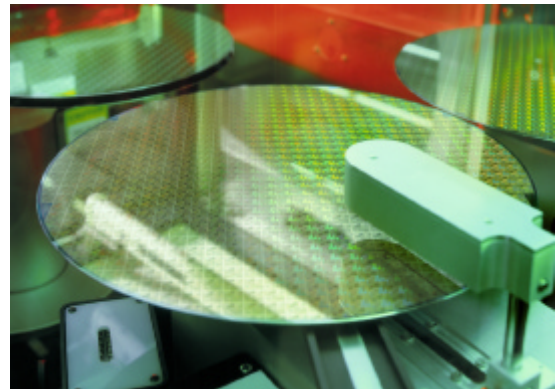


IC Manufacturing

Past methods of applying interconnects in IC (integrated circuit) manufacturing have included chemical vapour deposition (CVD) and ion implantation. A new method in the industry uses low-k, spin-on dielectrics which allows for faster interconnection delays and higher throughput. This method is thought to be better than previous methods because during the spin-on process, a more uniform layer is applied. Also, no additional equipment is needed such as polishers. Therefore, the total cost is less and the equipment has a smaller footprint where floor space in a clean room is limited.



The process of spin-on dielectrics starts with the wafer being placed on a turntable which spins at a given rate. While the wafer is spinning, the dielectric solution is applied. The wafer is then moved via a robotic arm and placed on a hot plate to bake at 500°C. This hot plate is located in a nitrogen purged chamber. During the baking process, small amounts of solvents may be evolved. At the end of the baking process, the wafer must be cooled quickly. Removing the wafer to ambient air is too slow. Therefore, the wafer is lifted from the hot plate and a nitrogen shower from above cools the wafer to less than 200°C within seconds. After the wafer is sufficiently cooled, it is removed from the chamber and placed back in the storage rack.

The use of nitrogen serves two purposes. First, the spin-on dielectrics, when baked in the presence of oxygen, will not work properly due to oxidation. Second, the nitrogen shower cools the wafer faster than ambient air. Oxygen concentrations range from ambient (20.9%) down to a very low ppm. As the wafer enters the hot plate chamber, ambient air is introduced. As the chamber purges, concentrations less than 5ppm are reached and maintained throughout the cooling cycle.

The 900 series analysers with RACE™ Sensors exceed the requirement for fast response and is unaffected by the solvent or hydrocarbons that may be produced during the baking process. The RACE™ Sensor has proven to be a valuable tool in this new semiconductor process.

Systech Instruments Ltd
17 Thame Park Business Centre,
Thame
OXON
UK
OX9 3XA

www.systech.co.uk
email advice@systech.co.uk
Fax +44 1844 217 220
Tel +44 1844 216 838