



## BREWERS ASSOCIATION FACTS ABOUT



# SERVING NITROGENATED BEER

**N**itrogenated beer (“nitro”) was developed in 1959 as a way to replicate the creaminess of cask-conditioned ale, which has lower carbonation than most beers. Nitro beer is dispensed utilizing a draught system, whereas cask ale is pulled out with a beer engine. One benefit of nitro beer is that kegs are easier to ship and serve than casks. (See [Draught Beer Quality Manual](#), Appendix D for more info on cask-conditioned ale). A nitrogenated beer has much lower volumes of carbon dioxide (1.1-1.7 v/v) dissolved in it than a typical beer as well as a small amount of nitrogen. Because the amount of nitrogen dissolved in the beer is so small, it isn’t usually quantified.

### NITROGEN’S EFFECT ON BEER

Nitrogen (N<sub>2</sub>) bubbles are smaller than carbon dioxide (CO<sub>2</sub>) bubbles. This creates a “creamy” or “smooth” mouthfeel. The small bubble size also contributes to a more stable and longer-lasting head. This is due to the relatively low gradient between the concentration of nitrogen in the beer compared to the high concentration of nitrogen in the air. The inverse is true in regard to CO<sub>2</sub>, which is why the head on a non-nitro beer is quicker to dissipate. The lower carbonation of nitrogenated beer combined with the different foam qualities of the head will likely subdue a beer’s aroma as well as soften the perception of bitterness in beer.

### THE BREWING PROCESS

The process of nitrogenation inside the brewery utilizes specially rated tanks and/or specialized packaging equipment that is required to infuse the beer with nitrogen. While carbon dioxide occurs naturally during fermentation and can be force-added to beer at lower pressures, the less soluble nitrogen requires higher pressures to dissolve in beer.

### STORAGE TEMPERATURE

As per the [Draught Beer Quality Manual](#), all kegged beer should be stored between 34 – 38°F and served between 38 – 44°F. Nitrogenated beers are no different in this regard.

## CAN YOUR BREWING EQUIPMENT WITHSTAND THE PRESSURE?

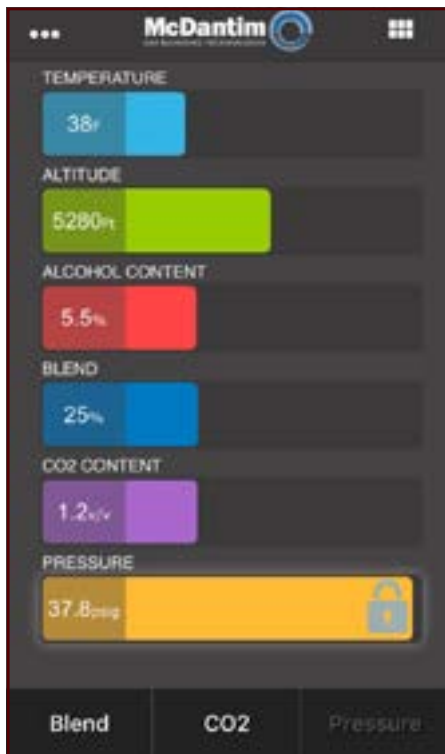
Typical methods used to nitrogenate beer require higher pressure than most brewing vessels are designed to safely operate under. In addition, many jurisdictions require any tank that is pressurized above 14.7 psig to carry an American Society of Mechanical Engineers (ASME) stamp. For safety and regulatory requirements, all tanks used to nitrogenate or serve nitrogenated beer should be rated to handle these higher pressures and must meet all local, state, and federal regulations.

### THE GAS BLEND

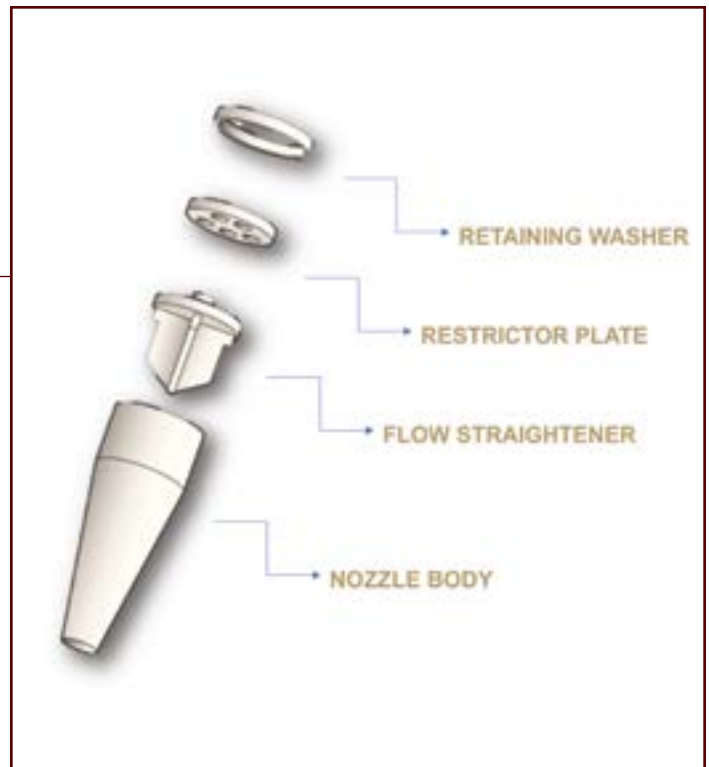
- To maintain the correct balance of carbon dioxide and nitrogen in a nitrogenated beer, a gas blend must be used to dispense these beers. A typical gas blend for nitro dispense is 25% CO<sub>2</sub>/75% N<sub>2</sub> (30/70 may also be used).
- Using a blend with a higher amount of CO<sub>2</sub> (including using 100% CO<sub>2</sub>) cannot be used to dispense nitro beer as the beer will become over carbonated.
- This blend can be obtained by using an on-site blender or by sourcing a mixed gas bottle, often called G-Mix, Beer Mix, Beer Gas, or Guinness Gas.
- Non-nitro beers should not be poured using this specialized gas blend. Beers with higher volumes of CO<sub>2</sub> that are poured with this blend (even at higher applied pressure) will lose carbonation and become flat over time.

