

**Welch®**  
**Laboratory Vacuum Catalog**  
**2005-2006**

**Freeze Dryer (Lypholizer)**  
**Catalog Page 11**

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**COMBINED FLUID PRODUCTS COMPANY**  
805 Oakwood Road, Lake Zurich, Illinois 60047  
[sales@combinedfluidproducts.com](mailto:sales@combinedfluidproducts.com)  
[www.combinedfluidproducts.com](http://www.combinedfluidproducts.com)  
Tel (847) 540-0054 Fax (847) 540-0513  
**(800) 521-2083**

# Freeze Dryer (Lypholizer)

## Extended Service Interval In A Compact Pump



"Did you know that the by-products from TFA that are used in sample preparation cause rapid degradation of standard pump oil?"

- 1 Continuous neutralization of acids in oil
- 2 Gold oil resistant to chemical attack
- 3 Large oil capacity – 1.3 Liters

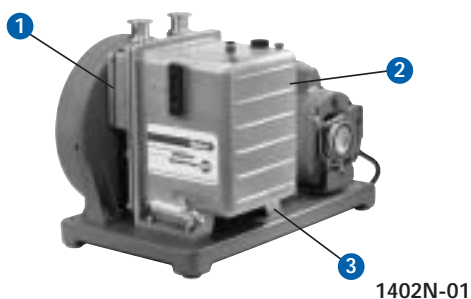
### Direct-Drive Freeze Dryer Vacuum System

The Welch direct-drive freeze dryer vacuum system is designed for the harsh chemical mixtures – TFA, TFA by-products, acetonitrile, and/or HBr, – removed during sample drying. Oil is continuously filtered and acids are neutralized using an integral oil filtration system. A large oil capacity (approximately 1.3 liters) dilutes organic vapors that do mix with the pump oil during the freeze drying run. The system comes with Welch Gold oil (see pg. 34), which has excellent resistance to chemical attack.

Cat. No.	Description <sup>1</sup>
8917A-80	173 L/min, 115V, 60Hz, 1 Ph with N. American 115V plug
8917C-80	Same as 8917A-80 except 143 L/min at 50Hz, 230V with universal IEC connector and detachable Schuko line cord, CE
1420A-01	Replacement wrench
1420E-03	Replacement oil filter element

Note: 1. See pg 23 for more details.

## Rugged Pump For Corrosive Vapors



- 1 Lower rotational speed for longer service life
- 2 Vital parts corrosion resistant
- 3 Large oil reservoir dilutes contaminants

### CHEMSTAR<sup>®</sup> Vacuum Pump

The CHEMSTAR belt-driven pump has built into it the three key features needed for harsh chemical freeze dryer applications. The high contamination tolerance comes from a large oil reservoir and few moving parts which increase pump ruggedness. The low pump rotational speed (580 RPM) reduces frictional wear resulting in less wear and a cooler running pump. Vital pump parts are corrosion resistant. The system comes with Welch Gold Oil (see pages 25 & 27), which has excellent resistance to chemical attack.

Cat. No.	Description <sup>2</sup>
1402N-01	160 L/min, 115V, 60Hz, 1 Ph with N. American 115V plug
1402N-50	Same as 1402N-01, except 230V, 50 Hz w/Schuko plug, CE

Note: 2. See pg 24 for more details.

### Application Note on Freeze Drying

Drug discovery labs are using freeze dryers for the final drying step that consists of heat sensitive proteins and peptides samples isolated using HPLC or column LC. These samples typically are dissolved in a water, acetonitrile and 0.1% TFA solution. TFA and its by-products will cause rapid breakdown of pump oil leading to a rapid rise in oil viscosity leading to pump failure – sometimes after only a few runs.

There is no fail safe solution to prevent the ingestion of harsh chemicals into the pump. Three steps to minimize ingestion of harsh chemicals are: 1. Clean the freeze dryer's condenser after each drying run to prevent sublimation from trap of harsh chemicals into the pump; 2. Size the pump for the freeze dryer – too high a pumping speed will shorten residence time in the condenser, dropping its trapping efficiency, 3. Spread the drying of multiple samples over time to evenly distribute the vapor load on condenser.

Caution: For high acetonitrile vapor loads, use a cold trap operating at -75 C or lower.

