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STAINLESS STEEL VACUUM GLOVE BOX

GBV-1 Stainless Steel Vacuum Glove Box

GBV-1

GBV-1 stainless steel vacuum glove box creates a controlled inert atmosphere for handling air- and moisture-sensitive materials in laboratory applications.

<https://www.gloveboxs.com/products/stainless-steel-vacuum-glove-box/gbv-1-stainless-steel-vacuum-glove-box.html>

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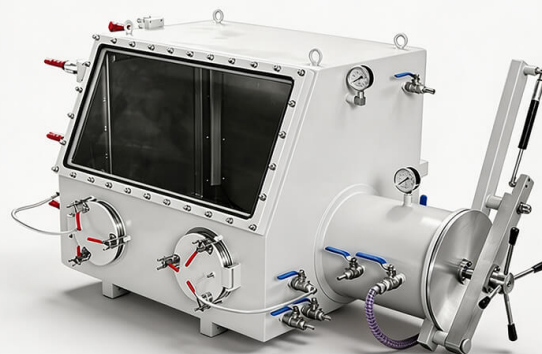
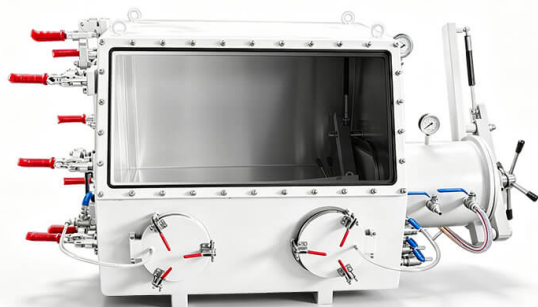


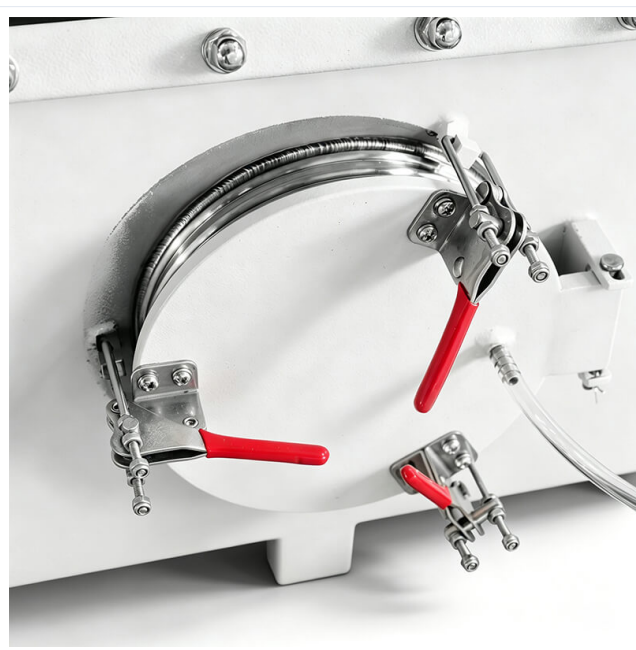
Product Overview

GBV-1 stainless steel vacuum glove box creates a controlled inert atmosphere for handling air- and moisture-sensitive materials in laboratory applications.

Technical Parameters

Parameter	GBV-1
Parameter 1	
Parameter 2	





Product Introduction

The **GBV-1 Stainless Steel Vacuum Glove Box** is a compact controlled-atmosphere workstation designed for handling materials that require protection from ambient air, moisture, or oxidation during laboratory preparation and processing.

The chamber can be evacuated and subsequently filled with an inert gas to create a controlled working environment. This allows operators to perform sample preparation, powder handling, weighing, mixing, loading, transfer, and other laboratory operations while reducing direct exposure of sensitive materials to the surrounding atmosphere.

Constructed with a durable stainless steel chamber, the GBV-1 combines mechanical strength, corrosion resistance, easy cleaning, and reliable sealing. A large transparent viewing window provides clear visibility of the working area, while integrated glove ports allow samples and

materials to be manipulated without opening the main chamber.

An independent vacuum transfer chamber enables samples, tools, and containers to be introduced or removed without repeatedly evacuating the entire main working chamber, improving operating efficiency and reducing inert gas consumption. The GBV-1 is particularly suitable for laboratories, universities, research institutes, and material-development facilities requiring a practical vacuum/inert-atmosphere workspace without a continuous gas purification system.

