

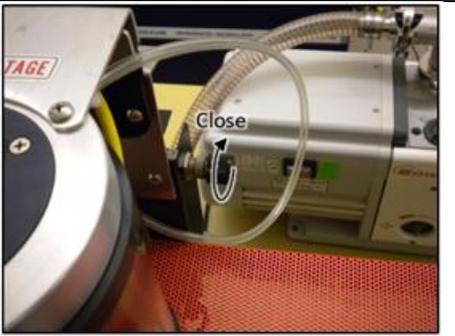
Number: 03

WORK INSTRUCTION BREAKDOWN SHEET

Operation: Sputter Coater **Startup/Shutdown**
 Instrument: Technics Hummer VI Sputter Coater

IMPORTANT STEPS	KEY POINTS	REASONS WHY
<p>A logical segment of the operation when something happens to advance the work.</p>	<p>Anything in a step that might:</p> <ol style="list-style-type: none"> 1. Make or break the job 2. Injure the worker 3. Be a Cultural Consideration 4. Make the work easier to do (i.e., “knack”, “trick”, special timing, or bit of special information). 	<p>Reasons for each key point.</p>
<p>Perform “Sputter Coater Sample Preparation” Work Instructions (See Number: <u> </u>)</p>		
<p>PRE-STARTUP EQUIPMENT and INSTRUMENT CHECK</p>		
<ul style="list-style-type: none"> • Put on clean disposable gloves. • Make sure appropriate Target is secured to underside of Top Plate. • After checking Target, gently lower Top Plate to rest on top of Glass Vacuum Deposition Chamber (hereafter referred to as “Chamber”). 	<ul style="list-style-type: none"> • NOTE: <u>always</u> wear clean disposable gloves whenever touching or handling Target. • Gently raise Top Plate and rest in upright position. • Target is the metal ring located between the thin vertical Top Plate wall and magnetic ring. • Gently lower Top Plate to rest on top of glass Chamber. • If Target is not present or needs to be changed, notify NanoLab Supervisor. 	<ul style="list-style-type: none"> • Wearing gloves minimizes contamination. • Typical Target type is gold (Au) or gold/palladium (Au/Pd). • Image shows Gold (Au) Target secured to underside of upright Top Plate. 
<p>Make sure Hummer VI instrument switches and dials are in correct position.</p>	<ul style="list-style-type: none"> • Power Switch is set to “off”. • High Voltage Control dial is set to zero voltage and switch is set to “off”. • Process Select Mode dial is set to “Plate D/C” and Pulse switch is set to “off”. • Timer switch is set to “Auto” and dial is set to zero minutes. • Vacuum Gauge needle is all the way to the right at or past the “ATM” millitorr position. • Plasma Discharge Current needle is all the way to the left at zero AC milliamperes. 	

¹ Adapted from Graupp, P. & Wrona, R. (2006) The TWI Workbook: Essential Skills for Supervisors. New York, NY. Productivity Press.

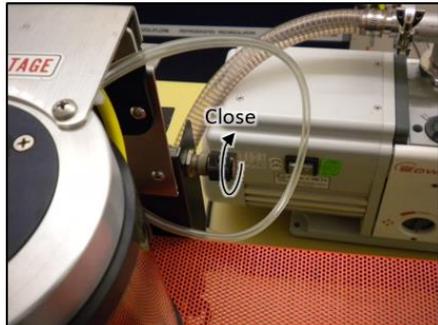
<p>Make sure Regulator Valve is closed.</p>	<ul style="list-style-type: none"> • Turn left-most thin black knob clockwise to close. • Note: <u>do not overtighten.</u> 	
<p>Make sure <i>Fine Gas Control Valve</i> on sputter coater is closed.</p>	<ul style="list-style-type: none"> • Turn knob clockwise away from Operator to close. • Note: <u>do not overtighten.</u> 	
<p>STARTUP - Prepare Argon Gas Supply</p>		
<p>Open the <i>Argon Gas Tank Valve.</i></p>	<ul style="list-style-type: none"> • Turn metallic valve handle counter-clockwise to completely open the valve. • Valve is completely open once Operator encounters resistance while opening. • DO NOT FORCE valve past completely open. 	
<p>Check the <i>Argon Gas Pressure Gauge.</i></p>	<ul style="list-style-type: none"> • Right (tank) gauge indicates how much gas is in the tank. • A full tank of argon gas may indicate as high as 3,000 psi, but any value greater than 200 psi is acceptable for use. • Notify NanoLab Supervisor if gauge indicates less than 400 psi. 	

¹ Adapted from Graupp, P. & Wrona, R. (2006) The TWI Workbook: Essential Skills for Supervisors. New York, NY. Productivity Press.

<p>Open the Regulator Valve and check its pressure gauge.</p>	<ul style="list-style-type: none"> • Turn left-most thin black knob counter-clockwise until loose. • Valve is completely open once Operator encounters resistance while opening. • DO NOT FORCE valve past completely open. • Left (regulator) gauge indicates pressure through regulator to sputter coater; should register approximately 10 psi (± 5 psi). • NOTE: Notify NanoLab Supervisor if gauge indicates greater than 15 psi or less than 5 psi after opening. 	
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Proceed to “Sputter Coater Operations” Work Instructions (See Number: ____)

SHUT DOWN – Close-off Argon Gas Supply

<p>Close the Fine Gas Control Valve on sputter coater.</p>	<ul style="list-style-type: none"> • Turn knob clockwise away from Operator to close. • Note: do not overtighten. 	<p>Overtightening may loosen or damage the knob and/or valve.</p> 
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<p>Close the Regulator Valve.</p>	<ul style="list-style-type: none"> • Turn left-most thin black knob clockwise to close. • Note: do not overtighten. • Regulator Pressure Gauge will still indicate pressure after closing valve; this is normal behavior and pressure will decrease very slowly. 	
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<p>Close the Argon Gas Tank Valve.</p>	<ul style="list-style-type: none"> • Turn metallic valve handle clockwise to close the valve. • Note: do not overtighten. • Argon Gas Pressure Gauge will still indicate pressure after closing; this is normal behavior and pressure will decrease very slowly. 	
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Remove disposable gloves.