



# SYNTHWARE GLASS





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## General Instructions

### Glass Properties

All Synthware<sup>®</sup> glass products meets ASTM Specification E438, Type 1, Class A “standard Specification for Glasses in Laboratory Apparatus”. This borosilicate glass with low linear coefficient of expansion is ideal choice for fabricating laboratory glassware.

Annealing Point .....560°C

Linear Coefficient of Expansion

..... $32 \times 10^{-7}/^{\circ}\text{C}$

Softening Point.....820°C

### Trade Marks

Registered trademarks found in this catalog.

Teflon<sup>®</sup> .....E.I. DuPont.

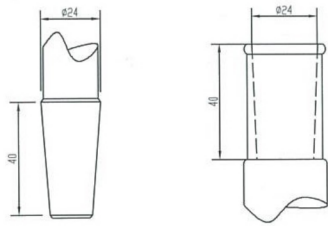
Viton<sup>®</sup> .....E.I. DuPont.

Nylon<sup>®</sup> .....E.I. DuPont.

Rodasis<sup>®</sup> .....S.A.V. France

Note: The most common US joints are 14/20 and 24/40. These sizes apply only to glassware in the US. There are also European ISO standard joints with common joint sizes of 5/13, 7/16, 10/19, 12/21, 14/23, 19/26, 24/29, 29/32, 34/35, 45/40, 60/46, 71/51 and 85/55. The US and ISO joints differ only in the length, not in the slope, and some can be used in combination. We have both US and European joints available upon your request.

## Dimensions of Joints

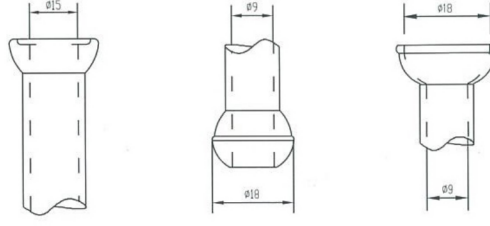


**Standard Dimensions for Full Length Interchangeable Taper-Ground Joints**

| Joint Size Number<br>(Designation) | Approximate Diameter at Small End<br>mm | Approximate Length of Ground Zone<br>mm | Diameter of large End of Ground Zone<br>mm |
|------------------------------------|---|---|--|
| 7/25                               | 5                                       | 25                                      | 7.5  |
| 10/30                              | 7                                       | 30                                      | 10.0                                       |
| 12/30                              | 9.5                                     | 30                                      | 12.5                                       |
| 14/35                              | 11                                      | 35                                      | 14.5                                       |
| 19/38                              | 15                                      | 38                                      | 18.8                                       |
| 24/40                              | 20                                      | 40                                      | 24.0                                       |
| 29/42                              | 25                                      | 42                                      | 29.2                                       |
| 34/45                              | 30                                      | 45                                      | 34.5                                       |
| 40/50                              | 35                                      | 50                                      | 40.0                                       |
| 45/50                              | 40                                      | 50                                      | 45.0                                       |
| 50/50                              | 45                                      | 50                                      | 50.0                                       |
| 55/50                              | 50                                      | 50                                      | 55.0                                       |
| 60/55                              | 55                                      | 50                                      | 60.0                                       |

**Standard Dimensions for Short Length Interchangeable Taper-Ground Joints**

| Joint Size Number<br>(Designation) | Approximate Diameter at Small End<br>mm | Approximate Length of Ground Zone<br>mm | Diameter of large End of Ground Zone<br>mm |
|------------------------------------|---|---|--|
| 7/10                               | 6.3                                     | 10                                      | 7.0  |
| 10/10                              | 9.0                                     | 10                                      | 10.0                                       |
| 14/10                              | 13.5                                    | 10                                      | 14.5                                       |
| 24/12                              | 22.8                                    | 12                                      | 24.0                                       |
| 29/12                              | 28.0                                    | 12                                      | 29.2                                       |
| 34/12                              | 28.0                                    | 12                                      | 29.2                                       |
| 40/12                              | 38.8                                    | 12                                      | 40.0                                       |
| 45/12                              | 43.8                                    | 12                                      | 45.0                                       |
| 50/12                              | 48.8                                    | 12                                      | 50.0                                       |
| 55/12                              | 53.8                                    | 12                                      | 55.0                                       |
| 60/12                              | 58.8                                    | 12                                      | 60.0                                       |



**Standard Dimensions for Medium Length Interchangeable Taper-Ground Joints**

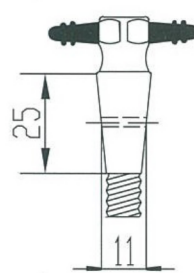
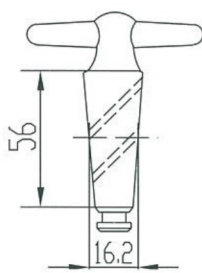
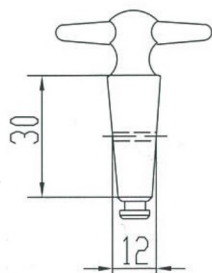
| Joint Size Number<br>(Designation) | Approximate Diameter at Small End<br>mm | Approximate Length of Ground Zone<br>mm | Diameter of large End of Ground Zone<br>mm |
|------------------------------------|---|---|--|
| 5/12                               | 3.8                                     | 12                                      | 5.0  |
| 7/15                               | 6.0                                     | 15                                      | 7.5  |
| 10/18                              | 8.2                                     | 18                                      | 10.0                                       |
| 12/18                              | 10.7                                    | 18                                      | 12.5                                       |
| 14/20                              | 12.5                                    | 20                                      | 14.5                                       |
| 19/22                              | 16.6                                    | 22                                      | 18.8                                       |
| 24/25                              | 21.5                                    | 25                                      | 24.0                                       |
| 29/26                              | 26.6                                    | 26                                      | 29.2                                       |
| 34/28                              | 31.7                                    | 28                                      | 34.5                                       |
| 40/35                              | 36.5                                    | 35                                      | 40.0                                       |

**Standard Dimensions for Interchangeable Spherical Ground Joints**

| Joint Size Number<br>(Designation) | Nominal Diameter of Ball<br>mm | Nominal Tube Inside Diameter<br>mm |
|------------------------------------|--------------------------------|------------------------------------|
| 21/1                               | 12                             | 1                                  |
| 21/1.5                             | 12                             | 1.5                                |
| 12/2                               | 12                             | 2                                  |
| 12/3                               | 12                             | 3                                  |
| 12/5                               | 12                             | 5                                  |
| 18/7                               | 18                             | 7                                  |
| 18/9                               | 18                             | 9                                  |
| 28/12                              | 28                             | 12                                 |
| 28/15                              | 28                             | 15                                 |
| 35/20                              | 35                             | 20                                 |
| 35/25                              | 35                             | 25                                 |
| 40/25                              | 40                             | 25                                 |
| 50/30                              | 50                             | 30                                 |
| 65/40                              | 65                             | 40                                 |
| 75/50                              | 75                             | 50                                 |



## Dimensions for Stopcocks



### Stopcocks with Glass Plugs

#### Single Straight-Bore Stopcocks

| Stopcock Size<br>(Designation and<br>Bore of Hole in<br>Plug mm) | Diameter of Plug<br>at Centerline of<br>Bore mm | Length of Shell<br>±0.5 mm |
|--|---|----------------------------|
| 1-m(1mm)   | 7   | 30                         |
| 1  | 12  | 30                         |
| 1-1/2  | 12  | 30                         |
| 2  | 12  | 30                         |
| 3  | 17  | 40                         |
| 4  | 17  | 40                         |
| 5  | 20  | 40                         |
| 6  | 20  | 44                         |
| 8  | 25  | 52                         |
| 10   | 35  | 56                         |

#### Single Oblique-Bore Stopcocks

| Stopcock Size<br>(Designation and Bore of<br>Hole in Plug<br>mm) | Diameter of Plug<br>at Opening<br>Nearest Large<br>End mm<br>(Gauging Point) | Distance of<br>Gauging<br>Point Form<br>Large end<br>mm | Length<br>of Shell<br>±0.5 mm |
|--|--|---|-------------------------------|
| 1  | 12.60  | 14.0  | 40                            |
| 1-1/2  | 12.60  | 14.0  | 40                            |
| 2  | 12.60  | 14.0  | 40                            |
| 3  | 17.35  | 16.5  | 50                            |
| 4  | 17.35  | 16.5  | 50                            |

#### T-Bore 120° Bore Stopcocks

| Stopcock Size<br>(Designation and<br>Bore of Hole in<br>Plug mm) | Diameter of Plug<br>at Centerline of<br>Bore mm | Length of Shell<br>±0.5 mm |
|--|---|----------------------------|
| 1  | 17  | 40                         |
| 1-1/2  | 17  | 40                         |
| 2  | 17  | 40                         |
| 3  | 20  | 44                         |
| 4  | 20  | 44                         |

#### Double Oblique-Bore Stopcocks

| Stopcock Size<br>(Designation and Bore of<br>Hole in Plug<br>mm) | Diameter of Plug<br>at Gauging<br>Point<br>(Center of<br>Plug) mm | Distance<br>Gauging<br>Point Form<br>Centerline<br>of Hole<br>nearest<br>Large End<br>mm | Length<br>of Shell<br>±0.5 mm |
|--|---|--|-------------------------------|
| 1  | 14.5  | 12.5   | 50                            |
| 1-1/2  | 14.5  | 12.5   | 50                            |
| 2  | 14.5  | 12.5   | 50                            |
| 3  | 16.2  | 14.0   | 56                            |
| 4  | 16.2  | 14.0   | 56                            |



## Stopcocks with Teflon® Plugs

### Single Straight-Bore Stopcocks

| Stopcock Size<br>(Designation and<br>Bore of Hole in<br>Plug mm) | Diameter of Plug<br>at Centerline of<br>bore mm | Length of Shell<br>±0.5 mm |
|--|---|----------------------------|
| 1  | 11  | 25                         |
| 2  | 11  | 25                         |
| 3  | 15.2  | 30                         |
| 4  | 15.2  | 30                         |
| 6  | 16  | 35                         |

### Single Oblique-Bore Stopcocks

| Stopcock<br>Size<br>(Designation<br>and Bore of<br>Hole in Plug<br>mm) | Diameter of Plug<br>at Opening<br>Nearest Large<br>End mm<br>(Gauging Point) | Distance of<br>Gauging<br>Point Form<br>Large end<br>mm | Length<br>of Shell<br>±0.5 mm |
|--|--|---|-------------------------------|
| 2  | 15.9   | 11.5  | 30                            |

### T-Bore 120° Bore Stopcocks

| Stopcock Size<br>(Designation and<br>Bore of Hole in<br>Plug mm) | Diameter of Plug<br>at Centerline of<br>bore mm | Length of Shell<br>±0.5 mm |
|--|---|----------------------------|
| 1  | 15.2  | 30                         |
| 2  | 15.2  | 30                         |
| 4  | 16  | 35                         |

### Double Oblique-Bore Stopcocks

| Stopcock<br>Size<br>(Designation<br>and Bore of<br>Hole in Plug<br>mm) | Diameter of<br>Plug at<br>Opening<br>Nearest<br>Large End<br>mm<br>(Gauging<br>Point) | Distance of<br>Gauging<br>Point Form<br>Large end<br>mm | Length<br>of Shell<br>±0.5 mm |
|--|---|---|-------------------------------|
| 1  | 12.9  | 9.4   | 44                            |
| 2  | 12.9  | 9.4   | 44                            |
| 3  | 14.4  | 10.4  | 44                            |
| 4  | 14.4  | 10.4  | 44                            |



## O-Ring-Organic Solvent Compatibility Chart<sup>1, 2</sup>

| Organic Solvents          | Viton® | Chemraz® 505 | Chemraz® 514 White |
|---------------------------|--------|--------------|--------------------|
| Acetic Acid, Glacial      | D      | A            | B                  |
| Acetic Anhydride          | B      | A            | B                  |
| Acetone                   | D      | A            | A                  |
| Acetonitrile              | A      | A            | A                  |
| Ammonia, Anhydrous Liquid | D      | A            | B                  |
| Benzene                   | A      | A            | A                  |
| Benzyl Chloride           | A      | A            | A                  |
| Bromine                   | A      | A            | A                  |
| Butane                    | A      | A            | A                  |
| Carbon Tetrachloride      | A      | B            | B                  |
| Chloroform                | A      | A            | A                  |
| Cyclohexane               | A      | A            | A                  |
| Decane                    | A      | A            | A                  |
| Diethyl Ether             | D      | A            | A                  |
| Ethanol                   | C      | A            | A                  |
| Ethyl Acetate             | D      | A            | A                  |
| Gasoline                  | A      | A            | A                  |
| n-Hexane                  | A      | A            | A                  |
| Isobutyl Alcohol          | A      | A            | A                  |
| Kerosene                  | A      | A            | A                  |
| Methanol                  | D      | A            | A                  |
| Methyl Ethyl Ketone       | D      | A            | A                  |
| Pentane                   | A      | A            | A                  |
| Propane                   | A      | A            | A                  |
| Pyridine                  | D      | A            | A                  |
| Tetrahydrofuran           | D      | A            | A                  |
| Toluene                   | D      | A            | A                  |

**A - Excellent.** Volumetric swell is less than 10% after exposure.

**B - Good.** Limited exposure is recommended.

**C - Fair.** Volumetric swell is between 20% - 40% after exposure. Limited exposure and frequent O-ring replacements may be necessary.

**D - Poor.** Not suitable for this type of reaction / condition.

<sup>1</sup>. We can not be responsible for use of the above data in specific applications. Immersion testing under actual conditions is always recommended. For specific chemical resistance, please call our office for technical information at 800-472-1658.

<sup>2</sup>. Fluorinated products should never be exposed to molten or gaseous alkali metals such as sodium or potassium, since vigorous exothermic reaction may occur.

**ADAPTER, BUSHING**

Bushing adapters allow for compact assemblies of dissimilar joints.



| Item#   | Top Outer Joint | Bottom Inner Joint |
|---------|-----------------|--------------------|
| A791419 | 14/20           | 19/22              |
| A793519 | 14/35           | 19/38              |
| A793524 | 14/35           | 24/40              |
| A791924 | 19/38           | 24/40              |
| A792434 | 24/40           | 34/45              |
| A792445 | 24/40           | 45/50              |


**ADAPTER, REDUCING**

With joints at top and bottom.

| Item#   | Top Joint | Bottom Joint |
|---------|-----------|--------------|
| A201024 | 10/30     | 24/40        |
| A201419 | 14/20     | 19/22        |
| A201424 | 14/20     | 24/40        |
| A201924 | 19/22     | 24/40        |
| A202429 | 24/40     | 29/42        |
| A202434 | 24/40     | 34/45        |
| A202445 | 24/40     | 45/50        |


**ADAPTER, ENLARGING**

With joints at top and bottom.

| Item#   | Top Joint | Bottom Joint |
|---------|-----------|--------------|
| A251914 | 19/22     | 14/20        |
| A252414 | 24/40     | 14/20        |
| A252419 | 24/40     | 19/22        |
| A252914 | 29/42     | 14/20        |
| A252924 | 29/42     | 24/40        |
| A253424 | 34/45     | 24/40        |
| A254024 | 40/50     | 24/40        |
| A254529 | 45/50     | 29/42        |



**ADAPTER, WITH BALL SOCKET**

With top spherical socket joint and lower standard taper inner joint.

| Item#   | Top Joint | Bottom Joint |
|---------|-----------|--------------|
| A663514 | 35/20     | 14/20        |
| A663524 | 35/20     | 24/40        |



**ADAPTER, INLET**

For use with gas inlet tubes or plain stem thermometers.

Supplied with one holed rubber adapter.

| Item#   | Joint |
|---------|-------|
| A451420 | 14/20 |
| A451922 | 19/22 |
| A452440 | 24/40 |

**Accessory:**

R045 Replacement rubber adapter



**ADAPTER, INLET OR THERMOMETER**

With a compression cap and Viton® O-ring to form a vacuum tight seal.

To use it as a syringe port, simply replace the O-ring with

Teflon® -lined septum. Cap accommodates 5.0 - 7.5mm O.D. thermometer.

Supplied with one Nylon® cap and one Viton® O-ring.

| Item#   | Joint |
|---------|-------|
| A521420 | 14/20 |
| A521922 | 19/22 |
| A522440 | 24/40 |

**Accessories:**

RC009 Nylon® caps

R107 Replacement Viton® O-rings, Size 107




**ADAPTER, INLET, WITH HOSE CONNECTION**

Same as above but with 8mm or 10mm hose connection for N<sub>2</sub>/Ar introduction or vacuum. Supplied with one Nylon<sup>®</sup> cap and one Viton<sup>®</sup> O-ring.

| Item#   | Joint |
|---------|-------|
| A531420 | 14/20 |
| A532440 | 24/40 |

**Accessories:**

|       |  |
|-------|--|
| RC009 | Nylon <sup>®</sup> caps                          |
| R107  | Replacement Viton <sup>®</sup> O-rings, Size 107 |


**ADAPTER, VACUUM OR ARGON**

With hose connection on the side and male joint.

| Item#   | Joint | Hose O.D.<br>(mm) |
|---------|-------|-------------------|
| A291420 | 14/20 | 8                 |
| A291922 | 19/22 | 8                 |
| A292440 | 24/40 | 10                |
| A292942 | 29/42 | 10                |


**ADAPTER, VACUUM/GAS, BALL JOINT**

With 35/20 ball joint and 10mm Hose connection.

| Item#   | Joint |
|---------|-------|
| A293520 | 35/20 |

**ADAPTER, VACUUM OR ARGON (NITROGEN)**

With hose connection on the top and male joint.

| Item#   | Joint | Hose O.D.<br>(mm) |
|---------|-------|-------------------|
| A301420 | 14/20 | 8                 |
| A301922 | 19/22 | 8                 |
| A302440 | 24/40 | 10                |
| A302942 | 29/42 | 10                |


**ADAPTER, VACUUM/INERT GAS, 90°**

| Item#   | Joint | Hose connection<br>O.D. (mm) |
|---------|-------|------------------------------|
| A921420 | 14/20 | 8                            |
| A921922 | 19/22 | 8                            |
| A922440 | 24/40 | 10                           |


**ADAPTER, VACUUM, 90°, OUTER JOINT**

| Item#   | Joint | Hose connection<br>O.D. (mm) |
|---------|-------|------------------------------|
| A951420 | 14/20 | 8                            |
| A951922 | 19/22 | 8                            |


**ADAPTER, INLET**

With an extra coarse disc to prevent solid from being introduced into reaction system during liquid transfer.

| Item#   | Joint | Height<br>(mm) |
|---------|-------|----------------|
| A831420 | 14/20 | 65             |
| A831922 | 19/22 | 67             |
| A832440 | 24/40 | 95             |



**ADAPTER, TWIN CONNECTING HOSE**

Adapter has two hose connections 180° from one another to permit a flow of inert gas over the apparatus.



| Item#   | Joint | Hose O.D.<br>(mm) |
|---------|-------|-------------------|
| A341420 | 14/20 | 8                 |
| A341922 | 19/22 | 8                 |
| A342440 | 24/40 | 10                |
| A342942 | 29/42 | 10                |


**ADAPTER, VACUUM, OUTER JOINT**

Ideal for use as a vent or for the introduction of pressure/vacuum.

| Item#   | Joint | Hose O.D.<br>(mm) |
|---------|-------|-------------------|
| A321420 | 14/20 | 8                 |
| A322440 | 24/40 | 10                |


**ADAPTER, VACUUM, WITH 1:5 TEFLON® STOPCOCK**

With 8mm or 10mm O.D. hose connection and 2mm Teflon® stopcock.

| Item#   | Joint |
|---------|-------|
| A381420 | 14/20 |
| A381922 | 19/22 |
| A382440 | 24/40 |

**Accessory:**

S181125 Replacement 2mm Teflon® Plug  
Only

**ADAPTER, VACUUM, PTFE STOPCOCK**

Used to regulate the flow of gases or liquids into reaction systems.  
Teflon<sup>®</sup> stopcock has a bore of 2mm. With standard taper inner joint.

| Item#   | Joint | Stopcock Bore (mm) |
|---------|-------|--------------------|
| A701420 | 14/20 | 2                  |
| A701922 | 19/22 | 2                  |
| A702440 | 24/40 | 2                  |

**Accessory:**

S181125 Replacement 2mm Teflon<sup>®</sup> Plug Only


**ADAPTER, OUTER JOINT, PTFE STOPCOCK**

For regulating the flow of gases or liquids into reaction systems.  
Stopcock has a bore of 2mm. With standard taper outer joint.

| Item#   | Joint | Stopcock Bore(mm) |
|---------|-------|-------------------|
| A711420 | 14/20 | 2                 |
| A711922 | 19/22 | 2                 |
| A712440 | 24/40 | 2                 |

**Accessory:**

S181125 Replacement 2mm Teflon<sup>®</sup> Plug Only


**ADAPTER, VACUUM, GLASS STOPCOCK, 90°**

Used to regulate the flow of gases or liquids into reaction systems.  
Stopcock has a bore of 2mm.

| Item#   | Joint | Stopcock Bore(mm) |
|---------|-------|-------------------|
| A751420 | 14/20 | 2                 |
| A751922 | 19/22 | 2                 |
| A752440 | 24/40 | 2                 |

**Accessories:**

S461230 Replacement 2mm Glass Plug Only  
S691230 Replacement S.S. Retention for 2mm Glass stopcock




**ADAPTER, VACUUM, GLASS STOPCOCK**

Used to regulate the flow of gases or liquids into reaction systems.

Stopcock has a bore of 2mm.

| Item#   | Joint | Stopcock Bore(mm) |
|---------|-------|-------------------|
| A611420 | 14/20 | 2                 |
| A611922 | 19/22 | 2                 |
| A612440 | 24/40 | 2                 |

**Accessories:**

|         |   |
|---------|---|
| S461230 | Replacement 2mm Glass Plug Only                   |
| S691230 | Replacement S.S. Retention for 2mm Glass stopcock |


**ADAPTER, OUTER JOINT, GLASS STOPCOCK**

For regulating the input of gases or liquids into reaction systems.

With 8mm or 10mm hose connection.

| Item#   | Joint | Stopcock Bore(mm) |
|---------|-------|-------------------|
| A691420 | 14/20 | 2                 |
| A692440 | 24/40 | 2                 |

**Accessories:**

|         |   |
|---------|---|
| S461230 | Replacement 2mm Glass Plug Only                   |
| S691230 | Replacement S.S. Retention for 2mm Glass stopcock |


**ADAPTER, FLUSHING**

With 2mm T-bore PTFE stopcock.

| Item#   | Joint |
|---------|-------|
| A681420 | 14/20 |
| A681922 | 19/22 |
| A682440 | 24/40 |

**Accessory:**

|         |                                    |
|---------|------------------------------------|
| S201530 | 2mm Teflon® "T"-bore Stopcock Plug |
|---------|------------------------------------|

**ADAPTER, VACUUM/INERT GAS**

With 4mm T-bore glass stopcock having constant pressure retention device or 2mm T-bore 1:5 taper Teflon<sup>®</sup> plug.

| Item#    | Joint | Stopcock Type       |
|----------|-------|---------------------|
| A881420G | 14/20 | Glass               |
| A882440G | 24/40 | Glass               |
| A881420  | 14/20 | Teflon <sup>®</sup> |
| A882440  | 24/40 | Teflon <sup>®</sup> |

**Accessories:**

- S511740      4mm Glass "T"-bore Stopcock Plug
- S201530      2mm Teflon<sup>®</sup> "T"-bore Stopcock Plug
- S691740      Replacement S.S. Retention for 4mm Glass stopcock


**ADAPTER, THERMOMETER**

With 10/30 thermometer joint, angled for use in multiple neck flask.

| Item#   | Joint |
|---------|-------|
| A162440 | 24/40 |


**ADAPTER, INLET**

| Item#   | Joint | Hose O.D.(mm) | Tube Length(mm) |
|---------|-------|---------------|-----------------|
| A314075 | 24/40 | 10            | 75              |
| A314250 | 24/40 | 10            | 250             |




**ADAPTER, FLOW CONTROL, METERING STOPCOCK, 90°**

Provides on/off control with the main valve. Allows delivery of preset volumes of gases or liquids to reactions using the needle valve.

| Item#   | Joint | Stopcock Bore( mm) |
|---------|-------|--------------------|
| A721420 | 14/20 | 2                  |
| A721922 | 19/22 | 2                  |
| A722440 | 24/40 | 2                  |

**Accessory:**

S191125 Replacement 2mm Teflon® Metering Plug


**ADAPTER, FLOW CONTROL, METERING STOPCOCK**

Adapter has a 2mm Teflon® metering stopcock between top outer and lower inner standard taper joints to permit flow control of fluids between apparatus.

| Item#   | Joints | Stopcock Bore(mm) |
|---------|--------|-------------------|
| A732440 | 24/40  | 2                 |

**Accessory:**

S191125 Replacement 2mm Teflon® Metering Plug


**ADAPTER, FLUSHING**

With 2mm T-bore PTFE stopcock.

| Item#   | Joints |
|---------|--------|
| A761420 | 14/20  |
| A762440 | 24/40  |

**Accessory:**

S201530 2mm Teflon® "T"-bore Stopcock Plug

**ADAPTER, CONNECTING**

With 2mm Teflon<sup>®</sup> stopcock. Converts standard vessels to airless applications.

| Item#   | Joints |
|---------|--------|
| A192424 | 24/40  |

**Accessory:**

|         |   |
|---------|---|
| S181125 | Replacement 2mm Teflon <sup>®</sup> Plug Only |
|---------|---|


**ADAPTER, VACUUM TRANSFER**

With 2mm Teflon<sup>®</sup> stopcock. For transfer of sensitive and hazardous solutions.

| Item#   | Joint |
|---------|-------|
| A121420 | 14/20 |
| A121922 | 19/22 |
| A122440 | 24/40 |

**Accessory:**

|         |   |
|---------|---|
| S181125 | Replacement 2mm Teflon <sup>®</sup> Plug Only |
|---------|---|


**ADAPTER, INLET WITH HOSE CONNECTION**

With vacuum take-off and drip tip.

| Item#   | Joints | Hose O.D. (mm) |
|---------|--------|----------------|
| A431420 | 14/20  | 8              |
| A431922 | 19/22  | 8              |
| A432440 | 24/40  | 10             |




**ADAPTER, VACUUM**

With 2mm straight-bore PTFE or Glass stopcock.

| Item#    | Joints | Stopcock Type       |
|----------|--------|---------------------|
| A741420  | 14/20  | Teflon <sup>®</sup> |
| A741922  | 19/22  | Teflon <sup>®</sup> |
| A742440  | 24/40  | Teflon <sup>®</sup> |
| A741420G | 14/20  | GLASS               |
| A741922G | 19/22  | GLASS               |
| A742440G | 24/40  | GLASS               |

**Accessories:**

|         |   |
|---------|---|
| S181125 | Replacement 2mm Teflon <sup>®</sup> Plug Only     |
| S461230 | Replacement 2mm Glass Plug Only Interchangeable   |
| S691230 | Replacement S.S. Retention for 2mm Glass stopcock |


**ADAPTER, DISTILLATION, BENT, 105°**

Also used as rotary evaporator washer. When filled with ethanol or acetone and suddenly with finger released, the mashing solvent is sprayed into the Rotavapor Condenser and thus cleans the entire system very simple and handy.

| Item#   | Joints |
|---------|--------|
| A412440 | 24/40  |

**ADAPTER, DISTILLING, 105°**

With an outer joint at top. Tapered drip tube extends into open receivers.

| Item#   | Joint | Height × Width,<br>(mm) |
|---------|-------|-------------------------|
| A961922 | 19/22 | 90×60                   |
| A962440 | 24/40 | 141×105                 |


**ADAPTER, ANTI-CLIMB**

Trap provides expanded volume for reactions that have a tendency to foam excessively. The inner vapor tube is sealed to the top of the trap to prevent entry into the condenser.

| Item#   | Top<br>Joint | Bottom<br>Joint | Capacity<br>(mL) |
|---------|--------------|-----------------|------------------|
| A272414 | 24/40        | 14/20           | 100              |
| A272419 | 24/40        | 19/22           | 100              |
| A274100 | 24/40        | 24/40           | 100              |
| A272250 | 24/40        | 14/20           | 250              |
| A274250 | 24/40        | 24/40           | 250              |
| A279450 | 29/42        | 24/40           | 250              |


**ADAPTER, DISTILLING TRAP**

Adapter is placed above flask to prevent carry-over of reactions which have a tendency to foam.

| Item#   | Upper<br>Joint | Lower<br>Joint | Capacity<br>(mL) |
|---------|----------------|----------------|------------------|
| A262414 | 24/40          | 14/20          | 100              |
| A262419 | 24/40          | 19/22          | 100              |
| A264100 | 24/40          | 24/40          | 100              |



**ADAPTER, ANTI-SPLASH**

This design prevents possible contamination from rotary evaporator.



| Item#   | Upper Joint | Lower Joint | Capacity (mL) |
|---------|-------------|-------------|---------------|
| A282414 | 24/40       | 14/20       | 100           |
| A282419 | 24/40       | 19/22       | 100           |
| A282424 | 24/40       | 24/40       | 100           |
| A282914 | 29/42       | 14/20       | 100           |
| A282924 | 29/42       | 24/40       | 100           |
| A281250 | 24/40       | 14/20       | 250           |
| A289250 | 24/40       | 19/22       | 250           |
| A284250 | 24/40       | 24/40       | 250           |
| A282250 | 29/42       | 24/40       | 250           |
| A288250 | 29/42       | 29/42       | 250           |

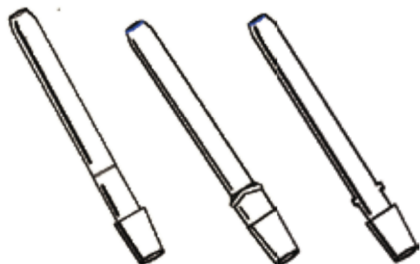

**ADAPTER, ANTI-SPLASH, WITH FRITTED DISC**

Similar to A28 except with extra coarse fritted disc sealed above lower inner joint. Frit reduces foam from being carryover.

| Item#   | Upper Joint | Lower Joint | Capacity(mL) |
|---------|-------------|-------------|--------------|
| A232414 | 24/40       | 14/20       | 100          |
| A232419 | 24/40       | 19/22       | 100          |
| A232424 | 24/40       | 24/40       | 100          |
| A231250 | 24/40       | 14/20       | 250          |
| A234250 | 24/40       | 24/40       | 250          |


**VAPOR DUCT, ROTARY EVAPORATOR**

Precision ground and polished. Meet manufacturer's standards. Please call with your rotary evaporator model.



| Item#    | Joint |
|----------|-------|
| V222440  | 24/40 |
| V222440L | 24/40 |
| V222440H | 24/40 |

**ADAPTER, ANTI-SPLASH, MODIFIED**

With two 4mm drain holes at the base of the inner tube to allow solvent to drain back into the evaporation flask.

| Item#   | Upper Joint | Lower Joint | Capacity (mL) |
|---------|-------------|-------------|---------------|
| A602414 | 24/40       | 14/20       | 100           |
| A602419 | 24/40       | 19/22       | 100           |
| A602424 | 24/40       | 24/40       | 100           |
| A602914 | 29/42       | 14/20       | 100           |
| A602924 | 29/42       | 24/40       | 100           |
| A601250 | 24/40       | 14/20       | 250           |
| A604250 | 24/40       | 24/40       | 250           |


**ADAPTER, ANTI-SPLASH, WITH FRITTED DISC**

Similar to A60 except with extra coarse fritted disc sealed above lower inner joint. Frit reduces foam overflow from being drawn into the condenser.

| Item#   | Upper Joint | Lower Joint | Capacity (mL) |
|---------|-------------|-------------|---------------|
| A462414 | 24/40       | 14/20       | 100           |
| A462424 | 24/40       | 24/40       | 100           |
| A461250 | 24/40       | 14/20       | 250           |
| A464250 | 24/40       | 24/40       | 250           |




**GROUND JOINT, REDUCED DIAMETER, EXTENDED, DRIP TUBE**

Inner joint with a sealed on lower tube extending 6" below the grind, having the same O.D. tubing on both ends of the grind.

| Item#   | Joint | Length below Joint (mm) | Tubing O.D. (mm) |
|---------|-------|-------------------------|------------------|
| A501420 | 14/20 | 153                     | 8                |
| A501922 | 19/22 | 153                     | 10               |
| A502440 | 24/40 | 153                     | 12               |


**ADAPTER, TRANSFER VALVE**

The 0-4mm high vacuum valves have two Viton® O-rings on the shaft and an integral PTFE O-ring on the tip.

| Item#   | Joints | Overall Height × Width, (mm) |
|---------|--------|------------------------------|
| A391420 | 14/20  | 150×75                       |
| A392440 | 24/40  | 180×75                       |

**Accessory:**

S600004      0-4mm high vacuum plug and control knob. (PTFE O-ring at tip)


**ADAPTER, DRYING TUBE, "U" SHAPED**

With joint. Cotton is usually used to contain drying agent.

| Item#   | Joint |
|---------|-------|
| A851420 | 14/20 |
| A851922 | 19/22 |
| A852440 | 24/40 |

**ADAPTER, DRYING TUBE, STRAIGHT**

With top and bottom joints.

| Item#   | Joints |
|---------|--------|
| A861420 | 14/20  |
| A861922 | 19/22  |
| A862440 | 24/40  |


**ADAPTER, DRYING TUBE, 75°**

Angled at 75° to avoid desiccant contact with reactions.

| Item#   | Joint |
|---------|-------|
| A871420 | 14/20 |
| A871922 | 19/22 |
| A872440 | 24/40 |


**ADAPTER, DISTILLATION CONNECTING**

For use as a component in atmospheric or vacuum distillations.

| Item#   | Top Joint | Bottom Joint | Side Joint | Immersion (Bottom of top joint to bottom of side hole) (mm) |
|---------|-----------|--------------|------------|---|
| A351014 | 10/18     | 14/20        | 14/20      | 50  |
| A351019 | 10/18     | 19/22        | 19/22      | 50  |
| A351024 | 10/18     | 24/40        | 24/40      | 76  |
| A351420 | 14/20     | 14/20        | 14/20      | —   |
| A351922 | 19/22     | 19/22        | 19/22      | —   |
| A352440 | 24/40     | 24/40        | 24/40      | —   |
| A351424 | 14/20     | 24/40        | 24/40      | —   |
| A354914 | 14/20     | 24/40        | 19/22      | —   |



**THERMOMETER, WITH 10/18 JOINT**

Immersion length is measured from the bottom of 10/18 joint to lower end of mercury bulb. Accuracy is  $\pm 1^{\circ}\text{C}$ .



| Item#   | Immersion (mm) | Range (°C) |
|---------|----------------|------------|
| T162511 | 25             | -20 to 110 |
| T162525 | 25             | -20 to 250 |
| T162532 | 25             | -20 to 320 |
| T165011 | 50             | -20 to 110 |
| T165025 | 50             | -20 to 250 |
| T165032 | 50             | -20 to 320 |
| T167611 | 76             | -20 to 110 |
| T167625 | 76             | -20 to 250 |
| T167632 | 76             | -20 to 320 |

## ADAPTER, DISTILLING, 75°

With compression cap (RC009) and Viton® O-ring for forming a vacuum tight seal of plain thermometer.



| Item#   | Joints | Height x Width |
|---------|--------|----------------|
|         |        | ( mm)          |
| A971420 | 14/20  | 110×55         |
| A971922 | 19/22  | 110×55         |
| A972440 | 24/40  | 155×100        |

### Accessories:

RC009

Nylon<sup>®</sup> cap

R107

## Replacement Viton® O-rings, size107



### ADAPTER, DISTILLING, BENT, 105°

With an inner drip joint at the bottom and an outer joint at the top.

| Item#   | Top Joint | Bottom Joint |
|---------|-----------|--------------|
| A891420 | 14/20     | 14/20        |
| A891922 | 19/22     | 19/22        |
| A892440 | 24/40     | 24/40        |

**ADAPTER, INLET, LONG STEM**

With standard taper top outer and lower inner joints with sealed in lower tube extending below inner joint.

| Item#   | Joints | Tube Length Below Joint(mm) |
|---------|--------|-----------------------------|
| A651420 | 14/20  | 100                         |
| A652440 | 24/40  | 200                         |


**ADAPTER, VACUUM TAKE-OFF, SHORT STEM**

With a hose connection and a drip tip.

| Item#   | Joints | Hose connection (mm) |
|---------|--------|----------------------|
| A621420 | 14/20  | 8                    |
| A621922 | 19/22  | 8                    |
| A622440 | 24/40  | 10                   |
| A622942 | 29/42  | 10                   |


