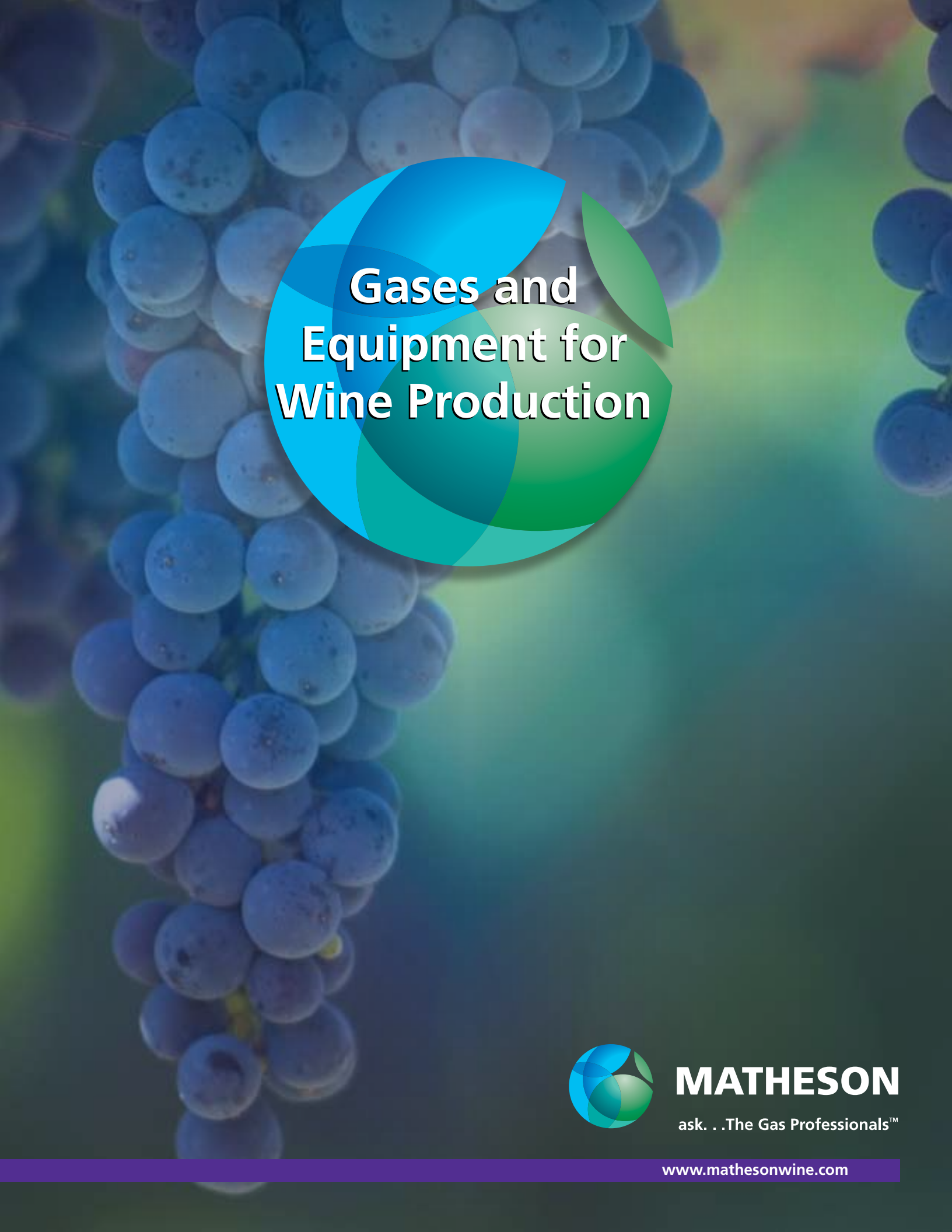

Gases and Equipment for Wine Production

MATHESON

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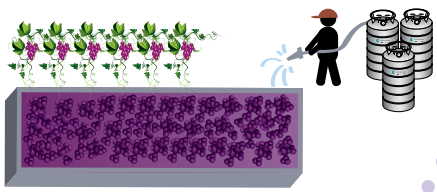
www.mathesonwine.com

MATHESON *Wine*

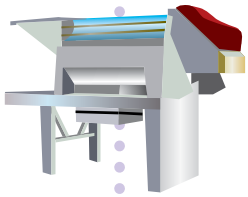
As one of the leading compressed gas providers in the world, we are completely qualified to deliver the gas and gas-related products you need. Count on **MATHESON** for Quality, Purity, On-time Delivery, and Safety.

As **MATHESON Wine**, we are dedicated to gases, chemicals, and equipment of special importance to wine producers. Not only do we offer products with off-the-shelf delivery, but our specialists can help you choose and use these tools for optimum results.



