

# Freeze Dryer / Lyophilizer

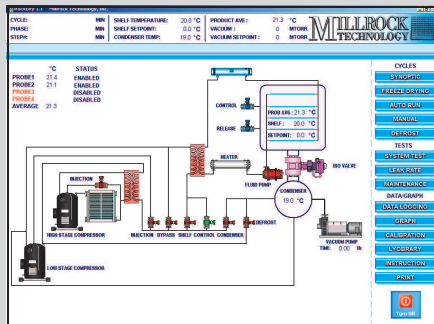


MAX Series freeze dryers provide up to 20 square feet of shelf area for phase one clinical trials, tissue freeze drying and small scale production. The shelf area is ideally matched with the condenser size to provide maximum throughput in minimum floor space. Using the best components and design techniques combined with the most advanced PC/PLC control system, the MAX provides all the tools to produce the best freeze dried product in the shortest period of time.

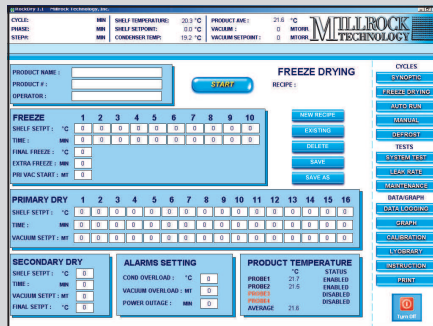
The MAX Series offers the largest shelves and best shelf-to-shelf spacing of any system in its class, resulting in more product capacity in a minimal footprint.

The exposed coil condenser eliminates vapor bypass that is common with 'cold wall' style condensers. During the freeze drying run the condensing surface area increases making vapor trapping more efficient.

## Opti-Dry Control Software



- Manual and Automatic Mode
- Graphic and Numeric Data Collection
- Automatic System and Leak Rate Testing
- Ethernet Based with Web Connectivity
- Optional Opti-Dry Pro provides the tools you need for protocol development

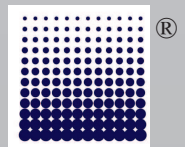


## Standard Features

Control System	PC/PLC with Opti-Dry Software
Shelf Temperature Range	-45C or -70C to +65C
Shelf Heat Transfer	Hollow Fluid Filled
Shelf Size and Finish	12" x 24" , 316L, 20 Ra or better
Shelf Area	10 sq ft to 20 sq ft
Shelf Assembly	Bulk or Hydraulic Stopping
Condenser Temperature	-53C or -85C
Condenser Capacity	30L
Condensing Rate	20L in 24 hours
Condenser Style	Exposed Coil
Vapor Port	6" Standard, 8" Option
Compressors	Scroll
Defrost	Hot Gas
Vacuum Pump	375 LPM, Corrosion Resistant
Vacuum Control	Pirani w/Solenoid & Needle Valve
Gas Backfill	Included
Product Sensors	One per shelf
	One per shelf included
Cabinet	46"W x 37"D x 80"H
Electrical	230V, 60Hz or 200V/50Hz, 1Ph

## System Performance

- Shelf pull down from +20 to -40C in less than 40 minutes
- Vacuum pull down to 100 mT in less than 20 minutes
- Vacuum leak rate less than 30 mT per hour
- Vacuum level 5 mT in clean dry system (-85)



## MAX Equipment Design Features

- Up to 20 sq ft of shelf area
- PC/PLC controls standard—no proprietary microprocessors
- 316L on all wetted parts
- Large shelves for more product capacity—12" x 24" each
- High shelf fluid flow for the best temperature uniformity
- Hydraulic stoppering (10 PSI)—no bladders or cables
- Exposed coil condenser design to prevent vapor bypass which can destroy vacuum pumps (a common problem on externally wrapped condensers)
- High reliability scroll compressors
- CFC-Free, Non-proprietary refrigerants
- Hot gas defrost
- Four product thermocouples with option for more
- Oversized air-cooled condenser to minimize the affect of changing ambient temperatures
- 375LPM two stage corrosion resistant vacuum pump with easy access from the front of the unit
- Built-in validation port
- Vacuum control and gas backfill standard
- Advanced instrumentation options

## NEW! Ask about hydrogen peroxide (H2O2) sterilization

### Opti-Dry PC/PLC Control

The system comes complete with PLC controls and a PC for programming and data collection. Our easy-to-use software provides automatic freeze-drying, defrost, system and leak rate testing. Data can be printed either numerically or graphically. This same control system can be used on industrial dryers, allowing scaling to production. An interactive maintenance screen simplifies component servicing.

Opti-Dry uses an Ethernet platform for hardware connectivity making data transmission extremely fast. It also provides web connectivity for those who want remote access to their systems.

Shelves	Spacing (in/mm)	Area (sq ft/sqM)
5	7/177	8/0.74
6	4.5/114	12/1.1
7	3.75/95	14/1.3
8	3.25/82	16/1.48
9	2.8/71	18/1.67
10	2.5/63	20/1.86

### Vial Capacity

Vial ml	Dia mm	Ht mm	Capacity						
			5	6	7	8	9	10	
2	16	41	3650	4380	5110	5840	6570	7300	
5	22	48	1990	2388	2786	3184	3582		
10	24	58	1680	2016	2352	2688	3024		
20	29	71	1100	1320	1540	1760			
50	43	81	455	546	637	728			
100	52	92	330	396	462				

### Bulk Fill (liters)

	5	6	7	8	9	10
10mm deep	9	10.8	12.6	14.4	16.2	18.0
15mm deep	13.5	16.2	18.9	21.6	24.3	27.0
20mm deep	18	21.6	25.2	28.8	32.4	36.0

### Opti-Dry Pro Upgrade

For R&D, Protocol Development, Cycle Automation and Optimization, Opti-Dry Pro offers all the tools you need.

Features:

- Product temperature feedback optimizes the recipe, both freezing and primary drying, based on the product temperature average.
- Multiple methods for Primary Drying Endpoint Determination via:
  - Pirani/Capacitance Manometer Comparison
  - Barometric Endpoint Determination
- Automatic Cycles for Optimum Drying Performance

## NEW! Ask about AUTO-DRY software

<b>Freeze Drying</b>	10 Freezing Steps 16 Drying Steps with Pressure Control 1 Step Secondary Drying 1 Step Final Drying
<b>Manual</b>	Individual switches for shelf, condenser, vacuum, isolation valve and release. Single set-points for shelf and set-point.
<b>Defrost</b>	Automatic timed hot gas.
<b>System Test</b>	Performance evaluation of shelf, condenser, vacuum, heating, and control.
<b>Leak Rate</b>	Automatic testing of leak rate.
<b>Maintenance</b>	Independent operation of components, with troubleshooting and calibration.

### Available Options

6" and 8" Vapor Ports	H2O2 sterilization
Shelf Latching Plates	Isolation Valve
Advanced Vacuum Control	Additional Product Probes
Dewpoint Sensor	Capacitance Manometer
Clean Room Configuration	LN2 Trap
21CFR Part 11 Compliance	Acid Trap
IQ/OQ Workbook	Extended Warranty
FAT and SAT	Validation Documents
Resistivity Probe	Water Cooled
Stainless Steel Doors	Isolator Interface

Note: Specifications subject to change without notice.  
All specifications based on 20C ambient on 60Hz

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## MAX Series



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