

# PHARMACEUTICAL FREEZE DRYER FDLS SERIES



Vekuma's FDLS freeze dryers are specifically designed to meet GMP requirements of industrial large production of a range of pharmaceutical products. Typical applications include vaccines, antibiotics, serum, penicillin, hormones and reagents. The FDLS industrial freeze drying units are complete with a hydraulic stoppering system and flexible shelves for vials closing under vacuum environment. And these lyophilizers can be equipped with CIP and SIP system to satisfy commercial aseptic production needs.

## Technical Specifications

	FD-1LS	FD-2LS	FD-3LS	FD-5LS	FD-10LS
Vials (2R/4R)	3700	8288	12432	21000	37800
Vials (6R/8R)	1944	4320	6480	10800	19440
<b>Shelf Area</b>	0.96m <sup>2</sup>	2.16m <sup>2</sup>	3.24m <sup>2</sup>	5.4m <sup>2</sup>	9.72m <sup>2</sup>
<b>No. of Shelves</b>	4+1	4+1	6+1	5+1	9+1
<b>Shelf Size</b>	400*600mm	600*900mm	600*900mm	900*1200mm	900*1200mm
<b>Shelves Spacing</b>	100mm	100mm	100mm	100mm	100mm
<b>Shelf Temp. Range</b>	-55C~+70C	-55C~+70C	-55C~+70C	-55C~+70C	-55C~+70C
<b>Condenser (24Hrs)</b>	10Kgs	20Kgs	30Kgs	50Kgs	100Kgs
<b>Condenser (Max)</b>	20Kgs	40Kgs	60Kgs	100Kgs	200Kgs
<b>Condenser Temp.</b>	-85C	-85C	-85C	-85C	-85C
<b>Vacuum Final</b>	1Pa	1Pa	1Pa	1Pa	1Pa
<b>Power Install</b>	15Kw	18Kw	25Kw	28Kw	60Kw
<b>Electric</b>	380V/50Hz/3P	380V/50Hz/3P	380V/50Hz/3P	380V/50Hz/3P	380V/50Hz/3P
<b>Size (W*L*H) (mm)</b>	1450*3100*2200	1600*3600*2300	1600*4000*2500	1700*4300*2700	2000*6200*2800
<b>Approx. Weight</b>	1500Kgs	2500Kgs	2800Kgs	4000Kgs	6000Kgs

## Technical Specifications

	FD-15LS	FD-20LS	FD-25LS	FD-30LS	FD-40LS
Vials (2R/4R)	56250	76725	95139	114576	156240
Vials (6R/8R)	29160	40392	50864	60588	82620
<b>Shelf Area</b>	14.4m <sup>2</sup>	19.8m <sup>2</sup>	24.7m <sup>2</sup>	29.7m <sup>2</sup>	40.5m <sup>2</sup>
<b>No. of Shelves</b>	10+1	11+1	11+1	11+1	15+1
<b>Shelf Size</b>	1200*1200mm	1200*1500mm	1500*1500mm	1500*1800mm	1500*1800mm
<b>Shelves Spacing</b>	100mm	100mm	100mm	100mm	100mm
<b>Shelf Temp. Range</b>	-55C~+70C	-55C~+70C	-55C~+70C	-55C~+70C	-55C~+70C
<b>Condenser (24Hrs)</b>	150Kgs	200Kgs	250Kgs	300Kgs	400Kgs
<b>Condenser (Max)</b>	300Kgs	400Kgs	500Kgs	600Kgs	800Kgs
<b>Condenser Temp.</b>	-85C	-85C	-85C	-85C	-85C
<b>Vacuum Final</b>	1Pa	1Pa	1Pa	1Pa	1Pa
<b>Power Install</b>	75Kw	82Kw	102Kw	125Kw	140Kw
<b>Electric</b>	380V/50Hz/3P	380V/50Hz/3P	380V/50Hz/3P	380V/50Hz/3P	380V/50Hz/3P
<b>Size (W*L*H) (mm)</b>	2300*6500*3200	2300*6800*3500	2500*7200*3500	2500*7500*4000	2500*8200*4000
<b>Approx. Weight</b>	8500Kgs	11000Kgs	13000Kgs	16000Kgs	18000Kgs

## Performance & Features

- All-in-one structure with clean room wall panel.
- S/S316L drying chamber door.
- S/S316L drying chamber, interior polish Ra<0.6um.
- S/S316L shelves, flatness <0.5mm/m.
- Shelves upper and bottom polish Ra<0.4um.
- Shelves Temp. controllable -50C ~ +70C, accuracy <+/-1C.
- Shelves cooling and heating rate >1C/Min.
- S/S316L ice condenser, interior polish Ra<0.6um.
- S/S316L condenser coils, surface polish Ra<0.4um.
- Condenser lowest -85C, pull down to -45C <10Min.
- Condenser hot water defrost.
- System final vacuum <1Pascal.
- Chamber vacuumize to 100Pa <30Min.
- Chamber leak rate <5Pa L/Sec.
- All-in-one structure or split structure. Thoroughly quality and performance test before it is shipped. Deliver includes:
  - Industrial grade, PLC and touch screen HMI based control system. LYO-MEGA interface.
  - PUF insulated drying chamber, condenser and door.
  - Sandwich type shelves enable thermal fluid circulates inside for heating and chilling. Electric heating and PID control.
  - Hydraulic stoppering system for vials closing under vacuum.
  - External ice condenser isolates with chamber by butterfly valve.
  - 2-stage reciprocating compressor system, water cooling method. Cool condenser by refrigerant direct expand, cool shelves through an intermediate plate heat exchanger.
  - 2-stage oil sealed rotary vane vacuum pump, roots pump for larger models. All pumps have isolate valve.
  - All valves that use to isolate air and water are pneumatic operated.
  - PT-100 temperature sensor and Pirani vacuum gauge.
  - Inert gas backfill port.

## Accessories and Options

Name	Part No.	Description
CIP		Clean in place system. Includes water ring pump for chamber quick dry after CIP.
SIP		Sterilize in place system. Includes chamber and condenser jacket cooling after SIP.
Auto Door Lock		
Door Position Sensor		
Slot Door		
Venting Filter		Chamber vacuum break 0.22um air filter.
HEPA Filter		
Vacuum Pump Oil Mist Filter		
Proportional Air Valve		
Capacitive Vacuum Gauge		
Eutectic Point Detector		
PC Control		
SCADA Package		

Name	Part No.	Description
Redundant System		Back up compressor, vacuum pump, fluid pump.
Qualification Documentation		IQ, OPQ validation documents.
		FAT and report file.
		SAT and IQ, OQ execution.
Technical Documents		P&ID, install drawing.
Training Service		Install, worker training etc.

## Vekuma Machinery Co.,Ltd

**Add:** No.1 GuanYun Road, Zhuozhou, Beijing, China

**Tel:** +86-13803827075 | **Web:** www.vekuma.com | **Mail:** sales@vekuma.com