

# STAINLESS STEEL PRESSURE DISPENSE SYSTEM (SSPDS)

North America

## EFFICIENT AND SAFE PACKAGING

Honeywell has been committed to innovation in solvents as well as organic and inorganic chemicals for analytical applications for more than 200 years. This pioneering spirit is still guiding us as we continue to evolve and strive to offer high-quality products that increase laboratory efficiency, while enhancing safety.

For Burdick & Jackson™™ and Chromasolv™ high-purity solvents as well as BioSyn™ DNA/RNA reagents Honeywell offers both common bottles, cans and drums as well as innovative returnable containers that maintain purity and reduce packaging waste. These customer-dedicated containers provide an environmentally responsible way to enhance lab safety and convenience. Dispensing from a fully sealed, break-resistant system reduces employee exposure and increases shelf life by maintaining purity.



## FEATURES AND BENEFITS



**INCREASE  
INSTRUMENT  
AND PRODUCTION  
RUN TIMES**



**REDUCE ANALYSIS  
AND PROCESS  
CONTAMINATION**



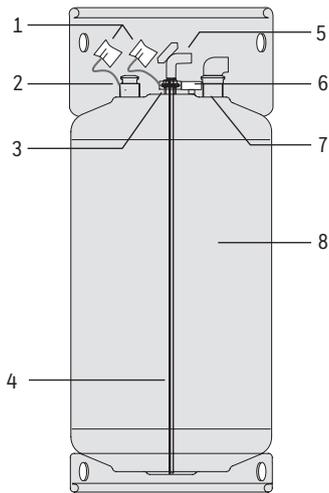
**ELIMINATE  
PACKAGING  
WASTE**



**ENVIRONMENTALLY  
SUSTAINABLE**

**Honeywell**

## SSPDS Container Diagram



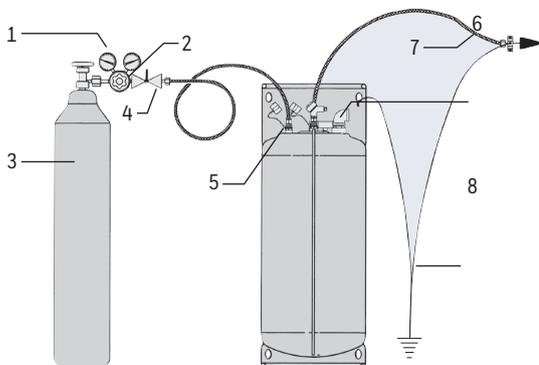
1. Quick-connect coupling protective caps
2. Male inert gas quick-connect coupling
3. Male solvent quick-connect coupling
4. Solvent dip tube
5. Optional level sensor
6. Pressure gauge
7. Pressure relief valve
8. 304 or 316 stainless steel container body

## STAINLESS STEEL PRESSURE DISPENSE SYSTEM (SSPDS) CONTAINER

The Stainless Steel Pressure Dispense System (SSPDS) container is engineered for shipping, storing and dispensing high-purity solvents. Each SSPDS container maintains solvent purity and meets UN, US DOT and OSHA standards for flammable and combustible liquids.

- SSPDS containers are made from stainless steel, specially cleaned to eliminate contamination prior to solvent filling.
- Tamper-evident seals help to verify the delivery of high-quality, uncontaminated solvent.
- SSPDS container and fittings are designed for a pressure-tight seal. Double-ended inert gas shut-off and solvent quick-connect couplings ensure minimal air inclusion and solvent loss when connecting and disconnecting the container at typical operating pressure.
- All solvent flow path surfaces are inert stainless steel, polytetrafluoroethylene (PTFE) or fluoroelastomer to ensure solvent stability.
- Hoses and solvent dispensers deliver solvent directly to instruments and dispensing stations.
- In addition to system installation recommendations, Honeywell offers regulatory assistance, training on safe container usage and a convenient round-trip shipping program.
- Solvent dispensed from SSPDS container meets or exceeds the already demanding glass bottle specifications. The sealed system protects solvents from contaminations and atmospheric moisture.

