



HOW TO PRESSURIZE A 1,900 LB. (862 KG) CYLINDER USING NITROGEN

Honeywell

PREFACE

Solstice blowing agents are based on Honeywell's hydrofluoro-olefin (HFO) technology and provide ultra-low global warming potential alternatives to HFC and HCFC blowing agents.

To dispense these blowing agents from the cylinders used to transport and store the material, correct pressurization is essential to their successful and safe use. This guide provides information on how to pressurize a 1,900 lb. (862 kg) or one-ton cylinder – among the packages widely used for all three products. Similar pressurization guides are available for other common cylinder sizes. If you require assistance, contact your Honeywell representative.

We recognize that the information provided does not include all circumstances. Pressurization requirements and processes may vary. **This brochure is intended as guidance only.**

PRECAUTIONS AND SAFETY

At the outset, it is important to note that anyone working with liquid under pressure should carefully follow instructions provided in the safety data sheet (SDS), including information provided on the addition of dry nitrogen.

Temperature

Cylinders should be protected from direct sunlight and should not be exposed to temperatures exceeding 131°F (55°C).

Personal Protective Equipment

Proper personal protective equipment must be worn.

This includes but is not limited to:

- Safety glasses with side shields
- Solvent-resistant gloves
- Long pants
- Long-sleeve shirt

Ventilation

The product should be dispensed in a well-ventilated area. Care should be taken to avoid contact with eyes, skin and clothing, and to avoid inhaling mist or vapor.

HONEYWELL PROVIDES THE FOLLOWING FOAM BLOWING AGENT SOLUTIONS:

- Solstice® Liquid Blowing Agent
- Solstice® Gas Blowing Agent
- Enovate® 245fa



Safety glasses with side shields and solvent-resistant gloves are included among the PPE that must be worn. See additional PPE listed on this page



CHECKS AND PREPARATION

All equipment should be checked before pressurization to ensure everything needed is present, working, and meets materials compatibility requirements.

CHECK THE CYLINDERS

Begin by checking the blowing agent cylinder:

- One ton cylinders are designed to be used horizontally and must never be used or stored vertically
- The identical valves are to be oriented with one directly above the other
- The top valve is used for vapor and the bottom valve is used to dispense liquid
- The maximum recommended service pressure is 260 psi (1800 kPa)
- There is no practical need for cylinder pressure to be greater than 100 psi (690 kPa) and this should not be exceeded

CHECK CONNECTIONS

Users must ensure they have proper connections for the cylinder fittings. In North America, this should conform to Compressed Gas Association (CGA) standards. The fitting used on the liquid discharge valve is a CGA-660 connection.

For the nitrogen supply, the connection is also a CGA-660 connection.

In other regions, connections required may vary depending on cylinder size and fittings. If you have questions or don't have the proper connections or hose assemblies, contact your Honeywell representative. You can call your local Honeywell office or 1-800-631-8138 (U.S. and Canada). You can also refer to the product's technical brochure or conversion manual available at www.honeywell-blowingagents.com

THE NITROGEN CYLINDER AND LIQUID DISCHARGE

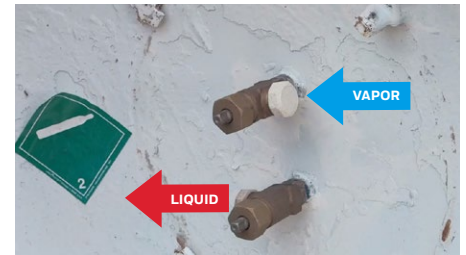
It is recommended that dry, regulated "in-house" nitrogen be used to pressurize one ton cylinders. **Do not mix with oxygen or air above atmospheric pressure because this mixture can be combustible.** If unavailable, 100 lb. (45.4 kg) nitrogen cylinders can be used, though multiple 100 lb. nitrogen cylinders may be needed.

For guidance on using a 100 lb. nitrogen cylinder, it may be helpful to reference Honeywell's documents and videos for pressurizing 100 lb. or 1000 lb. (454kg) blowing agent cylinders. These are available at www.honeywell-blowingagents.com. You can also contact your Honeywell representative for assistance.

Be sure that your nitrogen regulator can be set to 100 psi (690 kPa). To connect the nitrogen, use an appropriate gas hose rated for nitrogen use. This may also have a valve for an additional shut-off location.

In North America, a liquid discharge line with a CGA-660 connection and a gasket is required.

This connects to the blowing agent cylinder and is used to dispense the blowing agent into a suitable process container. As mentioned earlier, connections may vary by region so contact your Honeywell representative if you require assistance.



Dry, regulated in-house nitrogen is recommended to pressurize one ton cylinders.



If in-house nitrogen is unavailable, 100 lb. (45.4 kg) nitrogen cylinders can be used.



Be sure that your nitrogen regulator can be set to 100 psi (690 kPa).



