Congratulations on your purchase of frozen wine must from Midwest Supplies! The following pages will help to guide you through the winemaking process. If you have further questions, feel free to call us at 866-449-2739 or email at service@midwestsupplies.com

Thawing the Must
Let your must or juice thaw out in a space with constant, room temperature (60-70°F). It will take roughly 1-3 days for the grapes to thaw. The sooner your must or juice thaw to proper fermentation temperatures, the better. If the must thaws too slowly you run the risk of contamination by spoiling microorganisms. Stirring your must with a clean, sanitized utensil will help speed up the thawing process. Once the must is thawed, transfer it to your primary fermenter. Leave a small amount of must or juice behind to swirl in your pail to pick up any residuals in the pail to transfer to your primary fermenter.

Preparing for Fermentation
The majority of winemakers who make wine from frozen musts do not sulfite their must before proceeding. This is because the extended freezing period as well as the higher concentration of sugars inhibit the existence of microbes. We do not recommend adding sulfite to the must and rather inducing fermentation with your yeast as soon as the must reaches fermentation temperatures. If you choose to sulfite with Potassium Metabisulfite, we recommend not adding above 50ppm for the volume of must, as this can cause problems with the malolactic “fermentation” (MLF) later on. 30-50ppm will suffice. Bear in mind the amount of free SO2 (in ppm) in the wine is pH dependent. We sell SO2 test kits (T1056) and pH test (T1051) kits to help you determine these values. One gram of potassium metabisulfite will contribute approximately 50 ppm to 5 gallons of must. ¼ tsp is approximately one gram of metabisulfite.

Test your must for °Brix, TA, and pH: You’ll want to test your must for the sugar content (°Brix), titratable acidity, and pH level. Adjustments may be necessary if any of these values are out of range. Making adjustments as necessary will help you make great wine.

Start with the °Brix. Use a hydrometer (6385) or a refractometer (8261, 8261R) to get your °Brix reading from a well-mixed sample of the must – it should be within 22-25 °Brix. If using a hydrometer, make sure you are using a pure juice sample. Leftover grape material will skew the reading.

If the reading is below 22 °Brix, you’ll need to add sugar to bring the reading into an appropriate range. Adding 1.5 oz. of granulated sugar per gallon will raise the Brix value by 1°. Add an appropriate amount of sugar to the must to bring the sugar level to within 22-25 °Brix. You can first dissolve the sugar in a small amount of water before you add to the must, or you can add the sugar directly. In either case, you’ll want to make sure the sugar is dissolved and mixed well into the must.

If the Brix reading is more than 25°, we would recommend diluting with unchlorinated water to within the 22-25° range. We recommend treating the water first with 7 grams per liter tartaric acid. This is to ensure the wine’s acidity isn’t skewed out of range.
**Testing Titratable Acidity:** Now to test for the Titratable Acidity (TA). For a red wine, we want the TA to land within 0.6% to 0.8%. Shoot for 0.7-0.9% for white wines. In order to get a representative sample of a red wine must, start by lightly blending a sample of the must, that includes crushed grapes, in a blender. Then, strain the sample through a wire mesh strainer or mesh bag. You can squeeze the bag or push the must in the strainer to help produce a strained sample. Finally, use a coffee filter in a wine glass or jar to filter the strained sample. We recommend using a rubber band to fasten the filter to the jar or glass. You’ll want 30 mL or more of juice so you can sample both TA and pH.

Kits to test titratable acidity are available on our website. Follow the directions on the test kit to get your TA reading. You can also use a pH meter (6436) if you have one. Follow the same procedure as you would in a Titratable Acidity test kit (T1052, 8220), except use the pH meter reading as the indicator instead of the phenolphthalein color indicator. The endpoint is reached when the pH meter reads 8.2. Stir the sample with the pH meter between Sodium Hydroxide additions.

If the TA is above 0.9% for either reds or whites, you may want to lower the acids into the must or juice’s respective acceptable range. You can do this a couple ways. We recommend considering a Malolactic fermentation for reds after the primary and/or Cold Stabilization. Malolactic fermentation is often used for Chardonnays and Sauvignon Blancs, as well.