## Typical SSPDS Container Installation



1. Regulator (0–15 psig)
2. Valve
3. Inert gas (He)
4. Gas quick-connect coupling
5. Solvent quick-connect coupling
6. Pressure relief valve
7. Solvent hose
8. Ground cables

# CLOSED SYSTEM TO MAINTAIN HIGH SOLVENT QUALITY

Solvent dispensed from Honeywell Burdick & Jackson™ SSPDS container meets or exceeds the already demanding glass bottle specifications. Unlike a glass bottle, which must be opened, each SSPDS container is a sealed system, protecting solvents from atmospheric moisture and maintaining purity.

## PURITY

An excellent indicator of solvent purity is UV absorbance. Three 200 L SSPDS container were filled with BioSyn™ acetonitrile from one lot. A UV scan of acetonitrile from each container was recorded using a 5-cm path length quartz cell. The UV cutoffs for samples from each container are identical, and the three UV curves are virtually the same, indicating that solvent purity was not affected by filling and dispensing.

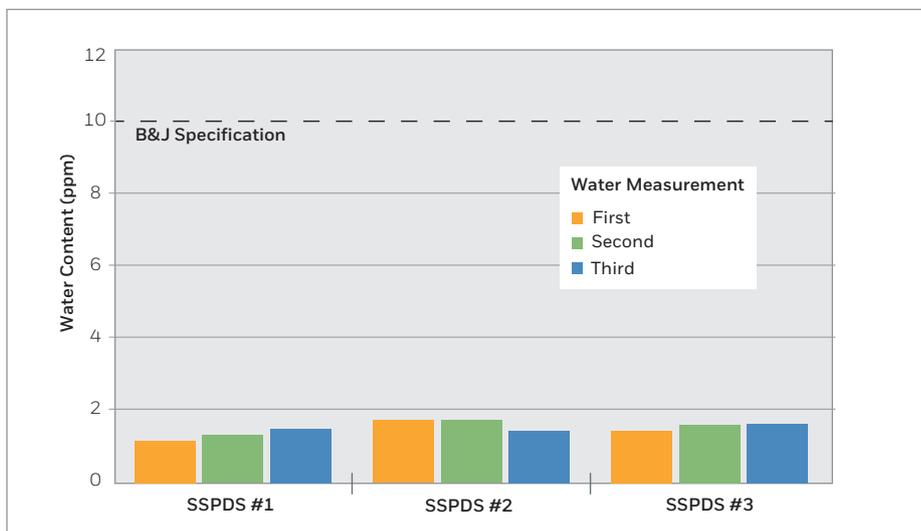
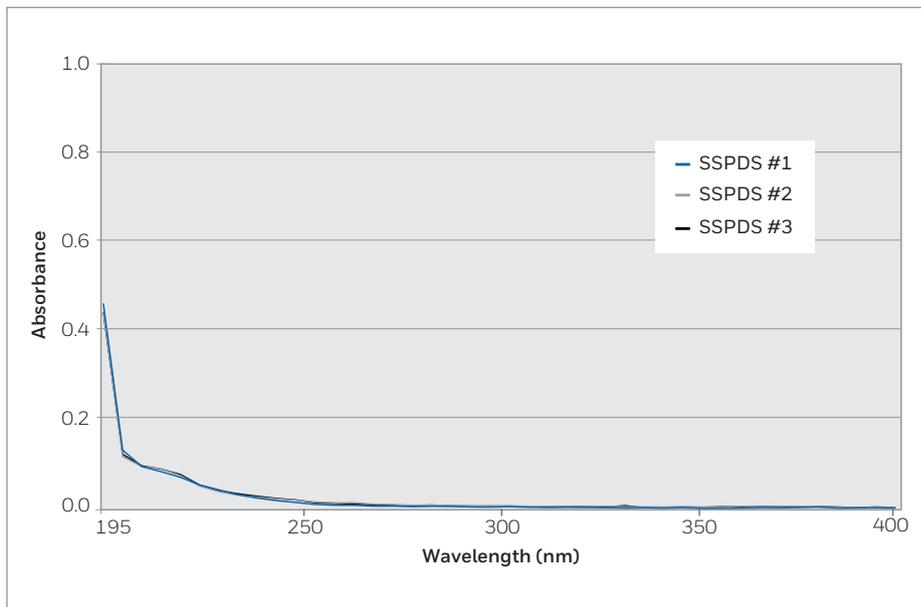
## WATER CONTENT

