GENERAL PROCESS AND OPERATION SPECIFICATION

Lesker PVD 75 RF Dielectric Sputter

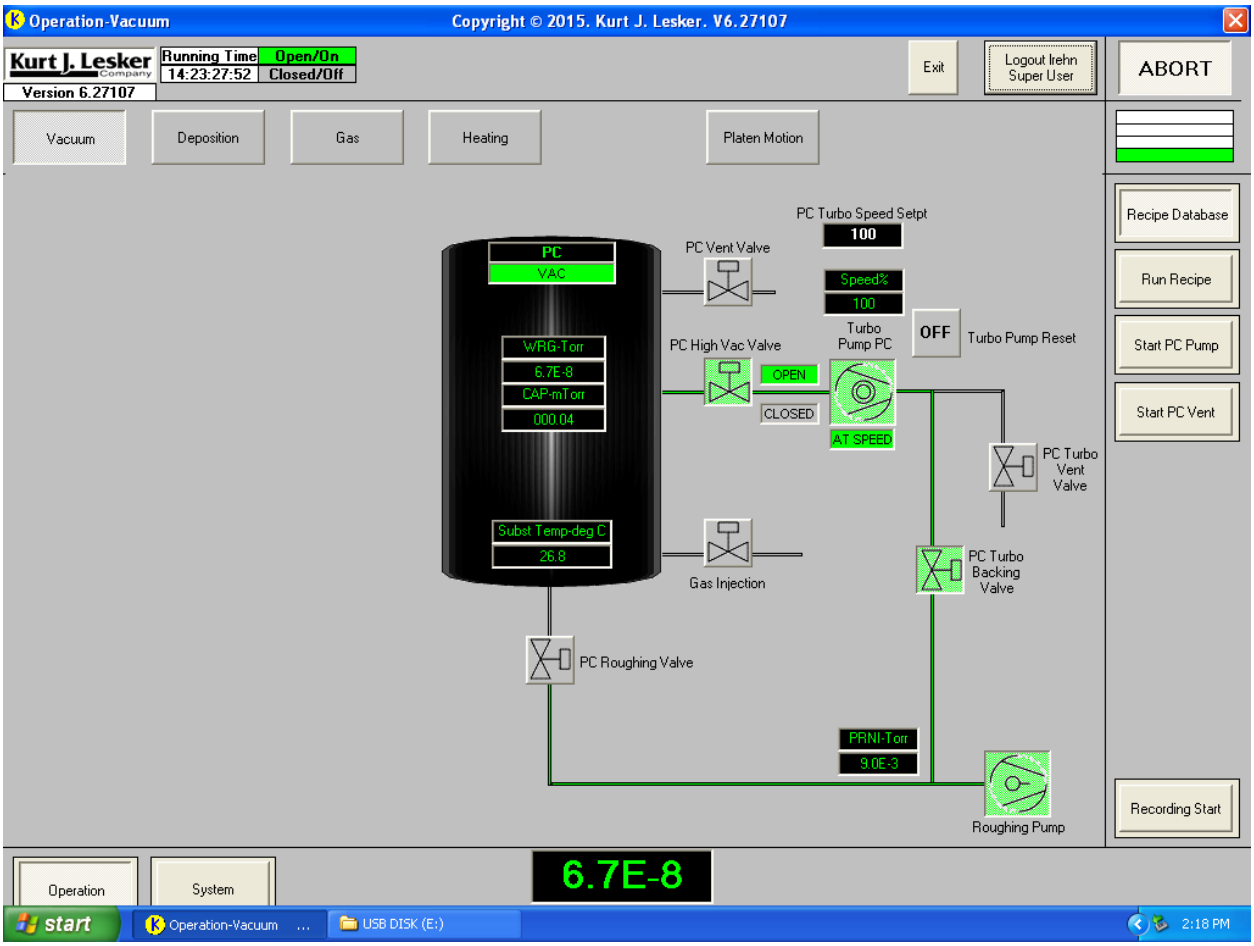
I. SCOPE
   a. The purpose of this document is to describe requirements and basic operating instructions for the Lesker PVD 75, RF Sputter tool. This tool is intended for thin film deposition of dielectric materials by RF Sputtering. Use of this tool is limited to only approved thin films and substrates.

