

DICE[™]

Patented

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TECHNOLOGIES[™]

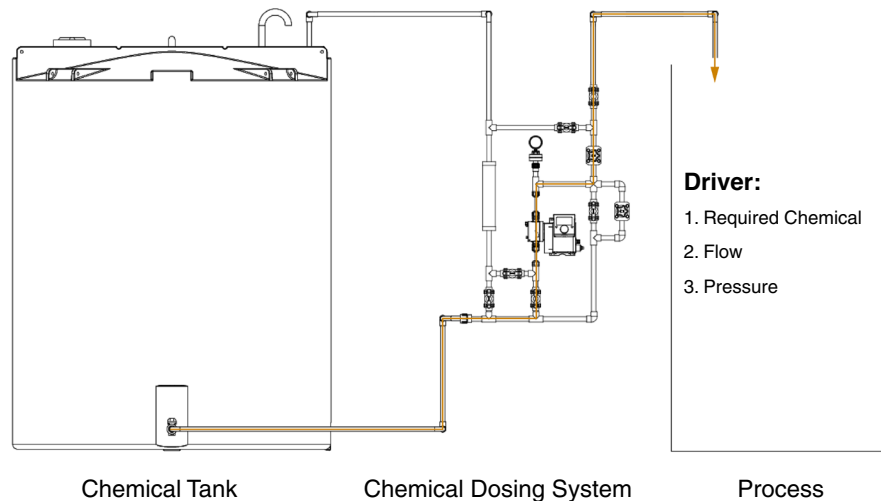
Why Chemical Dosing Systems Can Be Complex & What You Can Do To Solve This

Let's start from the beginning

The need for chemical

Explanation

The need for a chemical dosing system comes from one thing and one thing only: your process requires chemical addition. It may need chemical continuously, transitionally or only under specific circumstances.

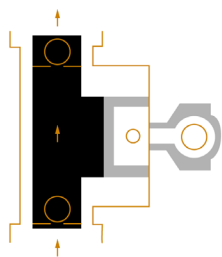


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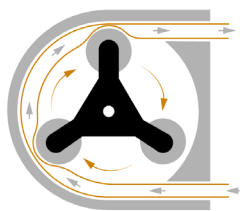
Dosing pump: the core of the application

The center piece of your chemical dosing system is the dosing pump. It's the motorized element which generates the chemical flow in the chemical feed system, resulting in the right volume being introduced in the process.

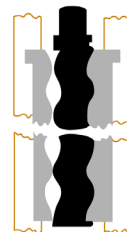
- Various types of pumps are available and selecting the right one for your application is critical.
- Not all pumps will perform equally nor be economical for a given application: this greatly depends on the chemical, flow and pressure.



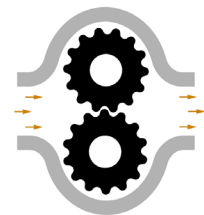
Diaphragm Pump



Peristaltic Pump



Progressive Cavity Pump



Gear Pump

Essential accessories

In order to offer versatility while making the pumps reliable, safe, redundant and efficient, your application should include the following components:

Pressure relief valve:

- Protects the system from overpressure

Back pressure valve / Non-return valve:

- Allows for a constant pressure on the pump discharge and prevents the process from returning to the make-up unit or leaking on the floor (in the case of a tube rupture on a peristaltic pump)

Note: The peristaltic pump being sensitive to its outlet pressure, the back pressure valve is set at a lower pressure than the process pressure. Therefore, the valve only acts as an extremely efficient non-return valve.

Pressure gauge:

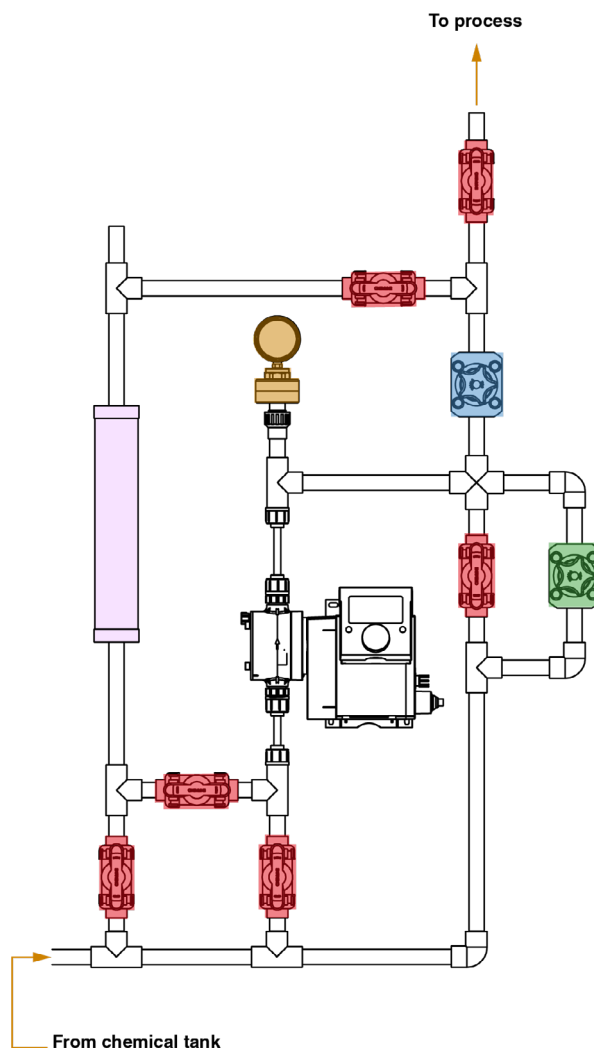
- A key element of the systems, serving two functions:
 1. During the system commissioning, the pressure gauge is used to set both the back pressure and the pressure relief valve.
 2. Following the system start-up, the pressure gauge serves as the primary indicator of the system's operation and can act as a valuable tool for troubleshooting.

Pressure gauge isolator:

- Using its diaphragm, serves as a protective layer between the pumped chemical and the metallic pressure gauge. Therefore, prevents any undesirable chemical damage to the pressure gauge.

Ball valves:

- Used for pump calibration, isolation and other functions



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Calibration column:

Allows for:

- Initial & periodic calibration of your metering pump
- Visual validation of the actual chemical volume added to the process (an essential troubleshooting feature)
- Troubleshooting

The challenges in using these accessories

Integrating the above accessories brings two main challenges: **leaks and complexity**



Leaks from joints

- Potential liabilities
- Health and Safety risks
- Warranty claims
- Cost of repairs
- Liquid damage
- Downtime

Leaks typically occur at the many system glued/welded and threaded connections. They can significantly reduce the useful life of the system, increase the OPEX and pose a serious health and safety risk.

Chemical leaks damage not only the systems but also the facility and its environment. Here we have an emergency eye wash station that was corroded to the point of not being functional and needed replacement. This was the result of a small sodium hypochlorite leak: a simple example that illustrates the indirect material damage that can result from chemical leaks.

Complexity

- Custom design
- Specific procedures
- Labour intensive
- Design
- Fabrication
- Assembly
- Complex troubleshooting
- Susceptible to gas locking

Integrating the few essential accessories can quickly create highly complex chemical dosing systems. Not only are they complicated to design, fabricate and integrate, they can also be confusing to operate and troubleshoot.

How to overcome these challenges

By integrating the DICE™ solution

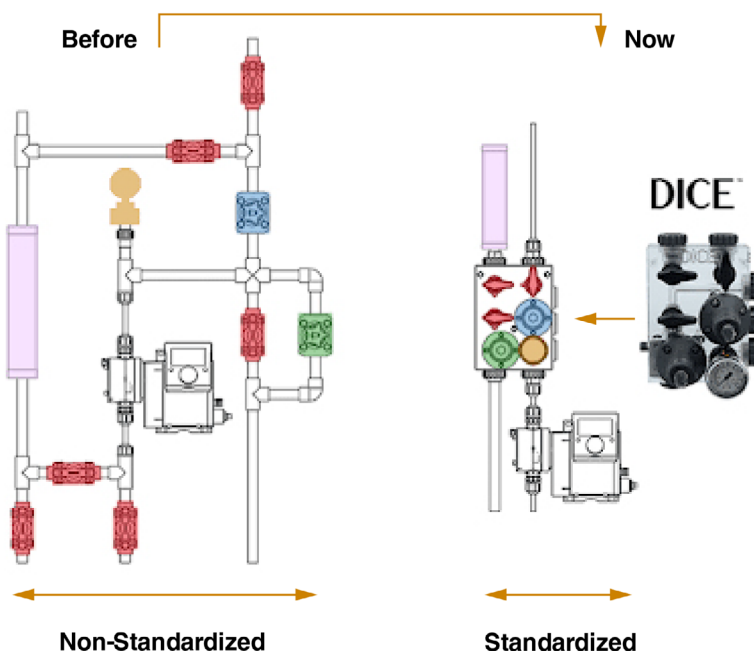
The DICE™ patented solution addresses the leak and complexity challenge by integrating all the essential components inside a single chemical-resistant block.

