



Calculating the required amount of hop

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Using hop in the brewing process is an integral part of the production of beer, even at home. Important features are the type of hops, how to use, doses and guiding methods for calculating them. Usually used in practice is hop pellets.

According to the hops type and the proportion of bitter substances there are two main hop types: bitter and aroma. Depending on the two types is the time of its incorporation into the boiling wort.

Adding hop in the small industries is mainly done twice – adding bitter and aroma hop (double method) or single - with bitter hop.

Bitter hops are added into the boiling wort 10-15 minutes after the boiling has started. In this case, hop bitter substances have enough time to be transformed during boiling. Addition of aroma hops for about 10-15 minutes before end of boiling. In this case we keep the maximum of aroma of the hop.

Usually for light beer we import about $80 \div 90$ mg/l α -bitter acids and for special and slightly bitter beer – about $110 \div 130$ mg/l α -bitter acids.

➤ Calculation for single method of adding hop

Usage of single method of adding hop we calculate based on standard dosing in light beer – 80 mg/l α -bitter acids in the hot wort or 0,08 g/l. Assume that content of α -bitter acids in bitter hops are 10,6 %

10,6 % α -bitter acids \Rightarrow 100g \rightarrow 10,6 g α -bitter acids
X g \rightarrow 0,08 g α -bitter acids

$$X = \frac{100 \cdot 0,08}{10,6} = 0,75 \text{ g hops}$$

Therefore if we have 10,6 % α -bitter acids in bitter hops to dose 80 mg/l α -bitter acids have to add 0,75 g hops for 1 litre of hot wort. If we have for example 100 litres:

0,75 g hops \rightarrow 1 litre hot wort
 G_x g hops \rightarrow 100 litres hot wort

$$G_x = \frac{0,75 \cdot 100}{1} = 75 \text{ g hops for 100 liters wort}$$

➤ Calculation for using double method of adding hop

Usage of double method of adding hop we calculate based on standard dosing in light beer – 80 mg/l α -bitter acids in the hot wort or 0,08 g/l. Assume also that the share of bitter hops is 85 % and aroma hops is 15 %.



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Assumed that: the content of α -bitter acids in bitter hops is 10,6 %
the content of α -bitter acids in aroma hops is 7,6 %

Bitter hops – 85 %

85 % of 80 mg/l are 68,0 mg/l

10,6 % α -bitter acids \Rightarrow 100g \rightarrow 10,6 g α -bitter acids
X g \rightarrow 0,068 g α -bitter acids

$$X = \frac{100 \cdot 0,068}{10,6} = 0,64 \text{ g bitter hops}$$

Therefore if we have 10,6 % α -bitter acids in bitter hops to dose 68,0 mg/l α -bitter acids have to add 0,64 g hops for 1 litre of hot wort. If we have for example 100 litres:

0,64 g hops \rightarrow 1 litre hot wort
 G_x g hops \rightarrow 100 litres hot wort

$$G_x = \frac{0,64 \cdot 100}{1} = 64 \text{ g hops for 100 liters wort}$$

Aroma hops – 15 %

15 % of 80 mg/l are 12,0 mg/l
7,6 % α -bitter acids \Rightarrow 100g \rightarrow 7,6 g α -bitter acids
X g \rightarrow 0,012 g α -bitter acids

$$X = \frac{100 \cdot 0,012}{7,6} = 0,16 \text{ g aroma hops}$$

Therefore if we have 7,6 % α -bitter acids in aroma hops to dose 12,0 mg/l α -bitter acids have to add 0,16 g aroma hops for 1 litre of hot wort. If we have for example 100 litres:

0,16 g hops \rightarrow 1 litre hot wort
 G_x g hops \rightarrow 100 litres hot wort

$$G_x = \frac{0,16 \cdot 100}{1} = 16 \text{ g hops for 100 liters wort}$$