### SERVING PRESSURE FOR NITRO BEER

In order to keep both the CO<sub>2</sub> and N<sub>2</sub> in the beer, relatively low temperatures and high applied pressure, along with the correct blend of gases is necessary. Volumes of CO<sub>2</sub> in the beer (which should be provided by the brewer and/or distributor) and the beer’s temperature will allow you to determine the recommended applied pressure, based on equilibrium/solubility charts. If your chart doesn’t address volumes below 2.0 v/v of CO<sub>2</sub>, we recommend using an on-line calculator, such as the McDantim “Easyblend” calculator.



**Fig 1.** The correct applied pressure for a 1.2 volume nitro beer, dispensed at 38 degrees, in Denver (5280 ft above sea level), at 5.5% ABV, using a blend of 25% CO<sub>2</sub>, will be 37.8 PSI.



**Fig 2.** A specialized nitro faucet includes a restriction plate to aid in nitro beer flavor and appearance.

## DISPENSING NITRO BEER

- The high applied pressure required to keep both gases in solution needs to be balanced within the draught system. For more info on balancing a system, refer to the section on “System Balance and Achieving Flow” in the [Draught Beer Quality Manual](#).
- To meet the high applied pressure requirements, a specially designed nitro faucet should be used to provide additional resistance to the system. A **restriction plate** in the faucet’s spout forces the beer through tiny holes in the plate. On the other side of the plate, the flow straightener ensures an even, consistent flow from the faucet.
- This restrictor plate also helps break the nitrogen out of the beer through turbulence, which contributes to the cascading effect in the glass, as well as the creamy mouthfeel and the stable head.

## CLEANING AND MAINTENANCE

- Nitro lines, faucets, and couplers should be cleaned and maintained the same way as other draught equipment. Consult the Draught Beer Quality Manual for all line cleaning recommendations.
- Faucet hygiene – The spouts attached to the bottom of nitro faucets require an added element of cleaning and maintenance. The faucet spout should be unscrewed and removed at the close of business each day, rinsed with water, and allowed to air dry before replacing for service. The faucet spout should be dismantled and cleaned every two weeks.

## POURING NITRO BEER

- Start with a “beer clean” glass.
- In order to achieve a head free from “fisheye” bubbles, dimples, and imperfections, the glass should be held at a 45° angle. Hold the glass as closely as possible to the bottom of the spout without touching it, open the tap fully toward you, allowing the beer to flow down the side of the glass. As the glass fills, tilt the glass completely upright, again keeping the bottom of the spout as close to the surface of the beer without touching.
- See Side Bar for information about the “Two-Part Pour.”
- Once the beer has completely settled, the head should be between ¾ to one inch.
- The faucet spout should never be immersed in the beer nor come in contact with the glassware.

## ADDITIONAL INFORMATION

- Blended gas may also be used to push beer through long-draw systems that require high applied pressures, without over carbonating the beer. Calculating the exact mix of CO<sub>2</sub> and N<sub>2</sub> needed in a long draw system depends on many factors – the beer’s carbonation levels and temperature, the system’s resistance, and the applied pressure that is required to maintain the carbonation of the beer. The blend for dispensing nitro beer is specific to the carbonation levels in nitrogenated beers and is independent of the type of system – direct or long draw.

## WHY A TWO-PART POUR?

- Bartenders will often employ a two-part pour when serving nitro beers, allowing the first three-quarter pour to settle fully before adding the final top-up. This custom is derived from the pre-nitro history of Guinness stouts being served from two separate casks – an aged, stale cask and a bright, lively one. By combining the two beers, bartenders created a unique, frothy beer with a long-lasting, creamy head. These days, the two-part pour is utilized in order to better control the final appearance of the head of the pint and as a tip of the cap to the heritage and history of nitrogenated beer.
  - If conducting a two-part pour, the glass should be set down to allow the first pour to settle (until the “surge” or cascade has stopped). To top the beer off, hold the glass completely upright, push the handle away from you, and top the beer up to just above the rim of the glass. Nitro handles work in both directions specifically for the two-part pour. Pushing the handle away allows the beer to flow, but reduces the flow rate slightly, allowing for more control on the top-up.
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- Nitrogenated beer is a unique product, made in a particular way. It requires a specific gas blend, and a specialized faucet. Nitro beer will not pour correctly if treated as a regular beer and dispensed through a standard draught system. In the same vein, non-nitrogenated beers with standard carbonation will be problematic if dispensed with a nitro gas blend and poured using a nitro faucet. ■