Three 200 L SSPDS container were filled with the same BioSyn™ low-water content acetonitrile lot. Each container was sampled and analyzed for water content in triplicate using coulometric Karl Fischer titration. The data demonstrates a reproducible low water content across different containers and after sampling. Honeywell Burdick & Jackson™ can reproducibly fill ultra-low-water content solvents into SSPDS container, and the solvent is dispensed without introducing water contamination. This is especially important for DNA manufacturing and other water-sensitive applications.

## STABILITY

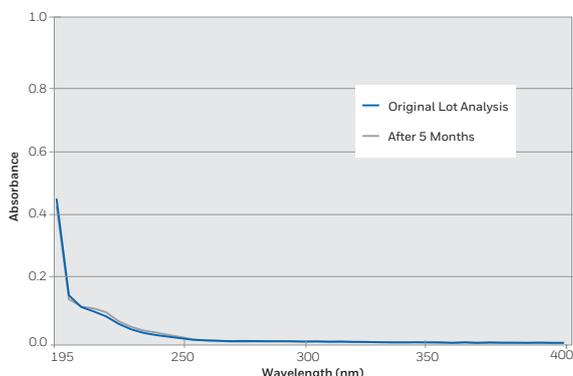
The SSPDS container are constructed using inert material for the container and all solvent flow path surfaces. Container and fittings are designed for a pressure-tight seal ensuring the solvent stability:

- No contact with atmospheric moisture
- Protected from airborne impurities and oxidation
- Highly UV transparent for analytical, preparative and process liquid chromatography
- Free from peaks detected by GC-ECD and GC-FID for pesticide residue analysis



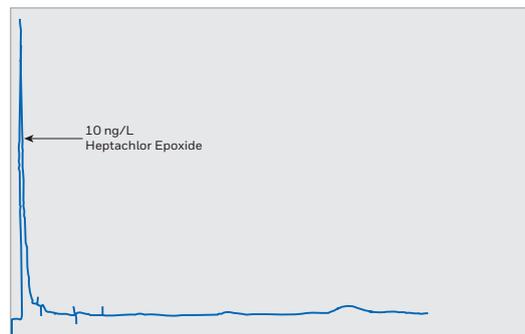
Stability studies confirm SSPDS containers maintain solvent purity over time. No contaminants were detected after a 5-month storage of the B&J Brand™ acetonitrile UV in a SSPDS container. The water content of the original lot was 0.001% determined using Karl Fischer titration and has not increased during storage. In addition, elemental analysis using inductively coupled plasma spectroscopy (ICP) demonstrated that after storage none of the tested metals (Aluminum, Barium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Gold, Iron, Magnesium, Manganese, Nickel, Strontium, Tin and Zinc) were detected with a detection limit of 10 ppm.

**UV Scan**



A UV scan as indicator of solvent purity was recorded using a 5-cm path length quartz cell of the original lot and after 5-month storage demonstrating no effect of storage.

**GC-ECD Chromatogram**



In addition, the GC-ECD chromatogram of acetonitrile stored for 5 months in a SSPDS container indicates no peaks that might interfere with pesticide residue analysis.



Pallet jack

## HANDLING SSPDS CONTAINER

### SSPDS CONTAINER BODY

The SSPDS container is constructed from 14 gauge 304 or 316 stainless steel. The container has a hydrostatically tested proof pressure of 900 kPa or 132 psig. It passes DOT/UN Packing Group I drop testing for highly hazardous material in a closed-head steel drum - dropping the container bearing a 566 lb load with all components in place from a height of 6 feet onto a solid surface. The Honeywell Burdick & Jackson™ SSPDS container also meets OSHA 29 CFR 1910.106 standards covering the storage of up to 60 gallons (227 L) of flammable or combustible liquid.

### SSPDS TRANSPORT

The 200 L SSPDS container is available with pallet base for transport with a pallet jack. In addition, it is available without the pallet base for transport with the SSPDS transport cart.