**ADAPTER, DISTILLATION HEAD**

Vacuum jacketed. The 10/18 top joint accommodates a 76mm immersion thermometer.

| Item#   | Top Joint | Other Joints |
|---------|-----------|--------------|
| A542440 | 10/18     | 24/40        |

**Accessory:**

T167625 76mm Immersion thermometer  
-20 °C to 250 °C



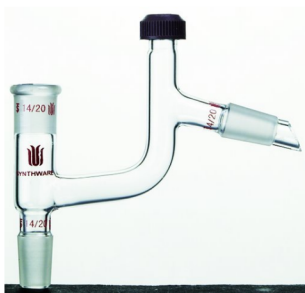

**ADAPTER, DISTILLATION CONNECTING, VIGREUX**

Accommodate a 76mm immersion thermometer.

| Item#   | Top Joint | Other Joint | Side Joint |
|---------|-----------|-------------|------------|
| A131024 | 10/18     | 24/40       | 24/40      |

**Accessory:**

T167625      76mm Immersion thermometer  
-20 °C to 250 °C


**ADAPTER, DISTILLATION**

With threaded thermometer port, supplied complete with Nylon® cap (RC009) and Viton® O-ring to (R107) accommodate 6-7.5mm O.D. plan thermometer.

| Item#   | Joints |
|---------|--------|
| A901420 | 14/20  |
| A901922 | 19/22  |
| A902440 | 24/40  |

**Accessories:**

RC009      Nylon® cap  
R107      Replacement Viton® O-rings, size 107


**ADAPTER, DISTILLATION**

With a 10/18 joint on the vertical side tube for a 76mm immersion thermometer.

| Item#   | All Joints | Thermometer Joint |
|---------|------------|-------------------|
| A362410 | 24/40      | 10/18             |

**Accessory:**

T167625      76mm Immersion thermometer  
-20 °C to 250 °C



**ADAPTER, CLAISEN**

Provides dual entry into a variety of flasks.

| Item#   | Joints |
|---------|--------|
| A371420 | 14/20  |
| A371922 | 19/22  |
| A372440 | 24/40  |
| A372942 | 29/42  |



**ADAPTER, CONNECTING**

Three-arm design for the assembly of three vessels.

| Item#   | Joints |
|---------|--------|
| A331420 | 14/20  |
| A332440 | 24/40  |



**ADAPTER, CLAISEN**

Three-inlet type for multiple entries into a single neck flask.  
One side joint is at a 45° angle.

| Item#   | Joints |
|---------|--------|
| A111420 | 14/20  |
| A112440 | 24/40  |




**ADAPTER, CONNECTING**

Three-arm design for the assembly of three vessels.

| Item#   | Joints |
|---------|--------|
| A101420 | 14/20  |
| A102440 | 24/40  |


**ADAPTER, BENT, 75°**

With inner joints at each end.

| Item#   | Joints |
|---------|--------|
| A151420 | 14/20  |
| A151922 | 19/22  |
| A152440 | 24/40  |


**ADAPTER, VACUUM FILTRATION**

Used with plain stem Buchner funnels and pluro-stopper. Hose connection has an O.D of 10mm at the largest serration. Order pluro-stoppers below separately.

| Item#   | Lower Joint | Pluro-stopper size | Fits Funnel Capacity (mL) |
|---------|-------------|--------------------|---------------------------|
| A841420 | 14/20       | #1                 | 2 to 30                   |
| A842415 | 24/40       | #3                 | 15 to 150                 |
| A842440 | 24/40       | #5 or #6           | 350 to 3000               |



**ADAPTER, WITH MINERAL OIL BUBBLER**

With 10mm O.D. hose connection.

| Item#   | Joint |
|---------|-------|
| A402440 | 24/40 |



**ADAPTER, VACUUM DISTILLING**

Distance between joints is 100mm. Useful in the sub-boiling separation of mixtures having volatile components.

| Item#   | Joints | Hose O.D.<br>(mm) |
|---------|--------|-------------------|
| A491420 | 14/20  | 8                 |



**ADAPTER, U-SHAPE**

| Item#   | Joints |
|---------|--------|
| A631420 | 14/20  |



**ADAPTER, KJELDAHL TRAP**

Distance between center of joints is approximate 200mm.

| Item#   | Joints |
|---------|--------|
| A172440 | 24/40  |




**BUBBLER, MINERAL OIL**

With 10mm O.D. hose connection.

| Item#    | Body O.D.<br>(mm) | Overall<br>Height ×<br>Width( mm) |
|----------|-------------------|-----------------------------------|
| B257040  | 26                | 185×80                            |
| B257040L | 26                | 500×80                            |


**BUBBLER**

With small ball joints to prevent mineral oil being sucked back under sudden negative pressure in the system.

| Item#   | Top<br>Joint | Bottom<br>Joint | Length (mm) |
|---------|--------------|-----------------|-------------|
| B262914 | 29/42        | 14/20           | 157         |
| B262924 | 29/42        | 24/40           | 157         |

**Accessory:**

S181125 Replacement 2mm Teflon® Plug Only


**BUBBLER**

With small ball joints to prevent mineral oil being sucked back under sudden negative pressure in the system.

| Item#   | Top<br>Joint | Bottom                  | Length(mm) |
|---------|--------------|-------------------------|------------|
| B262910 | 29/42        | 10mm Hose<br>connection | 157        |

**Accessory:**

S181125 Replacement 2mm Teflon® Plug Only

**BOTTLE, GAS WASHING, FRITTED DISC**

Gas washing bottle with standard taper 45/50 cap style stopper and fritted disc angled at 15° for even distribution of gas throughout absorbing material. Available with a coarse or extra coarse fritted disc.

Order plastic clip separately. (not supplied)

**Complete Bottles:**

| Item#    | Capacity (mL) | Approx. Height (mm) | Porosity |
|----------|---------------|---------------------|----------|
| B300125C | 125           | 290                 | C        |
| B300125X | 125           | 290                 | XC       |
| B300250C | 250           | 305                 | C        |
| B300500C | 500           | 380                 | C        |
| B300500X | 500           | 380                 | XC       |

**Accessory:**

CS004550 Plastic Clamp, 45/50


**BOTTLE, GAS WASHING, FRITTED DISC**

Gas washing bottle with an extra large diameter (60mm) fritted disc sealed into the bottom of the bottle to enable increased gas throughput and uniform gas distribution. Available with coarse fritted disc. The 24/40 standard taper top outer joint accepts a A292440 gas inlet adapter which is supplied with bottle.

**Complete Bottles:**

| Item#    | Capacity (mL) | Approx. Height (mm) | Porosity |
|----------|---------------|---------------------|----------|
| B310350C | 350           | 250                 | C        |

**Replacement Components:**

| Item#    | Description   |
|----------|---|
| A292440  | Adapter, 24/40 Gas Inlet Adapter, 8mm hose connection |
| CS002440 | 24/40 Joint clip, plastic                             |




**COLUMN, DISTILLING, VIGREUX**

Column length is measured from the highest to lowest indent in the column.

| Item#   | Indentation Length (mm) | Upper Joint | Lower Joint |
|---------|-------------------------|-------------|-------------|
| C101075 | 75                      | 14/20       | 14/20       |
| C101100 | 100                     | 14/20       | 14/20       |
| C101420 | 120                     | 14/20       | 14/20       |
| C101922 | 120                     | 19/22       | 19/22       |
| C109130 | 130                     | 19/22       | 19/22       |
| C102441 | 120                     | 24/40       | 24/40       |
| C104150 | 150                     | 24/40       | 24/40       |
| C102442 | 200                     | 24/40       | 24/40       |
| C102443 | 300                     | 24/40       | 24/40       |


**CONDENSER, DISTILLATION, VACUUM JACKETED**

With 12mm I.D. indentations to support packing material. Vacuum jacketed to improve performance .

| Item#   | Joints | Jacket Height (mm) |
|---------|--------|--------------------|
| C161100 | 14/20  | 130                |
| C164250 | 24/40  | 250                |


**DISTILLING COLUMN PACKING**

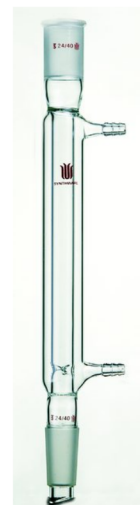
It is a particle type mini-glass coils packing and can be "poured" into any laboratory or pilot scale column. Easily removed for replacement or cleaning.

| Item#   | Material | Size O.D.×L(mm) |
|---------|----------|-----------------|
| D240001 | Glass    | 4×12            |

**CONDENSER, DISTILLATION**

Indentations at the bottom for supporting packing material.  
Jacket permits the column to be used as a condenser.

| Item#   | Joints | Jacket Height (mm) | Column Overall Height(mm) |
|---------|--------|--------------------|---------------------------|
| C171120 | 14/20  | 110                | 180                       |
| C171200 | 14/20  | 200                | 280                       |
| C179110 | 19/22  | 110                | 200                       |
| C179200 | 19/22  | 200                | 280                       |
| C174200 | 24/40  | 200                | 330                       |


**CONDENSER, DISTILLATION, REMOVABLE HOSE CONNECTIONS**

Indentations at the bottom for supporting packing material. Jacket permits the column to be used as a condenser.

| Item#   | Joints | Jacket Height (mm) | Column Overall Height(mm) |
|---------|--------|--------------------|---------------------------|
| C571120 | 14/20  | 110                | 180                       |
| C571200 | 14/20  | 200                | 280                       |
| C579110 | 19/22  | 110                | 200                       |
| C574200 | 24/40  | 200                | 330                       |


**Accessories:**

- RC14 #14 Nylon® cap with 9.5mm hole  
R201402 Replacement hose connection-Straight

**CONDENSER, FRIEDRICHS, WITH 24/40 JOINT**

With a joint at 15° angle.

| Item#   | Top Joint | Bottom Joint | Over Height (mm) |
|---------|-----------|--------------|------------------|
| C212440 | 24/40     | 24/40        | 330              |
| C214550 | 24/40     | 45/50        | 340              |




**CONDENSER, FRIEDRICHS, REMOVABLE HOSE CONNECTIONS**

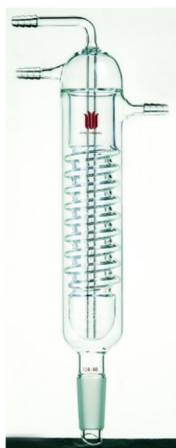
With a joint at 15° angle. Supplied completely with Nylon® cap and hose connections.

| Item#   | Top Joint | Bottom Joint | Over Height (mm) | Hose Connection (mm) |
|---------|-----------|--------------|------------------|----------------------|
| C272440 | 24/40     | 24/40        | 330              | 10                   |

**Accessories:**

RC14 #14 Nylon® cap with 9.5mm hole

R201402 Replacement hose connection-straight


**CONDENSER, FRIEDRICHS**

| Item#   | Joint | Overall Height (mm) | Hose Connection (mm) |
|---------|-------|---------------------|----------------------|
| C232440 | 24/40 | 330                 | 10                   |


**CONDENSER, COLD FINGER, WITH DRIP TIP**

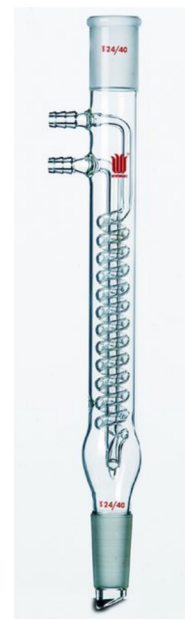
Extended offset lower tip for drop control.

| Item#   | Joint | Length Below Joint(mm) | Hose O.D.(mm) |
|---------|-------|------------------------|---------------|
| C111420 | 14/20 | 100                    | 8             |
| C114150 | 24/40 | 150                    | 10            |
| C114200 | 24/40 | 200                    | 10            |
| C114250 | 24/40 | 250                    | 10            |

**CONDENSER, REFLUX**

Coil style reflux condenser with tightly wrapped coil providing maximum cooling. Excellent for use with volatile solvents. Condenser has a top outer standard taper joint and lower inner drip tip joint. Hose connections have an O.D. of 8mm or 10mm at the middle serration.

| Item#   | Jacket Length<br>(mm) | Joints | Overall<br>Height<br>(mm) | Hose<br>Connection<br>(mm) |
|---------|-----------------------|--------|---------------------------|----------------------------|
| C261100 | 100                   | 14/20  | 205                       | 8                          |
| C262280 | 180                   | 14/20  | 305                       | 8                          |
| C269100 | 125                   | 19/22  | 205                       | 8                          |
| C264125 | 125                   | 24/40  | 275                       | 10                         |
| C264175 | 175                   | 24/40  | 325                       | 10                         |
| C264225 | 225                   | 24/40  | 375                       | 10                         |
| C264275 | 275                   | 24/40  | 425                       | 10                         |


**CONDENSER, REFLUX, REMOVABLE HOSE CONNECTIONS**

Coil style reflux condenser with tightly wrapped coil providing maximum cooling. Excellent for use with volatile solvents. Condenser has a top outer standard taper joint and lower inner drip tip joint.

| Item#   | Jacket Length<br>(mm) | Joints | Overall<br>Height<br>(mm) | Hose<br>Connection<br>(mm) |
|---------|-----------------------|--------|---------------------------|----------------------------|
| C561100 | 100                   | 14/20  | 210                       | 8                          |
| C562280 | 180                   | 14/20  | 305                       | 8                          |
| C564125 | 125                   | 24/40  | 285                       | 10                         |
| C564175 | 175                   | 24/40  | 335                       | 10                         |
| C564225 | 225                   | 24/40  | 375                       | 10                         |

**Accessories:**

- RC14 #14 Nylon<sup>®</sup> cap with 9.5mm hole
- R201402 Replacement hose connection-Straight




**CONDENSER, COILED**

With joints at top and bottom.

| Item#   | Jacket Length<br>(mm) | Joints | O.D. Hose<br>Connection(mm) |
|---------|-----------------------|--------|-----------------------------|
| C121100 | 100                   | 14/20  | 8                           |
| C121120 | 120                   | 14/20  | 8                           |
| C129200 | 200                   | 19/22  | 8                           |
| C124200 | 200                   | 24/40  | 10                          |
| C124300 | 300                   | 24/40  | 10                          |
| C124400 | 400                   | 24/40  | 10                          |


**CONDENSER, COILED, REMOVABLE HOSE CONNECTIONS**

With joints at top and bottom.

| Item#   | Jacket Length<br>(mm) | Joints | O.D. Hose<br>Connection (mm) |
|---------|-----------------------|--------|------------------------------|
| C524200 | 200                   | 24/40  | 8                            |
| C524300 | 300                   | 24/40  | 8                            |
| C524400 | 400                   | 24/40  | 8                            |
| C528300 | 300                   | 29/42  | 8                            |

**Accessories:**

- RC14      #14 Nylon® cap with 9.5mm hole  
R201402      Replacement hose connection-Straight


**CONDENSER, GRAHAM**

| Item#   | Joints | Jacket<br>Length(mm) | O.D. Hose<br>Connection(mm) |
|---------|--------|----------------------|-----------------------------|
| C141120 | 14/20  | 120                  | 8                           |
| C149200 | 19/22  | 200                  | 8                           |
| C144200 | 24/40  | 200                  | 8                           |
| C144250 | 24/40  | 250                  | 10                          |
| C144300 | 24/40  | 300                  | 10                          |
| C144400 | 24/40  | 400                  | 10                          |



### CONDENSER WEST, REMOVABLE HOSE CONNECTIONS

With narrow annular space for high cooling efficiency.

| Item#   | Joints | Jacket Length(mm) |
|---------|--------|-------------------|
| C551110 | 14/20  | 110               |
| C550190 | 14/20  | 190               |
| C554100 | 24/40  | 100               |
| C551190 | 24/40  | 190               |
| C554200 | 24/40  | 200               |
| C554300 | 24/40  | 300               |

#### Accessories:

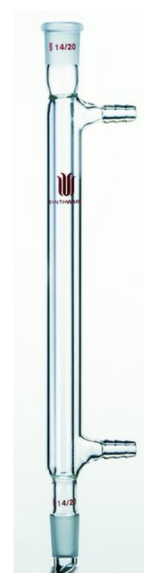
|         |  |
|---------|--|
| RC14    | #14 Nylon <sup>®</sup> cap with 9.5mm hole |
| R201402 | Replacement hose connection-Straight       |

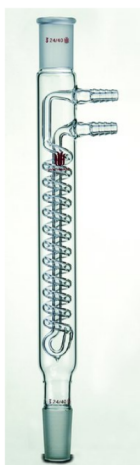


### CONDENSER WEST

With narrow annular space for fast coolant speed, thus high cooling efficiency.

| Item#   | Joints | Jacket Length(mm) |
|---------|--------|-------------------|
| C151110 | 14/20  | 110               |
| C150190 | 14/20  | 190               |
| C151200 | 14/20  | 200               |
| C159190 | 19/22  | 190               |
| C159200 | 19/22  | 200               |
| C154100 | 24/40  | 100               |
| C151190 | 24/40  | 190               |
| C154200 | 24/40  | 200               |
| C154300 | 24/40  | 300               |




**CONDENSER, REFLUX, LARGE COOLING CAPACITY**

Jacket has an O.D. of 40mm while coil O.D. is 8mm to provide maximum cooling capacity.

| Item#   | Coil Length (mm) | Joints | Overall Height(mm) | Hose Connection (mm) |
|---------|------------------|--------|--------------------|----------------------|
| C314125 | 125              | 24/40  | 300                | 10                   |
| C314175 | 175              | 24/40  | 350                | 10                   |

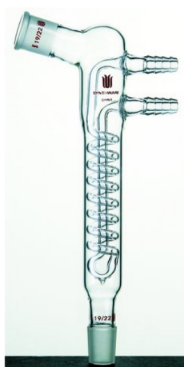

**CONDENSER, REFLUX, LARGE COOLING CAPACITY, REMOVABLE HOSE CONNECTIONS**

Jacket has an O.D. of 40mm while coil O.D. is 8mm to provide maximum cooling capacity.

| Item#   | Coil Length (mm) | Joints | Overall Height (mm) | Hose Connection (mm) |
|---------|------------------|--------|---------------------|----------------------|
| C534125 | 125              | 24/40  | 300                 | 8                    |

**Accessories:**

- RC14 #14 Nylon® cap with 9.5mm hole
- R201402 Replacement hose connection-straight


**CONDENSER, REFLUX**

Coil section is 100mm in height.

| Item#   | Joints |
|---------|--------|
| C351420 | 14/20  |
| C351922 | 19/22  |

**CONDENSER, ALLIHN**

With joints at the top and the bottom.

| Item#   | Jacket Length<br>(mm) | Joints | O.D. Hose<br>Connection<br>(mm) |
|---------|-----------------------|--------|---------------------------------|
| C251120 | 120                   | 14/20  | 8                               |
| C259200 | 200                   | 19/22  | 8                               |
| C259300 | 300                   | 19/22  | 8                               |
| C251200 | 200                   | 24/40  | 10                              |
| C254300 | 300                   | 24/40  | 10                              |
| C254400 | 400                   | 24/40  | 10                              |
| C255300 | 300                   | 29/42  | 10                              |
| C255400 | 400                   | 29/42  | 10                              |

**CONDENSER, ALLIHN, REMOVABLE HOSE CONNECTIONS**

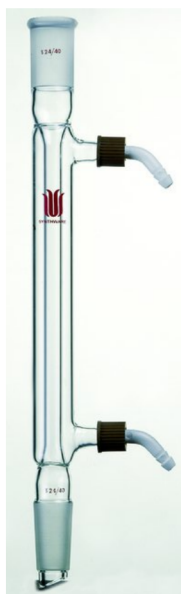
With joints at the top and the bottom.

| Item#   | Jacket Length<br>(mm) | Joints | O.D. Hose Connection<br>(mm) |
|---------|-----------------------|--------|------------------------------|
| C621120 | 120                   | 14/20  | 8                            |
| C621200 | 200                   | 24/40  | 8                            |
| C624300 | 300                   | 24/40  | 8                            |
| C624400 | 400                   | 24/40  | 8                            |
| C625300 | 300                   | 29/42  | 8                            |

**Accessories:**

- RC14            #14 Nylon® cap with 9.5mm hole  
R201402       Replacement hose connection-straight




**CONDENSER, LIEBIG, REMOVABLE HOSE CONNECTIONS**

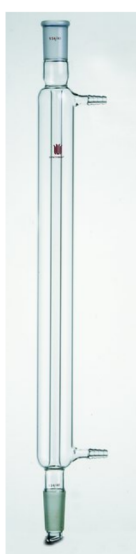
With joints at the top and the bottom.

| Item#   | Jacket Length<br>(mm) | Joints | O.D. Hose Connection<br>(mm) |
|---------|-----------------------|--------|------------------------------|
| C501120 | 120                   | 14/20  | 8                            |
| C509180 | 180                   | 19/22  | 8                            |
| C509300 | 300                   | 19/22  | 8                            |
| C504200 | 200                   | 24/40  | 8                            |
| C504250 | 250                   | 24/40  | 8                            |
| C504300 | 300                   | 24/40  | 8                            |
| C504400 | 400                   | 24/40  | 8                            |
| C504500 | 500                   | 24/40  | 8                            |

**Accessories:**

RC14 #14 Nylon® cap with 9.5mm hole

R201402 Replacement hose connection-straight


**CONDENSER, LIEBIG**

With joints at the top and the bottom.

| Item#   | Jacket Length (mm) | Joints | O.D. Hose Connection (mm) |
|---------|--------------------|--------|---------------------------|
| C201120 | 120                | 14/20  | 8                         |
| C209180 | 180                | 19/22  | 8                         |
| C209300 | 300                | 19/22  | 8                         |
| C204100 | 100                | 24/40  | 10                        |
| C204200 | 200                | 24/40  | 10                        |
| C204250 | 250                | 24/40  | 10                        |
| C204300 | 300                | 24/40  | 10                        |
| C204400 | 400                | 24/40  | 10                        |
| C204500 | 500                | 24/40  | 10                        |


**CONDENSER, DEWAR, MICRO**

Side joint is at 90° angle.

| Item#   | Inside Depth(mm) | I.D.(mm) | Joints |
|---------|------------------|----------|--------|
| C341014 | 90               | 31       | 14/20  |

**CONDENSER, FOR ROTARY EVAPORATORS**

Double coil condenser for use with Buchi rotary evaporators for cooling with tap water in a diagonal position. A 19/38 top valve. With 35/20 spherical ball joint.

| Item#   | Description                                 |
|---------|---|
| C910200 | Rotary Evaporator Condenser, diagonal style |

**Accessories:**

|         |  |
|---------|--|
| C910001 | Inlet feed tube  |
| RC14    | Nylon® cap for water inlet/outlet  |
| R201402 | Replacement Nylon® hose connection-straight, with O-ring(used with RC14 cap) |
| RC18    | Nylon® cap for vacuum  |
| R201801 | Replacement Nylon® hose connection-straight, with O-ring(used with RC18 cap) |


**CONDENSER, FOR ROTARY EVAPORATOR, UPRIGHT STYLE**

For vertical style of Heidolph.

| Item#   | Description                                 |
|---------|---|
| C900200 | Rotary Evaporator Condenser, vertical style |

**Accessories:**

|         |                                      |
|---------|--------------------------------------|
| C900001 | Inlet feed tube, 19/38 joint         |
| RC14    | Nylon® cap                           |
| R201402 | Replacement hose connection-straight |



**FLASK, DEWAR, LOW FORM, HEMISPHERICAL**

Flask size shown is the maximum capacity flask that will fit inside the Dewar.  
With Aluminum housing to transfer magnetic field.



| Item#   | Fits Flask Sizes<br>(mL) | Interior<br>Dimensions,<br>Depth× Diameter<br>(mm) |
|---------|--------------------------|--|
| F240100 | 100                      | 65×80  |
| F240250 | 250                      | 75×100   |
| F240500 | 500                      | 85×123   |
| F241000 | 1000                     | 100×143  |

**\*Due to extra high vacuum, the Dewar flasks still have a rare possibility to explode, so working behind a safety shield in hood and always wearing goggles are strongly recommended.**

**FLASK, DEWAR, WIDE MOUTH, METAL HOUSING**

Dewar flask with weighted metal base for stability and with a full-length aluminum housing which extends to the top rim for added protection.



| Item#    | Overall<br>Capacity<br>(mL) | Exterior<br>Dimensions<br>in<br>Height×Width<br>(mm) | Interior<br>Dimensions in<br>Depth×Diameter<br>(mm) |
|----------|-----------------------------|--|---|
| F110350  | 350                         | 157×86   | 125×70  |
| F110665  | 665                         | 241×86   | 195×70  |
| F111000  | 1000                        | 337×86   | 302×70  |
| F111900  | 1900                        | 252×160  | 190×120   |
| F111900L | 3500                        | 337×160  | 302×120   |
| F114300  | 4300                        | 365×178  | 305×143   |

**\*Due to extra high vacuum, the Dewar flasks still have a rare possibility to explode, so working behind a safety shield in hood and always wearing goggles are strongly recommended.**

### CHROMATOGRAPHY FLOW CONTROL ADAPTER

0-4mm high vacuum valve with metering tip to adjust air pressure. With standard taper joint. Order CC3525 pinch type clamps with screw-locking device for ball joints.

For replacement O-rings on high vacuum plug shaft, order R010. The O-rings on the high vacuum PTFE valve are completely encapsulated with thin layer of PTFE, making it inert to chemicals.

| Item# | Joint Size |
|-------|------------|
|-------|------------|

|       |       |
|-------|-------|
| C1301 | 35/20 |
|-------|-------|

|       |       |
|-------|-------|
| C1324 | 24/40 |
|-------|-------|

#### Accessories:

|         |  |
|---------|--|
| S660004 | 0-4mm high vacuum metering plug and control knob. (PTFE O-ring at tip) |
|---------|--|

|      |  |
|------|--|
| R010 | Replacement Viton® O-rings, size 010 for 0-4mm high vacuum plug shaft O-ring |
|------|--|

|        |                                      |
|--------|--------------------------------------|
| CC3525 | Clamps for 35/20 or 35/25 ball joint |
|--------|--------------------------------------|

|          |                               |
|----------|-------------------------------|
| CS002440 | Plastic clamp for 24/40 joint |
|----------|-------------------------------|



\* Since the chromatography column is used with positive air pressure, it's highly recommended that operator uses column behind a safety shield.

### CHROMATOGRAPHY RESERVOIR

For flash chromatography.

| Item#   | joints | Capacity(mL) |
|---------|--------|--------------|
| C184100 | 24/40  | 100          |
| C182402 | 24/40  | 250          |
| C182403 | 24/40  | 500          |
| C193502 | 35/20  | 250          |
| C193503 | 35/20  | 500          |

#### Accessories:

|        |   |
|--------|---|
| CC3525 | S.S. Clamps for 35/20 or 35/25 ball joint |
|--------|---|

|          |                               |
|----------|-------------------------------|
| CS002440 | Plastic clamp for 24/40 joint |
|----------|-------------------------------|



**CHROMATOGRAPHY COLUMN, HEAVY WALL DESIGN**

General purpose column has a Teflon<sup>®</sup> stopcock and a top outer joint.

For flash chromatography. All Synthware columns are heavy wall designed to increase safety.



| Item#   | Column O.D. (mm) | Column I.D. (mm) | Effective Length inch(mm) | Joint | Stopcock Bore (mm) |
|---------|------------------|------------------|---------------------------|-------|--------------------|
| C184171 | 17               | 13.4             | 8(203)                    | 24/40 | 2                  |
| C184172 | 17               | 13.4             | 10(254)                   | 24/40 | 2                  |
| C184173 | 17               | 13.4             | 12(305)                   | 24/40 | 2                  |
| C184261 | 26               | 20.0             | 8(203)                    | 24/40 | 2                  |
| C184262 | 26               | 20.0             | 10(254)                   | 24/40 | 2                  |
| C184263 | 26               | 20.0             | 12(305)                   | 24/40 | 2                  |
| C184264 | 26               | 20.0             | 18(457)                   | 24/40 | 2                  |
| C184321 | 32               | 26.0             | 8(203)                    | 24/40 | 2                  |
| C184322 | 32               | 26.0             | 10(254)                   | 24/40 | 2                  |
| C184323 | 32               | 26.0             | 12(305)                   | 24/40 | 2                  |
| C184324 | 32               | 26.0             | 18(457)                   | 24/40 | 2                  |
| C184461 | 46               | 40.0             | 8(203)                    | 24/40 | 2                  |
| C184462 | 46               | 40.0             | 10(254)                   | 24/40 | 2                  |
| C184463 | 46               | 40.0             | 12(305)                   | 24/40 | 2                  |
| C184464 | 46               | 40.0             | 18(457)                   | 24/40 | 2                  |
| C184603 | 60               | 53.0             | 12(305)                   | 24/40 | 4                  |
| C184604 | 60               | 53.0             | 18(457)                   | 24/40 | 4                  |
| C184605 | 60               | 53.0             | 24(610)                   | 24/40 | 4                  |

**Accessories:**

- CS002440 Plastic clamp for 24/40 joint
- S181125 Replacement 2mm Teflon<sup>®</sup> Plug Only
- S181530 Replacement 4mm Teflon<sup>®</sup> Plug Only

\* Since the chromatography column is used with positive air pressure, it's highly recommended that operator uses column behind a safety shield.


**TLC DEVELOPING TANKS – CYLINDRICAL**

Made of glass with lid. Compact size offers good plate visibility and minimal solvent use.



| Item#   | OD*H (mm) | Joint |
|---------|-----------|-------|
| T216105 | 65*105    | 60/12 |
| T216205 | 65*205    | 60/12 |

**CHROMATOGRAPHY COLUMN, HEAVY WALL DESIGN**

General purpose column has a Teflon<sup>®</sup> stopcock and a top outer joint.

With a coarse porosity fritted disc to support column packing. The section below disc is carefully minimized to prevent re-mixing of components already separated.

All Synthware columns are heavy wall designed to increase safety.

| Item#    | Column<br>O.D.<br>(mm) | Column<br>I.D.<br>(mm) | Effective<br>Length<br>Inch(mm) | Joint | Stopcock<br>Bore<br>(mm) |
|----------|------------------------|------------------------|---------------------------------|-------|--------------------------|
| C184171C | 17                     | 13.4                   | 8(203)                          | 24/40 | 2                        |
| C184172C | 17                     | 13.4                   | 10(254)                         | 24/40 | 2                        |
| C184173C | 17                     | 13.4                   | 12(305)                         | 24/40 | 2                        |
| C184261C | 26                     | 20.0                   | 8(203)                          | 24/40 | 2                        |
| C184262C | 26                     | 20.0                   | 10(254)                         | 24/40 | 2                        |
| C184263C | 26                     | 20.0                   | 12(305)                         | 24/40 | 2                        |
| C184264C | 26                     | 20.0                   | 18(457)                         | 24/40 | 2                        |
| C184321C | 32                     | 26.0                   | 8(203)                          | 24/40 | 2                        |
| C184322C | 32                     | 26.0                   | 10(254)                         | 24/40 | 2                        |
| C184323C | 32                     | 26.0                   | 12(305)                         | 24/40 | 2                        |
| C184324C | 32                     | 26.0                   | 18(457)                         | 24/40 | 2                        |
| C184461C | 46                     | 40.0                   | 8(203)                          | 24/40 | 2                        |
| C184462C | 46                     | 40.0                   | 10(254)                         | 24/40 | 2                        |
| C184463C | 46                     | 40.0                   | 12(305)                         | 24/40 | 2                        |
| C184464C | 46                     | 40.0                   | 18(457)                         | 24/40 | 2                        |
| C184602C | 60                     | 53.0                   | 10(254)                         | 24/40 | 4                        |
| C184603C | 60                     | 53.0                   | 12(305)                         | 24/40 | 4                        |
| C184604C | 60                     | 53.0                   | 18(457)                         | 24/40 | 4                        |
| C184605C | 60                     | 53.0                   | 24(610)                         | 24/40 | 4                        |

**Accessories:**

|          |   |
|----------|---|
| CS002440 | Plastic clamp for 24/40 joint                 |
| S181125  | Replacement 2mm Teflon <sup>®</sup> Plug Only |
| S181530  | Replacement 4mm Teflon <sup>®</sup> Plug Only |

\* Since the chromatography column is used with positive air pressure, it's highly recommended that operator uses column behind a safety shield.



**COLUMN, CHROMATOGRAPHY WITH RESERVOIR**

With 24/40 outer joint at top. All Synthware columns are heavy wall designed to increase safety.



| Item#   | Column<br>O.D.<br>(mm) | Column<br>I.D.<br>(mm) | Effective<br>Length<br>Inch(mm) | Joint | PTFE<br>Stopcock<br>Bore(mm) | Capacity<br>of<br>Reservoir<br>(mL) |
|---------|------------------------|------------------------|---------------------------------|-------|------------------------------|-------------------------------------|
| C371720 | 17                     | 13.4                   | 8(203)                          | 24/40 | 2                            | 100                                 |
| C371730 | 17                     | 13.4                   | 12(305)                         | 24/40 | 2                            | 100                                 |
| C371740 | 17                     | 13.4                   | 18(457)                         | 24/40 | 2                            | 250                                 |
| C372620 | 26                     | 20.0                   | 8(203)                          | 24/40 | 2                            | 250                                 |
| C372625 | 26                     | 20.0                   | 10(254)                         | 24/40 | 2                            | 250                                 |
| C372630 | 26                     | 20.0                   | 12(305)                         | 24/40 | 2                            | 250                                 |
| C372640 | 26                     | 20.0                   | 18(457)                         | 24/40 | 2                            | 500                                 |
| C373220 | 32                     | 26.0                   | 8(203)                          | 24/40 | 2                            | 500                                 |
| C373225 | 32                     | 26.0                   | 10(254)                         | 24/40 | 2                            | 500                                 |
| C373230 | 32                     | 26.0                   | 12(305)                         | 24/40 | 2                            | 500                                 |
| C373240 | 32                     | 26.0                   | 18(457)                         | 24/40 | 2                            | 500                                 |
| C374620 | 46                     | 40.0                   | 8(203)                          | 24/40 | 2                            | 500                                 |
| C374625 | 46                     | 40.0                   | 10(254)                         | 24/40 | 2                            | 500                                 |
| C374630 | 46                     | 40.0                   | 12(305)                         | 24/40 | 2                            | 500                                 |
| C374640 | 46                     | 40.0                   | 18(457)                         | 24/40 | 2                            | 500                                 |
| C376025 | 60                     | 53.0                   | 10(254)                         | 24/40 | 4                            | 500                                 |
| C376030 | 60                     | 53.0                   | 12(305)                         | 24/40 | 4                            | 1000                                |
| C376040 | 60                     | 53.0                   | 18(457)                         | 24/40 | 4                            | 1000                                |
| C378020 | 80                     | 73.0                   | 8(203)                          | 24/40 | 4                            | 1000                                |
| C378040 | 80                     | 73.0                   | 18(457)                         | 24/40 | 4                            | 1000                                |

**Accessories:**

- CS002440 Plastic clamp for 24/40 joint
- S181125 Replacement 2mm Teflon® Plug Only
- S181530 Replacement 4mm Teflon® Plug Only

\* Since the chromatography column is used with positive air pressure, it's highly recommended that operator uses column behind a safety shield.

**COLUMN, CHROMATOGRAPHY WITH RESERVOIR, FRITTED DISC**

With a coarse porosity sealed in fritted disc to support column packing.