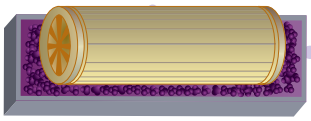
1. Controlling Fruit Temperature in the Vineyard during Harvest and Transport

Grapes need to be kept cool during harvest and transport (**CO_2** with **Snow Horn** or **Dry Ice**).



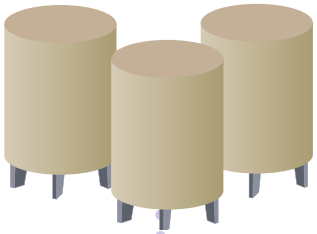
2. Must Stabilization

To control bacteria, wild yeasts, and mold - and to inhibit oxidation, the must needs to be stabilized by increasing the amount of molecular SO_2 in the must by adding **Sulfurous Acid Solution** (**H_2SO_3**, using an **H_2SO_3 Dispenser**).



3. After Pressing

The juice contained in the press pan needs to be blanketed at this stage of the processing (**CO_2** with **Snow Horn** or **Dry Ice**).



4. Temperature Control during Fermentation in Tanks or Open Tops

Chilling of the juice or must (**CO_2** with **Snow Horn** or **Dry Ice**) remains a priority until the barreling and aging process can begin. Micro-oxygenation is used to introduce controlled amounts of Oxygen or Air (**Beverage Gas O** or **Beverage Gas A**) for enhancing wine during fermentation and aging in a controlled environment.

5. Aging Wine

A gas blanket (**Argon**, **Nitrogen,** or **CO_2**) in the barrel can provide a non-reactive atmosphere for aging using a **Gas Blanketing Device**. Preserve Barrels (**SO_2 Gas)** and make SO_2 adjustments with **Sulfurous Acid Solution** (**H_2SO_3**).

6. Pressure Transfer from Barrels to Tanks

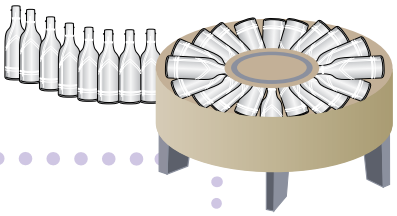
After barrel aging, when the product is being transferred to storage or blending tanks, gas pressure transfer (**Nitrogen** or **Argon** using the **Barrel Master** and a **Racking Arm**) is preferred over pumping to minimize turbulence, Oxygen mixing, and exposure of the ingredients to pump mechanicals.

7. Blanketing of Storage Tanks

Wine product stored in tanks prior to bottling should be blanketed (**Argon, Nitrogen,** or **CO_2** using the **Gas Blanketing Device** or **CO_2** with **Snow Horn**) to provide a controlled inert environment during storage periods. Alternatively a Positive Pressure System with a **Tri-Action Tank Safety Vent** can also be used.

8. Sparging of Wine during Storage or Blending

Sparging is used to remove Oxygen or CO_2 (using **Nitrogen**), and it may also be used to adjust the level of CO_2 (by adding **CO_2**) to the wine. In some situations, a mixture of Nitrogen and CO_2 (**Beverage Gas**) may be used. In all applications, an **In-Line Sparger** is used. Various size spargers are available, and flow control of the gas is used to adjust the rate of flow, depending upon the sparger and the desired results.

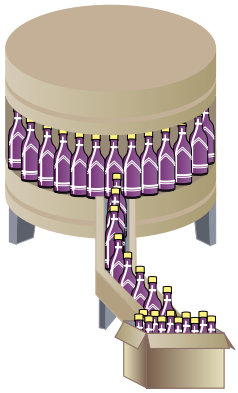


9. Stabilization of Wine at Bottling Stage

Biological stabilization (using **SO_2** and a **Pure SO_2 Dispenser** or a **Sulfurous Acid Solution** and **H_2SO_3 Dispenser**) of the wine, if needed, is conducted at the bottling tank.

10. Blanketing of the Bottling Tank

As is also the case for wine storage tanks, wine product in the bottling tank should be blanketed with **Argon, Nitrogen,** or **CO_2** to guard against uncontrolled oxidation or other reaction since the bottling tanks are subject to dynamic changes. **A Gas Blanketing Device** and, alternatively, a Positive Pressure System with a **Tri-Action Tank Safety Vent** can be used.



11. Bottle Purging during the Filling Process

In order to remove the risk of Oxygen mixing with the wine during bottling, wine bottles must be purged before the fill process. **Argon, Nitrogen**, or **CO_2** may be used as the purge gas. A **Bottle Purger/Sparger** is used to deliver the gas to the inside of the bottles.

