

SolventTrap svoc



Users Guide



16 Northwestern Drive, Salem, NH 03079

Telephone: (603) 893-3663

Toll-Free: (800) 997-2997 USA Only

Website: www.horizontechinc.com

Copyright © 2014 by Horizon Technology, Inc.

All rights reserved. Horizon Technology, Inc. reserves the right to change the information in this document without notice. No part of this work may be processed, reproduced, or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or by any information storage or retrieval system, except as may be expressly permitted in writing by Horizon Technology, Inc.

DryVap is a registered trademark of Horizon Technology, Inc.

Windows is a registered trademark of Microsoft Corporation.

All other product names herein are used for identification purposes only and are recognized as properties (including trademarks, registered trademarks, and referenced copyrighted materials) of their respective holders.

P/N: 29-0540 Rev. B

(April 2015)

Table of Contents

Preface	iv
Your SolventTrap ^{svoc} Module.....	iv
Manual Audience and Intent	iv
Conventions	v
Table of Symbols	v
Serial Number Label	v
Technical Support.....	vi
1 Introduction and Safety	1
1.1 System Overview	1
1.2 DryVap In-Line Evaporation/Concentration Unit	1
1.3 Product Safety Notice and Certification.....	1
1.3.1 General Safety.....	1
1.3.2 Chemical Safety.....	2
2 Theory of Operation	3
2.1 Solvent Recapture	3
3 Site Preparation and Unpacking	5
3.1 Preparing the Site	5
3.2 Unpacking the SolventTrap ^{svoc}	7
4 Installing the SolventTrap^{svoc}	10
4.1 Installing the SolventTrap ^{svoc}	10
5 Operation	16
5.1 Daily Startup: Preparing the Module	16
5.2 Daily Startup: Powering Up the Module	16
5.3 Considerations for DryVap Operation Conditions	16
5.4 Emptying the Collected Solvent	17
6 Maintenance	19
7 Troubleshooting	20
Appendices	22
A Technical Description	23
Equipment Specifications.....	23
Accessories and Kits.....	23
B SDS for Chiller Cooling Solution	24
C Limited Warranty	32

Preface

Your SolventTrap_{svoc} Module

Congratulations on your purchase of the SolventTrap_{svoc} module, the latest generation of solvent reclaiming systems from Horizon Technology. The SolventTrap_{svoc} offers a number of benefits and allows you to be environmentally friendly and compliant. We are sure your unit will offer you many years of use in your laboratory.

Regulatory Markings

The SolventTrap_{svoc} consists of a condenser system cooled with a chiller. The chiller has the following approvals:

CSA UL (60Hz units)

CE (50Hz units)

For more details, please refer to the complete chiller manual, included with your system.

Product Safety

The SolventTrap_{svoc} is designed with operator safety in mind. However, the product use is at the discretion and risk of the operator or laboratory supervisor/manager. Use the product as described in this manual. Refer to Section 1.3, *Product Safety Notice and Certification*.

Statement of Proper Use

The SolventTrap_{svoc} Module is a solvent reclamation system that works with the DryVap[®] In-line drying and evaporation system to recapture the evaporated solvent, primarily dichloromethane. See the DryVap manual (part number 29-2025) for additional information.



WARNING

To reduce the risk of electrical shock, do not disassemble the DryVap or chiller modules. There are no serviceable parts inside. Refer repairs to qualified service personnel.

Manual Audience and Intent

This manual, which is intended for all SolventTrap_{svoc} users in the laboratory environment, provides the information needed to operate and maintain SolventTrap_{svoc} Module. The information may contain typographical errors or technical inaccuracies and is subject to change without notice. Modifications or enhancements may also be made to the product at any time. For the most current information, consult the Horizon website at www.horizontechinc.com.

Conventions

The following texts are examples of conventions used in this manual.

Example	Description
<i>Declaration of Conformity</i>	Italicized text indicates document and section titles as well as special notes.
Setup .Exe	Courier type indicates a program file name.
OK/Save as	Bold type indicates a button or information displayed on the screen.
 WARNING	Symbols to the left of a NOTE or WARNING indicate the type of danger that could be present, such as high voltage, fire, explosion, etc. See the Table of Symbols, below, for details.

Table of Symbols

The following symbols point out important information and alert you to potential hazards.

Symbol	Type	Description
	Warning	A potentially hazardous situation, which if not avoided could result in death or serious injury.
	Note	A safety note for operation or additional explanation. This informs and guides you in safe practices to avoid injury and is intended to cover general safety requirements for a laboratory. Each laboratory is responsible for implementing and communicating its unique safety requirements and program to all workers.
	Caution	A caution concerning operations that may cause a hand pinch. Where indicated, keep hands clear and refer to the manual.
	Caution	A caution concerning potential eye injury. Eye protection in the form of safety glasses or goggles is highly recommended when operating the DryVap/Solvent Trap modules and any chemical processing. If reagents, liquids, or vapors come into contact with the eyes, follow the appropriate first aid procedures set forth in the laboratory's safety manual.
	Caution	A caution concerning the potential of a fire.
	Caution	A caution to wear protective gloves when handling harmful reagents.

Serial Number Label

The serial number on the back of the DryVap will include record of the SolventTrap svoc.



Technical Support

Visit the Horizon website for technical information in addition to that provided in this manual: www.horizontechnic.com. If you have questions about the SolventTrap^{SVOC} Module that are not fully addressed in this manual or our website, please contact the Horizon Technology Technical Customer Support Center:

Phone: (603) 893-3663

Fax: (603) 893-4994

E-mail: support-service@horizontechnic.com

Customer Support Center hours are Monday through Friday, 8:00 a.m. to 5:00 p.m. EST. The Center provides expert technical support including troubleshooting, repair instructions, service and installation scheduling, and replacement part information.

Notes:

1 Introduction and Safety

1.1 System Overview

The SolventTrap_{SVOC} Module, part number 49-0540, is the latest generation of solvent reclamation systems from Horizon Technology.