All Synthware columns are heavy wall designed to increase safety.

| Item#    | Column<br>O.D.<br>(mm) | Column I.D.<br>(mm) | Effective<br>Length<br>Inch (mm) | Joint | PTFE<br>Stopcock<br>Bore(mm) | Capacity<br>of<br>Reservoir<br>(mL) |
|----------|------------------------|---------------------|----------------------------------|-------|------------------------------|-------------------------------------|
| C391720C | 17                     | 13.4                | 8(203)                           | 24/40 | 2                            | 100                                 |
| C391730C | 17                     | 13.4                | 12(305)                          | 24/40 | 2                            | 100                                 |
| C391740C | 17                     | 13.4                | 18(457)                          | 24/40 | 2                            | 250                                 |
| C392620C | 26                     | 20.0                | 8(203)                           | 24/40 | 2                            | 250                                 |
| C392625C | 26                     | 20.0                | 10(254)                          | 24/40 | 2                            | 250                                 |
| C392630C | 26                     | 20.0                | 12(305)                          | 24/40 | 2                            | 250                                 |
| C392640C | 26                     | 20.0                | 18(457)                          | 24/40 | 2                            | 500                                 |
| C393220C | 32                     | 26.0                | 8(203)                           | 24/40 | 2                            | 500                                 |
| C393225C | 32                     | 26.0                | 10(254)                          | 24/40 | 2                            | 500                                 |
| C393230C | 32                     | 26.0                | 12(305)                          | 24/40 | 2                            | 500                                 |
| C393240C | 32                     | 26.0                | 18(457)                          | 24/40 | 2                            | 500                                 |
| C394620C | 46                     | 40.0                | 8(203)                           | 24/40 | 2                            | 500                                 |
| C394625C | 46                     | 40.0                | 10(254)                          | 24/40 | 2                            | 500                                 |
| C394630C | 46                     | 40.0                | 12(305)                          | 24/40 | 2                            | 500                                 |
| C394640C | 46                     | 40.0                | 18(457)                          | 24/40 | 2                            | 500                                 |
| C396020C | 60                     | 53.0                | 8(203)                           | 24/40 | 4                            | 500                                 |
| C396025C | 60                     | 53.0                | 10(254)                          | 24/40 | 4                            | 500                                 |
| C396030C | 60                     | 53.0                | 12(305)                          | 24/40 | 4                            | 1000                                |
| C396040C | 60                     | 53.0                | 18(457)                          | 24/40 | 4                            | 1000                                |
| C396060C | 60                     | 53.0                | 24(610)                          | 24/40 | 4                            | 1000                                |
| C398020C | 80                     | 73.0                | 8(203)                           | 24/40 | 4                            | 1000                                |
| C398025C | 80                     | 73.0                | 10(254)                          | 24/40 | 4                            | 1000                                |
| C398030C | 80                     | 73.0                | 12(305)                          | 24/40 | 4                            | 1000                                |
| C398060C | 80                     | 73.0                | 24(610)                          | 24/40 | 4                            | 1000                                |

**Accessories:**

|          |                                   |
|----------|-----------------------------------|
| CS002440 | Plastic clamp for 24/40 joint     |
| S181125  | Replacement 2mm Teflon® Plug Only |
| S181530  | Replacement 4mm Teflon® Plug Only |

\* Since the chromatography column is used with positive air pressure, it's highly recommended that operator uses column behind a safety shield.



**CHROMATOGRAPHY COLUMN, SPHERICAL JOINTS**

Spherical joint used with pinch clamp makes quick and tight connection under pressure for flash chromatography. All Synthware columns are heavy wall designed to increase safety.



| Item#   | Column O.D.<br>(mm) | Column I.D.<br>(mm) | Effective<br>Length Inch(mm) | Joint | PTFE<br>Stopcock<br>Bore (mm) |
|---------|---------------------|---------------------|------------------------------|-------|-------------------------------|
| C195173 | 17                  | 13.4                | 12(305)                      | 35/20 | 2                             |
| C195264 | 26                  | 20.0                | 18(457)                      | 35/20 | 2                             |
| C195323 | 32                  | 26.0                | 12(305)                      | 35/20 | 2                             |
| C195324 | 32                  | 26.0                | 18(457)                      | 35/20 | 2                             |
| C195464 | 46                  | 40.0                | 18(457)                      | 35/20 | 2                             |

**Accessories:**

- CC3525 Clamps for 35/20 ball joint  
S181125 Replacement 2mm Teflon® Plug Only

**CHROMATOGRAPHY COLUMN, FRITTED DISC, SPHERICAL JOINTS**

With a coarse porosity fritted disc to support packing material. All Synthware columns are heavy wall designed to increase safety.



| Item#    | Column<br>O.D. (mm) | Column<br>I.D.<br>(mm) | Effective<br>Length<br>Inch(mm) | Joint | PTFE<br>Stopcock<br>Bore (mm) |
|----------|---------------------|------------------------|---------------------------------|-------|-------------------------------|
| C195171C | 17                  | 13.4                   | 8(203)                          | 35/20 | 2                             |
| C195172C | 17                  | 13.4                   | 10(254)                         | 35/20 | 2                             |
| C195173C | 17                  | 13.4                   | 12(305)                         | 35/20 | 2                             |
| C195262C | 26                  | 20.0                   | 10(254)                         | 35/20 | 2                             |
| C195264C | 26                  | 20.0                   | 18(457)                         | 35/20 | 2                             |
| C195323C | 32                  | 26.0                   | 12(305)                         | 35/20 | 2                             |
| C195324C | 32                  | 26.0                   | 18(457)                         | 35/20 | 2                             |
| C195463C | 46                  | 40.0                   | 12(305)                         | 35/20 | 2                             |
| C195464C | 46                  | 40.0                   | 18(457)                         | 35/20 | 2                             |

**Accessories:**

- CC3525 Clamps for 35/20 ball joint  
S181125 Replacement 2mm Teflon® Plug Only

\* Since the chromatography column is used with positive air pressure, it's highly recommended that operator uses column behind a safety shield.

**COLUMN, CHROMATOGRAPHY WITH RESERVOIR**

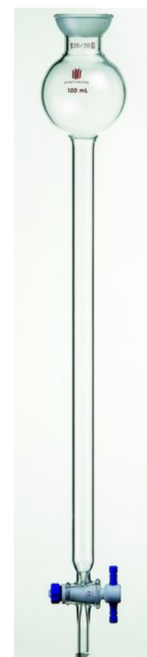
With 35/20 spherical joint.

| Item#   | Column<br>O.D.<br>(mm) | Column<br>I.D.<br>(mm) | Effective<br>Length<br>Inch(mm) | Joint | PTFE<br>Stopcock<br>Bore(mm) | Capacity<br>of<br>Reservoir(mL) |
|---------|------------------------|------------------------|---------------------------------|-------|------------------------------|---------------------------------|
| C381720 | 17                     | 13.4                   | 8(203)                          | 35/20 | 2                            | 100                             |
| C381730 | 17                     | 13.4                   | 12(305)                         | 35/20 | 2                            | 100                             |
| C381740 | 17                     | 13.4                   | 18(457)                         | 35/20 | 2                            | 250                             |
| C382620 | 26                     | 20.0                   | 8(203)                          | 35/20 | 2                            | 250                             |
| C382625 | 26                     | 20.0                   | 10(254)                         | 35/20 | 2                            | 250                             |
| C382630 | 26                     | 20.0                   | 12(305)                         | 35/20 | 2                            | 250                             |
| C382640 | 26                     | 20.0                   | 18(457)                         | 35/20 | 2                            | 500                             |
| C383220 | 32                     | 26.0                   | 8(203)                          | 35/20 | 2                            | 500                             |
| C383225 | 32                     | 26.0                   | 10(254)                         | 35/20 | 2                            | 500                             |
| C383230 | 32                     | 26.0                   | 12(305)                         | 35/20 | 2                            | 500                             |
| C383240 | 32                     | 26.0                   | 18(457)                         | 35/20 | 2                            | 500                             |
| C384630 | 46                     | 40.0                   | 12(305)                         | 35/20 | 2                            | 500                             |
| C384640 | 46                     | 40.0                   | 18(457)                         | 35/20 | 2                            | 500                             |

**Accessories:**

- CC3525                      Clamps for 35/20 ball joint  
S181125                    Replacement 2mm Teflon® Plug Only

\* Since the chromatography column is used with positive air pressure, it's highly recommended that operator uses column behind a safety shield.



**COLUMN, CHROMATOGRAPHY WITH RESERVOIR, FRITTED DISC**

With a coarse porosity fritted disc to support packing ,with 35/20 spherical joint. All Synthware columns are heavy wall designed to increase safety.



| Item#    | Column<br>O.D.<br>(mm) | Column<br>I.D.<br>(mm) | Effective<br>Length<br>Inch(mm) | Joint | PTFE<br>Stopcock<br>Bore(mm) | Capacity<br>of<br>Reservoir(mL) |
|----------|------------------------|------------------------|---------------------------------|-------|------------------------------|---------------------------------|
| C381720C | 17                     | 13.4                   | 8(203)                          | 35/20 | 2                            | 100                             |
| C381730C | 17                     | 13.4                   | 12(305)                         | 35/20 | 2                            | 100                             |
| C381740C | 17                     | 13.4                   | 18(457)                         | 35/20 | 2                            | 250                             |
| C382620C | 26                     | 20.0                   | 8(203)                          | 35/20 | 2                            | 250                             |
| C382625C | 26                     | 20.0                   | 10(254)                         | 35/20 | 2                            | 250                             |
| C382630C | 26                     | 20.0                   | 12(305)                         | 35/20 | 2                            | 250                             |
| C382640C | 26                     | 20.0                   | 18(457)                         | 35/20 | 2                            | 500                             |
| C383220C | 32                     | 26.0                   | 8(203)                          | 35/20 | 2                            | 500                             |
| C383225C | 32                     | 26.0                   | 10(254)                         | 35/20 | 2                            | 500                             |
| C383230C | 32                     | 26.0                   | 12(305)                         | 35/20 | 2                            | 500                             |
| C383240C | 32                     | 26.0                   | 18(457)                         | 35/20 | 2                            | 500                             |
| C384630C | 46                     | 40.0                   | 12(305)                         | 35/20 | 2                            | 500                             |
| C384640C | 46                     | 40.0                   | 18(457)                         | 35/20 | 2                            | 500                             |

**Accessories:**

CC3525 Clamps for 35/20 ball joint

S181125 Replacement 2mm Teflon® Plug Only

\* Since the chromatography column is used with positive air pressure, it's highly recommended that operator uses column behind a safety shield.


**CHROMATOGRAPHY COLUMN, MODIFIED**

Short column with lower 24/40 joint and hose connection for vacuum. All Synthware columns are heavy wall designed to increase safety.

| Item#    | Column<br>O.D.(mm) | Length*(mm) | Porosity |
|----------|--------------------|-------------|----------|
| F234020C | 40                 | 200         | Coarse   |
| F234030C | 40                 | 300         | Coarse   |
| F234030M | 40                 | 300         | Medium   |
| F236040C | 60                 | 400         | Coarse   |
| F238530C | 90                 | 300         | Coarse   |
| F238540C | 90                 | 400         | Coarse   |

\* Length above fritted disc.

**COLUMN, CHROMATOGRAPHY, TEFLON® STOPCOCK**

With reinforced beaded top. All Synthware columns are heavy wall designed to increase safety.

| Item#   | Column<br>O.D. (mm) | Column<br>I.D. (mm) | Effective<br>Length Inch(mm) | PTFE<br>Stopcock Bore<br>(mm) |
|---------|---------------------|---------------------|------------------------------|-------------------------------|
| C361320 | 13                  | 10.0                | 8(203)                       | 2                             |
| C361330 | 13                  | 10.0                | 12(305)                      | 2                             |
| C361340 | 13                  | 10.0                | 16(406)                      | 2                             |
| C361720 | 17                  | 13.4                | 8(203)                       | 2                             |
| C361725 | 17                  | 13.4                | 10(254)                      | 2                             |
| C361730 | 17                  | 13.4                | 12(305)                      | 2                             |
| C362620 | 26                  | 20.0                | 8(203)                       | 2                             |
| C362625 | 26                  | 20.0                | 10(254)                      | 2                             |
| C362630 | 26                  | 20.0                | 12(305)                      | 2                             |
| C362640 | 26                  | 20.0                | 18(457)                      | 2                             |
| C363225 | 32                  | 26.0                | 10(254)                      | 2                             |
| C364640 | 46                  | 40.0                | 18(457)                      | 2                             |
| C366030 | 60                  | 53.0                | 12(305)                      | 4                             |
| C366040 | 60                  | 53.0                | 18(457)                      | 4                             |
| C366060 | 60                  | 53.0                | 24(610)                      | 4                             |
| C368030 | 80                  | 73.0                | 12(305)                      | 4                             |

**Accessories:**

S181125 Replacement 2mm Teflon® Plug Only

S181530 Replacement 4mm Teflon® Plug Only

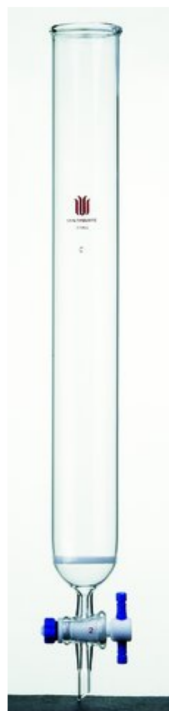
\* Since the chromatography column is used with positive air pressure, it's highly recommended that operator uses column behind a safety shield.



**COLUMN, CHROMATOGRAPHY, TEFLON® STOPCOCK, FRITTED DISC**

With reinforced beaded top, coarse porosity fritted disc to support column packing.

All Synthware columns are heavy wall designed to increase safety.



| Item#    | Column<br>O.D.<br>(mm) | Column<br>I.D.<br>(mm) | Effective<br>Length<br>Inch<br>(mm) | PTFE<br>Stopcock<br>Bore<br>(mm) |
|----------|------------------------|------------------------|-------------------------------------|----------------------------------|
| C361720C | 17                     | 13.4                   | 8(203)                              | 2                                |
| C361725C | 17                     | 13.4                   | 10(254)                             | 2                                |
| C361730C | 17                     | 13.4                   | 12(305)                             | 2                                |
| C361740C | 17                     | 13.4                   | 18(457)                             | 2                                |
| C362620C | 26                     | 20.0                   | 8(203)                              | 2                                |
| C362625C | 26                     | 20.0                   | 10(254)                             | 2                                |
| C362630C | 26                     | 20.0                   | 12(305)                             | 2                                |
| C362640C | 26                     | 20.0                   | 18(457)                             | 2                                |
| C363225C | 32                     | 26.0                   | 10(254)                             | 2                                |
| C363230C | 32                     | 26.0                   | 12(305)                             | 2                                |
| C363240C | 32                     | 26.0                   | 18(457)                             | 2                                |
| C364620C | 46                     | 40.0                   | 8(203)                              | 2                                |
| C364625C | 46                     | 40.0                   | 10(254)                             | 2                                |
| C364630C | 46                     | 40.0                   | 12(305)                             | 2                                |
| C364640C | 46                     | 40.0                   | 18(457)                             | 2                                |
| C366040C | 60                     | 53.0                   | 18(457)                             | 4                                |
| C366060C | 60                     | 53.0                   | 24(610)                             | 4                                |
| C368030C | 80                     | 73.0                   | 12(305)                             | 4                                |

**Accessories:**

S181125 Replacement 2mm Teflon® Plug Only

S181530 Replacement 4mm Teflon® Plug Only

\* Since the chromatography column is used with positive air pressure, it's highly recommended that operator uses column behind a safety shield.

**FLOW CONTROL ADAPTER, CHROMATOGRAPHY, RODAVISS® JOINT**

Flow control adapter for use with column with 24/40 or 45/50 inner Rodaviss® joint. Supplied complete with open top screw cap, loosening cap and O-ring. Adapter has a 0-4mm metering plug.

| Item    | Joint |
|---------|-------|
| C432440 | 24/40 |

**Accessories:**

|         |   |
|---------|---|
| RC2440  | 24/40 Open Top Screw Cap  |
| R202440 | 24/40 Loosening Ring  |
| R221    | #221 O-Rings for 24/40 Rodaviss® Joint                                    |
| S660004 | 0-4mm high vacuum metering plug and control knob.<br>(PTFE O-ring at tip) |
| R010    | Replacement Viton® O-rings, size 010                                      |

\*Since the chromatography column is used with positive air pressure, it's highly recommended that operator uses column behind a safety shield.


**RESERVOIR, CHROMATOGRAPHY, RODAVISS® JOINT**

Reservoir has a top 24/40 or 45/50 Rodaviss® outer joint for use with flow controller, and the listed size lower inner joint. Supplied complete with open top cap, Viton® O-ring and loosening ring.

| Item#   | Capacity<br>(mL) | Lower Inner<br>Joint Size |
|---------|------------------|---------------------------|
| C414250 | 250              | 24/40                     |
| C414500 | 500              | 24/40                     |

**Accessories:**

|         |  |
|---------|--|
| RC2440  | 24/40 Open Top Screw Cap               |
| R202440 | 24/40 Loosening Ring                   |
| R221    | #221 O-Rings for 24/40 Rodaviss® Joint |

\*Since the chromatography column is used with positive air pressure, it's highly recommended that operator uses column behind a safety shield.



**DISTILLING BULB, KUGELROHR**

Used in distillation of very small amount of distillate at lower temperature with high efficiency. Kugelrohr machine required but not supplied.

For the vacuum adapter, see A301420



| Item#   | Capacity (mL)                                 | Joints | Bulb O.D. (mm) | Overall Height (mm) |
|---------|---|--------|----------------|---------------------|
| D281005 | 5   | 14/20  | 25             | 80                  |
| D281010 | 10  | 14/20  | 31             | 85                  |
| D281015 | 15  | 14/20  | 35             | 90                  |
| D281025 | 25  | 14/20  | 42             | 98                  |
| D281050 | 50  | 14/20  | 48             | 105                 |
| A301420 | 14/20 vacuum adapter with 8mm hose connection |        |                |                     |

**DISH, CRYSTALLIZING, WITH SPOUTS**

Top of each dish is reinforced and fire polished to reduce chipping.



| Item#   | Approx. Dia. × Height (mm) | Approx. Capacity (mL) |
|---------|----------------------------|-----------------------|
| D290170 | 80×45                      | 150                   |
| D290700 | 115×65                     | 500                   |
| D291200 | 140×75                     | 900                   |

**DISTILLATION APPARATUS, MICROSCALE**

Short-path design for microscale application, used with 25mm immersion thermometer, and D27 distillation receiver.



| Item#   | Thermometer Joint | Joints |
|---------|-------------------|--------|
| D151814 | 10/18             | 14/20  |
| D151819 | 10/18             | 19/22  |

**DISTILLATION RECEIVER, WITHOUT HOSE CONNECTION**

With the outer and inner joint at 135° angle, used with short-path.

| Item#   | Joints |
|---------|--------|
| D271420 | 14/20  |
| D272440 | 24/40  |


**DISTILLATION APPARATUS, MICROSCALE, VIGREUX**

With Vigreux Indentations, used with 25mm immersion thermometer, and D27 distillation receiver.

| Item#   | Thermometer Joint | Joints |
|---------|-------------------|--------|
| D251014 | 10/18             | 14/20  |
| D251019 | 10/18             | 19/22  |


**DISTILLATION APPARATUS, SHORT PATH,VACUUM JACKETED**

Vacuum jacketed design for more efficiency. When a thermometer is inserted in the top of this apparatus, the bulb and stem serve as column packing. The close coupled condenser and vacuum connection offer an extremely short condensate travel path. Used with 25mm immersion thermometer, and D27 distillation receiver.

| Item#   | Thermometer Joint | Joints |
|---------|-------------------|--------|
| D121014 | 10/18             | 14/20  |



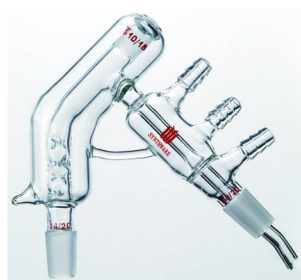

**DISTILLING RECEIVER**

Supplied with distribution adapter, three 12mL receiver tubes and three plastic joint clip. With 135° angle between top outer joint and lower inner joint.

| Item#   | Lower Inner Joint<br>Size |
|---------|---------------------------|
| D381412 | 14/20                     |

**Accessories:**

|          |                               |
|----------|-------------------------------|
| T230012  | Receiver Tube, 14/20, 12mL    |
| CS001420 | Plastic clamp for 14/20 joint |


**DISTILLATION APPARATUS, SHORT PATH, VACUUM JACKETED**

Used with 25mm immersion thermometer, and D27 distillation receiver.

| Item#   | Thermometer<br>Joint | Joints |
|---------|----------------------|--------|
| D371418 | 10/18                | 14/20  |


**DISTILLATION, SHORT PATH WITH 24/40 JOINT**

One-piece design for easy set-up. For the best result, use D272440 distillation receiver. To be used with 25mm immersion thermometer.

| Item#   | Thermometer<br>Joint | Joints |
|---------|----------------------|--------|
| D261024 | 10/18                | 24/40  |

**DISTILLING HEAD, SHORT PATH, FOR VOLATILE SOLVENTS**

With the condenser being a combination of a cold coil and Leibig. Top outer joint is a 10/18 for use with a 50mm immersion thermometer. For best result, use D272440.

| Item#   | Lower Inner Joint Size | Top Thermometer Joint |
|---------|------------------------|-----------------------|
| D531024 | 24/40                  | 10/18                 |


**DISTILLING HEAD, SHORT PATH, FOR VOLATILE DISTILLANTS**

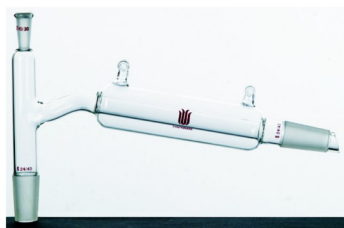
Same as above, but with Vigreux Indentations. Top outer joint is a 10/18 for use with a 50mm immersion thermometer.

| Item#   | Lower Inner Joint Size | Top Thermometer Joint |
|---------|------------------------|-----------------------|
| D541024 | 24/40                  | 10/18                 |



**DISTILLING HEAD**

Thermometer joint is 10/18 for 76mm immersion thermometer.  
Side arm is at 75° angle.



| Item#   | Lower Inner Joint Size | Top Thermometer Joint | Jacket Length (mm) |
|---------|------------------------|-----------------------|--------------------|
| D304150 | 24/40                  | 10/18                 | 150                |
| D304250 | 24/40                  | 10/18                 | 250                |
| D304400 | 24/40                  | 10/18                 | 400                |


**DISTILLATION RECEIVER, WITH HOSE CONNECTION**

Cow-type design having three receivers spaced 40° apart. 105° angle between top outer joint and lower inner joints.

| Item#   | Joints |
|---------|--------|
| D681420 | 14/20  |
| D681922 | 19/22  |
| D682440 | 24/40  |


**DISTILLATION COW RECEIVER**

Designed for microscale application. With one female joint and four drip-tip male joints.

| Item#   | Joints |
|---------|--------|
| D161420 | 14/20  |



### DISTILLING RECEIVER, GRADUATED, WITH HOOKS

Centrifuge tube shaped receiver with an upper standard taper joint.

| Item#   | Joint | Capacity(mL) |
|---------|-------|--------------|
| T230012 | 14/20 | 12           |
| T230015 | 14/20 | 15           |



### DISTILLING, COW RECEIVER, GRADUATED

Tubes are graduated from 0-3mL in 0.2mL subdivisions.

| Item#   | Joint |
|---------|-------|
| D351403 | 14/20 |



### DISTILLATION RECEIVER, WITH HOSE CONNECTION

Cow-type design having three receivers spaced 40° apart. 105° angle between top outer joint and lower inner joints.

| Item#   | Joints |
|---------|--------|
| D191420 | 14/20  |
| D191922 | 19/22  |
| D192440 | 24/40  |



### DISTILLATION APPARATUS, VACUUM

10/18 joint on side tube accommodates 25mm immersion thermometer.

| Item#   | Joints | Other Joints |
|---------|--------|--------------|
| D101410 | 10/18  | 14/20        |
| D101910 | 10/18  | 19/22        |
| D101414 | 14/20  | 14/20        |




**DISTILLATION RECEIVING SET**

Designed without hose connection to be used with D10 distillation apparatus.

| Item#   | Item Type      | Joints |
|---------|----------------|--------|
| A581420 | Vacuum Adapter | 14/20  |
| D201414 | Cow Receiver   | 14/20  |
| A581922 | Vacuum Adapter | 19/22  |
| D201922 | Cow Receiver   | 19/22  |

**Accessories:**

|          |                               |
|----------|-------------------------------|
| CS001420 | Plastic clamp for 14/20 joint |
| CS001922 | Plastic clamp for 19/22 joint |


**DISTILLATION RECEIVING SET**

Rotating cow receiver allows four flasks to be progressively filled.

| Item#   | Item Type            | Joints |
|---------|----------------------|--------|
| A551420 | Distribution Adapter | 14/20  |
| D201414 | Cow Receiver         | 14/20  |
| A551922 | Distribution Adapter | 19/22  |
| D201922 | Cow Receiver         | 19/22  |
| A552440 | Distribution Adapter | 24/40  |
| D202424 | Cow Receiver         | 24/40  |

**Accessories:**

|          |                               |
|----------|-------------------------------|
| CS001420 | Plastic clamp for 14/20 joint |
| CS001922 | Plastic clamp for 19/22 joint |
| CS002440 | Plastic clamp for 24/40 joint |


**DISTRIBUTION RECEIVER, VERTICAL ORIENTATION**

Rotating distillation receiver allows four fractions to be collected.

Vacuum adapter has a vertical orientation.

| Item#   | Item Type      | Joints |
|---------|----------------|--------|
| A592440 | Vacuum Adapter | 24/40  |
| D202424 | Cow Receiver   | 24/40  |

**Accessory:**

|          |                               |
|----------|-------------------------------|
| CS002440 | Plastic clamp for 24/40 joint |
|----------|-------------------------------|

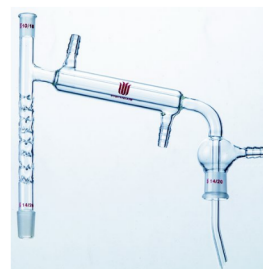
**DISTILLATION HEAD, VIGREUX, MICRO**

Distillation head with condenser sealed to a Vigreux column.

Vacuum adapter has an outer joint and accepts a distribution adapter (D201414).

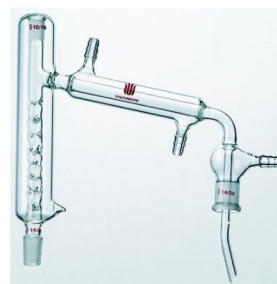
To be used with a 25mm immersion thermometer

| Item#   | Joint Size | Thermometer joint | Approx. Height× Width (mm) |
|---------|------------|-------------------|----------------------------|
| D141014 | 14/20      | 10/18             | 195×185                    |


**DISTILLATION HEAD, JACKETED, VIGREUX, MICRO**

Similar to D14 but with the Vigreux column vacuum jacketed to improve distillation performance. To be used with D201414 distribution adapter.

| Item#   | Joint Size | Thermometer joint | Approx. Height ×Width (mm) |
|---------|------------|-------------------|----------------------------|
| D171014 | 14/20      | 10/18             | 195×190                    |

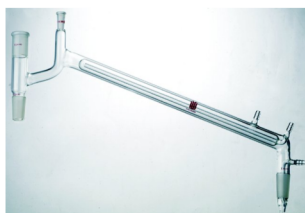

**DISTILLATION HEAD, VIGREUX, JACKETED**

Vacuum jacketed Vigreux distillation head having a sealed on condenser, braced for strength. Vacuum adapter has an inner joint and a sealed in drip tip.

To be used with a 25mm immersion thermometer

| Item#   | Joints | Column Height (mm) | Thermometer joint | Approx. Height×Width (mm) |
|---------|--------|--------------------|-------------------|---------------------------|
| D211100 | 14/20  | 100                | 10/18             | 200×180                   |
| D211150 | 14/20  | 150                | 10/18             | 250×180                   |
| D214200 | 24/40  | 200                | 10/18             | 325×350                   |
| D214300 | 24/40  | 300                | 10/18             | 425×350                   |




**DISTILLATION APPARATUS, LARGE SCALE**

One-piece design. With 10/18 thermometer joint and high efficiency cooling jacket. To be used with 50mm immersion thermometer with 10/18 joint.

| Item#   | Joints |
|---------|--------|
| D502440 | 24/40  |


**DRYING CHAMBER, ABDERHALDEN**

Drying samples for elemental analysis. Sample is placed in a vial which is placed into drying chamber. Under vacuum and gentle heat created by refluxing in outer jacket of low boiling point solvents.

| Item#   | Upper Joint | Lower Joint | Drying Chamber Joint |
|---------|-------------|-------------|----------------------|
| D222434 | 24/40       | 24/40       | 34/45                |


**DESICCANT FLASK**

Choice of Teflon<sup>®</sup> stopcock.

| Item#   | Joint | Stopcock   |
|---------|-------|------------|
| D133424 | 34/45 | 2mm (PTFE) |

**Accessory:**

S181125 Replacement 2mm Teflon<sup>®</sup> Plug Only

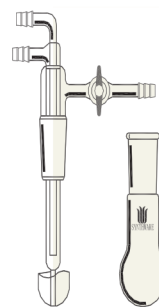
**DISTILLATION HEAD, MICROSCALE**

With 2mm glass stopcock and 24/40 joint. Supplied with a special 25mL long-neck flask for small volume efficiency.

| Item#    | Joints | Hose O.D. mm |
|----------|--------|--------------|
| D112440G | 24/40  | 10           |

**Accessories:**

|          |                                     |
|----------|-------------------------------------|
| DF302425 | Flask, round bottom, long neck 25mL |
| S461230  | Replacement 2mm Glass Plug Only     |

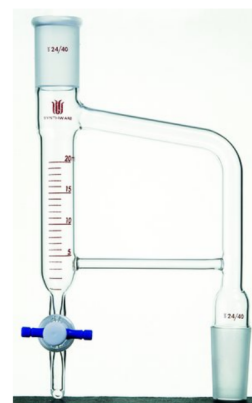

**DISTILLATION RECEIVER, DEAN STARK**

For easy separation of water from reaction or distillation system. Graduated with 2mm Teflon® stopcock or 2mm glass stopcock.

| Item#   | Capacity (mL) | Joints | Stopcock (mm) | Approx. Height×Width (mm) |
|---------|---------------|--------|---------------|---------------------------|
| D451414 | 5             | 14/20  | 2, PTFE       | 205×65                    |
| D451410 | 10            | 14/20  | 2, PTFE       | 190×65                    |
| D451910 | 10            | 19/22  | 2, PTFE       | 190×75                    |
| D452410 | 10            | 24/40  | 2, PTFE       | 275×95                    |
| D452424 | 20            | 24/40  | 2, PTFE       | 325×95                    |
| D452910 | 10            | 29/42  | 2, PTFE       | 275×95                    |
| D452920 | 20            | 29/42  | 2, PTFE       | 325×95                    |

**Accessories:**

|         |                                   |
|---------|-----------------------------------|
| S181125 | Replacement 2mm Teflon® Plug Only |
|---------|-----------------------------------|


**DISTILLATION RECEIVER, DEAN STARK**

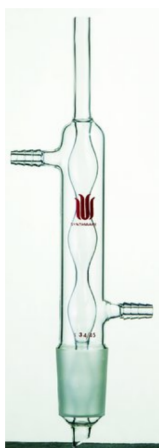
Similar to D451414 above but with the uptake tube vacuum jacketed to improve distillation performance. The jacket eliminates the possibility of condensation or recrystallization of distillate in the sidearm. With 2mm PTFE stopcock.

| Item#   | Capacity (mL) | Joints | Stopcock (mm) | Approx. Height×Width (mm) |
|---------|---------------|--------|---------------|---------------------------|
| D441405 | 5             | 14/20  | 2, PTFE       | 205×65                    |
| D441410 | 10            | 14/20  | 2, PTFE       | 190×65                    |
| D442410 | 10            | 24/40  | 2, PTFE       | 275×95                    |
| D442420 | 20            | 24/40  | 2, PTFE       | 275×95                    |

**Accessory:**

|         |                                   |
|---------|-----------------------------------|
| S181125 | Replacement 2mm Teflon® Plug Only |
|---------|-----------------------------------|




**CONDENSER, FOR SOXHLET EXTRACTORS**

Allihn reflux condenser with a water cooled inner drip joint at bottom.

| Item#   | Jacket Length<br>( mm) | Joint | Overall<br>Height<br>(mm) |
|---------|------------------------|-------|---------------------------|
| C243445 | 190                    | 34/45 | 275                       |
| C244500 | 260                    | 45/50 | 365                       |
| C245550 | 300                    | 55/50 | 405                       |


**EXTRACTOR, SOXHLET**

Extractor body only.

| Item#   | Upper Joint | Lower Joint |
|---------|-------------|-------------|
| E103424 | 34/45       | 24/40       |
| E104524 | 45/50       | 24/40       |
| E105550 | 55/50       | 24/40       |

**EXTRACTION THIMBLE, GLASS**

All glass extraction thimble permits viewing extraction process and subsequent weighing. C-Coarse, XC-Extra Coarse. Small thimble is used with **C243445** and **E103424**; Medium thimble is used with **C244500** and **E104524**; Large thimble is used with **C245550** and **E105550**.

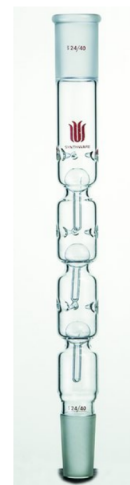


| Item#    | Fits Extractor<br>Size | O.D.×<br>Height<br>(mm) | Porosity |
|----------|------------------------|-------------------------|----------|
| E112585C | Small                  | 25×85                   | C        |
| E112585X | Small                  | 25×85                   | XC       |
| E113590C | Medium                 | 35×90                   | C        |
| E113590X | Medium                 | 35×90                   | XC       |
| E114513C | Large                  | 45×130                  | C        |
| E114513X | Large                  | 45×130                  | XC       |

**SNYDER DISTILLATION COLUMN**

For use with Kuderna-Danish flask.

| Item#   | Joints | Column Height (mm) | Overall Height (mm) |
|---------|--------|--------------------|---------------------|
| C302440 | 24/40  | 150                | 300                 |


**KUDERNA-DANISH FLASK**

Top joint is a 24/40 outer while the lower joint is a 19/22 inner.

| Item#   | Flask Capacity (mL) |
|---------|---------------------|
| F984250 | 250                 |
| F984500 | 500                 |

**Accessories:**

|          |                               |
|----------|-------------------------------|
| CS001922 | Plastic clamp for 19/22 joint |
| CS002440 | Plastic clamp for 24/40 joint |


**CONCENTRATOR TUBE, GRADUATED**

Graduated concentrator tubes for use with Kuderna-Danish evaporative set-ups.

