

# Purifiers

Gas purification begins by determining the contaminants that need to be removed from the particular gas stream, levels to which the contaminants must be reduced, flow and pressure needs of the system and the desired frequency of purifier change-out. Multiple purifiers may be necessary to remove the desired levels of contaminants to adequately protect the column and detector. Purifiers for most applications are listed below. Other purifiers are available, and can be found in our catalog and on our website.

## OMI® (Oxygen Moisture Indicating) Polishing Purifier



- Polishing purifier that removes many contaminants that other upstream purifiers miss
- Simultaneously removes moisture, oxygen, carbon monoxide, carbon dioxide, most sulfur compounds, most halogen compounds, alcohols and phenols to less than 10 ppb
- Detects moisture and oxygen in hydrogen, helium, nitrogen, argon and argon/methane
- As little as 1 ppm of moisture or oxygen will change the indicating resin from black to brown
- The indicating resin is licensed exclusively to Supelco® for use in chromatographic applications
- Inert glass body prevents diffusion of ambient room contaminants into the carrier gas stream
- See-through polycarbonate holder provides safety

## Supelcarb® HC Hydrocarbon Trap



- Removes organics from carrier gases, air and hydrogen
- Twice the trapping ability of activated charcoal

## Supelpure® HC Hydrocarbon Trap



- Activated charcoal purifier that adsorbs hydrocarbons and other contaminants from carrier gas, compressed air and hydrogen
- When the total hydrocarbons in the incoming gas average 100 ppm, operates efficiently for approximately six months

## High Capacity Gas Purifier

- Removes moisture, oxygen, carbon monoxide and carbon dioxide
- No other purifier removes both moisture and oxygen in such large quantities
- Removes up to 35 liters of moisture or 14 liters of oxygen
- Clamshell heating unit has been specifically designed to ensure maximum gas purity
- Purifier tube is heated inside an oven where moisture and oxygen react with the reactant material in the tube
- Irreversible chemical reaction prevents contaminants from returning to the gas stream even when the purifier tube reaches saturation
- 230V now CE approved



## Molecular Sieve 5Å Water Vapor Trap



- Can reduce moisture in the gas stream to final concentrations less than 0.1 ppm
- Also preferred for use on in-house gas lines where moisture content could be high
- Offers greater working capacity than similar molecular sieves

## Gas Delivery

### Gas Purifiers

#### How to Select Purifiers

Why use gas purifiers? Hydrocarbons in the carrier gas can lead to noisy baselines and irreproducible results. Moisture and oxygen can strip phase, creating excessive bleed, damaging the GC column and shortening lifetime. Purifiers help ensure the reliable and efficient performance of the GC instrument.

Our recommendation is to use individual purifiers to handle each of the typical contaminants. These contaminants (hydrocarbons, moisture and oxygen) are present in different impurity levels in the gases. Seldom do you find a purifier that has the activities of each adsorbent to match the contaminants in your gases. It is better to use separate purifiers for each contaminant on a need base.

**Indicating Purifiers** - These purifiers allow a continuous monitoring of the actual gas quality that reaches the GC instrument. They give an indication of a needed purifier change before an analytical problem is caused by insufficient gas purity. We strongly recommend these indicators to ensure a reliable delivery of pure carrier gas.

**Moisture indicators** (blue beads) - Most moisture purifiers that contain blue beads will show a color change at moisture levels above 50ppm. They can be regenerated under certain conditions.

**Oxygen indicators** - Purifiers such as the OMI line of purifiers indicate the presence of oxygen in your carrier gas. Oxygen indicators are designed for use primarily as an indicator. They are not designed for use as the main oxygen trap when purifying gases of low purity.

**Special Purpose Purifiers** These purifiers are designed for specific applications.

**GC/MS Purifiers** Purifiers such as the Supelco helium purifier and the UOP mat/sen are designed to produce high purity Helium carrier gas for use with GC/MS instruments. This results in greater sensitivity of the MS.

**Carbon Dioxide Purifier** This purifier is used with techniques involving FTIR, IR, Total Organic Carbon (TOC) and other detectors sensitive to Carbon Dioxide ( $\text{CO}_2$ ). We offer a purifier that removes  $\text{CO}_2$  and shows a color change. The reaction of  $\text{CO}_2$  with the adsorbent forms moisture. We recommend the use of a moisture-removing purifier downstream of the  $\text{CO}_2$  purifier.

More information is available in Supelco Bulletin 918 (T197918) on Selecting Purifiers for Gas Chromatography.

