

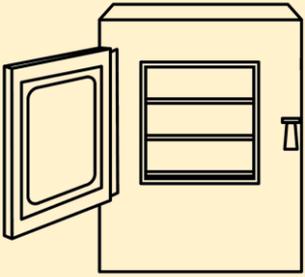
VACUUM PUMPS FOR BOTANICAL OIL EXTRACTIONS PROCESSING

Selection Chart,
Operating Tips,
Accessories



VACUUM OVEN PURGING

Small ovens up to 3 Cu Ft.



Vacuum Pump Welch #2052B-01



Chemical Duty Dry Vacuum Pump, 2.3 CFM x 29.86" Hg vacuum, 115v/60hz. Ideal flow rate and vacuum level for rapid purging that does not remove desired oil fractions. Use 331030-5 hose.
Use of passive or cold foreline traps essential for long service life of pump.

Fast Drying Vacuum Pump, Welch CHEMSTAR DRY #2070B-01



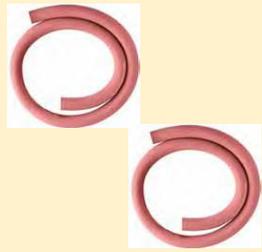
Patented dual-pumping technology delivers high pumping speeds at the critical vacuum levels above 29.5" hg vacuum. Significantly faster purging of extracting solvents possible. 150 LPM at 2 torr, ultimate pressure 0.050 torr, 115v/60hz. Use 331040-5 Hose.
Use of cold foreline traps essential for long service life of pump.

Passive Foreline Trap Welch #1423B-SS



Captures the volatile, sticky oil fractions so they don't build up on pump internals, which require cleanout when pump performance falters. See below and also page 3 about using **cold traps** for higher volume processing, or with Chemstar Dry.

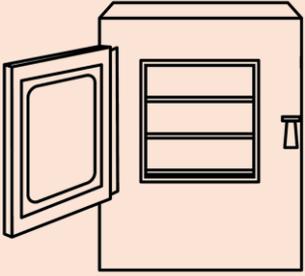
Vacuum Hose Welch #331030-5 Welch #331040-5



Thickwall, Red Rubber vacuum hose, 3/8" ID or 1/2" ID x 5 ft. We recommend you purchase 2 sets; one for pump-to-oven, another for exhaust port to ventilation source so hazardous vapors don't exhaust into your lab.

VACUUM OVEN PURGING

Large Ovens up to 5 Cu Ft



Vacuum Pump Welch #2163B-01



Chemical Duty Dry Vacuum Pump, 6.4 CFM x 29.7" Hg vacuum, 115v/60hz. Ideal flow rate and vacuum level for rapid purging that does not remove desired oil fractions. Use 331030-5 hose.
Use of passive or cold foreline traps essential for long service life of pump.

Fast Drying Vacuum Pump, Welch CHEMSTAR DRY #2070B-01



Patented dual-pumping technology delivers high pumping speeds at the critical vacuum levels above 29.5" hg vacuum. Significantly faster purging of extracting solvents possible. 150 LPM at 2 torr, ultimate pressure 0.050 torr, 115v/60hz. Use 331040-5 Hose.
Use of cold foreline traps essential for long service life with this innovative technology pump.

Cold Condenser Trap Kimble #34-27350



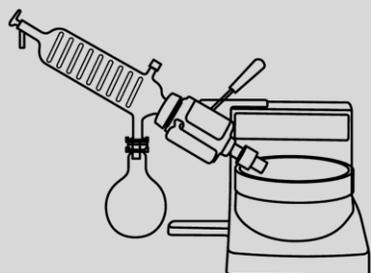
Captures the volatile, sticky oil fractions so they don't build up on pump internals, which require cleanout when pump performance falters. Requires cold, water or water/glycol (to -20 degrees C) from a Refrigerated Recirculating Chiller.

