

AUTOPORE[®] V SERIES

MERCURY INTRUSION POROSIMETER



PRE-INSTALLATION INSTRUCTIONS AND CHECKLIST

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ABOUT THIS MANUAL

The following icons may be found in this manual:



NOTE - Notes contain important information applicable to the topic.



CAUTION - Cautions contain information to help prevent actions that may damage the analyzer or components.



WARNING - Warnings contain information to help prevent actions that may cause personal injury.

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PRE-INSTALLATION DOCUMENT OVERVIEW

This document describes how to prepare a site for installation of the AutoPore V Series. When the enclosed procedures have been completed, signed, and dated, return the document to Micromeritics as outlined in [Commitment Statement and Signature on page 16](#).

The document is organized into two sections:

- **Section 1 - Pre-installation Instructions.** Contains information to help analyze the site and answer the questions in the checklist contained in Section 2 of this document.
- **Section 2 - Pre-installation Checklist.** Contains questions and a checklist about analyzer location and the laboratory environment, equipment, and supplies.

SECTION 1 - PRE-INSTALLATION INSTRUCTIONS

UNPACKING AND INSPECTION

When the shipment is received, unpack and inspect the contents of the shipping carton(s). Use the packing list to verify that all listed items are intact and in the correct quantity. Sort through all packing material before declaring missing items.

SHIPPING DAMAGE

If equipment is damaged or lost in transit, you are required to make note of the damage or loss on the freight bill. The freight carrier, not Micromeritics, is responsible for all damage or loss occurring during shipment. If damage or loss of equipment is discovered during shipment, report the condition to the carrier immediately. Insurance claims **MUST** be made with the freight carrier, **NOT** Micromeritics.

- Keep all software, manuals, and accessories with the analyzer.
- Report any shipping damage immediately to the carrier and follow their directions.
- Report missing or wrong parts to Micromeritics, in addition to any shipping damage, only after filing a claim with the carrier.
- **Micromeritics will NOT file a claim for shipping damage.**
- **Do not discard shipping boxes and containers until installation is complete.**

ANALYZER SPACE

A unobstructed lab work space that will accommodate the following specifications is needed:



- **Analyzer**

Height: 143 cm (56.25 in.)
Width: 54.3 cm (21.38 in.)
Depth: 78 cm (30.75 in.)
Weight: 250 kg (550 lb)

- **Computer and Printer**

Width: Approx. 96.5 cm (38 in.)

- **Gas Supply**

1 square ft (0.1 square m) for each gas cylinder needed for installation.

INSTALLATION CONFIGURATION

Standard installation requires the use of 1/8 in. (0.3175 cm) copper or stainless steel gas supply lines, located in the instrument accessories kit.

A nonstandard installation will be created if another gas supply line is used or if the gas cylinders cannot be placed within 6 ft (1.83 m) of the analyzer. There may be additional costs associated with a nonstandard installation. Please contact the Micromeritics Service Manager to discuss a nonstandard installation.

COMPUTER SYSTEM

We recommend that the computer be purchased from Micromeritics. Micromeritics thoroughly tests operating systems with the Micromeritics applications and offer technical support and maintenance for the computers we provide. For analyzers not installed by Micromeritics, please note:



- The labor and expense costs associated with delays traceable to a computer system not purchased from Micromeritics are not part of a standard installation.
- Micromeritics is not responsible for providing assistance for the connection to a company network or LIMS.
- During installation, Administrator rights will be required to make changes to the Ethernet settings. If access cannot be granted to the Service Engineer, an IT representative must be readily available to make these changes.

The computer system to be used with the analyzer must meet the following minimum requirements:

- **Operating System.** Windows 7 Professional or higher operating system is recommended for the best user experience.
- **Desktop Installation Required.** The application should not be installed on a network drive with shared access. Multiple users cannot operate the application at the same time.
- **10 Base T or 100 Base T Ethernet Port.** If the computer is to be connected to a network, two Ethernet ports are required. If more than one Ethernet based unit is connected to the same computer, an Ethernet switch will also be required.
- **Read / Write Permissions.** All users of the application will need Read/Write permission to all directories and subdirectories where the application is installed.
- **Drives.** CD-ROM drive and thumb drive.

