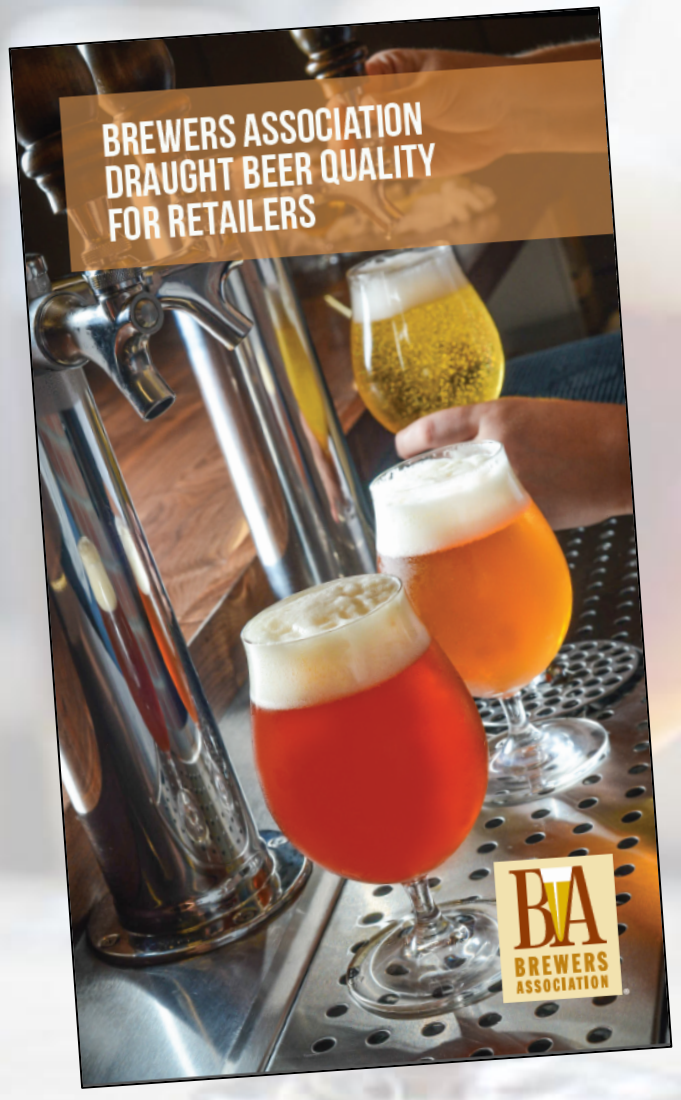

Draught Beer Quality for Retailers

Introduction:

Neil Witte
Duvel USA, Boulevard Brewing Company,
Brewery Ommegang

Matt Meadows
New Belgium Brewing Company

Rob Gerrity
Sierra Nevada Brewing Company

Development History and the Need for *Draught Beer Quality for Retailers*

Neil Witte
Technical Support and Training Manager
Duvel USA, Boulevard Brewing Co., Brewery Ommegang

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Draught Quality Group Background

- Draught Quality Subcommittee formed in March 2007
- Original committee intent was to address draught quality issues at all tiers
- One of the first projects was to align members' similar yet varied draught quality recommendations

Draught Manual Project

- Early in process of Manual development, larger brewers, AB/Miller/Coors (pre-merger) were approached and took part – industry effort
- Brewers were the authors. Distributors/Trade Partners were consulted and participated.
- Draught Beer Quality Manual published in August, 2009

Draught Beer Quality Manual

- Original conception included two versions
  - Full detailed manual, as exists today
  - Shorter, condensed version
- As the scope of the project came more into focus, the shorter version was delayed
- After the publication of DBQM in 2009, work began immediately on v.2, published in 2011
  - v.3 work beginning this year

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DBQM Content

One pagers

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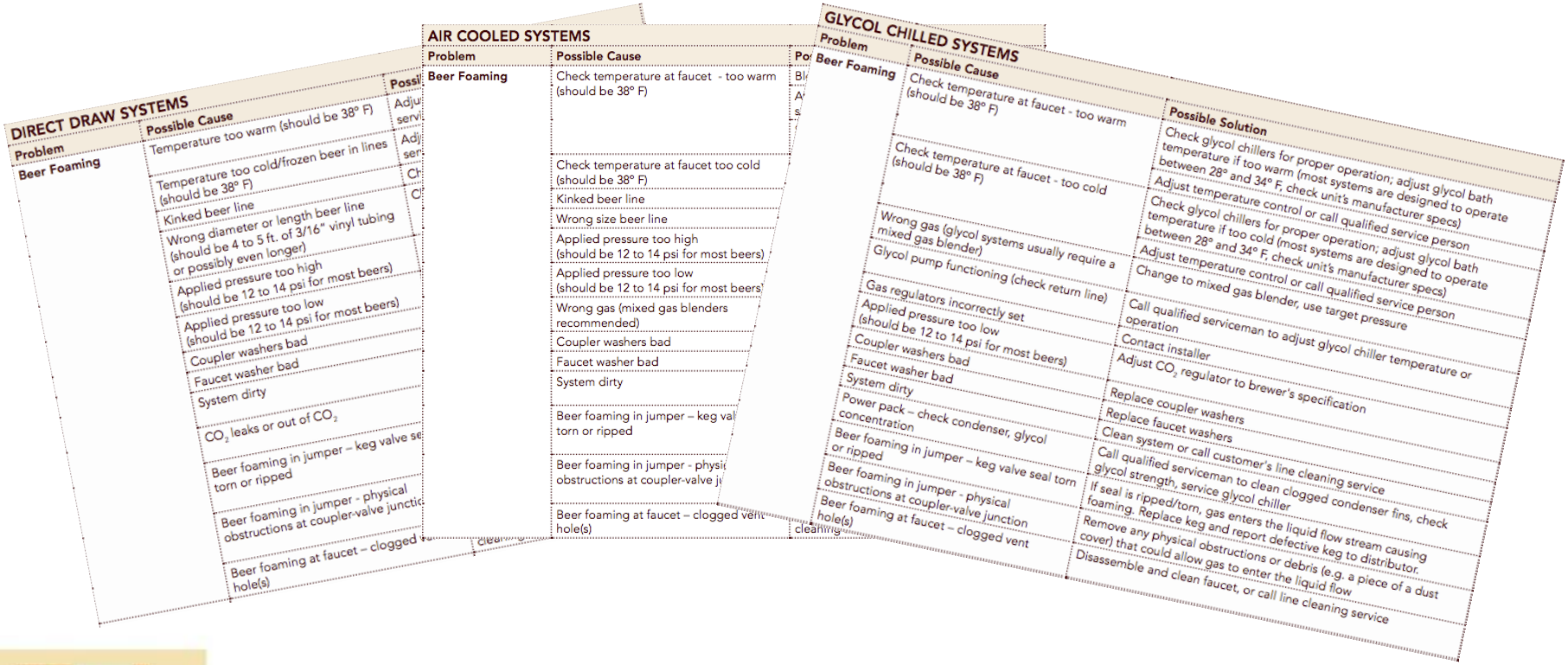
DBQM Content

Troubleshooting Section



DIRECT DRAW SYSTEMS

Problem	Possible Cause
Beer Foaming	Temperature too warm (should be 38° F)
	Temperature too cold/frozen beer in lines (should be 38° F)
	Kinked beer line
	Wrong diameter or length beer line (should be 4 to 5 ft. of 3/16" vinyl tubing or possibly even longer)
	Applied pressure too high (should be 12 to 14 psi for most beers)
	Applied pressure too low (should be 12 to 14 psi for most beers)
	Coupler washers bad
	Faucet washer bad
	System dirty
	CO_2 leaks or out of CO_2
	Beer foaming in jumper – keg valve se… torn or ripped
	Beer foaming in jumper - physical obstructions at coupler-valve junctio…
	Beer foaming at faucet – clogged … hole(s)

AIR COOLED SYSTEMS

Problem	Possible Cause
Beer Foaming	Check temperature at faucet - too warm (should be 38° F)
	Check temperature at faucet too cold (should be 38° F)
	Kinked beer line
	Wrong size beer line
	Applied pressure too high (should be 12 to 14 psi for most beers)
	Applied pressure too low (should be 12 to 14 psi for most beers)
	Wrong gas (mixed gas blenders recommended)
	Coupler washers bad
	Faucet washer bad
	System dirty
	Beer foaming in jumper – keg va… torn or ripped
	Beer foaming in jumper - physi… obstructions at coupler-valve j…
	Beer foaming at faucet – clogged vent hole(s)

GLYCOL CHILLED SYSTEMS

Problem	Possible Cause	Possible Solution
Beer Foaming	Check temperature at faucet - too warm (should be 38° F)	Check glycol chillers for proper operation; adjust glycol bath temperature if too warm (most systems are designed to operate between 28° and 34° F, check unit's manufacturer specs)
	Check temperature at faucet - too cold (should be 38° F)	Adjust temperature control or call qualified service person
	Wrong gas (glycol systems usually require a mixed gas blender)	Check glycol chillers for proper operation; adjust glycol bath temperature if too cold (most systems are designed to operate between 28° and 34° F, check unit's manufacturer specs)
	Glycol pump functioning (check return line)	Adjust temperature control or call qualified service person
	Gas regulators incorrectly set	Change to mixed gas blender, use target pressure
	Applied pressure too low (should be 12 to 14 psi for most beers)	Call qualified serviceman to adjust glycol chiller temperature or operation
	Coupler washers bad	Contact installer
	Faucet washer bad	Adjust CO_2 regulator to brewer's specification
	System dirty	Replace coupler washers
	Power pack – check condenser, glycol concentration	Replace faucet washers
	Beer foaming in jumper – keg valve seal torn or ripped	Clean system or call customer's line cleaning service
	Beer foaming in jumper - physical obstructions at coupler-valve junction	Call qualified serviceman to clean clogged condenser fins, check glycol strength, service glycol chiller
	Beer foaming at faucet – clogged vent hole(s)	If seal is ripped/torn, gas enters the liquid flow stream causing foaming. Replace keg and report defective keg to distributor.
		Remove any physical obstructions or debris (e.g. a piece of a dust cover) that could allow gas to enter the liquid flow
		Disassemble and clean faucet, or call line cleaning service

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DBQM Content

- Workshop Presentations
- Charts/Logs
- Videos/Other Resources

Existing Market Issues

- Line Cleaning
  - Awareness
  - Training
- Dispense Gas
  - 25/75 Gas
  - Air Compressors
- Pouring/Serving Issues
- Draught Equipment
  - Stainless Steel
  - FOBs

Draught Beer Quality for Retailers

- Realization of original plan for second, more condensed version
- Focus is on hot-button market issues
- Shorter, retail-focused content
- Easier to consume for retail owners/managers with limited time

Draught Beer Quality for Retailers

Matt Meadows
Director of Field Quality
New Belgium Brewing Company
Draught Beer Quality Subcommittee Chair
@meadows_nbb

Draught Beer Quality for Retailers

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Draught Beer Quality for Retailers

- A distilled down version of the Draught Beer Quality Manual
- Heavy on pictures, charts, graphs, and bullet points
- Easy to digest
- Easy to reference
- Less technical with more of a focus on great quality beer
- Quickly gets to the bottom-line-facts for decision-makers

Draught Beer Quality for Retailers

TABLE OF CONTENTS

Brewers Association would like to thank the Draught Beer Quality subcommittee for their continuing work for the advancement of draught beer quality: Jeff Bell, Todd Blondis, Peter J. Coors, Rob Garrity, Ken Grossman, Ernie Jimenez, Jaime Jurado, Charles Kyle, David Lujan, John Mallett, Matt Meadows (Chair), John Pinkerton, Kevin Reed, Jeff Schaefer, Ken Smith, Neil Witte.

