

Gin: Traditional Production Versus Modern Distillation Techniques

Vacuum distilled Gin with Rotavapor® R-300, R-220 Pro

1. Introduction

Gin has a long history as both a medicinal spirit and a popular alcoholic beverage. The Juniper flavored spirit has been in existence for hundreds of years. In recent years gin has experienced a renaissance. It has become one of the trendiest spirits. We find the traditional famous gins on the market as well as gins with completely different flavor profiles and distillation techniques.

2. What is gin

Gin is made from a neutral base spirit (often made from grain), natural ingredients used to flavor the spirit (called botanicals) and water to dilute the gin after distillation. What all gins have in common is the predominant juniper flavor. Other frequently used botanicals are coriander, citrus fruits, cardamom, and pepper. Most gins contain between six and ten botanicals.

Gin can be made by steeping the botanicals in the base spirit for up to 48 hours, before distilling it. Another traditional method to produce gin is the vapour infusion of botanicals. The botanicals are placed in a basket above the spirit. The alcohol vapour passes through the botanical basket and extracts aromatic compounds. This method gives a gentler flavour, compared to the method when the botanicals are in direct contact with the base spirit.

3. Traditional distillation

Traditionally, gin is distilled in a copper still. The still is heated with steam. As soon as the boiling point of the base spirit is reached (78 °C) it starts to evaporate and rise. Most distillation apparatus have different steps. By regulation of those steps, the distillation process can be influenced. Figure 1 shows a mobile distillation wagon, those were used in Switzerland over many years to distill fruit spirits directly on the farms.

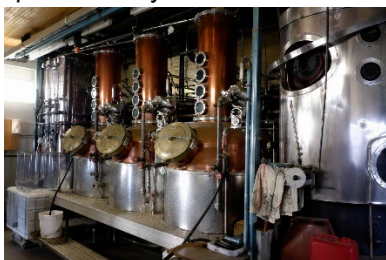


Figure 1:
Mobile distillation
wagon.

4. Vacuum distillation with Rotavapor®

A new method used for gin distillation originally comes from pharmaceutical laboratories. This technique is known as vacuum distillation. With this method the distillation of the botanical infused gin takes place in a vacuum. The advantage of this technique is that the boiling point of ethanol can be significantly reduced under vacuum. At atmospheric pressure, ethanol boils at 78 °C depending on the vacuum level the boiling point can be reduced to 30–40 °C. But why should we do that? If we lower the boiling point of the ethanol, we apply less heat to the botanicals. Some of the compounds and flavours in the plants are heat sensitive, with traditional distillation some of these compounds may be lost. Vacuum distillation allows producers to change the flavour profile of the gin by changing the boiling temperature. Another possibility is to use a diluted base spirit to infuse botanicals. In vacuum distillation we are able to distill not only the ethanol, but also the water and the water-soluble substances from the botanicals. This will result in a different and more intense taste of the gin.

5. Voice of experts

In collaboration with the Swiss distillery “Edelbrennerei Brunschwiler”, experiments were conducted to evaluate vacuum-distilled gin.

We distilled a gin produced by steeping botanicals in the base spirit with a Rotavapor® at two different temperatures. In parallel the same gin was distilled with the traditional method.

The results showed that all three gins exhibited distinct flavour profiles. By changing the boiling temperature at the vacuum distillation, also the flavour and taste of the gin changed.

The different gins were tasted by different experts in the Swiss gin industry. The results showed that the experts generally described vacuum-distilled gins as fresher and lighter in character.

6. References

- [1] www.flaviar.com/blog/how-gin-is-made
- [2] www.ginfoundry.com/gin/oxley-gin