ENVIRONMENTAL FACTORS

POWER

The AutoPore V is designed to operate with a universal input power supply (100 / 120 / 220 / 240 VAC) at 50 or 60 Hz. Noise-free power of the correct voltage and frequency, with a safety earth ground, should be available through a standard wall receptacle. The power outlet should be able to supply 15 amps @ 100 or 120 VAC \pm 10% or 7.5 amps @ 220 or 240 VAC \pm 10%. These requirements can be checked by using a circuit analyzer (available at most hardware or electronic supply houses) or a multimeter. There should also be sufficient outlets for the analyzer, pump, computer, monitor, and printer and any other peripheral devices.



The analyzer and peripheral devices **must** be installed on their own dedicated power line. Other devices — such as motors, generators, or ovens — **should not** be placed on the same power line.

TEMPERATURE AND HUMIDITY



Should mercury be present in the analyzer, see the analyzer operator manual for mercury safety.

Temperature and humidity must be controlled to within:

- **Temperature:** 10 to 30 °C operating (maximum 21 °C to minimize mercury vapor level); 0 to 50 °C non-operating (**with no mercury**)
- **Humidity:** 20 to 80% relative, non-condensing

Do Not:

- Allow room temperature or humidity to exceed limits.
- Install the analyzer where it is exposed to direct sunlight.
- Locate the analyzer near air conditioning or heating vents.

VENTILATION

The area reserved for installation of the AutoPore should be well ventilated. Access to an exhaust hood or other external ventilation is strongly recommended. The analyzer does not have an exhaust fan installed, unless an optional Exhaust Fan Kit was requested. The analyzer is provided with its own exhaust duct. Attaching the exhaust duct to a ventilation system that can pull air through the AutoPore provides adequate ventilation in the absence of any other system. Ducting the optional exhaust fan to the open atmosphere will also provide adequate ventilation in the absence of any other system.

The 5 in. (12.5 cm) OD exhaust duct is located on the rear of the analyzer and can be vented to the outside using flexible ducting.

The compressor needs sufficient air flow.

HAZARDS AND PRECAUTIONS

Inform Micromeritics of any on-site conditions that may present hazards to Micromeritics employees or equipment. Advise Micromeritics of any precautions that need to be taken.

SAFETY MEASURES

Inform Micromeritics of any safety equipment, requirements, or procedures necessary for Micromeritics employees to enter and install the system at your facility.

It is recommended to wear protective rubber (or latex) gloves when working with mercury or Micromeritics high-pressure fluid.

Disposal of mercury contaminated items varies with local codes. Make arrangements for the disposal of mercury contaminated items — such as disposable rubber gloves, paper towels, samples, etc.

It may be helpful, when unloading mercury filled penetrometers, to purchase or construct a device for picking up small mercury droplets.

GAS SUPPLY

A cylinder of compressed gas is needed. The gas must be dry, clean, inert, and regulated to 60 psig. The supply outlet should be equipped with a 1/8 in. Swage stainless steel tube.

GAS CYLINDERS AND GAS SUPPLY LINES

See [Gas Supply above](#) for the analytical gas needed during installation. Gas cylinders must be placed within 6 ft (1.8 m) of the analyzer inlet valves.

- It is required that the 1/8 in. (0.3175 cm) × 6 ft (1.8 m) single piece copper gas line in the analyzer accessories kit is used. Stainless steel gas lines are available from Micromeritics for use with gases that are not compatible with copper.



Gas supply lines made of materials other than copper or stainless steel may cause operational problems.

- **Do not** use gas cylinders with less than 500 psig (3549 kPag) pressure.
- **Do not** use any other gas lines to connect the gas supply to the analyzer.
- **Do not** use gas purifiers; they can cause operational problems.

GAS SUPPLY HARDWARE

Micromeritics recommends the gas regulators to be used with the analyzer be purchased from Micromeritics. The regulators Micromeritics provides have been carefully evaluated and tested to provide superior performance.