Vacuum Hose Welch #331030-5 Welch #331040-5



Thickwall, Red Rubber vacuum hose, 3/8" ID or 1/2" ID x 5 ft. We recommend you purchase 2 sets; one for pump-to-oven, another for exhaust port to ventilation source so hazardous vapors don't exhaust into your lab.

ROTARY EVAPORATORS



Vacuum Pump Ethanol but no Water Benchtop Rotovaps Welch #2014B-01



DryFast Collegiate Chemical Duty Dry Vacuum Pump, 35 LPM x 28.3" Hg vacuum. Use vacuum regulator to control vacuum so you don't boil ("bump") solvent; "tune" to fastest solvent removal rate ("stripping rate"). This unit is sufficient to strip Ethanol at bath temperatures of 95°F (35 °C)

Vacuum Pump Ethanol with Water Benchtop Rotovaps Welch #2034B-01



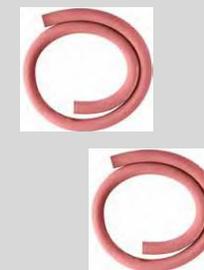
DryFast Research Chemical Duty Dry Vacuum Pump, 25 LPM x 29.7" Hg vacuum. Use vacuum regulator to control vacuum so you don't boil ("bump") solvent; "tune" to fastest solvent removal rate ("stripping rate"). This unit's deeper vacuum means you can strip even water at 77°F (25 °C)

Vacuum Pump Ethanol with Water Up to 50L Floor Units Welch #2163B-01



Chemical Duty Dry Vacuum Pump, 6.4 CFM x 29.7" Hg vacuum, 115v/60hz. Vacuum Regulator #700458 optional. Can strip water at room temperature 77°F (25 °C), very fast stripping rates.

Vacuum Hose Welch #331030-5



Thickwall, Red Rubber vacuum hose, 3/8" ID x 5 ft. We recommend you purchase 2 sets; one for pump-to-rotovap, another for exhaust port to ventilation source so hazardous vapors don't exhaust into your lab

KUGELROHR/SHORT PATH DISTILLATION, BENCHTOP

Welch #1400B-01

DuoSeal Belt Drive Pump, 25 LPM x 0.0001 torr, 115v/60hz
Oil-Seal High Vacuum Pump with perfect flow rate for high efficiency capture of each oil fraction. **Use of cold traps essential!**
Change oil when pressure reading taken at pump inlet degrades.



Welch #331040-5

Thickwall Red Rubber Vacuum Hose, 1/2" ID x 5 ft.



Duniway #MPO-190-1 (1 Gal)

MPO-190 High Quality Vacuum Pump Oil. Higher resistance to breakdown from heat and chemical attack. Ingestion of oil fractions compromises pump performance, solved by oil change. Contact Duniway regarding forced flush protocol if needed.



DIGITAL VACUUM GAUGE, FOR ROTOVAP, OVEN, SHORT PATH

Duniway #DRPG-531

Digital Vacuum Gauge, full-range. Can measure millitorr range (1-2000 millitorr) when used on SPD systems. Can measure Torr range when used on vacuum ovens or rotovaps. Has leak rate diagnostics so you can check health of your system. Runs on 4 x AA Batteries for 70 hours, or power using Micro DV connector on gauge.



KUGELROHR/SHORT PATH DISTILLATION, LARGE SCALE

Welch #2070B-01

Chemstar Dry Oil-Free, Chemical Duty, High Vacuum System, 150 LPM x 0.050 torr, 115v/60hz.

Dry Vacuum Pump ideal for larger SPD systems with integrated cold traps. **Pump is chemically resistant but susceptible to ingestion of sticky volatile oil fractions. Use of cold trap is essential system does not have one built in.**



Welch #331040-5

Thickwall Red Rubber Vacuum Hose, 1/2" ID x 5 ft.