12. In the Tasting Room

Wineries generally prefer to preserve open bottles to prevent oxidation of the wine and to maintain CO_2 levels.

Various **Beverage Gas Mixtures** are well-suited for this application, with the specific choice of gas depending upon the varietal and the amount of dissolved CO_2 desired. Gas is delivered to the bottle using a **Bottle Blanketing Device**. Special small-sized **aerosol-style gases** are also available.

Winery and Facility Maintenance

Vineyards and Wineries have infrastructure maintenance requirements just like any other manufacturing operation, such as tanks, stands, staircases, catwalks, and other facility elements – often fabricated from stainless steel and aluminum.

MATHESON offers various welding and cutting gases, as well as the associated equipment, parts, and supplies that are staples of any facility maintenance operation.

Gas or Liquid Supply?

Nitrogen (N_2), Argon (Ar), and Carbon Dioxide (CO_2), can each be supplied in conventional cylinders or in liquid dewars. Choosing the container type is typically a simple decision based on how much gas will be consumed. For the largest consumers, Bulk Nitrogen, Argon, and Carbon Dioxide can be delivered to an on-site tank.

Whether liquid or gas, **MATHESON** supplies all the dispensing, pressure regulators, and flow control devices for safe and effective handling.

Nitrogen: Nitrogen is non-reactive and is useful for pressure transfer of fluids, blanketing of tanks, tankers, and barrels, for sparging to remove oxygen or CO_2, or bottle purging.

Carbon Dioxide: CO_2 is used for refrigeration, purging, sparging, and blanketing. Comes in liquid, gas, and solid (dry ice). Proper wine must temperature can be maintained using dry ice. Use a liquid cylinder with a snow horn to cool harvested grapes in the vineyard, and blanket tanks fast and safely. With gas cylinders and a gas blanketing device you can blanket tanks, tankers, barrels, and purge bottles. Add CO_2 to wine by using an in-line sparger.

Argon: Argon is non-reactive and is considered a noble gas, and is useful for pressure transfer of fluids and for blanketing of tanks, tankers, barrels, and bottle purging.

Sulfur Dioxide: Cylinders come in gas and liquid withdrawal. SO_2 cylinders designed for gas withdrawal provide convenience for gassing barrels with a SO_2 gassing unit. SO_2 cylinders designed for liquid withdrawal can be used with pure SO_2 dispensers: 1000 gm and 5000 gm sizes, safe and accurate to make SO_2 additions to tanks.

Sulfurous Acid Solution: This is a 6% solution made with high purity liquid Sulfur Dioxide and water. It can be used with an H_2SO_3 dispenser and comes in 5, 42, and 330 gallon stainless steel containers.

Beverage Gas: Dedicated high purity gas cylinder mixtures for blanketing, purging, and sparging. While sparging for oxygen removal, achieve the desired dissolved CO_2 levels with Beverage Gas mixtures. Preserve open bottles and micro-oxygenate with Beverage Gas.

Propane: Used for forklifts, heaters, and power generation. Comes in cylinders and bulk.

MATHESON *Wine*

Specialty Equipment

The **Tri-Action Tank Safety Vent** is used as a pressure relief device to avoid vacuum or over pressurization inside a tank or piping system.

Gas Blanketing Devices diffuse the directional energy of the gas flow in tanks and tankers and allow the molecular weight of the gas to blanket gently (laminar flow).

CO_2 Snow Horns are used with liquid and dip tube cylinders to produce CO_2 snow for the effective purging of tanks, tankers, barrels, and gondolas.

The **In-Line Sparger's** unique design allows the wine to pass on top and around the diffuser surface generating turbulence and very small bubbles.

Racking Arms are available in various configurations for safe and efficient racking of tanks and barrels.

The **Barrel Master** uses inert gas pressure to transfer wine allowing easily controlled, gentle flow without agitation or oxidation.

A two **Bottle Purger/Sparger** is used with Argon, Nitrogen, or CO_2 to purge bottles before filling.

H_2SO_3 Digital Solution Dispensing Systems are designed for the easy addition of a 6% Sulfurous Acid Solution to barrels and crushers.

Bottle Blanketing Device is used to blanket open bottles of wine to prevent oxidation and wine spoilage. When used with Beverage Gas mixtures the device produces a blanket of protective atmosphere on the wine's surface and displaces oxygen.

- **Sanitary Fittings & Valves**
- **Gas Regulators & Flowmeters**
- **Sanitary Hoses**
  - FDA and USDA Compliant
- **Hygienic Tools & Handling**
  - Meets FDA and USDA Requirements
- **Specialty Chemicals**
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  - Acid Cleaners
  - Alkaline Cleaners
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- **Safety Equipment & Supplies**
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