

Welch®
Laboratory Vacuum Catalog
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Foreline Traps & Hose Adaptor Kits
Catalog Pages 32 & 33

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Foreline Traps

Foreline Trap Selection

For protection against contaminants in vacuum systems



Foreline traps are used to prevent harmful substances generated or resident in vacuum systems from damaging vacuum pumps. Particulates can become lodged in a pump mechanism causing physical damage. Vapors can condense to liquids within the vacuum pump as a natural result of gas compression. Liquid water, solvents and acids can cause serious damage to a vacuum pump mechanism. (Refer to CHEMSTAR®, pages 24 and 25 for work with corrosive gases).

Foreline traps are also used to prevent oil backstreaming, the migration of oil molecules from vacuum pumps back into vacuum systems causing contamination of those systems. This is more likely to occur at vacuum levels of 1×10^{-2} Torr (1.33×10^{-2} mbar) or deeper that are maintained continuously over long periods of time.

| TRAP SELECTION TABLE | | | | |
|--|-------------------------|----------------------------|----------------|-----------------|
| Effectiveness Rating: *** Very Good ** Good * Fair N/R Not Recommended | COAXIAL TRAP | ACID NEUTRALIZATION TRAPS | COLD TRAPS | |
| | Stainless Steel Element | Calcium Hydroxide | Dry Ice Slurry | Liquid Nitrogen |
| TRAP APPLICATIONS | | | | |
| Prevent Oil Backstreaming | ** | N/R | *** | *** |
| Trap Water Vapor | N/R | N/R | *** | *** |
| Trap Organics ¹ | N/R | N/R | *** | *** |
| Trap Acidic Vapors | N/R | *** | * | *** |
| TRAP MAINTENANCE | | | | |
| Time Interval To Replace Element | Six Months | Depends on Acid Vapor Load | - | - |
| Need Only Clean Trap | No | No | Yes | Yes |
| Refrigerant Hold Time (Hours with no load) | - | - | 24 | 2 to 4 |
| TRAP CHARACTERISTICS | | | | |
| Trapping Mechanism Operating Temperature | Room Temp | Room Temp | -79°C | -198°C |
| Limiting Pressure (Torr) | 10^{-4} | 10^{-2} | 10^{-4} | 10^{-5} |
| Can Lower Pump Base Pressure | — | - | Yes | Yes |

Note:

1. Examples: paraffins, solvents, organic acids, alcohols.

Application Note for Cold Traps

Cold traps employing a dry ice slurry or liquid nitrogen are effective as long as the refrigerant level is maintained. If the trap warms up while the pump is running, all of the trapped condensables will be ingested by the vacuum pump, contaminating the oil.

Cold traps must be cleaned out at the end of each day. If the pump is run overnight, the trapped condensables will ultimately be ingested by the pump as the trap warms up. Cleaning a Dry Ice Slurry/Liquid Nitrogen trap is easy. The steps are: 1. Turn off the pump; 2. Leak air into the trap; 3. Remove the center well and plexiglass ring to a hood. The center well can be washed off into a beaker or the condensables can be allowed to evaporate in the hood.

Foreline Traps & Hose Adapter Kits

Dry Ice/Liquid Nitrogen Trap



- Hose barb connection accepts 7/16 in. (11 mm) I.D. hose
- Removable 3 quart center well for dry ice/isopropyl alcohol slurry (do not use acetone) or liquid nitrogen
- Visible trapping surface
- Cold temperature up to 12 hours depending on vapor load with dry ice slurry
- Cold temperature up to 2 hours depending on vapor load with liquid nitrogen

| TUBING NEEDED | DIAM. | HEIGHT | DIAMETER | IN/OUT OFFSET | TRAP CAT. NO. | REPL. SEAL CAT. NO. |
|---------------|-------|--------|----------|---------------|---------------|---------------------|
| 7/16 I.D. | 10 | 8.25 | 10.75 | 3.5 | 1420H-14 | 545210 |

Tubing cat. no. 331040-5

Coaxial Traps



- ISO NW flange connection
- Reduces oil backstreaming
- Stainless steel construction
- Easy replacement of elements
- Element must be ordered separate from trap
- One way flow

| ISO SIZE | CAPACITY | DIAM. | HEIGHT ¹ | CAT. NO. |
|--|-----------------------|-------|---------------------|----------|
| NW 16 | To 4 CFM (140 L/min) | 3.75 | 8.25 | 541001 |
| NW 25 | To 12 CFM (340 L/min) | 5.50 | 8.25 | 541002 |
| Stainless steel element for ISO NW 16 Trap | | | | 541921 |
| Stainless steel element for ISO NW 25 | | | | 541922 |

1. Distance between ISO NW inlet and outlet connections.

Acid Neutralization Trap



- ISO NW flange connection
- Calcium Hydroxide element
- Element changes from white to bluish-transparent when spent

| ISO SIZE | CAPACITY | CATALOG NUMBER | | |
|----------|----------------------|----------------|---------------------|--|
| | | TRAP | REPLACEMENT ELEMENT | PUMP CONNECTOR KIT FOR TRAP ¹ |
| NW 16 | To 2 CFM (57L/min) | 1420H-21 | 1420E-02 | 1420K-16 |
| NW 25 | To 12 CFM (340L/min) | 1420H-20 | 1420E-01 | 1420K-25 |

1. Includes hinge clamp, centering ring and elbow. Use with CHEMSTAR® vacuum pumps.

Hose Adapter Kits • Hose Adaptors • Hose Valves



1420H-01

- Kits ensure proper sized tubing adaptors, and clamps for vacuum tight connections
- Kits include at least 5 ft(1.5m) of thick walled rubber vacuum hose

| ADAPTER KITS FOR PUMP MODELS | PUMP INLET O.D. | APPLIANCE CONNECTOR O.D. | CAT. NO. |
|--|-----------------|--------------------------|----------|
| 8890 (GEM) | 3/8 | 1/4 and 3/8 | 1420H-12 |
| 8890 (GEM) | 3/8 | 7/16 and 1/2 | 1420H-01 |
| 1400, 1405, 1399, 8905 | 7/16 | 1/4 and 3/8 | 1420H-01 |
| 1402, 1380, 8907, 8912, 8917, 8920, 8925 | 13/16 | 1/4 and 3/8 | 1420H-02 |

Dimensions are in inches