Tube can be stoppered for storage. Overall height is 100mm for 10mL, and 170mm for the 25mL.

| Item#   | Capacity (mL) | Joint Size | Subdivisions (mL)                 |
|---------|---------------|------------|-----------------------------------|
| C291910 | 10            | 19/22      | 0 to 1mL in 0.1, 2 to 10mL in 1.0 |
| C291925 | 25            | 19/22      | 0 to 1mL in 0.1, 2 to 25mL in 1.0 |



**FILTRATION APPARATUS, 47MM FRITTED, 40/35**

Using 47mm membranes for filtering corrosive solutions, particulate removal from HPLC solvents, and filtration analysis with solid phase extraction disks. Support base has a sealed-in coarse porosity fritted disc. Complete assembly includes a 300mL graduated funnel, aluminum clamp, support base and 1 liter filtering flask.



| Item#   | Description               |
|---------|---------------------------|
| F10401L | Complete Support Assembly |

**Replacement Components:**

|         |                                   |
|---------|-----------------------------------|
| F100001 | Funnel, 47mm, 300mL Graduated     |
| F100002 | Clamp, 47mm aluminum              |
| F100003 | Base, 47mm Fritted Support, 40/35 |
| F100004 | Flask, 1L Filtering, 40/35        |

**FILTRATION APPARATUS, 47MM STAINLESS STEEL, 40/35**

Using 47mm membranes for filtering corrosive solutions, particulate removal from HPLC solvents, and filtration analysis with solid phase extraction disks. Support base has removable 47mm stainless steel support screen for use with viscous or proteinaceous solutions. Complete assembly includes a 300mL graduated funnel, aluminum clamp, support base and 1 liter filtering flask.



| Item#    | Description               |
|----------|---------------------------|
| F10401LA | Complete Support Assembly |

**Replacement Components:**

|          |   |
|----------|---|
| F100001  | Funnel, 47mm, 300mL Graduated           |
| F100002  | Clamp, 47mm aluminum                    |
| F100003A | Base, 47mm SS Screen Support            |
| F100004  | Flask, 1L Filtering, 40/35              |
| F100007  | Stainless Steel Screen for base support |



**FLASK, ROUND BOTTOM, SINGLE NECK**

Heavy wall design. All sizes listed below are hand-blown from tubing to ensure uniform wall thickness.

| Item#   | Capacity<br>(mL) | Joint |
|---------|------------------|-------|
| F301405 | 5                | 14/20 |
| F301410 | 10               | 14/20 |
| F301910 | 10               | 19/22 |
| F301425 | 25               | 14/20 |
| F301925 | 25               | 19/22 |
| F302425 | 25               | 24/40 |
| F301450 | 50               | 14/20 |
| F301950 | 50               | 19/22 |
| F302450 | 50               | 24/40 |
| F301100 | 100              | 14/20 |
| F309100 | 100              | 19/22 |
| F304100 | 100              | 24/40 |
| F308100 | 100              | 29/42 |
| F301200 | 200              | 14/20 |
| F309200 | 200              | 19/22 |
| F304200 | 200              | 24/40 |
| F309250 | 250              | 19/22 |
| F304250 | 250              | 24/40 |
| F308250 | 250              | 29/42 |
| F301300 | 300              | 14/20 |
| F309300 | 300              | 19/22 |
| F304300 | 300              | 24/40 |
| F309500 | 500              | 19/22 |
| F304500 | 500              | 24/40 |
| F308500 | 500              | 29/42 |
| F303450 | 500              | 34/45 |
| F304000 | 1000             | 24/40 |
| F30291L | 1000             | 29/42 |
| F30242L | 2000             | 24/40 |
| F30292L | 2000             | 29/42 |
| F30452L | 2000             | 45/50 |



**FLASK, FLAT BOTTOM**

Heavy wall single neck, flat bottom flask with an outer joint.  
Heavy wall design. All sizes listed below are hand-blown from tubing to ensure uniform wall thickness.



| Item#   | Capacity (mL) | Joint |
|---------|---------------|-------|
| F122450 | 50            | 24/40 |
| F124100 | 100           | 24/40 |
| F124125 | 125           | 24/40 |
| F124250 | 250           | 24/40 |
| F124300 | 300           | 24/40 |
| F124500 | 500           | 24/40 |
| F124000 | 1000          | 24/40 |
| F128000 | 1000          | 29/42 |


**FLASK, ROUND BOTTOM, SPHERICAL JOINT**

Heavy wall design. All sizes listed below are hand-blown from tubing to ensure uniform wall thickness.

| Item#   | Capacity (mL) | Joint |
|---------|---------------|-------|
| F527500 | 500           | 35/20 |
| F527000 | 1000          | 35/20 |
| F52702L | 2000          | 35/20 |

**FLASK, ROUND BOTTOM, THREADED INLET**

With a threaded side port for insertion of thermometer or bleed tubes, having an O.D. between 5mm and 7.5mm. Heavy wall design. All sizes listed below are hand-blown from tubing to ensure uniform wall thickness.

| Item#   | Capacity (mL) | Joint |
|---------|---------------|-------|
| F141425 | 25            | 14/20 |
| F141450 | 50            | 14/20 |
| F149100 | 100           | 19/22 |
| F144100 | 100           | 24/40 |
| F141250 | 250           | 14/20 |
| F149250 | 250           | 19/22 |
| F144250 | 250           | 24/40 |
| F144500 | 500           | 24/40 |

**Accessories:**

RC009                      Nylon<sup>®</sup> cap  
 R107                      Replacement Viton<sup>®</sup> O-rings, Size 107


**FLASK, ROUND BOTTOM WITH HOOKS**

Heavy wall design.

| Item#   | Capacity (mL) | Joint |
|---------|---------------|-------|
| F331405 | 5             | 14/20 |
| F331410 | 10            | 14/20 |
| F331425 | 25            | 14/20 |
| F331450 | 50            | 14/20 |
| F339100 | 100           | 19/22 |

**Accessory:**

TH018                      S.S. Springs, 18mm



**FLASK, RECOVERY**

Heavy wall design. All sizes listed below are hand-blown from tubing to ensure uniform wall thickness.



| Item#   | Capacity (mL) | Joint |
|---------|---------------|-------|
| F311405 | 5             | 14/20 |
| F311410 | 10            | 14/20 |
| F311910 | 10            | 19/22 |
| F311425 | 25            | 14/20 |
| F311925 | 25            | 19/22 |
| F312425 | 25            | 24/40 |
| F311450 | 50            | 14/20 |
| F311950 | 50            | 19/22 |
| F312450 | 50            | 24/40 |
| F311100 | 100           | 14/20 |
| F319100 | 100           | 19/22 |
| F314100 | 100           | 24/40 |
| F318100 | 100           | 29/42 |
| F311200 | 200           | 14/20 |
| F314200 | 200           | 24/40 |
| F311250 | 250           | 14/20 |
| F319250 | 250           | 19/22 |
| F314250 | 250           | 24/40 |
| F318250 | 250           | 29/42 |
| F314500 | 500           | 24/40 |
| F318500 | 500           | 29/42 |
| F314000 | 1000          | 24/40 |
| F31291L | 1000          | 29/42 |

**FLASK, EVAPORATION**

Low profile design sits upright on bench and also provides for easy product access with a spatula. The unique flask shape is excellent for the controlled evaporation of foaming solvents such as toluene or xylene on a rotary evaporator.



| Item#   | Capacity (mL) | Joint |
|---------|---------------|-------|
| F791450 | 50            | 14/20 |
| F791100 | 100           | 14/20 |
| F794100 | 100           | 24/40 |
| F794200 | 200           | 24/40 |
| F791250 | 250           | 14/20 |
| F794250 | 250           | 24/40 |
| F798250 | 250           | 29/42 |
| F794500 | 500           | 24/40 |
| F794000 | 1000          | 24/40 |

**FLASK, PEAR SHAPED, SINGLE NECK**

Heavy wall design.

| Item#    | Capacity( mL ) | Joint |
|----------|----------------|-------|
| F321405L | 5              | 14/20 |
| F321410L | 10             | 14/20 |
| F321415L | 15             | 14/20 |
| F321225L | 25             | 14/20 |
| F329225L | 25             | 19/22 |
| F321250L | 50             | 14/20 |
| F329250L | 50             | 19/22 |
| F322450L | 50             | 24/40 |
| F321100L | 100            | 14/20 |
| F329100L | 100            | 19/22 |
| F324100L | 100            | 24/40 |
| F321200L | 200            | 14/20 |
| F324200L | 200            | 24/40 |


**FLASK, TWO NECK, PEAR SHAPED**

Pear shape with joints. Heavy wall design.

| Item#   | Capacity (mL) | Center Joint | Side Joint |
|---------|---------------|--------------|------------|
| F341105 | 5             | 14/20        | 14/20      |
| F341110 | 10            | 14/20        | 14/20      |
| F341115 | 15            | 14/20        | 14/20      |
| F341125 | 25            | 14/20        | 14/20      |
| F341150 | 50            | 14/20        | 14/20      |
| F341100 | 100           | 14/20        | 14/20      |
| F341200 | 200           | 14/20        | 14/20      |



**FLASK, TWO NECK, ANGLED**

Round bottom with joints. Heavy wall design. All sizes listed below are hand-blown from tubing to ensure uniform wall thickness.



| Item#   | Capacity<br>(mL) | Center<br>Joint | Side Joint |
|---------|------------------|-----------------|------------|
| F411110 | 10               | 14/20           | 14/20      |
| F411125 | 25               | 14/20           | 14/20      |
| F411925 | 25               | 19/22           | 14/20      |
| F419925 | 25               | 19/22           | 19/22      |
| F411150 | 50               | 14/20           | 14/20      |
| F419950 | 50               | 19/22           | 19/22      |
| F414150 | 50               | 24/40           | 14/20      |
| F414450 | 50               | 24/40           | 24/40      |
| F411100 | 100              | 14/20           | 14/20      |
| F411900 | 100              | 19/22           | 14/20      |
| F419900 | 100              | 19/22           | 19/22      |
| F414100 | 100              | 24/40           | 14/20      |
| F419100 | 100              | 24/40           | 19/22      |
| F414400 | 100              | 24/40           | 24/40      |
| F411250 | 250              | 14/20           | 14/20      |
| F410250 | 250              | 19/22           | 14/20      |
| F419250 | 250              | 19/22           | 19/22      |
| F414251 | 250              | 24/40           | 14/20      |
| F414259 | 250              | 24/40           | 19/22      |
| F414250 | 250              | 24/40           | 24/40      |
| F411501 | 500              | 19/22           | 14/20      |
| F414501 | 500              | 24/40           | 14/20      |
| F414504 | 500              | 24/40           | 24/40      |
| F415501 | 500              | 29/42           | 24/40      |
| F415502 | 500              | 29/42           | 29/42      |
| F41611L | 1000             | 24/40           | 14/20      |
| F41621L | 1000             | 24/40           | 19/22      |
| F41241L | 1000             | 24/40           | 24/40      |
| F41641L | 1000             | 29/42           | 29/42      |

**FLASK, THREE NECK, ANGLED**

Round bottom with joints. Heavy wall design. All sizes listed below are hand-blown from tubing to ensure uniform wall thickness.

| Item#   | Capacity<br>(mL) | Center<br>Joint | Side Joint |
|---------|------------------|-----------------|------------|
| F431110 | 10               | 14/20           | 14/20      |
| F431125 | 25               | 14/20           | 14/20      |
| F439925 | 25               | 19/22           | 19/22      |
| F431150 | 50               | 14/20           | 14/20      |
| F439150 | 50               | 19/22           | 14/20      |
| F439950 | 50               | 19/22           | 19/22      |
| F434150 | 50               | 24/40           | 14/20      |
| F434950 | 50               | 24/40           | 19/22      |
| F434450 | 50               | 24/40           | 24/40      |
| F431100 | 100              | 14/20           | 14/20      |
| F439100 | 100              | 19/22           | 14/20      |
| F439900 | 100              | 19/22           | 19/22      |
| F434100 | 100              | 24/40           | 14/20      |
| F434900 | 100              | 24/40           | 19/22      |
| F434400 | 100              | 24/40           | 24/40      |
| F431250 | 250              | 14/20           | 14/20      |
| F430250 | 250              | 19/22           | 14/20      |
| F439250 | 250              | 19/22           | 19/22      |
| F432250 | 250              | 24/40           | 19/22      |
| F434250 | 250              | 24/40           | 24/40      |
| F431500 | 500              | 14/20           | 14/20      |
| F439500 | 500              | 19/22           | 19/22      |
| F430500 | 500              | 24/40           | 19/22      |
| F434500 | 500              | 24/40           | 24/40      |
| F434524 | 500              | 45/50           | 24/40      |
| F43401L | 1000             | 24/40           | 24/40      |
| F431045 | 1000             | 45/50           | 24/40      |
| F43242L | 2000             | 24/40           | 24/40      |
| F43542L | 2000             | 45/50           | 24/40      |



**FLASK, THREE NECK, VERTICAL**

Round bottom with joints. Heavy wall design. All sizes listed below are hand-blown from tubing to ensure uniform wall thickness.



| Item#   | Capacity<br>(mL) | Center<br>Joint | Side Joint |
|---------|------------------|-----------------|------------|
| F441150 | 50               | 14/20           | 14/20      |
| F449950 | 50               | 19/22           | 19/22      |
| F441100 | 100              | 14/20           | 14/20      |
| F449100 | 100              | 19/22           | 14/20      |
| F449900 | 100              | 19/22           | 19/22      |
| F444100 | 100              | 24/40           | 14/20      |
| F444900 | 100              | 24/40           | 19/22      |
| F444400 | 100              | 24/40           | 24/40      |
| F441250 | 250              | 14/20           | 14/20      |
| F442250 | 250              | 24/40           | 19/22      |
| F444250 | 250              | 24/40           | 24/40      |
| F441500 | 500              | 14/20           | 14/20      |
| F449500 | 500              | 19/22           | 19/22      |
| F440500 | 500              | 24/40           | 19/22      |
| F444500 | 500              | 24/40           | 24/40      |
| F446500 | 500              | 29/42           | 24/40      |
| F448500 | 500              | 29/42           | 29/42      |
| F444000 | 1000             | 24/40           | 24/40      |
| F44841L | 1000             | 29/42           | 24/40      |
| F44341L | 1000             | 34/45           | 24/40      |
| F44451L | 1000             | 45/50           | 24/40      |
| F44242L | 2000             | 24/40           | 24/40      |
| F44842L | 2000             | 29/42           | 24/40      |
| F44292L | 2000             | 29/42           | 29/42      |
| F44342L | 2000             | 34/45           | 24/40      |
| F44542L | 2000             | 45/50           | 24/40      |

**FLASK, ROUND BOTTOM, 4-NECK, ANGLED**

Heavy wall design. All sizes listed below are hand-blown from tubing to ensure uniform wall thickness.

| Item#   | Capacity (mL) | Center Joint | Side Joint |
|---------|---------------|--------------|------------|
| F221125 | 25            | 14/20        | 14/20      |
| F221150 | 50            | 14/20        | 14/20      |
| F221100 | 100           | 14/20        | 14/20      |
| F221250 | 250           | 14/20        | 14/20      |
| F224250 | 250           | 24/40        | 24/40      |
| F221500 | 500           | 14/20        | 14/20      |
| F224500 | 500           | 24/40        | 24/40      |
| F222500 | 500           | 29/42        | 24/40      |
| F224000 | 1000          | 24/40        | 24/40      |


**FLASK, ROUND BOTTOM, 3-NECK BOTTOM OUTLET**

Lower outlet is a 4mm straight bore Teflon® stopcock.

| Item#   | Capacity (mL) | Center Joint | Side Joint |
|---------|---------------|--------------|------------|
| F424450 | 500           | 24/40        | 24/40      |
| F42441L | 1000          | 24/40        | 24/40      |
| F42442L | 2000          | 24/40        | 24/40      |
| F42542L | 2000          | 45/50        | 24/40      |

**Accessory:**

S181530 Replacement 4mm Teflon® Plug Only



**FLASK, ROUND BOTTOM 4-NECK, WITH THREADED SIDE ARM**

Round bottom, four-neck flask with standard taper outer joints and a thermometer joints. Supplied complete with a compression cap and Viton® O-ring. For insertion of plan thermometers or bleed tubes having an O.D. between 5.0-7.0 mm.



| Item#   | Capacity (mL) | Center Joint | Side Joints |
|---------|---------------|--------------|-------------|
| F714500 | 500           | 24/40        | 24/40       |
| F71241L | 1000          | 24/40        | 24/40       |
| F71842L | 2000          | 29/42        | 24/40       |
| F71542L | 2000          | 45/50        | 24/40       |

**Accessories:**

RC009 Nylon® caps

R107 Replacement Viton® O-rings, Size 107

\* All sized including 2L flasks are hand-blown from tubing to ensure heavy and uniform wall.

**FLASK, ROUND BOTTOM, 4-NECK**

With identical vertical side joints.



| Item#   | Capacity (mL) | Center Joint | Side Joints |
|---------|---------------|--------------|-------------|
| F214250 | 250           | 24/40        | 24/40       |
| F214500 | 500           | 24/40        | 24/40       |
| F212500 | 500           | 29/42        | 24/40       |
| F218500 | 500           | 29/42        | 29/42       |
| F214000 | 1000          | 24/40        | 24/40       |
| F21841L | 1000          | 29/42        | 24/40       |
| F21842L | 2000          | 29/42        | 24/40       |
| F21342L | 2000          | 34/45        | 24/40       |

\*All sizes including 2L flasks are hand-blown from tubing to ensure heavy and uniform wall.

**FLASK, ERLLENMEYER**

With joint. Stopper is not supplied.

| Item#   | Joint | Capacity(mL) |
|---------|-------|--------------|
| F661405 | 14/20 | 5            |
| F661410 | 14/20 | 10           |
| F661425 | 14/20 | 25           |
| F661450 | 14/20 | 50           |
| F661950 | 19/22 | 50           |
| F662450 | 24/40 | 50           |
| F662950 | 29/42 | 50           |
| F661125 | 14/20 | 125          |
| F669125 | 19/22 | 125          |
| F664125 | 24/40 | 125          |
| F664250 | 24/40 | 250          |
| F669250 | 29/42 | 250          |
| F664500 | 24/40 | 500          |
| F669500 | 29/42 | 500          |
| F664000 | 24/40 | 1000         |
| F668000 | 29/42 | 1000         |



\*All sizes including 1L flasks are hand-blown from tubing to ensure heavy and uniform wall.

**FLASK, FILTERING, WITH JOINT**

Heavy wall design made from tubing to ensure excellent quality with 10 mm hose connection

| Item#   | Capacity (mL) | Joint |
|---------|---------------|-------|
| F724250 | 250           | 24/40 |
| F724500 | 500           | 24/40 |
| F724000 | 1000          | 24/40 |



**TUBE, STORAGE, HIGH VACUUM VALVE**

Supplied with high vacuum valve with PTFE O-ring at tip and PTFE wiper ("umbrella") to protect Viton<sup>®</sup> O-ring on shaft.



| Item#   | Capacity<br>(mL) | Valve Size | Tube O.D.× Length<br>(mm) |
|---------|------------------|------------|---------------------------|
| F580025 | 25               | 0-4mm      | 26×110                    |
| F580825 | 25               | 0-8mm      | 26×110                    |
| F580050 | 50               | 0-4mm      | 28×120                    |
| F580850 | 50               | 0-8mm      | 28×120                    |
| F580100 | 100              | 0-4mm      | 40×165                    |
| F588100 | 100              | 0-8mm      | 40×165                    |
| F588250 | 250              | 0-8mm      | 60×185                    |

**Accessories:**

|         |   |
|---------|---|
| S600004 | Replacement 0-4mm high vacuum plug and control knob. (PTFE O-ring at tip) |
| S600008 | Replacement 0-8mm high vacuum plug and control knob. (PTFE O-ring at tip) |
| R010    | Viton <sup>®</sup> O-ring for 0-4mm high vacuum plug shaft                |
| R110    | Viton <sup>®</sup> O-ring for 0-8mm high vacuum plug shaft                |

**FLASK, MODIFID SCHLENKN TUBE**

Choice of either 2mm glass stopcock, 2mm Teflon<sup>®</sup> stopcock or 0-4mm high vacuum valve.

| Item#    | Capacity(mL) | Joint | Stopcock Type       |
|----------|--------------|-------|---------------------|
| F901410  | 10           | 14/20 | Teflon <sup>®</sup> |
| F901425  | 25           | 14/20 | Teflon <sup>®</sup> |
| F901450  | 50           | 14/20 | Teflon <sup>®</sup> |
| F901950  | 50           | 19/22 | Teflon <sup>®</sup> |
| F902450  | 50           | 24/40 | Teflon <sup>®</sup> |
| F901100  | 100          | 14/20 | Teflon <sup>®</sup> |
| F909100  | 100          | 19/22 | Teflon <sup>®</sup> |
| F904100  | 100          | 24/40 | Teflon <sup>®</sup> |
| F901200  | 200          | 14/20 | Teflon <sup>®</sup> |
| F909200  | 200          | 19/22 | Teflon <sup>®</sup> |
| F904200  | 200          | 24/40 | Teflon <sup>®</sup> |
| F904500  | 500          | 24/40 | Teflon <sup>®</sup> |
| F904000  | 1000         | 24/40 | Teflon <sup>®</sup> |
| F901410G | 10           | 14/20 | Glass               |
| F901425G | 25           | 14/20 | Glass               |
| F901450G | 50           | 14/20 | Glass               |
| F901950G | 50           | 19/22 | Glass               |
| F902450G | 50           | 24/40 | Glass               |
| F901100G | 100          | 14/20 | Glass               |
| F909100G | 100          | 19/22 | Glass               |
| F904100G | 100          | 24/40 | Glass               |
| F901200G | 200          | 14/20 | Glass               |
| F904200G | 200          | 24/40 | Glass               |
| F904500G | 500          | 24/40 | Glass               |
| F904000G | 1000         | 24/40 | Glass               |
| F901425H | 25           | 14/20 | HV Valve            |
| F901450H | 50           | 14/20 | HV Valve            |
| F901950H | 50           | 19/22 | HV Valve            |
| F902450H | 50           | 24/40 | HV Valve            |
| F901100H | 100          | 14/20 | HV Valve            |
| F909100H | 100          | 19/22 | HV Valve            |
| F904100H | 100          | 24/40 | HV Valve            |
| F901200H | 200          | 14/20 | HV Valve            |
| F909200H | 200          | 19/22 | HV Valve            |
| F904200H | 200          | 24/40 | HV Valve            |
| F904500H | 500          | 24/40 | HV Valve            |
| F904000H | 1000         | 24/40 | HV Valve            |

**Accessories:**

|         |  |
|---------|--|
| S181125 | Replacement 2mm Teflon <sup>®</sup> Plug Only                    |
| S461230 | Replacement 2mm Glass Plug Only                                  |
| S691230 | Replacement S.S. Retention for 2mm Glass                         |
| S600004 | 0-4mm high vacuum plug and control knob.<br>(PTFE O-ring at tip) |
| R010    | Vilton <sup>®</sup> O-ring for 0-4mm high vacuum plug shaft      |



**TUBE, STORAGE WITH OUTER JOINT**

Supplied with high vacuum valve with PTFE O-ring at tip.



| Item#   | Capacity (ml) | Joint | Valve Size | Tube O.D.×Length (mm) |
|---------|---------------|-------|------------|-----------------------|
| F761425 | 25            | 14/20 | 0-4mm      | 26×110                |
| F761450 | 50            | 14/20 | 0-4mm      | 28×120                |
| F762450 | 50            | 24/40 | 0-4mm      | 28×120                |
| F761100 | 100           | 14/20 | 0-4mm      | 40×165                |
| F764100 | 100           | 24/40 | 0-4mm      | 40×165                |
| F761108 | 100           | 14/20 | 0-8mm      | 40×165                |
| F764108 | 100           | 24/40 | 0-8mm      | 40×165                |
| F764258 | 250           | 24/40 | 0-8mm      | 60×185                |
| F764358 | 350           | 24/40 | 0-8mm      | 70×200                |

**Accessories**

|         |  |
|---------|--|
| S600004 | Replacement 0-4mm high vacuum plug and control knob.<br>(PTFE O-ring at tip) |
| S600008 | Replacement 0-8mm high vacuum plug and control knob.<br>(PTFE O-ring at tip) |
| R010    | Viton® O-ring for 0-4mm high vacuum plug shaft                               |
| R110    | Viton® O-ring for 0-8mm high vacuum plug shaft                               |

**FLASK, STORAGE WITH OUTER JOINT**

Supplied with high vacuum valve with PTFE O-ring at tip.



| Item#   | Capacity (mL) | Joint | Valve Size |
|---------|---------------|-------|------------|
| F461010 | 10            | 14/20 | 0-4mm      |
| F461025 | 25            | 14/20 | 0-4mm      |
| F461050 | 50            | 14/20 | 0-4mm      |
| F461100 | 100           | 14/20 | 0-4mm      |
| F464100 | 100           | 24/40 | 0-4mm      |
| F461250 | 250           | 14/20 | 0-4mm      |
| F464250 | 250           | 24/40 | 0-4mm      |
| F461500 | 500           | 14/20 | 0-4mm      |
| F464500 | 500           | 24/40 | 0-4mm      |
| F464508 | 500           | 24/40 | 0-8mm      |
| F464008 | 1000          | 24/40 | 0-8mm      |

**Accessories:**

|         |   |
|---------|---|
| S600004 | Replacement 0-4mm high vacuum plug and control knob. (PTFE O-ring at tip) |
| S600008 | Replacement 0-8mm high vacuum plug and control knob. (PTFE O-ring at tip) |

**FLASK, SOLVENT TRANSFER/STORAGE**

| Item#   | Capacity (mL) | Joint | Valve Size |
|---------|---------------|-------|------------|
| F484250 | 250           | 24/40 | 0-4mm      |
| F484258 | 250           | 24/40 | 0-8mm      |
| F481500 | 500           | 14/20 | 0-4mm      |
| F484500 | 500           | 24/40 | 0-4mm      |
| F484508 | 500           | 24/40 | 0-8mm      |
| F484000 | 1000          | 24/40 | 0-4mm      |
| F484008 | 1000          | 24/40 | 0-8mm      |

**Accessories:**

|         |   |
|---------|---|
| S600004 | Replacement 0-4mm high vacuum plug and control knob. (PTFE O-ring at tip) |
| S600008 | Replacement 0-8mm high vacuum plug and control knob. (PTFE O-ring at tip) |
| R010    | Viton <sup>®</sup> O-ring for 0-4mm high vacuum plug shaft                |
| R110    | Viton <sup>®</sup> O-ring for 0-8mm high vacuum plug shaft                |


**FLASK, HIGH VACUUM VALVE**

Supplied with high vacuum valve with PTFE O-ring at tip and PTFE wiper( "umbrella") to protect Viton<sup>®</sup> O-ring on shaft..

| Item#   | Capacity( mL) | Valve Size |
|---------|---------------|------------|
| F490010 | 10            | 0-4mm      |
| F490050 | 50            | 0-4mm      |
| F490100 | 100           | 0-4mm      |
| F490250 | 250           | 0-4mm      |
| F490258 | 250           | 0-8mm      |
| F490500 | 500           | 0-4mm      |
| F49081L | 1000          | 0-8mm      |

**Accessories:**

|         |  |
|---------|--|
| S600004 | 0-4mm high vacuum plug and control knob.<br>(PTFE O-ring at tip) |
| S600008 | 0-8mm high vacuum plug and control knob.<br>(PTFE O-ring at tip) |
| R010    | Viton <sup>®</sup> O-ring for 0-4mm high vacuum plug shaft       |
| R110    | Viton <sup>®</sup> O-ring for 0-8mm high vacuum plug shaft       |



**FLASK, REACTION, HIGH VACUUM VALVE**

Supplied with high vacuum valve with PTFE O-ring at tip and PTFE wiper to protect Viton® O-ring on shaft.



| Item#   | Capacity (mL) | Joint | Valve Size |
|---------|---------------|-------|------------|
| F541050 | 50            | 14/20 | 0-4mm      |
| F541950 | 50            | 19/22 | 0-4mm      |
| F541100 | 100           | 14/20 | 0-4mm      |
| F549100 | 100           | 19/22 | 0-4mm      |
| F544100 | 100           | 24/40 | 0-4mm      |
| F541250 | 250           | 14/20 | 0-4mm      |
| F549250 | 250           | 19/22 | 0-4mm      |
| F544250 | 250           | 24/40 | 0-4mm      |
| F544500 | 500           | 24/40 | 0-4mm      |
| F54241L | 1000          | 24/40 | 0-4mm      |

**Accessory:**

S600004 0-4mm high vacuum plug and control knob.  
(PTFE O-ring at tip)

**FLASK, REACTION TUBE, HIGH VACUUM VALVE**

Supplied with high vacuum valve with PTFE o-ring at tip and PTFE wiper ("umbrella") to protect Viton® O-ring on shaft.



| Item#   | Capacity (mL) | Joint | Valve Size |
|---------|---------------|-------|------------|
| F561025 | 25            | 14/20 | 0-4mm      |
| F561050 | 50            | 14/20 | 0-4mm      |
| F561100 | 100           | 14/20 | 0-4mm      |
| F564100 | 100           | 24/40 | 0-4mm      |
| F564250 | 250           | 24/40 | 0-4mm      |
| F564350 | 350           | 24/40 | 0-4mm      |

**Accessories:**

S600004 0-4mm high vacuum plug and control knob.  
(PTFE O-ring at tip)

R010 Viton® O-ring for 0-4mm high vacuum plug shaft

**FLASK, REACTION, WITH GLASS STOPCOCK**

With 2mm glass stopcock. With spring retention device for smooth turning purpose.

| Item#   | Capacity (mL) | Joint |
|---------|---------------|-------|
| F531050 | 50            | 14/20 |
| F531100 | 100           | 14/20 |
| F539100 | 100           | 19/22 |
| F534100 | 100           | 24/40 |
| F531250 | 250           | 14/20 |
| F534250 | 250           | 24/40 |
| F534500 | 500           | 24/40 |

**Accessories:**

|         |   |
|---------|---|
| S461230 | Replacement 2mm Glass Plug Only                   |
| S691230 | Replacement S.S. Retention for 2mm Glass stopcock |


**REPLACEMENT STAINLESS STEEL RETENTION KIT**

| Item#   | Plug Size(mm) |
|---------|---------------|
| S691230 | 12/30         |
| S691656 | 16.2/56       |
| S691740 | 17/40         |

**FLASK, REACTION, 2-NECK**

With a 2mm glass stopcock having a constant pressure retention device.

| Item#   | Capacity (mL) | Joints |
|---------|---------------|--------|
| F161450 | 50            | 14/20  |
| F161100 | 100           | 14/20  |
| F169100 | 100           | 19/22  |
| F164100 | 100           | 24/40  |
| F164250 | 250           | 24/40  |
| F164500 | 500           | 24/40  |

**Accessories:**

|         |   |
|---------|---|
| S461230 | Replacement 2mm Glass Plug Only                   |
| S691230 | Replacement S.S. Retention for 2mm Glass stopcock |


**CRUCIBLE, GOOCH, LOW FORM**

| Item#    | Capacity (mL) | Frit O.D. (mm) | Porosity |
|----------|---------------|----------------|----------|
| F771520M | 15            | 20             | medium   |
| F773030C | 30            | 30             | coarse   |
| F773030M | 30            | 30             | medium   |



**FLASK, REACTION TUBE**

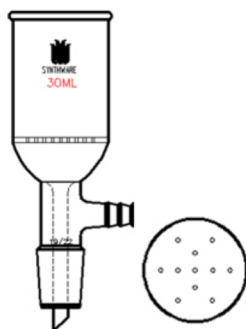
With an outer joint and 2mm glass stopcock having a constant pressure retention device.



| Item#   | Capacity (mL) | Joint |
|---------|---------------|-------|
| F891410 | 10            | 14/20 |
| F891425 | 25            | 14/20 |
| F891450 | 50            | 14/20 |
| F891950 | 50            | 19/22 |
| F892450 | 50            | 24/40 |
| F891100 | 100           | 14/20 |
| F894100 | 100           | 24/40 |
| F894200 | 200           | 24/40 |
| F894250 | 250           | 24/40 |

**Accessories:**

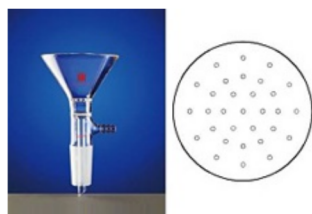
|         |  |
|---------|--|
| S461230 | Replacement 2mm Glass Plug Only                      |
| S691230 | Replacement S.S. Retention for 2mm<br>Glass stopcock |

**FILTER FUNNEL, BUCHNER, INNER JOINT, PERFORATED PLATE**


| Item#   | Glass Disc Size (mm) | Capacity (mL) | Joint |
|---------|----------------------|---------------|-------|
| F963014 | 32                   | 30            | 14/20 |
| F963024 | 32                   | 30            | 24/40 |
| F964014 | 42                   | 60            | 14/20 |
| F964024 | 42                   | 60            | 24/40 |
| F966024 | 60                   | 150           | 24/40 |
| F969024 | 90                   | 600           | 24/40 |

**FILTER FUNNEL, PERFORATED PLATE**

Disc of O.D. is 24mm.



| Item#   | Joint | O.D. (mm) |
|---------|-------|-----------|
| F932450 | 24/40 | 50        |
| F932475 | 24/40 | 75        |
| F932490 | 24/40 | 90        |

## FILTER FUNNEL

O.D. of Disc is 24mm.

| Item#    | Joint | O.D. (mm) | Porosity |
|----------|-------|-----------|----------|
| F752450C | 24/40 | 50        | C        |
| F752450M | 24/40 | 50        | M        |
| F752475C | 24/40 | 75        | C        |
| F752475M | 24/40 | 75        | M        |
| F752490C | 24/40 | 90        | C        |
| F752490M | 24/40 | 90        | M        |



## FUNNEL, POWDER

Funnels have 60° side angle and a standard taper inner joint.

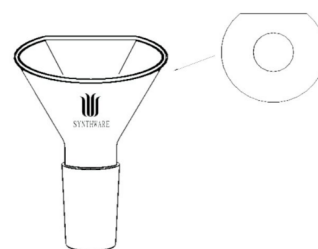
| Item#   | Top Dia. (mm) | Joint Size |
|---------|---------------|------------|
| F182450 | 50            | 24/40      |
| F182475 | 75            | 24/40      |
| F184100 | 100           | 24/40      |
| F188100 | 100           | 29/42      |



## FUNNEL, POWDER, FLATTENED SIDE

Funnels have 60° angled side with a standard taper inner joint.

| Item#   | Top Dia. (mm) | Joint Size |
|---------|---------------|------------|
| F191450 | 50            | 14/20      |
| F191950 | 50            | 19/22      |
| F192475 | 75            | 24/40      |
| F192975 | 75            | 29/42      |
| F194100 | 100           | 24/40      |
| F198100 | 100           | 29/42      |



## FUNNEL, POWDER, 60° OFFSET

For use with multi-neck flasks.

| Item#   | Joint | Approx. Diameter at Top (mm) |
|---------|-------|------------------------------|
| F392475 | 24/40 | 75                           |
| F394100 | 24/40 | 100                          |



**FUNNEL, SOLVENT ADDITION**

Design of funnel permits addition of solvents to flash chromatography columns without disturbing the silica-gel/packing layer. Lower end of the funnel is closed and the stem has a series of small holes through which the solvent drains. Top of the funnel is 90mm in diameter with the stem size as listed.



| Item#   | Stem O.D. × length (mm) |
|---------|-------------------------|
| F291275 | 12×75 *                 |
| F291210 | 12×100 *                |
| F291975 | 19×75 *                 |
| F291910 | 19×100 *                |
| F292810 | 28×100 **               |
| F292812 | 28×125 **               |

\* Fit column with 24/40 joint or 35/20 joint.

\*\* Fit column with large joint like 45/50 standard or 50/30 spherical joint.

