



# **FIXED SPEED DRAWDOWN COATER**

**MODEL EC-100**

## **OPERATING INSTRUCTIONS**

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## PRODUCT DESCRIPTION

Congratulations on the purchase of your new ChemInstruments Fixed Speed Drawdown Coater. The Fixed Speed Drawdown Coater is a precision instrument designed to make consistent, repeatable samples. The coating bed is a sheet of flat, float glass for consistent, smooth coatings. This is a fixed speed instrument for the preparation of laboratory samples.



**WARNING:** This equipment can cause injury if not used properly. It is the operator's responsibility to observe all safety rules and warnings.

## SPECIFICATIONS

<b>Electrical</b>	Model specific 120V model: 120 VAC, 60 Hz, 2 amps 240V model: 240 VAC, 50 Hz, 2 amps
<b>Operating Temperature</b>	32 – 150 degrees Fahrenheit (0 – 70 degrees Celsius)
<b>Coating Area</b>	8.5 inches wide, 13.5 inches long (22 centimeters x 34 centimeters)
<b>Coating Load Weight</b>	600 grams
<b>Wire Wound Rod Size</b>	3/8 inch diameter, 12 inches long (0.9 centimeters x 30 centimeters) with 9 inch (23 centimeters) coating width
<b>Fixed Speed</b>	47 inches per minute (119 centimeters per minute)
<b>Physical Dimensions</b>	Width: 12 inches (30 centimeters) Depth: 22 inches (56 centimeters) Height: 7 inches (18 centimeters) Weight: 18 pounds (8 kilograms)

## UNPACKING

ChemInstruments has made every effort to ensure that the Fixed Speed Drawdown Coater arrives at your location without damage. Carefully unpack the instrument and check for any damage that may have occurred during shipment. If any damage did occur during transit, notify the **carrier** immediately.

The ChemInstruments EC-100 consists of the following parts:

- Fixed Speed Drawdown Coater
- Glass Top
- Power Cord
- Wire Wound Rod – per customer request
- Foam sheet

Make sure all of these components are present before discarding the packaging material.



## ASSEMBLY

Carefully remove the Fixed Speed Drawdown Coater from the packaging and set it on a sturdy bench top. Check the physical dimensions listed previously for the space required for the instrument. As with any precision piece of laboratory equipment, it is preferable to locate the Fixed Speed Drawdown Coater in an area where temperature and humidity are controlled to standard conditions of  $72 \pm 2$  degrees Fahrenheit and  $50 \pm 5\%$  relative humidity.



**WARNING:** Make sure the power source matches the requirements of the Fixed Speed Drawdown Coater. Damage will occur if this unit is plugged into the incorrect power supply.

Connect the power cord to its receptacle on the backside of the cabinet. Complete the connection by inserting the male end of the power cord into a convenient AC outlet. Notice that the on/off power switch is located directly next to the power cord receptacle.



Power Receptacle



**WARNING:** Before proceeding with using the Fixed Speed Drawdown Coater, it is advisable to become familiar with the Key Components. These Key Components and a brief description of their function follow in the next section.

## KEY COMPONENTS

- **POWER SWITCH** is located on the back panel of the cabinet to the left the power cord connection.
- **SNAP ACTION CLIP** is used to hold the glass top and foam.
- **CONTROL DIAL** sets the state of the coating rod.
  - **Test** moves the wire wound rod away from the snap action clip.
  - **Stop** keeps the wire wound rod at its current position.
  - **Return** moves the wire wound rod towards the snap action clip.



## THEORY OF OPERATION



**WARNING: Possibility of crushing or pinching. Do not insert limbs in the path of the coating rod or insert objects in the openings on the side of the cabinet.**

The Fixed Speed Drawdown Coater features a coating bed that uses a sheet of float plate glass to provide consistent and smooth coatings. It provides machine-controlled preparation of laboratory samples for adhesive, coating, ink and sealant testing.

## INSTALLATION

The installation of this device is as follows:

- The unit should be set on a flat, level surface.
- The leveling feet can be adjusted to level the unit.
- The glass top should be unpacked and placed on top of the coater.
- Raise the Snap Action Clip to place the glass under the clip.
- Place foam on top of glass and under clip if needed.

## POWER UP

Turn on the power switch located on the back panel of the cabinet next to the power line receptacle.



**WARNING: Operating temperature for this equipment is 32 to 150 degrees Fahrenheit (0 to 70 degrees Celsius). The equipment needs to be completely free of condensation, inside and out, before applying power.**

## OPERATION

At this point the machine is ready for use. The following procedure describes normal operation for making a wire rod coating.