If purchased from a source other than Micromeritics, please keep in mind that many commercially available gas regulators lack key features which are required for gas adsorption measurements. These vital criteria must be met:

- **Cleanliness.** Clean regulators designed specifically for high-vacuum service are required. Other regulators often contain elastomeric material or oils which can contaminate the gas.
- **High stability.** Excess pressure at the gas inlet ports to the analyzer can interfere with accurate gas dosing and flow rates. The combined change in the outlet pressure from the gas regulator, as the gas cylinder pressure decreases or as the flow rate stops, should not change more than 5 psig (34.4 kPag) from the selected setting. When the analyzer is idle for an extended period of time, such as 8 to 10 hours, this same stability of gas delivery pressures should be achieved.
- **Range of pressure.** The regulator output must operate from 0 to 50 psig (345 kPag).
- **Suitable sub-assemblies.** The regulator must have a shutoff or outlet isolation valve compatible with 1/8 in. (0.3175 cm) or 1/4 in. (0.6 cm) Swagelok® compression fittings.

REGULATOR EXPANSION KITS

It is sometimes beneficial to attach more than one analyzer, and/or accessory device, or different inlet ports to a single gas supply. Any time this is done, it is critically important that there be a means of isolating, or shutting-off, each device attached to the gas supply regulator. Micromeritics recommends the use of a vacuum rated shutoff/isolation valve for this purpose.

This shutoff/isolation valve is required in order to prevent problems when changing gas cylinders or servicing any of the devices attached to the gas supply.

If the need to attach more than one inlet or one analyzer and/or accessory device is anticipated, one or more of the following regulator expansion kits must be acquired:

- **004-33601-00** – Regulator Expansion Kit (2 outlet, 1000 psi maximum). This kit contains one T fitting, two vacuum rated shutoff valves, and other necessary hardware. This expansion kit allows gas to be provided to two inlets.
- **004-33601-01** – Regulator Expansion Kit (3 outlet, 1000 psi maximum). This kit contains one cross fitting, three vacuum rated shutoff valves, and other necessary hardware. This expansion kit allows gas to be provided to three inlets.

LABORATORY EQUIPMENT AND SUPPLIES

ANALYSIS EQUIPMENT AND SUPPLIES

Since the analysis results are expressed in units of pore volume per gram of sample, the true mass of the sample must be known. This requires an analytical balance with the capacity of 300 grams measurement and 1 mg readability. It would be advantageous if the balance could accommodate an upright penetrometer, approximately 10.5 in.

In order to obtain accurate analysis results, the penetrometers must be clean. The following items are suggested for cleaning penetrometers:

- Alconox[®] or similar laboratory detergent
- Brush
- Drying oven
- Isopropyl alcohol
- Sink
- Small plastic tub for detergent solution

Additional items needed:

- Fume hood
- Mercury - 10 pounds (99.999%) triple distilled

APPLICATION RELATED ISSUES

To ensure a thorough installation, it will be helpful for Micromeritics to know which types of samples will be tested. If known, list them in [Application Related Issues Checklist on page 15](#).

Please advise us if your samples require any pretreatment. If required, do you have the proper equipment to pretreat your samples?

Micromeritics offers application assistance through our materials analysis laboratory (Micromeritics Analytical Services).

GAS FOR ANALYZER TEST

To verify proper operation and to train users, Micromeritics representatives will analyze the reference material provided in the analyzer accessories. If the required gas is not available Micromeritics representatives will not be able to perform analyzer tests during installation and operator training.

See [Gas Supply on page 6](#) for gas requirements.

PERSONNEL SECURITY CLEARANCE

If security clearances, insurance certificates, or any other special arrangements are required for Micromeritics employees to enter your facility, see [Personnel Security Clearance Checklist on page 15](#) to explain. Inform Micromeritics how much advance notice you require to obtain clearance.

PROJECTED INSTALLATION DATE

After reading the site preparation requirements in this document, enter a date your site will be prepared and a preferred date for installation. After returning the checklist to Micromeritics, your Micromeritics representative will contact you to confirm an installation date. See [Projected Installation Date on page 16](#).

COMMITMENT STATEMENT / SIGNATURE

Read this document carefully and complete all checklists. If unsure about any part of this document or the checklist, contact the Micromeritics Service Department for clarification. When this Pre-installation Checklist has been completed, see [Commitment Statement and Signature on page 16](#). Sign and date the form, then send it to Micromeritics.

Within the United States, send the completed and signed checklist to one of the following:

Service Operations Manager / 1-770-662-3604

Service.Helpdesk@Micromeritics.com

Micromeritics Instrument Corporation
ATTN: Service Operations Manager
4356 Communications Drive
Norcross, GA / USA / 30093-2901

Outside the United States, send the completed and signed checklists to your Micromeritics representative.

