



General Air Products Wine & Beverage Process Cooling Specialists

A leading manufacturer of equipment for the industrial refrigeration and air conditioning markets, General Air Products specializes in providing products designed to meet the unique requirements of the wine & beverage processing and storage market segments.

This application experience, coupled with General Air Products' technically superior, highly efficient products, translates to consistent, high quality wine & beverage products benefiting both processors and consumers.

General Air Products offers a wide variety of standard chiller models in capacities ranging from ½ Ton to over 350 Tons. Furthermore General Air Products excels in the design and construction of custom chillers made to fit unique applications in any industry.

Excellent wine depends on excellent process temperature control

Certainly, the production of wine is a complicated mixture of art and science. Color, flavor and aroma-characteristics that define a quality wine-rely as much on the technical expertise and experience of the winemaker as on the grapes themselves.

Precise process temperature control is one of the most critical technical requirements of modern winemaking. It allows high volume production while insuring that the unique character of the final product is consistently attained.

Temperature control is also an important factor in the preservation of wine to insure the consistent quality required to allow worldwide distribution in today's global market. General Air Products' chillers give you that control.

Pre-Fermentation Process Cooling

During a process called crio-maceration the grape musts (freshly pressed grapes still containing solids- pulp, skins, stems, and seeds) are cooled to a temperature of 40°F in stainless steel tube-in-tube heat exchangers. The time and the temperature at which this process takes place greatly determine the characteristics of the finished product.

Cooling also plays a critical role in the clarification process. This pre-fermentation process involves static separation of the musts at a temperature of 50°F- 58°F to remove suspended impurities.

Cooling Required During the Fermentation Process

Temperature control of the musts during the fermentation process is required for the production of high quality wines. Alcoholic fermentation is the chemical reaction in which yeast is used to transform the natural sugars of the fruit into alcohol.

The heat generated by this exothermic reaction has to be managed. If must temperatures are allowed to reach the 85°F to 105°F range the reaction will be stopped. This results in high sugar content and an unstable product that requires the addition of sulphur dioxide (SO₂) to allow it to be stored without spoiling. In general, optimal fermentation temperatures are 65°F - 68°F for white wines and 77°F for red wines.

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For more details call
1-800-345-8207

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www.GeneralAirProducts.com



Cooling Required During the Fermentation Process

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Although fermentation tanks are generally cooled, certain system features may require heating as well. In these cases General Air Products' heat pump version of our standard chiller is available to meet this requirement. This customized unit is available with stainless steel casing panels making them more hygienic and increasing overall durability.

For example, a winery with an annual production of 500 tons would use a General Air Products chiller to manage the 18 tons of cooling associated with the fermenting process. The chiller's on-board storage tank maintains a 90 gallon supply of chilled water at 41°F from which it is pumped through heat exchangers immersed in the fermentation tanks (or in some cases, through tank jackets). The large volume of the chiller's storage tank provides a thermal mass which compensates for sudden changes in cooling load to provide constant chilled water temperatures regardless of external conditions.

A unique feature of our chillers is the extended surface evaporator located inside the storage tank which provides high cooling efficiency and low resistance to water flow. This minimizes the electric energy costs associated both with the refrigeration compressor and the chilled water circulating pump.

Malolactic Fermentation

Malic acid occurs naturally in wine and provides a tart, apple taste. For the wine to have a more delicate taste, malolactic fermentation is employed by adding lactic acid bacteria to the wine to convert the malic acid to the softer-tasting lactic acid. This is often used for barrelaged (oaked) wines. Sometimes malolactic fermentation can occur unintentionally after bottling resulting in a slightly carbonated, bad tasting wine. This can be avoided by raising the wine temperature to about 77°F. Either a customized heat pump chiller or a chiller that is equipped with condenser heat recovery can provide the heat required for this process.

Cold Stabilization

At low temperatures, potassium bitartrate, a natural component of the wine will appear as sediment in the bottle. To avoid this situation the wine is chilled to about 27°F for a period of up to 24 hours prior to bottling. This process, called cold stabilization, causes the potassium bitartrate to precipitate out of the wine where it can be filtered out. Continuing the example of the winery above, cold stabilization is achieved with (4) 10 Ton chillers that chill brine to about 19°F. This brine is then circulated to the wine tanks to maintain the proper temperature.

Precise Temperature Control

Wine making is delicate business. Each phase of the process requires controlled conditions to achieve optimum quality. The winemaker must have complete control of process temperatures and be informed of any problems. Each model of the General Air Products line of process chillers includes a user friendly electronic controller that provides digital temperature indication, easy parameter adjustment and enunciates over twenty individual alarms to provide instant troubleshooting.

Remote monitoring and control is also available with a supervisor system or your chiller can be equipped with a technologically advanced server card that can communicate with any PC-client anywhere in the world. This web-based server transmits performance data and allows remote operation via a web browser interface.

Conclusion

General Air Products' chillers provide the winemaker with an efficient tool to optimize the temperature control portion of the winemaking process. And with many years of experience and long-tested reliability, this industry is just one of the many food and beverage applications where General Air Products offers the right refrigeration products to insure the quality of the finished product.

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Process Chillers for Wine Making Applications



*Unit shown with
front panel removed for internal viewing.*

- **Prevents clouding or browning during fermentation**
 - Quick chill to 20-25°F (chills to 5°F if necessary)
 - Inexpensive complete system with enclosed cabinet
 - Small footprint of 30" x 22"
- Caster wheels can be optioned where mobility is needed
 - Self-contained system with pump & tank



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Industrial Air Cooled Chillers Spec Sheet
Model Number: TAE M10



Model Number:
TAE M10

Nominal Capacity:
1.03 Tons

BTU/H: 12300

Total FLA: 12.9

Compressor Qty.: 1

Compressor Absorbed

Power (kW): 1.7

Standard Voltage:
230/1/60 (additional
options available)

Tank Size: 7 Gal.

Standard Pump HP: 1/2

Nominal Flow (GPM):
2.4

Available Head (FT): 62

Fan HP: .15

Fan CFM: 1800

Dimensions:
29.2" x 21.7" x 33.9"

Weight: 176 lbs

Connection Size: 1/2"



High Ambient Operation

Large condenser and increased airflow permit operation up to 105°F

Low Water Pressure Drop

Less than 2 psi.
Low velocity water flow through energy storage tank evaporator. Reduced frictional resistance of water in contact with exchanger fins.

Accumulation Tank

Made of stainless steel, can be connected to open fluid circuits, and is completely sealed.

Cabinet

Manufactured from galvanized steel, etched and finished in baked epoxy coating.

Microprocessor Controls

General's M10 comes standard with level 1 microprocessor controls plus main switch, 4 membrane switches, 2 digit LED window (7 segments each), 2 LEDs

R22 Evaporator / Energy Storage Tank

Refrigeration grade copper coil with external aluminum fins, immersed in an insulated storage tank. Supplied with 304 stainless steel tanks, which are sealed. A built in plastic fill/vent tank is included. Suited for open circuits only.

Water Circuit

Combination evaporator/storage tank is piped to a pump with a fixed by-pass to prevent dead head condition and to ensure continuous water flow through the evaporator. Close-coupled TEFC motor is standard.

Refrigeration Compressor

High efficiency, fully hermetic, reciprocating, heat pump duty compressor, with low noise level, suction gas cooled, fitted with internal thermal protection and anti-vibration mountings.

Easy Maintenance

All main components are easily accessed by removing the front panel.

Ask about our wide variety of custom options!

1-800-345-8207

for more information on these and all of our products please visit our web site
www.GENERALAIRPRODUCTS.com