Because solvent vapors emitted into the atmosphere are harmful to the environment, the SolventTrap_{SVOC} Solvent Recovery System, hereafter referred to as the SolventTrap_{SVOC} System, is designed to condense and collect solvent vapors which are generated by Horizon Technology's DryVap[®] In-line Drying and Evaporation System. Using a vacuum pump, the solvent vapors are pulled through a cold condenser coil, where the solvent vapors are chilled and converted back into a liquid form. The solvent then flows by gravity into a heavy glass flask and can be periodically drained through a stopcock valve to a collection bottle. Once the bottle is full, the solvent is properly disposed. Designed specifically to handle the volume of solvent vapor generated by the DryVap System, the SolventTrap_{SVOC} System operates at $0 \pm 0.25^{\circ}\text{C}$ and is capable of condensing and capturing approximately 85-95% of the solvent vapor, depending upon the solvent (95% for dichloromethane (DCM)).

The SolventTrap_{SVOC} System allows facilities to:

- Prevent harmful solvent vapors from being released to the atmosphere
- Collect solvents for proper disposal or potential redistillation and reuse
- Protect workers from exposure to harmful solvent vapors

The following are features of the SolventTrap_{SVOC}:

- Minimal space is required: The condenser coil sits next to the DryVap System, but the chiller system is generally placed on the floor, under the bench. The vacuum pump can be placed in a hood, on the bench or on the floor.
- The chiller has a temperature gauge, showing you quickly when the system is ready to use
- The chiller has an illuminated coolant level gauge that indicates if the coolant needs to be replenished if the liquid level drops.
- The vacuum gauge displays the vacuum level inside of the condenser coil and is positioned for easy viewing and access for adjustment.

1.2 DryVap In-Line Evaporation/Concentration Unit

The SolventTrap_{SVOC} is designed to operate with a new DryVap In-line Drying and Evaporation System. Installation of the DryVap System can be found in the manual for that system. Some settings for DryVap Operation may need to be adjusted for the ultimate solvent recovery and these will be addressed in this manual.

1.3 Product Safety Notice and Certification

1.3.1 General Safety

1: Introduction and Safety



- Eye protection in the form of safety glasses or goggles is highly recommended when operating the SmartPrep Module or any chemical processing. If reagents, liquids, or vapors come into contact with the eyes, follow the appropriate first aid procedures set forth in the laboratory's safety manual.
- Lab coats should be provided for protection. They should be worn at all times when operating the SolventTrap_{SVOC}.



- Protection of the hands is essential when working with reagents or any hazardous material. Wear gloves selected on the basis of the hazard. If reagents or other chemicals come into contact with the skin, follow the appropriate first aid procedures set forth in the laboratory's safety manual.
- The equipment must be set up and operated in a well-ventilated area.
- Do not work with volatile reagents without adequate ventilation from chemical fume hoods or other protective devices.
- Disconnect the power cord before working on the module.

1.3.2 Chemical Safety

- A Safety Data Sheet (SDS) is the source for chemical hazard information including basic information on the manufacturer or distributor, identification of the chemical, the product's hazardous ingredients, physical data, fire and explosion data, toxicity information, protection information, and more. The laboratory is responsible for having a SDS for every chemical or substance being used. It is also the laboratory's responsibility to make the SDS available and accessible to all employees and to provide training in the safe handling of hazardous chemicals. The SDS can be obtained from the vendor.
- All hazardous reagents and chemicals must be disposed in accordance with appropriate Federal, state, and local regulations.



- The SolventTrap_{SVOC} uses organic reagents that can pose inhalation, skin, and ingestion hazards with potential chronic health effects. Some of the reagents may also be flammable, which could cause fire and/or explosion hazards. In general, chlorinated reagents are not flammable while non-chlorinated reagents are often flammable. However, chlorinated reagents do decompose when burned, resulting in high concentrations of toxic vapors. All reagents must be handled using appropriate personal protection equipment and in a properly operating fume hood to eliminate inhalation hazards. For handling and safety instructions, refer to the Safety Data Sheet (SDS) for the specific chemical. The SDS for the chiller cooling solution is located in Appendix B in this manual.

Notes:

2 Theory of Operation

2.1 Solvent Recapture

Extraction is performed using solvent or solid phase extraction to remove the analytes of interest from a matrix such as water, where they are widely dispersed. The solvent is dried and is generally evaporated to provide a more concentrated extract for injection into an HPLC or GC. Evaporation to exchange solvents is also common, especially with HPLC, where a solvent such as acetonitrile may be preferred.

The evaporation step releases large quantities of solvent which can be released into the atmosphere and/or laboratory. It is environmentally conscious and may be regulatory required to recapture the solvent used for extraction in order to reuse it or dispose of it properly.

Condensation of the solvent from vapor to liquid allows recapture. This is accomplished by chilling the vapor and collecting the condensed solvent in a vessel.

The process is shown in Figure 2-1.

