

# Nitrogen Blowdown Evaporator Purchasing Guide

## Understanding Nitrogen Blowdown Evaporators

### What is a Nitrogen Blowdown Evaporator?

A nitrogen blowdown evaporator is a device used to remove solvents from samples through the application of a gentle stream of nitrogen gas. This method is particularly effective for concentrating small volatile samples and is widely used in applications like chromatography, pharmaceuticals, and environmental testing. By utilizing nitrogen gas, these evaporators provide a controlled and efficient means of sample preparation, ensuring the integrity of the samples is maintained.

### Key Benefits of Nitrogen Blowdown Evaporators

- **Efficiency:** Rapid evaporation speeds up the sample preparation process.
- **Safety:** Nitrogen is an inert gas, reducing the risk of oxidation and contamination.
- **Precision:** Controlled evaporation rates lead to consistent and reproducible results.
- **Versatility:** Suitable for a wide range of solvents and sample types.

### Types of Labs Using N2 Blowdown Evaporators



#### Academic Research Laboratories

Academic institutions often use nitrogen blowdown evaporators for both teaching and research purposes. These labs need reliable and precise sample preparation tools to support a broad range of scientific studies, from fundamental research to applied science. Common applications include preparing samples for chromatographic and spectroscopic analysis.



#### Environmental Testing Laboratories

Environmental testing labs use nitrogen blowdown evaporators to concentrate samples for detecting pollutants and other contaminants in water, soil, and air. This precision is crucial for regulatory compliance and environmental monitoring. Typical tasks include preparing samples for gas chromatography and mass spectrometry to detect trace levels of contaminants.



#### Government Laboratories

Government labs utilize nitrogen blowdown evaporators for diverse research and regulatory activities. These labs often focus on public health, environmental protection,

and safety compliance. Applications include analyzing environmental samples, conducting food safety tests, and performing forensic investigations.



### Pharmaceutical & Biotech Laboratories

Pharmaceutical and biotech companies rely on nitrogen blowdown evaporators for drug development, quality control, and research. These evaporators are essential for concentrating compounds and preparing samples for high-performance liquid chromatography (HPLC) and mass spectrometry. They handle various solvents and sample types, making them versatile tools for pharmaceutical research and production.



### Food & Beverage Laboratories

In the food and beverage industry, nitrogen blowdown evaporators are used for quality control and safety testing. These labs ensure that products meet regulatory standards and are free from harmful substances. Typical applications include testing for pesticide residues, contaminants, and nutritional content in food and beverages.



### Hospital & Medical Center Laboratories

Medical labs use nitrogen blowdown evaporators to prepare samples for diagnostic testing and clinical research. These labs require accurate and reliable results for patient care and medical research. Common uses include preparing biological samples for analysis using techniques like liquid chromatography-mass spectrometry (LC-MS).



### Forensic & Toxicology Laboratories

Forensic labs use nitrogen blowdown evaporators to concentrate samples for the analysis of drugs, toxins, and other substances in criminal investigations. Precision and reliability are crucial in forensic analysis to ensure accurate results for legal proceedings. Applications include toxicology screening and drug analysis.



### Chemical & Petrochemical Laboratories

Chemical and petrochemical labs utilize nitrogen blowdown evaporators for various

analytical processes, such as analyzing chemical compositions and purity. These evaporators handle corrosive solvents and volatile compounds, making them suitable for industrial applications. Common tasks include preparing samples for gas chromatography and other analytical techniques.



### **Agriculture Laboratories**

Agricultural labs use nitrogen blowdown evaporators to analyze soil, plant, and water samples for pesticides, herbicides, and other agricultural chemicals. These labs support agricultural research and regulatory compliance, ensuring that agricultural products are safe and meet environmental standards.

## **Typical Uses of Nitrogen Blowdown Evaporators**

### **Chromatography and Mass Spectrometry**

Nitrogen blowdown evaporators are commonly used to prepare samples for chromatography and mass spectrometry. By concentrating samples and removing solvents, these evaporators ensure that samples are ready for accurate and efficient analysis.