#### Gas Purifier Recommendations

HYDROCARBONS	MOISTURE	OXYGEN
<b>CARRIER GAS (HELIUM, HYDROGEN OR NITROGEN)</b>		
Single GC, Part time usage and low gas flows Supelcarb-HC 120 cc	Molecular Sieve 5A 200 cc	Supelpure-O 120 cc
GC usage and normal gas flows, up to 4 units Option 1: Supelcarb-HC 120 cc Option 2: Supelpure-HC 120 cc	High Capacity Gas Purifier <sup>1</sup> & OMI-2 <sup>1,4</sup> Molecular Sieve 5A 200 cc	High Capacity Gas Purifier <sup>1</sup> & OMI-2 <sup>1,4</sup> Supelpure-O 120 cc
Multiple GC usage, 5 and more units Option 1: Supelcarb-HC 750 cc Option 2: Supelcarb-HC 750 cc	High Capacity Gas Purifier <sup>1</sup> & OMI-2 <sup>1,4</sup> Molecular Sieve 5A 750 cc	High Capacity Gas Purifier <sup>1</sup> & OMI-2 <sup>1,4</sup> Supelpure-O 750 cc
GC/MS Usage Option 1: Supelco Helium Purifier <sup>3</sup> Option 2: UOP mat/sen <sup>3</sup>	Supelco Helium Purifier <sup>3</sup> UOP mat/sen <sup>3</sup>	Supelco Helium Purifier <sup>3</sup> UOP mat/sen <sup>3</sup>
<b>AIR</b>		
Single GC usage, up to 4 units Supelcarb-HC 120 cc	Molecular Sieve 5A 200 cc	
Multiple GC usage, 5 and more units Supelcarb-HC 750 cc	Molecular Sieve 5A 750 cc	
<b>HYDROGEN (AS A FUEL GAS)</b>		
GC usage and normal gas flows, up to 4 units Supelcarb-HC 120 cc		
Multiple GC Usage, 5 and more units Supelcarb-HC 750 cc		
<sup>1</sup> One needed per GC		
<sup>2</sup> Do not use with hydrogen		
<sup>3</sup> Use with helium only		
<sup>4</sup> Requires 4 ft. tubing between high-capacity gas purifier and OMI-2		

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Gas Chromatography

Gas Purifiers for Hydrocarbon Removal

NAME OF PURIFIER	CARRIER GASES PURIFIED	CONTAMINANTS REMOVED	PRODUCT DESCRIPTION	MAXIMUM FLOW & INLET PRESSURE		CAPACITY (GRAMS HC X 75%) <sup>3</sup>	STATED LIFE (CYLINDERS) <sup>1</sup>
				(CC/MIN)	(PSIG/BAR)		
Supelcarb HC	He, H <sub>2</sub> , N <sub>2</sub> , Ar/CH <sub>4</sub> , air	C3 and higher hydrocarbons	120cc tube	2000	250/17.2	18	16.5
			1/8" 24448 1/4" 24449	10,000	250/17.2	120	110
			750cc tube				
1/4" 24564 1/2" 24565							
Supelpure HC	He, H <sub>2</sub> , N <sub>2</sub> , Ar/CH <sub>4</sub> , air	C4 and higher hydrocarbons	120cc tube	2000	250/17.2	9	8.0
			1/8" 22445-U 1/4" 22446	10,000	250/17.2	60	55.0
			750cc tube				
1/4" 24518 1/2" 24519							
UOP Inert Gas Purifier	He	O <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub> , CO halocarbons, hydrocarbons, sulfurs	364cc tube	500	250/17.2	7.5	6.9
			1/8" 22680-U 1/4" 22681				

Gas Purifiers for Moisture Removal

NAME OF PURIFIER	CARRIER GASES PURIFIED	CONTAMINANTS REMOVED	PRODUCT DESCRIPTION	MAXIMUM FLOW & INLET PRESSURE		CAPACITY (GRAMS H <sub>2</sub> O X 75%) <sup>3</sup>	STATED LIFE (CYLINDERS) <sup>1</sup>
				(CC/MIN)	(PSIG/BAR)		
Molecular Sieve 5A Trap	He, H <sub>2</sub> , N <sub>2</sub> , many others	H <sub>2</sub> O	120cc tube	2000	250/17.2	15.6	68
			1/8" 20619 1/4" 20618	10,000	250/17.2	58.5 <sup>6</sup>	253
			750cc tube				
1/4" 23991 1/2" 23992							
High Capacity Heated Purifier	He, N <sub>2</sub> , Ar/CH <sub>4</sub> not compatible with air, O <sub>2</sub> , H <sub>2</sub>	O <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub> , CO	32cc tube <sup>4</sup>	1100	150/10.3	16.9	73
			1/8" 22396 1/4" 22398				
OMI	He, H <sub>2</sub> , N <sub>2</sub> , Ar/CH <sub>4</sub> not compatible with air or O <sub>2</sub>	O <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub> , CO, NH <sub>3</sub> , alkynes, halocarbons, halogens, hydrogen halides	OMI-2, 15cc tube <sup>5</sup>	1000	150/10.3	0.2	0.8
			1/8" 23906	1000	150/10.3	1.3	5.8
			OMI-4, 90cc tube <sup>5</sup>				
1/8" 23909							
GateKeeper	He, H <sub>2</sub> , Ni <sub>2</sub> , Ar not compatible with air or O <sub>2</sub>	O <sub>2</sub> , H <sub>2</sub> O, H <sub>2</sub> , CO <sub>2</sub> , CO, (removes H <sub>2</sub> as a contaminant, also can purify H <sub>2</sub> carrier gas)	35cc cartridge	1000	200/13.8	0.1	0.5
			24970	60,000	200/13.8	1.4	6.0
500cc cartridge							
24971							
Supelpure-O	He, H <sub>2</sub> , N <sub>2</sub> , Ar/CH <sub>4</sub> not compatible with air or O <sub>2</sub>	O <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub> , CO, NH <sub>3</sub> , alcohols, alkanes, alkenes, amines, aromatics, diethylether, halogens, sulfurs	120cc tube	250	100/6.9	1.5	6.5
			1/8" 22449 1/4" 22450-U	10,000	250/17.2	10.2 <sup>6</sup>	44.3
			750cc tube				
1/4" 503088 1/2" 503096							
UOP Inert Gas Purifier	He	O <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub> , CO, halocarbons, hydrocarbons, sulfurs	364cc tube	500	250/17.2	26.3	114
			1/8" 22680-U 1/4" 22681				