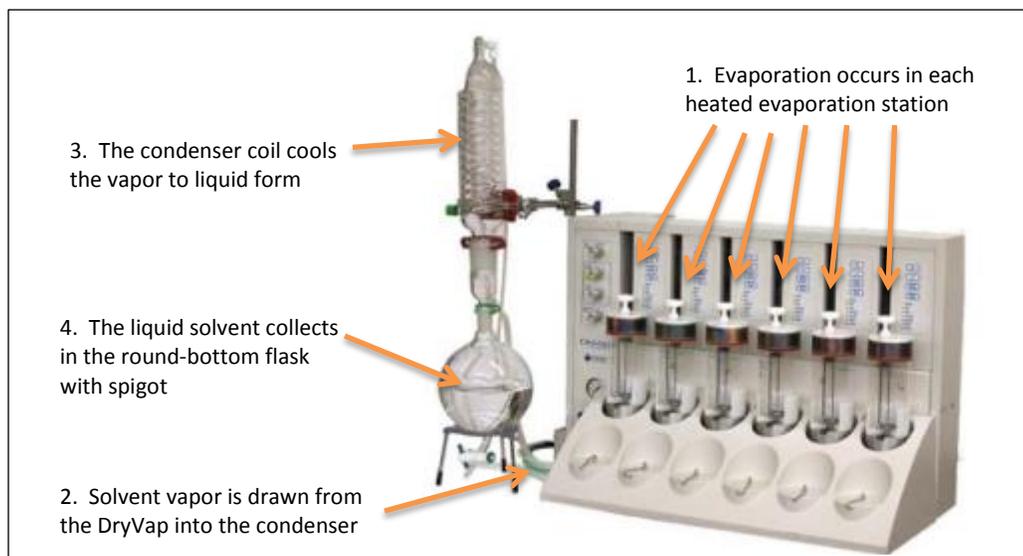


Figure 2-1: General description of the solvent reclamation process

2: Theory of Operation

Notes:

3 Site Preparation and Unpacking

The Customer *Pre-Installation Form* was emailed/faxed prior to delivery of the system to ensure a successful DryVap/SolventTrap_{SVOC} Module installation. Follow the *Pre-Installation Form* directions. Contact Horizon Technology (603-893-3663) if you have any difficulty fulfilling the requirements.

3.1 Preparing the Site

When setting up the SolventTrap_{SVOC}, adequate space for reagents, samples, and storage space for waste containers must be available. Determine a suitable installation location with nitrogen gas and electrical sources. As specified on the *Customer Pre-Installation Form*, verify:

- Space
- Ventilation
- Power

Facility Requirements

In addition to the site preparation for the DryVap System, the following must also be considered.

Requirement	Specification		
Space	Minimum space for each module: The chiller sits on the floor and requires 25.4Width x 48.3Height x 76.2 Depth cm (10W x 19H x 30D inches) The glassware is placed on the bench top and attached to the DryVap increasing the space needed for the DryVap to 102W x 81H x 53D cm (40W x 32H x 21 D inches) The pump can be placed on the floor or bench top and vented to the hood or placed in the hood and requires 30W x 36H x 51D cm (12W x 14H x 20D inches)		
Support	The table on which the module sits must accommodate each module at a weight of 9 kg (20 lbs) plus the weight of the DryVap System.		
Ventilation	The vacuum pump should be vented into a hood		
Power	Chiller Module	120 VAC, 12.0 amp or 220VAC, 6.0 amp, 50Hz (a circuit separate from the DryVap should be provided)	
	Vacuum Pump	Line Voltage	110 VAC (to power supply) or 220 VAC
		Line Frequency	60 Hz
Waste Containers	The collected solvent will need to be drained from the flask on a regular basis and a suitable line and container must be provided, and can be optionally purchased from Horizon Technology		

Notice on Vacuum Pumps:

A rotary vane vacuum pump is not suitable for this work; only a diaphragm vacuum pump should be used. Properly optimized diaphragm vacuum pumps may be purchased through Horizon Tech-

3: Site Preparation and Unpacking

nology. These pumps include two eight-foot pieces of tubing to allow the vacuum pump to be properly exhausted to a fume hood.

For proper operation of the DryVap System, the vacuum system must be able to evacuate all six stations operating simultaneously. The pumps offered by Horizon Technology are able to sustain a flow of 3.8 CFM (6.46 m³/h) at a vacuum of -26 inches of Hg (-880 mbar).

For proper operation, constant system vacuum is maintained by a solvent resistant vacuum regulator connected on the vacuum pump. For most installations, the vacuum regulator is set to -5 inches of Hg for operation of the SolventTrap_{SVOC}.

3.2 Unpacking the SolventTrap svoc

Follow the steps below when unpacking the SmartPrep Module. Call Horizon Technology at 603-893-3663 for any assistance required for your installation.

Part Number 49-0540: SolventTrap_{SVOC} system including glassware.

The SolventTrap_{SVOC} System will arrive in several boxes, separate from the DryVap System.

One box will include the chiller with 1 gallon of coolant strapped to the side of the box (PN 41-0540) or for 220V applications PN 41-0541.

The second box is shown as in Figure 3-1, opened to see the contents.

Remove the contents of the box and check against the list:

03-0540-01 – Glass Coil Condenser, packaged with two green-capped connectors

03-0540-02 – Collection Vessel

03-0540-03 – Vacuum Adapter

50-0540 – Condenser Mount Block Assy

99-0540-01 – Condenser Mount Pole

99-0540-02 – Chain Clamp

99-0540-03 – Clamp Holder

50-0540-02 – Collection Tube Assembly (white tubing with brass elbow and nut)

20-0540-01 – ¼ Barb Fitting w/ ½ NPT Adapter and brass offset

05-0352 – Blue Tubing for Chiller 3/8 od, ¼ id

99-0540-06 – Keck Clamp, Brown

99-0540-05 – Keck Clamp, Green

22-0540-02 – PTFE Swagelok Union Elbow

99-0540-04 – Vacuum Pump Fitting, Reduced Luer

50-0540-01 – Tripod

50-0540-03 – Vacuum Regulator Assy

29-0540-01 - CD with manuals

The parts are shown displayed in Figure 3-2, removed from the box, but still in their packing materials.

Optional Parts:

50-2355 – DryVap Software

04-1683 – Carboy, 20L

99-0540-10 – Drain Tubing



Figure 3-1: Box containing parts other than the Chiller

3: Site Preparation and Unpacking

Consumable Parts:

48-0540-01 - Vacuum Regulator Service Kit



Figure 3-2: Parts from the box still in their packing materials

Notes:

4 Installing the SolventTrap svoc

The SolventTrap svoc is straightforward to install. It is however, important that the portions of the system are installed in the proper order.

