

## Dry Hopping Techniques

**Explanation and History;** The practice of adding raw hops to fermented beer is an old technique and was very common in Britain until about 1980. Typically a 36 gallon cask would have 2 ounces of fresh aroma hops added when filling, the casks were then stored at the brewery for a few days prior to despatch to the pub, upon where they were kept on stillage in the cellar for at least a week before tapping. This period gave a chance for the beer to absorb some of the aroma compounds from the hops resulting in an enticing aroma when the beer was served. Many regional and large breweries regularly dry hopped their bitter's and pale ales but not their mild, a hop aroma not being a feature of that particular style. The hops selected for this purpose were usually English goldings although fuggles and a few other varieties were used on occasion. However in more recent times the practice of dry hopping has rapidly declined, and is today limited to a very few regional breweries who still own tied houses and can exert some control regarding the storage and serving of their beer.

Pubs today in general have a quicker turn round of the beers they serve and usually stock a wider range which means that the beer would not be cellared long enough for dry hopping to be effective. Also cost cutting in respect to cask washing has no doubt added to the demise and of course the extra cost of the hops would be noticed by many brewery accountants.

**Dry hopping for Craft Brewers;** This has become very popular in recent years with American brewers but isn't quite so common in Britain, where craft brewers usually tend to rely on late hopping to achieve that extra hop flavour and aroma. However dry hopping isn't difficult and given a little care and time excellent results can be achieved. Dry hopping can take place in a FV, secondary tank, pressure barrel, polypin or Cornelius keg, depending which is convenient and most practical for the brewer. Before discussing these methods lets have a brief look at the suitability of using hops in different forms.

**Whole hops** may be used loose or contained in a suitable muslin bag which must be weighted down, this is to prevent the bag simply floating on top of the beer resulting in minimal contact with much reduced efficiency. If added loose, some agitation will occasionally be necessary such as stirring the hops back in to the beer or inverting a cask or polypin from time to time. When agitation is being carried out great care must be taken not to introduce oxygen otherwise staling may occur. And please note that the *quantity* of hops to be added must be considerably greater than on a commercial scale where agitation occurs en route to the pub, also the cask being stillaged in the horizontal position means greater contact with the hops than is the case with our vertical tanks and kegs. *Note; when loose hops are used some straining device must be attached to the vessel tap to prevent blocking.*

**Type 100 hop pellets,** also known as "hop plugs" which are simply whole hops compressed into 14g plugs, are used commercially and do not require weighing but for craft brewers they do not seem to have much of an advantage over whole hops, other than they will keep fresh longer and do not oxidise quite so easily.

**Type 90 hop pellets,** have the seeds, bracts and other extraneous matter removed before being compressed in into small pellets with a hammer mill. They have an advantage over whole hops in that they tend to sink back into the beer after a few days thus increasing contact, this resulting in more effective aroma extraction. They are very popular in the USA with craft brewers who largely prefer them for dry hopping over whole hops. Previously difficult to obtain in convenient packs, the Malt Miller is now stocking a useful and varied range of these pellets in 100g vacuum packed foil bags; the varieties I've tried have been fresh and of high quality. An important point when dry hopping is that the hops must be fresh and aromatic irrespective of variety. Old or stale hops that have been incorrectly stored will likely impart off flavours, often with cheesy or vegetative taints.

**Contact time** depends on the form of hop that you're using, in general I've found that whole hops and plugs require a minimum soak of a week and preferably ten to fourteen days to ensure a good extraction of the aroma compounds. Type 90 pellets tend to disintegrate rapidly and sink to the

bottom after a few days. When using these pellets I've found that a good aroma can be achieved with a contact time of only five days although I usually prefer to leave them for seven days.

***Does dry hopping increase bitterness?*** Some beer writers ( *Graham Wheeler* ) have stated that “dry-hopping does not and cannot increase the bitterness as the hops are not boiled.” Other beer writers ( *George Fix, Roger Protz* ) have suggested otherwise, and there is evidence to support that over a longer period of time the ethanol content of the beer can extract some bittering compounds from the hops.

### **Methods of dry-hopping.**

In the **FV** hops can be added once the fermentation has been completed and the temperature lowered. If added whilst fermentation is still active the CO2 produced will tend to strip out the aroma and good results may not be achieved.

A **secondary tank** or plastic barrel can be utilised but care should be taken whilst racking to avoid any aeration. If hops are added loose note that some straining device should be connected to the drain tap to avoid the possibility of blocking.

If using a **pressure barrel** or **polypin** the hops can either be added loose ( with the precautions noted above ) or contained in a muslin bag. The barrel or polypin can be rolled or shaken ( with care ) a few times which will enhance the results.

Many craft brewers use **Cornelius kegs** to store and serve their beer, and dry-hopping can be easily be applied here too, however the method needs to be different. In this case whole hops cannot be added loose as blockage of the narrow dip tube is a certainty. Hops contained in a muslin bag would be well contained but the bag itself could quite easily be drawn to towards the dip tube and obstruct the flow. The problem can easily be solved by using an American idea in which the hops are placed in a stainless steel “tea ball.” These are about 2.5 inches circular and can readily be obtained on e Bay at a very reasonable price. I prefer to use these with the Type 90 pellets, however there is no reason why whole hops cannot be used although more than one tea ball may be needed as hop cones take up far more space. If whole hops are used the tea ball(s) will float on the surface although this is not a problem in a sealed keg which can be inverted or shaken a few times during the conditioning period. An advantage with tea balls is that in addition to being unable to block the dip tube owing to their circular shape, they make cleaning out and removal of hops much easier.

### **Dry-hopping rates and hop varieties;**

This is dependant on what form of hop is used, ( *whole or pellet* ) the aromatic properties of your chosen hop and most importantly how much hop aroma suits your particular taste. For my own beers I find that 10g of pellets added in a secondary tank for five to seven days suits my palate as the subtle aroma doesn't swamp the malt character. However for other brewers who prefer more aroma, 50g – 100g of hops isn't unusual and my advice would be to experiment with a modest amount then step up as required and take note of the advice given on the Beer Forums. As for hop variety, there is now a wide choice available which includes the traditional English and continental aroma varieties whilst American and New Zealand hops are rapidly becoming popular for this purpose. But the choice is yours, be bold and don't be afraid to experiment, you will be sure to produce some very interesting and distinctive beers.

*Peter F ( MCB & CCB )*