### **Non-Traditional Uses**

- **Sparging:** Sparging involves injecting nitrogen gas into a liquid to remove dissolved gases like oxygen. This technique is used in various industries to reduce oxidation and improve product quality, such as in water treatment and beverage production.
- **Blanketing:** Nitrogen blanketing maintains an inert atmosphere over reactive substances in storage tanks, preventing oxidation and contamination. This is crucial in industries like chemical manufacturing and pharmaceuticals.

- **Inerting Reactions:** Nitrogen blowdown evaporators can create an inert environment to complete chemical reactions without the interference of oxygen or moisture. This is particularly useful in the production of sensitive chemicals and materials.
- **Solvent Exchange:** Solvent exchange involves replacing one solvent with another in a sample preparation process. Nitrogen blowdown evaporators facilitate this by evaporating the initial solvent, allowing the addition of a new solvent without significant sample loss.

## Types of Nitrogen Blowdown Evaporators

### 1. Flexible Evaporators

Flexible evaporators offer versatility in handling various sample types and volumes. For example, they can concentrate both small vials and micro-well plates with the same instrument base. Additionally, some designs allow a variety of sample vials to be inserted without additional equipment, making them adaptable to different laboratory needs.



- **Academic Research Laboratories:** Often need flexible evaporators to handle a variety of research projects involving different sample types and sizes.
- **Pharmaceutical & Biotech Laboratories:** Utilize flexible evaporators for developing and testing new drugs that require varying sample volumes and formats.
- **Government Laboratories:** Benefit from flexible evaporators to support diverse regulatory and research activities.

## 2. Batch Evaporators

Designed for high-throughput applications, batch evaporators can handle large numbers of samples simultaneously. They are ideal for laboratories that need to process many samples efficiently. Each vial size typically requires a dedicated sample holder, which ensures optimal performance and consistent results.



- **Environmental Testing Laboratories:** Benefit from batch evaporators to process numerous environmental samples quickly and accurately.
- **Food & Beverage Laboratories:** Use batch evaporators for quality control testing of multiple food and beverage samples in parallel.
- **Agriculture Laboratories:** Use batch evaporators to analyze large quantities of agricultural samples efficiently.
- **Hospital & Medical Center Laboratories:** Benefit from batch evaporators for reliable and consistent sample preparation in diagnostic testing.

## 3. Automated Evaporators

Automated nitrogen evaporators provide programmable settings and automated shut-off features, reducing manual intervention and enhancing efficiency. These advanced models are perfect for labs looking to minimize labor costs and errors.

- **Chemical & Petrochemical Laboratories:** Prefer automated evaporators to ensure consistent and precise sample preparation for complex analytical processes.
- **Pharmaceutical & Biotech Laboratories:** Utilize automated evaporators to streamline drug testing and quality control processes, enhancing efficiency and reducing human error.

### Factors to Consider When Choosing an Evaporator

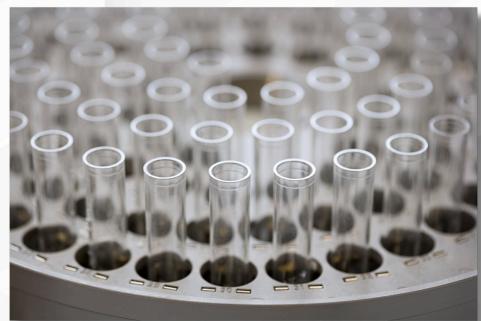
When selecting a nitrogen blowdown evaporator, several factors should be taken into account to ensure you choose the best model for your laboratory's needs. Here are some key considerations:

#### **1. Price Range**

Your budget will significantly influence your choice. High-end models offer advanced features and automation, while cost-effective models provide essential functionality without the extras. Consider how often and intensively you will use the evaporator and what features are indispensable for your applications.

#### **2. Sample Capacity**

Consider the number of samples you need to process daily. High-throughput labs will benefit from batch units, while lower throughput may be better served by flexible or automated models. Evaluate your workflow to determine the capacity required to meet your lab's productivity needs.



#### **3. Sample Vial Size Flexibility**

Ensure the evaporator can accommodate the variety of vial sizes you use. Some models offer adjustable racks or holders to fit different vial dimensions. This flexibility can save time and reduce the need for additional equipment, making the evaporator more versatile for various applications.



