

ABSTRACT

A protective shield and a semiconductor processing system including a protective shield is provided. The shield includes a frame assembly including a pair of spaced end walls and a pair of side walls extending between and mounted to the end walls, and a plurality of shield bodies carried by the frame assembly. Each of the shield bodies includes a base having a continuous unit frame, a perforated sheet carried by said continuous frame, a plenum between the base and the perforated sheet, and a gas delivery device for delivering an inert gas to the plenum at a flow rate such that the gas diffuses through the perforated sheet. The chemical vapor deposition system includes a plurality of processing chambers, a conveyor for transporting substrates through the processing chambers, buffer modules isolating the processing chambers from the rest of the process path all enclosed within a muffle. a protective shield mounted in the processing chambers includes injector shield bodies positioned adjacent the injector and shunt shield bodies spaced from the injector shield bodies, an inlet port between the injector shield bodies, and an outlet port between the shunt shield bodies for the flow of reagents through the protective shield. The shunt shield bodies each include a plenum filled with an inert gas and a bottom outlet port coupled to the plenum for delivering a supply of inert gas below the protective shield to form buffer barriers on opposite sides of the injection ports. The shield body captures the perforated sheets and shield bodies such that the sheets and shield body base can freely expand and contract relative to each other and the end walls under varying temperature conditions, maintaining the precise chamber geometry control required for CVD processing. The buffer modules are connected to a common by-pass exhaust which is independent from the system. The processing chambers are connected to a common chamber exhaust plenum which is separate from the by-pass exhaust. Such separate exhaust paths allow for separate control of each and for the substantially constant flow of gases within the system.

