

Fountain Beverage Equipment

by Danamark Watercare

This Fountain Beverage Application module will cover:

- Types of beverages
- Types of dispensers and how they work
- How water quality impacts drink quality



Non-Carbonated Drinks

Contain flavoured syrup concentrate and water, but do not include carbon dioxide (CO_2) gas. Fruit punch, lemonade and flavoured Iced Tea are examples of popular non-carbonated drinks.



Carbonated Drinks

Contain flavoured syrup, water & CO_2 gas.

The CO_2 is added to the water to enhance the syrup flavour and provide a fizzy taste.

Coca-Cola and Pepsi are popular examples.

Frozen Carbonated Beverages

Also known as FCB, have the same basic ingredients as carbonated drinks, but the final product is frozen into a slush. The Slurpee and Icee brands are well known examples.



Frozen Uncarbonated Beverages

With the expansion of specialty coffee shops & frozen cocktails, there is a new growth market in frozen ‘non’ or ‘un’ carbonated drinks, also referred to as FUB.



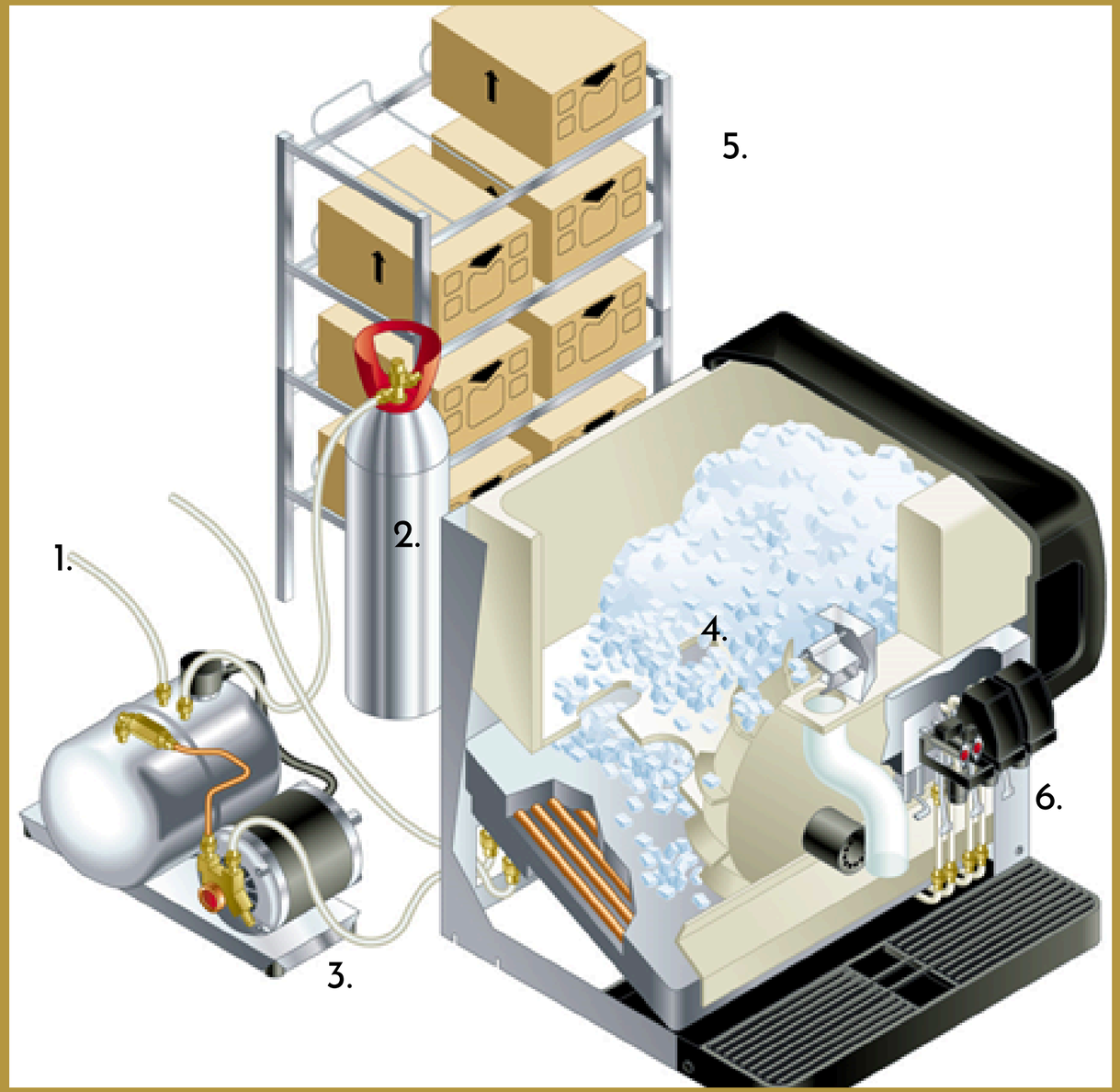


Types of Fountain Systems

Most fountain dispensers use post mix technology, which means that the water and syrup are mixed in the fountain valve (post) and immediately dispensed into the cup. This finished drink is manufactured in the fountain system.

Components of a Fountain System

1) Water Supply
2) Tank of CO2
3) Carbonator
4) Refrigeration
5) Syrup Supply
6) Dispenser



Components of a Fountain System continued...