SSPDS container transport cart

### TAMPER-EVIDENT SEALING

Tamper-evident seals on the Honeywell Burdick & Jackson™ SSPDS container ensure solvent integrity and traceability during container shipping and storage. The seal condition should be verified upon container receipt.

## BUILT-IN PRESSURE GAUGE

On 56L, 200L and 1250L containers, a stainless-steel pressure gauge with an easy-to-read dial allows continuous container pressure monitoring. All Honeywell Burdick & Jackson™ SSPDS container are filled and shipped with an 8 to 10 psig blanket of inert helium gas. Along with the tamper-evident seal, the pressure gauge provides verification that positive pressure was maintained during transit and solvent quality has not been compromised.

## RESEALING PRESSURE RELIEF VALVE

The Honeywell Burdick & Jackson™ SSPDS container is an exceptionally safe bulk delivery system. The SSPDS pressure relief valve minimizes danger of explosion associated with non-vented or inadequately vented storage containers during fire exposure. The SSPDS container emergency venting system is sized using methodologies developed by the Design Institute for Emergency Relief Systems (DIERS). A boiling liquid expanding vapor explosion can occur when an insufficiently vented vessel contains a superheated liquid. Because the liquid is heated above its normal boiling point, flash vaporization occurs. This rapid gas generation creates pressures high enough to destroy the vessel.

## SSPDS DISPENSING AND ACCESSORIES

### SSPDS QUICK-CONNECT COUPLINGS

Solvent is dispensed from a SSPDS container using quick-connect couplings. All internal quick-connect coupling surfaces are 316 stainless steel or polytetrafluoroethylene (PTFE). These rugged, highly reliable connectors maintain solvent purity and are pressure rated to 150 psig. Their automatic shutoff feature allows hoses to be connected or disconnected from the pressurized SSPDS container without requiring manual venting. The high-quality construction of the quick-connect couplings eliminates leakage.

### SPECIALLY CLEANED SSPDS HOSES

Honeywell uses a proprietary cleaning process to remove trace contaminants from the hoses attached to female quick-connect couplings. The cleaning process enables these hoses to maintain even pesticide residue analysis solvent standards. Hoses can be provided cut to any desired length in 1/4, 1/2 and 3/8 inch diameters.

SSPDS hoses are pressure rated to 1500 psig, and the inert PTFE inner tubing is protected from damage and kinking by a flexible stainless steel over braid.

The hoses include two sets of end fittings - one set to attach the inert gas or solvent female quick-connect coupling and another set to connect the hose to either an inert gas source or a solvent dispenser.



1. Male inert gas quick-connect coupling
2. Built-in pressure gauge
3. Male solvent quick-connect coupling
4. Optional level sensor port
5. Resealing pressure relief valve



### 1" SS EPSILON coupler ball valve (CA1250)

The Epsilon Dry-Break couplings on the 1250 L SSPDS containers maximize throughput with a straight-through ball-valve design. These couplings also minimize spillage and increase worker safety with automatic safety interlocks.



PTFE hose with flexible stainless steel over braid

## SSPDS HOSES

Are available in custom lengths (with 1/4" and 1/2" outer diameters) and custom fittings.

COUPLING	HOSE LENGTH	OUTSIDE DIMENSION (OD)	CATALOG NUMBER
Custom hose	Sold by the foot	1/4 inch	CA-HOSE-4-CUSTOM
		1/2 inch	CA-HOSE-8-CUSTOM

## SSPDS DISPENSING AND ACCESSORIES (CONTINUED)

### PRESSURE DISPENSING

The SSPDS can deliver much greater flow rates than are normally used in laboratory and manufacturing dispensing. Because the SSPDS does not necessitate using excessive pressure, safety and degassing problems are avoided. Most laboratory and manufacturing applications do not require SSPDS operating pressures to exceed 15 psig. For example, HPLC instruments typically use flow rates of 2 mL/min, a DNA synthesizer requires approximately 120 mL/min and general dispensing into laboratory glassware or other vessels can safely be done only with a maximum flow rate of 2 to 3 L/min.