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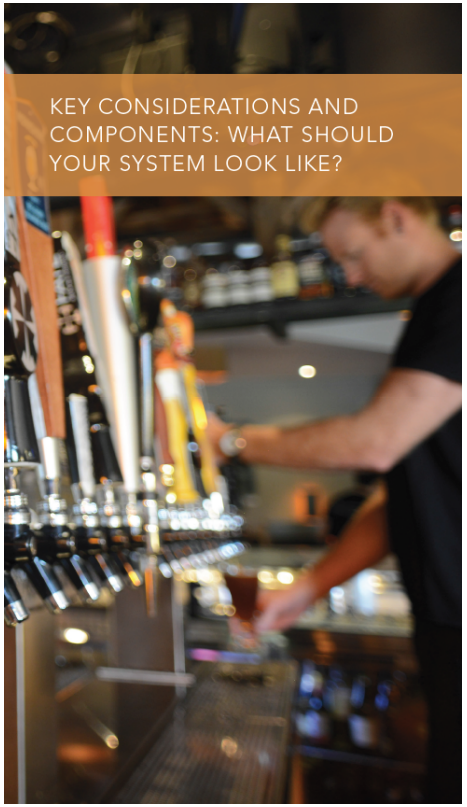
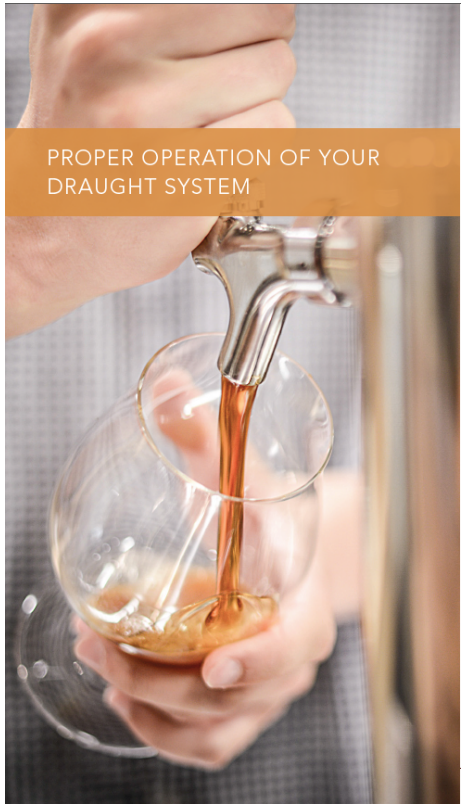
Draught Beer Quality for Retailers





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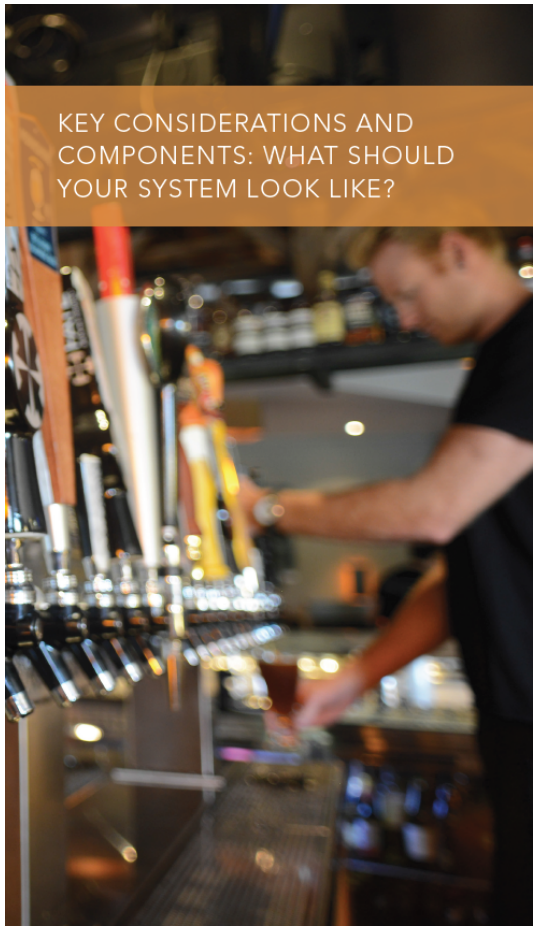
Draught Beer Quality for Retailers

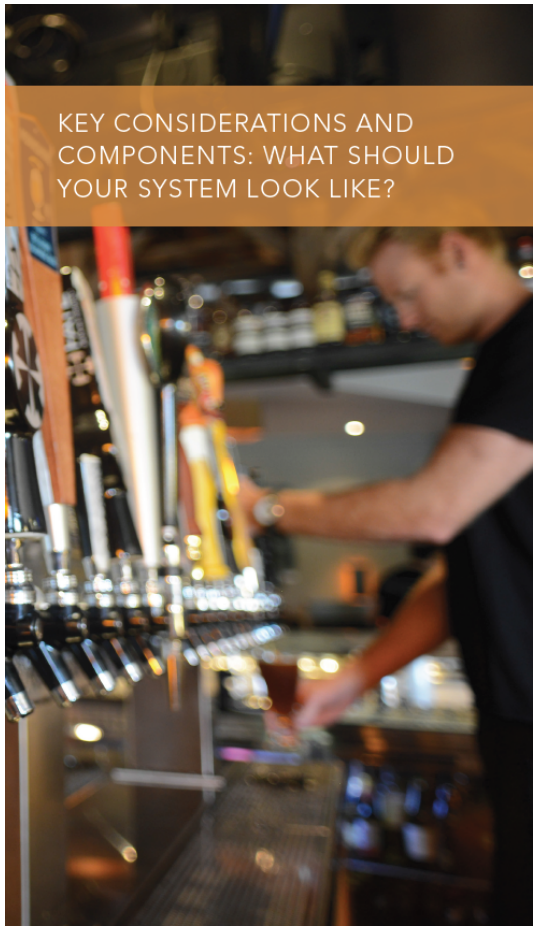
- **Gas**
- **Temperature/Pressure relationship**
- **Components**
- **Hardware**
- **System Types**



Draught Beer Quality for Retailers

Quick and easy reference for every 100% CO_2 system

Vol. CO_2	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1
Temp. °F	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi
33	5.0	6.0	6.9	7.9	8.8	9.8	10.7	11.7	12.6	13.6	14.5
34	5.2	6.2	7.2	8.1	9.1	10.1	11.1	12.0	13.0	14.0	15.0
35	5.6	6.6	7.6	8.6	9.7	10.7	11.7	12.7	13.7	14.8	15.8
36	6.1	7.1	8.2	9.2	10.2	11.3	12.3	13.4	14.4	15.5	16.5
37	6.6	7.6	8.7	9.8	10.8	11.9	12.9	14.0	15.1	16.1	17.2
38	7.0	8.1	9.2	10.3	11.3	12.4	13.5	14.5	15.6	16.7	17.8
39	7.6	8.7	9.8	10.8	11.9	13.0	14.1	15.2	16.3	17.4	18.5
40	8.0	9.1	10.2	11.3	12.4	13.5	14.6	15.7	16.8	17.9	19.0
41	8.3	9.4	10.6	11.7	12.8	13.9	15.1	16.2	17.3	18.4	19.5
42	8.8	9.9	11.0	12.2	13.3	14.4	15.6	16.7	17.8	19.0	20.1



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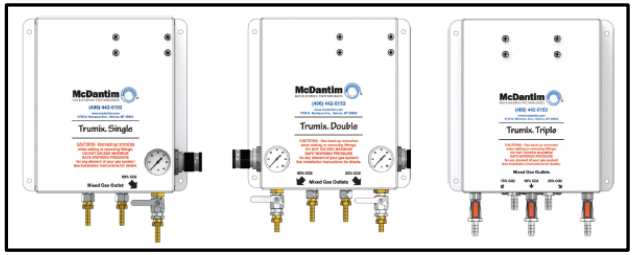
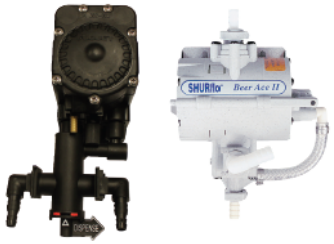
Draught Beer Quality for Retailers

Concise explanation of different gas sources…



BEER PUMPS

Beer pumps are an alternative to using blended gases for system with higher pressure requirements (such as longer runs or rises from cooler to tap)



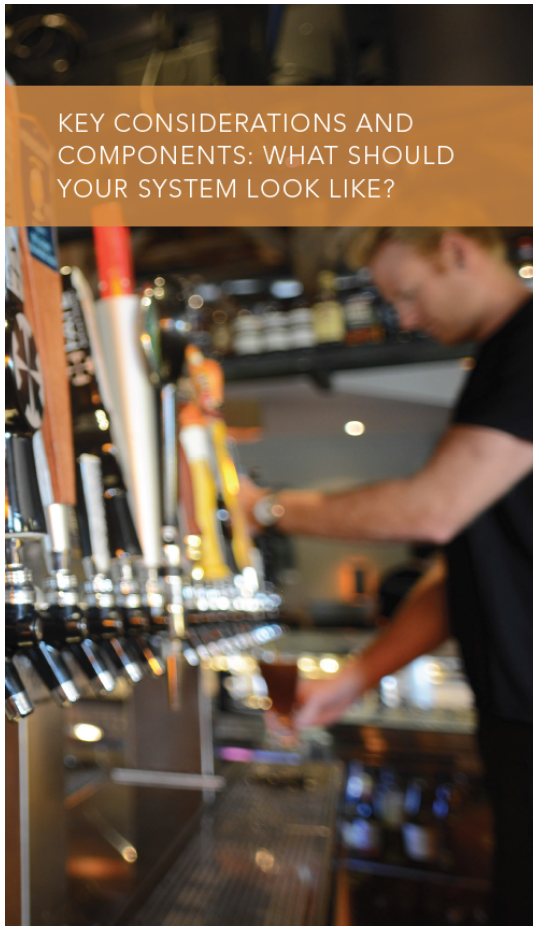
Beer Pumps

Pure CO_2 is applied to the keg at ideal pressures. This pressure pushes the beer to the pump, which is mounted on the cooler wall above the keg.