1. Turn the Control Dial to Return and allow the coating head to return to the position closest to the Snap Action Clip.
2. Insert a piece of substrate to be coated under the Snap Action Clip.
3. Install a Wire Wound Rod into the rod holders and bring the rod in contact with the substrate.
4. Make sure that the rod is held in place by the spring plungers. The rod is not to rotate.
5. Pour a small puddle of coating in front of the rod.
6. Turn the Control Dial to "Test". The rod will coat the substrate and stop at the end of the stroke.
7. Lift the Wire Wound Rod Handle and remove the rod. Remove the coated substrate.
8. Return the coating head to rear position by turning the Control Dial to "Return".
9. The unit is ready for another sample.
10. Make sure to clean your Wire Wound Rod before using it again.



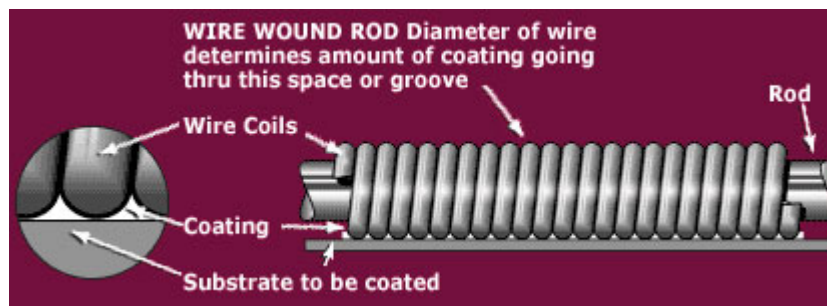
## APPLIED COATING AMOUNTS WITH WIRE WOUND RODS

Rod Size Wire #	Wet Thickness		Grams Dry Per Square Meter Percent Solids				Pounds Dry Per 3000 Sq. Ft. Percent Solids			
	Mils	Microns	30%	40%	75%	100%	30%	40%	75%	100%
#2 ½	.25	6.4	1.82	2.42	4.54	6.05	1.12	1.49	2.79	3.72
#3	.3	7.6	2.18	2.91	5.47	7.29	1.34	1.79	3.36	4.48
#4	.4	10.2	2.91	3.88	6.83	9.11	1.79	2.39	4.47	5.96
#5	.5	12.7	3.64	4.85	9.11	12.14	2.24	2.98	5.60	7.46
#6	.6	15.2	4.38	5.82	10.93	14.58	2.69	3.58	6.72	8.96
#7	.7	17.8	5.09	6.80	12.74	16.99	3.13	4.18	7.82	10.44
#8	.8	20.3	5.82	7.78	14.58	19.43	3.58	4.78	8.96	11.94
#9	.9	22.9	6.56	8.34	16.40	21.87	4.03	5.37	10.08	13.44
#10	1.0	25.4	7.28	9.71	18.21	24.28	4.48	5.97	11.19	14.92
#11	1.1	27.9	8.00	10.69	20.04	26.72	4.92	6.57	12.32	16.42
#12	1.2	30.5	8.74	11.65	21.87	29.16	5.37	7.16	13.44	17.92
#13	1.3	33.0	9.47	12.63	23.71	31.60	5.82	7.76	14.57	19.42
#14	1.4	35.6	10.20	13.60	25.51	34.00	6.27	8.36	15.68	20.90
#15	1.5	38.1	10.93	14.58	27.32	36.41	6.72	8.96	16.79	22.38
#16	1.6	40.6	11.65	15.54	29.14	38.85	7.16	9.55	17.91	23.88
#17	1.7	43.2	12.38	16.51	30.99	41.29	7.61	10.15	19.04	25.38
#18	1.8	45.7	13.11	17.49	32.78	43.70	8.06	10.75	20.15	26.86
#19	1.9	48.3	13.85	18.45	34.61	46.14	8.51	11.34	21.27	28.36
#20	2.0	50.8	14.58	19.43	36.41	48.55	8.96	11.94	22.38	29.84
#22	2.2	55.9	16.03	21.36	40.07	53.43	9.85	13.13	24.63	32.84
#24	2.4	61.0	17.49	23.31	43.72	58.28	10.75	14.33	26.87	35.82
#26	2.6	66.0	18.94	25.25	47.38	63.16	11.64	15.52	29.12	38.82
#28	2.8	71.1	20.40	27.20	51.04	68.04	12.54	16.72	31.37	41.82
#30	3.0	76.2	21.85	29.14	54.65	72.86	13.43	17.91	33.59	44.78
#32	3.2	81.3	23.31	31.09	58.28	77.72	14.33	19.11	35.82	47.76
#34	3.4	86.4	24.76	33.04	61.92	82.55	15.22	20.31	38.06	50.74
#36	3.6	91.4	26.23	34.96	65.55	87.40	16.12	21.49	40.29	53.72
#38	3.8	96.5	27.66	36.92	69.21	92.28	17.01	22.69	42.54	56.72
#40	4.0	101.6	29.14	38.85	72.86	97.13	17.91	23.88	44.78	59.70
#42	4.2	106.7	30.60	40.79	76.49	101.98	18.81	25.07	47.01	62.68
#44	4.4	111.8	32.07	42.74	80.15	106.86	19.71	26.27	49.26	65.68
#46	4.6	116.8	33.53	44.67	83.79	111.70	20.61	27.46	51.50	68.66
#48	4.8	121.9	34.96	46.62	87.42	116.56	21.49	28.66	53.73	71.64
#50	5.0	127.0	36.43	48.57	91.06	121.40	22.39	29.85	55.97	74.62
#52	5.2	132.1	37.88	50.50	94.72	126.29	23.28	31.04	58.22	77.62
#54	5.4	137.2	39.34	52.45	98.38	131.17	24.18	32.24	60.47	80.62