In North America, a liquid discharge line with a CGA-660 connection and gasket is required.

PRESSURIZATION AND DISPENSING

With the correct equipment and supplies in place, you can commence pressurization. This process is designed to ensure the cylinder has a consistent regulated pressure of 100 psi (690 kPa) during dispensing to ensure a constant flow.

It is a three-step process.

Step 1 – Prepare the blowing agent cylinder to be pressurized and to dispense product



1. Turn the cap on the one ton cylinder so that the notches line up. This allows the cap to be removed.



2. This reveals two valves, which may have a plastic wrap that should also be removed.



3. It is critical that the valves are well aligned vertically for proper dispensing. To achieve this, the cylinder may have to be rolled.

Once aligned, remove the cap from the top port. This is the vapor port and is used to allow the nitrogen gas to enter the blowing agent cylinder. Check for the required gasket on the nitrogen gas hose, and then connect this to the blowing agent vapor port and secure tightly.



4. Next, remove the cap from the bottom port. This is the liquid discharge port on the blowing agent cylinder.



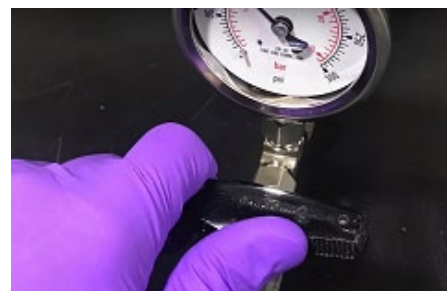
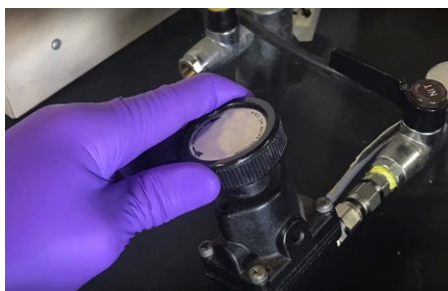
5. Before attaching the liquid discharge line to the discharge port on the blowing agent cylinder, make sure to check for the required gasket.



6. It is also critical to ensure that the line is rated for the desired pressure and the hose material is compatible with the blowing agent. If you have questions, refer to the materials compatibility section in the product's technical brochure, conversion manual, or contact your Honeywell representative.

When all these have been checked, connect the liquid discharge line and secure tightly.

Step 2 – Pressurize with in-house nitrogen



1. To pressurize the blowing agent cylinder, the nitrogen source regulator from the in-house source must be set to dispense at the correct pressure of 100 psi (690 kPa). Remember not to exceed this pressure.

2. When this is confirmed, begin by opening the valve at the nitrogen regulator from the in-house source.



3. Next, open the ball valve on the nitrogen gas line.

3. Then open the vapor valve on the blowing agent cylinder by turning it counter clockwise.

This allows the nitrogen gas to flow into the cylinder, pressurizing it. Pressure should equalize quickly.

Step 3 – Dispense the blowing agent into your process or mixing vessel

Dispensing Solstice LBA and Enovate 245fa:

With the blowing agent cylinder now pressurized, you are ready for the final step in the process -dispensing blowing agent into your process or mixing vessel.

First, check that the end of the liquid discharge line is securely connected to your process or mixing vessel. Then open the liquid valve of the blowing agent cylinder to dispense the blowing agent.

Be sure to carefully monitor the flow of liquid blowing agent into your process or mixing vessel to avoid over filling and spillage.

Dispensing Solstice GBA

This dispensing process differs from that used for Solstice LBA or Enovate 245fa.

It is important to remember that Solstice GBA is a gas at room temperature when not pressurized and will flash off if dispensed into an open container.

Therefore, Solstice GBA **MUST** be dispensed directly into an appropriate pressure-rated container or process line of a closed system. If you have questions, refer to the Solstice GBA conversion manual or contact your Honeywell representative.



DISCONNECTING AND COMPLETING THE PROCESS

Once you are satisfied that the blowing agent has been adequately dispensed from the cylinder, you can take the following steps to conclude the process:

- Close the liquid valve on blowing agent cylinder by turning it clockwise to stop the flow of blowing agent
- Close the vapor valve on blowing agent cylinder
- Close the valve on nitrogen gas hose connected to blowing agent cylinder
- Close the valve at nitrogen regulator from source

When all valves are closed, slowly disconnect nitrogen gas hose from top port of the blowing agent cylinder to relieve pressure on the line. Finally, disconnect the liquid discharge line from the bottom port of the one ton cylinder.

RETURNING EMPTY CYLINDERS

Empty returnable cylinders can be returned to Honeywell. Check for cylinder return instructions for your region. For additional information, you can reference the technical brochure or conversion manual available for each product.

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Learn More

To learn more, call 1-800-631-8138 (U.S. and Canada) or your local Honeywell office
Visit www.honeywell-blowingagents.com

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