<sup>1</sup> Based on 9" X 51" cylinders (218 cubic feet) of carrier gas containing 50ppm of contaminants supplying 1 chromatograph with 2 capillary columns. Ask our supplier for specifications for the cylinders you use. To correct for other volumes of gas per cylinder, multiply Stated Life (cylinders) by the number of cubic feet in your cylinders, then divide by 218.

<sup>2</sup> Quantity of adsorbent material – dimensions of fitting – catalog number.

<sup>3</sup> Expressed as medium weight (C8 – C20) hydrocarbons.

<sup>4</sup> Heat required (tube must be installed in a specially designed heater).

<sup>5</sup> Holder required.

<sup>6</sup> At a flow rate of 1000cc/min.

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Gas Chromatography

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## Gas Delivery

### Gas Purifiers

#### Gas Purifiers for Oxygen Removal

NAME OF PURIFIER	CARRIER GASES PURIFIED	CONTAMINANTS REMOVED	PRODUCT DESCRIPTION	MAXIMUM FLOW & INLET PRESSURE (CC/MIN) (PSIG/BAR)	CAPACITY (GRAMS O <sub>2</sub> X 75%)	STATED LIFE (CYLINDERS) <sup>1</sup>
OMI	He, H <sub>2</sub> , N <sub>2</sub> , Ar/CH <sub>4</sub> not compatible with air or O <sub>2</sub>	O <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub> , CO, NH <sub>3</sub> , alkynes, halocarbons, halogens, hydrogen halides	OMI-2, 15cc tube <sup>3</sup> 1/8" 23906	1000 150/10.3	0.16	0.4
			OMI-4, 90cc tube <sup>3</sup> 1/8" 23909	1000 150/10.3	1.19	2.9
High Capacity Heated Purifier	He, N <sub>2</sub> , Ar/CH <sub>4</sub> not compatible with air, O <sub>2</sub> , H <sub>2</sub>	O <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub> , CO	32cc tube <sup>4</sup> 1/8" 22396 1/4" 22398	1100 150/10.3	15.0	36.5
Supelpure-O	He, H <sub>2</sub> , N <sub>2</sub> , Ar/CH <sub>4</sub> not compatible with air or O <sub>2</sub>	O <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub> , CO, NH <sub>3</sub> , alcohols, alkanes, alkenes, amines, aromatics, diethylether, halogens, sulfurs	120cc tube 1/8" 22449 1/4" 22450-U	250 100/6.9	0.45	1.1
			750cc tube 1/4" 503088 1/2" 503096	10,000 250/17.2	2.4 <sup>6</sup>	5.8
GateKeeper	He, H <sub>2</sub> , N <sub>2</sub> , Ar not compatible with air or O <sub>2</sub>	O <sub>2</sub> , H <sub>2</sub> O, H <sub>2</sub> , CO <sub>2</sub> , CO (removes H <sub>2</sub> as a contaminant, also can purify H <sub>2</sub> carrier gas)	35cc cartridge 24970	1000 200/13.8	0.77	1.9
			500cc cartridge 24971	60,000 200/13.8	9.56	23.3
Oxisorb	He, H <sub>2</sub> , N <sub>2</sub> , Ar/CH <sub>4</sub>	O <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub> , CO	52cc cartridge <sup>3</sup> 20631	5000 90/6.2	NA <sup>5</sup>	1.0 <sup>5</sup>
Oxiclear	He, H <sub>2</sub> , N <sub>2</sub> , Ar/CH <sub>4</sub>	O <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub> , CO	180cc cartridge 1/8" 22992 1/4" 22993	3000 250/17.2	NA <sup>5</sup>	3.5 <sup>5</sup>
UOP Inert Gas Purifier	He	O <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub> , CO, halocarbons, hydrocarbons, sulfurs	364cc tube 1/8" 22680-U 1/4" 22681	500 250/17.2	2.14	5.2

<sup>1</sup> Based on 9" X 51" cylinders (218 cubic feet) of carrier gas containing 50ppm of contaminants supplying 1 chromatograph with 2 capillary columns. Ask your supplier for specifications for the cylinders you use. To correct for other volumes of gas per cylinder, multiply Stated Life (cylinders) by the number of cubic feet in your cylinders, then divide by 218.