A higher gas pressure is applied to the pump, which in turn applies a direct pressure to the beer, pushing it the longer distance to the faucet. The gas drives the pump and does not come in direct contact with the beer, eliminating the risk of over-carbonation.

Beer pumps are ideal for very long draught systems (200 feet or more).

Including beer pumps distilled down to two paragraphs



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Draught Beer Quality for Retailers

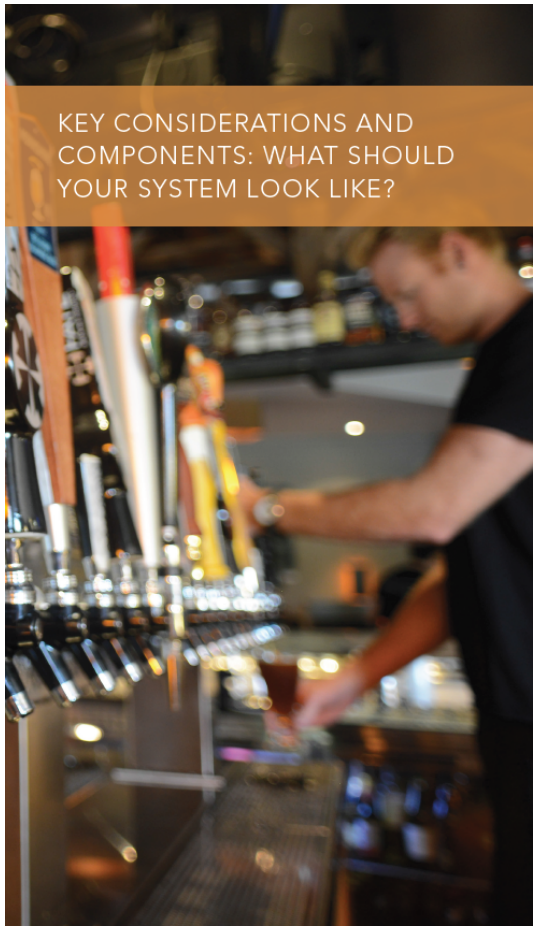
Cost Analysis of using Guinness Gas

Here is a comparison of using 25%/75% on your fully carbonated beers v. blending onsite with a more appropriate blend:

GAS COST ANALYSIS FOR BEER DISPENSED AT 25 PSI				
Gas Type	Price	Cu. Ft	Kegs Dispensed*	Gas cost per keg
Pre-Mix(25%/75%)	$33.00	244	45.2	$0.73
CO_2(50lb.)	$16.00	405	75.0	$0.21
N2	$25.00	244	45.2	$0.55
Self Mix (70% CO_2-30%N2)				$0.32

*A keg dispensed at 25 PSIG uses 5.4 Cu. Ft. of Gas – Calculations assume no waste

Pre-Mix is *more than twice as expensive* as blending onsite. Dispensing carbonated beers with Pre-Mix wastes money and makes beer go flat.

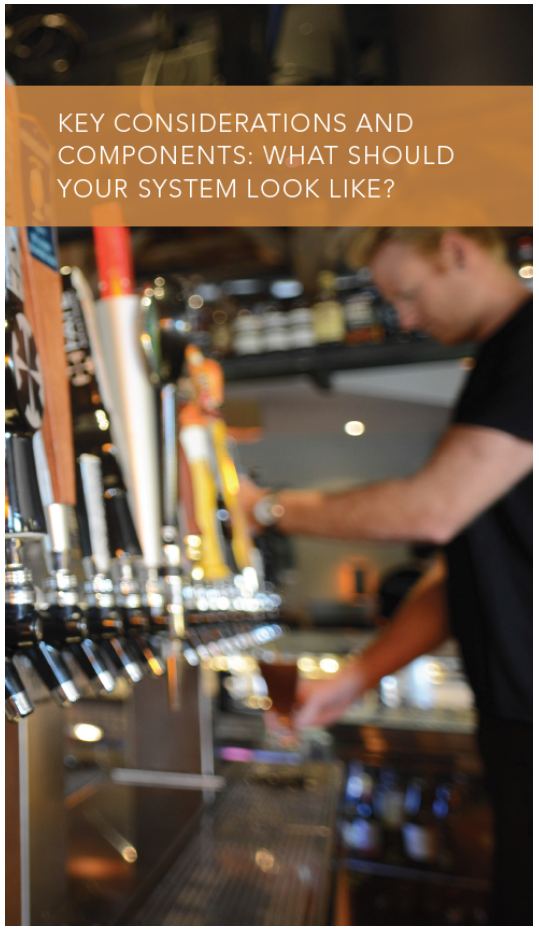


Draught Beer Quality for Retailers

Air Compressors Warning

AIR COMPRESSORS

Some systems employ compressed air instead of N_2 for blending with CO_2. While this declining practice allows higher pressures to be applied without risk of over-carbonation, oxygen ruins the flavor of the beer in less than a day, resulting in declining beer sales. **Compressed air should never be used to dispense draught beer.**



Draught Beer Quality for Retailers

Brief Discussion of System Types

DIRECT DRAW

In direct draw systems, the draught lines are fully contained in the keg cooler. The most common examples are keg boxes with the tower mounted on top or walk-in coolers with the shank and faucet assemblies running through the wall.

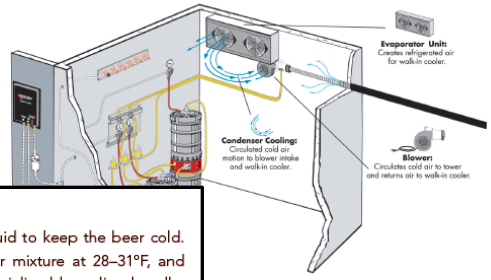
Direct Draw Kegerator

FORCED AIR/BLOWER SYSTEM

Forced air blower systems are for lines which exit the cooler and are not longer than a distance of 25 feet.

Beer lines run to the tower through an insulated duct system. A blower is mounted in the keg cooler and blows cold air from the cooler through the ductwork to the tower. Another duct is set up to provide a return for the airflow.

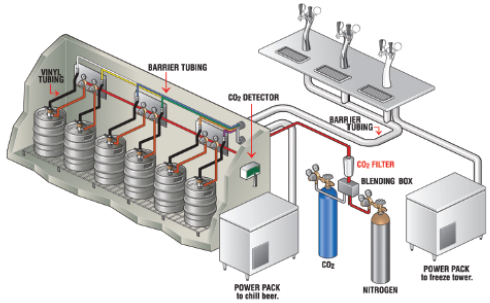
These systems are vulnerable to temperature pickup from factors like high traffic flow in the cooler and high temperatures in the environment surrounding the duct.



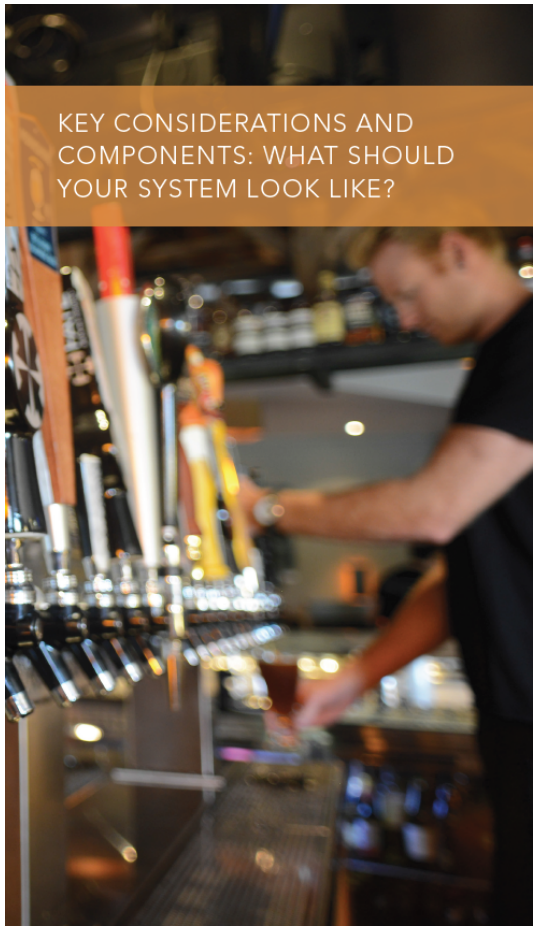
Walk-in Cooler

GLYCOL SYSTEM

Longer draught beer systems typically use chilled liquid to keep the beer cold. A chiller maintains the temperature of a glycol/water mixture at 28–31°F, and continuously pumps the cold solution through a specialized beer line bundle. Inside this tightly insulated housing, beer lines are bundled around the glycol supply and return lines, keeping the beer cold and the CO_2 in solution. Glycol systems are very efficient and can be used for runs of any length.



Long-Draw System



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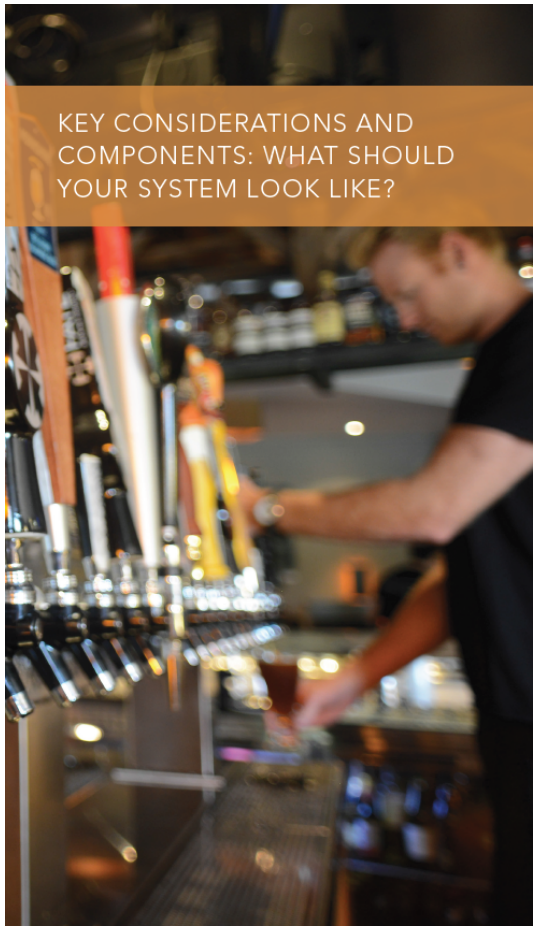
Draught Beer Quality for Retailers

Recommendations for short systems

SYSTEM DISTANCE

When it comes to draught system length, shorter is usually better. Benefits of shorter draught systems include:

- Less overall draught line surface means less overall buildup in the lines, making cleaning easier and less expensive.
- Overall cost of equipment and installation is usually less expensive with shorter systems.
- Line replacement costs are less with shorter systems, especially systems short enough to utilize direct draw or forced air cooling systems.
- Less beer is contained in the lines due to shorter length and the ability to utilize smaller diameter tubing. This means less beer is lost during line cleaning, lowering the associated costs of system maintenance.
- Shorter systems won't require beer pumps or FOBs, both of which can introduce quality-related issues.



