LPCVD

Low pressure chemical vapor deposition (LPCVD)
SI-LP80

Our Company is proud of introducing a sophisticated fabrication unit called as "low pressure chemical vapor deposition". This unit which is called "LPCVD" for short, is one of the most important units in the fabrication of micro and nano-electronic devices and circuits. The formation of highly resistant silicon-nitride is feasible by using a proper mixture of silane (SiH_4) and ammonia (NH_3) in a low pressure quartz tube and at temperatures as high as 750 to 800 °C. Such a layer is used as the mask for micro and nano-machining purposes as well as a suitable barrier against thermal oxidation of silicon in a high temperature quartz furnace. In addition, the deposition of polysilicon films is feasible using this machine. For this material, one can use SiH_4 and H_2 as the carrier gas. The operation temperature is around 580 to 620 °C while the pressure is maintained at a few "torr" level.

Apart from polysilicon and silicon-nitride, LPCVD can be used for the deposition or growth of silicon nanowires where operation at lower temperatures around 400 °C is required. The use of ultra thin layers of "gold" as the catalyst for the decomposition of silane in a "Vapor-Liquid-Solid" reaction is a critical parameter in such a unit. The formation of silicon nanowires in a VLS process could be exclusively achieved in a machine of this nature and our LPCVD is one of the best and safest units for this purpose. Owing to the serious safety hazards of such a useful and exclusive unit, LPCVD machines are realized with great complexity and of course with higher costs. The SI-LP80 is a unit which has been designed with a novel "double-wall" stainless chamber to ensure about the safety of the system, once exposed to hazardous gases such as hydrogen and silane. A dual-pumping system allows achieving excellent conditions for the formation of suitable layers.

Specifications

Model		LPCVD (SI-LP80)
Process chamber	Chamber Type & Size	Quartz tube reactor, 800mm in length
	Useful heat zone	200 mm in the middle of reactors
	Operating Temperature	500-850°c for different applications
Gas Module	Gas Distribution	Two mass flow controllers, SS lines Gas Ring, Main valve, Vacuum gage, Necessary connections, Up to 4 Gas Line
	Gases	
Pumping System	Vacuum Pumping Systems	rotary vane pump
	Base Pressure	Around 80 MiliTorr depended on processes
Control Module	Industrial PC/PLC	User Friendly windows7 Operator Interface- Temperature control unit
Physical Dimensions	Main Frame	Metallic suitable for one or two tubes
	Dimensions	700 × 1200 ×1700 mm (width, depth, height)
	Total Weight	300 kg
Power	Electrical	2 KW, 110/220 V, 3 Phase, 20/40 A
Applications	Micro-Nano Electronic, Nano-Structures (Nano-Wires, etc)	