	SAFE WORK PROCEDURE:	Doc No.		SWP-COE-10		
		Last Rev/Date		00	31 Mar 2010	
	Metal-Organic Chemical Vapour Deposition (Emcore)	Current Rev/Date		00	31 Mar 2010	
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1. Application to:

All personnel working on MOCVD growths using the Emcore D125 system

2. Pre-requisite for Operation of Emcore MOCVD:

- 2.1. Must have attended the operation and safety training.
- 2.2. Must be fully understand the system risk assessment.
- 2.3. Must have read and understood the operation procedure
- 2.4. Must have apprenticed in using the system together with experience user of the system
- 2.5. Must be able to change gas cylinders and gas tanks when they are depleted

3. Hazards that may be present:

- 3.1. Handling of hot wafer carrier may burn hand.
- 3.2. Hot furnace may cause burns
- 3.3. Potential hazard of leakage of hydrogen, nitrogen, silane or ammonia gases from system
- 3.4. Micro size carbon particles may cause breathing problem when inhaled while opening growth chamber.


4. Personal Protection Required:

- 4.1. Half mask respirator with particulate cartridge
- 4.2. Gloves


5. Procedures:

5.1. Operating the MOCVD

- 5.1.1. On the control panel of the main system, put down the lever switch of the load lock chamber door found on the Logic Control Module panel to open the load lock chamber.
- 5.1.2. Put on face mask & gloves while waiting for the load lock chamber door to open.
- 5.1.3. When the load lock chamber door is opened, load the substrate wafer onto the wafer carrier which is supported by a movable arm.
- 5.1.4. Close the load lock chamber by pushing the load lock chamber lever switch up.
- 5.1.5. Wait for the load lock chamber to pump down and await the TDS software to show "Idle" on the computer screen.

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- 5.1.6. When the computer screen shows "Idle", lower the growth chamber pressure to around 5 Torr by reducing the hydrogen supply by setting MFCs 31 and 23 to a value of 5 sccm respectively and setting MFC 18 to 400 sccm and MFC 19 to 0 sccm.
- 5.1.7. Open the gate valve by putting up the lever switch on the main panel on the system.
- 5.1.8. When the gate valve is open, use the movable arm to transport the wafer carrier to the growth chamber.
- 5.1.9. After the wafer carrier is placed inside the growth chamber, retract the movable arm all the way back to the end in the load lock chamber.
- 5.1.10. Close the gate valve by putting down the lever switch on the main panel.
- 5.1.11. Wait for system to return to "Idle"
- 5.1.12. Load in the required run software.
- 5.1.13. When the system is "Idle", turn on the motor for the spindle by putting the switch for the motor (found on the main panel) to "Auto"
- 5.1.14. Turn on the power for the inner and outer filaments
- 5.1.15. Start run when the " Start Run" command is made available on the spreadsheet
- 5.1.16. When the run is completed, enter the command to return the system back to "Idle"
- 5.1.17. When the system is at "Idle" state, lower the growth chamber pressure to around 5 Torr by reducing the hydrogen supply by setting MFCs 31 and 23 to a value of 5 sccm respectively and setting MFC 18 to 400 sccm and MFC 19 to 0 sccm.
- 5.1.18. Open the gate valve by putting up the lever switch on the main panel on the system.
- 5.1.19. When the gate valve is open, use the movable arm to transport the wafer carrier from the growth chamber to the load-lock chamber, making sure the arm is retracted all the way to the end.
- 5.1.20. Close the gate valve by putting the gate valve lever switch down.
- 5.1.21. When the system has returned to "idle", put up the lever switch for the load-lock chamber glass door (found on machine main panel) to open the glass door.
- 5.1.22. Take out the grown sample after the glass door is opened.
- 5.1.23. Close the glass door after the samples have been retrieved and put down the lever switch for the load-lock chamber glass door (found on machine main panel) to close the glass door.
- 5.1.24. On the TDS software, lower the growth chamber pressure to reducing the hydrogen supply by setting MFCs 31 and 23 to a value of 100 sccm respectively and setting MFC 18 to 400 sccm and MFC 19 to 400 sccm.

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5.2 Maintenance of the MOCVD

- 5.2.1 Check that the system CDA pressure is around 90 psi
- 5.2.2 Ensure of sufficient Hydrogen & Nitrogen supply
- 5.2.3 Ensure the load-lock mechanical pump has sufficient oil
- 5.2.4 Check that the system exhaust is working fine
- 5.2.5 Check that the water level for individual thermal bath for MO source are sufficient

5.3 Specific Processes

N.A.

6. Communication Frequency:

The Lab Supervisors shall arrange for this Safe Work Procedure to be communicated as & when required and once in every year.

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