VACUUM FILTRATION

Welch #2546B-01

Standard Duty Dry Vacuum Pump, 45 LPM x 27.6" Hg Vacuum, 115v/60hz. Ideal for vacuum filtering to remove waxes and debris. Vacuum gauge lets you know vacuum level. Vacuum controller lets you weaken vacuum for slower filtering. Even has a ball-in-cup system to prevent pump ingesting liquid overflowing from funnel.



Welch #331020-5

Thickwall Red Rubber Vacuum Hose, 1/4" ID x 5 ft.



DIAGNOSING VACUUM PERFORMANCE ISSUES:

For systems not performing at the expected vacuum level, determine if pump, oven, or line leaks are the Root Cause.

1. Measure vacuum level for the pump at its inlet. Does it achieve the specified pressure?
2. Then, measure pressure reading for the full system. Is it higher pressure (weaker vacuum) than the reading at the pump inlet?
3. If pump reading is weak and matches system reading, then pump needs flushing, cleaning, oil change, or repair
4. If pump reading is good, then leak is in system or with hose/joint/port connections. Are hose clamps on all hoses for leaktight connections? Any leaks on oven that's vacuum sealed? DRPG-531 digital gauge is ideal to measure millitorr, or torr, and leak rates.

COLD TRAPPING ESSENTIALS! CAPTURE STICKY, VOLATILE-OIL FRACTIONS BEFORE THEY INGEST INTO YOUR VACUUM PUMP!

Vacuum Purge Ovens

- **Passive Foreline Trap Welch #1423B-SS** for light or moderate volume processing. Put Foreline Trap on ice in ice bucket for improved trapping efficiency.
- **Kimble Immersion Style Cold Traps Kimble #926055-0500 or #926300-0021** for higher volume processing. With winterized extracts, use ice or dry ice in proper ice bucket. With butane extracts, use ice but not dry ice.
- **Kimble Cavity Condenser Style Cold Trap Kimble #34-27349** for higher volume processing. Put ice or dry ice in condenser space in middle of this unit. Includes a 1000ml Round Bottom collection flask. Dry Ice or ice for winterized extracts, *ice only but NOT dry ice for butane extracts.*
- **Kimble Coil Condenser Style Cold Trap, walkaway. Kimble #34-27350.** (See page 1) Use cold water from your chilling circulator at -20 °C with this chilled-water coil style condenser. **No need to monitor or replenish coolant.** Includes a 1000ml Round Bottom collection flask.

Rotovaps

- Typically, the condenser on the rotovap itself provides very good trapping of volatile oil fractions and therefore no need usually for cold trap.

Kugelrohr/Short Path Distillation

- **Essential to protect 1400B-01 (small setups) or 2070B-01 (large setups) against ingestion of sticky volatile oil fractions. Such ingestion can require frequent cleaning, or cause pumps to fail if not taken care of properly.**
- **Kimble Immersion Style Cold Traps Kimble #926055-0500, or #926300-0021** for higher volume processing. Use ice or dry ice in proper ice bucket.
- **Kimble Cavity Condenser Style Cold Trap Kimble #34-27349** for higher volume processing. Put ice or dry ice in condenser space in middle of this unit. Includes a 1000ml Round Bottom collection flask. Dry Ice or ice for winterized extracts, *ice only but NOT dry ice for butane extracts.*
- **Kimble Coil Condenser Style Cold Trap, walkaway. Kimble #34-27350.** (See page 1) Use cold water + ethylene glycol from your chilling circulator at -20 °C with this chilled-water coil style condenser. **No need to monitor or replenish coolant.** Includes a 1000ml Round Bottom collection flask.

Kimble #926055-0500

Large Bulb High Quality Glass Cold Trap 2 piece construction for easy recovery and cleaning. 14.2"H, accepts 331040-5 vacuum hose

Kimble #926300-0021

Cold Finger High Quality Glass Cold Trap. 2 piece construction for easy recovery and cleaning. 12.2"H x 4.3" W, accepts 331040-5 vacuum hose



Use an insulated ice bucket to chill **1423B-SS** Foreline Trap, or plunge your Kimble immersion-style cold trap into the ice or dry ice.