1. Install the DryVap first, following the instructions in the DryVap manual. Position the vacuum pump for access to the SolventTrap svoc
2. Assemble the glassware for the SolventTrap svoc and attach it carefully to the DryVap
3. Prepare the chiller and plumb it to the condenser



It is important for optimal solvent recovery that all connections are tight and leak-free, however, connections with glass must be done with care to ensure glass breakage or injury does not occur. Also, all connections achieved using compression-style fittings are subject to vacuum leaks if over tightened. Compression fittings should be made finger-tight and then turn 1/4 of a full rotation further.

4.1 Installing the SolventTrap svoc

Follow these instructions to install a SolventTrap svoc System.

- Step 1: Find the condenser mount block assembly (PN 50-0540). Remove the two screws in the left bottom front side of the DryVap and use the included longer screws to attach the block to the DryVap. Find the condenser mount pole (PN 99-0540-01) and insert into hole in the top of the block. Tighten with the black turnkey on the block. See Figure 4-1.



Figure 4-1: Condenser Mount Block and Pole

- Step 2: Locate the chain clamp (PN 99-0540-02) and clamp holder (PN 99-0540-03). Place the clamp on the condenser mount pole and adjust the height to approximately 2 inches above the side of the DryVap (see Figure 4-2).



Figure 4-2: Clamp holder positioned above the DryVap

Step 3: Locate the tripod three-legged stand box (PN 50-0540-01). Assemble the tripod by attaching the legs as shown in Figure 4-3 and position it near the condenser mount pole.

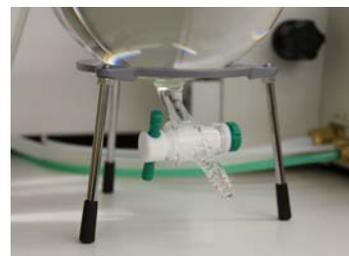


Figure 4-3: Tripod assembled

Step 4: Locate the glass coil condenser (PN 03-0540-01) and remove the bubble wrap. Put the two connectors with green caps aside. The condenser is packed with salt for shipping to prevent breakage. Carefully remove the stopper at the bottom and drain the salt into a plastic bag (save in case the condenser needs to be shipped in the future). Remove all the black tape (using a sharp knife, such as an X-acto[®] knife, might be the easiest). (see Figure 4-4) Rinse the condenser with water so any retained salt is removed, reducing the possibility of scratching the stopper in the round-bottom collection vessel. Dry with acetone.



Figure 4-4: Condenser packed with salt

Step 5: Locate the vacuum adapter (PN 03-0540-03) and connect it to the bottom of the condenser. Secure the connection with the brown Keck clamp (PN 99-0540-06). See Figure 4-5 for the adapter and clamp.



Figure 4-5: Adapter and Keck clamp

Step 6: Locate the round-bottom collection vessel (PN 03-0540-02) and connect it to the bottom of the adapter, taking care with the stopcock. Secure the connection with the green Keck clamp.



Figure 4-6: Adapter with collection vessel attached

4: Installing the SolventTrap SVOC

Step 7: Carefully lift the assembled glass and place it on the tripod. While continuing to hold the assembly, wrap the chain of the chain clamp around the condenser and secure it on the hook. Carefully rotate the screw to tighten the chain until just tight. Ensure the glassware is vertical (straight up and down, not leaning in one direction).



Caution, over tightening may damage the glass.



Figure 4-7: Chain clamp hook and adjustment knob

Step 8: Locate the vacuum regulator assembly (PN 50-0540-03) and slide it onto the condenser mount pole (Figure 4-8) and tighten the screws in the back to hold it in place above the chain clamp. The tubing on the left side should be attached to the top of the condenser (Figure 4-9) using the PTFE Swagelok® union elbow (PN 22-0540-02). Attach the tubing on the right side of the vacuum regulator to the vacuum pump (Figure 4-10) using the vacuum pump fitting (PN 99-0540-04)



Over tightening may strip the threads on the compression fitting and cause a vacuum leak



Figure 4-8: Vacuum regulator installed on the condenser mount pole



Figure 4-9: PTFE elbow connecting the condenser to the vacuum regulator



Figure 4-10: Fitting connecting vacuum regulator tubing to the vacuum pump

4.1: Installing the SolventTrap SVOC

Step 9: Attach the plain end of the collection tube assembly (PN 50-0540-02) to the nipple on the vacuum adapter. A few drops of isopropyl alcohol can help to lubricate the plastic to ensure the tubing is firmly fitted without breaking the glass. (Figure 4-11) The end of the tubing with the brass nut should be attached to the DryVap vacuum line connection (Figure 4-12).



Figure 4-11: Connecting the condenser nipple to the vacuum line from the DryVap



Figure 4-12: Vacuum connection on the DryVap

Step 10: Set up the chiller, following the instructions in the provided manual for mixing and adding the coolant solution.

Step 11: Locate the two pieces of blue tubing and the barbed fitting with 0.5-inch NPT adapter with brass offset connector (Figure 4-13). Attach one barbed fitting to the plain end of each piece of tubing. Attach the brass connector end of the barbed fitting to the inlet and outlet on the back of the chiller as shown in Figure 4-14. Do not use the connectors supplied with the chiller.



Figure 4-13: Blue tubing with barbed fitting for chiller connections and green-capped connectors for condenser



Figure 4-14: Connections to the chiller

4: Installing the SolventTrap SVOC

Step 12: Connect the output line to one of the nipples on the condenser using the green-capped connector. Connect the input line to the other nipple on the condenser using the second green capped connector. Make sure the connections are hand tight and not over tightened. (Figure 4-15)



Figure 4-15: Green connectors for coolant coming from the chiller and going back to the chiller

Step 13: The initial set up of the unit is complete as shown in Figure 4-16.