Draught Beer Quality for Retailers

Explanation of the pitfalls of using brass components

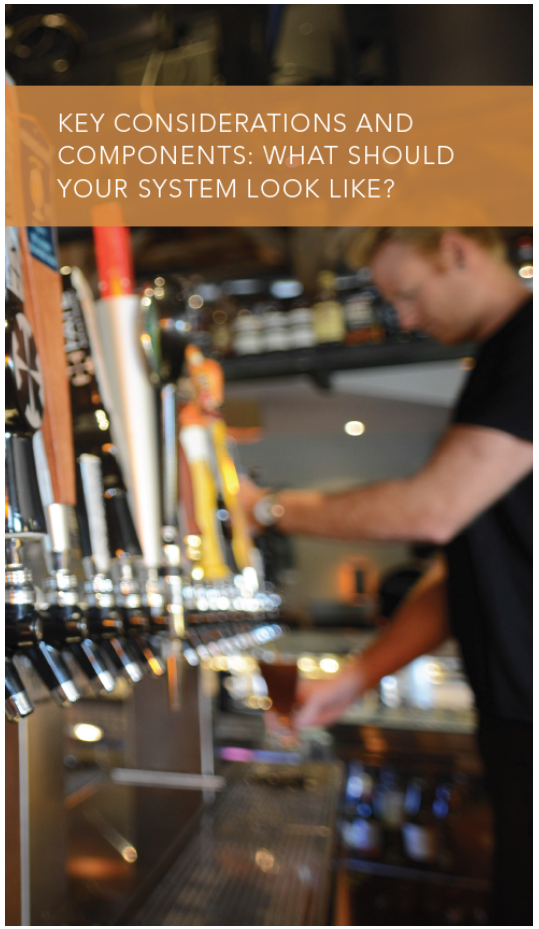
EQUIPMENT

Many draught system fittings and equipment are made of chrome plated brass. Despite their functionality, they should be avoided if possible, as the plating can wear off, exposing the brass, which can impart a metallic off-flavor in the beer.

Stainless Steel Faucets

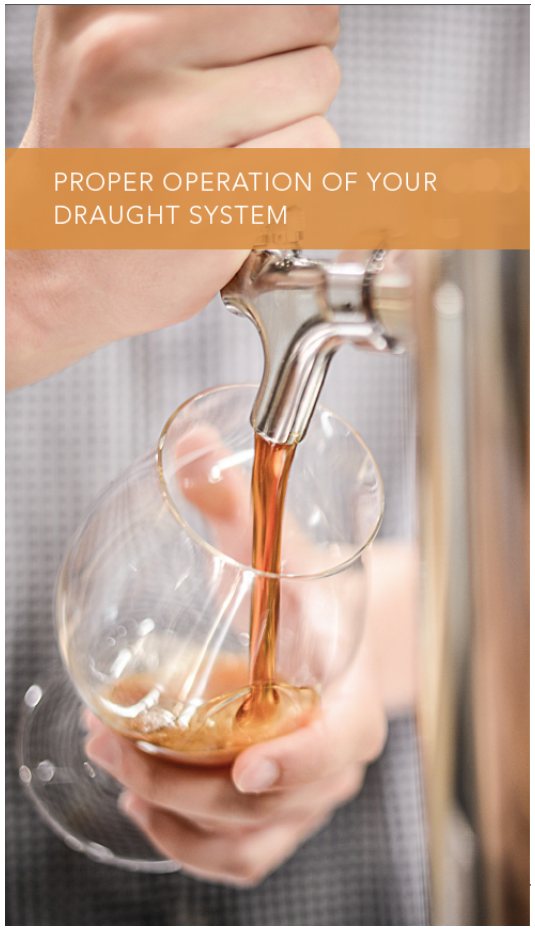
In addition, brass parts are more susceptible to bacterial growth.

Wherever possible, stainless steel parts should be used. This use of stainless steel includes faucets, splicers, T's, etc. You will notice a huge flavor advantage and so will your customer.



Draught Beer Quality for Retailers

- **Freshness**
- **Storage Temperatures**
- **Glassware Styles**
- **Glassware Cleanliness**
- **Pouring Technique**
- **Growlers**



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Draught Beer Quality for Retailers

Understanding the importance of freshness dating

FRESHNESS

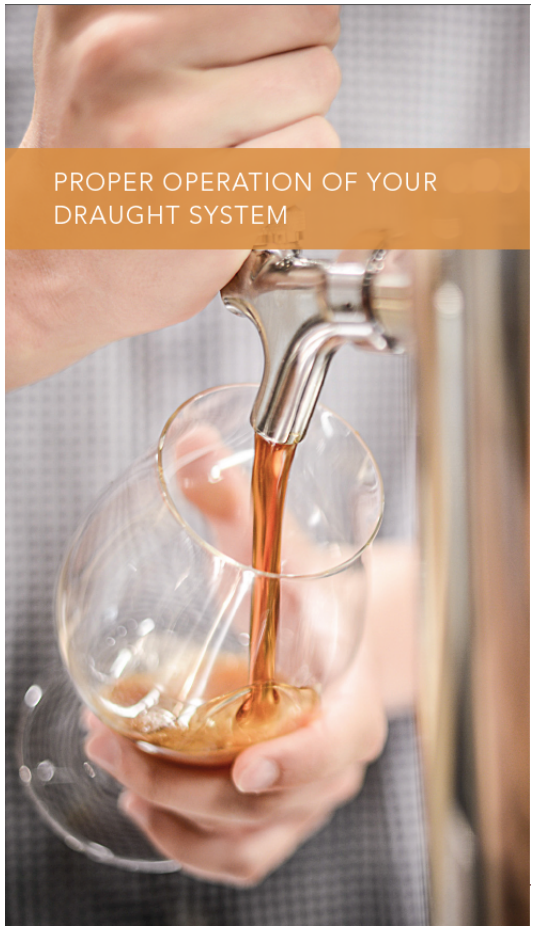
Beer is like liquid bread – the fresher the better. Focusing on freshness is key to serving great draught beer. Retailers represent the last line of defense in dispensing fresh beer by keeping their inventory sized appropriately, rotating their stock, and buying brewery fresh beer from their wholesaler partners.

Time and temperature are the two major enemies of beer flavor. Oxidation begins the day the beer is packaged, so flavor suffers as time marches on. And higher temperatures rapidly accelerate oxidation, damaging beer flavor faster still.

TIME

All beer brands have a recommended freshness window, past which the brewery has determined the beer no longer represents the intended flavors. When a beer is older than the freshness window, oxidation significantly alters the flavor, aroma and appearance of the beer. Every beer brand is different, so the freshness window might vary by weeks or months.

Breweries communicate freshness information in many ways. Most beer brands are marked with a "packaged-on" date, a "best before" or "pull" date, or another coding system. Manage your inventory to finish your draught beer well within the freshness window. If needed, contact your beer suppliers to determine the shelf life of each beer brand you carry.



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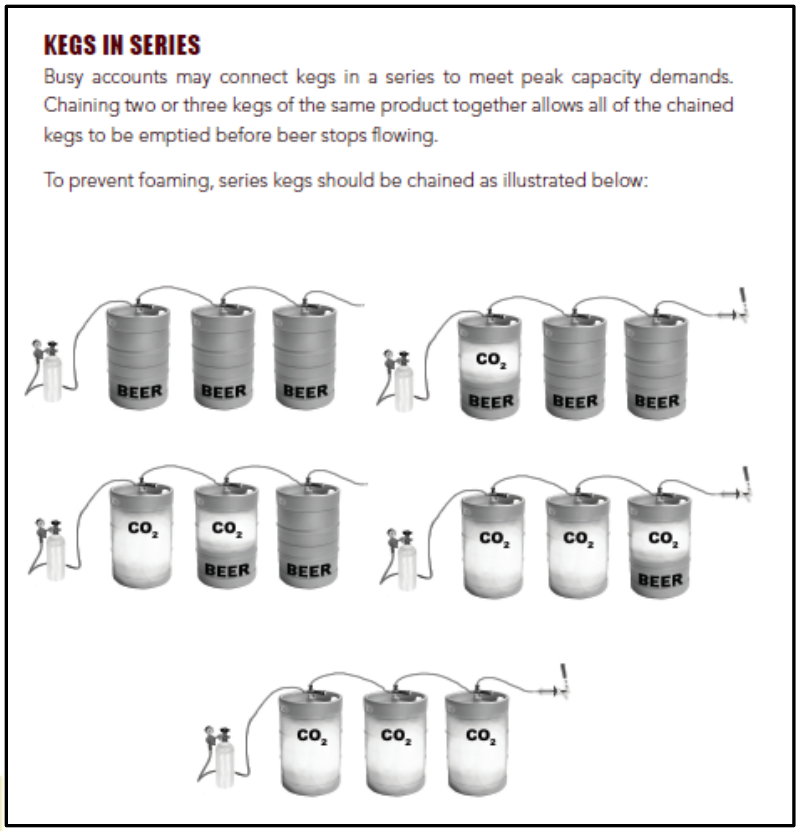
Draught Beer Quality for Retailers

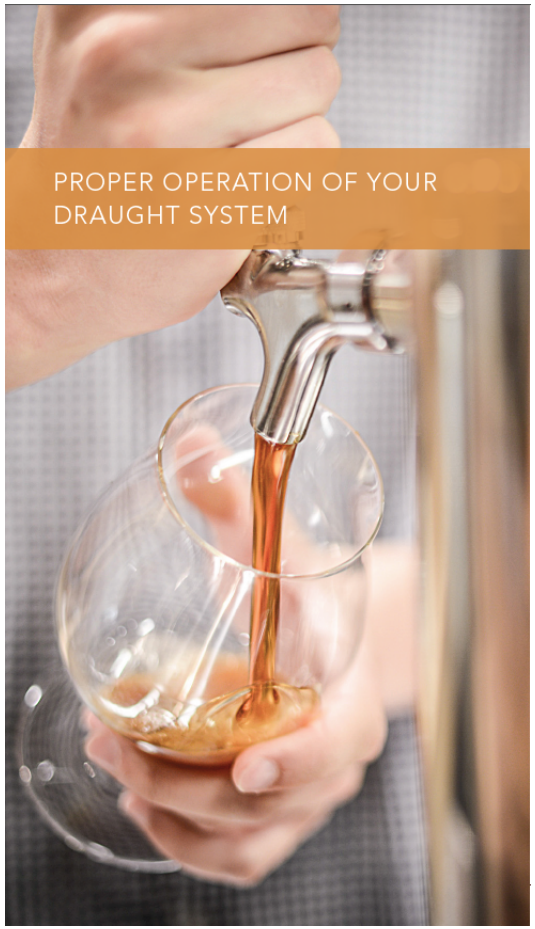
Looking at kegs-in-series from a quality perspective



KEGS IN SERIES

Busy accounts may connect kegs in a series to meet peak capacity demands. Chaining two or three kegs of the same product together allows all of the chained kegs to be emptied before beer stops flowing.