### 4. Control of Gas Flow

Precise control of nitrogen flow is crucial for reproducibility and efficiency. Look for models with adjustable flow rates and digital controls. Fine control over the gas flow ensures that samples are evaporated at optimal rates, preserving sample integrity and improving consistency.

### 5. Nitrogen Consumption

Evaluate the nitrogen consumption rate of the evaporator. More efficient models will reduce operational costs over time by using less nitrogen. This is especially important for labs with high sample throughput, where nitrogen costs can accumulate significantly.



### 6. Use with Corrosive Solvents

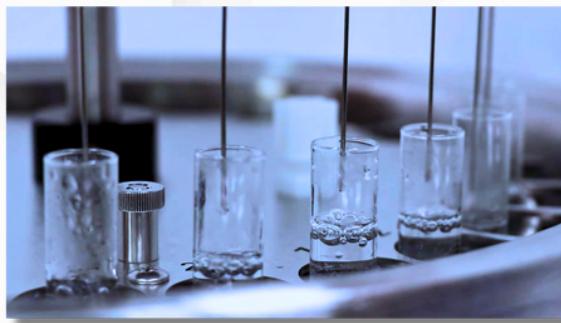
If your applications involve corrosive solvents, ensure the evaporator is constructed from materials resistant to corrosion, such as stainless steel or specialized coatings. This will extend the lifespan of the equipment and maintain its performance over time.

### 7. Temperature Range

Consider the temperature range the evaporator can achieve. Some applications may require heating to speed up evaporation or cooling to protect heat-sensitive samples. Ensure the evaporator can reach the necessary temperatures for your specific applications.

### 8. Use with Flammable Solvents

For volatile solvents, it's important that the evaporator can safely handle the rapid evaporation rates without compromising safety or efficiency. Look for features that manage vapor handling and minimize the risk of accidents or contamination.



### 9. Fume Hood Requirement

Determine whether the evaporator needs to be operated within a fume hood or can be used on the benchtop next to one. This will impact the setup and space requirements in your lab. Ensure you have the appropriate infrastructure to support safe and effective operation.



### 10. Standard Warranty

Check the warranty provided by the manufacturer. A robust warranty can offer peace of mind and protect your investment. Consider the length and coverage of the warranty, as well as the manufacturer's reputation for customer service and support.

These factors are crucial in selecting the right nitrogen blowdown evaporator for your laboratory. By carefully evaluating each aspect, lab personnel can ensure they choose an evaporator that meets their specific needs and enhances their sample preparation workflow.

## Popular N2 Blowdown Evaporators on the Market

### 1. Glas-Col Barvap Evaporator

The Glas-Col Barvap Evaporator offers an affordable solution for laboratories needing efficient sample evaporation without heating.

Price Range:	Very low
Sample Capacity:	6 or 12 samples

Vial Flexibility:	Fairly low - restricted by vial height
Gas Flow Control:	Needle valve for precise control
N2 Consumption:	Efficient usage
Corrosive Solvents:	Not suitable materials for corrosive solvents
Temperature Range:	Unheated but can be placed on hot-plate
Flammable Solvents:	Safe for use with flammable solvents
Placement:	Typically used in a fume hood
Warranty:	1 year warranty



## 2. Organomation's MICROVAP Product Line

The MICROVAP series offers compact and efficient solutions for evaporating small volumes of samples. These evaporators are ideal for labs with limited space but high demands for precision.

Price Range:	Low
Sample Capacity:	6, 15 or 24 vials; 1 or 3 microplates
Vial Flexibility:	Adjustable for various small vial sizes
Gas Flow Control:	Fine control using a precise flowmeter
N2 Consumption:	Designed for low consumption
Corrosive Solvents:	Made with corrosion-resistant materials
Temperature Range:	Ambient to 130 °C
Flammable Solvents:	Safe for use with flammable solvents
Placement:	Typically used in a fume hood
Warranty:	2 year warranty



[Organomation MICROVAP vs. Porvair UltraVap - Product Comparison With Pricing!](#)

### 3. Organomation's N-EVAP Product Line

Organomation's N-EVAP series is renowned for its efficiency and versatility, catering to a wide range of sample preparation needs. This product line is ideal for laboratories that require consistent performance and ease of use.

