

SPARKLING WINE

THE PROCESS

A Sparkling Wine (Champagne) starts with a finished, base wine having no more than 11% Alcohol and a free SO₂ level no greater than 30ppm. A second fermentation is then induced in this wine, in the bottle, to produce carbonation and the bottle then cleared of the resulting sediment.

PRODUCING THE BASE WINE

The juice, before initial fermentation, should be sulfited to 50ppm, if not previously done, and the sugar adjusted to 18 to 20 °Brix. Bentonite may be added at the rate of 0.5 gm/gal (1/2 tsp/5 gal) to remove protein and the juice allowed to settle. After 24 hours the juice should be racked off the sediment. Yeast is then added and the juice kept cool, typically 60 to 65 °F. The wine is racked off the lees when fermentation is complete, then sulfited to 25ppm SO₂, eventually cold stabilized and then fined if needed. If oak flavor is wanted, the wine can be stored at this time in an oak barrel or in a carboy with oak chips. About six months from start, the wine could be clear and ready for bottle fermentation.

- The finished wine should now have zero residual sugar. If in doubt, check with a Clinitest kit.

YEAST STARTER

Two days before starting the secondary fermentation, make up a yeast starter by mixing: • 2 Tablespoons of frozen grape or orange juice; • 2 cups of cooled, previously boiled water; • 1/8 tsp Yeast Nutrient; and • One pack of Red Star Premier Cuvee Champagne yeast or Lalvin EC1118 yeast, previously rehydrated in 2 ounces of 95 °F water for 15 minutes. This amount of starter is sufficient for 5 gallons. Scale accordingly for different volumes, always using the full packet of yeast.

SECOND FERMENTATION (To produce carbonation in the bottle.)

- With the finished base wine in a partially filled carboy, add 1 tsp of yeast nutrient for each gallon, then add .536 ounces (1.2 Tbsp) of cane sugar for each gallon of wine for each atmosphere of pressure to be produced. Four to five atmospheres is a reasonable level, however, Do not exceed 5 atmospheres as exploding bottles could result. Then,
 - Add the actively fermenting yeast starter and mix thoroughly.
 - After 24 hours siphon the inoculated wine into clean, scratch free, sanitized champagne bottles, filling to one inch from the top. Stir the inoculated wine frequently while bottling to keep the yeast suspended. Cap the bottles with sanitized crown caps, then lay the bottles on their side in a darkened area where the temperature will remain between 60 to 65 °F. Shake each bottle daily for the first few days to help mix the yeast with the wine. (To aid in checking the progress of the fermentation, a small plastic soda bottle can be filled with the same inoculated wine and sealed with the original screw cap. As fermentation progresses, the plastic bottle will become increasingly firm.)
 - After 6 months to a year the wine should have finished its second fermentation, aged, and be ready for finishing. (The plastic soda bottle should now be hard.)

The following operations should be done wearing SAFETY GLASSES AND HEAVY LEATHER GLOVES AND APRON.

RIDDLING (Jarring the sediment from the side of the bottle, down into the neck.)

- Shake each bottle vigorously to loosen the sediment from the side of the bottle, then place the bottles neck down in a rack or case.
- Each day lift each bottle an inch or two from the rack or case, give it a sharp twist, and drop it back in place. Continue this for about a month or until all the sediment is in the neck of the bottle and the wine is crystal clear.
- [*An alternate technique for riddling is to place a case containing the wine, neck down, in the trunk of your car and driving around for a week or so, providing the temperature is moderately cool (30 to 50 °F).*]

DISGORGING AND DOSAGE (Removing the sediment from the bottle, topping up, and re-capping.)