To prevent foaming, series kegs should be chained as illustrated below:



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Draught Beer Quality for Retailers

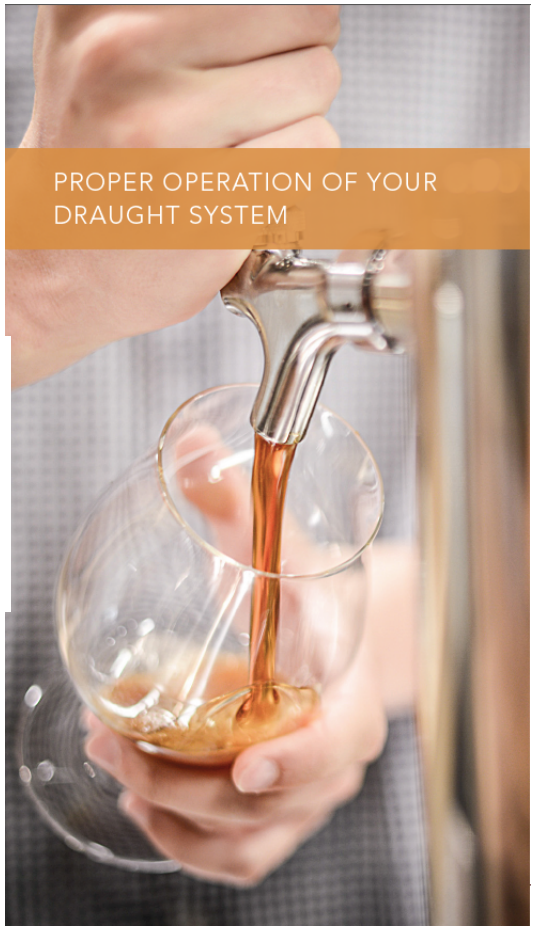
The addition of glassware styles

GLASSWARE

Glassware is an important and often overlooked component of the draught beer ritual. Clean, cool (but never frozen) glassware will increase the presentation value of the beer you serve and enhance consumer enjoyment of their favorite beer brand.

STYLES

Glassware is available in myriad shapes and serving sizes. Each brand of beer will taste different in different styles of glassware. For this reason breweries will often suggest certain glassware style that enhance the flavor and aromas of their beer brands.



These glasses all contain features designed for specific beer styles, exhibiting functionality, tradition or both. Choosing the proper glassware style will enhance a consumer's experience and lead to repeat sales.

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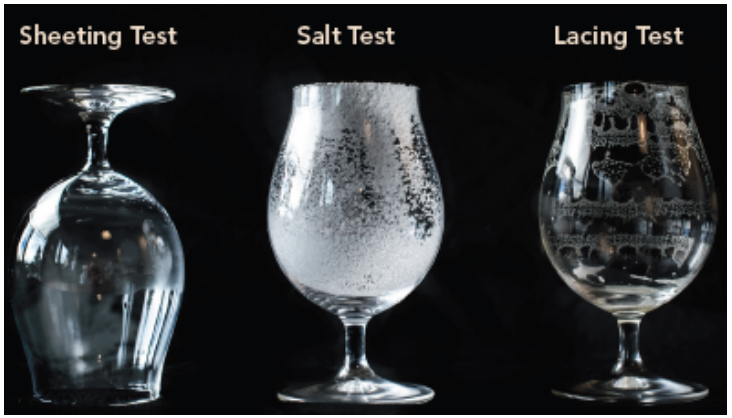
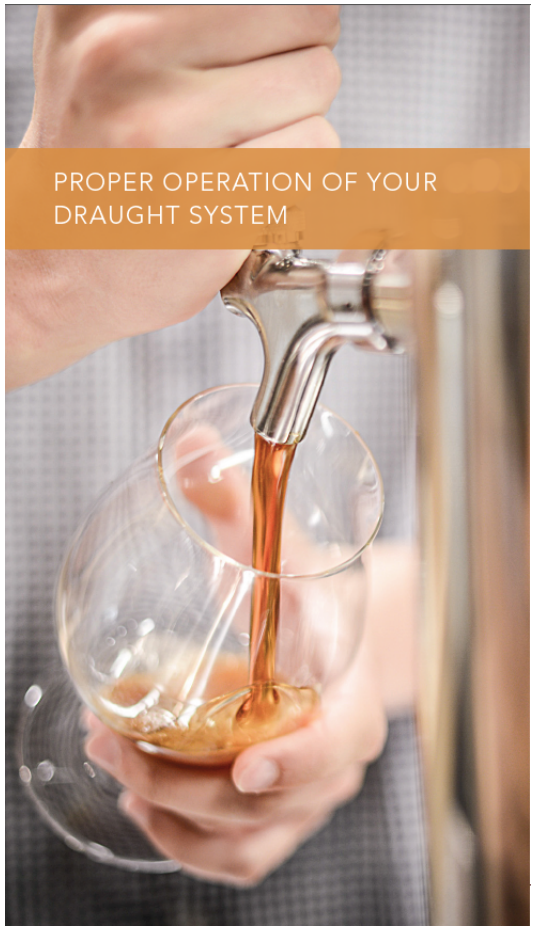
Cleaning, storing, and testing for
“beer clean” glassware





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Draught Beer Quality for Retailers

Proper pouring technique

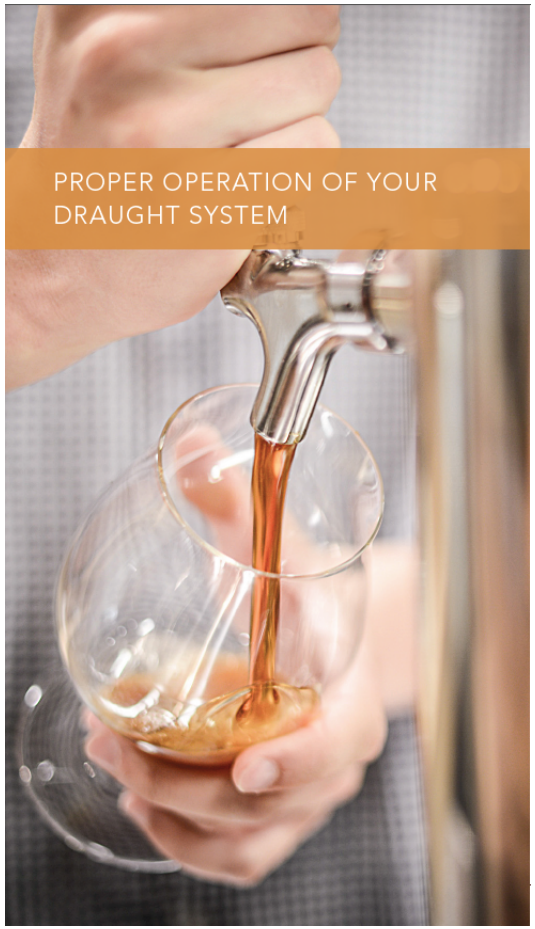
POURING DRAUGHT BEER:

Proper serving of draught beer creates a "controlled" release of carbonation that develops a better tasting beer and a complete sensory experience. The evolution of CO_2 gas during pouring builds the head and releases desirable flavors and aromas.

TECHNIQUE

Hold the glass at a 45-degree angle about two inches below the spout so that beer will initially flow down the side of the glass [NOTE: To prevent transfer of bacteria, in no instance should a faucet nozzle touch the inside of the glass.]

1. Grip tap handle at its base, open the faucet quickly and completely so beer flows freely.
2. As the glass fills, gradually tilt it upright so that you finish pouring straight down the middle of the glass to build a one inch collar of foam.
3. Close faucet quickly to avoid wasteful overflow.



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Draught Beer Quality for Retailers

Growler quality and *safety*

ABOUT GROWLERS

Growlers are reusable sustainable packages used to take draught beer home from breweries, taverns, super markets and even gas stations and convenience stores. The galvanized pail of the early 1900's has evolved into the 32 – to 64 – ounce pressure rated, sealed container made of glass, ceramic, stainless steel or other material. Recent changes in some state statutes now allow retailers to fill and sell growlers.

Growlers are filled in many ways, most commonly by attaching a tube to a draught beer faucet. The tube is then inserted to the bottom of the growler, and the faucet is opened completely, filling the growler from the bottom up. When the beer reaches the proper fill height the faucet is turned off and the growler is disengaged from the tube. The growler should be capped immediately, then sealed and labelled according to state law. Typically, consumption is recommended within 72 hours of filling.

Growlers are increasingly popular, *but the decision to sell them introduces significant safety and hygiene issues*. Tips for managing these issues include:

- *Fill and sell only pressure rated growler containers*. Ask your growler supplier to confirm the growlers are suitable for storing carbonated beer.
- Rinse growlers with cool water immediately prior to filling.
- Never overfill a growler, leaving 5% headspace or filling to the manufacturer's recommended level.
- Never etch or scratch glass growlers, as this weakens them.
- Keep filled growlers cold at all times and remind customers to do the same. *The pressure in a warming growler can increase enough to cause the vessel to explode.*
- Clean growler immediately after emptying, and allow to drip dry upside down and uncapped.

Brewers Association Facts About Growlers

Growler use by consumers and retailers is becoming an increasingly popular way to bring the retail draught beer experience home or to transport rare or small production beers. The important decision to fill and use growlers must be made with an eye towards safety, delivering quality draught beer and compliance with all state and local regulations. The following best practices will help brewers, wholesalers, retailers, and consumers avoid many potential pitfalls and ensure the highest quality growler experience possible.

Growler Containers

Growlers have evolved from simple galvanized pails with lids of yore to today's many container options including glass, stainless steel, ceramic, and a variety of plastics. Dark brown glass or opaque materials such as stainless steel or ceramic will protect beer best from "skunking" caused by light; clear glass will not protect beer from light. No matter what kind of container is used, consumers and filling establishments must be aware that all filled growlers are pressurized containers. The growler container used must be able to withstand the pressures exerted by carbonated beer as well as the growler filling method.