If the TA reads much lower that 0.6%, you can raise it into the target range by adding tartaric acid. When calculating the amount of tartaric acid necessary, make the calculation based on the expected final yield of the wine. For 5 gallons of red wine must, that number is roughly 3.5 gallons. For settled white wine juice, it’s essentially the volume of the juice. 3.8 grams of tartaric acid per gallon will raise the TA by 0.1%. You can also use a teaspoon. A level teaspoon will raise the acidity by about 0.12% per gallon. Mix the tartaric acid into a small amount of water and add to the must. If you want to increase the TA by more than 0.2%, we’d recommend adding half the tartaric acid, and retest.

**Check the pH:** A suitable pH range is 3.4 – 3.6. In most cases, if the TA and the Brix are in the proper range, the pH will be within the range, but it’s best to be sure with a test with a pH meter. The Checker 1 pH meter (6436) will make this reading quick and easy.

**Add yeast:** We have a variety of wine yeasts to choose from. Choose a strain that will suit the style of wine you are making. Check our website and read the descriptions for the wine yeasts we offer. They will help you choose a strain. There may be several suitable strains, so choose one that sounds good to you.

Follow the instructions on the yeast packaging to inoculate the must with your chosen yeast strain. We recommend making a yeast nutrient addition along with pitching your yeast. We have several kinds available. Add half the total addition now, and make another half-addition when the Brix ready about 13°Brix. Yo u’re on your way to making wine!

**Primary Fermentation**

We’d recommend starting the fermentation in the 60-70°F range. A floating thermometer will help you monitor the must’s temperature. Fermentation will create heat and bring the temperatures into the 70s and above. For red, you’ll want to make sure the fermentation temperature isn’t rising into the 90s for an extended period of time, although some winemakers think a short spike in the lower 90s is ok. If the temperature gets too hot, you can freeze plastic water bottles (filled with water) in your freezer, sanitize the sealed bottles and add them to your must to keep things cool.

For whites, we’d recommend starting the fermentation in the same temperature range as reds. Once fermentation begins, if possible, slowly lower the temperature to a cooler range of 55-65°F. Do not cool too fast or the yeast may cease fermenting. Do the best you can — and don’t worry too much.

**Punching the Cap:** Once fermentation on a red wine must begins, you’ll want to “punch the cap” 2-6 times daily. That’s a lot of attention to your wine — be sure to punch the cap at least 2 times a day. To an extent, the more you punch the cap the better — it will aid your wine in several ways. The CO2 produced will lift and suspend a “cap” of crushed grapes above the juice. Punching the cap is simply using a large, sanitized spoon.
or cap-punching tool to push the grape material back into the must. Stir up the yeast at the bottom of the fermenter as well. This allows the CO2 and heat to escape as well as improves the color and flavor development of the wine among other things. As you are punching the cap, it’s a good idea to check the fermentation temperature as you are doing so.

**Note for white wines:** Punching the cap is not necessary on white wine juice since the skins and seeds have already been pressed and removed.

Most of the sugars will be fermented away in about a week, but times will vary due to fermentation temperature, amount of yeast pitched, and other factors. After about 7 days, you’ll want to start checking the sugar level of the must. You can test the sugar level of the juice with a hydrometer (be sure to get a pure sample of juice without much sediment). When the hydrometer reads around -1.5° to -2°, it means the Brix value has reached 0°, and it’s time to press. We also offer Clinitest tablets, which make testing the Brix level a breeze.

**Pressing**

**Note for white wines:** If you are making white wine, you can skip this step.

In the press process, you are separating liquids from solids. When doing small batches, you can use a nylon straining bag and your hands to squeeze the fermented juices out of the grapes. A ratcheting basket press or bladder press is an even easier pressing option and we have several sizes of both types available for purchase.

If using a press, move the must to the press and be sure to have a collection vessel below the press outlet. Some of the juice will flow freely (called “free-run” juice), and is considered higher quality juice than the pressed juice due to fewer harsh tannins being extracted from the grapes. Some winemakers opt to separate the free-run juice and juice from the pressed juice (“press-run”) and store them separately. You could blend the two later if you so desired. It’s also fine to simply combine the free-run and the press-run and age together. Be sure to sample and taste the press run-off to know when to stop pressing. You’ll know to stop when the runoff starts to taste astringent. Consider sulfiting the spent grape skins and using them to add extra structure to a Winexpert wine kit.

