



Force Carbonation

Many home brewers approach their beer with a fierce sense of pride and the idea of force (artificially) carbonating their beer will send shivers down their spine.

'Nothing artificial in my beer!'

Let's look at this from a different angle. When you bottle you add a measured dose of fermentables to your beer to allow the residual yeast to re-commence fermentation in the bottle and create the carbonation in a bottle-conditioned beer.

This method is tried and true but completely ignores the following variants:

- 1) Yeast viability. After fermenting your beer, especially if it's a higher gravity beer of 1.060 or more your yeast may be tired out and might not be up to the task.
- 2) Sediment. Although it's good for you, it's not pretty. This is probably the single biggest turn-off to the average non-educated beer drinker.
- 3) Balance. Many home brewers shudder at the idea of deviating from the Reinheitsgebot (German purity law of 1516 - a very noble stance to take) and would rather prime with dried malt extract instead of dextrose or force carbonation.

Force carbonating will allow you to hit your desired level every time, without exception.

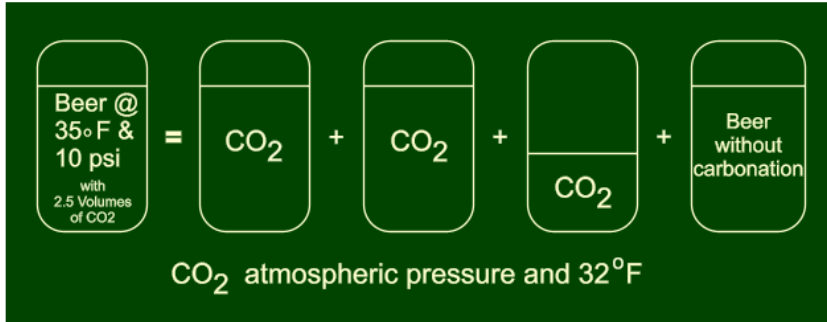
There are two methods of force carbonating your beer in a Homebrew keg. The patient method (recommended) and the impatient method (relax-don't worry-you know the drill). The patient method will always give you the best results. It's based strictly on numbers so you can do it over and over and achieve the same results every time.

The amount of CO² that will dissolve into your beer is dependent on two factors - temperature and pressure.

Generally ales tend to be carbonated at the lower end, 1.9 to around 2.3; most German style lagers at around 2.4 to 2.7; and Australian lagers, Japanese lagers, and wheat beers at around 2.7 to 3.0. The amount of CO² dissolved in beer is most often referred to in terms of volumes.

Volumes of CO² are defined as the volume the CO² gas would occupy if it were removed from the beer at atmospheric pressure and 0°C, compared to the original volume of beer.

Most beers in the Australia contain roughly 2.5-3.0 volumes of carbon dioxide, or about 5 grams per litre. This means that if all the carbon dioxide in one litre of beer were expanded at 0°C and at one atmosphere of pressure, its volume would be 2.5-3 litres.



Using the temperature and pressure conditions of the beer at equilibrium conditions and reading the volumes directly from a chart easily obtain determining the volumes of CO² in beer.

Equilibrium means the same amount of CO² is diffusing out of the beer as is being dissolved back into solution. It is critical that the readings used for determining CO² volumes are taken under equilibrium conditions and the instruments used are accurate.

The Patient Method

- 1) Clean and sanitise your keg thoroughly. I always purge the Keg with a little CO² to exclude oxygen.
- 2) Gently rack your beer into the keg and filter if required.
- 3) Replace the lid on the keg and re-pressurise again to 10 psi, let it sit for a minute, bleed the pressure off again to re-purge (also known as 'burping' your keg).
- 4) Determine the temperature that your beer will be during carbonation and set your regulator accordingly. Give your beer 48 hours to carbonate. It will reach its saturation point within this amount of time if the temperature is right, and the regulator will shut down altogether.

Remember that the gas should be connected to the black beverage disconnect (you will need a black connector to make this easy) so that the CO² bubbles up through the beer.

A big word of caution here - if your cylinder runs low, beer can return via the gas line and ruin your regulator. This method is called reverse booting and has ruined many an expensive regulator. Fit a non return valve in you gas line to be safe.

Better to get a carbonation keg lid that has a 0.5 micron stainless steel air-stone at the bottom of the keg to introduce the CO² as a very fine mist that will rise slowly in the keg and adsorb much faster.

Carbonation time with the carbonation keg lid can be reduced to as little as one hour at the correct temperature!

The Impatient Method

- 1) Follow step 1 through 3 from the patient method and chill to desired temperature Remember beer will not absorb the CO² at room temperature.
- 2) Set your regulator to 30 psi and pressurise your keg through the gas beverage fitting until you hear/feel the flow of gas stop, and shake your keg vigorously for 5 minutes.

Alternatively lay your keg on its side and gently rock the keg, if you have the gas post at the bottom you will hear the gas rushing into the keg. Stop rocking and soon the gas will stop, rock again and gas will once again flow.

- 3) Repeat step 2 until:
 - a) Your beer will receive no more carbonation at this pressure setting at which time it will be over-carbonated.
 - b) You die of a massive heart attack.
 - c) You fluke the correct carbonation level

Obviously this method should only be used as a last resort. Even if it doesn't cause you grievous bodily harm, it leads to rough handling of your precious homebrew and uncertain carbonation levels.