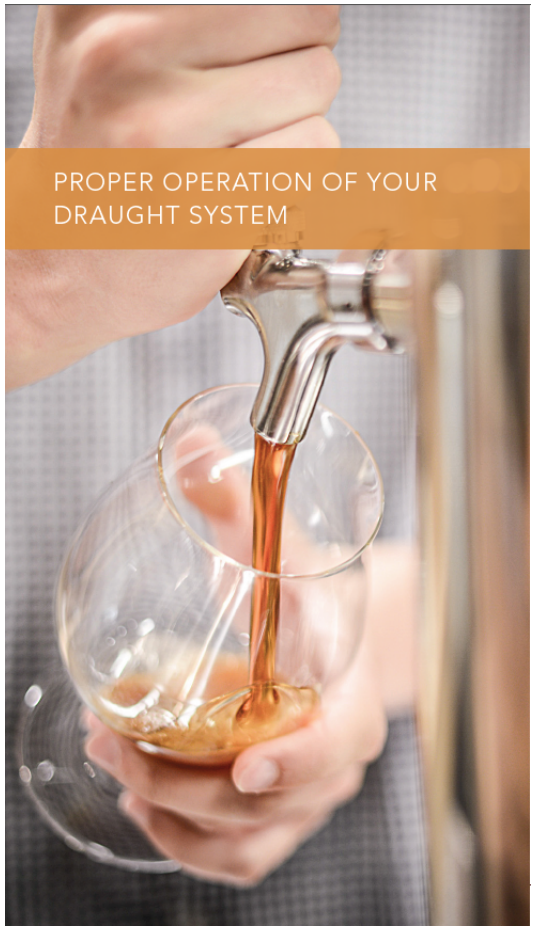
Growler Container Cleanliness

- Retailers are ultimately responsible for ensuring a sanitary "beer clean" container is filled. Consumers also have a responsibility to maintain and care for growlers they own. Growler cleaning concepts mirror those outlined in the glassware cleaning section of the Brewers Association Draught Beer Quality Manual.
- Detergents should not be fat- or oil-based.
- Proper detergent ratios should be used to ensure thorough cleaning as well as to avoid residual chemical aromas.
- The use of a large carboy-type brush can be used to assist in cleaning; however brushes with exposed metal on any brush part should not be used to clean ceramic or glass growlers.

Safety Notes For Retailers & Consumers

Filled growlers can shatter or explode if allowed to warm or freeze, especially if they are overfilled. The internal pressure of a filled growler warmed to room temperature (68F) or in a hot car (90F) may be as high as 2.0 atm (29 psi) or 3.7 atm (52 psig) respectively. (Example assumes a growler filled to 99% of capacity with beer at 38F containing 2.5 volumes CO_2, and then sealed). Brewers Association recommends:

- only use growler containers specifically designed for packaged carbonated beer, and ask the container supplier to verify that the pressure rating is equal to or greater than the pressure from carbonation in the beer being filled. Many containers currently in use are not designed for carbonated beverages.
- if filling by counter-pressure, know the pressure rating of the system used and ensure the system includes shielding between the growler being filled and people nearby in case of failure.
- do not overfill a growler. Always leave 5% headspace or fill to the manufacturers recommended fill line if one is shown.
- for growlers with threaded screw-on closures, consider using plastic rather than metal closures; plastic closures may vent more readily if over pressurization occurs; if using metal closures you may wish to discuss this issue with your supplier.
- keep filled growlers cold and dark, and never allow a filled growler to warm or to freeze, due to potentially hazardous shattering.
- visually inspect every growler before filling. Do not fill glass or ceramic growlers with cracks or chips, those which have been engraved, or older growlers with pitted or unsmooth glass surfaces, as the pressure strength of these growlers will be significantly reduced.



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DraughtQuality.org

Draught Beer Quality for Retailers

Draught System Check List

DRAUGHT BEER SYSTEM CHECK LIST

TEMPERATURE

- Air Temperature in keg cooler: between 36°F – 38°F
- Beer Temperature in keg cooler and at point of dispense: between 36°F – 38°F

DRAUGHT LINE AGE

- Vinyl tubing: less than 2 years old
- Barrier tubing: less than 10 years old

DRAUGHT LINE VISUAL

- Free of sediment
- Should not be translucent or discolored (when filled with clear water)

DRAUGHT LINE CLEANING LOG

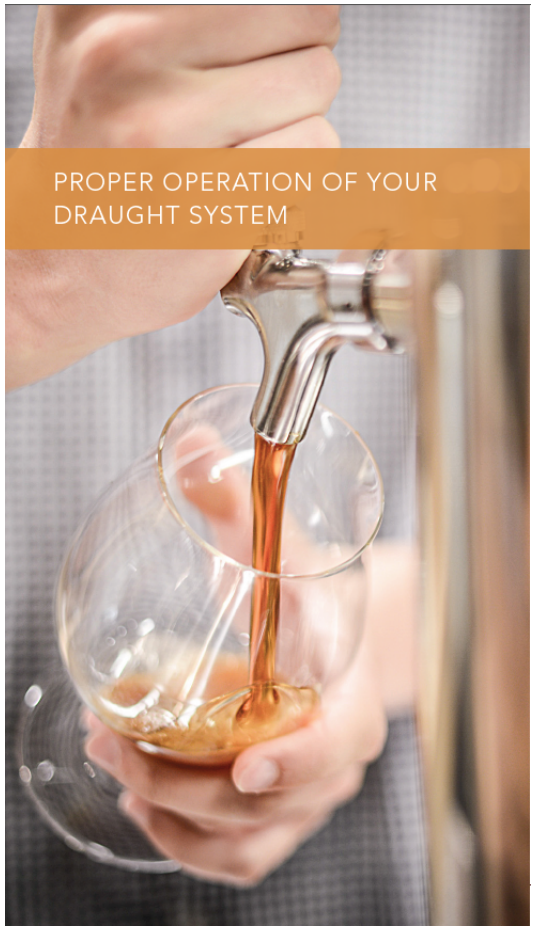
- Between 7 – and 14 – day cleaning cycle (see local ordinances concerning frequency)
- Gaps in service of more than 21 days require special attention
- Seasonal accounts require special attention to protect beer lines during off season

GAS SOURCE

- Straight CO_2 for Ales and Lagers, 12 – 15 PSI (direct draw systems)
- Blended CO_2 - Rich blend (60 – 80% CO_2) for Ales and Lagers, 22 – 28 PSI (long draw systems)
- Pre-Mix 25% CO_2 / 75% N_2 for Nitrogenized beers ONLY
- Compressed air should never be used to dispense draught beer

FAUCETS AND DRIP TRAY

- Rinsed free of beer
- No Physical buildup of beer soils or mold present



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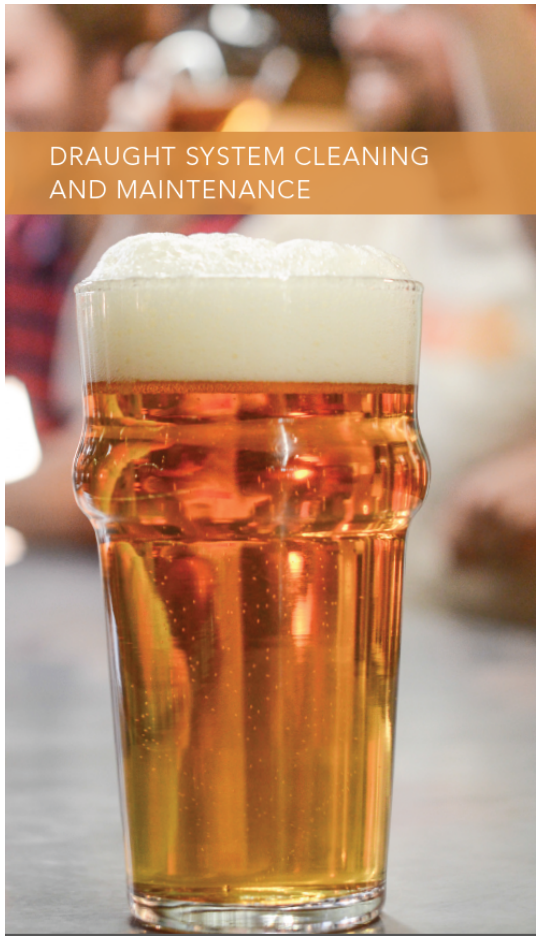
Draught Beer Quality for Retailers

- **Cleaning Frequencies**
- **Chemical Concentrations**
- **Hardware Cleaning**
- **Line Replacement**
- **Recirculation Pump Usage**

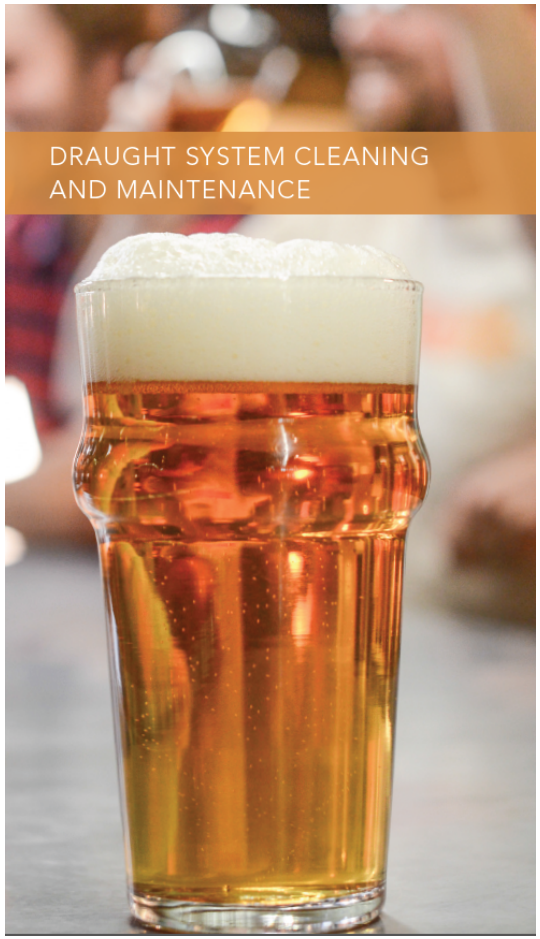


Draught Beer Quality for Retailers

Cleaning Frequencies and Procedures

DRAUGHT SYSTEMS CLEANED AND SERVICED - AT A MINIMUM EVERY TWO WEEKS (14 DAYS) - AS FOLLOWS:

- Clearly posted documentation of line cleaning and servicing records is recommended in all keg coolers (visit http://www.draughtquality.org/wp-content/uploads/2012/01/CleaningLog.pdf for a printable line cleaning log).
- Turn off your glycol system if possible and push beer from lines with cold water.
- Clean lines with caustic solution at 2% or greater concentration for routine cleaning of well-maintained lines, or at 3% for older or more problematic lines. Contact your chemical manufacturer to determine how much chemical is needed to achieve these recommended concentrations. If you use non-caustic-based cleaners, such as acid-based or silicate-based cleaners, be sure to use the cleaning concentrations recommended by the manufacturer. For best results, maintain a solution temperature of 80 to 110 °F during the cleaning process.
- Using an electric pump, circulate caustic solution through the lines at a minimum of 15 minutes at a flow rate of up to 2 gallons per minute. If a static or pressure pot is used (though not recommended) the solution needs to be left standing in the lines for no less than 20 minutes before purging with clean water.
- Disassemble, service and hand clean faucets; hand clean couplers.
- After cleaning, **completely rinse lines with cold water** until pH matches that of tap water **to ensure all cleaning chemicals have been removed**, and no visible debris is being carried from the lines.
- Repack beer lines with beer **only after rinsing lines with water**.



