Low Temperature Oxidation Furnace Tube

Process Description:

Low-pressure chemical vapor deposition (LPCVD) is performed in a dedicated vacuum environment at higher substrate temperatures such as 600 - 820°C. This process is based on the chemical reaction of gaseous compounds to form a thin film deposition. The gases are controlled from the back of the tube using mass flow controllers and flow to the front of the tube. Thermal energy is the primary source for the reaction while the lower pressure reduces gas phase nucleation. Together these system parameters achieve reasonable deposition uniformity and allow control of the deposition kinetics.

Equipment Description:

The polysilicon system is located in Tube 4 of the Tystar furnace. The system uses a microprocessor sequencer to automatically control the in and out movement of the cantilever and process steps, which includes the tube temperature, the vacuum valves, the reaction pressure, and gas flow. Wafers are loaded onto boats and transferred into the tube by a cantilever system. Two recipes have been developed to offer phosphorus doped and undoped silicon oxide depositions.

Gases:

Oxygen
Phosphine
Silane