GBV-1 Technical Overview

For the **GBV-1** configuration currently listed on the product page:

Item	GBV-1
Product Type	Stainless Steel Vacuum Glove Box
Overall Dimensions	1030 × 570 × 530 mm
Main Chamber Dimensions	600 × 500 × 500 mm
Internal Clear Dimensions	460 × 345 mm (upper) 490 mm (lower) × 490 mm
Transfer Chamber	Ø200 × 280 mm
Glove Port Diameter	Ø150 mm
Working Pressure Range	0–0.1 MPa
Optional Side Door	330 × 260 mm
Optional Transfer Drawer	126 × 250 mm

These specifications correspond to the GBV-1 configuration shown on the current product page; customized dimensions and configurations are also offered.

Key Features

01. Durable Stainless Steel Chamber

The main chamber is manufactured from stainless steel with a reinforced structure, providing good mechanical strength, corrosion resistance, and durability. Its smooth surfaces also simplify routine cleaning and maintenance, making the system suitable for laboratory environments involving powders and experimental materials.

02. Large Viewing Window

A wide transparent front viewing window provides a clear field of vision inside the working chamber. Operators can easily observe samples, tools, and experimental procedures throughout the handling process.

03. Independent Vacuum Transfer Chamber

The integrated transfer chamber, also commonly referred to as an **antechamber or airlock**, allows materials and tools to be transferred between the external environment and the glove

box without directly opening the main chamber.

Its dual-door structure helps minimize disturbance to the atmosphere inside the main chamber and avoids the need to repeatedly evacuate the entire glove box during routine sample transfer.

04. Vacuum Ball Valves

The chamber is equipped with vacuum ball valves for connecting vacuum and gas lines. They provide convenient access for chamber evacuation, inert-gas introduction, and other process connections according to experimental requirements.

05. Reliable Glove-Port Operation

Front-mounted glove ports equipped with durable laboratory gloves allow operators to manipulate samples and equipment inside the sealed chamber while remaining isolated from the internal atmosphere.

The ergonomic front-access configuration is suitable for routine operations such as powder handling, sample loading, mixing, weighing, container transfer, and experimental preparation.

06. Controlled Vacuum and Inert Atmosphere

By combining vacuum evacuation with inert-gas backfilling, the glove box can reduce the amount of ambient air and moisture inside the chamber before materials are processed.

This makes the system suitable for applications requiring general protection against oxidation or moisture exposure where an ultra-low-ppm purification environment is not required. The product page specifies a working pressure range of **0-0.1 MPa**.

07. Integrated Utility Connections

Utility ports can be used for introducing gas or other required services into the chamber, allowing the glove box to be adapted to different laboratory processes and experimental setups.

08. Internal Electrical Support

The chamber can be equipped with internal lighting and electrical outlets, providing convenient power access for small laboratory instruments or auxiliary devices used during experiments.

09. Easy-to-Operate Sealed Structure

The chamber, viewing window, glove ports, valves, and transfer chamber form an integrated sealed workspace designed for convenient vacuum operation and inert-gas replacement while maintaining straightforward daily operation.

10. Customizable Configuration

Dimensions, chamber configuration, material options, shape, openings, and other structural features can be customized according to specific experimental or process requirements.

Working Principle

The **GBV-1 Vacuum Glove Box** creates a controlled atmosphere through a combination of **vacuum evacuation and inert-gas replacement**.

Before operation, the working chamber can be evacuated to remove a substantial portion of the ambient air. An inert gas, such as nitrogen or argon, can then be introduced into the chamber. Depending on process requirements, evacuation and gas-refilling steps may be repeated to further reduce the concentration of oxygen and moisture inside the workspace.

Once the required atmosphere has been established, operators manipulate samples through the sealed glove ports without directly opening the main chamber.

For material transfer, samples or tools are first placed inside the independent antechamber. After the outer door is closed, the transfer chamber can be evacuated and/or filled with inert gas before its inner door is opened. This procedure reduces direct air exchange between the main chamber and the surrounding environment and helps maintain a more stable internal atmosphere. The product configuration and transfer-chamber design are documented on the manufacturer's product page.

Typical Operations

The GBV-1 Stainless Steel Vacuum Glove Box can support a variety of laboratory operations, including:

- Air-sensitive powder handling
- Powder weighing and dispensing
- Sample preparation
- Material mixing and blending
- Sample loading and unloading
- Crucible or container loading
- Powder transfer
- Specimen assembly
- Material packaging under inert atmosphere
- Pre-treatment before milling, pressing, sintering, or testing
- Laboratory experiments requiring isolation from ambient air
- Temporary storage of moisture- or oxidation-sensitive samples

Industry Applications

1. Powder Metallurgy

The GBV-1 provides an enclosed atmosphere for handling metal powders and other materials that may be affected by oxygen or atmospheric moisture.