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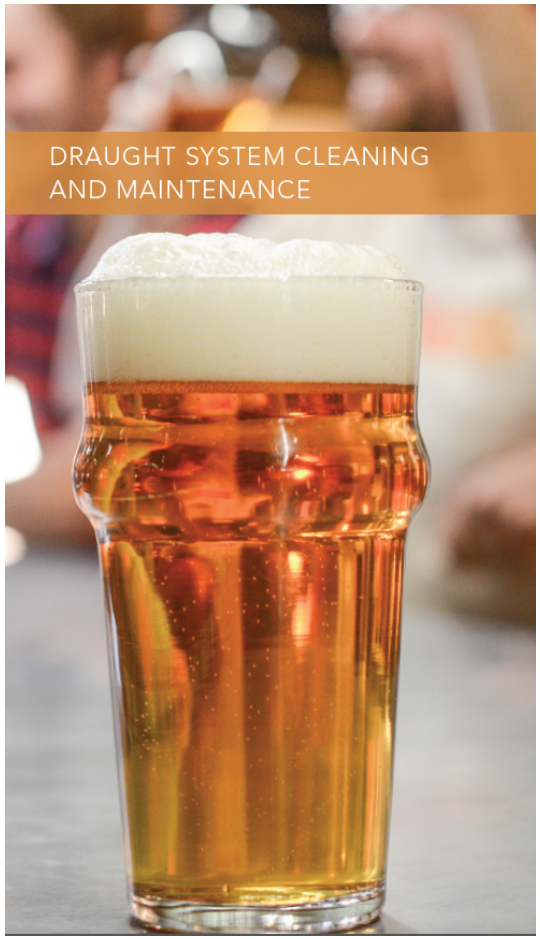
Draught Beer Quality for Retailers

Recirculation Pump Usage

ELECTRIC PUMP CLEANING:
THE RECOMMENDED CLEANING PROCEDURE

The industry currently uses two primary beer line cleaning procedures: re-circulation by electric pump and static or pressure pot cleaning. Electric re-circulating pump cleaning is recommended as the approach for nearly all systems. Re-circulation pump cleaning uses the combination of chemical cleaning and mechanical action, to effectively clean a draught system, by increasing the normal flow rate through the beer lines during the cleaning process.

While static or pressure pot cleaning is an alternative, it is a less effective and is not a recommended method for cleaning. This procedure requires additional time to ensure that the cleaning solutions have the right contact time in line, to make up for the lack of mechanical force. For more detailed descriptions and complete step-by-step procedures visit Chapter 8 of the Draught Beer Quality Manual at www.draughtquality.org



BA BREWERS ASSOCIATION

Profitability, Case Studies, & Economics of Line Cleaning

Rob Gerrity
Trade Quality Manager
Sierra Nevada Brewing Company

BA BREWERS ASSOCIATION

Economics of Draught Line Cleaning

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Draught Beer Quality for Retailers

System cleaning recommendations

DRAUGHT SYSTEMS CLEANED AND SERVICED - AT A MINIMUM EVERY TWO WEEKS (14 DAYS) - AS FOLLOWS:

- Clearly posted documentation of line cleaning and servicing records is recommended in all keg coolers (visit http://www.draughtquality.org/wp-content/uploads/2012/01/CleaningLog.pdf for a printable line cleaning log).
- Turn off your glycol system if possible and push beer from lines with cold water.
- Clean lines with caustic solution at 2% or greater concentration for routine cleaning of well-maintained lines, or at 3% for older or more problematic lines. Contact your chemical manufacturer to determine how much chemical is needed to achieve these recommended concentrations. If you use non-caustic-based cleaners, such as acid-based or silicate-based cleaners, be sure to use the cleaning concentrations recommended by the manufacturer. For best results, maintain a solution temperature of 80 to 110 degrees F during the cleaning process.
- Using an electric pump, circulate caustic solution through the lines at a minimum of 15 minutes at a flow rate of up to 2 gallons per minute. If a static or pressure pot is used (though not recommended) the solution needs to be left standing in the lines for no less than 20 minutes before purging with clean water.
- Disassemble, service and hand clean faucets; hand clean couplers.
- After cleaning, **completely rinse lines with cold water** until pH matches that of tap water **to ensure all cleaning chemicals have been removed**, and no visible debris is being carried from the lines.
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Draught Beer Quality for Retailers

CASE STUDY I: TOTAL PROFIT IN A 1/2 BARREL OF BEER RETAILED AT $4.00/ GLASS.
Cost of 1/2 bbl of beer = $100.00
Refundable Deposit = $50.00
Number of 16 oz. glass Servings with 3/4" of foam and 15 oz. of beer = 132
Retail Price = $4.00
Total Gross profit = $528.00 minus keg cost = $428.00 net profit.
Return on each $1.00 invested = $4.28

The formula for profit margin is net profit divided by gross profit. In the case (above) of a single keg, that is $428/$528 or 81%. $0.81 per $1.00 in sales is profit. The remainder is the serving cost. In this example the serving cost would be $0.19 per $1.00 in sales or 19% serving cost.

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Draught Beer Quality for Retailers

CASE STUDY II: COST TO MAINTAIN A 10 FAUCET DRAUGHT SYSTEM.
10 Draught Lines x $10.00 per draught line cleaning and maintenance investment = $100.00
Servings Per Week from example above = 1,320 x 2 weeks = 2,640 servings in 14 days
Let's take the $100.00 investment in cleaning and maintenance and divide by the 2,640 servings. You will see each serving of draught beer will require $0.04 to protect the flavor and integrity of the beer on draught.

Draught Beer Quality for Retailers

CASE STUDY III: YEARLY PROFIT FROM DRAUGHT BEER AT A RETAIL ACCOUNT WITH 10 DRAUGHT BEER LINES.

Here is what a case study looks like when you dig a little deeper into the draft beer numbers.

Number of Draught Lines = 10
Number of 1/2 barrels sold each week = 10
Weekly Net Profit in this 10 draught line system at 10 kegs per week = $4,280.00
52 weeks per year x $4,280.00 = $222,560.00 total profits from draught beer.

In this example the cost of cleaning for 10 dispense lines, cleaned once every two weeks, is $100/system clean x 26 cleans/year...or $2600 annually. Proper cleaning as recommended by the Brewers Association consumes only 1.2 % of net profits... this is the cost of draught quality.

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Draught Beer Quality for Retailers

CASE STUDY IV: *How much beer is in each line of this 10 line system.**
3/8" Vinyl or "jumper line" = ¾ oz. per foot. 6' of line contains 4.5 ounces of beer
Assume 50 foot run from cooler to taps
5/16" barrier tubing = ½ oz. per foot. 50' of line contains 25 ounces of beer
¼" stainless = 1/6 oz. per foot. 3' contains 0.5 ounces of beer
Total beer per draught line = 30 ounces
10 draught lines = 300 ounces
$100.00 keg cost divided by 1984 ounces = $0.05 per ounce beer cost.
ounces of beer cost = $15.00 cost of beer in the entire draught system.

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Draught Beer Quality for Retailers

Work your numbers here…

NUMBER OF DRAUGHT LINES	
AMOUNT OF BEER IN LINES - OUNCES *Use example above*	
COST PER OUNCE OF BEER *Keg cost/ounces in keg*	
COST OF BEER IN LINES *Number of draught lines x cost of beer x cost per ounce of beer*	
LINE CLEANING COST *This will vary depending on your line length and design of your system*	
TOTAL COST OF LINE CLEANING *Cost of beer in lines plus line cleaning cost*	
YEARLY CLEANING INVESTMENT *Total cost of line cleaning x 26*	
YEARLY PROFITS FROM DRAUGHT BEER SALES	
LINE CLEANING COST AS A % OF PROFITS *Line cleaning cost/yearly profits*	

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Draught Beer Quality for Retailers

CASE STUDY V: INFREQUENT DRAUGHT LINE CLEANING IMPACT ON REVENUE
15 ½ bbl kegs sold per week = 780 ½ bbl kegs per year sold
7% decline in sales = 55 less ½ bbl kegs per year
Profit from a $100 ½ bbl keg sold at $4.00 per pint = $428.00
55 ½ bbl kegs x $428.00 = $23,540.00 in lost revenue by going to a 5 to 8 week cleaning frequency.

Brewers from the U.S. report similar experiences with various retail accounts. Draught beer can and will deliver sales and profits, but only when equipment is properly maintained. The upward trend in U.S. draught beer sales is due to many factors. Brewer, wholesaler and retailer investment in education is paying off. Sales and service from draught professionals are generating profits that will sustain a rise in U.S. draught beer sales for years to come.

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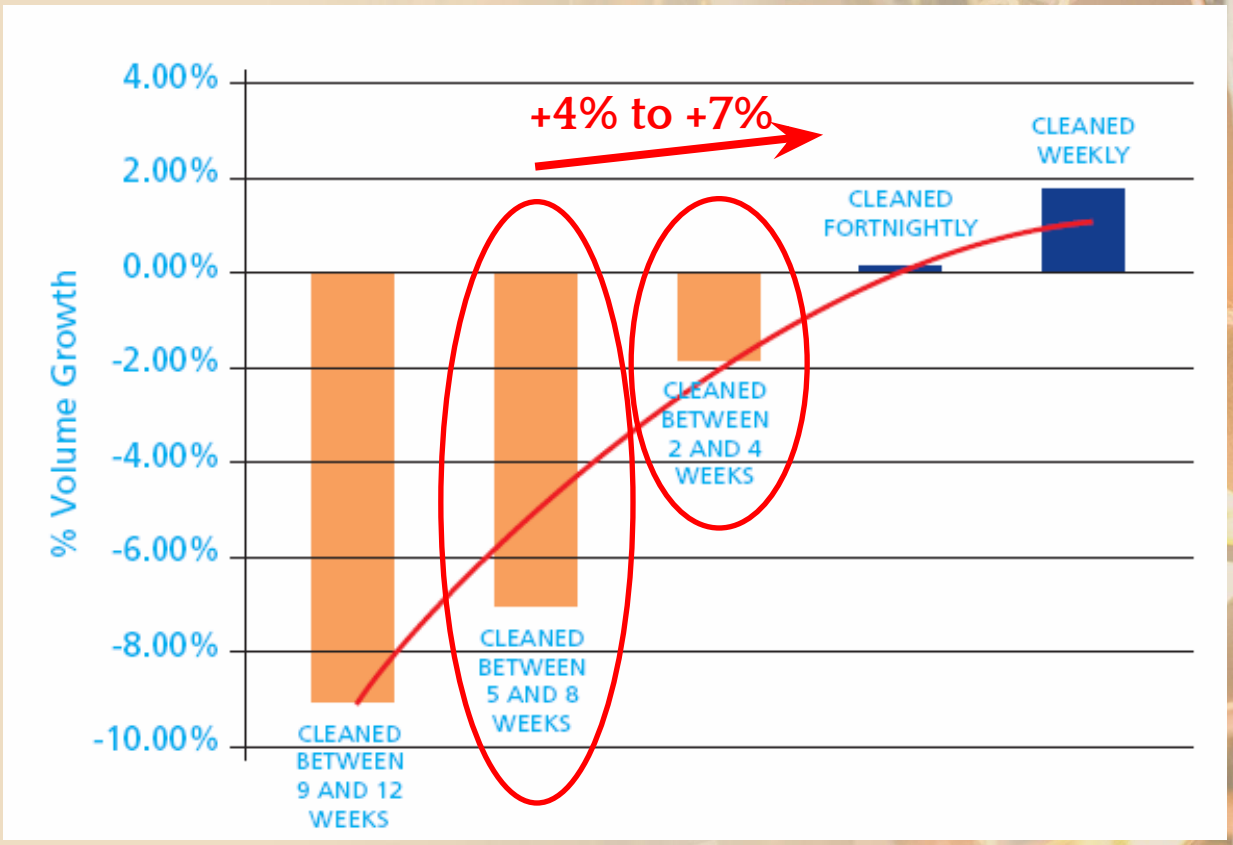
Economics of Draught Quality



Prove this study right...