II. SAFETY
   a. Be sure that you are trained and signed off to use this equipment.
   b. Be sure to keep all doors and protective shields in place before operating this equipment.
   c. Use care when operating around high voltage or high current.
   d. Use care when operating in RF mode of operation. Avoid coming near any electrodes or conductors carrying RF energy.
   e. High pressure gas cylinders for this tool are stored in ventilated gas cabinets located in the 7H1 service corridor. Be sure to ask a staff member for assistance to change out any gases.
   f. If you are unsure about any procedure or indication while operating this equipment be sure to contact a staff member or trainer for assistance.

III. APPLICABLE DOCUMENTS, MATERIALS AND REQUIREMENTS
   a. For more information about the detailed operation of this tool refer to the Lesker factory manual – "PVD 75 Thin Film Deposition System Operation Manual." File name: PVD 75 Manual.pdf.
   b. Appendix A: Editing of Recipes in KJL Software
   c. This tool is intended to be used with a restricted selection of substrate and target materials.
   d. Approved target materials: TiN, TaN, Al_2O_3, AlN, ITO, SiO_2, Si
   e. Materials provided by AggieFab as part of normal lab fees: SiO_2
   f. Approved substrate materials: Glass, Si, PVDF (with no substrate heating)
   g. Other substrate and target materials must be pre-approved by the Materials Review Board before running in this tool.

IV. OPERATION

NORMAL OPERATION


Operation-Vacuum
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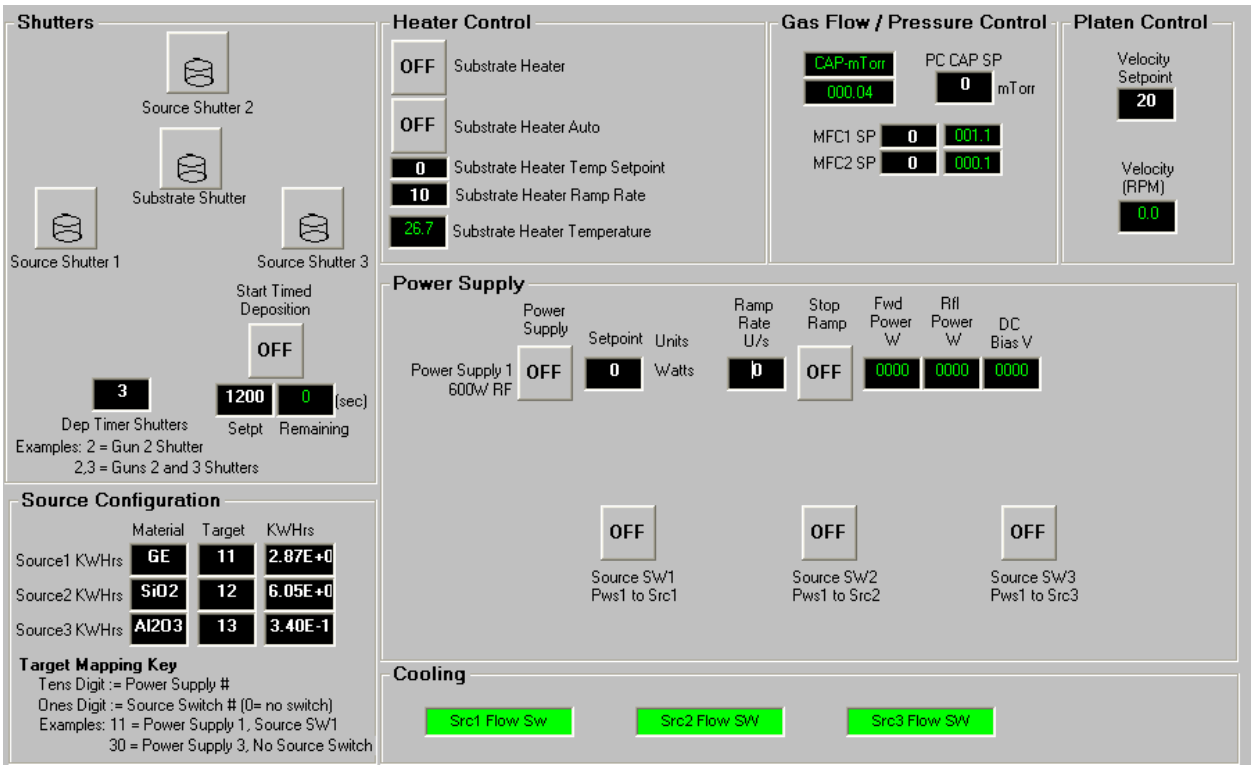
Kurt J. Lesker Company
Version 6.27107
Running Time
14:23:27:52
Open/On
Closed/Off
Exit
Logout Irehn
Super User
ABORT
Vacuum
Deposition
Gas
Heating
Platen Motion
Recipe Database
Run Recipe
Start PC Pump
Start PC Vent
Recording Start
PC
VAC
WRG-Torr
6.7E-8
CAP-mTorr
000.04
Subst Temp-deg C
26.8
PC Turbo Speed Setpt
100
PC Vent Valve
Speed%
100
Turbo
Pump PC
OFF
Turbo Pump Reset
PC High Vac Valve
OPEN
CLOSED
AT SPEED
PC Turbo
Vent
Valve
PC Turbo
Backing
Valve
Gas Injection
PC Roughing Valve
PRNI-Torr
9.0E-3
Roughing Pump
Operation
System
6.7E-8
start
Operation-Vacuum ...
USB DISK (E:)
2:18 PM