The dispenser (cup filler) will be the most visible and may be located on kitchen or service counters, in the drive-thru or in a self-serve area.

This component includes the water/syrup mixing valves and some type of mechanical refrigeration or ice bin for chilling the ingredients before blending and dispensing the drink.



Components of a Fountain System - continued...

The carbonator is the heart of the beverage system and the entry point for the water supply. It includes a pump, holding tank and pressure switch.



Ambient carbonation versus cold carbonation

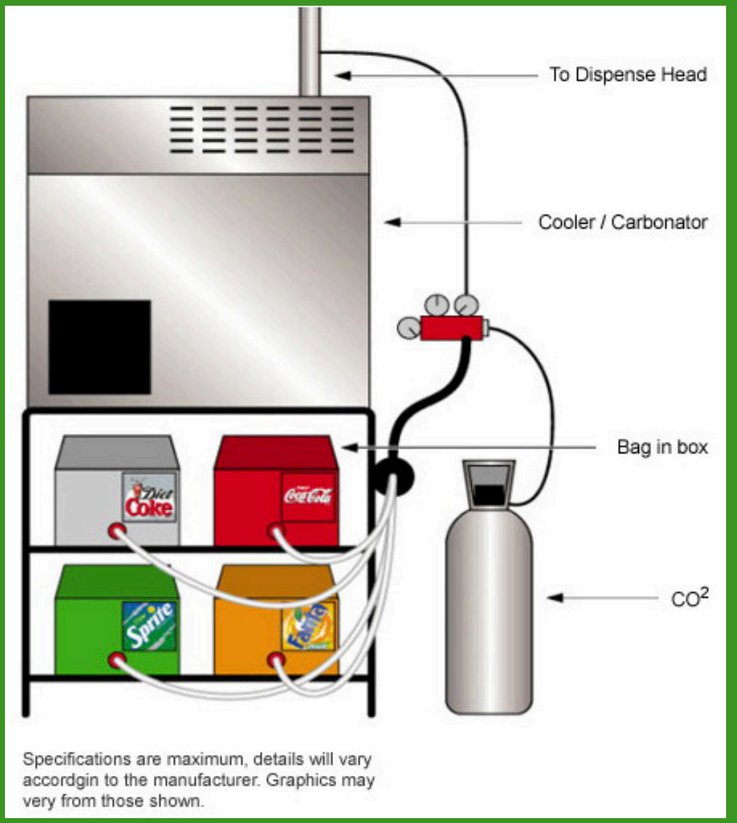
If a carbonator is placed before the water is chilled using a cold plate, the associated term is ambient carbonation. When it is placed post-chilling, it is cold carbonation. Water that is cold absorbs CO2 better so drinks will have more fizz.



Most fountain syrup is now dispensed from a Bag-in-a-box (BIB) System

Each cardboard box contains a 5-gallon plastic bag of syrup with a quick disconnect fitting for easy change out. The boxes of syrup are stacked on a metal rack in a cool, dry storage area away from the kitchen.

Clear tubing is plumbed from the bag to a small BIB pump driven with carbon dioxide gas pressure. The BIB pumps push the syrup through bundles of tubing to the fountain dispensers.



Occasionally, you may find a '*pre-mix*' fountain system.

The finished drink is manufactured in a local bottling plant and bulk packaged for use in a special fountain dispenser.