<sup>2</sup> Quantity of adsorbent material - dimensions of fitting - catalog number.

<sup>3</sup> Holder required.

<sup>4</sup> Heat required (tube must be installed in a specially designed heater).

<sup>5</sup> Data for determining oxygen capacity was not available from the manufacturer. Stated life in cylinders in the manufacturer's recommendation.

<sup>6</sup> At a flow rate of 1000cc/min.

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Gas Chromatography

## Gas Delivery Gas Purifiers

### OMI Indicating Purifiers

- Simultaneously remove water vapor, CO, CO<sub>2</sub>, most sulfur compounds, most halogen compounds, alcohols, phenols to less than 10ppb
- Purify helium, hydrogen, nitrogen, argon-methane
- Color change indicates purifier exhaustion
- Glass body does not diffuse air or off-gas
- Ideal for Hall, ECD, GC/MS detection systems
- OMI-4 purifier protects multiple instruments (three times the capacity of OMI-2 tubes)

Irreversibly remove contaminants from carrier gas. Install an OMI purifier downstream from your primary gas purifying device, and tell at a glance whether or not oxygen and water vapor are being effectively eliminated from your system. The OMI purifier will provide point-of-use gas polishing and final visual assurance of gas quality before the gas enters the GC. OMI purifier tubes contain Nanochem resin, developed for the demanding gas purity needs of the semiconductor manufacturing industry. As little as 1ppm of oxygen or water will change the indicating resin from black to brown.

Spent tubes are easily replaced. Simply unscrew the end assembly from the tube holder and replace the tube. The design prevents air from entering the new tube during installation.

Note: For optimum performance, we do not recommend storing OMI tubes for longer than 6 months.

### Protect Your Column from Many Carrier Gas Contaminants

CONTAMINANT	OMI PURIFIER	INDICATING DEVICES	NON-INDICATING OXYGEN TRAPS
Oxygen	Yes	Yes	Yes
Water	Yes	No	Maybe
Carbon monoxide	Yes	No	Maybe
Carbon dioxide	Yes	No	No
Alcohols/Phenols	Yes	No	No
Sulfur-containing compounds	Yes	No	No <sup>2</sup>
Halogen-containing compounds	Yes	No	No <sup>2</sup>

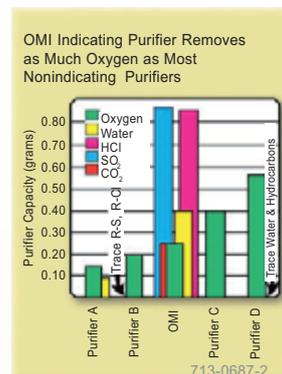
<sup>1</sup> If incoming oxygen level does not exceed 10ppm.

<sup>2</sup> Corrosive compounds may poison some of these devices.

DESCRIPTION	CAT. NO.	PRICE
OMI-2 Purifier Tube <sup>3</sup>	23906	
OMI-2 Tube Holder, 1/8" fittings <sup>3</sup>	23921	
Seal Kit for OMI-2 Tube Holder (includes 2 Teflon seals and tool)	23917	
OMI-4 Purifier Tube <sup>3</sup>	23909	
OMI-4 Tube Holder, 1/8" fittings <sup>3</sup>	23926	
OMI-1 Replacement Tube <sup>4</sup> (includes 2 ferrules)	23900-U	
3/8" Ferrules (pk. of 10)	22311	
1/4" to 1/8" Swagelok SS Reducer	21517	

<sup>3</sup> First time users must order both purifier tube and corresponding holder. Holder is reusable.

<sup>4</sup> Will not fit OMI-2 tube holder – use with OMI-1 installation kit only (kit no longer available).



DIMENSIONS OF OMI PURIFIERS	
OMI-2	Tube: 6"/15.2cm x 5/8"/1.6cm OD Tube Holder: 10"/25.4cm x 1 1/2"/3.8cm OD Endfittings: 2 1/2"/6.4cm
OMI-4	Tube: 12"/30.5cm x 1"/2.5cm OD Tube Holder: 16"/40.6cm x 1 1/2"/3.8cm OD Endfittings: 2 1/2"/6.4cm

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Gas  
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## Gas Delivery Gas Purifiers

### High Capacity Gas Purifier

No other purifier removes both oxygen and water in such large quantities. To reliably protect your GC columns and detectors from oxygen and water vapor damage, you should use a gas purifier specifically designed to ensure maximum gas purity. The Supelco High Capacity Gas Purifier tube is heated inside an oven, and oxygen and water react with the gettering material in the tube. Unlike purifiers which remove contaminants by adsorption, chemical reaction with the gettering material prevents these contaminants from returning to the gas stream — even when the temperature changes or as the material approaches saturation. The High Capacity Gas Purifier also removes carbon monoxide and carbon dioxide.