SECTION 2 - PRE-INSTALLATION CHECKLISTS

For each question, circle **Yes** if the condition applies to your laboratory or **No** if it does not. When this *Pre-installation Checklist* has been completed, see [Commitment Statement and Signature on page 16](#). Sign and date the form, then send it to Micromeritics.

UNPACKING AND INSPECTION CHECKLIST

Unpacking and Inspection		
Have the shipping cartons been unpacked and their contents inspected?	Y	N
Was there any shipping damage?	Y	N
If Yes, has a claim been filed with the freight carrier?	Y	N
Were all items listed on the packing list received?	Y	N
If No, has Micromeritics been notified?	Y	N
Was an Ethernet switch purchased with the analyzer or is there one available, if needed?	Y	N

ANALYZER SPACE CHECKLIST

Analyzer Space		
Can the lab area where the analyzer and computer will be placed accommodate the combined dimensions of the analyzer, accessories, computer, and printer?	Y	N

INSTALLATION CONFIGURATION CHECKLIST

Installation Configuration		
Will 1/8 in. (0.375 cm) copper gas supply lines (supplied with the analyzer for standard installation) be used?	Y	N
Will a gas supply cylinder be available within 6 ft of the analyzer gas inlet port (for standard installation)?	Y	N

ENVIRONMENTAL FACTORS CHECKLIST

Environmental Factors		
Is power available with the correct voltage and frequency, and a safety earth ground?	Y	N
Are temperature and humidity controlled within specifications?	Y	N
Are hazards present or precautions necessary in area of installation?	Y	N
If Yes , please explain:		
Are safety measures required?	Y	N
If Yes , please explain:		

COMPUTER SYSTEM CHECKLIST

Computer System		
Was the computer purchased from Micromeritics?	Y	N
If NO , does the computer meet Micromeritics' minimum requirements?	Y	N
Will the computer be connected to the local network?	Y	N
If YES , will two Ethernet ports be available during the installation?	Y	N
Will there be more than one Micromeritics Ethernet based analyzers connected to this computer?	Y	N
If YES , will an Ethernet switch be available during the installation?	Y	N
All application users are required to have Read / Write permission to all directories and subdirectories where the application is installed. Will these permissions be set prior to installation?	Y	N
Will the Micromeritics Service Engineer have Administrator rights to the computer?	Y	N
If NO , will an IT representative be available?	Y	N

GAS SUPPLY CHECKLIST

Gas Supply		
A dry air supply at 60 psig with a 1/8 in. in. fitting is required. Will it be available at the analyzer?	Y	N
Were gas regulators purchased from Micromeritics? If NO , do your gas regulators meet Micromeritics' specifications?	Y	N

LABORATORY EQUIPMENT AND SUPPLIES CHECKLIST

Laboratory Equipment and Supplies		
Are sufficient quantities of isopropyl alcohol available?	Y	N
Is a balance available for weighing samples?	Y	N
Are 10 pounds triple distilled mercury available?	Y	N

APPLICATION RELATED ISSUES CHECKLIST

Application Related Issues

What types of samples will be tested?

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Will these samples require pretreatment?	Y	N
Will any application assistance from Micromeritics Analytical Services be required?	Y	N

SAFETY RELATED ISSUES

Safety Related Issues

Are rubber or disposable latex gloves available?	Y	N
Have arrangements been made for the disposal of mercury contaminated items — such as tested samples, paper towels, and disposable gloves?	Y	N
Is equipment available for handling spilled mercury?	Y	N

PERSONNEL SECURITY CLEARANCE CHECKLIST

Security Clearance

Are there any special arrangements required concerning security clearance?	Y	N
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If **Yes**, please explain:

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PROJECTED INSTALLATION DATE

When would installation be most convenient? Date: _____ / _____ / _____

(This is not a commitment for a specific installation date.)

COMMITMENT STATEMENT AND SIGNATURE

I have read this document and understand my responsibilities regarding preparations for the installation of our analysis system. I believe this site is ready for the system to be installed.

Signature: _____
Name (Printed): _____
Title (Printed): _____
Company: _____
City / State / Zip: _____
Phone Number: _____ Fax Number: _____
E-mail: _____
Analyzer: _____ Model: _____ Serial Number: _____
Date: _____

Is the Customer Representative also the End User? **Yes** **No**