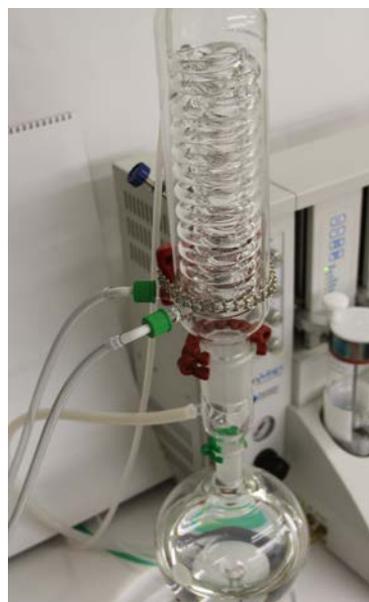


Figure 4-16: Glassware assembled

Notes:

5 Operation

5.1 Daily Startup: Preparing the Module

Before using the SolventTrap_{SVOC} to collect solvent, perform the following:

- Step 1: Inspect all connections to be sure they are tight.
- Step 2: Empty all waste containers and make sure they are of sufficient capacity to contain all solvent to be collected from the samples to be processed.
- Step 3: Ensure the stopcock on the bottom of the glass collection vessel is closed.



WARNING

Avoid eye injury by wearing safety glasses and other required personal protective equipment when working with reagents. Always work with extreme care when handling reagents.

5.2 Daily Startup: Powering Up the Module

- Step 1: Turn on the power switch on the back of the chiller.
- Step 2: Turn on the chiller standby switch on the front of the module and ensure the temperature is set to 0 degrees C.
- Step 3: When the temperature has reached 0°C (20-30 minutes), set up the DryVap to run following instructions in the DryVap manual.

5.3 Considerations for DryVap Operation Conditions

The ultimate goal is to evaporate the solvent from samples as quickly as possible while retaining the greatest portion of analytes and recovering the greatest volume of solvent with the SolventTrap_{SVOC}. Although this is the goal, compromise is often required to optimize the component most important to the laboratory.

- If solvent recovery is the most important component it can be optimized by adjusting the nitrogen sparge flow to zero on the DryVap system and use -5 inches Hg.
- If recovery of analytes should be optimized, the same conditions will serve
- If the methodology in older application notes is used, specifying a higher nitrogen flow and stronger vacuum, the solvent recovery will be less than at the conditions specified for optimum solvent recovery.

If in-line drying is desired nitrogen should be on at 20 psig for the drying part...it purges the sample left in the line into the evaporation tube. Then turn to 0 psig for evaporation and recovery steps.

When ALL the heaters have turned off and the stations are in the sparge state, then bring the N₂ pressure to 20 psig. This is necessary to evaporate the remaining 6.5 mL of extract down to the optical endpoint volume.

5.4 Emptying the Collected Solvent

When the solvent level approaches the capability of the flask do NOT start another evaporation run until it has been emptied.

Connect tubing to the stopcock fitting as shown in Figure 5-1.

Loosen the vacuum fitting on the right side of the vacuum regulator to ensure the pressure is normalized and open the stopcock to drain the solvent into a suitable waste vessel. When the solvent is completely drained, close the stopcock and tighten the connection to the vacuum regulator (see Figure 5-2).



Figure 5-1: Attach tubing to the drain stopcock



Figure 5-2: Loosen fitting to relieve vacuum and normalize pressure

5: Operation

Notes:

6 Maintenance

There is no routine maintenance that needs to be performed on the SolventTrap_{SVOC}. If problems are encountered with the unit, please see Section 7.0 – Troubleshooting.

Please see the manual for the chiller for any required maintenance on that part of the system.

7 Troubleshooting

To establish the cause of unexpected behavior, review the table below.

System Troubleshooting

Symptom	Probable Cause	Solution
Chiller not able to maintain temperature during run	Chiller may be frozen or have another issue	See maintenance section in the chiller manual for trouble shooting
Vacuum regulator is not maintaining the set vacuum	The integrity of the regulator seals may be compromised.	The regulator is considered a “Service Item” and is recommended to be changed annually. PN 48-0540-01
The condenser does not feel cold when the chiller is powered on and equilibrated	Chiller fuse may have blown. Visually inspect for confirmation that the wire inside the fuse is broken	See maintenance section in the chiller manual for changing the fuse

For all other service related issues, please contact Horizon Technology, Inc. at 603-893-3663 or email support-service@horizontechinc.com.

Notes:

Appendices

A Technical Description

Equipment Specifications

Requirement	Specification		
Space	Minimum space for each module: The chiller sits on the floor and requires 25.4Width x 48.3Height x 76.2 Depth cm (10W x 19H x 30D inches) The glassware is placed on the bench top and attached to the DryVap increasing the space needed for the DryVap to 102W x 81H x 53D cm (40W x 32H x 21 D inches) The pump can be placed on the floor or bench top and vented to the hood or placed in the hood and requires 30W x 36H x 51D cm (12W x 14H x 20D inches)		
Support	The table on which the module sits must accommodate each module at a weight of 9 kg (20 lbs) plus the weight of the DryVap System.		
Ventilation	The vacuum pump should be vented into a hood		
Power	Chiller Module	120 VAC, 12.0 amp or 220VAC, 6.0 amp, 50Hz (a circuit separate from the DryVap should be provided)	
	Vacuum Pump	Line Voltage	110 VAC (to power supply) or 220 VAC
		Line Frequency	60 Hz
Waste Containers	The collected solvent will need to be drained from the flask on a regular basis and a suitable line and container must be provided, and can be optionally purchased from Horizon Technology		

Accessories and Kits

Refer to the Horizon Technology E-store (<http://www.horizontechstore.com/>) for spare parts, accessories, and consumables.

For a complete listing and current pricing, contact the Horizon Technology Sales Department:

+1 603-893-3663

Notes:

B **SDS for Chiller Coolant Solution**

The coolant solution is provided through PolyScience and the Safety Data Sheet is provided here and on the Horizon Technology Website (http://www.horizontechinc.com/Support/SDS_MSDS.htm) for convenience.