### SSPDS DIRECT INSTRUMENT CONNECTION

The Honeywell Burdick & Jackson™ SSPDS maintains solvent purity and low water content by connecting directly to synthesizers and other instruments. Because the SSPDS container serves as a large reservoir, instruments can run unattended longer and less time is spent changing solvent container. Solvent levels within the container can be monitored by an electronic level sensor.

Honeywell Technical Service can provide installation recommendations and system components for delivering high-purity solvent to several instruments simultaneously. Dispensing systems can also include multiple SSPDS container connected using a manifold.

### SSPDS FLOAT-TYPE LEVEL SENSORS

Honeywell offers an electronic level sensor that determines liquid levels using float-type level switches. A float encircling a stationary stem is equipped with a permanent magnet. As the float rises or lowers with liquid level, the magnet within the float actuates reed switches within the stem. This design provides a consistent vertical accuracy of 1/8" with repeatability of no more than 1% deviation. A cable connecting a container to a Float Level Sensor Display Box will provide accurate digital readout of the liquid level.



#### Float Level Sensor Display Box (CA0093LS)

Float-type level sensor probe measures the liquid level in containers and sends the information to the display box for a continuous digital readout. To be used with a Float Level Sensing Probe:

- 56 L (CA0082LS)
- 200 L (CA0083LS)
- 1250 L (CA0084LS)



#### SSPDS Solvent Dispensing Toggle Valve

1/4" (CA0309), 1/2" (CA0316) For added convenience, a hand-held Solvent Dispensing Toggle Valve with swivel allows control of solvent flow with the touch of a finger. This toggle valve dispenser is non-contaminating and connects directly to a SSPDS using the 1/4" and 1/2" solvent hose.



Connection between instrument tubing and SSPDS hoses

## CUSTOM DISPENSING AND CONNECTIONS

Honeywell offers custom solvent dispensing options to support multiple applications, including:

- Custom configured connections and fittings to our returnable container.
- Direct connection from our returnable container to a custom fitted line feeding into a production line, vessel or instrument.

Working closely with end-users has allowed Honeywell to develop a wide range of dispensing capabilities. The flexibility to retrofit connections onto solvent hoses creates an opportunity to expand your range while maintaining solvent purity to your dispensing point.

Honeywell custom solutions for dispensing or installations include:

1. Solvent hose reels mounted above or near a dispensing point which receive solvent from a remote location being fed through our PTFE hose with a stainless steel over braid to prevent damage and kinking during use.
2. Custom lengths of solvent lines connected to a SSPDS container which feed into hardplumbed stainless steel solvent lines which will provide solvent to a remote dispensing point in a fume hood for safe handling and venting of solvents.
3. SSPDS container with multiple point-of use dispense points for filling glassware in hoods.
4. SSPDS container connected to multiple hose reels in a production facility.
5. SSPDS container connected to multiple different brands of instruments that require the use of solvent. Pumps or pressure feed, many tubing diameters, DNA/RNA synthesizers, HPLC instruments, etc.
6. Two containers connected to a switch system that provides an uninterrupted supply of high purity solvents or DNA/RNA reagents.



### SSPDS transport cart with brake (CA2375)

*Cart to conveniently and safely move 200 L SSPDS containers around tight areas and over uneven surfaces such as door frames and ramps.*

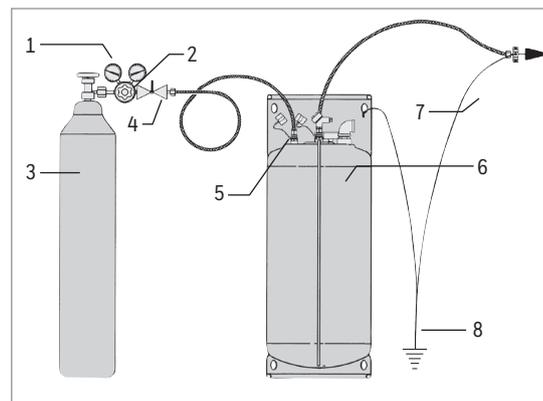
## SSPDS INSTALLATION AND OPERATION

Please follow the steps outlined below when you receive your Honeywell Burdick & Jackson™ SSPDS container.

