

Wine Room Preparation & Construction Guide

Disclaimer: This information is provided as a general guideline. The consultation of a local qualified contractor along with the understanding and adherence to local building codes and standards is necessary. The building science of wine room construction and building materials is continually developing and may have different application and interpretations in different climate zones. The improper construction of a refrigerated wine cellar/wine room can result in excess condensation, mold growth and mechanical equipment failure.

Types of Wine Storage

- **Passive:** Non-refrigerated wine storage. Typically, this is a conditioned, interior environment with ambient temperatures in the 65–70 degree range that does not fluctuate much. This format works fine for non-collectable ‘everyday drinking’ wine that is stored and consumed within 6 months of stocking.
- **Active:** Refrigerated wine storage. A mechanical unit is utilized to maintain ideal long-term wine storage for the purpose of slowing the maturing rate of wine. This allows wine to age and develop. Temperature ranges can be programmed to maintain constant 55 degree temperatures and elevated humidity is maintained and controlled. Proper room construction is required.

Ideal Conditions for Wine

- **Avoiding UV light** is necessary to properly store and age wine. Modern wine rooms are more aesthetic entertaining spaces and tend to benefit from display lighting. LED lighting is low heat and does not have a UV light frequency making it perfect for wine rooms.
- **Vibration agitates wine**, stirs sediments, and inhibits proper aging. Avoid sharing walls with mechanical equipment that can cause vibration (air handlers, clothes dryers, garage doors, etc.).
- **Constant temperature is king**, The optimal storage temperature is 55-58 (debatable), but more important is a constant environment that does not fluctuate. Frequent temperature spikes have an adverse effect on wine.
- **Proper bottle orientation** is a critical element in storing and aging wine. Most wine should be stored on its side with the wine in contact with the cork. This keeps the cork from drying out and letting oxygen get into the wine bottle. Exceptions can include Champagne and Port.

Note: Wine storage temperatures should not be confused with wine serving temperatures. Storage temperatures are the same for most wine types, whereas serving temperatures vary by varietal. It is a common practice to store wine at an optimal red wine serving temperature (60-68 degrees). This results in less energy costs and reds ‘ready to drink’ at the optimal temp.

Room Construction

- **Passive:** Wine rooms should be located on an interior wall to minimize exterior temperature fluctuations and be out of direct sunlight. Non-insulated frameless glass walls and doors can be used.
- **Active:** A climate controlled wine cellar is like a refrigerator. It's an insulated sealed envelope with an airtight door. There are many modern building materials that address these issues and are ideal for wine room construction. This enables the wine room to be located anywhere in the home or business, not just the basement. There are certain key factors required to build-out a wine cellar to maintain temperatures produced by a mechanical refrigeration system.
 - **Insulation:** A minimum of R15 and R19 if possible, is recommended. If the cellar shares an exterior wall, R30 insulation is preferable for that wall. Do not forget the floor and ceiling. Spray foam (closed cell) is ideal, although fiberglass insulation is a commonly used material.
 - **Vapor/Moisture Barrier:** It is imperative to use a moisture or vapor barrier when constructing a wine cellar. The most common vapor barrier is 6 mil polyethylene. You should wrap this material around the entire wine cellar on the outside (the warm side) of the insulation. Open-cell spray foam requires a physical vapor barrier.
 - **Airtight Seal:** When the wine cellar door is closed, there should be no airflow entering or leaving the space. The door should have weather-stripping and a door-sweep to prevent air from coming into the cellar when the door is shut. Kessick offers wine doors that are exterior rated with weather seals and insulated glass that are constructed to match the

Compensate for conditions:

- Glass walls, windows and doors require a 'thermal load calculation' by the refrigeration equipment supplier and may result in a higher BTU requirement.
- Un-insulated frameless glass should be used with caution. Frameless glass has very low R-value and requires the proper upsizing of refrigeration along with care to avoid glass condensation.
- Electrical outlets, light switches and ceiling lights need to be insulated and sealed.
- Concrete walls and floors are a 'thermal mass' that do not provide adequate R-values and require additional insulation for an active wine cellar environment.

Wine Refrigeration Systems

Disclaimer: Kessick LLC are not refrigeration technicians and recommend consultation with a local refrigeration and/or a nation wine refrigeration company.

Types of Wine Refrigeration Systems:

Note: There is a direct correlation between price and performance when it comes to selecting a wine cooling system.

Through-the-wall cooling systems are the most cost-effective and easiest to install. They are shipped fully-charged and ready to use in a self-enclosed case.

Split cooling systems are built so that some of the components are located outside the wine cellar and some inside the cellar. The 2 sets of components are connected by 2 refrigerant lines, along with power and a condensation drain, that are installed by a qualified professional.

Ducted cooling systems, in which the entire cooling unit is located remotely, and cold air is ducted into the wine cellar, are generally the most expensive wine cooling systems. Their main advantages are that the wine cellars won't be subject to noise from the cooling unit and can be serviced by most HVAC professionals. In addition, space in the wine cellar can be maximized for wine storage, because the cooling unit doesn't take any space inside the cellar.

Recommended wine refrigeration companies:

<http://www.cellarprocoolingsystems.com/> **Cellar Pro**

<http://wineguardian.com/> **Wine Guardian**



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