A single, replaceable High Capacity Gas Purifier tube can remove 14 liters of oxygen or 35 liters of water vapor (STP). It removes oxygen and water from at least 60 tanks of heavily contaminated gas — gas containing 100ppm of oxygen and/or water. It efficiently removes oxygen and water at gas flow rates up to 1100mL/minute, and you can use it with any common carrier gas except hydrogen.

The stainless steel converter tube is 10" x 1/2" OD. The split-sided heater is 10" long. An integral mounting bracket allows you to bolt the unit to a bench top or wall. The 90 watt power consumption makes the unit as economical to operate as a light bulb. Mount horizontally only.

2-year guarantee; elements guaranteed for 90 days.

DESCRIPTION	CAT. NO.	PRICE
<b>HIGH CAPACITY GAS PURIFIER</b>		
110VAC, 1/8" Fittings <sup>1</sup>	23800-U	
110VAC, 1/4" Fittings <sup>1</sup>	23802	
220VAC, 1/8" Fittings <sup>1</sup>	23801	
220VAC, 1/4" Fittings <sup>1</sup>	23803	
<b>REPLACEMENT PURIFIER TUBES</b>		
1/8" Fittings	22396	
1/4" Fittings	22398	
<b>REPLACEMENT ELEMENTS</b>		
Element for 110VAC Unit (2 required)	24975	
Top element for 220VAC Unit	24976	
Bottom element for 220VAC Unit	24977	

<sup>1</sup> CE approved.

<sup>2</sup> Modifications may be required on older purifiers.



P000329

SPECIFICATIONS	
Oven with 1/4" or 1/8" Tube	
Height:	5 1/4"/13.3cm
Width (with shields):	14 1/2"/36.8cm
Depth:	6"/15.2cm
Tube (1/8" or 1/4")	
Diameter:	1/2"/12.7mm
Length:	10"/25.4cm
Max. Inlet Pressure:	150psi
Max. Flow Rate:	1100mL/min.
Operating Temp.:	580°C

### Complete Pressure Gauge Kit

Use with our high capacity gas purifier, to indicate when the purifier tube should be replaced. Change purifier tube when pressure drop exceeds 10psi. 2"/5cm gauge (0-100psi), NPT to Swagelok adapter, 18"/1/2m of 1/8" copper line, 1/8" tee, installation instructions.

DESCRIPTION	CAT. NO.	PRICE
Pressure Gauge Kit	20392	

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23800-U

20392

P000356

Gas Chromatography

## Gas Delivery Gas Purifiers



### Supelcarb HC Hydrocarbon Traps

Remove organics from carrier gases, air, and hydrogen. We manufacture these traps in our own facilities, to ensure the cleanest material available and the best trapping ability per gram. – Supelcarb HC adsorbent has twice the trapping ability of activated charcoal.

DESCRIPTION	CAT. NO.	PRICE
120cc, 1/8" Fittings	24448	
120cc, 1/4" Fittings	24449	
750cc, 1/4" Fittings	24564	
750cc, 1/2" Fittings	24565	
S-Trap, 1/8" Fittings	503134	
Supelcarb Refill, 300cc	24566	
Mounting Clip for 120cc Traps	23993	
Mounting Clip for 750cc Traps	24983	

### Supelpure-HC Hydrocarbon Traps

Activated charcoal adsorbs hydrocarbons and other contaminants from carrier gases, air, and hydrogen. Operates efficiently for approximately six months when total hydrocarbons in the incoming gas average 10ppm.

DESCRIPTION	CAT. NO.	PRICE
120cc, 1/8" Fittings	22445-U	
120cc, 1/4" Fittings	22446	
750cc, 1/4" Fittings	24518	
750cc, 1/2" Fittings	24519	
S-Trap, 1/8" Fittings	503142	
Charcoal Refill for 400cc	22451	
Mounting Clip for 120cc Traps	23993	
Mounting Clip for 750cc Traps	24983	



### Molecular Sieve 5A Water Vapor Traps

Remove water vapor and pump oils. Molecular Sieve 5A efficiently removes water and heavy hydrocarbons from compressed air, electrolytically produced hydrogen, house nitrogen, or other gases with high moisture or hydrocarbon content. 200cc traps are 26 1/4" x 1" (67 x 2.5cm), 750cc traps are 18 x 2 3/8" (45.7 x 6cm), S-trap is 1/2"/13mm OD x 5 9/16"/14.1cm wide x 7 1/2"/19cm long (total bed length: 19 3/4"/50.2cm) – the extended bed length ensures prolonged contact between the gas and the adsorbent and provides greater working capacity. Use the smaller traps with up to 5 GCs, the larger traps with 6-20 instruments.

DESCRIPTION	CAT. NO.	PRICE
200cc, 1/8" Fittings	20619	
200cc, 1/4" Fittings	20618	
750cc, 1/4" Fittings	23991	
750cc, 1/2" Fittings	23992	
S-Trap, 1/8" Fittings	503118	
Molecular Sieve 5A Refill, 1/2lb./0.22kg	20298	
Mounting Clip for 200cc Traps	503231	
Mounting Clip for 750cc Traps	24983	



### Economy Water Vapor Traps

For air and actuator gases. These clear polycarbonate polymer tubes contain a mixture of Molecular Sieve 13X and Molecular Sieve 4A with indicating capability. Because some oxygen and water vapor will permeate through the polymer shell, these traps should not be used with carrier gases, but they are an excellent value for cleaning air and actuator gases to suitable purity. Dimensions: 2"/51mm OD x 17 1/2"/44.4cm long.

