



VARIABLE SPEED DRAWDOWN COATER

MODEL EC-200

OPERATING INSTRUCTIONS

CHEMINSTRUMENTS

510 COMMERCIAL DRIVE

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PRODUCT DESCRIPTION

Congratulations on the purchase of your new ChemInstruments Variable Speed Drawdown Coater. The Variable Speed Drawdown Coater is designed to make consistent, trouble free, wire wound bar drawdowns for proofing inks and coatings.



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

SPECIFICATIONS

Electrical	120/240 VAC, 50/60 Hz, 2 amps
Operating Temperature	32 – 150 degrees Fahrenheit (0 – 70 degrees Celsius)
Coating Area	12 inches wide, 13.5 inches long (30 centimeters x 34 centimeters)
Coating Load Weight	600 grams
Wire Wound Rod Size	½ inch diameter, 16 inches long (1.3 centimeters x 41 centimeters) with 12.5 inch (32 centimeter) coating width
Selectable Speed Range	15 – 450 inches per minute (38 – 1143 centimeters per minute)
Physical Dimensions	Width: 15 inches (38 centimeters) Depth: 22 inches (56 centimeters) Height: 7 inches (18 centimeters) Weight: 30 pounds (13 kilograms)

UNPACKING

ChemInstruments has made every effort to ensure that the Variable 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-200 consists of the following parts:

- Variable 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.



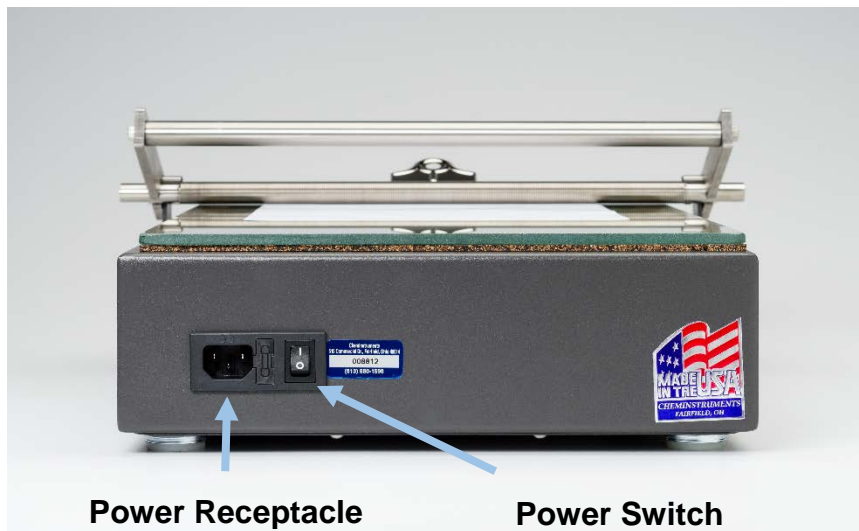
ASSEMBLY

Carefully remove the Variable 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 Variable Speed Drawdown Coater in an area where temperature and humidity are controlled to standard conditions of 72 ± 2 degrees Fahrenheit and $50 \pm 5\%$ relative humidity.



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

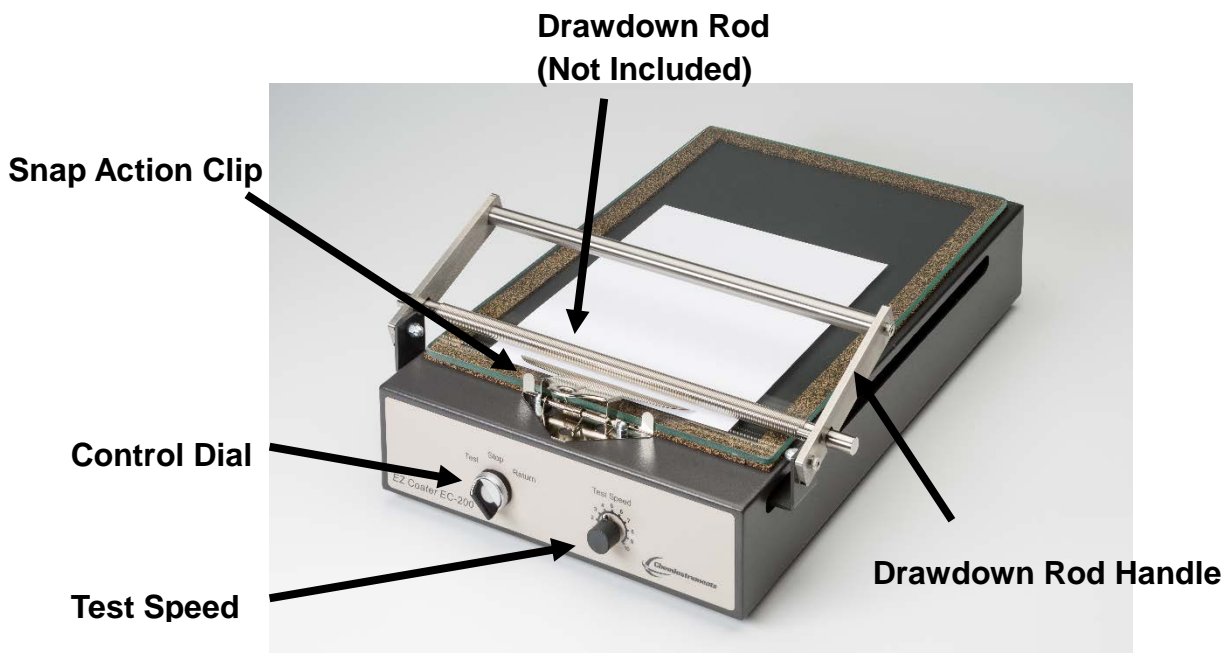
Connect the power cord to its receptacle on the backside of the cabinet. Complete the connection by inserting the male end of the power cord into a convenient AC outlet. Notice that the on/off power switch is located directly next to the power cord receptacle.