PRODUCT NAME: polycool EG -25
PART NUMBER: 060340
REVISION DATE: 01/14/2010

SUPERSEDES: 11/30/2006

1. IDENTIFICATION OF THE SUBSTANCE AND COMPANY

Chemical Name: Ethylene glycol
CAS no. 107-21-1
Product Description: colorless liquid with sweet odor.

Supplier:
Univar USA Inc.
17425 NE Union Hill Rd
Redmond, WA 98052
Telephone: (425)889-3400

Bottler:
Accumetric Inc
411 E Dixie
Elizabethtown, KY 42701

Distributor:
PolyScience
6600 W Touhy Ave
Niles, IL 60714
Telephone: (847)647-0611

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS, CALL - CHEMTREC (800) 424-9300

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Color: Colorless
Physical State: Liquid
Odor: Sweet

Hazards of Product: WARNING! Harmful or fatal if swallowed. May cause eye irritation. Isolate area.

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

POTENTIAL HEALTH EFFECTS:

Eye Contact: May cause slight eye irritation. Corneal injury is unlikely. Vapor or mist may cause eye irritation.

Skin Contact: Brief contact is essentially nonirritating to skin. Prolonged contact may cause slight skin irritation with local redness. Repeated contact may cause skin irritation with local redness.

Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts. Repeated skin exposure to large quantities may result in absorption of harmful amounts. Massive contact with damaged skin or of material sufficiently hot to burn skin may result in absorption of potentially lethal amounts.

Inhalation: At room temperature, exposure to vapor is minimal due to low volatility. With good ventilation, single exposure is not expected to cause adverse effects. If material is heated or areas are poorly ventilated, vapor/mist may accumulate and cause respiratory irritation and symptom such as headache and nausea.

Ingestion: Oral toxicity is expected to be moderate in humans due to ethylene glycol even though tests with animals show a lower degree of toxicity. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause serious injury, even death. May cause nausea and vomiting. May cause abdominal discomfort or diarrhea. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure.



POTENTIAL HEALTH EFFECTS continued.

EFFECTS OF REPEATED EXPOSURE:	Repeated excessive exposure may cause irritation of the upper respiratory tract. In humans, effects have been reported on the following organs: Central nervous system. Observations in humans include: Nystagmus (Involuntary eye movement). In animals, effects have been reported on the following organs: Kidney, Liver.	
BIRTH DEFECTS/DEVELOPMENTAL EFFECTS:	Based on animal studies, ingestion of very large amounts of ethylene glycol appears to be the major and possibly only route of exposure to produce birth defects. Exposure by inhalation or skin contact, the primary routes of occupational exposure, had minimal effects on the fetus, in animal studies.	
REPRODUCTIVE EFFECTS:	Ingestion of large amounts of ethylene glycol has been shown to interfere with reproduction in animals.	
NFPA Ratings (0-4):	Health:	1
	Fire:	1
	Reactivity:	0

3. COMPOSITION/INGREDIENTS INFORMATION

COMPONENT	CAS NO.	WEIGHT %
Ethylene glycol	107-21-1	>99.0%

4. FIRST-AID MEASURES

EYE CONTACT:	Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.
SKIN CONTACT:	Wash skin with plenty of water.
INHALATION:	Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth, use rescuer protection (pocket masks, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility immediately.
INGESTION:	Do not induce vomiting. Seek medical attention immediately. If person is fully conscious, give 1 cup or 8 ounces (240ml) of water. If medical advice is delayed and if an adult has swallowed several ounces of chemical, then give 3-4 ounces (1/3-1/2 Cup) (90-120ml) of hard liquor such as 80 proof whiskey. For children, give proportionally less liquor at a dose of 0.3 ounce (1 1/2 tsp.) (8ml) liquor for each 10 pounds of body weight, or 2ml per kg body weight (e.g., 1.2 ounce (2 1/3 tbsp.) for a 40 pound child or 36ml for an 18kg child).
NOTE TO PHYSICIAN:	If several ounces (60-100ml) of ethylene glycol have been ingested, early administration of ethanol may counter the toxic effect (metabolic acidosis, renal damage). Consider hemodialysis or peritoneal dialysis & thiamine 100mg plus pyridoxine 50mg intravenously every 6 hours. If ethanol is used, a therapeutically effective blood concentration in the range of 100-150mg/dl may be achieved by a rapid loading dose followed by a continuous intravenous infusion. Consult standard literature for details of treatment. 4-Methyl pyrazole (Antizol*) is an effective blocker of alcohol dehydrogenase and should be used in the treatment of ethylene glycol (EG), di- or triethylene glycol (DEG, TEG), ethylene glycol butyl ether (EGBE), or methanol intoxication if available. Fomepizole protocol (Brent, J. et al., New England Journal of Medicine, Feb. 8, 2001, 344:6, p. 434-9); loading dose 15mg/kg intravenously, followed by bolus dose of 10mg/kg every 12 hours; after 48 hours, increase bolus dose to 15mg/kg every 12 hours. Continue fomepizole until serum methanol, EG, DEG, TEG, or EGBE are undetectable. The signs and symptoms of poisoning include anion gap metabolic acidosis, CNS depression, renal tubular injury, and possible late stage cranial nerve involvement. Respiratory symptoms, including pulmonary edema, may be delayed. Person receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. Maintain adequate ventilation and oxygenation of the patient. In severe poisoning, respiratory support with mechanical ventilation and positive end expiratory pressure may be required. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. If burn is present, treat as any thermal burn, after decontamination. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.



5. FIRE-FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA:	Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. May spread fire. Alcohol (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.
FIRE FIGHTING PROCEDURE:	Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of re-ignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.
SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS:	Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.
HAZARDOUS COMBUSTION PRODUCTS:	During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide, Carbon dioxide.

6. ACCIDENTAL RELEASE MEASURES

Steps to be Taken if Material is Released or Spilled: Contain spilled material if possible. Collect in suitable and properly labeled container.

Small spills: Absorb with materials such as: Cat litter, Sand, Sawdust, Vermiculite, Zorb-all*, Hazorb*.