The dosing module intention is to overcome the many design challenges of conventional systems, such as: poor quality of the piping connections, many potential leakage points, excessive vibration caused by the pump pulsation (which leads to mechanical fatigue on connections and components) and the unjustified large footprint required.



Key benefits of DICE™

DICE™ has no threaded or glued connections, and it has a 50% smaller footprint than any regular dosing system. Learn more about the six major benefits it brings to the industry in the next pages.

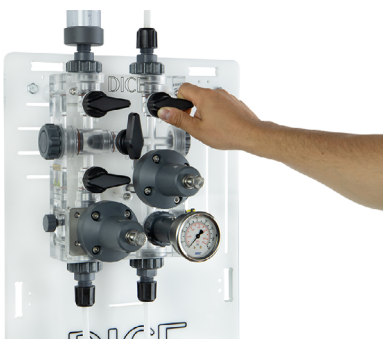


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1. Minimized Footprint

- 2 times smaller than a traditional skid system
- Extremely compact
- Maximum size module only 14.8" x 10.59" x 9.16"



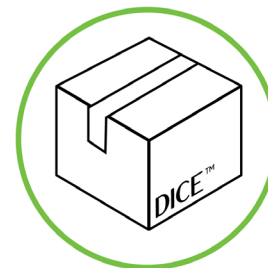
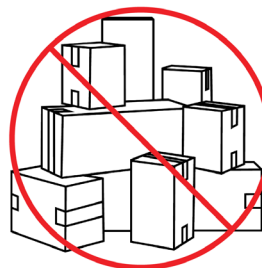
3. Ease of Operation

- Intuitive design
- Troubleshooting within seconds
- Vertical configuration, minimizing gas lock condition (see next page)
- Minimal volume to pressurize the system (see next page)
- Minimal downtime, replacement in minutes



2. Enhanced Reliability

- › Limiting leaks
 - No onsite service required
 - Minimizing maintenance cost
 - Reducing contingency on projects
 - Ensuring health & safety
 - Limiting downtime



4. Standard Solution

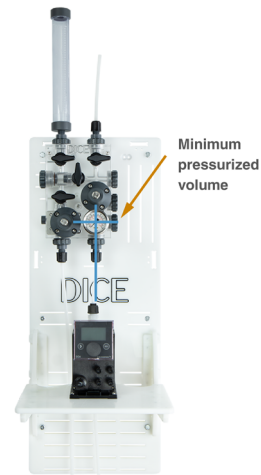
- › One simple box product:
 - Only a few models for all applications
 - Purchasing and logistics made easy
 - Shipping within 48 hrs* for urgent needs
 - Ease of commissioning and offsite troubleshooting
 - Specifiable product
- › Saving:
 - Design time
 - Labour on fabrication, assembly and management
 - Onsite services & no specific tools

**For urgent requests, on all currently stocked DICE™ dosing modules*



5. Vertical Configuration

The DICE™ vertical configuration facilitates the evacuation of gas in the system, thereby avoiding the tendency of gas being trapped. This is even more important for highly degassing chemicals such as sodium hypochlorite and hydrogen peroxide.



6. Pressurized Volume

Having a minimum pressurized volume is critical to system reliability, precision and performance.

DICE™ ½" has an extremely small pressurized volume of 5 in³ before the back pressure valve.

Same for the DICE™ 1" with a pressurized volume of 12 in³ before the back pressure valve.

Conclusion

The DICE™ chemical dosing equipment can be one of the best ways to overcome the complexity challenge and limit leaks, while offering many innovative features to simplify installation and daily operations.

Be part of the innovation

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