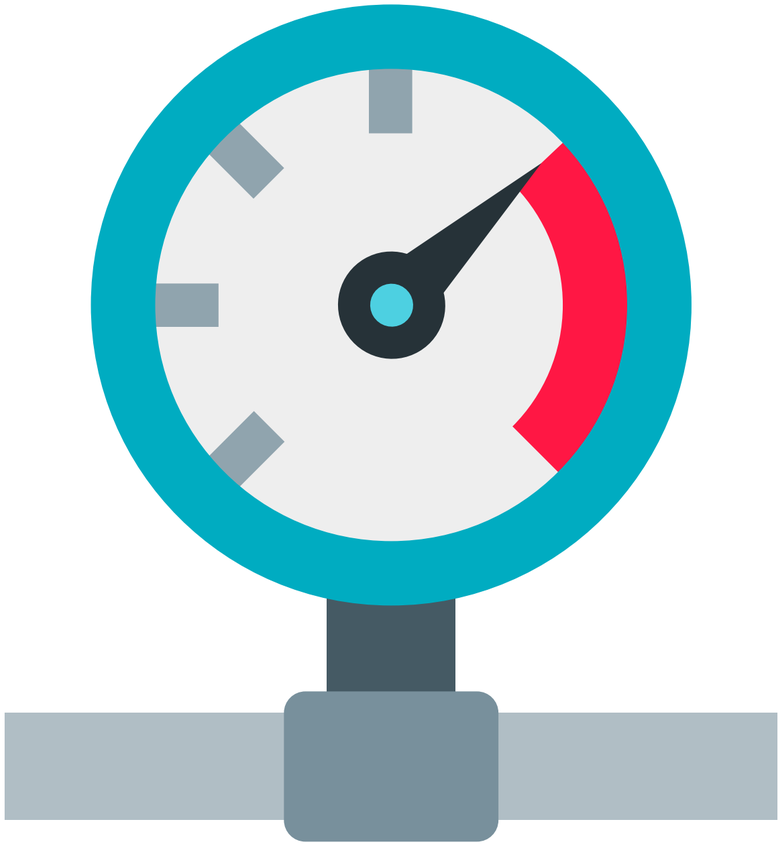
A pre-mix system might be found at a temporary location for a public event, where an adequate or safe water supply cannot be found.



Booster pump verses Carbonator pump

Some restaurants have a water booster pump for non-carbonated beverages. This pump should not be confused with the carbonator pump.

The booster pump is used to assure at least 40 pounds of steady pressure at the non-carbonated drink valves on the fountain dispenser. This constant pressure is needed to maintain an exact syrup/water ratio for each drink.

