A COMPOSITE SHOWERHEAD ELECTRODE ASSEMBLY FOR A PLASMA PROCESSING APPARATUS

ABSTRACT

A showerhead electrode for a plasma processing apparatus includes an elastomeric sheet adhesive bond between mating surfaces of an electrode and a backing member to accommodate stresses generated during temperature cycling due to mismatch in coefficients of thermal expansion. The elastomeric sheet comprises a thermally conductive silicone adhesive able to withstand a high shear strain of ≥ 300% in a temperature range of room temperature to 3000C such as heat curable high molecular weight dimethyl silicone with fillers. The sheet form adhesive has bond thickness control for parallelism of bonded surfaces over large areas. The sheet adhesive may be cast or die cut into pre-form shapes that can conform to irregularly shaped features, maximize surface contact area with mating electrode surfaces, and installed into cavities of the mating assembly. Installation can be manually, manually with installation tooling, or with automated machinery. Composite layers of sheet adhesive having different physical properties can be laminated or coplanar.

Figure 1