**FILTER FUNNEL, BUCHNER, INNER JOINT**

Not recommended for filtration where pressure would exceed 15psi.



| Item#    | Capacity (mL) | Joint | Frit O.D. (mm) | Porosity |
|----------|---------------|-------|----------------|----------|
| F362014C | 15            | 14/20 | 20             | C        |
| F362014M | 15            | 14/20 | 20             | M        |
| F362019C | 15            | 19/22 | 20             | C        |
| F362019M | 15            | 19/22 | 20             | M        |
| F362024C | 15            | 24/40 | 20             | C        |
| F362024M | 15            | 24/40 | 20             | M        |
| F363014C | 30            | 14/20 | 30             | C        |
| F363014M | 30            | 14/20 | 30             | M        |
| F363019C | 30            | 19/22 | 30             | C        |
| F363019M | 30            | 19/22 | 30             | M        |
| F363024C | 30            | 24/40 | 30             | C        |
| F363024M | 30            | 24/40 | 30             | M        |
| F364014C | 60            | 14/20 | 40             | C        |
| F364014M | 60            | 14/20 | 40             | M        |
| F364019C | 60            | 19/22 | 40             | C        |
| F364019M | 60            | 19/22 | 40             | M        |
| F364024C | 60            | 24/40 | 40             | C        |
| F364024M | 60            | 24/40 | 40             | M        |
| F366024C | 150           | 24/40 | 60             | C        |
| F366024M | 150           | 24/40 | 60             | M        |
| F366029C | 150           | 29/42 | 60             | C        |
| F366029M | 150           | 29/42 | 60             | M        |
| F368024C | 350           | 24/40 | 80             | C        |
| F368024M | 350           | 24/40 | 80             | M        |
| F369024C | 600           | 24/40 | 90             | C        |
| F369024M | 600           | 24/40 | 90             | M        |

**FILTER FUNNEL, BUCHNER**

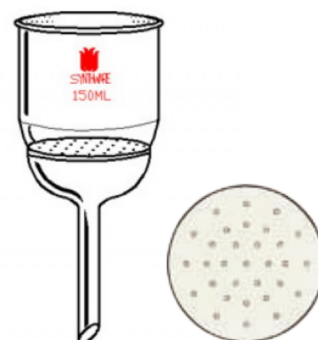
With sealed-in glass disc of the listed porosity. Not recommended for filtration where pressure would exceed 15psi. XC-extra coarse, C-Coarse, M-Medium, F-Fine porosity.

| Item#    | Capacity<br>(mL) | Disc O.D.<br>(mm) | Porosity |
|----------|------------------|-------------------|----------|
| F601002C | 2                | 10                | C        |
| F601002M | 2                | 10                | M        |
| F601002F | 2                | 10                | F        |
| F602015C | 15               | 20                | C        |
| F602015X | 15               | 20                | XC       |
| F602015M | 15               | 20                | M        |
| F602015F | 15               | 20                | F        |
| F603030X | 30               | 30                | XC       |
| F603030C | 30               | 30                | C        |
| F603030M | 30               | 30                | M        |
| F603030F | 30               | 30                | F        |
| F604060X | 60               | 40                | XC       |
| F604060C | 60               | 40                | C        |
| F604060M | 60               | 40                | M        |
| F604060F | 60               | 40                | F        |
| F606150X | 150              | 60                | XC       |
| F606150C | 150              | 60                | C        |
| F606150M | 150              | 60                | M        |
| F606150F | 150              | 60                | F        |
| F608350X | 350              | 80                | XC       |
| F608350C | 350              | 80                | C        |
| F608350M | 350              | 80                | M        |
| F608350F | 350              | 80                | F        |
| F609600C | 600              | 90                | C        |
| F609600M | 600              | 90                | M        |
| F609600F | 600              | 90                | F        |


**FUNNEL, FILTER, BUCHNER, PERFORATED PLATE**

With sealed-in perforated glass disc to support filter media. Pressure may be used but should not exceed 15 psi. This design solve the contamination problem with fritted disc and also the blindness problem with ceramic Buchner funnel.

| Item#   | Glass Disc Size<br>(mm) | Capacity<br>(mL) |
|---------|-------------------------|------------------|
| F804260 | 42                      | 60               |
| F806150 | 60                      | 150              |
| F808350 | 80                      | 350              |
| F809600 | 90                      | 600              |




**GAS DISPERSION TUBE, FRITTED**

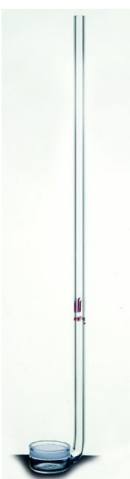
Stem is 8mm O.D ×150mm length, XC stands for extra coarse porosity.

| Item#    | Disc. Dia<br>(mm) | Porosity |
|----------|-------------------|----------|
| F260810X | 10                | XC       |
| F260810C | 10                | C        |
| F260810M | 10                | M        |


**GAS DISPERSION TUBE, FRITTED, 15°ANGLE**

The 15° angle permits tube to be inserted into vessels where a large opening is not available. Stem is 8mm O.D.×150mm length, XC stands for extra coarse porosity.

| Item#    | Disc. Dia<br>(mm) | Opening<br>Required<br>(mm) | Porosity |
|----------|-------------------|-----------------------------|----------|
| F271018M | 10                | 18                          | M        |
| F272025C | 20                | 25                          | C        |
| F272025M | 20                | 25                          | M        |
| F273035X | 30                | 35                          | XC       |
| F274045M | 40                | 45                          | M        |


**GAS DISPERSION TUBE, FRITTED, 90°ANGLE**

The 90° angle permits bubbles to be spread over a large area. Stem is 8mm O.D.×150 Length; XC stands for extra coarse porosity

| Item#    | Disc.<br>Dia.<br>(mm) | Opening<br>Required<br>(mm) | Porosity |
|----------|-----------------------|-----------------------------|----------|
| F282035M | 20                    | 35                          | M        |
| F283045C | 30                    | 45                          | C        |
| F284060X | 40                    | 60                          | XC       |
| F284060C | 40                    | 60                          | C        |
| F284060M | 40                    | 60                          | M        |

**FILTER, TUBE, FRITTED DISC**

Available with a choice of coarse or medium porosity fritted discs.

| Item#    | Joints | Approximate Frit O.D.<br>(mm) | Porosity |
|----------|--------|-------------------------------|----------|
| F701420C | 14/20  | 20                            | C        |
| F701420M | 14/20  | 20                            | M        |
| F701430C | 14/20  | 30                            | C        |
| F701430M | 14/20  | 30                            | M        |
| F702440C | 24/40  | 36                            | C        |
| F702440M | 24/40  | 36                            | M        |


**FILTER, TUBE, FRITTED DISC**

With two 2mm glass stopcocks having constant pressure retention devices.

| Item#    | Joints | Approximate Frit<br>O.D.<br>(mm) | Porosity |
|----------|--------|----------------------------------|----------|
| F351430C | 14/20  | 30                               | C        |
| F351430M | 14/20  | 30                               | M        |
| F352440C | 24/40  | 36                               | C        |
| F352440M | 24/40  | 36                               | M        |


**Accessories:**

- S461230 Replacement 2mm Glass Plug Only  
S691230 Replacement S.S. Retention for 2mm Glass stopcock

**FUNNEL, ADDITION, HIGH VACUUM VALVE**

Supplied with high vacuum valve with PTFE O-ring at tip and PTFE wiper to protect Viton® O-ring on shaft.

| Item#   | Joints | Capacity(mL) |
|---------|--------|--------------|
| F551060 | 14/20  | 100          |
| F554200 | 24/40  | 250          |

**Accessories:**

- S600004 0-4mm high vacuum plug and control knob.(PTFE O-ring at tip)  
R010 Viton® O-ring for 0-4mm high Vacuum plug shaft



**PEPTIDE SYNTHESIS VESSEL, SOLID PHASE**

With a fritted disc of coarse or medium porosity to support resin. Top of the vessel has GL thread and a Teflon® lined screw cap. Teflon® stopcock has a 2mm bore with the arm being 8mm O.D.



| Item#    | Capacity<br>(mL) | Fritted Disc O.D.<br>(mm) | GL thread size |
|----------|------------------|---------------------------|----------------|
| P120010C | 10               | 15                        | 14             |
| P120010M | 10               | 15                        | 14             |
| P120025C | 25               | 20                        | 25             |
| P120025M | 25               | 20                        | 25             |
| P120050C | 50               | 25                        | 25             |
| P120050M | 50               | 25                        | 25             |

**Accessories:**

|         |                                   |
|---------|-----------------------------------|
| S181125 | Replacement 2mm Teflon® Plug Only |
| GL14    | Nylon® cap 14mm                   |
| GL25    | Nylon® cap 25mm                   |
| R14     | PTFE septum 14mm                  |
| R25     | PTFE septum 25mm                  |

**PEPTIDE SYNTHESIS VESSEL, SOLID PHASE**
**T-BORE TEFLON® STOPCOCK**

With a fritted disc of coarse or medium porosity to support resin. Top of the vessel has GL thread and a Teflon® lined screw cap. Teflon® stopcock has a 2mm bore with the arm being 8mm O.D.



| Item#    | Capacity<br>(mL) | Fritted Disc<br>O.D. (mm) | GL thread size |
|----------|------------------|---------------------------|----------------|
| P130010C | 10               | 15                        | 14             |
| P130050C | 50               | 25                        | 25             |
| P130050M | 50               | 25                        | 25             |
| P130100C | 100              | 40                        | 25             |
| P130100M | 100              | 40                        | 25             |

**Accessories:**

|         |                                  |
|---------|----------------------------------|
| S201530 | 2mm Teflon® T-bore Stopcock Plug |
| GL14    | Nylon® cap 14mm                  |
| GL25    | Nylon® cap 25mm                  |
| R14     | PTFE septum 14mm                 |
| R25     | PTFE septum 25mm                 |

**PEPTIDE SYNTHESIS VESSEL, SOLID PHASE, T-BORE, VACUUM**

A connection of 8mm O.D. is sealed on the inner joint for connection to an inner gas. With a fritted disc of coarse or medium porosity to support resin. Top of the vessel has GL thread and a Teflon® lined screw cap. Teflon® stopcock has a 2mm bore with the arm being 8mm O.D.

| Item#    | Capacity (mL) | Fritted Disc O.D. (mm) | GL thread size |
|----------|---------------|------------------------|----------------|
| P140010M | 10            | 15                     | 14             |
| P140025M | 25            | 20                     | 25             |
| P140050M | 50            | 25                     | 25             |
| P140100M | 100           | 40                     | 25             |

**Accessories:**

|         |                                  |
|---------|----------------------------------|
| S201530 | 2mm Teflon® T-bore Stopcock Plug |
| GL14    | Nylon® cap 14mm                  |
| GL25    | Nylon® cap 25mm                  |
| R14     | PTFE septum 14mm                 |
| R25     | PTFE septum 25mm                 |


**NYLON® CAP WITH PROTECTED SEAL**

Replacement caps for use with Solid Phase Reaction Vessels, with PTFE protected Silicone Septum.

| Item# | Size (mm) | Material |
|-------|-----------|----------|
| GL14  | 14        | Nylon®   |
| GL25  | 25        | Nylon®   |
| GL32  | 32        | Nylon®   |


**SEPTUM, TEFLON®**

| Item# | Size(mm) | Material |
|-------|----------|----------|
| R14   | 14       | PTFE     |
| R25   | 25       | PTFE     |
| R32   | 32       | PTFE     |



**VESSEL, WITH LOWER JOINT AND T-BORE PTFE PLUG**

Solid phase peptide synthesis vessels feature 2mm PTFE stopcocks and fritted glass supports for resin beads during operation. The 24/40 inner drip joint can be assembled with other standard glassware. The vessel has a 8mm hose connection for vacuum and the stopcock has an 8mm O.D. sidearm for inert gas introduction. Vessels are supplied with PTFE-faced silicone lined Nylon® cap.



| Item#    | Capacity<br>(mL) | Fritted Disc O.D.<br>(mm) | Porosity | GL thread<br>Size |
|----------|------------------|---------------------------|----------|-------------------|
| P150025M | 25               | 25                        | M        | 25                |
| P150050C | 50               | 30                        | C        | 25                |
| P150050M | 50               | 30                        | M        | 25                |
| P150100M | 100              | 45                        | M        | 25                |
| P150250M | 250              | 57                        | M        | 32                |
| P150500M | 500              | 80                        | M        | 32                |

**Accessories:**

|         |                                  |
|---------|----------------------------------|
| S201530 | 2mm Teflon® T-bore Stopcock Plug |
| GL14    | Nylon® cap 14mm                  |
| GL25    | Nylon® cap 25mm                  |
| GL32    | Nylon® cap 32mm                  |
| R14     | PTFE septum 14mm                 |
| R25     | PTFE septum 25mm                 |
| R32     | PTFE septum 32mm                 |

**REACTION VESSEL, PHOTOCHEMICAL, INTERNAL THREAD**

Reaction Vessel constructed of borosilicate glass to accommodate immersion well. With #50 internal thread at top which accepts a RC50 bushing and Viton<sup>®</sup> O-ring to form a compression seal with the immersion well, one 14/20 joint for sparger tube, one 24/40 vertical joint for condenser and one #7 internal thread side arm for thermometer. Complete with quartz immersion well, caps and O-rings.



| Item#   | Capacity(mL) |
|---------|--------------|
| V150500 | 500          |

**Accessories:**

|      |   |
|------|---|
| RC50 | Bushing,#50,Nylon <sup>®</sup> w/o O-ring, Only |
| R225 | O-ring for #50 internal thread                  |
| RC7  | Nylon <sup>®</sup> cap for #7 internal thread   |
| R008 | O-ring for #7 internal thread                   |

**IMMERSION WELL, PHOTOCHEMICAL, QUARTZ, WITHOUT JOINT**

Double-walled quartz immersion well for use with V150500 reactor and lamp. A small diameter inner tube extends down the annular space to insure flow of coolant from bottom of well upward to outlet. Well is used with RC50 Nylon<sup>®</sup> Bushing with Viton<sup>®</sup> O-ring to form a compression type seal with threaded vessels. Well offers a greaseless connection and can be adjusted to desired height. The lack of the ground joint means easier dismantling since there is no freezing.



| Item#   | Total Length |
|---------|--------------|
| V190390 | 390mm        |

**PRESSURE VESSEL, HEAVY WALL\***

Heavy wall cylindrical vessels have an internal thread for use with a 15mm Teflon<sup>®</sup> bushing as a pressure seal. This unique design allows hand tightening and loosening for easy access into the vessel. The O-ring is positioned on the bushing above the thread for improved sealing. The vessels are useful for pressure reactions and applications such as polymerization and analysis of halogens by thermal decomposition in the presence of lime. Complete apparatus is supplied with vessel, Teflon<sup>®</sup> bushing and Viton<sup>®</sup> O-ring.



| Item#   | Capacity<br>(mL) | O.D.×Overall<br>(mm) | GL thread<br>size | Supplied |
|---------|------------------|----------------------|-------------------|----------|
| P160001 | 15               | 26×109               | 15                | complete |
| P160002 | 35               | 26×164               | 15                | complete |
| P160003 | 38               | 26×174               | 15                | complete |
| P160004 | 48               | 46×109               | 15                | complete |
| P160005 | 100              | 46×149               | 15                | complete |
| P160006 | 120              | 46×169               | 15                | complete |

**\*Important Warnings for Pressurized Glassware:** Due to varying conditions, we cannot guarantee glass vessels from breakage under pressure. Always work behind a safety shield.

**PRESSURE VESSEL, HEAVY WALL\***

Heavy wall round bottom vessels have an internal thread for use with a 15mm Teflon<sup>®</sup> bushing as a pressure seal. This unique design allows hand tightening and loosening for easy access into the vessel. The O-ring is positioned on the bushing above the thread for improved sealing. The vessels are useful for pressure reactions and applications such as polymerization and analysis of halogens by thermal decomposition in the presence of lime. Complete apparatus is supplied with vessel, Teflon<sup>®</sup> bushing and Viton<sup>®</sup> O-ring.



| Item#   | Capacity<br>(mL) | O.D.×Overall<br>(mm) | GL thread<br>size | Supplied |
|---------|------------------|----------------------|-------------------|----------|
| P170001 | 75               | 46×129               | 15                | complete |
| P170002 | 75               | 50×137               | 25                | complete |
| P170003 | 150              | 60×139               | 15                | complete |
| P170004 | 150              | 60×147               | 25                | complete |
| P170005 | 350              | 80×154               | 15                | complete |
| P170006 | 350              | 80×162               | 25                | complete |

**\*Important Warnings for Pressurized Glassware:** Due to varying conditions, we cannot guarantee glass vessels from breakage under pressure. Always work behind a safety shield.

**FUNNEL, FILTER, FRITTED DISC**

With two 2mm glass stopcocks

| Item#    | Joints | Frit O.D.<br>(mm) | Porosity | Capacity<br>(mL) |
|----------|--------|-------------------|----------|------------------|
| F973014C | 14/20  | 30                | Coarse   | 60               |
| F973014M | 14/20  | 30                | Medium   | 60               |
| F973024C | 24/40  | 30                | Coarse   | 60               |
| F973024M | 24/40  | 30                | Medium   | 60               |

**Accessories:**

|         |   |
|---------|---|
| S461230 | Replacement 2mm Glass Plug only                   |
| S691230 | Replacement S.S. Retention for 2mm Glass stopcock |


**FUNNEL, FILTER, FRITTED DISC**

With a 0-4mm high vacuum valve and a 2mm glass stopcock having constant pressure retention device.

| Item#    | Joints | Frit O.D.<br>(mm) | Porosity | Capacity<br>(mL) |
|----------|--------|-------------------|----------|------------------|
| F371460M | 14/20  | 30                | medium   | 60               |
| F374200C | 24/40  | 40                | coarse   | 200              |
| F374200M | 24/40  | 40                | medium   | 200              |

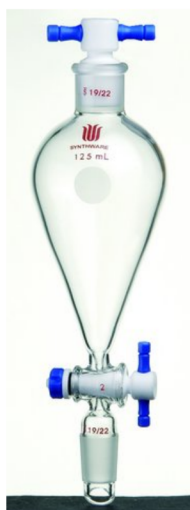
**Accessories:**

|         |  |
|---------|--|
| S461230 | Replacement 2mm Glass Plug only  |
| S691230 | Replacement S.S. Retention for 2mm Glass stopcock  |
| S600004 | 0-4mm high vacuum plug and control knob( PTFE<br>O-ring at tip and PTEF wiper to protect Viton®<br>O-ring on shaft |
| R010    | Viton® O-ring for 0-4mm high vacuum plug shaft   |



**FUNNEL, SEPARATOR**

With 2mm Teflon<sup>®</sup> stopcock. Supplied with a glass stopper or PTFE stopper.



| Item#    | Capacity<br>(mL) | Joints | PTFE stopcock<br>(mm) | Stopper |
|----------|------------------|--------|-----------------------|---------|
| F451010  | 10               | 14/20  | 2                     | PTFE    |
| F451010A | 10               | 14/20  | 2                     | GLASS   |
| F451025  | 25               | 14/20  | 2                     | PTFE    |
| F451025A | 25               | 14/20  | 2                     | GLASS   |
| F459025  | 25               | 19/22  | 2                     | PTFE    |
| F451050  | 50               | 14/20  | 2                     | PTFE    |
| F451050A | 50               | 14/20  | 2                     | GLASS   |
| F459050  | 50               | 19/22  | 2                     | PTFE    |
| F451100  | 100              | 14/20  | 2                     | PTFE    |
| F451100A | 100              | 14/20  | 2                     | GLASS   |
| F459100  | 100              | 19/22  | 2                     | PTFE    |
| F459100A | 100              | 19/22  | 2                     | GLASS   |
| F451125  | 125              | 14/20  | 2                     | PTFE    |
| F451125A | 125              | 14/20  | 2                     | GLASS   |
| F459125  | 125              | 19/22  | 2                     | PTFE    |
| F459125A | 125              | 19/22  | 2                     | GLASS   |
| F454125  | 125              | 24/40  | 2                     | PTFE    |
| F454125A | 125              | 24/40  | 2                     | GLASS   |
| F451250  | 250              | 14/20  | 4                     | PTFE    |
| F451250A | 250              | 14/20  | 4                     | GLASS   |
| F459250  | 250              | 19/22  | 4                     | PTFE    |
| F459250A | 250              | 19/22  | 4                     | GLASS   |
| F454250  | 250              | 24/40  | 4                     | PTFE    |
| F454250A | 250              | 24/40  | 4                     | GLASS   |

**Accessories:**

|         |   |
|---------|---|
| S181125 | Replacement 2mm Teflon <sup>®</sup> Plug Only |
| S181530 | Replacement 4mm Teflon <sup>®</sup> Plug Only |
| S401420 | 14/20 Hollow glass stopper , Penny-head       |
| S401922 | 19/22 Hollow glass stopper , Penny-head       |
| S402440 | 24/40 Hollow glass stopper , Penny-head       |
| S111420 | 14/20 Teflon <sup>®</sup> stopper             |
| S111922 | 19/22 Teflon <sup>®</sup> stopper             |
| S112440 | 24/40 Teflon <sup>®</sup> stopper             |

**FUNNEL, SEPARATORY, TEFLON® STOPCOCK**

Supplied with a Glass or Teflon® stopper

| Item#    | Capacity<br>(mL) | Joint | PTFE<br>Stopcock<br>(mm) | Stopper |
|----------|------------------|-------|--------------------------|---------|
| F471010  | 10               | 14/20 | 2                        | PTFE    |
| F471025  | 25               | 14/20 | 2                        | PTFE    |
| F479025  | 25               | 19/22 | 2                        | PTFE    |
| F471330  | 30               | NO.13 | 2                        | PTFE    |
| F471050  | 50               | 14/20 | 2                        | PTFE    |
| F479050  | 50               | 19/22 | 2                        | PTFE    |
| F471660  | 60               | NO.16 | 2                        | PTFE    |
| F471100  | 100              | 14/20 | 2                        | PTFE    |
| F479100  | 100              | 19/22 | 2                        | PTFE    |
| F471125  | 125              | 14/20 | 2                        | PTFE    |
| F479125  | 125              | 19/22 | 2                        | PTFE    |
| F474125  | 125              | 24/40 | 2                        | PTFE    |
| F472125  | 125              | No.22 | 2                        | PTFE    |
| F479250  | 250              | 19/22 | 4                        | PTFE    |
| F474250  | 250              | 24/40 | 4                        | PTFE    |
| F472925  | 250              | 29/42 | 4                        | PTFE    |
| F472250  | 250              | No.22 | 4                        | PTFE    |
| F472950  | 500              | 29/42 | 4                        | PTFE    |
| F477500  | 500              | No.27 | 4                        | PTFE    |
| F474000  | 1000             | 24/40 | 4                        | PTFE    |
| F477000  | 1000             | No.27 | 4                        | PTFE    |
| F471010A | 10               | 14/20 | 2                        | GLASS   |
| F479010A | 10               | 19/20 | 2                        | GLASS   |
| F471025A | 25               | 14/20 | 2                        | GLASS   |
| F479025A | 25               | 19/22 | 2                        | GLASS   |
| F471330A | 30               | NO.13 | 2                        | GLASS   |
| F471050A | 50               | 14/20 | 2                        | GLASS   |
| F479050A | 50               | 19/22 | 2                        | GLASS   |
| F471660A | 60               | NO.16 | 2                        | GLASS   |
| F471100A | 100              | 14/20 | 2                        | GLASS   |
| F479100A | 100              | 19/22 | 2                        | GLASS   |
| F471125A | 125              | 14/20 | 2                        | GLASS   |
| F479125A | 125              | 19/22 | 2                        | GLASS   |
| F474125A | 125              | 24/40 | 2                        | GLASS   |
| F472125A | 125              | No.22 | 2                        | GLASS   |
| F479250A | 250              | 19/22 | 4                        | GLASS   |
| F474250A | 250              | 24/40 | 4                        | GLASS   |
| F472925A | 250              | 29/42 | 4                        | GLASS   |
| F472250A | 250              | No.22 | 4                        | GLASS   |
| F472950A | 500              | 29/42 | 4                        | GLASS   |
| F477500A | 500              | No.27 | 4                        | GLASS   |
| F474000A | 1000             | 24/40 | 4                        | GLASS   |
| F477000A | 1000             | No.27 | 4                        | GLASS   |


**Accessories:**

- S181125 Replacement 2mm Teflon® Plug Only
- S181530 Replacement 4mm Teflon® Plug Only
- S401420 14/20 Hollow Glass Stopper,Penny-head
- S401922 19/22 Hollow Glass Stopper,Penny-head
- S402440 24/40 Hollow Glass Stopper,Penny-head
- S402942 29/42 Hollow Glass Stopper,Penny-head
- S111420 14/20 Teflon® Stopper
- S111922 19/22 Teflon® Stopper
- S112440 24/40 Teflon® Stopper
- S112942 29/42 Teflon® Stopper
- S120013 # 13 Teflon® Stopper
- S120016 # 16 Teflon® Stopper
- S120022 # 22 Teflon® Stopper
- S120027 # 27 Teflon® Stopper
- S280013 # 13 Glass Stopper , Penny-head
- S280016 # 16 Glass Stopper , Penny-head
- S280022 # 22 Glass Stopper , Penny-head
- S280027 # 27 Glass Stopper , Penny-head


**FUNNEL, SEPARATORY, SQUIBB, GLASS STOPCOCK**

Supplied complete with a flask length glass stopper of the listed size

| Item#   | Capacity (mL) | Stopper size | Stopcock bore (mm) | Stopper |
|---------|---------------|--------------|--------------------|---------|
| F780030 | 30            | #13          | 2                  | GLASS   |
| F780060 | 60            | #16          | 2                  | GLASS   |
| F780125 | 125           | #22          | 2                  | GLASS   |
| F780250 | 250           | #22          | 4                  | GLASS   |
| F780500 | 500           | #27          | 4                  | GLASS   |
| F787000 | 1000          | #27          | 4                  | GLASS   |

**Accessories:**

|         |   |
|---------|---|
| S461230 | Replacement 2mm Glass Plug Only                   |
| S461740 | Replacement 4mm Glass Plug Only                   |
| S691230 | Replacement S.S. Retention for 2mm Glass stopcock |
| S691740 | Replacement S.S. Retention for 2mm Glass stopcock |
| S280013 | # 13 Glass Stopper , Penny-head                   |
| S280016 | # 16 Glass Stopper , Penny-head                   |
| S280022 | # 22 Glass Stopper , Penny-head                   |
| S280027 | # 27 Glass Stopper , Penny-head                   |


**FUNNEL SEPARATORY SURE-GRIP**

Globe shaped separatory funnel with a long stopper neck and straight section between the funnel body and stopcock, which provides a secure grip while shaking and also aids in clamping. Available with Teflon® stopcocks. Supplied complete with one listed size Teflon® or glass stopper.

| Item#    | Capacity (mL) | Stopper size | PTFE Stopcock Bore (mm) | Stopper |
|----------|---------------|--------------|-------------------------|---------|
| F687500A | 500           | 27           | 4                       | Glass   |
| F687000A | 1000          | 27           | 4                       | Glass   |
| F687000  | 1000          | 27           | 4                       | PTFE    |
| F68272LA | 2000          | 27           | 4                       | Glass   |
| F68272L  | 2000          | 27           | 4                       | PTFE    |

**Accessories:**

|         |                                   |
|---------|-----------------------------------|
| S181530 | Replacement 4mm Teflon® Plug Only |
| S280027 | # 27 Glass Stopper , Penny-head   |
| S120027 | # 27 Teflon® Stopper              |

**FUNNEL, PRESSURE EQUALIZING**

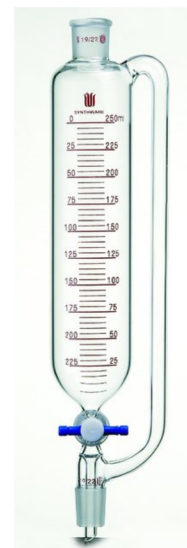
With 1:5 Teflon<sup>®</sup> stopcock

| Item#   | Capacity(mL) | Joints | Stopcock Bore(mm) |
|---------|--------------|--------|-------------------|
| F621410 | 10           | 14/20  | 2                 |
| F621425 | 25           | 14/20  | 2                 |
| F622425 | 25           | 24/40  | 2                 |
| F621460 | 60           | 14/20  | 2                 |
| F621960 | 60           | 19/22  | 2                 |
| F622460 | 60           | 24/40  | 2                 |
| F621125 | 125          | 14/20  | 2                 |
| F629125 | 125          | 19/22  | 2                 |
| F624125 | 125          | 24/40  | 2                 |
| F629250 | 250          | 19/22  | 2                 |
| F624250 | 250          | 24/40  | 2                 |
| F624500 | 500          | 24/40  | 4                 |
| F62241L | 1000         | 24/40  | 4                 |

**Accessories:**

S181125 Replacement 2mm Teflon<sup>®</sup> Plug Only

S181530 Replacement 4mm Teflon<sup>®</sup> Plug Only


**FUNNEL, PRESSURE EQUALIZING, TEFLON<sup>®</sup> METERING STOPCOCK**

With Teflon<sup>®</sup> adjustable bore metering plug. Turning the adjustment knob allows flow rate to be controlled from full flow to drop wise. The metering plug completely solves the problems of sudden overflow or non-flow during addition of reagents.

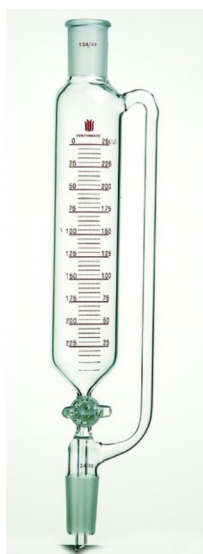
| Item#   | Capacity (mL) | Joints | PTFE Stopcock Bore(mm) |
|---------|---------------|--------|------------------------|
| F611410 | 10            | 14/20  | 2                      |
| F611425 | 25            | 14/20  | 2                      |
| F611460 | 60            | 14/20  | 2                      |
| F611960 | 60            | 19/22  | 2                      |
| F612460 | 60            | 24/40  | 2                      |
| F614125 | 125           | 24/40  | 2                      |
| F614250 | 250           | 24/40  | 2                      |
| F614500 | 500           | 24/40  | 4                      |

**Accessories:**

S191125 Replacement 2mm Teflon<sup>®</sup> Metering Only

S191530 Replacement 4mm Teflon<sup>®</sup> Metering Only




**FUNNEL, PRESSURE EQUALIZING, GLASS STOPCOCK**

With glass stopcock, graduated.

| Item#    | Capacity<br>(mL) | Joints | Stopcock<br>Bore(mm) |
|----------|------------------|--------|----------------------|
| F621410G | 10               | 14/20  | 2                    |
| F621425G | 25               | 14/20  | 2                    |
| F621460G | 60               | 14/20  | 2                    |
| F622460G | 60               | 24/40  | 2                    |
| F621125G | 125              | 14/20  | 2                    |
| F624250G | 250              | 24/40  | 2                    |

**Accessories:**

S461230 Replacement 2mm Glass Plug Only

S691230 Replacement S.S. Retention for 2mm Glass Stopcock

**FUNNEL, PRESSURE EQUALIZING, TEFLON® STOPCOCK**

With straight bore Teflon® stopcock in pressure equalizing line, graduated

| Item#   | capacity (mL) | Joints | Stopcock Bore(mm) |
|---------|---------------|--------|-------------------|
| F671425 | 25            | 14/20  | 2                 |
| F672460 | 60            | 24/40  | 2                 |
| F674125 | 125           | 24/40  | 2                 |
| F674250 | 250           | 24/40  | 2                 |
| F674500 | 500           | 24/40  | 4                 |
| F67241L | 1000          | 24/40  | 4                 |

**Accessories:**

|         |                         |           |
|---------|-------------------------|-----------|
| S181125 | Replacement 2mm Teflon® | Plug Only |
| S181530 | Replacement 4mm Teflon® | Plug Only |


**FUNNEL, PRESSURE EQUALIZING, HIGH VACUUM VALVE**

With Teflon® extended tip valve for semi-needle valve adjustment.

| Item#   | Capacity (mL) | Joints | Valve Orifice (mm) |
|---------|---------------|--------|--------------------|
| F641425 | 25            | 14/20  | 0-4                |
| F641460 | 60            | 14/20  | 0-4                |
| F641960 | 60            | 19/22  | 0-4                |
| F642460 | 60            | 24/40  | 0-4                |
| F641125 | 125           | 14/20  | 0-4                |
| F649125 | 125           | 19/22  | 0-4                |
| F644125 | 125           | 24/40  | 0-4                |
| F644250 | 250           | 24/40  | 0-4                |

**Accessories:**

|         |   |
|---------|---|
| S660004 | 0-4mm high vacuum metering plug and control knob.(PTFE O-ring at tip and PTFE wiper to protect Viton® O-ring on shaft.) |
| R010    | Viton® O-ring for 0-4mm high vacuum plug shaft  |



**MANIFOLD, VACUUM/INERT GAS, DOUBLE**

General purpose double bank manifold for use with vacuum and inert gas. Supplied with 0-4mm high vacuum valves for grease-free operation. Both banks are made from 22mm medium wall tubing and have all banks open. Ports are spaced 100mm center to center and have an O.D. of 10mm.



| Item#   | Number of ports | Overall width (mm) | Valve orifice (mm) |
|---------|-----------------|--------------------|--------------------|
| M111004 | 4               | 450                | 0-4                |
| M111005 | 5               | 550                | 0-4                |

**Accessories:**

- S540004 0-4mm high vacuum plug and control knob.  
(With Viton<sup>®</sup> O-ring at tip)
- R010 Viton<sup>®</sup> O-ring for 0-4mm high vacuum plug shaft
- R007 Viton<sup>®</sup> O-ring for 0-4mm high vacuum valve tip O-ring

**MANIFOLD, VACUUM/INERT GAS, DOUBLE**

Same to the manifold above except with front-left and rear-right 10mm hose connections.



| Item#   | Number of Ports | Overall Width (mm) | Valve Orifice (mm) |
|---------|-----------------|--------------------|--------------------|
| M171005 | 5               | 550                | 0-4                |

**Accessories:**

- S540004 0-4mm high vacuum plug and control knob.  
(With Viton<sup>®</sup> O-ring at tip)
- R010 Viton<sup>®</sup> O-ring for 0-4mm high vacuum plug shaft
- R007 Viton<sup>®</sup> O-ring for 0-4mm high vacuum valve tip O-ring

**MANIFOLD, VACUUM/INERT GAS, DOUBLE**

Same to the manifold above except with front-left and rear-right 10mm hose connections.

| Item#   | Number of Ports | Overall Width (mm) | Valve Orifice (mm) |
|---------|-----------------|--------------------|--------------------|
| M101003 | 3               | 350                | 0-4                |
| M101004 | 4               | 450                | 0-4                |
| M101005 | 5               | 550                | 0-4                |


**Accessories:**

- S540004 0-4mm high vacuum plug and control knob.  
(With Viton<sup>®</sup> O-ring at tip)
- R010 Viton<sup>®</sup> O-ring for 0-4mm high vacuum plug shaft
- R007 Viton<sup>®</sup> O-ring for 0-4mm high vacuum valve tip O-ring

**MANIFOLD, VACUUM/INERT GAS, DOUBLE**

Same to the manifold above except with front- right and rear- left 10mm hose connections.

| Item#   | Number of Ports | Overall Width(mm) | Valve Orifice (mm) |
|---------|-----------------|-------------------|--------------------|
| M141004 | 4               | 450               | 0-4mm              |
| M141005 | 5               | 550               | 0-4mm              |


**Accessories:**

- S540004 0-4mm high vacuum plug and control knob.  
(With Viton<sup>®</sup> O-ring at tip)
- R010 Viton<sup>®</sup> O-ring for 0-4mm high vacuum plug shaft
- R007 Viton<sup>®</sup> O-ring for 0-4mm high vacuum valve tip O-ring

**MANIFOLD, VACUUM/INERT GAS, DOUBLE**

Same to the manifold above except with front-left-right and rear-right 10mm hose connections.

| Item#   | Number of Ports | Overall Width (mm) | Valve Orifice (mm) |
|---------|-----------------|--------------------|--------------------|
| M471004 | 4               | 450                | 0-4mm              |
| M471005 | 5               | 550                | 0-4mm              |


**Accessories:**

- S540004 0-4mm high vacuum plug and control knob.  
(With Viton<sup>®</sup> O-ring at tip)
- R010 Viton<sup>®</sup> O-ring for 0-4mm high vacuum plug shaft
- R007 Viton<sup>®</sup> O-ring for 0-4mm high vacuum valve tip O-ring

**MANIFOLD, VACUUM/INERT GAS, ALL GLASS**

With 4mm double oblique, high vacuum hollow glass stopcocks precision ground with corresponding numbers on barrel and plug. Lower vacuum chambers on stopcock are evacuated with a separate hole in the plug in order to hold the plug in the stopcock barrels. Beams are 22mm O.D. with front-left-right and rear-left- right 10mm hose connections. Distance between stopcocks is 75mm center to center.



| Item#   | Number of Ports | Overall Width<br>(mm) |
|---------|-----------------|-----------------------|
| M411003 | 3               | 300                   |
| M411004 | 4               | 375                   |
| M411005 | 5               | 450                   |

**MANIFOLD, VACUUM/INERT GAS, ALL GLASS**

With 4mm double oblique, high vacuum hollow glass stopcocks precision ground with corresponding numbers on barrel and plug. Lower vacuum chambers on stopcock are evacuated with a separate hole in the plug in order to hold the plug in the stopcock barrels. Beams are 22mm O.D. with front-left and rear-right 10mm hose connections. Distance between stopcocks is 75mm center to center.



| Item#   | Number of Ports | Overall Width<br>(mm) |
|---------|-----------------|-----------------------|
| M181003 | 3               | 300                   |
| M181004 | 4               | 375                   |
| M181005 | 5               | 450                   |

**MANIFOLD, VACUUM/INERT GAS, ALL GLASS**

With 4mm double oblique, high vacuum hollow glass stopcocks precision ground with corresponding numbers on barrel and plug. Lower vacuum chambers on stopcock are evacuated with a separate hole in the plug in order to hold the plug in the stopcock barrels. Beams are 22mm O.D. with front-right and rear-left 10mm hose connections. Distance between stopcocks is 75mm center to center.



| Item#   | Number of Ports | Overall Width<br>(mm) |
|---------|-----------------|-----------------------|
| M401004 | 4               | 375                   |
| M401005 | 5               | 450                   |

**MANIFOLD, VACUUM/INERT GAS, ALL GLASS**

With 4mm double oblique, high vacuum hollow glass stopcocks precision ground with corresponding numbers on barrel and plug. Lower vacuum chambers on stopcock are evacuated with a separate hole in the plug in order to hold the plug in the stopcock barrels. Beams are 22mm O.D. with front-left-right and rear-left 10mm hose connections. Distance between stopcocks is 75mm center to center.

| Item#   | Number of ports | Overall width<br>(mm) |
|---------|-----------------|-----------------------|
| M421003 | 3               | 300                   |
| M421004 | 4               | 375                   |
| M421005 | 5               | 450                   |


**MANIFOLD, VACUUM/INERT GAS, ALL GLASS**

With 4mm double oblique, high vacuum hollow glass stopcocks precision ground with corresponding numbers on barrel and plug. Lower vacuum chambers on stopcock are evacuated with a separate hole in the plug in order to hold the plug in the stopcock barrels. Beams are 22mm O.D. with front-left and rear-left-right 10mm hose connections. Distance between stopcocks is 75mm center to center.

| Item#   | Number of Ports | Overall Width<br>(mm) |
|---------|-----------------|-----------------------|
| M431003 | 3               | 300                   |
| M431004 | 4               | 375                   |
| M431005 | 5               | 450                   |


