METHOD FOR PREPARING MOLTEN SILICON MELT FROM POLYCRYSTALLINE SILICON CHARGE

ABSTRACT

A process for preparing a molten silicon melt from polycrystalline silicon for use in producing single crystal silicon by the Czochralski method is disclosed. Granular and chunk polycrystalline silicon are loaded into a Czochralski crucible as a mixed charge. Preferably, the granular polycrystalline silicon is loaded onto the bottom, mounded toward the centerline of the crucible, and not contacting the upper portion of the wall of the crucible. The chunk polycrystalline silicon is loaded onto the granular polycrystalline silicon. The granular polycrystalline silicon and chunk polycrystalline silicon are melted to form a silicon melt, preferably by heating the polycrystalline silicon from the bottom up such that a substantial portion of the granular polycrystalline silicon is melted before a substantial portion of the chunk polycrystalline silicon is melted. As the melting progresses, the chunk polycrystalline silicon exerts a downward force on the granular polycrystalline silicon to keep the latter in the relatively hotter bottom region of the crucible. If the polycrystalline silicon is exposed to a purge gas, the chunk polycrystalline silicon thermally shields the granular polycrystalline silicon from the cooling effects of the purge gas.

THIS SHEET HAS BEEN REPLACED

This Sheet Has Been Replaced