DESCRIPTION	CAT. NO.	PRICE
400cc, 1/8" Fittings	23987	
400cc, 1/4" Fittings	23988	
Molecular Sieve 13X/4A Refill, ~475cc	23989	
Mounting Clip for 400cc Traps	23990	

## Gas Delivery

### Gas Purifiers



#### Supelpure-O Oxygen/Water Trap

The Supelpure-O trap reduces oxygen to less than 0.5ppm when the level in the incoming gas does not exceed 10ppm. It can extract contaminating oxygen at 10ppm from at least three 300ft (8.5m<sup>3</sup>) cylinders. Because the oxygen-removing catalyst is coated on a molecular sieve, the trap also can remove significant amounts of water vapor (up to 1.5g for the 120cc trap; 10.2g for the 750cc trap).

DESCRIPTION	CAT. NO.	PRICE
<b>SUPELPURE-O OXYGEN/WATER TRAP</b>		
120cc, 1/8" Fittings	22449	
120cc, 1/4" Fittings	22450-U	
750cc, 1/4" Fittings	503088	
750cc, 1/2" Fittings	503096	
S-Trap, 1/8" Fittings	503126	
<b>MOUNTING CLIP FOR SUPELPURE TRAPS</b>		
for all 100cc Traps (each)	502936	
for all 120cc Traps (each)	23993	
for all 200cc Traps (each)	503231	
for all 250cc Traps (each)	23990	
for all 750cc Traps (each)	24983	

#### HELPFUL HINTS

##### Dimensions of Supelcarb and Supelpure Traps

120cc Traps:	1 3/8" OD (35mm) x 11 1/8" long (28.2cm)
750cc Traps:	2 5/16" OD (59mm) x 16 1/2" long (41.9cm)
S-Traps:	1/2" OD (13mm) x 5 9/16" wide (14.1cm) x 7 1/2" long (19cm) (total bed length: 19 3/4"/50.2cm)



#### Aeronex GateKeeper Purifiers

- Remove water, oxygen, CO<sub>2</sub>, and H<sub>2</sub> in bulk inert gases to less than 1ppb, at ambient temperature
- Stainless steel face seal fittings, for maximum sealing capability

High capacity + highly effective contaminant reduction = low cost per liter of purified gas. Using a proven, patented technology GateKeeper purifiers reduce contaminants in inert specialty gases to sub parts per billion levels (<1ppb), creating 99.999999% pure gas from standard ultra high purity gas. In addition to being more effective than typical molecular sieve-type purifiers they last up to five times longer, providing a better return on your investment. The patented metallic purifying medium does not release trapped contaminants, and the units can be returned for recharging. The state of the art in inert gas purification.

#### SPECIFICATIONS

Construction:	Model 35K: 304 SST
	Model 400K: 304 SST
	Model 500K: 316L SST (internal electropolish)
Max. Inlet Pressure:	200psig (1380 kPa)
Maximum Flow:	Model 35K: 1 liter/min
	Model 400K: 3 liters/min
	Model 500K: 60 liters/min
Operating Temp.:	-40°C to 65°C
Dimensions:	Model 35K: 3.31" x 1.5" OD (8.4 x 3.8cm)
	Model 400K: 20.86" x 1.5" OD (52.4 x 3.8cm)
	Model 500K: 7.94" x 3.0" OD (20.2 x 7.6cm)
Pure Gas Delivered:	Model 35K: 40,000 liters
(Estimated)	Model 400K: 400,000 liters
	Model 500K: 650,000 liters

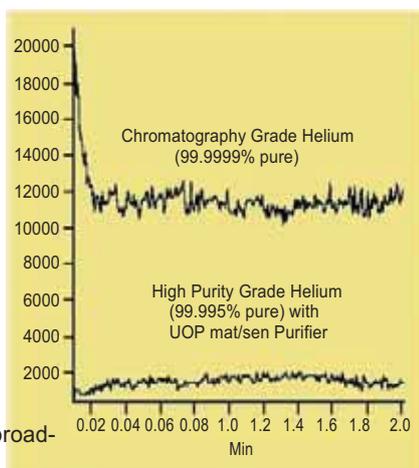
DESCRIPTION	CAT. NO.	PRICE
Model 35K, 1/4" Face Seal Fittings	24970	
Model 500K, 1/4" Face Seal Fittings	24971	
Model 400K with Compression Fittings		
1/4" Fittings	502987	

## Gas Delivery Gas Purifiers



Supelco Helium Purifier

- Removes water vapor, hydrocarbons, CO from helium
- Output gas is 99.99999% pure
- Cost per cubic foot of purified gas is 50% that for other broad-spectrum purifiers



This purifier incorporates multiple beds of highly effective, high UOP mat/sen Purifier

capacity adsorbent materials to remove oxygen, water vapor, hydrocarbons, carbon dioxide, and carbon monoxide from helium gas streams. The volumes of the various adsorbents in the Supelco helium purifier were determined through rigorous evaluations, to ensure that breakthrough of the five major contaminant types is as close to simultaneous as possible. Because you no longer have to replace a broad-spectrum purifier that has exhausted its capacity for one contaminant, but still has much of its capacity for other contaminants, you can reduce instrument down time and save money. Relative to separate traps for oxygen, water vapor, and hydrocarbons, combining these functions into one unit also reduces the potential for leaks at connections.