The collected juice can be transferred to cleaned and sanitized carboys or other containers that can be purged of oxygen. For the most part, you want to prevent oxygen from entering your wine from this point forward.

Within 24-48 hours after pressing and transferring to your temporary storage container(s), you’ll want to transfer off the sediment (called gross lees) that has collected at the bottom. This particular type of sediment can lead to off-flavors in your wine if left in contact with your wine too long. Transfer into cleaned and sanitized carboy(s) leaving minimal headspace.

**Malolactic Fermentation (MLF)**
You may choose to conduct a malolactic fermentation (MLF) with malolactic bacteria on your wine, which is traditionally done on most red wines and Chardonnays or even Sauvignon Blancs. This process converts the harsher malic acid into lactic acid, which is a softer acid on the palate. MLF rounds out red wine in most cases, helps lower the acidity, and adds body to the wine. We have liquid (ACT4007) and dry malolactic bacteria (ML001, ML002) available.

Malolactic bacteria are extremely sensitive to sulfite, so you will want to wait on any sulfite additions until after MLF is complete. Keep an airlock on the carboy while MLF is active. Three things will contribute to a successful MLF: stir the lees up from the bottom of the carboy twice a week, keep temperatures in the 70-75°F range, and keep oxygen out of the headspace. Our inert gas product, Private Preserve (A6031), can help you purge the headspace. The MLF process can take 2-6 weeks to complete. You can test for the completion of MLF with the Malic Acid Test Kit (T1054). When complete, you can make additions as necessary and transfer the wine off the lees.
**Racking after MLF**

Once MLF is done, you will want to transfer off the lees into a new cleaned and sanitized carboy. During the transfer you can sulfite the wine and make adjustments to the pH and TA. Starting with the sulfite, we’d recommend adding half the total amount necessary to protect your wine, as the amount necessary is dependent on pH. The pH will shift if you make adjustments to the TA. Test and taste a sample of the wine for TA and pH, since the MLF will have changed these values. Make adjustments, as necessary, to the TA in order to please your palate and bring the pH value within the acceptable 3.4-3.65 range. It helps to make the sulfite and TA additions at the beginning of the transfer off the lees to promote good mixing. Proceed to aging in the carboy.

**Aging/Sulfites**

In terms of storage temperature, there are benefits and drawbacks of storing the wine in warmer temperatures as well and benefits and drawbacks of storing in cooler temperatures. Aging the wine in roughly 55-60°F, if possible, is a good balance of the two.

During the aging process you will also want to monitor and maintain a protective quantity of free SO2 in the wine to protect it from oxygen and wine-spoiling microorganisms. To help you do this, it’s useful to have a SO2 Test Kit. Even if you calculate how much sulfite to add to maintain sufficient free SO2, depending how it binds in the wine, it may not be enough. Testing the wine and adjusting the SO2 into the proper range is the only way to be sure your wine is protected properly. You’ll want to do this as the wine ages when any taste testing is performed during the aging process, as well as to account for the slight loss that occurs with time.

The optimum amount of free SO2 to protect your wine is pH dependent, but if the wine is within the 3.4-3.65 pH range, the ppm of free SO2 necessary is about 20-35. Use the chart below from Accuvin as a guide:

![SO2 Chart](chart_image)

The Sulfite Calculator at Winemaker Magazine’s website (www.winemakermag.com) will help you with your sulfite addition quantities.

**Questions?**

As a full-blown home winemaker, it is wise to equip yourself with good resources. We carry several winemaking books that cover much more that what is overviewed here. We highly recommend books such as “The Way to Make Wine” by Sheridan Warrick (W8991), “Home Winemaking Step by Step” by John Iverson (8980) or David Pambianchi’s “Techniques in Home Winemaking” (9123). You can also give us a call if you have any questions in the winemaking process: 888-449-2739

Cheers!

**The Crew @ Midwest Supplies**