It can be used for laboratory-scale **powder weighing, batching, mixing, sample transfer, container loading, and pre-processing** before subsequent operations such as ball milling, pressing, sintering, or material characterization.

For powder metallurgy laboratories, the glove box can also be combined with suitable sealed containers or vacuum milling accessories to help reduce unnecessary exposure of prepared powders to ambient air.

2. Advanced Materials Research

Many advanced-material experiments involve powders, precursors, or intermediate products whose properties may change after prolonged exposure to air.

A vacuum glove box provides a practical controlled workspace for preparation and handling of experimental materials such as:

metal powders, alloy powders, ceramic powders, composite materials, functional materials, and research-scale powder formulations.

It is particularly useful during sample preparation and transfer steps where atmospheric isolation is required but continuous ultra-high-purity gas purification is unnecessary.

3. Battery Material Research

The system can be used for selected battery-material preparation and sample-handling processes that benefit from an inert atmosphere, including powder transfer, electrode-material preparation, sample packaging, and preliminary experimental operations.

For applications requiring extremely low and continuously controlled moisture and oxygen concentrations—such as demanding lithium-metal, solid-state electrolyte, or long-duration battery assembly processes—a glove box equipped with a dedicated gas purification system is generally the more appropriate configuration.

This distinction is important because the GBV series is presented as a vacuum glove box for general water/oxygen-control requirements, while the manufacturer's separate purification glove-box range specifies sub-ppm water and oxygen performance.

4. Chemical and Air-Sensitive Materials

The glove box provides a sealed operating space for selected chemicals, powders, and intermediates that need to be protected from atmospheric oxygen or moisture during laboratory handling.

Typical operations include:

sample transfer, reagent preparation, weighing, mixing, container loading, temporary storage, and experimental assembly under inert atmosphere.

The suitability of the glove box for a particular chemical should always be evaluated according to the material's compatibility, toxicity, flammability, and process-safety requirements.

5. Ceramic and Functional Powder Materials

Ceramic powders and functional materials may require controlled handling during formulation and sample preparation to minimize moisture adsorption, contamination, or undesirable reactions with the atmosphere.

The GBV-1 can provide an enclosed workspace for small-batch experimental procedures such as powder weighing, blending, sample loading, and preparation before grinding, forming, heat treatment, or characterization.

6. Universities and Research Laboratories

Its relatively straightforward vacuum/inert-gas operating principle makes the GBV-1 suitable for universities, research institutes, teaching laboratories, and R&D departments conducting experiments involving controlled-atmosphere material handling.

Typical research fields include:

materials science, powder metallurgy, chemistry, ceramics, energy materials, nanomaterials, metallurgy, and laboratory powder processing.

Suitable Materials

Depending on the process requirements and material safety assessment, typical materials may include:

Metal Powders Alloy powders, metallic powders, research-grade powder metallurgy materials and oxidation-sensitive powder samples.

Ceramic Materials Ceramic powders, precursor powders and functional ceramic materials.

Battery Materials Selected cathode/anode powders, conductive materials and experimental energy-storage materials requiring reduced exposure to ambient air.

Advanced Materials Composite powders, functional powders, nanomaterials and specialty material formulations.

Chemical Materials Selected moisture-sensitive or oxidation-sensitive reagents and experimental intermediates compatible with the glove box construction and operating conditions.

Why Use a Vacuum Glove Box?

For many laboratory applications, completely exposing a sensitive material to ambient air during every weighing, transfer, or preparation step may negatively affect experimental

repeatability or material quality.

The GBV-1 provides a practical intermediate solution between open-air laboratory operation and a high-specification continuous purification glove box.

Its key advantages include:

Reduced Air Exposure — helps protect sensitive samples from direct contact with ambient oxygen and moisture.

Simple Atmosphere Control — vacuum evacuation and inert-gas replacement provide a straightforward method for establishing a controlled environment.

Efficient Material Transfer — the independent antechamber minimizes the need to disturb the atmosphere inside the main chamber.

Clear Observation — a large viewing window enables convenient monitoring of experimental procedures.

Flexible Laboratory Use — suitable for numerous powder-processing and material-research operations.

Easy Maintenance — stainless steel construction provides durability and convenient cleaning.

Accessories & Customization

Accessories

Grinding jars, heating elements, sample holders, control modules and other matching accessories can be selected according to the product configuration.

Customization

For voltage, capacity, chamber size, process temperature or application requirements, please contact TENCAN for a suitable configuration.