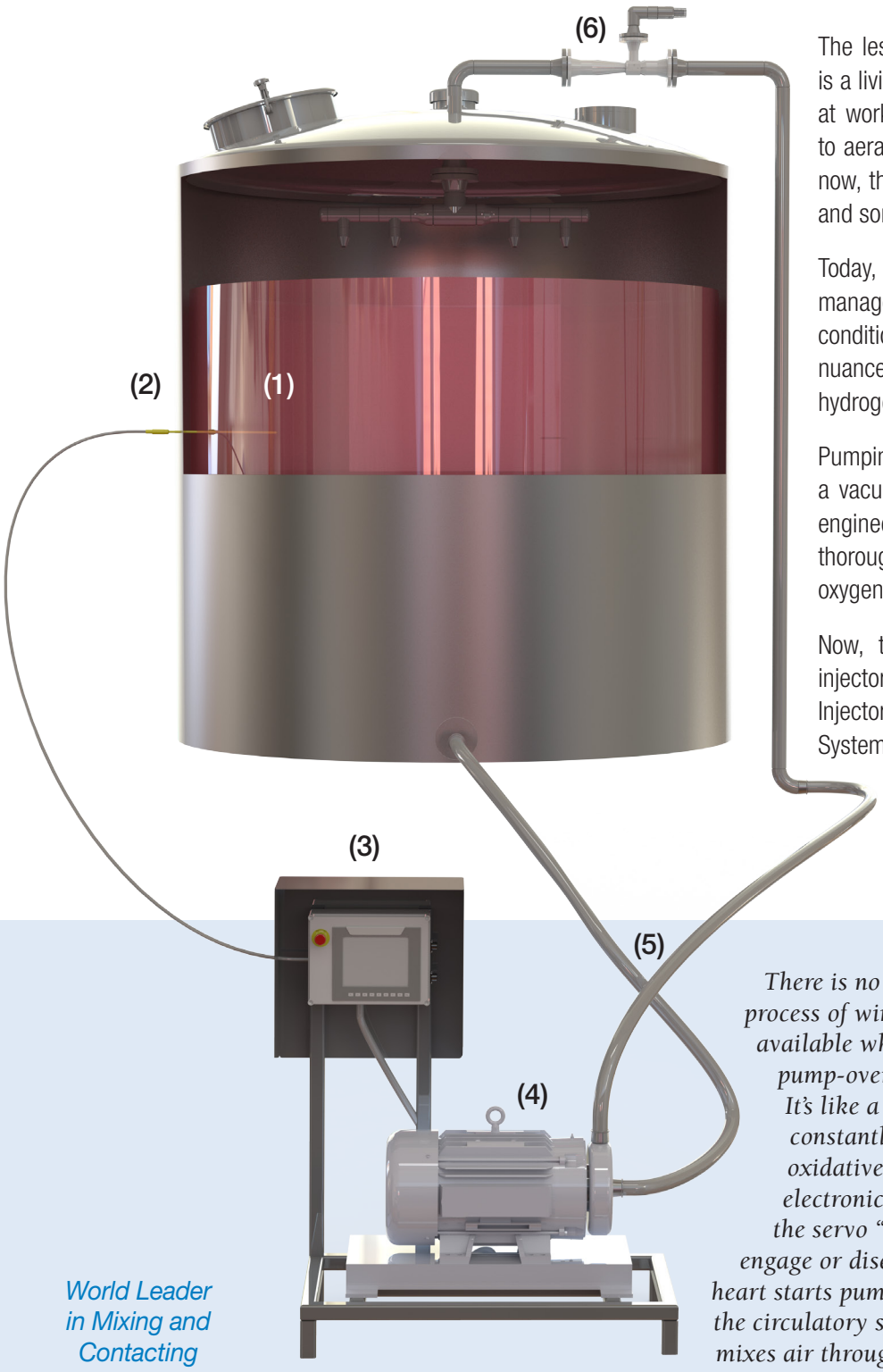
PRECISION AERATION...

ORP Management: The Future of Wine Pump-over



The lesson of fermentation is simple and profound: wine is a living, breathing ecosystem, especially when yeast are at work. For generations, winemakers have used pumps to aerate and agitate wine during fermentation—but until now, that has largely been governed by habit, guesswork, and sometimes sense of smell.