Shutters
Source Shutter 2
Substrate Shutter
Source Shutter 1
Source Shutter 3
Start Timed Deposition
OFF
3
Dep Timer Shutters
Examples: 2 = Gun 2 Shutter
2,3 = Guns 2 and 3 Shutters
1200
Setpt
0
Remaining
(sec)
Heater Control
OFF
Substrate Heater
OFF
Substrate Heater Auto
0
Substrate Heater Temp Setpoint
10
Substrate Heater Ramp Rate
26.7
Substrate Heater Temperature
Gas Flow / Pressure Control
CAP-mTorr
000.04
PC CAP SP
0
mTorr
MFC1 SP
0
001.1
MFC2 SP
0
000.1
Platen Control
Velocity Setpoint
20
Velocity (RPM)
0.0
Power Supply
Power Supply
Setpoint
Units
Ramp Rate U/s
Stop Ramp
Fwd Power W
Rfl Power W
DC Bias V
Power Supply 1 600W RF
OFF
0
Watts
0
OFF
0000
0000
0000
OFF
Source SW1 Pws1 to Src1
OFF
Source SW2 Pws1 to Src2
OFF
Source SW3 Pws1 to Src3
Source Configuration
Material
Target
KWHrs
Source1 KWHrs
GE
11
2.87E+0
Source2 KWHrs
SiO2
12
6.05E+0
Source3 KWHrs
Al2O3
13
3.40E-1
Target Mapping Key
Tens Digit := Power Supply #
Ones Digit := Source Switch # (0= no switch)
Examples: 11 = Power Supply 1, Source SW1
30 = Power Supply 3, No Source Switch
Cooling
Src1 Flow Sw
Src2 Flow SW
Src3 Flow SW


Kurt J. Lesker
ABORT
6.7E-8
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SIGNATURES AND REVISION HISTORY

a. Author of this document: Larry Rehn
b. Author Title or Role: Technical Manager
c. Date:
d. Revision: Original Issue

Approvals:

Technical Manager Signature:_____

Date: _____

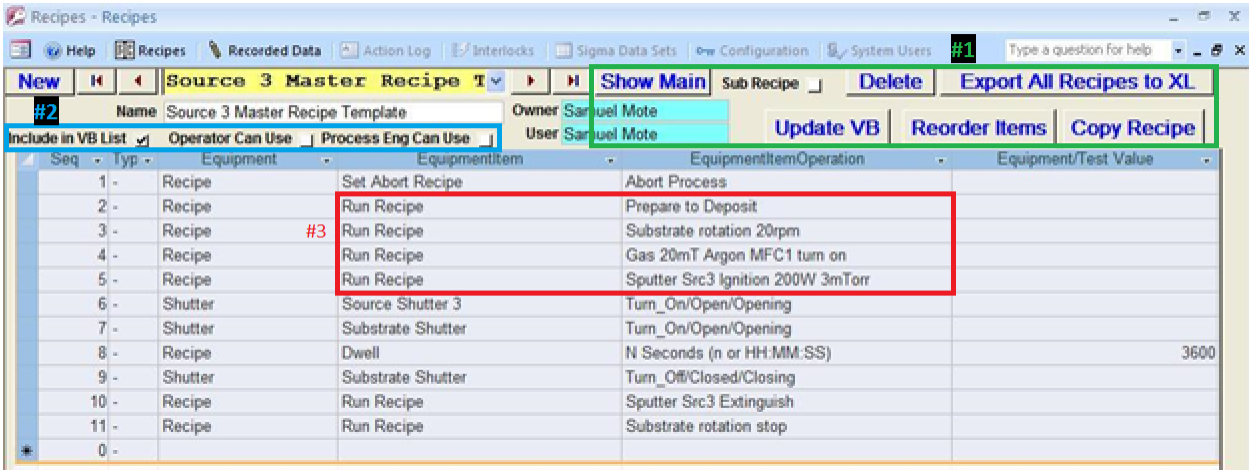
Revision History:

Revision	Author	Date
Original Issue	L. Rehn	
Rev A		
Rev B		
Rev C		

Appendix A – Editing of Recipes in KLJ Software:

Editing Recipes

Note: You can only edit recipes if you are the owner or if the owner has opened access to you for editing. The owner of a file cannot be changed and only the owner or a system administrator can delete the file.



#1:

Show Main/(Show All): Toggles the yellow recipe list between showing only Main Recipes or both Main and Sub Recipes. (The button displays the opposite of what is being used. For example, when the button reads "Show Main", the recipe list will be showing all.)
Sub Recipe Check Box: Defines Recipe as a Sub Recipe; Default as Main Recipe
Delete: Remove Recipe file
Export All Recipes to XL: Used only by system administrators
Update VB: Save all recipes that have been edited
Reorder Items: Move lines of the recipe
Copy Recipe: Create new recipe file with all of the same specifications currently selected. You will become the "Owner" of the new file.

#2:

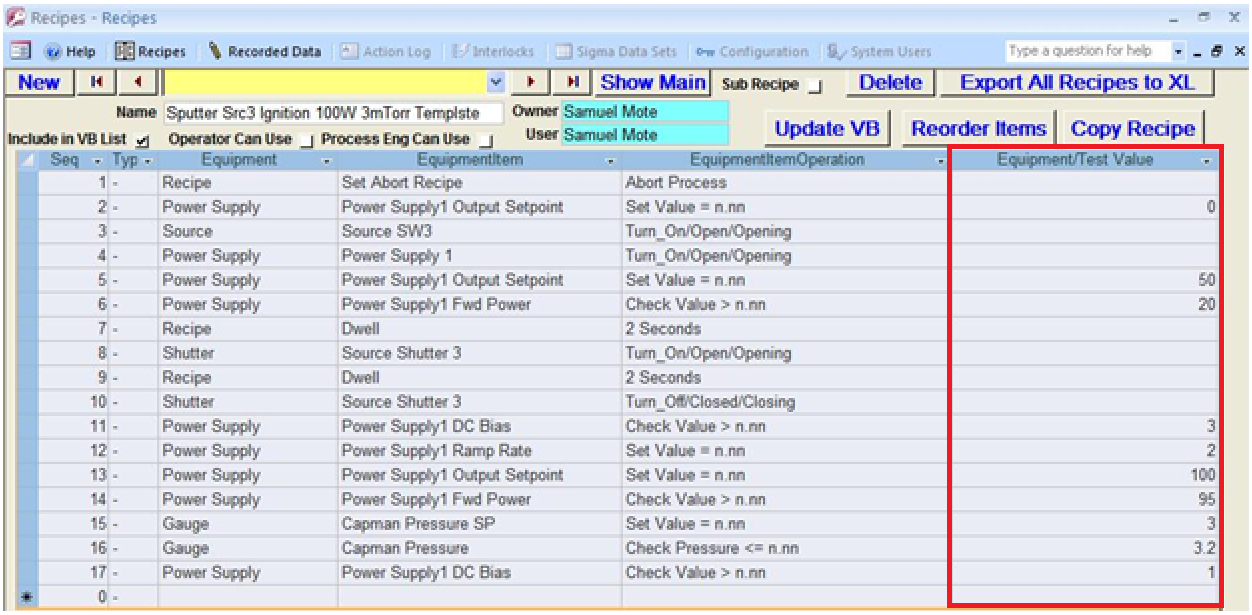
Include in VB List Check Box: (Default checked.) If checked, and if the recipe is a main recipe, it will be made visible in the yellow recipe list when Show Main is selected. If not checked, it will only show when Show All is selected.
Operator /Process Eng Can Use Check Boxes: (Default unchecked.) These boxes specify what groups are given access to editing the recipe file. If unchecked, only the owner and system administrators can edit it.

#3:

If the "Equipment/Item" column reads "Run Recipe", then the next column will specify what Sub Recipe is being called. Sub Recipes contain most editable parameters of a process. By clicking on the Sub Recipe name, a drop down box will appear that will allow you to select which specific Sub Recipe to run. Other "Equipment/Item" commands specify an action to be taken within the Main Recipe.

Editing Sub Recipes

Sub Recipes are where most parameters are defined.



Seq	Typ	Equipment	EquipmentItem	EquipmentItemOperation	Equipment/Test Value
1	-	Recipe	Set Abort Recipe	Abort Process	
2	-	Power Supply	Power Supply1 Output Setpoint	Set Value = n.nn	0
3	-	Source	Source SW3	Turn_On/Open/Opening	
4	-	Power Supply	Power Supply 1	Turn_On/Open/Opening	
5	-	Power Supply	Power Supply1 Output Setpoint	Set Value = n.nn	50
6	-	Power Supply	Power Supply1 Fwd Power	Check Value > n.nn	20
7	-	Recipe	Dwell	2 Seconds	
8	-	Shutter	Source Shutter 3	Turn_On/Open/Opening	
9	-	Recipe	Dwell	2 Seconds	
10	-	Shutter	Source Shutter 3	Turn_Off/Closed/Closing	
11	-	Power Supply	Power Supply1 DC Bias	Check Value > n.nn	3
12	-	Power Supply	Power Supply1 Ramp Rate	Set Value = n.nn	2
13	-	Power Supply	Power Supply1 Output Setpoint	Set Value = n.nn	100
14	-	Power Supply	Power Supply1 Fwd Power	Check Value > n.nn	95
15	-	Gauge	Capman Pressure SP	Set Value = n.nn	3
16	-	Gauge	Capman Pressure	Check Pressure <= n.nn	3.2
17	-	Power Supply	Power Supply1 DC Bias	Check Value > n.nn	1
0	-				

Equipment/Test Value: This is where the parameters of a Sub Recipe within a process are defined and edited. The same owner permissions are required as in a Main Recipe for editing.
If there are a set value and a check value for the same parameter, make sure to change both values together to keep the logic true. For example, if the power is set to 200 W and the check is set to greater than 190 W originally, and you want to drop to only 100 W set point, make sure that the check point is reduced similarly to greater than 95 or something close.