Large spills: Dike area to contain spill. Pump into suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

Ignition Sources Removal: Keep away from sources of ignition.

Dust Control: Not applicable.

Personal Precautions: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls/Personal Protection. Refer to Section 7, Storage and Handling, for additional precautionary measures.

Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. STORAGE AND HANDLING

HANDLING

GENERAL HANDLING: Do not swallow. Avoid contact with eyes. Wash thoroughly after handling. Spills of these organic materials on hot fibrous insulations may lead to lowering of the Autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, Exposure Controls/Personal Protection.

STORAGE: Do not store near food, foodstuffs, drugs or potable water supplies. Additional storage and handling information on this product may be obtained by calling Univar's sales or customer service contact. Ask for a product brochure.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits Component	List	Type	Value
Ethylene Glycol	ACGIH	Ceiling Aerosol	100mg/m ³

Personal Protection

EYE/FACE PROTECTION: Use safety glasses. If exposure causes eye discomfort, use a full-face respirator.

SKIN PROTECTION: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly. When handling hot material, protect skin from thermal burns as well as from skin absorption.

HAND PROTECTION: If hands are cut or scratched, use gloves chemically resistant to this material even for brief exposures. Use gloves with insulation for thermal protection, when needed. Examples of preferred glove barrier materials include: Butyl rubber, Natural rubber ("latex"), Neoprene, Nitrile/butadiene rubber ("nitrile" or "NBR"), Polyethylene, Ethyl vinyl alcohol laminate ("EVAL"), Polyvinyl alcohol ("PVA"), Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.



PERSONAL PROTECTION continued.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

INGESTION: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

ENGINEERING CONTROLS

VENTILATION: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Colorless
Odor:	Sweet
Flash Point - Closed Cup:	116°C (241°F) ASTM D56
Flammable Limits in Air:	Lower: 3.2% (V) Literature Upper: 15.2% (V) Literature
Autoignition Temperature:	427°C (801°F) Literature
Vapor Pressure:	0.05mmHg @ 20°C Literature
Boiling Point (760mmHg):	>197°C (>387°F) Literature
Vapor Density (air = 1):	2.1 Literature
Specific Gravity (H ₂ O = 1):	1.115 @ 20°C Literature
Freezing Point:	-13°C (9°F) Literature
Melting Point:	Not applicable
Solubility in Water (by weight):	100% Literature
pH	9 Literature
Molecular Weight:	62g/mol Literature
Octanol/Water Partition	-1.36 Measure Coefficient
Evaporation Rate (Butyl Acetate = 1):	0.01 Literature

10. STABILITY AND REACTIVITY

Stability/Instability

Stable under recommended storage conditions. See Storage and Handling, Section 7

Incompatible Materials: Avoid contact with: Strong acids. Strong bases. Strong oxidizers.

Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems.

Thermal Decomposition.

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Aldehydes, Ketones, Organic acids.

Hazardous Polymerization

Will not occur.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Ingestion

For ethylene glycol: Lethal Dose, Human, adult 3 ounces

LD50, Rat: 6,000-13,000mg/kg

Skin Absorption: LD50, Rabbit: >22,270mg/kg

Inhalation: LC50, 7 h, Aerosol, Rat: >3.95mg/L

Repeated Dose Toxicity: Repeated excessive exposure may cause irritation of the upper respiratory tract. In humans, effects have been reported on the following organs: Central nervous system. Observations in humans include: Nystagmus (involuntary eye movement). In animals, effects have been reported on the following organs: Kidney, Liver.

Chronic Toxicity and Carcinogenicity: Ethylene glycol did not cause cancer in long-term animal studies.

Developmental Toxicity: Based on animal studies, ingestion of very large amounts of ethylene glycol appears to be the major and possibly only route of exposure to produce birth defects. Exposures by inhalation or skin contact, the primary routes of occupational exposure, had minimal effects on the fetus in animal studies.

Reproductive Toxicity: Ingestion of large amounts of ethylene glycol has been shown to interfere with reproduction in animals.

Genetic Toxicology: In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.



12. ECOLOGICAL INFORMATION

CHEMICAL FATE

Movement & Partitioning

Bioconcentration potential is low (BCF <100 or Log Pow <3). Potential for mobility in soil is very high (Koc between 1 and 50). Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

Henry's Law Constant (H): 8.05E-09 atm*m³/mole; 25 C Estimated

Partition coefficient, n-octanol/water (log Pow): -1.36 Measured

Partition coefficient, soil organic carbon/water (Koc): 1 Estimated

Distribution in Environment: Mackay Level 1 Fugacity Model:

Air	Water	Biota	Soil	Sediment
2.1%	98%	<0.01%	<0.01%	<0.01%

Persistence and Degradability

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches >70% mineralization in OECD test(s) for inherent biodegradability). Indirect Photodegradation with OH Radicals.

Rate Constant	Atmospheric Half-Life	Method
8.32E-12 cm ³ /s	15 h	Estimated

OECD Biodegradation Test	Exposure Time	Method
Biodegradation >94%	28 d	OECD 301 F Test

Theoretical Oxygen Demand: 1.29mg/mg

ECOTOXICITY

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50 >100mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

LC50, rainbow trout (*Oncorhynchus mykiss*), static, 96 h: 18,000 – 46,000 mg/L

Aquatic Invertebrate Acute Toxicity

LC50, water flea *Daphnia magna*, static, 48 h: 46,300 – 51,000 mg/L

Aquatic Plant Toxicity

EC50, green alga *Selenastrum capricornutum*, biomass growth inhibition, 96 h: 9,500 – 13,000 mg/L

Toxicity to Micro-organisms

EC50, OECD 209 Test; activated sludge, respiration inhibition, 30 min: 225 mg/L

13. DISPOSAL CONSIDERATIONS

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Water characterizations and compliance with applicable laws are the responsibility solely of the waste generator. WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: 3. Composition/Ingredients Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Recycler, Reclaimer, Incinerator or other thermal destruction device. As a service to our customers, Univar or the supplier can provide names of information resources to help identify water management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Please contact Univar's or the supplier's Customer Information Group (telephone number in Section 1 of this document) for further details.