**MANIFOLD, VACUUM/INERT GAS, ALL GLASS**

With 4mm double oblique, high vacuum hollow glass stopcocks precision ground with corresponding numbers on barrel and plug. Lower vacuum chambers on stopcock are evacuated with a separate hole in the plug in order to hold the plug in the stopcock barrels. Beams are 22mm O.D. with front-left-right and rear-right 10mm hose connections. Distance between stopcocks is 75mm center to center.

| Item#   | Number of Ports | Overall Width<br>(mm) |
|---------|-----------------|-----------------------|
| M441005 | 5               | 450                   |



**MANIFOLD, VACUUM/INERT GAS, ALL GLASS**

With 4mm double oblique, high vacuum hollow glass stopcocks precision ground with corresponding numbers on barrel and plug. Lower vacuum chambers on stopcock are evacuated with a separate hole in the plug in order to hold the plug in the stopcock barrels. Beams are 22mm O.D. with front-right and rear-left-right 10mm hose connections. Distance between stopcocks is 75mm center to center.



| Item#   | Number of Ports | Overall Width (mm) |
|---------|-----------------|--------------------|
| M451004 | 4               | 375                |
| M451005 | 5               | 450                |

**MANIFOLD, HIGH VACUUM SOLID GLASS STOPCOCKS**

With 4mm double oblique, high vacuum solid glass stopcocks precision ground with corresponding numbers on barrel and plug. Solid glass stopcocks have constant pressure retention devices. Beams are 22mm O.D. with front-left-right and rear-left-right 10mm hose connections. Distance between stopcocks is 75mm center to center.



| Item#   | Number of Ports | Overall Width (mm) |
|---------|-----------------|--------------------|
| M250003 | 3               | 300                |
| M250004 | 4               | 375                |
| M250005 | 5               | 450                |

**Accessory:**

S691656 Replacement stainless steel retention kit for 16.2/56 glass stopcock

**MANIFOLD, HIGH VACUUM SOLID GLASS STOPCOCKS**

With 4mm double oblique, high vacuum solid glass stopcocks precision ground with corresponding numbers on barrel and plug. Solid glass stopcocks have constant pressure retention devices. Beams are 22mm O.D. with front-left and rear-right 10mm hose connections. Distance between stopcocks is 75mm center to center.



| Item#   | Number of Ports | Overall Width (mm) |
|---------|-----------------|--------------------|
| M230003 | 3               | 300                |
| M230004 | 4               | 375                |
| M230005 | 5               | 450                |

**Accessory:**

S691656 Replacement stainless steel retention kit for 16.2/56 glass stopcock

**MANIFOLD, HIGH VACUUM SOLID GLASS STOPCOCKS**

With 4mm double oblique, high vacuum solid glass stopcocks precision ground with corresponding numbers on barrel and plug. Solid glass stopcocks have constant pressure retention devices. Beams are 22mm O.D. with front-right and rear-left 10mm hose connections. Distance between stopcocks is 75mm center to center.

| Item#   | Number of Ports | Overall Width (mm) |
|---------|-----------------|--------------------|
| M240004 | 4               | 375                |

**Accessory:**

S691656 Replacement stainless steel retention kit for 16.2/56 glass stopcock


**MANIFOLD, HIGH VACUUM SOLID GLASS STOPCOCKS**

With 4mm double oblique, high vacuum solid glass stopcocks precision ground with corresponding numbers on barrel and plug. Solid glass stopcocks have constant pressure retention devices. Beams are 22mm O.D. with front-left-right and rear-left 10mm hose connections. Distance between stopcocks is 75mm center to center.

| Item#   | Number of Ports | Overall Width (mm) |
|---------|-----------------|--------------------|
| M260003 | 3               | 300                |
| M260004 | 4               | 375                |
| M260005 | 5               | 450                |

**Accessory:**

S691656 Replacement stainless steel retention kit for 16.2/56 glass stopcock


**MANIFOLD, HIGH VACUUM SOLID GLASS STOPCOCKS**

With 4mm double oblique, high vacuum solid glass stopcocks precision ground with corresponding numbers on barrel and plug. Solid glass stopcocks have constant pressure retention devices. Beams are 22mm O.D. with front-left and rear-left-right 10mm hose connections. Distance between stopcocks is 75mm center to center.

| Item#   | Number of Ports | Overall Width (mm) |
|---------|-----------------|--------------------|
| M280004 | 4               | 375                |
| M280005 | 5               | 450                |

**Accessory:**

S691656 Replacement stainless steel retention kit for 16.2/56 glass stopcock



**MANIFOLD, HIGH VACUUM SOLID GLASS STOPCOCKS**

With 4mm double oblique, high vacuum solid glass stopcocks precision ground with corresponding numbers on barrel and plug. Solid glass stopcocks have constant pressure retention devices. Beams are 22mm O.D. with front-left-right and rear-right 10mm hose connections. Distance between stopcocks is 75mm center to center.



| Item#   | Number of Ports | Overall Width<br>(mm) |
|---------|-----------------|-----------------------|
| M290004 | 4               | 375                   |
| M290005 | 5               | 450                   |

**Accessory:**

S691656 Replacement stainless steel retention kit  
for 16.2/56 glass stopcock

**MANIFOLD, HIGH VACUUM SOLID GLASS STOPCOCKS**

With 4mm double oblique, high vacuum solid glass stopcocks precision ground with corresponding numbers on barrel and plug. Solid glass stopcocks have constant pressure retention devices. Beams are 22mm O.D. with front-right and rear-left-right 10mm hose connections. Distance between stopcocks is 75mm center to center.



| Item#   | Number of Ports | Overall Width<br>(mm) |
|---------|-----------------|-----------------------|
| M300005 | 5               | 450                   |

**Accessory:**

S691656 Replacement stainless steel retention kit  
for 16.2/56 glass stopcock

**VACCUM MANIFOLD, TEFLON® STOPCOCKS**

General purpose manifold with 2mm or 4mm Teflon® stopcocks. Main tube is 22mm O.D. with serrated hose connection(10mm O.D.) at right side. Delivery ports have 10mm serrated hose connections. Distance between stopcocks is 75mm.



| Item#   | Number of Ports | Stopcock Bore<br>(mm) |
|---------|-----------------|-----------------------|
| M190042 | 4               | 2                     |
| M190044 | 4               | 4                     |
| M190064 | 6               | 4                     |

**Accessories:**

S181125 Replacement 2mm Teflon® Plug Only  
S181530 Replacement 4mm Teflon® Plug Only

**VACUUM MANIFOLD, TEFLON® STOPCOCKS**

General purpose manifold with 2mm or 4mm Teflon® stopcocks. Main tube is 22mm O.D. with serrated hose connection(10mm O.D.) at left side. Delivery ports have 10mm serrated hose connections. Distance between stopcocks is 75mm.

| Item#   | Number of Ports | Stopcock Bore (mm) |
|---------|-----------------|--------------------|
| M500044 | 4               | 4                  |
| M500064 | 6               | 4                  |

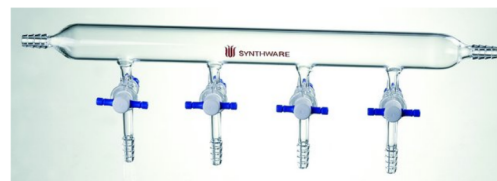

**Accessories:**

S181530 Replacement 4mm Teflon® Plug Only

**VACUUM MANIFOLD, TEFLON® STOPCOCKS**

General purpose manifold with 2mm or 4mm Teflon® stopcocks. Main tube is 22mm O.D. with serrated hose connection(10mm O.D.) at both ends. Delivery ports have 10mm serrated hose connections. Distance between stopcocks is 75mm.

| Item#   | Number of Ports | Stopcock Bore (mm) |
|---------|-----------------|--------------------|
| M490042 | 4               | 2                  |
| M490044 | 4               | 4                  |
| M490062 | 6               | 2                  |
| M490064 | 6               | 4                  |


**Accessories:**

S181125 Replacement 2mm Teflon® Plug Only

S181530 Replacement 4mm Teflon® Plug Only

**VACUUM MANIFOLD, HIGH VACUUM VALVES**

With a serrated hose connection(10mm O.D.) at right hand side. Main tube is 22mm O.D. and the distance between valves is 100mm center to center.

| Item#   | Number of Ports | Stopcock Bore(mm) | Overall Width(mm) |
|---------|-----------------|-------------------|-------------------|
| M202403 | 3               | 0-4               | 325               |
| M202404 | 4               | 0-4               | 425               |
| M202405 | 5               | 0-4               | 525               |


**Accessories:**

S540004 0-4mm high vacuum plug and control knob.  
(With Viton® O-ring at tip)

R010 Viton® O-ring for 0-4mm high vacuum plug shaft

R007 Viton® O-ring for 0-4mm high vacuum valve tip

**VACUUM MANIFOLD, HIGH VACUUM VALVES**

With a serrated hose connection(10mm O.D.) at left hand side. Main tube is 22mm O.D. and the distance between valves is 100mm center to center.



| Item#   | Number of Ports | Stopcock Bore (mm) | Overall Width (mm) |
|---------|-----------------|--------------------|--------------------|
| M522403 | 3               | 0-4                | 325                |
| M522404 | 4               | 0-4                | 425                |
| M522405 | 5               | 0-4                | 525                |

**Accessories:**

S540004 0-4mm high vacuum plug and control knob.

(With Viton® O-ring at tip)

R010 Viton® O-ring for 0-4mm high vacuum plug shaft

R007 Viton® O-ring for 0-4mm high vacuum valve tip

**MANIFOLD, NITROGEN/ARGON LINE, TEFLON®**

With 14/20 outer joint at the center to fit a rubber septum for keeping syringes under an inert environment cutting down on the number used. Main tube is 22mm O.D. with both ends connections(10mm). Delivery ports have 8mm hose connections.



| Item#   | Number of Ports | Stopcock Bore (mm) | Joint |
|---------|-----------------|--------------------|-------|
| M211042 | 4               | 2                  | 14/20 |
| M211044 | 4               | 4                  | 14/20 |

**Accessories:**

S181125 Replacement 2mm Teflon® Plug Only

S181530 Replacement 4mm Teflon® Plug Only

**MANIFOLD, NITROGEN/ARGON LINE, TEFLON®**

With 14/20 outer joint at the center to fit a rubber septum for keeping syringes under an inert environment cutting down on the number used. Main tube is 22mm O.D. with left hose connections(10mm). Delivery ports have 8mm hose connections.

| Item#   | Number of Ports | Stopcock Bore (mm) | Joint |
|---------|-----------------|--------------------|-------|
| M531042 | 4               | 2                  | 14/20 |


**Accessories:**

S181125 Replacement 2mm Teflon® Plug Only

**MANIFOLD, NITROGEN/ARGON LINE, TEFLON®**

With 14/20 outer joint at the center to fit a rubber septum for keeping syringes under an inert environment cutting down on the number used. Main tube is 22mm O.D. with right hose connections(10mm). Delivery ports have 8mm hose connections.

| Item#   | Number of Ports | Stopcock Bore (mm) | Joint |
|---------|-----------------|--------------------|-------|
| M541044 | 4               | 4                  | 14/20 |


**Accessories:**

S181530 Replacement 4mm Teflon® Plug Only

**MANIFOLD, DOUBLE, HOLLOW GLASS STOPCOCKS, SPHERICAL JOINT**

With 35/20 ball joints and 4mm double oblique high vacuum hollow glass stopcocks precision ground with corresponding numbers on barrel and plugs. Lower vacuum chambers on stopcock are evacuated with a separate hole in the plug in order to hold the plug in the stopcock barrels.

| Item#   | Number of Ports | Overall Width (mm) | Glass Stopcock |
|---------|-----------------|--------------------|----------------|
| M270004 | 4               | 365                | hollow         |
| M270005 | 5               | 450                | hollow         |



**MANIFOLD, DOUBLE, HOLLOW GLASS STOPCOCKS, RIGHT HAND SIDE**

With high vacuum hollow glass stopcocks. The smaller O.D.(17mm) front tube is for inert gases and the larger O.D.(22mm) back tube is for vacuum, which has a 35/20 socket on the right hand side.



| Item#   | Number of Ports | Hose Connections (mm) | Glass Stopcock |
|---------|-----------------|-----------------------|----------------|
| M340004 | 4               | 10                    | Hollow         |

**MANIFOLD, DOUBLE, HOLLOW GLASS STOPCOCKS, LEFT HAND SIDE**

Similar to above manifold, but with the 35/20 socket on the left hand side



| Item#   | Number of Ports | Hose Connections (mm) | Glass Stopcock |
|---------|-----------------|-----------------------|----------------|
| M350004 | 4               | 10                    | Hollow         |

**VACUUM TRAP, SPHERICAL JOINTS**

With 35/20 spherical joints for added flexibility. Trap body is 50mm O.D. and 360 mm in length. Please order the three adapters and 35/20 SS pinch clamp separately.



| Item#   | Joints | Description                                  |
|---------|--------|--|
| V175036 | 35/20  | Vacuum Trap body                             |
| V175037 | 35/20  | Top Adapter, 16mm O.D. outlet                |
| V175038 | 35/20  | Middle adapter/pump Adapter 16mm O.D. outlet |
| V175039 | 35/20  | Bottom Adapter, 16mm O.D. outlet             |
| CC3525  | 35/20  | Clamps for 35/20 ball joints                 |

**VACUUM TRAP, 35/20 BALL JOINTS**

For use with vacuum manifolds having 35/20 socket joints. Please order the pump adapter and socket clamp separately.

| Item#   | Joints | Outer Body<br>O.D.(mm) | Length Outer Body<br>Below Joint (mm) |
|---------|--------|------------------------|---------------------------------------|
| V415045 | 45/50  | 50                     | 250                                   |

**Accessories:**

|         |                             |
|---------|-----------------------------|
| V175038 | Pump Adapter                |
| CC3525  | Clamps for 35/20 ball joint |


**MANIFOLD, DOUBLE, HIGH VACUUM VALVE AND 35/20 SPHERICAL JOINT**

This manifold is designed to incorporate a 0-8mm high vacuum valve as the vacuum shut-off. The front tube is for inert gases (17mm O.D.), with a 10mm hose connection. The rear tube is for vacuum (22mm O.D.), with two 35/20 socket joints. Please order each component separately.

| Item#   | Description         |
|---------|---------------------|
| M360004 | Vacuum/gas manifold |

**Accessories:**

|         |  |
|---------|--|
| S540008 | 0-8mm high vacuum plug and control Knob (Viton® O-ring at tip) |
| S450035 | 35# ball stopper   |
| CC3525  | Clamps for 35/20 ball joint                                    |
| R108    | Tip O-ring for 0-8mm high vacuum valve plug                    |
| R110    | Shaft O-ring for 0-8mm high vacuum valve plug                  |



**MANIFOLD, WITH #15 O-RING JOINTS**

With 4mm double hollow high vacuum stopcocks. This four-port manifold is fitted with two 14/20 and 24/40 inner joints, and is 100mm center to center joints. #15 O-ring joint stopper (S480015) and #15 O-ring joint to serrated hose adapter have to be ordered separately. Viton® O-rings can be ordered using item #R116.



| Item#   | Description         |
|---------|---------------------|
| M150004 | Vacuum/gas manifold |

**Accessories:**

|         |  |
|---------|--|
| CC2815  | #15 O-ring joint stainless steel clamp |
| R116    | #116 Viton® O-ring                     |
| S480015 | #15 O-ring joint stopper               |
| M131604 | 10mm O.D. serrated hose connection     |
| M131605 | 16mm O.D. serrated hose connection     |

**MANIFOLD, VACUUM, SINGLE, WITH #15 O-RING JOINTS**

Four ports are spaced 100mm center to center, with 0-8mm high vacuum valves mounted on 45° angle to the operator for easy access. Overall width is 395mm. Standard taper components or stoppers are available below and have to be ordered separately.



| Item#   | Description                  |
|---------|------------------------------|
| M311508 | Vacuum manifold, single bank |

**Accessories:**

|         |   |
|---------|---|
| S540008 | 0-8mm high vacuum plug and control knob, Viton® O-ring at tip |
| CC2815  | #15 O-ring joint stainless steel clamp                        |
| R116    | #116 Viton® O-ring  |
| S480015 | #15 O-ring joint stopper                                      |
| M131604 | 10mm O.D. serrated hose connection                            |
| M131605 | 16mm O.D. serrated hose connection                            |

**MANIFOLD, DOUBLE BANKS, WITH #15 O-RING JOINTS**

Forward facing 0-8mm high vacuum valves allow easy operation of manifold inside of a fume hood. Main parts are spaced 100mm center to center.

Adapter components or stoppers are available below and have to be ordered separately.

| Item#   | Description                  |
|---------|------------------------------|
| M330804 | Vacuum manifold, single bank |

**Accessories:**

|         |  |
|---------|--|
| S540008 | 0-8mm high vacuum plug and control knob, Viton® O-ring at tip. |
| CC2815  | #15 O-ring joint stainless steel clamp                         |
| R116    | #116 Viton® O-ring   |
| S480015 | #15 O-ring joint stopper                                       |
| M131604 | 10mm O.D. serrated hose connection                             |
| M131605 | 16mm O.D. serrated hose connection                             |


**MANIFOLD, SOLVENT TRANSFER**

Supplied with high vacuum valve with PTFE O-ring at tip and PTFE wiper to protect Viton® O-ring on shaft.

| Item#   | Joints | Overall Height*Width(mm) |
|---------|--------|--------------------------|
| M164380 | 24/40  | 140*380                  |

**Accessory:**

|         |   |
|---------|---|
| S600004 | 0-4mm high vacuum plug and control knob (Teflon® O-ring at tip) |
|---------|---|


**STOPPER, WITH #15 O-RING JOINT**

For use with manifolds having #15 O-ring joints. Supplied completely with One #116(R116) Viton® O-ring.

| Item#   | Description              |
|---------|--------------------------|
| S480015 | #15 O-ring joint stopper |

**Accessories:**

|        |  |
|--------|--|
| CC2815 | #15 O-ring joint stainless steel clamp |
| R116   | #116 Viton® O-ring                     |




**ADAPTER, #15 O-RING JOINT TO SERRATED HOSE CONNECTION**

| Item#   | Description                        |
|---------|------------------------------------|
| M131604 | 10mm O.D. serrated hose connection |
| M131605 | 16mm O.D. serrated hose connection |

**Accessories:**

|        |  |
|--------|--|
| CC2815 | #15 O-ring joint stainless steel clamp |
| R116   | #116 Viton® O-ring                     |


**ADAPTER, #15 O-RING JOINT TO INNER JOINT**

| Item#   | Description                                |
|---------|--|
| M131514 | From #15 O-ring joint to 14/20 inner joint |
| M131519 | From #15 O-ring joint to 19/22 inner joint |
| M131524 | From #15 O-ring joint to 24/40 inner joint |

**DUAL VACUUM TRAP ASSEMBLY, WITH #15 O-RING JOINTS**

For use with manifolds having #15 O-ring joints on banks (i.e, M150004 above ) (E) and (G) are 0-12mm high vacuum valves as the shut off. (F) is a 0-4mm high vacuum valve having 9mm O.D. tubing towards the back of the drawing. (H) is a 0-8mm high vacuum valve. The pre-trap uses two 28/15 ball joints to add more flexibility to the assembly. The pre-trap uses a 57mm horseshoe clamp (CC0057) and two 57mm O-ring flanges to make quick connection. The #15 O-ring joint at the far-left is used to connect to manifold. The complete assembly comes with one brown Viton® O-ring (R116), two #15 O-ring clamps, and one 57mm horseshoe clamp.

| Item#   | Description                  |
|---------|------------------------------|
| V115712 | Dual trap assembly, complete |

**Accessories:**

|         |  |
|---------|--|
| S540004 | 0-4mm high vacuum plug and control knob<br>Viton® O-ring at tip  |
| S540008 | 0-8mm high vacuum plug and control knob<br>Viton® O-ring at tip  |
| S540012 | 0-12mm high vacuum plug and control knob<br>Viton® O-ring at tip |
| CC0057  | 57mm horseshoe clamp   |
| CC2815  | #15 O-ring joint stainless steel clamp                           |
| R116    | #116 Viton® O-ring   |
| R331    | #331 Viton® O-ring   |


**VACUUM TRAP, #15 O-RING JOINT**

Supplied with two R116 Viton® O-rings.

| Item#   | Joint | O.D. outer Body (mm) | Outer Body Length Below Joint(mm) | O.D. Inner&Side Tube(mm) |
|---------|-------|----------------------|-----------------------------------|--------------------------|
| V325045 | 45/50 | 50                   | 250                               | 18                       |

**Accessories:**

|         |   |
|---------|---|
| CC2815  | #15 O-ring joint stainless steel clamp                |
| R116    | #116 Viton® O-ring                                    |
| A910001 | Adapter with #15 O-ring joint, 19mm Outlet, 90° Angle |
| A910002 | Adapter with #15 O-ring joint, 19mm Outlet, Straight  |




**VACUUM TRAP, WITH #15 O-RING JOINTS**

Two-piece design, with a 0-12mm high vacuum valve as the shut off. Connection is made via a 57mm O-ring flat flange(supplied, item CC0057) and a #331 Viton® O-ring (supplied, item R331). Outer body length below flange is 300mm. Smaller size tubing adapters are also available below. Please order #15 O-ring joint stainless Steel clamp (CC2815) separately.

| Item#   | Description                       |
|---------|-----------------------------------|
| V381512 | Vacuum trap with #15 O-ring joint |

**Accessories:**

|         |   |
|---------|---|
| S540012 | 0-12mm high vacuum plug and control knob<br>(with Viton® O-ring at tip) |
| CC0057  | 57mm horseshoe clamp  |
| CC2815  | #15 O-ring joint stainless steel clamp                                  |
| R116    | #116 Viton® O-ring  |
| R331    | #331 Viton® O-ring  |


**VACUUM TRAP, WITH #15 O-RING JOINT**

For use with above manifolds with #15 O-ring joint. The seal between upper and lower parts is made with a 57mm flat O-ring flange. Trap body is 57mm O.D.×300mm in length. Complete trap assembly comes with CC0057 horseshoe clamp, One R331 Viton® O-ring and two R116 Viton® O-rings.

| Item#   | Description                    |
|---------|--------------------------------|
| V391557 | Vacuum trap assembly, complete |

**Accessories:**

|        |  |
|--------|--|
| CC0057 | 57mm horseshoe clamp                   |
| CC2815 | #15 O-ring joint stainless steel clamp |
| R116   | #116 Viton® O-ring                     |
| R331   | #331 Viton® O-ring                     |


**ADAPTER, CONNECTING, INLET**

Adapter has a #15 O-ring joint with a 0-4 mm high vacuum valve at a 90°angle connected to a piece of 10mm O.D. medium wall tubing, Overall height is 100mm. Each adapter is supplied completely with one #116 Viton® O-ring.

| Item#   | Description                        |
|---------|------------------------------------|
| A560001 | Adapter, 90°,with #15 O-ring joint |

**Accessories:**

|         |  |
|---------|--|
| S540004 | High vacuum valve, with Viton® O-ring at tip |
| CC2815  | #28 clamp for #15 O-ring joint               |
| R116    | #116 Viton® O-ring                           |

**STORAGE VESSEL, #15 O-RING JOINT**

Storage vessel with a #15 O-ring joint on the sidearm and a high vacuum valve to control gas or liquid flow into the vessel. Supplied complete with one #116 Viton® O-ring.

| Item#   | Capacity (mL) | Valve Size | Approx. Height (mm) |
|---------|---------------|------------|---------------------|
| S490050 | 50            | 0-4mm      | 190                 |
| S490100 | 100           | 0-8mm      | 235                 |
| S490350 | 350           | 0-8mm      | 240                 |

**Replacement Components:**

|         |  |
|---------|--|
| S600004 | 0-4mm high vacuum plug and control knob(Teflon®<br>O-ring at tip |
| S600008 | 0-8mm high vacuum plug and control knob(Teflon®<br>O-ring at tip |
| CC2815  | #15 O-ring joint stainless steel clamp                           |
| R116    | #116 Viton® O-ring   |


**STORAGE FLASK, #15 O-RING JOINT**

Flask has a #15 O-ring joint on the sidearm and a high vacuum valve to control gas or liquid flow into the vessel. Supplied complete with one #116 Viton® O-ring.

| Item#   | Capacity (mL) | Valve Size | Approx. Height (mm) |
|---------|---------------|------------|---------------------|
| S520500 | 500           | 0-8mm      | 190                 |
| S521000 | 1000          | 0-8mm      | 220                 |

**Replacement Components:**

|         |  |
|---------|--|
| S600008 | 0-8mm high vacuum plug and control knob(Teflon®<br>O-ring at tip |
| CC2815  | #15 O-ring joint stainless steel clamp                           |
| R116    | #116 Viton® O-ring   |




**VACUUM TRAP**

With joints for easy removal of condensate. Body length is measured below the joint. Connections at center tube is 10mm O.D. while side tube hose connection is 13mm.

| Item#   | Joint | O.D. Outer Body (mm) | Outer Body Length Below Joint(mm) | O.D. Inner& Side Tube (mm) |
|---------|-------|----------------------|-----------------------------------|----------------------------|
| V103029 | 29/42 | 32                   | 200                               | 10                         |
| V103834 | 34/45 | 40                   | 225                               | 13                         |
| V104045 | 40/50 | 50                   | 250                               | 16                         |
| V105045 | 45/50 | 50                   | 250                               | 22                         |
| V105050 | 50/50 | 55                   | 275                               | 26                         |
| V105550 | 55/50 | 60                   | 300                               | 30                         |


**VACUUM TRAP**

Trap is designed for large volume solvent removal by vacuum. With 45/50 joint. Connections at center tube is 12mm O.D. while side tube is 10mm.

| Item#   | Flask Capacity (mL) | Fits Dewar Flask Size | Approx. Overall Height×Width (mm) |
|---------|---------------------|-----------------------|-----------------------------------|
| V120500 | 500                 | 1900 mL               | 310×130                           |
| V121000 | 1000                | 4300 mL               | 340×130                           |


**VACUUM TRAP**

With joints for easy removal of condensate. Serrated hose connections for side tube have an O.D. of 13mm at the smallest serration and 16mm at the largest serration. Center tube hose connection is always 10mm for easy connection to manifold bank tubes which are also with 10mm hose connection.

| Item#   | Joint | O.D. Outer Body (mm) | Length, Outer Body Below Joint(mm) | O.D. Inner & Side Tube (mm) |
|---------|-------|----------------------|------------------------------------|-----------------------------|
| V163024 | 24/40 | 30                   | 200                                | 10                          |
| V163229 | 29/42 | 32                   | 200                                | 10                          |
| V164034 | 34/45 | 40                   | 225                                | 16                          |
| V164050 | 40/50 | 45                   | 250                                | 16                          |
| V165045 | 45/50 | 50                   | 250                                | 22                          |
| V165050 | 50/50 | 55                   | 275                                | 26                          |
| V165550 | 55/50 | 60                   | 300                                | 30                          |

**NMR TUBE WASHER**

With 24/40 inner joint and 10mm hose connection. For 5mm NMR tube only. The NMR tube is inserted into the tube cleaner with its plastic cap placed on the closed end to provide support and a vacuum seal. The washing solvent is sequentially added through the side tube while a vacuum is applied through the hose connection.

| Item#   | Joint |
|---------|-------|
| T100024 | 24/40 |

**VACUUM TRAP, MICRO, DEWAR**

Small scale dry ice, Dewar style trap. The dry-ice chamber is 40mm I.D. x 60mm in length. Choice PTFE stopcock for grease-free operation.

| Item#    | Lower Reservoir (mL) | Stopcock Type | Stopcock Bore (mm) |
|----------|----------------------|---------------|--------------------|
| V200100G | 100                  | Glass         | 2                  |
| V200100  | 100                  | Teflon®       | 2                  |

**Accessories:**

|         |   |
|---------|---|
| S181125 | Replacement 2mm Teflon® Plug Only                 |
| S461230 | Replacement 2mm Glass Plug Only                   |
| S691230 | Replacement S.S. Retention for 2mm Glass Stopcock |

**VACUUM TRAP, DEWAR TYPE**

Dry ice, Dewar style trap condenser designed for large volume solvent removal. Choice either glass stopcock for better vacuum or PTFE stopcock for grease-free operation. With 10mm hose connections.

| Item#    | Lower Reservoir (mL) | Stopcock Type | Stopcock Bore | Inner Chamber I.D. x Depth (mm) |
|----------|----------------------|---------------|---------------|---------------------------------|
| V210250G | 250                  | GLASS         | 4             | 59 x 230                        |
| V210250  | 250                  | Teflon®       | 4             | 59 x 230                        |
| V210500G | 500                  | GLASS         | 4             | 75 x 275                        |
| V210500  | 500                  | Teflon®       | 4             | 75 x 275                        |
| V211000G | 1000                 | GLASS         | 4             | 95 x 330                        |
| V211000  | 1000                 | Teflon®       | 4             | 95 x 330                        |

**Accessories:**

|         |   |
|---------|---|
| S181530 | Replacement 4mm PTFE Plug Only                    |
| S461740 | Replacement 4mm Glass Plug Only                   |
| S691740 | Replacement S.S. Retention for 4mm Glass Stopcock |




**SOLVENT STILL HEAD, REPURIFICATION (GREASE-FREE)**

Head only. Condenser and flasks not supplied. Access port has threaded 14/10 joint to accept a Teflon<sup>®</sup>-lined silicone septum with a compression cap (supplied). Threaded 14/10 also accept regular 14/20 glass or Teflon<sup>®</sup> stopper (not supplied).

| Item#   | Capacity(mL) | Joint |
|---------|--------------|-------|
| S134250 | 250          | 24/40 |
| S134500 | 500          | 24/40 |

**Accessories:**

- S211444 Replacement 4mm Double Oblique PTEF Plug  
 RC112 Replacement Nylon<sup>®</sup> compression cap  
 R1420 Replacement Teflon<sup>®</sup>-lined silicone septum


**SOLVENT STILL HEAD**

Similar to above but with drip tip on the delivery port other than 14/20 inner joint. With 4mm straight bore stopcock in the upper portion for easy syringe needle access.

| Item#   | Capacity(mL) | Top Joint | Bottom joint |
|---------|--------------|-----------|--------------|
| S234504 | 500          | 24/40     | 24/40        |
| S234004 | 1000         | 24/40     | 24/40        |

**Accessories:**

- S181530 Replacement 4mm Teflon<sup>®</sup> Plug Only  
 S201530 2mm Teflon<sup>®</sup> "T"-bore Stopcock Plug


**SOLVENT STILL HEAD**

Syringe port has 14/20 outer joint for a rubber septum and a 4mm Teflon<sup>®</sup> Stopcock. Solvent is drained through 2mm T-bore Teflon<sup>®</sup> stopcock. The drainage arm has a 14/20 inner joint.

| Item#   | Capacity(mL) | Top Joint | Bottom joint |
|---------|--------------|-----------|--------------|
| S244504 | 500          | 24/40     | 24/40        |
| S244004 | 1000         | 24/40     | 24/40        |
| S244509 | 1000         | 24/40     | 29/42        |

**Accessories:**

- S181530 Replacement 4mm Teflon<sup>®</sup> Plug Only  
 S201530 2mm Teflon<sup>®</sup> "T"-bore Stopcock Plug  
 A741420 Evacuation/purging adapter, 14/20

**SOLVENT STILL HEAD, HIGH VACUUM VALVES**

For great solvent/chemical resistance, the two 0-4mm high vacuum valves have Teflon<sup>®</sup> covers over the two Viton<sup>®</sup> O-ring on the shaft and one integral Teflon<sup>®</sup> O-rings on the tip, without exposing any material other than Teflon<sup>®</sup> to any solvents. Syringe port has a 4mm Teflon<sup>®</sup> stopcock and a 14/20 outer joint. Delivery port has 14/20 inner joint.

| Item#   | Capacity(mL) | Joints |
|---------|--------------|--------|
| S264250 | 250          | 24/40  |

**Accessories:**

|         |   |
|---------|---|
| S181530 | Replacement 4mm Teflon <sup>®</sup> Plug Only   |
| S660004 | 0-4mm high vacuum metering plug and control valve (Teflon <sup>®</sup> protect O-rings) |
| A741420 | Evacuation/purging adapter, 14/20   |


**SOLVENT STILL, BUILT-IN CONDENSER**

Grease-free design. Same as above with 14/10 threaded joint and Teflon<sup>®</sup>-lined septum for syringe access.

| Item#   | Capacity(mL) | Joint |
|---------|--------------|-------|
| S144125 | 125          | 24/40 |

**Accessories:**

|         |  |
|---------|--|
| S211444 | Replacement 4mm Double Oblique PTFE Plug               |
| RC112   | Replacement Nylon <sup>®</sup> compression cap         |
| R1420   | Replacement Teflon <sup>®</sup> -lined silicone septum |




**DISTILLING HEAD, SOLVENT**

Upper sampling port has a 4mm Teflon<sup>®</sup> stopcock with a 14/20 outer joint for use with septa. Lower drain is centered to allow total drainage of storage head.

| Item#   | Take-off Joint | Capacity (mL) | Double Oblique Stopcock Bore(mm) |
|---------|----------------|---------------|----------------------------------|
| S251250 | 14/20          | 250           | 2                                |
| S254250 | 24/40          | 250           | 2                                |
| S254500 | 24/40          | 500           | 2                                |
| S254000 | 24/40          | 1000          | 2                                |

**Accessories:**

S181530 Replacement 4mm Teflon<sup>®</sup> Plug Only

S211944 Replacement 2mm Double Oblique PTEF Plug


**SEPTUM, STOPPER, SLEEVE TYPE**

Flanged type stopper with a hollow plug and sleeve extension that folds down over the neck of vessel, tubing, etc. The diaphragm can be punctured with a syringe needle, resealing after needle is withdrawn.

| Item#    | For use with      |
|----------|-------------------|
| RS111420 | 14/20 outer joint |
| RS111922 | 19/22 outer joint |
| RS112440 | 24/40 outer joint |
| RS112942 | 29/42 outer joint |


**SYRINGE NEEDLE, STAINLESS STEEL**

Long needle for solvent retrieval.

| Item#   | O.D.(mm) | Length (mm) |
|---------|----------|-------------|
| S380216 | 1.2      | 180         |
| S380221 | 1.2      | 200         |
| S380230 | 1.6      | 300         |

**STOPPER, PENNY-HEAD, GLASS, HOLLOW**

All sizes are with joints. Heavy wall design.

| Item#   | Joint |
|---------|-------|
| S401018 | 10/18 |
| S401410 | 14/10 |
| S401420 | 14/20 |
| S401922 | 19/22 |
| S402440 | 24/40 |
| S402942 | 29/42 |
| S403445 | 34/45 |
| S404550 | 45/50 |


**STOPPER, PENNY-HEAD, GLASS, SOLID**

| Item#   | Joint |
|---------|-------|
| S291018 | 10/18 |
| S291030 | 10/30 |
| S291420 | 14/20 |
| S291922 | 19/22 |
| S292440 | 24/40 |
| S292942 | 29/42 |


**STOPPER, GLASS, FLASK LENGTH, PENNY-HEAD**

| Item#   | Joint* |
|---------|--------|
| S280013 | # 13   |
| S280016 | # 16   |
| S280019 | # 19   |
| S280022 | # 22   |
| S280027 | # 27   |
| S280032 | # 32   |
| S280038 | # 38   |



\* All sizes are solid except #32 and #38 which are hollow.


