

Wine Fortification

Volume of alcoholic spirit required

The volume of spirit required for fortification can be calculated by applying the following calculations, based on using the Pearson's square.

$$V_s = V_j \times ([X_f - x_j] / [X_s - x_f])$$

Where:

V_s = the volume (L) of fortifying spirit required in liters

V_j = the volume (L) of juice, must or wine to be fortified

X_f = the final alcohol content (% v/v) desired

X_j = the alcohol content (% v/v) of the fermenting juice at start of fortification

X_s = the alcoholic strength (% v/v) of the fortifying spirit

Example:

You want to fortify 100 liters of 4.8% (v/v) alcohol wine to 18% alcohol (v/v) using 95% (v/v) neutral grape spirits. How much spirits is needed?

$$V_s = ? \text{ L}$$

$$V_j = 100 \text{ L}$$

$$X_f = 18 \% \text{ v/v}$$

$$X_j = 4.8 \% \text{ v/v}$$

$$X_s = 95 \% \text{ v/v}$$

$$V_s = 100 \text{ L} (18.0 - 4.8) / 95.0 - 18 = 17.1 \text{ L}$$

Therefore:

Volume of 95% v/v spirits = 17.1 L

Final volume of wine = 100 L + 17.1 L = 117.1 L

Note that the final volume will not be exact due to shrinkage of volume of the ethanol/water/sugar solution by the addition of ethanol.