... how much money is at stake?

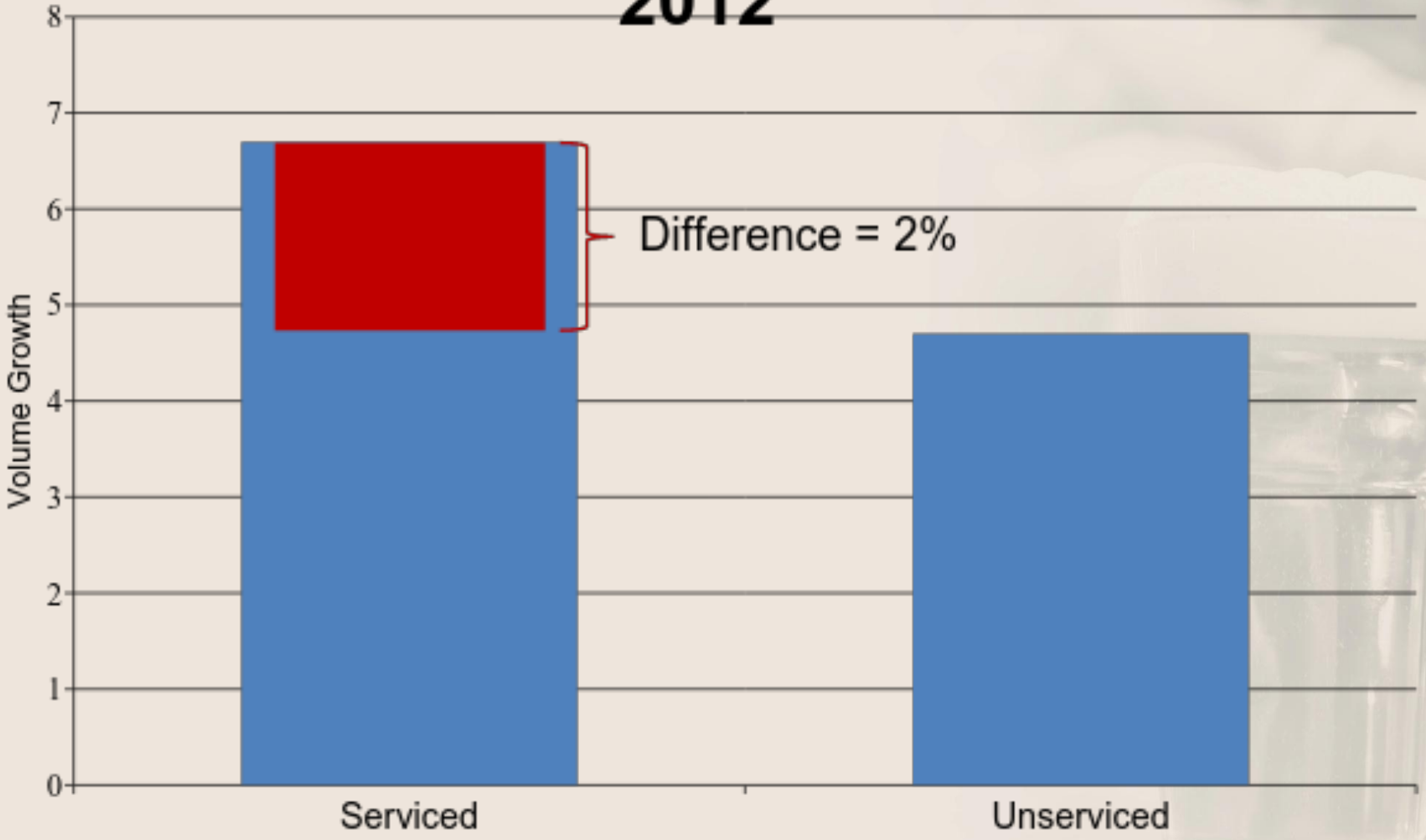
A Natural Experiment

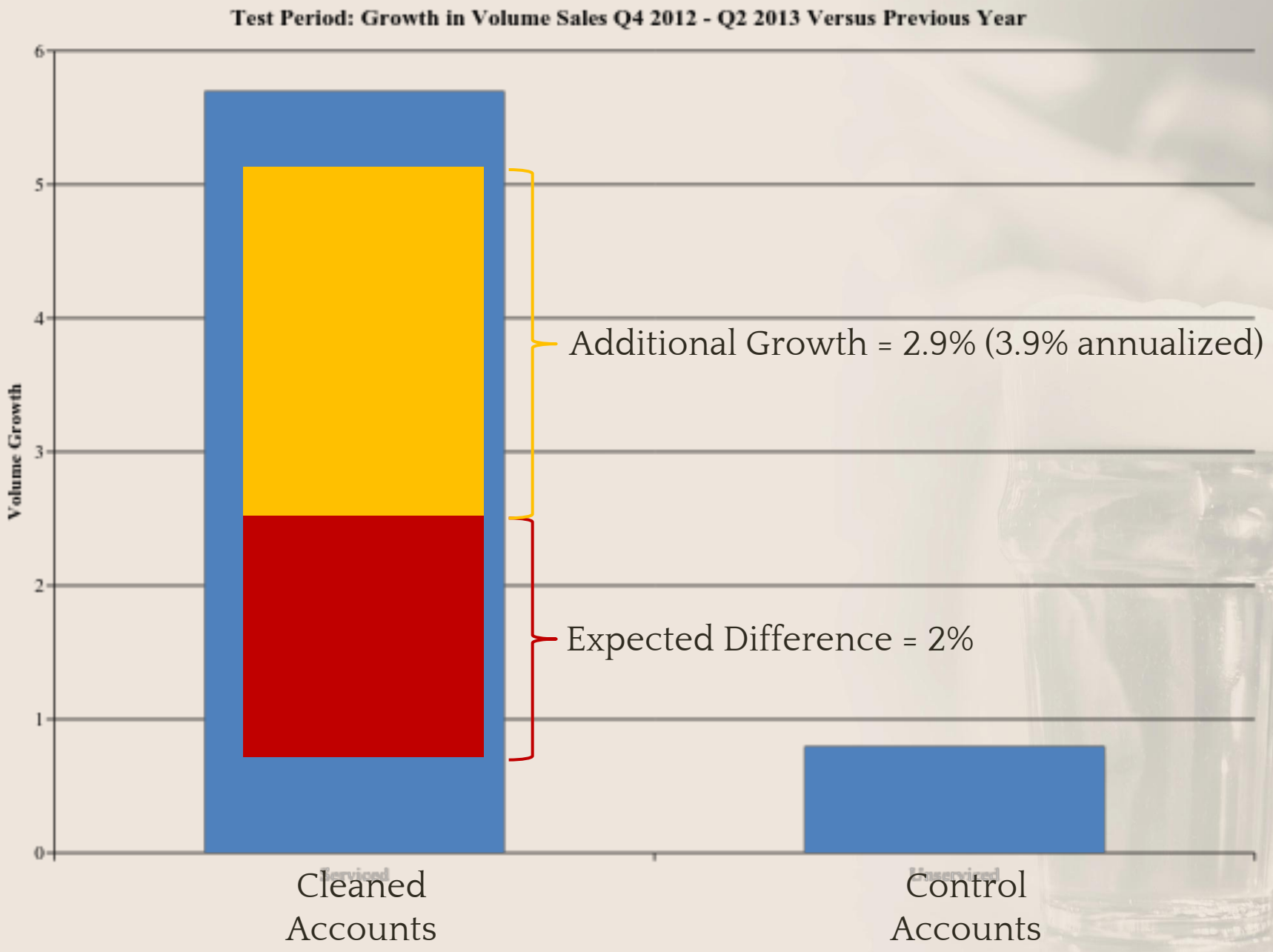
- In September of 2012, a U.S. wholesaler purchased a local draught line-cleaning business. Can compare:
  - Accounts using the line-cleaning service, versus
  - Those that do not

Strong Opportunity

- Both groups are relatively large
  - Line-cleaning accounts > 40,000 barrels annually
  - Other accounts >120,000 barrels annually
  - No other known differences
    - Same area, beers, etc.

Control Period (Before): Growth in Volume Sales Q1 - Q3, 2011 to 2012




Test Period: Growth in Volume Sales Q4 2012 - Q2 2013 Versus Previous Year
Volume Growth
6
5
4
3
2
1
0
Additional Growth = 2.9% (3.9% annualized)
Expected Difference = 2%
Cleaned Accounts
Control Accounts

+3.9% Annualized Growth

At 132 servings in a keg
= 5 additional pints per keg per year

Across the Cleaned Accounts **that's:**

- **450,000+ new pints/year**

Control Accounts, it represents almost:

- **1.3 million pints a year in foregone growth**
- Almost 5,000 barrels in lost growth across accounts that are >

Doing the Math…

- More frequent cleaning = 5 new pints/keg

New Profits/Keg

>

Costs of Cleaning

Does Entail New Costs

- Net Cost of lost beer = $217.69
  - This is less than 1% of total beer cost
- Net cost of labor = $800
  - May be cheaper with cleaning service; retailers often do not bear cost
- Net cost of cleaning materials = $371.65
  - May be cheaper in bulk
- **Total Net Cost = $1,389.34**

FAR Outweighed by New Profits

5 pints/keg x $3.41 profit/pint x 52 kegs/year/line =

$886.60 profit/year/line x 4 lines =

= **$3,546.40 in new profit**

Total Net Profit

- Under this scenario, moving from two-month to two-week cycle generates:
- **Total Net Profit = $2,157.06 ($539.26 a line)**

- Can re-work assumptions to increase costs
- ***Even with the most extreme set of assumptions, retailers are projected to reap new profits from frequent line cleaning***

Draught vs Bottle $$$

Case of 24, 12 oz bottles = $26.40

Need 6.88 cases = ½ bbl @ $125.00

$181.63 cost of bottles vs. ½ bbl

$181.63 btls – $125.00 keg = $56.63 per keg

1 Line @ 1 Keg Week...

$56.63 x 52 weeks = **$2944.76 YR**

CRAFTBEER.COM

Poll Results

- “5 Cardinal Sins of Craft Beer Service”
- 23% of survey “say” Dirty Beer Lines
- Very close to “quality of service” and “diversity of beer menu” and MORE important than dirty glassware

Q & A

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