Rod Size Wire #	Wet Thickness		Grams Dry Per Square Meter Percent Solids				Pounds Dry Per 3000 Sq. Ft. Percent Solids			
	Mils	Microns	30%	40%	75%	100%	30%	40%	75%	100%
#56	5.6	142.2	40.79	54.39	102.00	135.98	25.07	33.43	62.69	83.58
#58	5.8	147.3	42.25	56.34	105.62	140.83	25.97	34.63	64.92	86.56
#60	6.0	152.4	43.70	58.28	109.29	145.71	26.86	35.82	67.17	89.56
#62	6.2	157.5	45.17	60.22	112.93	150.56	27.76	37.01	69.41	92.54
#64	6.4	162.6	46.63	62.16	116.56	155.41	28.66	38.21	71.64	95.52
#66	6.6	167.6	48.08	64.12	120.20	160.26	29.55	39.41	73.88	98.50
#68	6.8	172.7	49.54	66.07	123.86	165.14	30.45	40.61	76.13	101.50
#70	7.0	177.8	50.99	67.99	127.49	169.99	31.34	41.79	78.36	104.48
#72	7.2	182.9	52.45	69.93	131.14	174.84	32.24	42.98	80.60	107.46
#74	7.4	188.0	53.90	71.88	134.76	179.69	33.13	44.18	82.83	110.44
#76	7.6	193.0	55.37	73.82	138.43	184.57	34.03	45.37	85.08	113.44
#78	7.8	195.1	56.81	75.77	142.07	189.42	34.92	46.57	87.32	116.42
#80	8.0	203.2	58.28	77.71	145.73	194.30	35.82	47.76	89.57	119.42
#82	8.2	208.3	59.74	79.66	149.34	199.11	36.72	48.96	91.79	122.38
#84	8.4	213.4	61.19	81.59	153.00	203.99	37.61	50.15	94.04	125.38
#86	8.6	218.4	62.66	83.53	156.63	208.84	38.51	51.34	96.27	128.36
#88	8.8	223.5	64.12	85.48	160.28	213.69	39.41	52.54	98.51	131.34
#90	9.0	228.6	65.58	87.42	163.90	218.53	40.31	53.73	100.74	134.32

$$\text{Percent Solids} = \frac{100 * \text{Dry Coating Weight (or volume)}}{\text{Wet Coating Weight (or volume)}}$$

8 pound/gallon coating weights assumed. All coating amounts are theoretical. Actual amounts applied may vary depending upon web characteristics and the rheology of the coatings.



## MAINTENANCE

### TROUBLESHOOTING



**WARNING:** Unplug the machine before attempting the following maintenance procedures. Electric shock may occur if the machine is connected to a power source.

**NOTE:** The motor inside the machine may make some noise initially. It will only make this noise during the "break-in period." This noise is nothing to be alarmed about and will stop over time.

The troubleshooting chart describes some problems that may occur over time. After determining the problem, follow one of the following maintenance procedures.

#### Troubleshooting Chart

<b>Problem</b>	<b>Possible Cause</b>	<b>Procedure</b>
Coating head is not moving.	Control dial is not in proper position.	Turn Control Dial to Test or Return.
	Power switch is off.	Turn power switch on.
	Fuse is blown.	Replace fuse.
	Machine is not plugged in.	Plug machine in to AC outlet.
Rod is not being held in place.	Spring plungers are not working properly.	Check the spring plungers.
Cart doesn't stop at end of travel.	Limit switches are not working properly.	Replace limit switch.