1. When you receive a SSPDS container, verify the serial number. Each container is tracked by serial number and dedicated to a single customer and solvent.
2. Use a suitable cart to transport the container and ensure it is properly secured to prevent accidental loss of control and possible personnel injury.
3. Place the container on a level surface to ensure stability. Clamp a ground wire to the main body of the container. The originating end of the ground wire must be attached to a proper ground per standard facility procedure.

4. Remove the tamper-evident seal (protective plastic lid) from the chime. Note any obvious signs of external container damage. Keep the envelope containing the return instructions and three plastic ties for reattaching the protective shipping lid when returning the empty container.
5. After the container has equilibrated to room temperature, verify that the pressure gauge registers positive pressure, ensuring the solvent has remained under an inert gas blanket and no contamination has occurred during shipping.
6. Remove the plastic protective caps from the male couplers.
7. If a quality control sample is required, connect the sampling adapter to the male solvent quick-connect coupling. The gas pressure inside the container should be sufficient to withdraw at least 4 L of liquid from the container.
8. To connect the male inert gas quick-connect coupling to the female quick-connect coupling, align the female coupling with the male coupling, pushing straight down until the couplings click. Honeywell recommends using an inert gas, preferably helium, with a purity level of 99.9999% and very low water content. Make certain the pressure regulators used are designed for high-purity gas. The regulators must be oil-free with stainless steel components and inert seals to avoid introducing contaminants.
9. Connect the male solvent quick-connect coupling to the female solvent coupling as in step 8.
10. Once the inert gas pressure line and the solvent dispense line are connected, pressurize the container to the desired operating pressure by first opening the gas pressure regulator and then opening the regulator shutoff valve.

### Typical SSPDS Container Installation



- |                               |                                   |
|-------------------------------|-----------------------------------|
| 1. Regulator (0–15 psig)      | 5. Solvent quick-connect coupling |
| 2. Valve                      | 6. Pressure relief valve          |
| 3. Inert gas (He)             | 7. Solvent hose                   |
| 4. Gas quick-connect coupling | 8. Ground cables                  |



### Sampling adapter (CA000-SA)

*The shipment pressure is sufficient to allow sampling using the sampling adaptor prior to connecting the inert gas source.*

## SSPDS ROUND-TRIP PROGRAM

The Honeywell Burdick & Jackson™ SSPDS container is not only safe and easy to use, but also convenient to return for refilling. Honeywell has established a round-trip shipping program that simplifies container return. A common carrier has been preselected based on their ability to handle the SSPDS container and the best available rate to you. Under this program, Honeywell provides return instructions and attaches it to the SSPDS container. When the container is empty, call the third-party logistics provider designated on the return instructions for a bill of lading. Round-trip shipping costs are added to your solvent invoice. This program expedites empty container return and helps ensure an uninterrupted solvent supply.

### SSPDS CONTAINER RETURN

Only a few easy steps are required to prepare the SSPDS container for return and refilling at Honeywell.

1. Remove as much solvent as possible from the container, verifying that inert gas pressure remains inside. To meet DOT/UN regulations, the pressure must be under 10 psig. Honeywell checks the pressure gauge when receiving containers to make certain no contamination has occurred during shipping.
2. Disconnect the female inert gas and solvent quick-connect couplings and hoses by pulling back on the coupling. The coupling will spring apart. Disconnect the grounding wire.
3. Replace the male quick-connect coupling caps.
4. Replace the plastic lid to protect the container fittings during shipment. Ties are provided (found in the SSPDS return instructions envelope) to securely attach the lid to the container chime.
5. When you are ready for a container pick-up, simply call the Honeywell Return Desk at the phone number provided on the return instructions.

### YOUR SSPDS FLEET

To eliminate cross-contamination and provide traceability, each SSPDS container is dedicated to a single customer and a single solvent. Every container is tracked by serial number, with Honeywell keeping complete records of handling and filling. The SSPDS container fleet size necessary for your application will be determined based on your solvent volume requirements, the shipping time to and from your facility, your on-site storage capacity and your desired safety stock level.