WARNING: Before proceeding with using the Variable 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.
 - **Return** moves the wire wound rod towards the snap action clip.
 - **Stop** keeps the wire wound rod at its current position.
- **TEST SPEED** sets the “Test” speed. “Return” speed is not adjustable.



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 Variable 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.

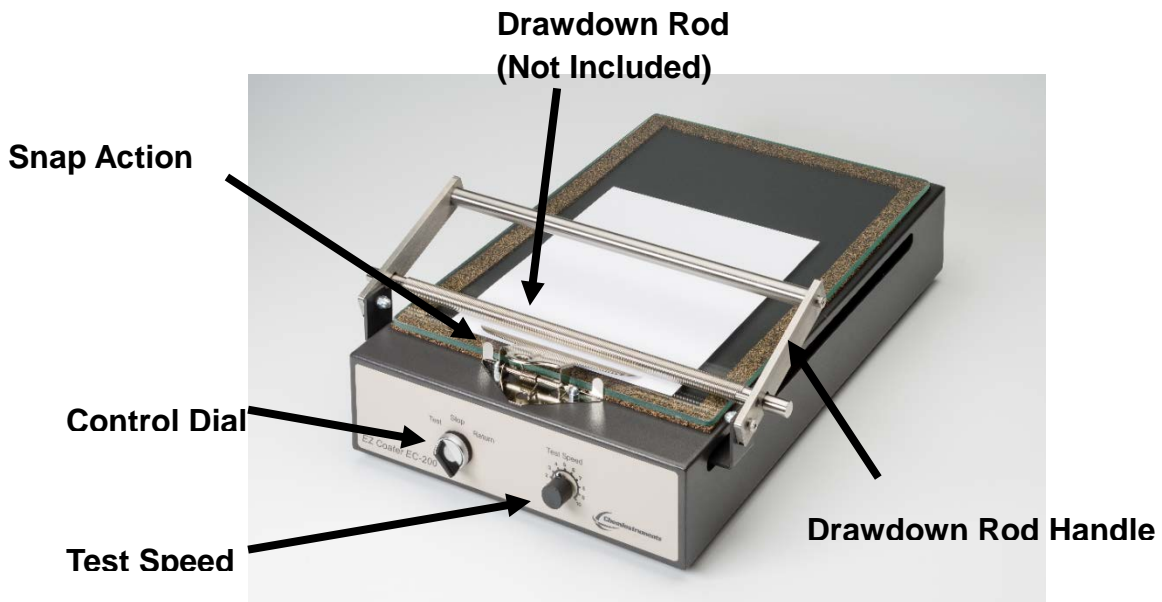


WARNING: Operating temperature for this equipment is 32 to 150 degrees Fahrenheit (0 to 70 degrees Celsius). The equipment needs to be completely free of condensation, inside and out, before applying power.

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. Pour a small puddle of coating in front of the rod.
5. Turn the Test Speed knob to a desired setting and turn the Control Dial to "Test". The rod will coat the substrate and stop at the end of the stroke.
6. Lift the Wire Wound Rod Handle and remove the rod. Remove the coated substrate.
7. Return the coating head to rear position by turning the Control Dial to "Return".
8. The unit is ready for another sample.
9. Make sure to clean your Wire Wound Rod before using it again.



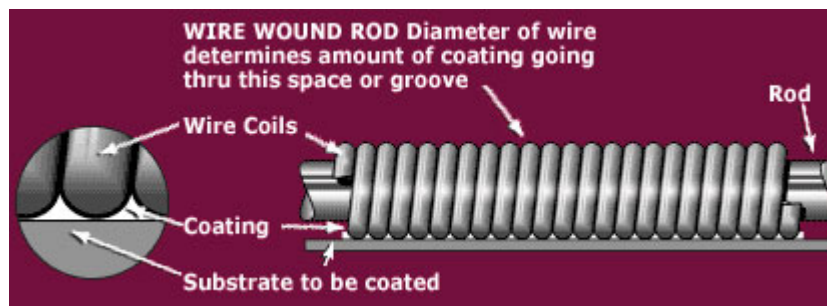
APPLIED COATING AMOUNTS WITH WIRE WOUND RODS

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

Problem	Possible Cause	Procedure
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.
	Test Speed knob is at 0.	Adjust Test Speed knob.
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.