**STOPPER, CAP DESIGN**

For apparatus having an inner opening.

| Item#   | Joint |
|---------|-------|
| S391420 | 14/20 |
| S392440 | 24/40 |
| S392942 | 29/42 |


**STOPPER, WITH #15 O-RING JOINT**

For use with manifolds having #15 O-ring joints. Supplied completely with One #116(R116) Viton® O-ring.

| Item#   | Description              |
|---------|--------------------------|
| S480015 | #15 O-ring joint stopper |

**Accessories:**

|        |  |
|--------|--|
| CC2815 | #15 O-ring joint stainless steel clamp |
| R116   | #116 Viton® O-ring                     |


**STOPPER, SPHERICAL, PENNY-HEAD**

Hollow stopper for use with spherical socket joint.

| Item#   | Spherical Size |
|---------|----------------|
| S450035 | 35             |

**Accessory:**

|        |  |
|--------|--|
| CC3525 | Metal clamp for 35/20 or 35/25 spherical joint |
|--------|--|


**STOPPER, TEFLON®**

Teflon® handle stoppers for easy gripping.

| Item#   | Joint |
|---------|-------|
| S111420 | 14/20 |
| S111922 | 19/22 |
| S112425 | 24/25 |
| S112440 | 24/40 |
| S112942 | 29/42 |
| S113445 | 34/45 |

**STOPPER, TEFLON®, FLASK LENGTH**

| Item#   | Joint Size |
|---------|------------|
| S120013 | # 13       |
| S120016 | # 16       |
| S120022 | # 22       |
| S120027 | # 27       |
| S120038 | # 38       |

**STOPPER, PTFE**

Teflon® stopper has a Nylon® extraction nut permitting easy removal of the stopper from the glass outer joint.

| Item#   | Joint |
|---------|-------|
| S531018 | 10/18 |
| S531420 | 14/20 |
| S531922 | 19/22 |
| S532440 | 24/40 |

**TUBE, CONNECTING, Y-SHAPE**

| Item#   | Tubing O.D.(mm) |
|---------|-----------------|
| T110800 | 8               |

**TUBE, CONNECTING, T-SHAPE**

| Item#   | Tubing O.D.(mm) |
|---------|-----------------|
| T120800 | 8               |
| T121000 | 10              |

**CHECK VALVE**

All glass, with ground seat for liquid seal.

| Item#   | Hose Connection(mm) |
|---------|---------------------|
| V180008 | 8                   |




**SLEEVE, TEFLON®, RIBBED WITH GRIPPING RING**

| Item#   | Joint |
|---------|-------|
| T131420 | 14/20 |
| T131922 | 19/22 |
| T132440 | 24/40 |
| T132942 | 29/42 |
| T133445 | 34/45 |


**SPRING, STAINLESS STEEL**

| Item# | Length of Coil(mm) |
|-------|--------------------|
| TH006 | 6.35               |
| TH025 | 25.0               |
| TH032 | 32.0               |


**JOINT CLIP, STANDARD TAPER JOINT**

Made of plastic.

| Item#    | Joint |
|----------|-------|
| CS001420 | 14/20 |
| CS001922 | 19/22 |
| CS002440 | 24/40 |
| CS002942 | 29/42 |
| CS003445 | 34/45 |
| CS004550 | 45/50 |


**GLASS CUTTER, NATURAL DIAMOND**

With rack on shank for breaking off single or double strength glass.  
Extra large natural diamond for durability.

**Item#**  
DC18001

**CLAMP, HORSESHOE STYLE**

Made of aluminum with black epoxy coating.

| Item#  | For Flange Size |
|--------|-----------------|
| CC0057 | 57mm            |
| CC0080 | 80mm            |


**CLAMP, PINCH, STAINLESS STEEL, SPHERICAL**

With a screw type locking nut.

| Item#  | Spherical Joint size/O-ring Joint Size                            |
|--------|---|
| CC0012 | 12/5 ball joint, or #5 O-ring joint stainless steel clamp         |
| CC0018 | 18/8 ball joint, or #9 O-ring joint stainless steel clamp         |
| CC2815 | 28/15 ball joint, or #15 O-ring joint stainless steel clamp       |
| CC3525 | 35/20,35/25 ball joint, or #25 O-ring joint stainless steel clamp |
| CC0050 | 50/30 ball joint, or #30 O-ring joint stainless steel clamp       |
| CC0065 | 65/40 ball joint, or #40 O-ring joint stainless steel clamp       |
| CC0075 | 75/50 ball joint, or #50 O-ring joint stainless steel clamp       |



**O-RING, VITON®**

For solvent and chemical compatibility.



| Item# | Dimensions(mm) |       |      | Possible Application  |
|-------|----------------|-------|------|---|
|       | Size           | I.D.  | W    |   |
| R007  | 007            | 3.70  | 1.78 | 0-4mm high vacuum plug-tip or 5/5 threaded joint                            |
| R010  | 010            | 6.07  | 1.78 | 0-4mm high vacuum plug-shaft 7/10 threaded joint                            |
| R013  | 013            | 10.8  | 1.78 | O-ring for 15mm stopper of internal thread                                  |
| R014  | 014            | 12.30 | 1.78 | 14/10 threaded joints-Microscale  |
| R107  | 107            | 5.23  | 2.62 | Thermometer/inlet Adapters  |
| R108  | 108            | 6.0   | 2.62 | Top O-ring for 0-8mm high vacuum valve plug                                 |
| R110  | 110            | 9.2   | 2.62 | O-ring for 0-8mm high Vacuum valve plug/0-12mm high vacuum valve tip O-ring |
| R112  | 112            | 12.4  | 2.62 | 0-12mm high Vacuum valve shaft O-ring                                       |
| R116  | 116            | 18.7  | 2.62 | #15 O-ring joint  |
| R121  | 121            | 26.6  | 2.62 | O-ring for 25mm stopper of internal thread                                  |
| R212  | 212            | 21.8  | 3.50 | O-ring for 25mm bushing of internal thread                                  |
| R221  | 221            | 21.8  | 3.50 | Replacement #221 O-ring for Rodaviss joint                                  |
| R223  | 223            | 40.9  | 3.50 | Replacement #223 O-ring for Rodaviss joint                                  |
| R225  | 225            | 4.72  | 3.50 | O-ring for #50 internal thread  |
| R226  | 226            | 50.4  | 3.50 | O-ring for #40 O-ring joint   |
| R229  | 229            | 59.9  | 3.50 | O-ring for #50 O-ring joint   |
| R331  | 331            | 56.5  | 5.33 | 57mm flat O-ring flange   |


**FOUR FINGER CLAMP (SHANK)**

Die-cast alloy, Ni/Cr plated finish, with cork lined interlocking jaws. Accepts articles up to 80mm in diameter.

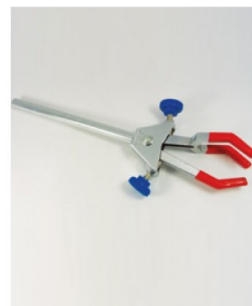
| Item#   | Model   |
|---------|---------|
| W170004 | Chromed |

**THREE FINGER DOUBLE ADJUST-ABLE CLAMP (LARGE)**

Double adjustable, PVC coated prongs, made of chrome-plated Zinc-alloy. Accept objects from 0 to 60mm.

**Item#**

W181103


**THREE FINGER DOUBLE ADJUST-ABLE CLAMP (SMALL)**

Double adjustable, PVC coated prongs, made of chrome-plated Zinc-alloy. Accept objects from 0 to 30mm.

**Item#**

W192203


**BOSSHEAD**

Chrome plated finish, plastic headed screws. For rods up to 15mm diameter.

**Item#**

W200002


**CLAMP THERMOMETER EXTENSION**

Extension rod 10mm in diameter. Total length: 200mm.

**Item#**

W140200


**CHAIN CLAMP**

With chain and spring, for diameter from 80mm to 150mm.

**Item#**

W150150



**SPATULAS**

One end rounded and bend up, one end square.



| Item#   | Length(mm) |
|---------|------------|
| W160100 | 100        |
| W160120 | 120        |
| W160125 | 125        |
| W160140 | 140        |
| W160150 | 150        |
| W160160 | 160        |
| W160180 | 180        |
| W160200 | 200        |
| W160220 | 220        |
| W160230 | 230        |

**WEIGHT RING**

Cast iron, PVC coated rings, for stabilizing Erlenmeyer flasks. Immersed in water.



| Item#   | Weight(kg) | I.D(mm) | For flasks |
|---------|------------|---------|------------|
| W110048 | 0.22       | 48      | 125-700mL  |
| W110056 | 0.45       | 56      | 250-1000mL |

**CAP, COMPRESSION, WITH HOLE**

Replacement caps with hole for use with thermometer/inlet adapters or microscale reaction vials.



| Item#  | Size (mm) | Possible Application             | Material |
|--------|-----------|----------------------------------|----------|
| RC005  | 8         | Side port Hickman still head     | Phenolic |
| RC009  | 13        | Thermometer/inlet adapters       | Nylon®   |
| RC112  | 20        | 14/10 threaded joints-Microscale | Nylon®   |
| RC2440 | 24        | 24/40 Rodaviss® Joint            | Nylon®   |

**SEPTUM, TEFLON®-LINED SILICONE RUBBER**

Made of silicone rubber with PTFE face.

| Item# | Size (mm) | Possible Application         |
|-------|-----------|------------------------------|
| R1408 | 8         | Side port-Hickman still head |
| R1413 | 13        | Thermometer/inlet adapters   |
| R1420 | 20        | 14/10 threaded joints        |


**REMOVABLE HOSE CONNECTION, FOR GL THREAD**

With Caps listed below. Order each part separately.

| Item#   | Size | Style                          |
|---------|------|--------------------------------|
| R201402 | 14   | Straight                       |
| R201801 | 18   | Straight                       |
| RC14    | 14   | #14 Nylon® Cap with 9.5mm hole |
| RC18    | 18   | #18 Nylon® Cap with 11mm hole  |


**PLURO-STOPPER**

Used with Buchner and fritted glass funnels.

| Item# | Size | Top/Bottom O.D. (mm) | Top/Bottom I.D. (mm) |
|-------|------|----------------------|----------------------|
| P10   | #1   | 21×11                | 17×7                 |
|       | #3   | 37×22                | 31×16                |
|       | #5   | 58×38                | 50×30                |
|       | #6   | 69×45                | 60×36                |



**SEPTUM, STOPPER, SLEEVE TYPE**

Flanged type stopper with a hollow plug and sleeve extension that folds down over the neck of vessel, tubing, etc. The diaphragm can be punctured with a syringe needle, resealing after needle is withdrawn.



| Item#    | For use with      |
|----------|-------------------|
| RS111420 | 14/20 outer joint |
| RS111922 | 19/22 outer joint |
| RS112440 | 24/40 outer joint |
| RS112942 | 29/42 outer joint |


**SEPTUM, STOPPER, SLEEVE TYPE THREADED**

Stoppers are made from natural white rubber.

| Item#    | Joint |
|----------|-------|
| RS121420 | 14/20 |
| RS121922 | 19/22 |
| RS122440 | 24/40 |


**SEPTUM, STOPPER, SLEEVE TYPE**

Stoppers are made from natural white rubber for use with 5mm OD NMR Tubes.

| Item#  | NMR TUBE OD (mm) |
|--------|------------------|
| RS1305 | 5                |

**SYRINGE NEEDLE, STAINLESS STEEL**

Long needle for solvent retrieval.

| Item#   | O.D.(mm) | Length (mm) |
|---------|----------|-------------|
| S380216 | 1.2      | 180         |
| S380221 | 1.2      | 200         |
| S380230 | 1.6      | 300         |


**CANNULA, STAINLESS STEEL**

For the transfer and handling of air sensitive materials.

| Item#   | Gauge | O.D.(mm) | I.D.(mm) | Needle Length(mm) |
|---------|-------|----------|----------|-------------------|
| C701618 | 16    | 1.65     | 1.20     | 460               |
| C701624 | 16    | 1.65     | 1.20     | 600               |
| C701636 | 16    | 1.65     | 1.20     | 900               |
| C701818 | 18    | 1.30     | 0.80     | 460               |
| C701824 | 18    | 1.30     | 0.80     | 600               |
| C701836 | 18    | 1.30     | 0.80     | 900               |
| C702018 | 20    | 0.90     | 0.60     | 460               |
| C702024 | 20    | 0.90     | 0.60     | 600               |
| C702036 | 20    | 0.90     | 0.60     | 900               |
| C702218 | 22    | 0.70     | 0.40     | 460               |
| C702224 | 22    | 0.70     | 0.40     | 600               |
| C702236 | 22    | 0.70     | 0.40     | 900               |


**THERMOMETER, WITH 10/18 JOINT**

With 10/18 joint, immersion length is measured from the bottom of 10/18 joint on thermometer to lower end of mercury bulb. Filling liquid is not Mercury.

Accuracy is  $\pm 1^{\circ}\text{C}$ .

| Item#   | Immersion(mm) | Range $^{\circ}\text{C}$ |
|---------|---------------|--------------------------|
| T162511 | 25            | -20 to 110               |
| T162525 | 25            | -20 to 250               |
| T162532 | 25            | -20 to 320               |
| T165011 | 50            | -20 to 110               |
| T165025 | 50            | -20 to 250               |
| T165032 | 50            | -20 to 320               |
| T167611 | 76            | -20 to 110               |
| T167625 | 76            | -20 to 250               |
| T167632 | 76            | -20 to 320               |




**STOPCOCK, TEFLON® STRAIGHT BORE**

With 1:5 Teflon® plug and a threaded pressure nut. Stopcock barrels are polished to prevent PTFE plug from scratch.

| Item#   | Bore(mm) | Plug size | Stem<br>O.D.(mm) |
|---------|----------|-----------|------------------|
| S101502 | 2        | 11/25     | 8                |
| S101504 | 4        | 15.2/30   | 10               |
| S101506 | 6        | 16/35     | 12               |

**Accessories:**

|         |                                   |
|---------|-----------------------------------|
| S181125 | Replacement 2mm Teflon® Plug Only |
| S181530 | Replacement 4mm Teflon® Plug Only |
| S181635 | Replacement 6mm Teflon® Plug Only |


**STOPCOCK REPLACEMENT PLUG, 1:5 TEFLON®, STRAIGHT BORE**

This replacement kit is complete with one Teflon® plug (1:5 taper), one Teflon® washer, one O-ring.

| Item#   | Plug size | Bore(mm) | Stopcock Type  |
|---------|-----------|----------|----------------|
| S181125 | 11/25     | 2        | handle and nut |
| S181530 | 15.2/30   | 4        | handle and nut |
| S181635 | 16/35     | 6        | handle and nut |


**STOPCOCK REPLACEMENT PLUG, 1:5 TEFLON®, METERING VALVE**

With a threaded Teflon® needle valve for the fine control of flow through the bore of the stopcock plug. This replacement kit is complete with all the components.

| Item#   | Plug Size | Bore(mm) |
|---------|-----------|----------|
| S191125 | 11/25     | 2        |
| S191530 | 15.2/30   | 4        |

**STOPCOCK, 1:5 TEFLON®, T-BORE**

Stopcock with three stems sealed 90° apart. Teflon® Plug has a “T” shape bore to connect any two or all three stems.

| Item# | Plug Size | Bore(mm) | Stem O.D.(mm) |
|-------|-----------|----------|---------------|
|-------|-----------|----------|---------------|

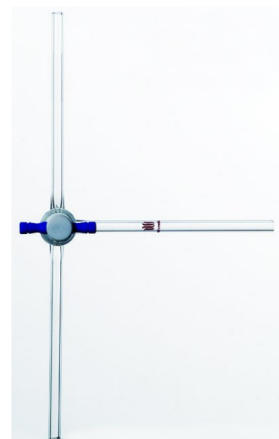
|         |         |   |   |
|---------|---------|---|---|
| S161530 | 15.2/30 | 2 | 8 |
|---------|---------|---|---|

|         |       |   |    |
|---------|-------|---|----|
| S161635 | 16/35 | 4 | 10 |
|---------|-------|---|----|

**Accessories:**

S201530 2mm Teflon® “T”-bore Stopcock Plug

S201635 4mm Teflon® “T”-bore Stopcock Plug


**STOPCOCK REPLACEMENT PLUG, 1:5 TEFLON®, T-BORE**

| Item# | Plug Size | Bore(mm) |
|-------|-----------|----------|
|-------|-----------|----------|

|         |         |   |
|---------|---------|---|
| S201530 | 15.2/30 | 2 |
|---------|---------|---|

|         |       |   |
|---------|-------|---|
| S201635 | 16/35 | 4 |
|---------|-------|---|


**STOPCOCK, 1:5 TEFLON®, DOUBLE OBLIQUE BORE**

With polished barrels.

| Item# | Plug Size | Bore(mm) | Stem O.D.(mm) |
|-------|-----------|----------|---------------|
|-------|-----------|----------|---------------|

|         |         |   |   |
|---------|---------|---|---|
| S171244 | 12.9/44 | 2 | 8 |
|---------|---------|---|---|

|         |         |   |    |
|---------|---------|---|----|
| S171444 | 14.4/44 | 4 | 10 |
|---------|---------|---|----|

**Accessories:**

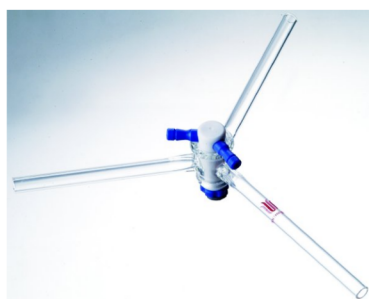
S211944 Replacement 2mm Double Oblique PTFE Plug

S211444 Replacement 4mm Double Oblique PTFE Plug




**STOPCOCK REPLACEMENT PLUG, 1:5 TEFLON®,  
DOUBLE OBLIQUE BORE**

| Item#   | Plug Size | Bore(mm) |
|---------|-----------|----------|
| S211944 | 12.9/44   | 2        |
| S211444 | 14.4/44   | 4        |


**STOPCOCK, TEFLON®, 120° BORE**

A 1:5 taper Teflon® stopcock with three sidearms sealed 120° apart  
Plug has a bore to allow connection of any two arms at once.

| Item# | Plug Size | Bore(mm) | Stem O.D.(mm) |
|-------|-----------|----------|---------------|
|-------|-----------|----------|---------------|

|         |         |   |   |
|---------|---------|---|---|
| S411530 | 15.2/30 | 2 | 8 |
|---------|---------|---|---|

**Accessory:**

|         |                                     |
|---------|-------------------------------------|
| S221530 | 2mm Teflon® 120° Bore Stopcock Plug |
|---------|-------------------------------------|


**STOPCOCK, GLASS, HIGH VACUUM, STRAIGHT BORE**

Plug is precision ground and hand-lapped with corresponding numbers  
one the barrel and plug, 1:10 taper. With constant pressure retention spring  
and clip.

| Item# | Plug Size | Bore(mm) | Stem O.D.(mm) |
|-------|-----------|----------|---------------|
|-------|-----------|----------|---------------|

|         |       |   |    |
|---------|-------|---|----|
| S331230 | 12/30 | 2 | 8  |
| S331740 | 17/40 | 4 | 10 |
| S332044 | 20/44 | 6 | 12 |

**Accessories:**

|         |   |
|---------|---|
| S691230 | Replacement S.S. Retention for 2mm Glass Stopcock |
| S691740 | Replacement S.S. Retention for 4mm Glass Stopcock |
| S692044 | Replacement S.S. Retention for 6mm Glass Stopcock |

**STOPCOCK, STRAIGHT BORE, GLASS, INTERCHANGEABLE**

Plugs and barrels are ground to be interchangeable, with 1:10 taper.

| Item#   | Bore(mm) | Stem O.D.<br>(mm) | Supplied |
|---------|----------|-------------------|----------|
| S321230 | 2        | 8                 | Complete |
| S321740 | 4        | 10                | Complete |
| S322044 | 6        | 12                | Complete |

**Accessories:**

|         |   |
|---------|---|
| S461230 | Replacement 2mm Glass Plug Only                   |
| S461740 | Replacement 4mm Glass Plug Only                   |
| S462044 | Replacement 6mm Glass Plug Only                   |
| S691230 | Replacement S.S. Retention for 2mm Glass Stopcock |
| S691740 | Replacement S.S. Retention for 4mm Glass Stopcock |
| S692044 | Replacement S.S. Retention for 6mm Glass Stopcock |


**STOPCOCK REPLACEMENT PLUG 1:10 GLASS**

To be used with constant pressure retention kit (S69)

| Item#   | Bore(mm) | Plug<br>size(mm) | Stopcock<br>Type |
|---------|----------|------------------|------------------|
| S461230 | 2        | 12/30            | Straight glass   |
| S461740 | 4        | 17/40            | Straight glass   |

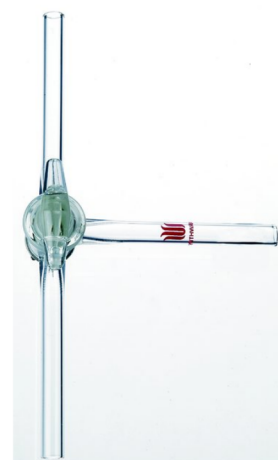

**STOPCOCK, GLASS, T-BORE**

With solid glass plug. With constant pressure retention spring and clip.

| Item#   | Plug Size | Bore(mm) | Stem O.D.(mm) |
|---------|-----------|----------|---------------|
| S310217 | 12/30     | 2        | 8             |
| S311740 | 17/40     | 4        | 10            |
| S312044 | 20/44     | 6        | 12            |

**Accessories:**

|         |   |
|---------|---|
| S510217 | Replacement "T"-bore glass plug, 2mm hole         |
| S511740 | 4mm Glass "T"-bore Stopcock Plug                  |
| S512044 | Replacement T-bore glass plug, 6mm hole           |
| S691230 | Replacement S.S. Retention for 2mm Glass Stopcock |
| S691740 | Replacement S.S. Retention for 4mm Glass stopcock |
| S692044 | Replacement S.S. Retention for 6mm Glass Stopcock |




**REPLACEMENT STAINLESS STEEL RETENTION KIT**

| Item#   | Plug Size(mm) |
|---------|---------------|
| S691230 | 12/30         |
| S691740 | 17/40         |
| S691750 | 17.35/50      |
| S691656 | 16.2/56       |
| S692044 | 20/44         |

**STOPCOCK, GLASS, HIGH VACUUM, DOUBLE OBLIQUE BORE**

With solid glass plug. Barrel and plug are precision ground, hand lapped with corresponding numbers on the barrel and plug. With constant pressure retention spring and clip.



| Item# | Plug Size | BoreSize(mm) | Sidearm O.D.(mm) |
|-------|-----------|--------------|------------------|
|-------|-----------|--------------|------------------|

|         |         |   |    |
|---------|---------|---|----|
| S391656 | 16.2/56 | 4 | 10 |
|---------|---------|---|----|

Accessories:

|         |  |
|---------|--|
| S691656 | Replacement S.S. Retention Kit for<br>16.2/56 Glass Stopcock |
|---------|--|

**STOPCOCK, GLASS, HOLLOW PLUG, OBLIQUE, HIGH VACUUM**

Precision ground with corresponding numbers on the barrel and plug. Lower vacuum chamber is evacuated via a separate 2mm hole in the plug which is not in the line of flow.



| Item# | Plug Size | Bore(mm) | Stem O.D.(mm) |
|-------|-----------|----------|---------------|
|-------|-----------|----------|---------------|

|         |          |   |    |
|---------|----------|---|----|
| S341750 | 17.35/50 | 4 | 10 |
|---------|----------|---|----|

|         |       |   |    |
|---------|-------|---|----|
| S342565 | 25/65 | 8 | 16 |
|---------|-------|---|----|

**STOPCOCK, GLASS, HOLLOW PLUG, DOUBLE OBLIQUE, HIGH VACUUM**

Precision ground with corresponding numbers on the barrel and plug.  
Lower vacuum chamber is evacuated via a separate 2mm hole in the plug which is not in the line of flow.

| Item# | Plug Size | Bore(mm) | Stem O.D.(mm) |
|-------|-----------|----------|---------------|
|-------|-----------|----------|---------------|

|         |         |   |    |
|---------|---------|---|----|
| S351656 | 16.2/56 | 4 | 10 |
|---------|---------|---|----|


**STOPCOCK, GLASS, HOLLOW PLUG, OFFSET, HIGH VACUUM**

Precision ground with corresponding numbers on the barrel and plug.  
Lower vacuum chamber is evacuated via a separate 2mm hole in the plug which is not in the line of flow.

| Item# | Plug Size | Bore(mm) | Stem O.D.(mm) |
|-------|-----------|----------|---------------|
|-------|-----------|----------|---------------|

|         |          |   |    |
|---------|----------|---|----|
| S701240 | 12.6/40  | 2 | 8  |
| S701754 | 17.35/50 | 4 | 10 |
| S701756 | 17.35/50 | 6 | 12 |


**STOPCOCK, GLASS, HOLLOW PLUG, 90°, HIGH VACUUM**

Precision ground with corresponding numbers on the barrel and plug.  
Lower vacuum chamber is evacuated via a separate 2mm hole in the plug which is not in the line of flow.

| Item# | Plug Size | Bore(mm) | Stem O.D.(mm) |
|-------|-----------|----------|---------------|
|-------|-----------|----------|---------------|

|         |          |   |    |
|---------|----------|---|----|
| S711240 | 12.6/40  | 2 | 8  |
| S711754 | 17.35/50 | 4 | 10 |
| S711756 | 17.35/50 | 6 | 12 |


**STOPCOCK, GLASS, HOLLOW PLUG, T-TYPE, HIGH VACUUM**

Precision ground with corresponding numbers on the barrel and plug.  
Lower vacuum chamber is evacuated via a separate 2mm hole in the plug which is not in the line of flow.

| Item# | Plug Size | Bore(mm) | Stem O.D.(mm) |
|-------|-----------|----------|---------------|
|-------|-----------|----------|---------------|

|         |          |   |    |
|---------|----------|---|----|
| S721240 | 12.6/40  | 2 | 8  |
| S721754 | 17.35/50 | 4 | 10 |



**PLUG, HIGH VACUUM VALVE, PTFE STEM, VITON® O-RING**

Complete with control knob and PTFE stem having three O-rings.



| Item#   | Description   |
|---------|---|
| S540004 | 0-4mm high vacuum plug and control knob Viton® O-ring at tip  |
| S540008 | 0-8mm high vacuum plug and control knob Viton® O-ring at tip  |
| S540012 | 0-12mm high vacuum plug and control knob Viton® O-ring at tip |

**Accessories:**

- R7010 Viton® O-ring replacement Kit (Two 010 shaft O-rings and one 007 tip O-ring)for 0-4mm plug
- R108110 Viton® O-ring replacement Kit (Two 010 shaft O-rings and one 007 tip O-ring)for 0-4mm plug
- R110112 Viton® O-ring replacement Kit (Two 010 shaft O-rings and one 007 tip O-ring)for 0-4mm plug

**VALVE, HIGH VACUUM, PTFE, O-RING, 90°**

With two 9mm O.D. sidearms sealed to the barrel at a 90° angle to one another. The non-rotating PTFE plug has three O-rings, the tip O-ring making the primary seal on the precision formed tapered seat.



| Item#   | Description                           |
|---------|---------------------------------------|
| S550004 | 0-4mm high vacuum valve,90° ,complete |

**Accessory:**

- S540004 0-4mm high vacuum plug and control knob Viton® O-ring at tip

**VALVE, HIGH VACUUM, PTFE, O-RING, 180°**

With two 9mm O.D. sidearms sealed to the barrel at a 90° angle to one another. The non-rotating PTFE shaft has three O-rings, the tip O-ring making the primary seal on the precision formed tapered seat . For replacement Viton® O-ring Kit, see R7010,or R108110.



| Item#   | Description                   |
|---------|-------------------------------|
| S560004 | 0-4mm high vacuum valve ,180° |
| S560008 | 0-8mm high vacuum valve ,180° |

**Accessories:**

- S540004 0-4mm high vacuum plug and control knob Viton® O-ring at tip
- S540008 0-8mm high vacuum plug and control knob Viton® O-ring at tip

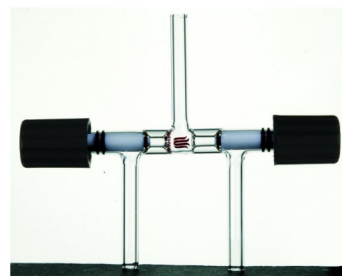
**VALVE, HIGH VACUUM, PTFE, O-RING, THREE-WAY**

With two 9mm O.D. sidearms sealed to the barrel at a 90° angle to one another. The non-rotating PTFE plug has three O-rings, the tip O-ring making the primary seal on the precision formed tapered seat.

| Item#   | Description                      |
|---------|----------------------------------|
| S580008 | 0-8mm high vacuum valve (3-way)  |
| S580012 | 0-12mm high vacuum valve (3-way) |

**Accessories:**

|         |   |
|---------|---|
| S540008 | 0-8mm high vacuum plug and control knob Viton® O-ring at tip  |
| S540012 | 0-12mm high vacuum plug and control knob Viton® O-ring at tip |

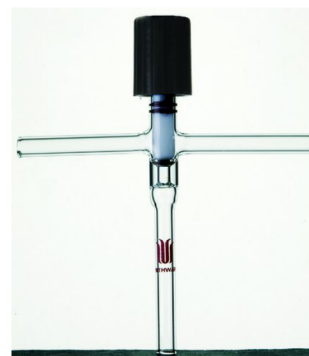

**VALVE, HIGH VACUUM, PTFE, O-RING, T-TYPE**

With two 9mm O.D. sidearms sealed to the barrel at a 90° angle to one another, The non-rotating PTFE shaft has three O-rings, the tip O-ring making the primary seal on the precision formed tapered seat. For replacement Viton® O-ring Kit, see R110112.

| Item#   | Description                      |
|---------|----------------------------------|
| S590012 | 0-12mm high vacuum valve(T-Type) |

**Accessory:**

|         |  |
|---------|--|
| S540012 | 0-12mm high vacuum plug and control knob<br>Viton® O-ring at tip |
|---------|--|


**PLUG, HIGH VACUUM, TEFLON® PROTECTED**

Complete with control knob. Viton® O-rings on PTFE shaft are protected with precision Teflon® wipers. The plug has a machined-in integral PTFE tip O-ring to make the primary seal. This design provides for an excellent vacuum tight seal without exposing any material other than Teflon® to chemicals.

| Item#   | Description   |
|---------|---|
| S600004 | 0-4mm high vacuum plug and control knob(Teflon® O-ring at tip)  |
| S600008 | 0-8mm high vacuum plug and control knob(Teflon® O-ring at tip)  |
| S600012 | 0-12mm high vacuum plug and control knob(Teflon® O-ring at tip) |



**VALVE, HIGH VACUUM, TEFLON® PROTECTED, 180°**

With two 9mm O.D. sidearms sealed to the barrel at a 180° angle to one another. Viton® O-ring on PTFE shaft are protected with precision Teflon® wipers. The plug has a machined-in integral PTFE tip O-ring to make the primary seal. This design provides for an excellent vacuum tight seal without exposing any material other than Teflon® to chemicals.



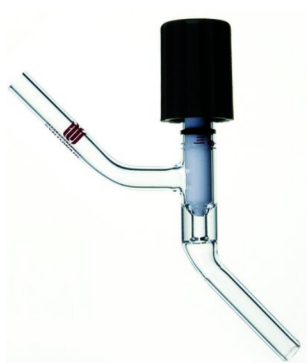
| Item#   | Description                    |
|---------|--------------------------------|
| S620004 | 0-4mm high vacuum valve(180°)  |
| S620008 | 0-8mm high vacuum valve(180°)  |
| S620012 | 0-12mm high vacuum valve(180°) |

**Accessories:**

|         |   |
|---------|---|
| S600004 | 0-4mm high vacuum plug and control Knob(Teflon® covered O-ring)   |
| S600008 | 0-8mm high vacuum plug and control Knob(Teflon® covered O-ring )  |
| S600012 | 0-12mm high vacuum plug and control Knob(Teflon® covered O-ring ) |

**VALVE, HIGH VACUUM, TEFLON® PROTECTED, LOW HOLD UP**

With two 9mm O.D. sidearms bent to minimize hold up of liquids,. Viton® O-ring on PTFE shaft are protected with precision Teflon® wipers. The plug has a machined-in integral PTFE tip O-ring to make the primary seal. This design provides for an excellent vacuum tight seal without exposing any material other than Teflon® to chemicals



| Item#   | Description                           |
|---------|---------------------------------------|
| S630004 | 0-4mm high vacuum valve(Low hold up)  |
| S630008 | 0-8mm high vacuum valve(Low hold up)  |
| S630012 | 0-12mm high vacuum valve(Low hold up) |

**Accessories:**

|         |   |
|---------|---|
| S600004 | 0-4mm high vacuum plug and control Knob(Teflon® covered O-ring)   |
| S600008 | 0-8mm high vacuum plug and control Knob(Teflon® covered O-ring )  |
| S600012 | 0-12mm high vacuum plug and control Knob(Teflon® covered O-ring ) |

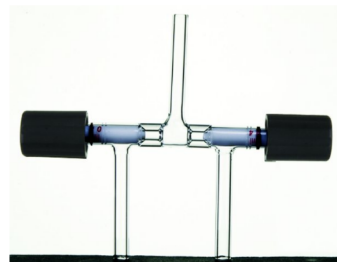
**VALVE, HIGH VACUUM, TEFLON® PROTECTED, THREE-WAY**

Viton® O-ring on PTFE shaft are protected with precision Teflon® wipers. The plug has a machined-in integral PTFE tip O-ring to make the primary seal. This design provides for an excellent vacuum tight seal without exposing any material other than Teflon® to chemicals.

| Item#   | Description                    |
|---------|--------------------------------|
| S640008 | 0-8mm high vacuum valve(3-way) |

**Accessory:**

|         |   |
|---------|---|
| S600008 | 0-8mm high vacuum plug and control Knob(Teflon® covered O-ring) |
|---------|---|


**PLUG, HIGH VACUUM, TEFLON® PROTECTED, METERING**

Complete with control knob. Viton® O-rings on PTEF shaft are protected with two precision Teflon® wipers (or as shown in the second picture, O-ring is inside shaft).The plug has a machined-in integral PTFE tip O-ring to make the primary seal. This design provide for an excellent vacuum tight seal without exposing any material other than Teflon® to chemicals.

| Item#   | Description  |
|---------|--|
| S660004 | 0-4mm high vacuum metering plug and control Valve (Teflon® half-covered O-ring)  |
| S660008 | 0-8mm high vacuum metering plug and control Valve (Teflon® half-covered O-ring)  |
| S660012 | 0-12mm high vacuum metering plug and control Valve (Teflon® half-covered O-ring) |




**VALVE, HIGH VACUUM, TEFLON® PROTECTED, 90° METERING**

Viton® O-ring on PTFE shaft are protected with precision Teflon® wipers.

The plug has a machined-in integral PTFE tip O-ring to make the primary seal.

This design provides for an excellent vacuum tight seal without exposing any material other than Teflon® to chemicals. The glass portion has two sidearms sealed to the barrel at a 90° angle to one another.

| Item#   | Description  |
|---------|--|
| S670008 | 0-8mm high vacuum valve 90°<br>( Teflon® covered O-rings ) |

**Accessory:**

|         |   |
|---------|---|
| S660008 | 0-8mm high vacuum metering plug<br>and control Valve (Teflon®<br>half-covered O-ring) |
|---------|---|

**VALVE, HIGH VACUUM, TEFLON® PROTECTED,  
LOW HOLD UP, METERING**

Viton® O-ring on PTFE shaft are protected with precision Teflon® Wipers.

The plug has a machined-in integral PTFE tip O-ring to make the primary seal.

