safe operation procedures
 - Wear seat belt, lower load before moving, do not speed, etc.

Powered Industrial Trucks – DON'Ts

- Never load a PIT over its rated capacity
- Never allow anyone on a PIT, other than the operator
 - Except when using a platform on a forklift, ensuring it is securely attached and following OSHA requirements
- Never use a PIT that has failed an inspection

Safely Moving Barrels w/ Forklift

- Never move more than 4 barrels at one time
 - Ex: Stack of 2, 2-barrel racks
- Can pick up 2-barrel racks from front or side
- If picking up from the side:
 - Use fork extensions
 - Set the rack as far back as possible to minimize tilting/shifting
 - Tilt the forks backwards to rest the rack on the forklift



Source: www.winebusiness.com

Manual Material Handlers



Pallet Jack



Source: www.reighleyresources.com

Portable Lifter



Source: www.vestilmfg.com

Manual Material Handlers – Safe Practices



- Use manual material handlers with extreme caution!
 - Use only if a powered industrial truck can't be used
- Ensure equipment is rated to handle the weight
 - Full barrel = 600 lb.
- Use only with at least 2 people to help push, pull, and/or steer
- Wear steel-toed footwear

Moving 1 Barrel – Forklift Attachments



Source: Cascade Corporation



Source: RGP Industries



Source: Deschutes Brewery

Moving 1 Barrel – 2-barrel Rack Adapter



- Use an adapter that fits in the middle of the 2-barrel rack



Source: www.carolinawinesupply.com



Source: www.carolinawinesupply.com

Never move 1 barrel on a 2-barrel rack without an adapter!

Storage Safety – General Tips

- Stack barrels as low as possible (< 4 tiers high)
 - Fire Code requires top of storage be ≥ 24 " below ceiling
- Have skilled/trained forklift driver to properly center racks
- Place racks onto barrels, leaving ≥ 1 in. from edge
 - Helps prevent racks from sliding off barrels
- Use caution when stacking different sized barrels
- Never climb barrel racks



Source: www.altwinery.com

Rack Safety – General Tips

- Inspect racks for rust, bends, cracks, or other damage prior to use
- Use caution when purchasing refurbished racks
 - Could be rusted on the inside
- Replace racks per manufacturers' recommendations
 - Ex: Western Square recommends 6 years; RGB recommends 15 years
- Immediately remove any damaged racks from service

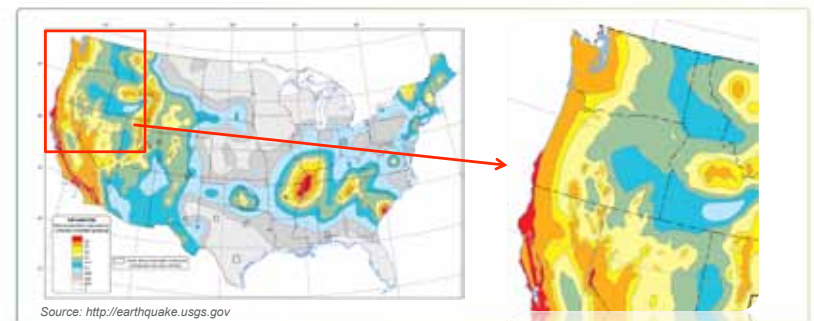
Seismic Hazard

- 6.0 earthquake near Napa, CA on 8/24/14
- \$80M+ in damages and lost product
- Could damage or losses have been prevented?
 - Better racks
 - Better practices/procedures
 - Insurance



Source: www.cbsnews.com

Seismic Risk in the NW



Source: <http://earthquake.usgs.gov>

Seismic Hazard – Controls

- Racks which stack rack-on-rack



Source: www.barrelsafe.com



Source: www.gorillaproducts.com.au

Seismic Hazard – Controls (cont.)

- Cap for the top barrels (a “top cap”)



Source: www.barrel-racks.com

Seismic Hazard – Controls (cont.)

- Four barrel racks
 - Wider and more stable than 2 barrel rack, but difficult to move



Source: www.barrelsandracks.com

Seismic Hazard – Controls (cont.)

- Additional controls include:
 - Strap barrels onto racks and/or adjacent structures for stability
 - Use bottom barrels racks which have wheels

Additional Quick Tips

Barrel
Turner

Chemical
Hazards

Hazard
Controls

Turning Barrels Using a Barrel Turner

- Used to make turning barrels easier



Source: www.thevintnervault.com



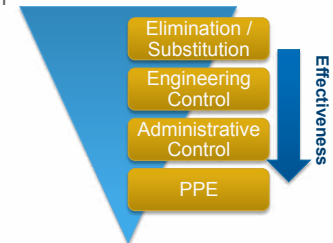
Source: King Estate Winery

Chemical Hazards

- If using chemicals, follow supplier recommended safe practices, controls, and PPE
- Chemicals potentially used:
 - Sodium Metabisulfite – Slightly acidic, irritant
 - Sulfur Dioxide (SO₂) – Irritant, can be toxic if inhaled
 - Ozone – Strong odor, irritant, highly reactive

Examples of Hazard Controls

- Eliminate hazards before controlling them
- Example:
 - Only move barrels when required
 - Place barrels on rack and fill/empty in place
 - If you must move barrels, use a forklift
 - Procedures/training for using forklift
 - PPE: steel-toed boots, safety glasses, high-visibility vest, etc.



In Summary...



- Use extreme caution when using, moving, and storing barrels
- Have a written program and documented training for workers who use powered industrial trucks (e.g., forklifts)
- Properly store barrels in the lowest tiered racks possible
- Inspect your racks for damage
- Proactively identify and control hazards

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Thank you!

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