14. TRANSPORTATION INFORMATION

DOT Non-Bulk
NOT REGULATED

DOT Bulk
Proper Shipping Name: OTHER REGULATED SUBSTANCES, LIQUID, NOS
Technical Name: CONTAINS ETHYLENE GLYCOL
Hazard Class: 9 ID Number: NA3082 Packing Group: PG III

B: SDS for Chiller Coolant Solution



TRANSPORTATION INFORMATION continued.

IMDG

Proper Shipping Name: OTHER REGULATED SUBSTANCES, LIQUID, NOS
Technical Name: CONTAINS ETHYLENE GLYCOL
Hazard Class: 9 ID Number: NA3082 Packing Group: PG III
Marine Pollutant: No.

THIS SHIPMENT IS MARKED, LABELED AND/OR PLACARDED AND DESCRIBED IN ACCORDANCE WITH US DOT REGULATIONS AND IS NOT REGULATED BY IMDG.

ICAO/IATA

NOT REGULATED

Additional Information

Reportable quantity: 5,05 lb – ETHYLENE GLYCOL

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard

This product is a Hazardous Chemical as defined by the OSHA Hazard communication Standard, 29 CFR 1910.1200 Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	Yes
Flre Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1896 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

This product contains the following substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and which are listed 40 CFR 372.

Component	CAS #	Amount
Ethylene Glycol	107-21-1	>99.0%

Pennsylvania (Worker and Community Right-to-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List: The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Ethylene Glycol	107-21-1	>99.0%

Pennsylvania (Worker and Community Right-to-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List: To the best of our knowledge, this product does not contain chemical levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986) WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

Component	CAS #	Amount
Acetaldehyde	75-07-0	<= 8.0 PPM
1,4-Dioxane	123-91-1	<= 0.25 PPM

U.S. Toxic Substances Control Act

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

European Inventory of Existing Commercial Chemical Substances (EINECS)

This product is on the EINECS inventory.

CEPA –Domestic Substances List (DSL)

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.



16. OTHER INFORMATION

Recommended Uses and Restrictions
For Industrial use. It is recommended that you use this product in a manner consistent with the recommended use.

Legend
N/A Not available
W/W Weight/Weight
OEL Occupational Exposure Limit
STEL Short Term Exposure Limit
TWA Time Weighted Average
ACGIH American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG Dow Industrial Hygiene Guidelines
WEEL Workplace Environmental Exposure Level
HAZ DES Hazard Designation
Action Level A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

FOR ADDITIONAL INFORMATION

CONTACT MSDS COORDINATOR (UNIVAR USA INC) DURING BUSINESS HOURS, PACIFIC TIME (425) 889-3400

NOTICE

MSDS prepared by UNIVAR USA.
Product manufactured by UNIVAR, bottled and packed for distribution by Accumetric, and distributed by PolyScience.

***** UNIVAR USA INC ("UNIVAR") and POLYSCIENCE EXPRESSLY DISCLAIM

ALL EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED HEREIN, AND SHALL UNDER NO CIRCUMSTANCES BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

DO NOT USE INGREDIENT INFORMATION AND/OR PERCENTAGES IN THIS MSDS AS A PRODUCT SPECIFICATION. FOR PRODUCT SPECIFICATION INFORMATION REFER TO A PRODUCT SPECIFICATION SHEET AND/OR A CERTIFICATE OF ANALYSIS. THESE CAN BE OBTAINED FROM YOUR LOCAL UNIVAR SALES OFFICE.

ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS BELIEVED TO BE ACCURATE, UNIVAR AND POLYSCIENCE MAKE NO REPRESENTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND UNIVAR'S AND POLYSCIENCE'S CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND THEY ASSUME ALL RISKS OF THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM THE PUBLICATION OR USE OF, OR RELIANCE UPON, INFORMATION CONTAINED HEREIN. THIS INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER PROCESS.

C Limited Warranty

Horizon Technology, Inc. provides a **SolventTrap_{svoc}** (Product) warranty against defects in material or workmanship as follows:

1. **LABOR:** For a period of one year from the date of purchase, if this Product is determined to be defective, Horizon will repair the Product, and will cover all labor charges. The Product must be returned to Horizon Technology, prepaid, for repair. Horizon will pay the return shipping charges.
2. **PARTS:** Horizon will supply, at no charge, new replacement parts for a period of one (1) year. Horizon will send the replacement parts directly to the customer site, for customer installation. If the customer does not wish to install these parts, the Product must be returned to Horizon Technology for the necessary repairs. The customer is responsible for shipment of the Product to Horizon.

To obtain warranty service, the Product must be delivered prepaid, in the original packaging. If needed, new packaging is available for purchase from Horizon Technology.

Warnings and Restrictions of use of the SolventTrap_{svoc} System

The following Warnings and Restrictions of use are to guide the operator for safe and effective use of the Horizon Technology SolventTrap_{svoc}. Failure to use the system as intended will void the warranty.

Warnings and Restrictions

This warranty does not cover customer installation, or set up adjustments and/or Product optimization. The warranty also does not cover cosmetic damage or damage due to acts of nature, accident, misuse, abuse, negligence, or modifications of, or to any part of the Product. This warranty does not cover damage due to improper operation or maintenance, or attempted repair of any electrical components.

No other warranties are expressed or implied.

For service assistance or resolution of a service problem, or for product information or operation, contact:

Horizon Technology, Inc.

1-(800)-997-2997 (Toll-free, US only)

1-(603)-893-3663

Horizon Technology, Inc.

16 Northwestern Drive

Salem, NH 03079

Email: support-service@horizontechinc.com

Website: www.horizontechinc.com

P/N: 29-0540 Rev. B