This design provides for an excellent vacuum tight seal without exposing any material other than Teflon® to chemicals. With two 9mm O.D. sidearm bent to minimize hold up of liquids.



| Item#   | Description                                      |
|---------|--|
| S680004 | 0-4mm high vacuum valve low hold up<br>metering  |
| S680008 | 0-8mm high vacuum valve low hold up<br>metering  |
| S680012 | 0-12mm high vacuum valve low hold up<br>metering |

**Accessories:**

|         |   |
|---------|---|
| S660004 | 0-4mm high vacuum metering plug and<br>control valve(Teflon® covered O-rings)       |
| S660008 | 0-8mm high vacuum metering plug and<br>control Valve (Teflon® half-covered O-ring)  |
| S660012 | 0-12mm high vacuum metering plug and<br>control Valve (Teflon® half-covered O-ring) |

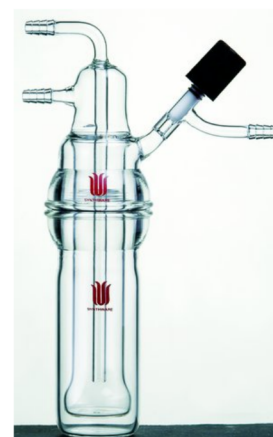
**SUBLIMATOR**

A grease-free, two-piece sublimation apparatus consisting of an upper water cooled condenser and lower vessel to hold the material to be sublimed. The sublimate collects on the lower end of the condenser which has a flat bottom. Condenser is constructed using a grease-free, threaded valve. Connection of the condenser and lower vessel via an O-ring joint enables the two parts to be gently separated for maximum product recovery. Complete apparatus consists of the cold finger condenser, lower vessel, Viton<sup>®</sup> O-ring and stainless steel pinch clamp.

| Item#   | Description                  | Capacity<br>(mL) | Joint<br>Size | O-Ring<br>Size | Clamp<br>Size |
|---------|------------------------------|------------------|---------------|----------------|---------------|
| S732510 | 10mL sublimation<br>Complete | 10               | 25            | 217            | 35            |
| S734040 | 40mL sublimation<br>Complete | 40               | 40            | 226            | 65            |
| S735060 | 60mL sublimation<br>Complete | 60               | 50            | 229            | 75            |

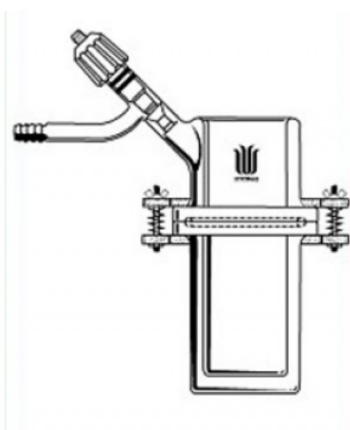
**Accessories:**
**Application**

|         |   |
|---------|---|
| CC3525  | #35 Stainless steel clamp or #25 O-ring joint                                     |
| CC0065  | #65 Stainless steel clamp or #40 O-ring joint                                     |
| CC0075  | #75 ball joint or #50 O-ring joint  |
| R217    | #217 Viton <sup>®</sup> O-ring for #25 O-ring joint                               |
| R226    | #226 Viton <sup>®</sup> O-ring for #40 O-ring joint                               |
| R229    | #229 Viton <sup>®</sup> O-ring for #50 O-ring joint                               |
| S600004 | 0-4mm high vacuum plug and control knob<br>(Teflon <sup>®</sup> protected O-ring) |



**SUBLIMATION APPARATUS**

Two-piece grease-free sublimer with a flat bottom to enable heating on a hot plate stirrer. Condenser has a large top opening for use with dry ice/acetone or liquid nitrogen. Connection between the flask and condenser is made with a flat O-ring joint permitting parts to be gently separated for maximum product recovery. The capacity listed is that below the bottom of the cold finger. Vacuum control is provided by a 0-8mm high vacuum valve. Complete apparatus consists of the condenser, flask, Viton<sup>®</sup> O-ring and horseshoe clamp.



| Item#   | Description             | Capacity (mL) | O-Ring Size | Flange Size(mm) |
|---------|-------------------------|---------------|-------------|-----------------|
| S740100 | 100mL Sublimer Complete | 100           | 331         | 57              |
| S740150 | 150mL Sublimer Complete | 150           | 339         | 80              |

**Replacement Components:**

|         |                                |
|---------|--------------------------------|
| R331    | #331 Viton <sup>®</sup> O-ring |
| R339    | #339 Viton <sup>®</sup> O-ring |
| S600008 | 0-8mm PTFE Plug Only           |
| CC0057  | 57mm Horseshoe Clamp           |
| CC0080  | 80mm Flange Horseshoe Clamp    |


**SUBLIMATOR, WITH 2MM GLASS STOPCOCK**

Supplied with a special 25mL long-neck flask for small volume efficiency.

| Item#    | Stopcock  | Joint |
|----------|-----------|-------|
| D232440G | 2mm Glass | 24/40 |

**Accessories:**

|          |   |
|----------|---|
| DF302425 | Flask, round bottom, long neck, 25mL              |
| S461230  | Replacement 2mm Glass Plug Only                   |
| S691230  | Replacement S.S. Retention for 2mm Glass stopcock |

**ADAPTER, GAS INLET/OUTLET**

For microscale applications.

| Item#   | Joint | Hose Connection<br>O.D.(mm) |
|---------|-------|-----------------------------|
| A301410 | 14/10 | 8                           |

**ADAPTER, VACUUM, WITH 1:5 TEFLON® STOPCOCK**

For microscale applications.

| Item#   | Joint | Stopcock<br>Bore (mm) | Hose Connection<br>O.D.(mm) |
|---------|-------|-----------------------|-----------------------------|
| A381410 | 14/10 | 2                     | 8                           |

**ADAPTER, INLET OR THERMOMETER**

With a compression cap and Viton® O-ring to form a vacuum tight seal.

To use it as syringe port, simply replace the O-ring with Teflon®-lined septum. Cap accommodates 5.0-7.5mm O.D. thermometer.

Supplied with one Nylon® cap (RC009) and one Viton® O-ring (R107).

| Item#   | Joint |
|---------|-------|
| A771410 | 14/10 |

**ADAPTER, THERMOMETER, WITH HOSE CONNECTION**

With a compression cap and Viton® O-ring to form a vacuum tight seal.

To use it as syringe port, simply replace the O-ring with Teflon®-lined septum.

Cap accommodates 5.0-7.5mm O.D. thermometer.

Supplied with one Nylon® cap (RC009) and one Viton® O-ring (R107).

| Item#   | Joint |
|---------|-------|
| A781410 | 14/10 |




**ADAPTER, DISTILLATION, THREADED**

Supplied with one holed compression cap and one Viton® O-ring.  
For replacement caps, see RC112; for Viton® O-ring, see R014.

| Item#   | Joint |
|---------|-------|
| A351410 | 14/10 |


**ADAPTER, CLAISEN, THREADED**

Supplied with two holed compression caps, two Viton® O-rings and two Teflon®-lined silicone rubber septa. For replacement caps, see RC112; for Viton® O-rings, see R014; for septa, see R1420.

| Item#   | Joint |
|---------|-------|
| A371410 | 14/10 |


**ADAPTER, VACUUM TAKEOFF, THREADED**

Supplied with one holed compression cap and one Viton® O-ring.  
For replacement caps, see RC112; for Viton® O-ring, see R014.

| Item#   | Joint |
|---------|-------|
| A621410 | 14/10 |


**CONDENSER, AIR REFLUX, THREADED**

Supplied with one holed compression cap one Viton® O-ring. For replacement caps, see RC112; for Viton® O-rings, see R014.

| Item#   | Joint | Effective Length (mm) |
|---------|-------|-----------------------|
| C221410 | 14/10 | 100                   |

**COLUMN, DISTILLING, VIGREUX**

Supplied with one holed compression cap and one Viton® O-ring.  
For replacement caps, see RC112; for Viton® O-rings, see R014.

| Item#    | Joint | Overall Length<br>(mm) | Length<br>Indented<br>Section (mm) |
|----------|-------|------------------------|------------------------------------|
| C221410B | 14/10 | 122                    | 75                                 |


**COLUMN, AIR REFLUX, 14/20 JOINT**

| Item#   | Joints | Overall<br>Length<br>(mm) | Length<br>between<br>Joints(mm) |
|---------|--------|---------------------------|---------------------------------|
| C221420 | 14/20  | 143                       | 96                              |


**CONDENSER, REFLUX, JACKETED, THREADED**

I.D. of inner tube is designed large enough to accept a thermometer. Supplied with one holed compression cap and one Viton® O-ring. For replacement caps, see RC112; for Viton® O-ring, see R014.

| Item#   | Joint | Jacket Length<br>(mm) | Hose Connection<br>O.D. (mm) |
|---------|-------|-----------------------|------------------------------|
| C201080 | 14/10 | 80                    | 8                            |


**CONDENSER, COIL REFLUX**

For low boiling solvents. Supplied with one holed compression cap and one Viton® O-ring. For replacement caps, see RC112; for Viton® O-rings, see R014; for septa, see R1420.

| Item#   | Joint |
|---------|-------|
| C321410 | 14/10 |




**TUBE, DRYING, 90° BENT**

| Item#   | Joint |
|---------|-------|
| A851410 | 14/10 |


**HICKMAN STILL HEAD**

Designed for microscale fractional distillation. Supplied with one compression cap, one Viton® O-ring and one Teflon® - faced silicone rubber septum. For replacement caps, see RC112; for Viton® O-rings, see R014; for septa, See R1420.

| Item#   | Joint |
|---------|-------|
| H101410 | 14/10 |


**HICKMAN STILL HEAD, WITH SIDE PORT**

Side port with cap and 8mm Teflon®-lined septum for syringe injection or retrieval. Designed for microscale fractional distillation. Supplied with one compression cap, one Viton® O-ring and one Teflon® -faced silicone rubber septum. For replacement caps, see RC005 and RC112; for Viton® O-rings, see R014; for septa, see R1408 and R1420.

| Item#   | Joint |
|---------|-------|
| H121410 | 14/10 |


**DISTILLATION HEAD, HICKMAN-HINKLE, WITH SIDE PORT**

This head has a threaded side port with septum and cap for easier syringe access to well contents. Supplied with one compression cap, one Viton® O-ring and one Teflon®-faced silicone rubber septum. For replacement caps, see RC005 and RC112; for Viton® O-rings, see R014; for septa, see R1408 and R1420.

| Item#   | Joint |
|---------|-------|
| H141410 | 14/10 |

**TUBE, CRAIG RECRYSTALLIZATION**

Complete with a glass outer tube and an inner plug.

| Item#   | Capacity Below Grind |
|---------|----------------------|
| T140002 | 2mL, Complete        |


**VIAL, CONICAL REACTION, HEAVY WALL, GRADUATED**

Supplied with one holed compression cap, one Viton® O-ring and one Teflon® -faced silicone rubber septum. For replacement caps, see RC112; For Viton® O-rings, see R014; for septa, see R1420.

| Item#   | Joint  | Capacity(mL) |
|---------|--------|--------------|
| V130501 | 5/5*   | 0.1          |
| V130701 | 7/10** | 0.1          |
| V130711 | 7/10** | 1            |
| V131003 | 14/10  | 3            |
| V131005 | 14/10  | 5            |
| V131008 | 14/10  | 8            |

\*5/5 joint uses RC005 cap, R1408 septa and R006 O-ring.

\*\*7/10 joint uses RC009 cap, R1413 septa and R107 O-ring.


**CONICAL REACTION VIAL, 14/20, GRADUATED**

Heavy wall vials have an internal conical bottom and flat bottom.

| Item#   | Joint | Capacity(mL) |
|---------|-------|--------------|
| V141003 | 14/20 | 3            |
| V141005 | 14/20 | 5            |
| V141008 | 14/20 | 8            |




**FLASK, ROUND BOTTOM, THREADED**

Supplied with one holed compression caps, one Viton® O-rings and one Teflon® - faced silicone rubber septum. For replacement caps, see RC112; for Viton® O-rings, see R014; for septa, see R1420.

| Item#   | Joint | Capacity (mL) |
|---------|-------|---------------|
| F301005 | 14/10 | 5             |
| F301010 | 14/10 | 10            |
| F301025 | 14/10 | 25            |


**FLASK, PEAR SHAPE, THREADED**

Supplied with one compression cap, one Viton® O-ring and one Teflon® -faced silicone rubber septum. For replacement caps, see RC112; for Viton® O-rings, see R014; for septa, see R1420.

| Item#   | Joint | Capacity(mL) |
|---------|-------|--------------|
| F321005 | 14/10 | 5            |
| F321010 | 14/10 | 10           |
| F321025 | 14/10 | 25           |


**FLASK, ROUND BOTTOM, 3-NECK**

Microscale, round bottom flask with three 14/10 outer ground joints externally threaded. For replacement caps, see RC112; for Viton® O-rings, see R014; for septa, see R1420.

| Item#   | Joint | Capacity(mL) |
|---------|-------|--------------|
| F591025 | 14/10 | 25           |
| F591050 | 14/10 | 50           |


**FUNNEL, FILTER**

With 14/20 joints and a 20mm O.D. fritted disc.

| Item#    | Joints | Disc O.D.<br>(mm) | Disc<br>Porosity |
|----------|--------|-------------------|------------------|
| F381420M | 14/20  | 20                | M                |

**FILER FUNNEL, HIRSCH**

With 10mm O.D. fritted disc of coarse porosity for all microscale application with 14/10 joints. The capacity above disc is approximately 7mL. The O.D. of plain stem is 7mm.

| Item#    | Porosity |
|----------|----------|
| F650010C | C        |


**FUNNEL, MICRO**

| Item#   | Description      |
|---------|------------------|
| F740027 | 27mm O.D. on top |


**STILL, SOLVENT REFLUX, MICROSCALE**

Capacity of collection bulb is 15mL and has side syringe port with cap and septum for removal of solvent. With 2mm Teflon® stopcock and 14/20 Joints.

| Item#   | Description                  |
|---------|------------------------------|
| S431015 | Complete, w/o two-neck flask |
| F411125 | Two neck flask, 14/20, 25ml  |
| RC005   | 8mm Side port cap with hole  |


**FLASK, ERLLENMEYER, THREADED**

Supplied with one compression cap, one Viton® O-ring and one Teflon®-faced silicone rubber septum. For replacement caps, see RC112; for Viton® O-ring s, see R014; for septa, see R1420.

| Item#   | Joint | Capacity ( mL) |
|---------|-------|----------------|
| F501005 | 14/10 | 5              |
| F501010 | 14/10 | 10             |
| F501025 | 14/10 | 25             |




**FLASK, FILTERING, MICROSCALE**

Top is tooled for a #2 neoprene filter adapter or #3 rubber stopper.

| Item#   | Capacity (mL) |
|---------|---------------|
| F150025 | 25            |
| F150050 | 50            |


**HEAT TRANSFER BLOCK FOR MINI VIALS**

Aluminum heat transfer block, used in place of a glass sand both in microscale experiments. It has holes to hold 3.0 and 5.0mL heavy wall reaction vials and four Craig crystallization tubes, one hold on the top for a standard thermometer.

**Item#**  
H200001


**HEATING TRANSFER BLOCK FOR ROUND BOTTOM FLASK**

Aluminum heat transfer block, used in place of a glass sand both in microscale experiments. It will hold 5, 10 and 25mL round bottom flasks, one hold on the top for a standard thermometer.

**Item#**  
H200003


**SPINVANE FOR VIALS**

Magnet is encased in PTFE and is used with conical shaped Mini-Vials.

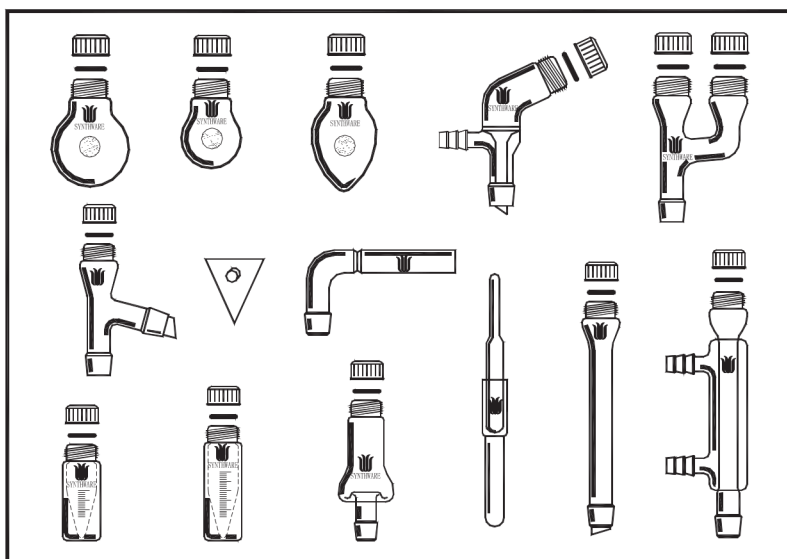
| Item#   | Vial size (mL) |
|---------|----------------|
| S470001 | 3.0 and 5.0    |

**KIT, MICROSCALE, THREADED, 14 PIECES**

Due to synthware®'s packaging flexibility, we can readily customize a kit that includes the specific components you require. Just give us a call and we'll give a quotation within 2 days.

This kit contains each of the following components:

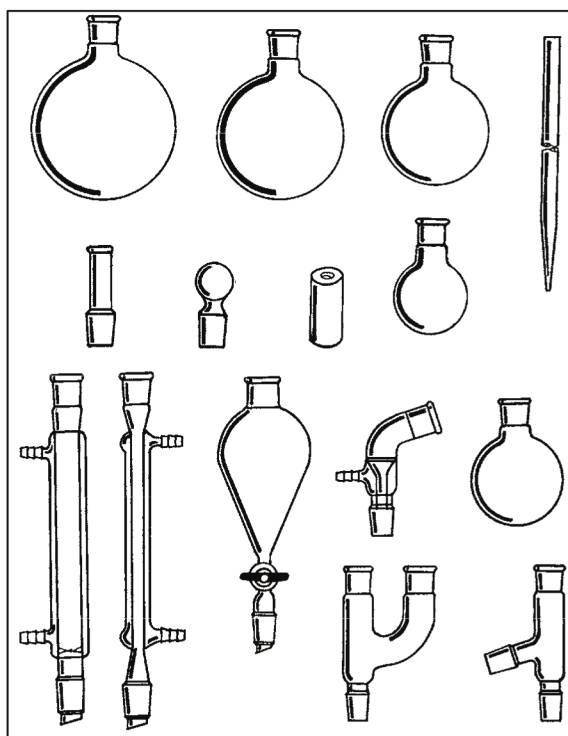
| Item #  | Description                                     | Quantity |
|---------|---|----------|
| K151410 | Microscale Kit                                  | 1        |
| A371410 | Claisen adapter                                 | 1        |
| A351410 | Distillation adapter                            | 1        |
| A621410 | Vacuum take-off adapter                         | 1        |
| C221410 | Air reflux condenser                            | 1        |
| C201080 | Jacket condenser                                | 1        |
| A851410 | Drying tube                                     | 1        |
| H101410 | Hickman still head                              | 1        |
| T140002 | Craig recrystallization tube, 2mL               | 1        |
| V131003 | Heavy wall conical vial, 3mL                    | 1        |
| V131005 | Heavy wall conical vial, 5mL                    | 1        |
| F301010 | Round bottom flask, 10mL                        | 1        |
| F301025 | Round bottom flask, 25mL                        | 1        |
| F321010 | Pear shape flask, 10mL                          | 1        |
| S470001 | Spin vane, Teflon®                              | 1        |
| K130902 | Polypropylene box with adjustable compartments. | 1        |



**KIT, ORGANIC CHEMISTRY, 14/20**

For use in college organic laboratory teaching courses. Considering most labs have equipped with drawers for every student, this kit can be ordered in paper carton, not with plastic box and foam insert in order to reduce cost.

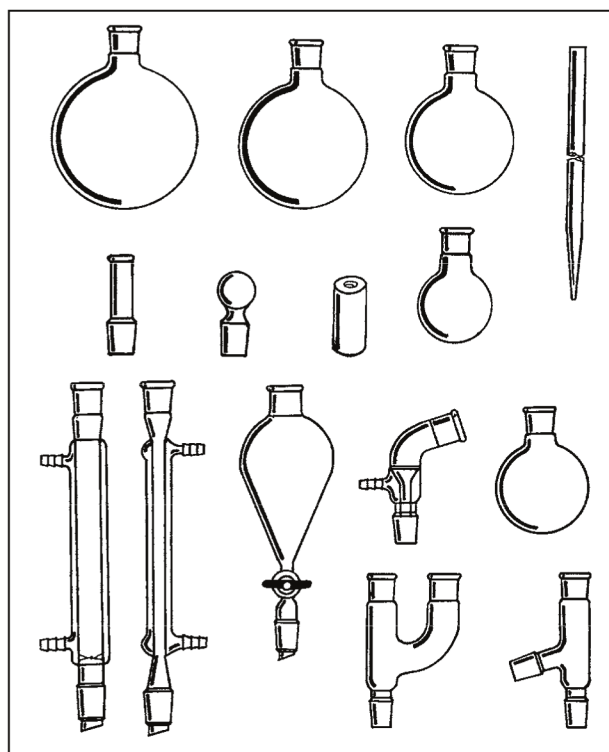
| Item#   | Description                              | Quantity |
|---------|--|----------|
| K161420 | Organic Chemistry Kit, Complete          | 1        |
| A371420 | Claisen adapter                          | 1        |
| A351420 | Distillation adapter, 75° Angle          | 1        |
| A621420 | Vacuum takeoff adapter                   | 1        |
| A451420 | Inlet/Thermometer Adapter                | 1        |
| C150190 | West Condenser, 190mm Jacket Length      | 1        |
| C171200 | Distillation Column, 200mm Jacket Length | 1        |
| F301425 | Round Bottom Flask, 25mL                 | 1        |
| F301450 | Round Bottom Flask, 50mL                 | 1        |
| F301100 | Round Bottom Flask, 100mL                | 1        |
| F301250 | Round Bottom Flask, 250mL                | 1        |
| F301500 | Round Bottom Flask, 500mL                | 1        |
| F451125 | Separatory Funnel, 125mL                 | 1        |
| S401420 | Glass Pennyhead Stopper                  | 1        |
| T151922 | Bleed Tube                               | 1        |



**KIT, ORGANIC CHEMISTRY, 19/22**

For use in college organic laboratory teaching courses. Considering most labs have equipped with drawers for every student, this kit can be ordered in paper carton, not with plastic box and foam insert in order to reduce cost.

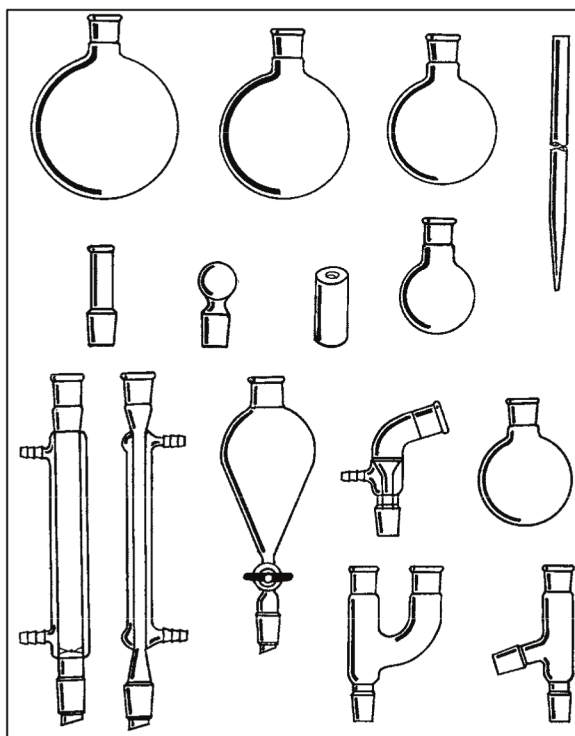
| Item#   | Description                              | Quantity |
|---------|--|----------|
| K161922 | Organic Chemistry Kit, Complete          | 1        |
| A371922 | Claisen adapter                          | 1        |
| A351922 | Distillation adapter, 75° Angle          | 1        |
| A621922 | Vacuum take-off adapter                  | 1        |
| A451922 | Inlet/Thermometer Adapter                | 1        |
| C159190 | West Condenser, 190mm Jacket Length      | 1        |
| C179200 | Distillation Column, 200mm Jacket Length | 1        |
| F301925 | Round Bottom Flask, 25mL                 | 1        |
| F301950 | Round Bottom Flask, 50mL                 | 1        |
| F309100 | Round Bottom Flask, 100mL                | 1        |
| F309250 | Round Bottom Flask, 250mL                | 1        |
| F309500 | Round Bottom Flask, 500mL                | 1        |
| F459125 | Separatory Funnel, 125mL                 | 1        |
| S401922 | Glass Pennyhead Stopper                  | 1        |
| T151922 | Bleed Tube                               | 1        |



**KIT, ORGANIC CHEMISTRY, 24/40**

For use in college organic laboratory teaching courses. Considering most labs have equipped with drawers for every student, this kit can be ordered in paper carton, not with plastic box and foam insert in order to reduce cost.

| Item#   | Description                              | Quantity |
|---------|--|----------|
| K162440 | Organic Chemistry Kit, Complete          | 1        |
| A372440 | Claisen adapter                          | 1        |
| A352440 | Distillation adapter, 75° Angle          | 1        |
| A622440 | Vacuum take-off adapter                  | 1        |
| A452440 | Inlet/Thermometer Adapter                | 1        |
| C151190 | West Condenser, 190mm Jacket Length      | 1        |
| C174200 | Distillation Column, 200mm Jacket Length | 1        |
| F302425 | Round Bottom Flask, 25mL                 | 1        |
| F302450 | Round Bottom Flask, 50mL                 | 1        |
| F304100 | Round Bottom Flask, 100mL                | 1        |
| F304250 | Round Bottom Flask, 250mL                | 1        |
| F304500 | Round Bottom Flask, 500mL                | 1        |
| F454125 | Separatory Funnel, 125mL                 | 1        |
| S402440 | Glass Pennyhead Stopper                  | 1        |
| T151922 | Bleed Tube                               | 1        |





| Item. No. | Page No.        | Item. No. | Page No.    | Item. No. | Page No. | Item. No. | Page No.       |
|-----------|-----------------|-----------|-------------|-----------|----------|-----------|----------------|
| <b>A</b>  |                 |           |             |           |          |           |                |
| A10       | 21              | A72       | 9           | C27       | 27       | D37       | 49             |
| A11       | 20              | A73       | 9           | C29       | 58       | D38       | 49             |
| A12       | 10              | A74       | 11          | C30       | 58       | D44       | 56             |
| A13       | 19              | A74-G     | 11          | C31       | 31       | D45       | 56             |
| A15       | 21              | A75       | 6           | C32       | 144      | D50       | 55             |
| A16       | 8               | A76       | 9           | C34       | 33       | D53       | 50             |
| A17       | 22              | A77       | 142         | C35       | 31       | D54       | 50             |
| A19       | 10              | A78       | 142         | C36       | 44       | D68       | 51             |
| A20       | 1               | A79       | 1           | C36-C     | 45       | DC18      | 121            |
| A23       | 13              | A83       | 4           | C37       | 39       |           |                |
| A25       | 1               | A84       | 21          | C38       | 42       | <b>E</b>  |                |
| A26       | 12              | A85       | 15,145,150  | C38-C     | 43       | E10       | 57             |
| A27       | 12              | A86       | 16          | C39-C     | 40       | E11-X/C   | 57             |
| A28       | 13              | A87       | 16          | C41       | 46       | <b>F</b>  |                |
| A29       | 3               | A88       | 8           | C43       | 46       | F10       | 59             |
| A30       | 4,47,142        | A88-G     | 8           | C50       | 33       | F10-L-LA  | 59             |
| A31       | 8               | A89       | 17          | C52       | 29       | F11       | 35             |
| A32       | 5               | A90       | 19          | C53       | 31       | F12       | 61             |
| A33       | 20              | A92       | 4           | C55       | 30       | F14       | 62             |
| A34       | 5               | A95       | 4           | C56       | 28       | F15       | 149            |
| A35       | 16,143,150-153  | A96       | 12          | C57       | 26       | F16       | 76             |
| A36       | 19              | A97       | 17          | C62       | 32       | F18       | 78             |
| A37       | 20,143, 150-153 | <b>B</b>  |             | C70       | 128      | F19       | 78             |
| A38       | 5,142           | B25       | 23          | C90       | 34       | F21       | 69             |
| A39       | 15              | B25-L     | 23          | C91       | 34       | F21L      | 69             |
| A40       | 22              | B26       | 23          | CC        | 122      | F22       | 68             |
| A41       | 11              | B30-X/C   | 24          | CS        | 121      | F23-C/M   | 43             |
| A43       | 10              | B31-C     | 24          | <b>D</b>  |          | F24       | 35             |
| A45       | 2,151-153       | <b>C</b>  |             | D10       | 52       | F26-X/C/M | 81             |
| A46       | 14              | C10       | 25          | D11-G     | 56       | F27-X/C/M | 81             |
| A49       | 22              | C11       | 27          | D12       | 48       | F28-X/C/M | 81             |
| A50       | 15              | C12       | 29          | D13       | 55       | F29       | 79             |
| A52       | 2               | C13       | 36          | D14       | 54       | F30       | 60,147,150-153 |
| A53       | 3               | C14       | 29          | D15       | 47       | F30L      | 60             |
| A54       | 18              | C15       | 30,151-153  | D16       | 51       | F31       | 63             |
| A55       | 53              | C16       | 25          | D17       | 54       | F31L      | 63             |
| A56       | 111             | C17       | 26,151-153  | D19       | 52       | F32       | 147,150        |
| A58       | 53              | C18       | 36,37       | D20       | 53       | F32L      | 64             |
| A59       | 53              | C18-C     | 38          | D21       | 54       | F33       | 62             |
| A60       | 14              | C19       | 36,41       | D22       | 55       | F34       | 64             |
| A61       | 7               | C19-C     | 41          | D23-G     | 141      | F35-C/M   | 82             |
| A62       | 18,143,150-153  | C20       | 33,144,150  | D24       | 25       | F36-C/M   | 79             |
| A63       | 22              | C21       | 26          | D25       | 48       | F37-C/M   | 88             |
| A65       | 18              | C22       | 143,144,150 | D26       | 49       | F38-M     | 147            |
| A66       | 2               | C22-B     | 144         | D27       | 48       | F39       | 78             |
| A68       | 7               | C23       | 27          | D28       | 47       | F41       | 65,148         |
| A69       | 7               | C24       | 57          | D29       | 47       | F41L      | 65             |
| A70       | 6               | C25       | 32          | D30       | 51       | F42       | 68             |
| A71       | 6               | C26       | 28          | D35       | 52       | F42L      | 68             |



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|-------------------|------------|-----------|-------------|---------------|-------------|-------------|----------|
| F43 -----         | 66         | F98 ----- | 58          | P12-C/M ----- | 83          | S60 -----   | 136      |
| F43L -----        | 66         |           | <b>G</b>    | P13-C/M ----- | 83          | S62 -----   | 137      |
| F44 -----         | 67         | GL -----  | 84          | P14-M -----   | 84          | S63 -----   | 137      |
| F44-L -----       | 67         |           | <b>H</b>    | P15-C/M ----- | 85          | S64 -----   | 138      |
| F45 -----         | 89,151-153 | H10 ----- | 145,150     | P16 -----     | 87          | S66 -----   | 138      |
| F45-A -----       | 89         | H12 ----- | 145         | P17 -----     | 87          | S67 -----   | 139      |
| F46 -----         | 73         | H14 ----- | 145         |               | <b>R</b>    | S68 -----   | 139      |
| F47 -----         | 90         | H20 ----- | 149         | R -----       | 84,123,126  | S69 -----   | 76,133   |
| F47-A -----       | 90         |           | <b>K</b>    | RC -----      | 125,126,148 | S70 -----   | 134      |
| F48 -----         | 74         | K13 ----- | 150         | RS -----      | 117,127     | S71 -----   | 134      |
| F49 -----         | 74         | K15 ----- | 150         |               | <b>S</b>    | S72 -----   | 134      |
| F49L -----        | 74         | K16 ----- | 151,152,153 | S10 -----     | 129         | S73 -----   | 140      |
| F50 -----         | 148        |           | <b>M</b>    | S11 -----     | 119         | S74 -----   | 141      |
| F52 -----         | 61         | M10 ----- | 96          | S12 -----     | 120         |             | <b>T</b> |
| F52L -----        | 61         | M11 ----- | 95          | S13 -----     | 115         | T10 -----   | 114      |
| F53 -----         | 76         | M13 ----- | 109         | S14 -----     | 116         | T11 -----   | 120      |
| F54 -----         | 75         | M14 ----- | 96          | S16 -----     | 130         | T12 -----   | 120      |
| F54-L -----       | 75         | M15 ----- | 107         | S17 -----     | 130         | T13 -----   | 121      |
| F55 -----         | 82         | M16 ----- | 108         | S18 -----     | 129         | T14 -----   | 146,150  |
| F56 -----         | 75         | M17 ----- | 95          | S19 -----     | 129         | T15 -----   | 151-153  |
| F58 -----         | 71         | M18 ----- | 97          | S20 -----     | 130         | T16 -----   | 17,128   |
| F59 -----         | 147        | M19 ----- | 101         | S21 -----     | 131         | T21 -----   | 37       |
| F60-X/C/M/F ----- | 80         | M20 ----- | 102         | S23 -----     | 115         | T23 -----   | 52       |
| F61 -----         | 92         | M21 ----- | 103         | S24 -----     | 115         | TH -----    | 121      |
| F62 -----         | 92         | M23 ----- | 99          | S25 -----     | 117         |             | <b>V</b> |
| F62-L-G -----     | 92,93      | M24 ----- | 100         | S26 -----     | 116         | V10 -----   | 113      |
| F64 -----         | 94         | M25 ----- | 99          | S28 -----     | 118         | V11 -----   | 110      |
| F65-C -----       | 148        | M26 ----- | 100         | S29 -----     | 118         | V12 -----   | 113      |
| F66 -----         | 70         | M27 ----- | 104         | S31 -----     | 132         | V13 -----   | 146,150  |
| F67 -----         | 94         | M28 ----- | 100         | S32 -----     | 132         | V14 -----   | 146      |
| F67-L -----       | 94         | M29 ----- | 101         | S33 -----     | 131         | V15 -----   | 86       |
| F68 -----         | 91         | M30 ----- | 101         | S34 -----     | 133         | V16 -----   | 113      |
| F68-A-L-LA -----  | 91         | M31 ----- | 107         | S35 -----     | 134         | V17 -----   | 105      |
| F70-C/M -----     | 82         | M33 ----- | 108         | S38 -----     | 117,128     | V18 -----   | 120      |
| F71 -----         | 69         | M34 ----- | 105         | S39 -----     | 119,133     | V19 -----   | 86       |
| F71-L -----       | 69         | M35 ----- | 105         | S40 -----     | 118,151-153 | V20 -----   | 114      |
| F72 -----         | 70         | M36 ----- | 106         | S41 -----     | 131         | V20-G ----- | 114      |
| F74 -----         | 148        | M40 ----- | 97          | S43 -----     | 148         | V21 -----   | 114      |
| F75-C/M -----     | 78         | M41 ----- | 97          | S45 -----     | 119         | V21-G ----- | 114      |
| F76 -----         | 73         | M42 ----- | 98          | S46 -----     | 132         | V22 -----   | 13       |
| F77-C/M -----     | 77         | M43 ----- | 98          | S47 -----     | 149,150     | V32 -----   | 110      |
| F78 -----         | 91         | M44 ----- | 98          | S48 -----     | 108,119     | V38 -----   | 111      |
| F79 -----         | 63         | M45 ----- | 99          | S49 -----     | 112         | V39 -----   | 111      |
| F80 -----         | 80         | M47 ----- | 96          | S51 -----     | 8,132       | V41 -----   | 106      |
| F89 -----         | 77         | M49 ----- | 102         | S52 -----     | 112         |             | <b>W</b> |
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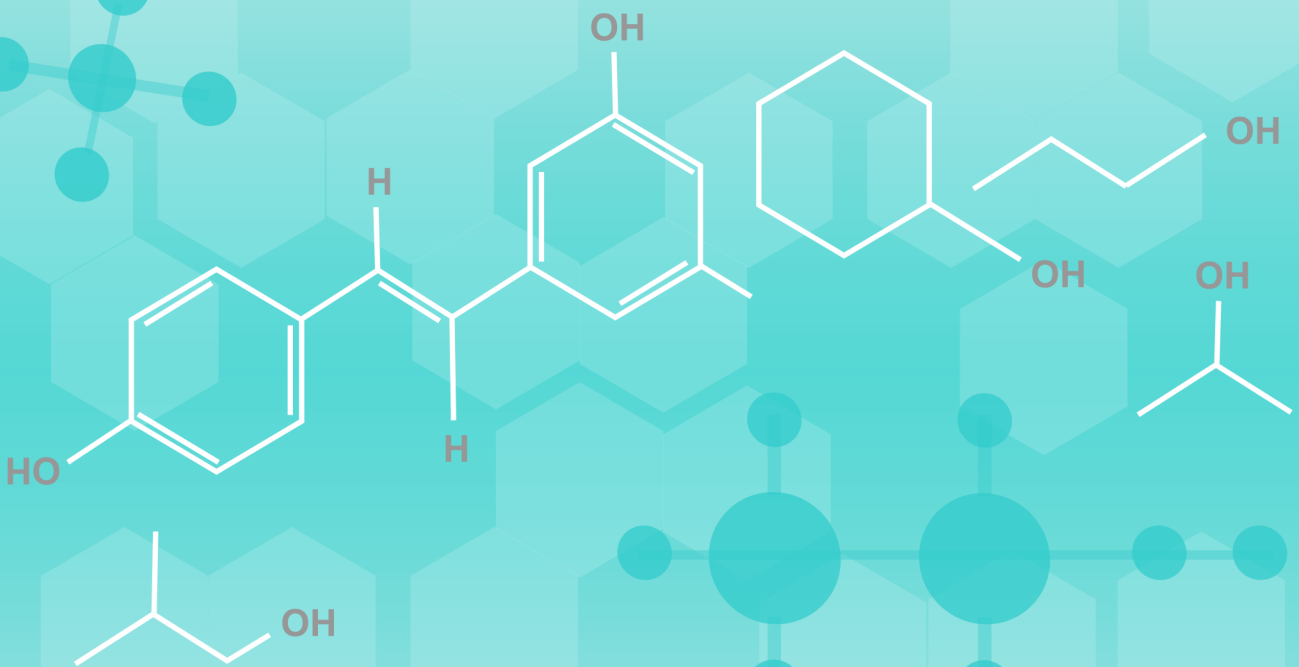
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