One purifier will easily purify the contents of 13 ~200 cylinders of 99.997% purity helium to a cumulative level of 100ppb of O<sub>2</sub>, H<sub>2</sub>O, CO<sub>2</sub>, CO, and hydrocarbons, at flow rates up to 8 liters/minute – and comparative investigations indicate that a purifier will deliver this gas purity for virtually 50% of the cost per cubic foot of gas, compared to any competitor's broad-spectrum purifier.

Supelco helium purifiers are ideal for any GC or GC/MS application in which high purity helium is essential.

### SPECIFICATIONS

Contaminant Capacity <sup>1</sup> :	oxygen: 1.07L water vapor: 46g hydrocarbons <sup>2</sup> : 20g
Contaminant Removal Efficiency:	total: <100ppb oxygen: <2ppb water vapor: <20ppb hydrocarbons <sup>2</sup> : <30ppb CO <sub>2</sub> : <20ppb CO: <20ppb
Output Gas Purity <sup>3</sup> :	99.99999%
Capacity:	>4000ft <sup>3</sup>
Maximum Flow Rate:	8L/min
Maximum Pressure:	500psig
Maximum Temperature:	100°C

<sup>1</sup> At standard temperature and pressure.

<sup>2</sup> As methane.

<sup>3</sup> 99.999% helium purified to 99.99999% helium, based on removal of 5 major contaminants.

- Produces better than 99.9999% gas when supplied with 99.995% pure gas
- Original equipment in Finnigan, Hewlett-Packard, and Varian mass spectrometers
- Also used in Leco, Perkin-Elmer, and Shimadzu equipment

Assures mass spectrometer-suitable baselines from high purity (99.995%) gas. One of the most important factors in ensuring very sensitive detection in GC/MS analyses is the signal to noise ratio. Mass spectrometer manufacturers recommend that the signal be at least three times as large as the background noise to assure statistical significance. These UOP mat/sen purifier modules dramatically reduce levels of most contaminants, including oxygen, water, and hydrocarbons, from many parts per million to levels below detection. They adsorb a wider variety of contaminants than many commonly used adsorptive materials.

UOP mat/sen guarantees these purifiers produce gases that are at least a factor of ten higher in purity than 99.9999% "chromatography grade" gas when the purifier is supplied with 99.995% "high purity" gas. The cost difference between the two grades of gas will pay for the cost of the purifier several times over during the operating life of the purifier.

### SPECIFICATIONS

Length:	21"/53.3cm
Diameter:	1.5"/3.8cm
Maximum Inlet Pressure:	250psig/1724 kPa
Maximum Flow:	500mL/min
Pressure Drop:	<0.30 psig/2.1 kPa

<sup>1</sup> 120psig (827 kPa) inlet, 0 to 500mL/min

DESCRIPTION	CAT. NO.	PRICE
1/8" Compression Fittings	22680-U	
1/4" Compression Fittings	22681	

DESCRIPTION	CAT. NO.	PRICE
1/8" Swagelok Stainless Steel Fittings	27600-U	
1/4" Swagelok Stainless Steel Fittings	27601-U	
Mounting Clip	24983	

Order: 1.800.325.3010 Technical Service: 1.800.355.4110 Web: www.supelco.com

Gas Chromatography

## Gas Delivery

### Gas Purifiers



P000333

#### Carbon Dioxide Traps

Designed to remove  $\text{CO}_2$  from gases used in applications such as carbon-hydrogen determinations, analyses of respiratory gases, and especially in quantitative organic micro-analyses. The sodium hydroxide nonfibrous silicate trapping medium is universally accepted for its high absorptive capacity and indicating properties. Typically, this material will absorb 20-30% of its weight in carbon dioxide before replacement of the saturated material is required. As  $\text{CO}_2$  absorbed, the greenish-brown material turns white because of the formation of sodium carbonate. A water vapor trap should be installed downstream from this unit to absorb water evolved in the absorption of carbonic gases.

The trap body is constructed of borosilicate glass. The trap is available in two sizes, and with 1/8" and 1/4" fittings. Fittings are nickel plated and have sintered stainless steel frits. Exercise extreme caution when refilling the trap, due to the caustic nature of the absorbent.

