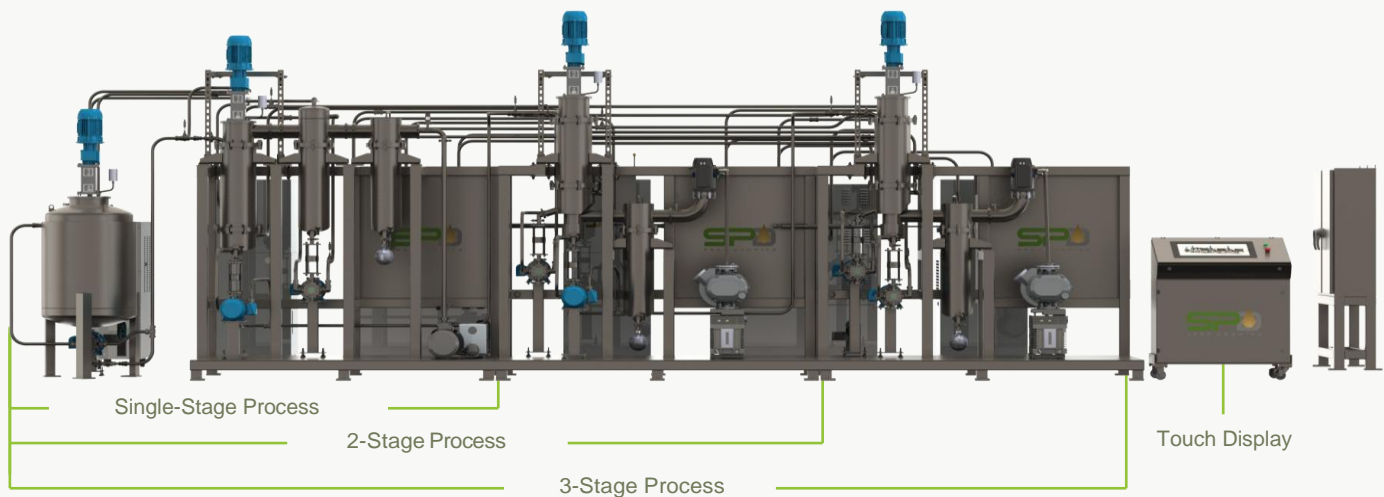


# SPD-16

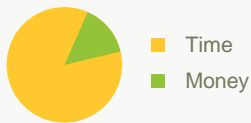


The SPD-16 was named for its throughput rate of 16L per hour. This unit is available in one, two or three stages with manual or automated operation capabilities. This unit is ideal for high throughput distillation for commercial production or for pilot testing of processes before scaling to larger capacity.



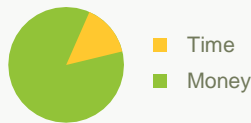
## Batching vs. Continuous Processing

Molecular separation can be achieved by many different distillation methods, each with varying operating costs. An optimized multi-stage distillation system utilizes the most efficient distillation configuration/ method at each point in the refinement process.



### Single Stage (Batching)

- ✓ Lower initial cost
- ✗ Lower consistency
- ✗ Increased run-time (multiple-passes required)
- ✗ Increased labor and operating costs
  - Batch collection / handling / transfer
  - Breaking vacuum and cleaning



### Multi Stage (Continuous)

- ✓ Higher initial cost
- ✓ Quicker ROI
- ✓ Consistent results
- ✓ Faster run-time (single pass)
- ✓ Less operating cost / operator error
  - Hands free "recipe" programming
  - Easy operation / intuitive SOP
  - Remote support available

# SPD-16



## Configurations

### 3 Stage



Rolled-Film + Short-Path + Short-Path

### 2 Stage



Rolled-Film + Short-Path

### Single Stage



Short-Path

## Run Time to High Potency

### 3 Stage



### 2 Stage

= 2 x Time



### Single Stage

= 3 x Time



### Time

Run Break Vacuum Collect Re-run

## Operation Considerations

- “Hands-free” distillation from crude to highly concentrated product
- Integrate with upstream/feed stock process (ex: extraction, solvent recovery, holding vessel)
- Custom automation and in-line modifications
  - Feedcycle - WashCycle - In-line Analyzers - FlowMeters - In-line filtration
- May require additional refinement passes to achieve desired concentration
  - Optional semi-automated loop recycler
- Integrate with upstream/feed stock process (ex: extraction, solvent recovery, holding vessel)
- Custom automation and in-line modifications
  - Feedcycle - WashCycle - In-line Analyzers - FlowMeters - In-line filtration
- Requires multiple passes (~3-8x) to achieve high concentration
  - Optional semi-automated loop recycler
- Integrate with upstream/feed stock process (ex: extraction, solvent recovery, holding vessel)
- Custom automation and in-line modifications
  - Feedcycle - WashCycle - In-line Analyzers - FlowMeters - In-line filtration

# SPD-16



## Throughput

Up to 16 L/h

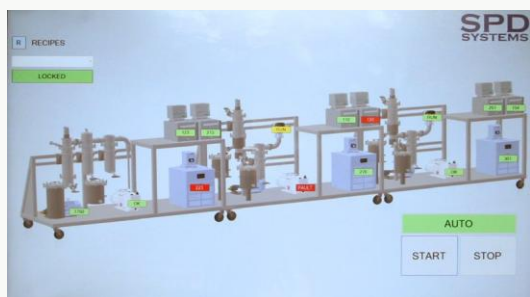
## Feedtank Capacity

200 Liters Jacketed

- Automatic In-Feed Available
- Custom feed tank configurations Available

## Controller & HMI

- Allen - Bradley® Industrial PLC
- Windows® Based Operating System
- 21" Color Touchscreen
- 1-Click Recipe Based Setup
- Data Collection Capability
- Remote Access, Monitoring, and Diagnostics



## Cold Trap Cooling

- Liquid Nitrogen = 5L/hr/stage

## Dimensions & Weights

Stage	Dimensions W x L x H	Weight
Single Stage	12'x14'x10'	2500 lbs
2 Stage	12'x22'x10'	5000 lbs
3 Stage	12'x30'x10'	7500 lbs

- Additional stages can be added after initial purchase for additional cost
- Standard straight line configuration. Other layouts available
- Does not include aisles for access around machine (recommend ~3')
- Recommend additional 4' above unit for installation and maintenance

## Construction

Part of Process	Grade of Steel
Components That Contact Product	316 SS
Frame & Controller Body	304 SS

## Power Requirements

Hz (Voltage)/Stage	3p/60hz (240/480vac)
480vac @ 1 / 2 / 3 Stage	100a / 200a / 300a

# SPD-16



## Commercial Models

### SPD-4.5

4.5 L/h  
4' x 22' x 5.3'  
240vac @ 3 Phase



### SPD-8.0

8 L/h  
4' x 30' x 5.3'  
240vac @ 3 Phase



### SPD-16

16 L/h  
12' x 30' x 10'  
480vac @ 3 Phase



### SPD-25

25 L/h  
12' x 30' x 10'  
480vac @ 3 Phase