Price Range:	Low to mid-range
Sample Capacity:	6 to 45 samples depending on model
Vial Flexibility:	Adjustable sample holder for various sizes
Gas Flow Control:	Individual valves for control to each sample
N2 Consumption:	Optimized for low consumption
Corrosive Solvents:	Constructed with corrosion-resistant materials
Temperature Range:	Water bath: up to 90 °C ; Dry bath: up to 130 °C
Flammable Solvents:	Designed to handle flammable solvents safely
Placement:	Typically used in a fume hood
Warranty:	1 or 2 years depending on model



### Organomation N-EVAP vs. Biotage TurboVap - Product Comparison With Pricing!

### 4. Organomation's MULTIVAP Product Line

The MULTIVAP series by Organomation is designed for high-throughput applications, making it perfect for laboratories that need to process large numbers of samples efficiently.

Price Range:	Mid-range
Sample Capacity:	30 to 100 samples depending on model
Vial Flexibility:	Various racks available for different vial sizes
Gas Flow Control:	Precise control to each individual row
N2 Consumption:	Efficient design minimizes gas usage
Corrosive Solvents:	Compatible with resistant materials



Temperature Range:	Water baths: 30-100 °C ; Dry baths: 30-120 °C
Flammable Solvents:	Equipped to handle flammable solvents safely
Placement:	Typically used in a fume hood
Warranty:	1 year warranty

### Organomation MULTIVAP vs. Biotage TurboVap - Product Comparison With Pricing!

## 5. Porvair's UltraVap Product Line

Porvair's UltraVap series offers robust and versatile evaporators designed for a wide range of sample preparation needs. They are well-suited for laboratories requiring high precision and flexibility.

Price Range:	High
Sample Capacity:	12 to 384 samples depending on model
Vial Flexibility:	Adjustable racks for different vial sizes
Gas Flow Control:	Precise digital gas control ( <i>Mistral &amp; Levante models only</i> )
N2 Consumption:	Efficient design reduces gas usage
Corrosive Solvents:	Not for use with corrosive solvents
Temperature Range:	Up to 60 or 80 °C depending on model
Flammable Solvents:	Safe operation with flammable solvents
Placement:	Typically used in or near a fume hood
Warranty:	1 year warranty



### Organomation MICROVAP vs. Porvair UltraVap - Product Comparison With Pricing!

### 6. Biotage TurboVap Product Line

Biotage's TurboVap series is known for its advanced automation and high throughput capabilities. These evaporators are designed to meet the needs of demanding laboratory environments.

Price Range:	High
Sample Capacity:	6 to 48 samples depending on model
Vial Flexibility:	Compatible with various vial sizes
Gas Flow Control:	Automated and programmable gas flow control
N2 Consumption:	High nitrogen flow requirements
Corrosive Solvents:	Built with corrosion-resistant components
Temperature Range:	Ambient to 90 °C
Flammable Solvents:	Handles flammable solvents with advanced safety features
Placement:	Typically used in or near a fume hood
Warranty:	1 year warranty



#### [Organomination N-EVAP vs. Biotage TurboVap - Product Comparison With Pricing!](#)

### Maintenance & Best Practices

#### Routine Maintenance

Regular maintenance ensures the longevity and reliability of your nitrogen blowdown evaporator. This includes cleaning the system, checking for leaks, and replacing any worn parts.

### Best Practices for Optimal Performance

- Use high-purity nitrogen gas to avoid contamination.
- Calibrate the system regularly to maintain accuracy.
- Follow manufacturer guidelines for operation and maintenance.

### Conclusion

Choosing the right nitrogen blowdown evaporator can significantly enhance your laboratory's efficiency and accuracy. By considering factors such as price range, sample capacity, vial flexibility, gas flow control, nitrogen consumption, solvent compatibility, temperature range, fume hood requirements, and warranty, you can find an evaporator that perfectly fits your requirements. This guide aims to provide the knowledge and insights necessary to make an informed purchasing decision, ensuring your lab is equipped with the best tools for success.

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