Today, science provides winemakers with an ideal tool to manage pump-over to optimize aeration and create the conditions that allow yeast to create beautifully balanced, nuanced, richly colored wines without the formation of hydrogen sulfide and other products of reductive reactions.

Pumping fermenting must through a venturi injector creates a vacuum that draws air into the stream. The precision-engineered chambers and vanes in Mazzei injectors thoroughly mix oxygen into the solution, raising dissolved oxygen levels in the must to supply hard-working yeast.

Now, the efficiency and simplicity of using a venturi injector in pump-over has taken a new leap. Mazzei Injector Company's new Macro-Aeration Pump-Over System precisely adjusts the aeration process according to continual measurements of oxidation reduction potential (ORP). That delivers oxygen to the yeast exactly when it's needed, and maintains ORP at target levels.

There is no better approach to enhancing the biological process of winemaking than ensuring that oxygen is available when yeast need it. The Mazzei macro-aeration pump-over system mimics a biological system itself. It's like a body. An ORP sensor (1) "tastes" the wine constantly, precisely measuring whether it is in an oxidative or reductive state. Through the system's electronic nervous system (2), it communicates with the servo "brain," (3) which determines whether to engage or disengage the pump "heart" (4). When the heart starts pumping, the movement of fermenting must in the circulatory system (5) creates a vacuum that draws and mixes air through the Mazzei venturi injector (6)—the "lungs" of the system. The result brings wine to life.

World Leader in Mixing and Contacting Technologies

Advantages of the Mazzei Macro-Aeration Wine Pump-Over System include:

- Precise, science-driven control of the aeration process.
- Better data management allows for repeatable performance.
- Efficient, effective mixing of oxygen into the fermenting must, using the flow of fluid through the system to draw in and incorporate air.
- Infinite adaptability, allowing winemakers to experiment and fine-tune aeration parameters to manage fermentation exactly the way they want.
- One-piece, machined 316L or cast CF3M stainless steel injectors—precision-engineered, durable, and easy to sanitize.
- Flexibility to aerate during racking or mixing.
- The ability to cleanly, precisely and conveniently inject liquid fining agents, tannin, carbon or other inputs.
- Easy installation, sanitation and operation—the only moving part is the pump.

In short, the Mazzei macro-aeration pump-over system enhances the biological process of fermentation with life's most essential element: oxygen.

Mazzei developed this revolutionary tool for winemakers by combining its experience in the winemaking industry with the company's decades of experience helping industrial and municipal water engineers manage ORP at a massive scale. Contact us to explore how you can use the Mazzei macro-aeration pump-over system to take control of aeration in your winemaking process.

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ORP: Oxidation Reduction Potential

The key to the Mazzei macro-aeration wine pump-over system is oxidation reduction potential, or ORP—sometimes called redox. ORP is an electrical measure of whether a solution is capable of releasing electrons (oxidizing) or receiving them (reducing). As fermentation occurs and yeast cells multiply, ORP falls rapidly from an oxidizing state to a reductive state.

Fermenting must in a reductive state is prone to the chemical conversion of elemental sulfur into hydrogen sulfide. The addition of oxygen reverses the trend and pulls the system out of its reductive state, minimizing hydrogen sulfide production without the need for copper or other additives.

Skilled winemakers have used their noses to stay alert to the production of H_2S. But monitoring ORP makes the process more responsive and helps winemakers intervene sooner. Studies by Dr. Gordon Walker and the staff of Opus One demonstrated the ability of electronic monitoring of ORP to predict reduction before winemakers could even begin to smell the telltale odors of hydrogen sulfide.

Innovative winemakers have demonstrated the power of Mazzei venturi injectors to efficiently aerate fermenting must during pump-over and thoroughly dissolve oxygen into the stream for use by metabolizing yeast. Now, Mazzei Injector Company is integrating ORP measurements with the effectiveness of venturi injector aeration in its new wine pump-over system, using readings from the ORP sensor to turn the pump on or off—essentially letting the yeast drive the aeration process based on its need for oxygen.