

Making Port Wine

Authentic red port may be made from many grapes, mainly Tinta Barroca, Tina Cao, Bastardo, Tempranillo and others. In California Zinfandel or even Syrah make fine ports. The technique below is universal, and may produce a Ruby port (aged in steel, glass or oak for two to 4 years), or a Tawny port (aged in oak, without topping for several years). Tawny port will lose color and may be blended with other ports to suit the winemaker.

Technique:

1. Harvest late at an elevated brix (26 to 30 will do). This is to augment the short primary fermentation time and to maximize the fruit's natural alcohol production. Fruit should be overripe, but no raisins.
2. Aerate the must well prior to and during inoculation. Choose the yeast carefully; select a yeast that is easy to kill with alcohol. Consider reducing yeast nutrients. Sulfite as normal. But bear in mind that the late harvest fruit is probably at a high pH which can will greatly reduce the effectiveness of sulfites. Color extraction can be a problem, so consider cold soaking (after sulfiting) and/or supplementing the must with OptiRED or pectic enzyme.
3. At 10 to 12 brix, juice should be at 9.5 to 10.5% abv (Alcohol by Volume). Once the juice reaches the target brix; say 11°, fortify the must or juice per formula below. Final alcohol content fo the finished port should be 18.5 to 20% abv.
4. Fortify with grape neutral spirits (GNS) at 190-proof (95% abv), or use aged or unaged brandy at 140-proof (70% abv) or above. If it is necessary to use store-bought brandy at 40% abv, know that the finished product will contain about 40% brandy and will taste principally like the brandy that was added.
5. Press straight to the barrel (or glass) to avoid the possibility of harsh tannin extraction from lengthy skin contact. Note: adding the GNS/brandy to the must rather than to the pressed wine doubles the amount of alcohol required. Nonetheless, some winemakers may prefer to leave it on the skins for 3 to 10 days.

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6. Use the following formula to determine the amount of GNS or brandy to add (note that this is an adaptation of the universal formula for blending - the *Pearson's Square*):

A = alcohol content (abv) of the brandy or GNS
B = alcohol content (abv) of the wine to be fortified¹
C = target alcohol content (abv) of the finished port
D = C minus B
E = A minus C
D÷E = the fractional amount of GNS or brandy to add

7. Be sure to hit the target brix accurately, and to measure carefully. Too little alcohol addition will result in a sweet, fermenting mess; too much alcohol will result in a hot, biting brew. Once alcohol is added, assist in the yeast kill by creating an atmosphere that is inimical to yeast growth, i.e. chilling the juice, adding SO₂, etc. It may take one to three days for the yeast to play out so use care before topping up a container.
8. For Ruby Port, the product should be aged for two years in steel, glass or netral oak. Adjust oak to taste before bottling. The use of OptiRED and good aeration or cold soaking could make the wine ready to consume in 18 months. The port may be fined or filtered, as necessary, before bottling.

(Examples follow)

Example:

The following is the et-up for 60-gal of typical Ruby Port using 167.5 proof brandy, an 11 brix fortify point and a target finish abv of 19%.

$$A = 83.75 \quad B = 10.2^1 \quad C = 19 \quad D = 8.8 \quad E = 64.75$$

$$D \div E = .1359 \times 60\text{-gal juice} = 8.15\text{-gal brandy or GNS}$$

$$60\text{-gal juice} + 8.15\text{-gal addition} = 68.15\text{-gal total}$$

¹ To estimate alcohol content (B): Calculate the potential alcohol (PA) at the beginning of fermentation and the PA at the present brix. The different is an indication of present abv. Use the formula:

$$PA = (0.6 \times \text{Brix}) - 1$$

Example: Beginning brix was 28. It is now 11.

$$\text{Beginning PA} = (0.6 \times 28) - 1 = 15.8$$

$$\text{Present PA} = (0.6 \times 11) - 1 = \underline{5.6}$$

Approximate present abv: 10.2

Notes: Because of the presence of sugar in port, it is essential that an alcohol level of at least 18% abv is obtained. Port in steel or glass undergo “reductive” ageing; tawny ports aged in oak undergo “oxidative” aging and *must* have sufficient abv. For all ports, I suggest a target abv of 19.5%, with an acceptable range of 18.5 to 20%.

Courtesy of D.D. Smith, 2011