Accuracy, quality, and throughput are key performance criteria that Analytical Laboratory, Inkjet, and Diagnostics equipment have in common. Requirements for accurate sample dosing, accurate detector readings, reduction of cavitation, the removal of unwanted gases, or the prevention of surface defects, all point to the need for vacuum degassing of liquid media.

Degassing with vacuum is typically achieved by passing liquid media through a membrane path of defined porosity with deep vacuum applied to the outer surface. This applied vacuum works with the porous membrane to remove unwanted gases from the media.

Benefits of degassing within analytical systems:
- Reduce bubble formation when solvents are mixed
- Prevent bubbles from entering the detector
- Improve baseline stability and reduce noise
- Improve HPLC pump performance (less cavitation)
- Prevent escape of solvent vapors to the atmosphere (laboratory safety)

Typical Application Requirements:
- 50-400 mbar abs (end vacuum)

Laboratory – Pure Water System (EDI) Electro Deionization System

To achieve pure water of the highest quality, CO₂ gas must be removed from the supply water within a filtration system.

System challenges if CO₂ remains:
- Movement of the ions through the resin is blocked
- System failure caused by CO₂ buildup
- Reduction in water purity due to increased conductivity
Reduced printing surface defects and foaming: high-quality output at faster speeds
- Reduced ink flow interruptions and ink shortage in the print head: decreased downtime

**Typical Application Requirements:**
- Aqueous ink: 100 - 150 mbar abs
- UV ink: 150 - 200 mbar abs
- Solvent ink: 100 - 200 mbar abs

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**Benefits of degassing within an EDI system:**
- Ultrapure water quality from the constant high-efficiency ion exchanger layer bed
- Environmental safety due to the absence of regeneration chemicals
- Cost and time savings due to the elimination of the resin exchange process

**Typical Application Requirements:**
- 5 l/min (at vacuum)
- 600 mbar abs

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**Inkjet: Drop on Demand (DOD), Continuous Inkjet (CIJ), 3D-printing and Bioprinting**

Degassing of inks improves print line speed, reduces downtime, and improves print quality.

**Benefits of degassing within printing systems:**
- Increased productivity: improvement of printer line speeds
- Improved nozzle efficiency: degassing the ink promotes smooth printer operation

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**Diagnostics – IVD, Clinical Chemistry, Hematology, Immunology, Molecular Diagnostics, Capillary Electrophoresis**

Accuracy of test results is critical for any type of diagnostics instrument. Precise dosing and minimizing dead volume are key requirements for test accuracy. Degassing (debubbling) the samples and reagents is an essential process to achieve improved test accuracy. Gases dissolved in liquids cause problems due to bubble formation from gas molecules when pressure or temperature changes occur. These bubbles affect the accuracy, precision and performance of the equipment. Degassing removes and reduces noise, improves baseline stability, reduces instrumentation downtime and contributes to more consistent results.
Benefits of degassing within diagnostic systems:
• Accurate dosing of liquids
• Accurate measurement of level control in pipette and chambers

Typical Application Requirements:
• Less than 10 ml/min (at vacuum)
• 100 mbar abs
• Start against vacuum

KNF solution: Degassing pump system

Our solution is a line of highly reliable, compact, and efficient pumps with high vacuum capabilities, along with high torque brushless or stepper motors. Thanks to our singular focus on pumps, we can offer solutions at competitive market pricing.

Benefits of KNF Degassing Pumps:
• Compact 2-headed pump running in series achieves deep vacuum
• Able to maintain performance and restart in deep vacuum
• Able to withstand most any type of aggressive solvent vapors and gases

Typical Degassing Pump Systems and Setup:
• Small size allows reduced instrumentation footprint
• Available with brushless DC or stepper motor
• High initial pump-down RPM followed by speed control to maintain a high, constant vacuum
• High torque motor to start against deep vacuum levels
• Solvent resistant wetted materials
• Gas ballast to help remove condensate

A Valued Solution Partner

KNF works alongside the world’s leading manufacturers. Thanks to our extensive expertise acquired over many years and our close working relationship with developers and designers, we know exactly how vital these technical details are to both you as a manufacturer and your customers.

KNF’s modular system: We grow with your business

KNF gas and liquid pumps are the products of decades of engineering experience in diaphragm pump technology. Each of our solutions is tailored precisely to your equipment and process requirements. A single pump or serial production? Small or large production numbers? It makes no difference for us – we produce and deliver an optimal solution. Thanks to the KNF modular system, every one of our pump series models can be quickly and inexpensively adapted to meet specific needs.