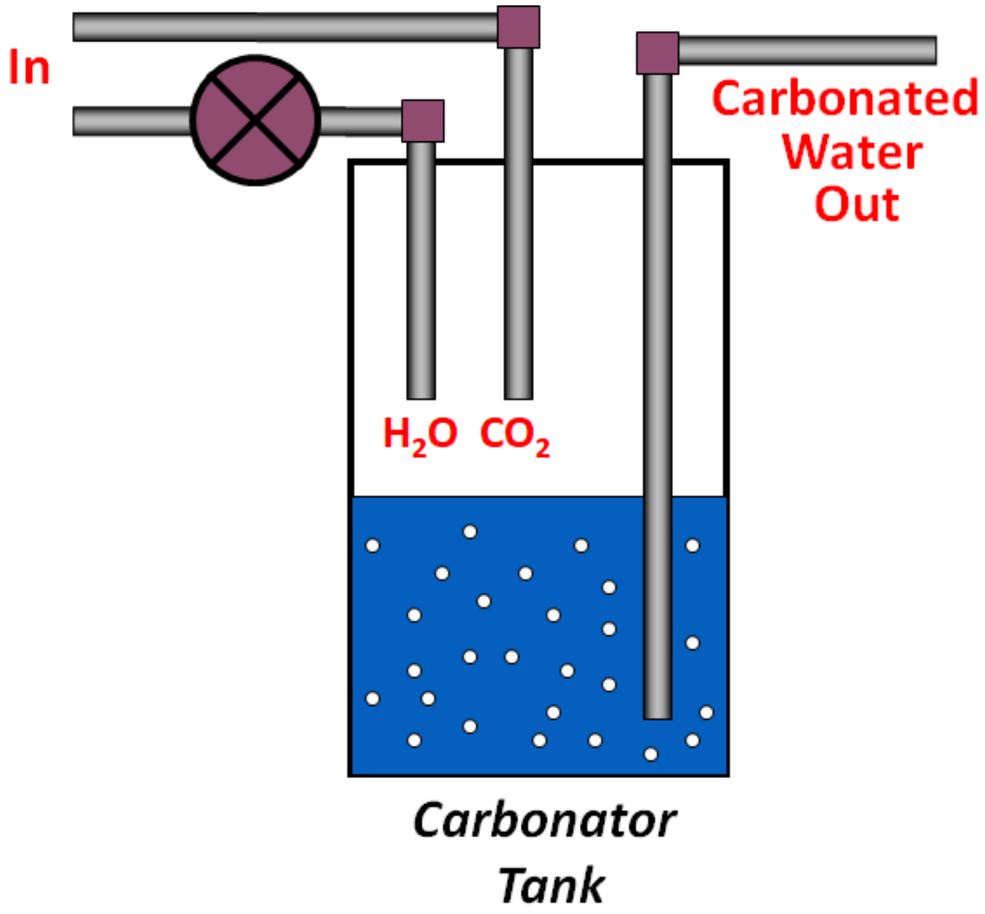


Carbonation Basics

Cold water is connected to the inlet side of the carbonator pump. The electric motor and pump pushes the water into the carbonator tank at 190 – 225 PSI.

Carbon dioxide (CO2) gas is released from a high-pressure storage cylinder, and regulated to about 105 PSI before it enters the carbonator tank through a second inlet.

The combined effect of pressure and agitation within the carbonator tank allows the water to absorb a large volume of CO2 gas, and create carbonated water. With proper carbonation, the water holds approximately three times its own volume of compressed gas.



Dispensing Basics

Quality in the cup includes a maximum temperature of 36 degrees F for the finished drink. The fountain dispenser uses mechanical refrigeration or stainless chiller coils around an ice bin to cool the carbonated water and the syrups before mixing at the dispenser valves.

Higher temperatures will release the carbon dioxide gas and create flat drinks. Many fountain dispensers have an overhead icemaker, or ice storage with dispenser, for customer convenience and drink cooling.



Dispensing Basics - continued

Quality in the cup also includes the proper ratio of carbonated water to syrup in each drink. The formula for most fountain drinks includes five parts carbonated water and one part flavored syrup.

Diet drinks usually have a higher ratio of 4.75 to 1. Each fountain syrup company has recommended specific adjustments for the type of ice used in the finished drink.





Refractometer for measuring Brix

Brix verses Ratio

You may hear the term “brix” in a fountain discussion, and it should not be confused with Ratio.

Ratio = The prescribed formula of water and syrup volumes in a finished drink.

Brix = The percentage of sugar in a volume of liquid.

Components of an FCB Machine

Frozen Beverage Systems are self-contained units, with separate inlet connections for water, carbon dioxide (CO2) gas, and flavored syrups.

The carbonated water & syrup are usually mixed at a 4:1 ratio to increase the liquid density, which creates a soft slush in the freezing chamber.

As a rule of thumb, every two flavors require one carbonator pump.



The Target - Drink Quality!

Fountain syrup companies and foodservice operators want their fountain beverage drinks to have the same taste as the can or bottle choice for each brand.

Drink quality, brand identity and customer satisfaction drive increased sales volume for everyone involved.



How water quality impacts drink quality

- Chemical disinfectants, such as chlorine and chloramine, can provide unwanted taste in addition to attacking rubber seals & gaskets
- Natural / organic chemical contaminants can provide unwanted taste, odour and colour
- Suspended solids / turbidity can cause abrasion, clogging and equipment damage



How water quality impacts drink quality - cont'd

- Small solids can drive carbonation out of the finished drink
- Cysts have potential health effects and are a possible food safety liability
- High TDS and mineral levels in water cause bitter taste
- Water with high sediment cause beverages to be cloudy





Fountain drinks are 83% water....

But water isn't just H2O. Water is a natural solvent, carrying away particles of whatever it encounters along its way.

It's these particulates, chemicals, and contaminants that impact fountain quality & equipment performance.

RECAP

As a quick review, quality in the cup is a function of the following:

- Fresh Syrup – Date Codes and Stock Rotation
- Taste – Water is 83% of the beverage
- Proper Carbonation
- Temperature – Maximum 36 Degrees F
- Proper Syrup Ratio – Brix





This concludes this module. Thank you for your time.