

# Freeze Dryer Systems Training

**Benefit from lyophilization training at every level from our experts, on-site at our facilities.**

Courses include quizzes, notebook, thumb drive with course materials, and a certificate of completion.

## Workshop Details

Each training is a 3-Day program.

## Registration

The registration fee includes course manuals, lodging, and meals. In order to maintain the high quality of our workshops, our seating is limited, so please register early. No registrations will be accepted at the door. Seating is assigned as a first come first served basis.

## Cancellations

Refund requests must be in writing. You will receive a full refund if we are notified of your cancellation up to 2 weeks prior to the start of the training course. If we are notified of your cancellation within 2 weeks of the start date, 50% of the registration fee will be refunded.

## Fundamentals I: Basic Freeze Dryer Operation and Maintenance

### Freeze Dryer Overview

- Refrigeration Circuit
- Electrical & Control Systems
- System & Process Integration
- Maintenance
- Safety Highlight

### Freeze Dryer Sub-Systems

- Circulation Vacuum
- Hydraulic Temperature
- Steam

### Compressor Systems

- Dunham/Bush Carlyle
- Mycom
- Copeland

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## Fundamentals II: Advanced Freeze Dryer Operation and Maintenance

### Freeze Dryer Overview

- Compressor Use & Types
- Compound Compressors
- Compressor Failures
- Industry Efficiency Standard

### Refrigeration Loops

- Basic Refrigerant Flow
- Proportional Refrigeration Flow
- Cascade Systems
- Auto-Cascade Systems
- Capillary Tube Shelf Control Systems

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## Diagnostic Workshop - Understanding Methodology

This is an advanced program developed for individuals with at least 5 years of industry experience.

### Sub-Systems

- Circulation
- Vacuum
- Hydraulic
- Compressors

### Refrigeration Loops

- Refrigeration Control Devices
- Compressor Operation
- Compressor Ratio
- Volumetric Efficiency

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## Pilot Freeze Dryer Systems Training

Freeze Dryer models covered include: Advantage, Advantage Pro, General Purpose Freeze Dryer, Freezemobile, Genesis, Ultra and LyoStar.

### Freeze Dryer Overview

- Freeze-Drying Basics
- Freeze Dryer Components

### Sub-Systems

- Refrigeration Systems
- Vacuum Systems
- Heat Transfer Fluid Systems
- Hydraulic Systems
- Control Systems

### Freeze Dryer Processes

- Installation and Start-up
- Hands-on Training