#### DIMENSIONS

100cc traps: 1 3/4"/44mm OD x 12 3/4"/32.4cm long  
250cc traps: 2"/51mm OD x 17 1/2"/44.4cm long

DESCRIPTION	CAT. NO.	PRICE
100cc, 1/8" Fittings	503185	
100cc, 1/4" Fittings	503193	
250cc, 1/8" Fittings	503207	
250cc, 1/4" Fittings	503215	
Absorbent Refill, 500cc	503223	
Mounting Clip for 100cc Traps	502936	
Mounting Clip for 250cc Traps	23990	

#### Purifiers For Less Demanding Applications

Gas purifiers listed below are economical, but cannot ensure output of chromatographic grade gas when impurity levels in the input gas exceed 10-15ppm.



P000334

Oxisorb Oxygen Scrubber reduces oxygen and water to less than 1ppm when incoming  $\text{O}_2$  does not exceed 15ppm and  $\text{H}_2\text{O}$  does not exceed 10ppm. Use a new cartridge for each new cylinder of gas.

Dimensions: 2"/51mm OD (maximum) x 9 1/4" x 23.5cm long; replacement cartridge

#### DIMENSIONS

Scrubber: 2"/51mm OD (maximum) x 9 1/4"/23.5cm long  
Replacement Cartridge: 1 1/8"/29mm OD x 4 7/8"/12.4cm long

DESCRIPTION	CAT. NO.	PRICE
Oxisorb Oxygen Scrubber, 1/4" Fittings	20639-U	
Replacement Cartridge	20631	



22992

P000232

Oxiclear Disposable Gas Purifier removes oxygen, trace water, and organic contaminants from three 300ft (8.5m<sup>3</sup>) cylinders of inert carrier gas. Output is less than 1ppm when incoming  $\text{O}_2$  does not exceed 10ppm.

#### DIMENSIONS

Purifier: 1 7/8"/48mm OD x 7 1/2"/19.0cm long

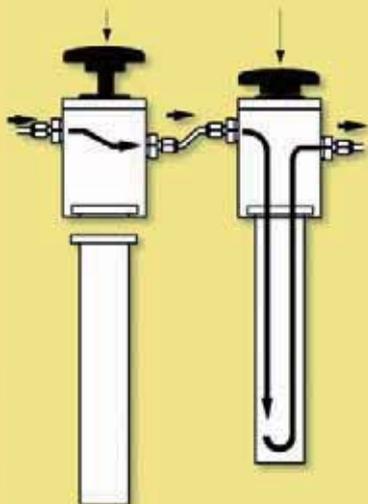
DESCRIPTION	CAT. NO.	PRICE
with 1/8" fittings	22992	
with 1/4" fittings	22993	

Order: 1.800.325.3010 Technical Service: 1.800.359.3041 Web: www.sigma-aldrich.com/supelco

## Gas Delivery Gas Purifiers

### Change Cartridges Without Interrupting Gas Flow

- Handle Up: Gas flows through filter head  
 Handle Down: Cartridge seal broken, gas flows through purifier bed



796-0447

#### SPECIFICATIONS

3-Head QC+ Panel: 9 x 11 1/2 x 5" (23 x 29 x 13cm) (H x W x D)

4-Head QC+ Panel: 11 x 15 1/4 x 5" (28 x 39 x 13cm)

Max. Pressure: 125psig

Cartridge: 1 1/4"/32cm OD x 6 1/4"/15.9cm long\*

\* Cat. Nos. 503061 and 24567 are 6 3/4"/17.1cm long.



#### QC+ Point-of-Operation Panels

- Replace up to four cartridges in one minute **without** purge time

QC+ panels make cartridge replacement fast and easy. Rotate the valve handle(s) on the filter head(s) counterclockwise, to allow gas to pass through the head. Replace the cartridge, then rotate the valve handle clockwise, to puncture the seal on the new cartridge and restore gas flow through the purifier bed.

Replacement cartridges are designed to remove hydrocarbons, moisture and oxygen. The 3-Head QC+ Panel (P/N 23999) includes P/Ns 23997, 23996 and 23995. The 4-Head QC+ Panel (P/N 23998) includes P/Ns 23997, 23996, 23995 and 24987.

The SupelCarb cartridge (P/N 24567) has twice the capacity for hydrocarbons, relative to the activated charcoal in the standard hydrocarbon-removing cartridge.

The indicating water-removing cartridge (P/N 23996) contains a mixture of Molecular sieve 5A and Drierite. The color changes from blue to pink as the material becomes spent.

The indicating oxygen-removing cartridge (P/N 24987) contains a Manganese oxide. The color changes from green to brown as the material becomes spent.

DESCRIPTION	CAT. NO.	PRICE
3-Head QC+ Panel, 1/8" Fittings	23999	
4-Head QC+ Panel, 1/8" Fittings	23998	
Replacement Cartridges		
Hydrocarbon-Removing Cartridge (GC-3)	23997	
SupelCarb Cartridge	24567	
Water-Removing Cartridge (GC-2)	23996	
Indicating Water-Removing Cartridge (GC2-1)	503061	
Oxygen-Removing Cartridge (GC-1)	23995	
Indicating Oxygen-Removing Cartridge (GC-4)	24987	