### SSPDS SYSTEM SUPPORT

Honeywell Technical Service will assist you in establishing a SSPDS installation plan that meets your storage and dispensing needs. Together, we will:

- Review your application in detail.
- Assess your solvent purity requirements.
- Discuss your anticipated solvent usage patterns and volume.
- Determine the number of SSPDS containers in your fleet.
- Establish plumbing requirements for system hook-up.
- Review safety and regulatory issues.
- Address any special delivery arrangements such as dockside lift gate service.

# RETURNABLE CONTAINER SPECIFICATIONS



	56 L SSPDS	200 L SSPDS	1250 L SSPDS	800 L PTFE Lined IBC	1250 L Hoover IBC
Footprint	15.5 in (diameter)	21.8 in (diameter)	44.9 in x 44.9 in	45 in x 45 in	42 in x 48 in
	39.4 cm (diameter)	55.3 cm (diameter)	114.1 cm x 114.1 cm	114 cm x 114 cm	107 cm x 122 cm
Height	26.5 in	51.8 in	73.5 in	64 in	51 in
	724 cm	132 cm	186.7 cm	162 cm	130 cm
Volume	56 L	200 L	1250 L	800 L	1250 L
	14.8 gal	52.8 gal	330.3 gal	211.3 gal	330.3 gal
Approximate weight when empty	50 lbs	107 lbs	760 lbs	926 lbs	475 lbs
	22.7 kg	48.5 kg	345 kg	420 kg	215 kg
Approximate weight when full	147 lbs <sup>1</sup>	455 lbs <sup>1</sup>	2710 lbs <sup>1</sup>	2487 lbs <sup>2</sup>	2656 lbs <sup>1</sup>
	67 kg <sup>1</sup>	206 kg <sup>1</sup>	1229 kg <sup>1</sup>	1128 kg <sup>2</sup>	1204 kg <sup>1</sup>
DOT/UN packaging specification	UN1A1/X2.8/900	UN1A1/X2.0/900	UN31A/Y	UN31A/Y	UN31A/Y

1- Filled with methanol

2- Filled with 3% dichloroacetic acid/97% toluene

## ALTERNATIVE PACKAGING OPTIONS

### INTERMEDIATE BULK CONTAINER (IBC)

Depending on the required solvent purity or for corrosive liquids Honeywell offers returnable intermediate bulk container (IBC) as alternative for the SSPDS container.

### STAINLESS STEEL 800 L IBC

The 800 L stainless steel IBC lined with polytetrafluoroethylene (PTFE) are suited to store and pressure-dispense ultra-high purity and corrosive liquids for your most demanding biosynthetic applications such as DNA/RNA synthesis.

### NON-PRESSURIZED STAINLESS STEEL IBC

The 304-stainless steel 1250 L IBC (Hoover) are non-pressurized and offer a safe and cost-effective package solution to meet your high-volume chemical delivery needs. The chemical is dispensed with a pump.



## ADDITIONAL PACKAGING OPTIONS



### NOWPAK® AND NOWPAK® II CONTAINER

High-purity solvents are also available in an inert and specially cleaned liner inside rigid 10 L and 20 L high-density polyethylene (HDPE) or 20 L stainless steel overpacks. Solvents packaged in inert, particle-free nature lined NOWPak and NOWPak II container are suitable for high-purity applications, including DNA/RNA or peptide synthesis, HPLC and pharmaceutical manufacturing.

### HANDLELOCK® B-JACKET® (S1337-20)

Glass bottles present serious safety hazards when dropped. The Honeywell HandleLock B-Jacket is a convenient secondary containment for 4 L solvent bottles as recommended by OSHA Laboratory Standards (29 CFR 1910.1450 Appendix A). The B-Jacket acts as a shock absorber and if a bottle does break, it contains broken glass and solvent spills, protecting people and property from a broken bottle of flammable or hazardous liquid.



#### For more information:

Technical Support Team  
1-800-368-0050  
[www.lab.honeywell.com](http://www.lab.honeywell.com)

#### Honeywell Research Chemicals

115 Tabor Road  
Morris Plains, NJ 07950, USA

Manufacturing Facilities:  
1953 South Harvey Street  
Muskegon, MI 49442, USA

Wunstorferstrasse 40  
30926 Seelze, Germany



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FUTURE  
IS  
WHAT  
WE  
MAKE IT**

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