- The bottles are then placed neck down in a refrigerator for at least 10 hours to pre-chill the wine.
- A few bottles at a time are placed, with the necks still down, in a freezer for about an hour or just until ice forms from 1/2 to 1 inch up the neck of the bottle, encapsulating the sediment.
- [*An alternate technique for forming a plug of ice is to place the neck of the bottle an inch and a half into a cracked ice and brine solution (enough salt in the water to float an egg).*]
- Once the plug of ice has sufficiently formed, hold the neck of the bottle in warm water about five seconds to loosen the ice. Then hold the bottle with the neck up at a 45 degree angle and remove the cap sharply allowing the plug of ice with the sediment to be forcefully ejected. (This is best done in an area away from people and breakable objects.) After keeping the bottle at the 45 degree angle for an additional 15 seconds, turn the bottle upright and immediately top up with ice cold wine, or a measured amount of cold sweetened brandy or sweetened vodka, then immediately recap.
- The bottles are then stored on their sides at a temperature of 50 to 60 °F for another three months before drinking.

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The New York State Home Wine Committee of the American Wine Society

www.nys-homewine.info

Notes:

oz = ounce by weight
fl oz = ounce by volume

YEAST STARTER (based on Ace & Eakin)

- 1 cup of diluted frozen grape or orange juice
- 3 Tablespoons of cane sugar
- 3 cup of water
- 1/4 tsp Yeast Nutrient.
- One pack of Lalvin EC1118, or Red Star Premier Cuvee Champagne Yeast previously rehydrated for 15 minutes in 2 ounces of 95 deg F Water. (one packet of yeast for up to 5 gal of wine);
- After 24 hours, use 2 cups for 5 gal of wine

STARTERS

| | Juice | Sugar | Nutrient | Yeast | Water | Use |
|-------------|---------------|---------|----------|----------|--------|----------------|
| | +++++ | +++++ | +++++ | +++++ | +++++ | +++++ |
| Ace & Eakin | 1 cup | 3 Tbsp | "pinch" | 1 pckt | 3 cups | 2 cups / 5 gal |
| Nardone | 2 Tbsp Conc | 0 | ? | 1 pckt ? | 2 cups | all |
| Gifford | 5% of base wn | to 3-4% | 0 | 1 pckt ? | o | 5% of basewine |

SUGAR

Assuming: 2.25 cups granulated cane sugar per pound (2.25 cups / 16 oz)
4 gm sugar per liter will produce 1 atmosphere of pressure. (4 gm / liter → 1 Atm)

$$(4.0 \text{ gm sugar / liter}) \times (3.785 \text{ liter / gal}) = 15.14 \text{ gm sugar / gal} \rightarrow 1 \text{ Atm}$$

$$(15.14 \text{ gm sugar / gal}) \times (1.0 \text{ oz} / 28.35 \text{ gm}) = 0.534 \text{ oz sugar / gal} \rightarrow 1 \text{ Atm}$$

$$(0.534 \text{ oz sugar / gal}) \times (2.25 \text{ cups} / 16 \text{ oz}) \times (16 \text{ Tbsp} / \text{cup}) = 1.202 \text{ Tbsp cane sugar / gal} \rightarrow 1 \text{ Atm}$$

BENTONITE: •1tsp = 5gm

- Bentonite should be added at the rate of 0.5 gm/gal (1/2 tsp/5 gal) to remove protein and the juice allowed to settle. After 24 hours the juice should be racked off the sediment.
 $0.5\text{gm/gal} = 0.5\text{gm/gal} \times 1\text{tsp}/5\text{gm} = 0.1\text{tsp/gal} = 0.5\text{tsp}/5\text{gal}$
- As a riddling aide, add 0.15 gm (0.03 tsp) Bentonite previously soaked in 1/4 fl oz of water for 24 hours; for each gallon of wine.
 $4\text{gm}/100\text{L} = 4\text{gm}/100\text{L} \times 3.785\text{L}/\text{gal} \times 1\text{tsp}/5\text{gm} = 0.0303\text{tsp}/\text{gal}$

TEASPOONS etc.

- 3 tsp = 1 Tbsp
- 4 Tbsp = 1/4 cup = 2 fl oz
- 16 Tbsp = 1 cup = 8 fl oz
- 1 Tbsp = 1/2 fl oz

- 1 oz = 28.35 gm
- 16 oz = 453.59 gm = 1 lb

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