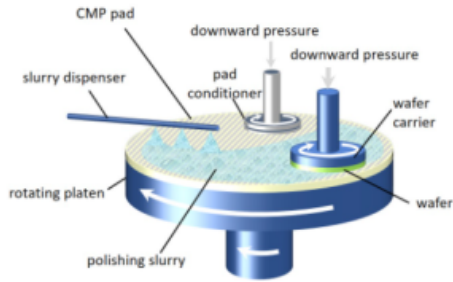


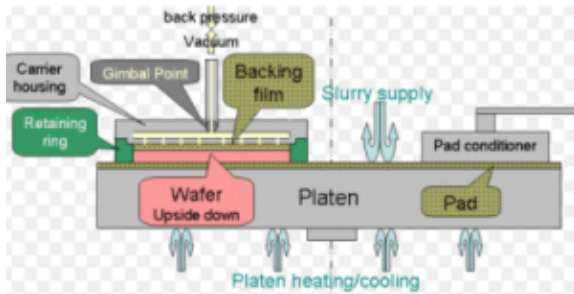
CMP retainer ring

Chemical mechanical planarization (CMP) is used during the semiconductor manufacturing process at each layer of the wafer to remove excess materials and create a smooth surface. This is done through the interaction of a pad and slurry on a polishing tool.



The **main functions** of the retainer ring are :

- To hold the wafer in place during polishing.
- To ensure that each die on the outer edge of the wafer can be effectively planarized. The ring applies a larger force on the pad than the wafer and is able to push out the undulations present in the PU-pad conformation. This allows a uniform polishing all across the wafer.
- To permit the flow of the polishing slurry into/out from underneath the wafer through millimeter-sized channels carved into the ring.



CMP retainer rings require **excellent chemical resistance**, **high mechanical strength** and **thermal stability**. In CMP, there is both a mechanical and chemical actions. The retainer ring plastic must have **good wear resistance** as it is subjected to:

- Adhesive component involving the polyurethane pad
- Abrasive component associated with slurry particles.
- Chemical attack from the chemicals in the slurry

The wear debris should not be hard, sticky, or anything that might harm the silicone wafer, like a black speck. So neat polymers are commonly used. Low ionic contamination levels and good processability in extrusion are also important.



The retainer ring is usually manufactured by the extrusion of large tubes, followed by machining. 90% of the market is based on **PPS material** and 10% on **PEEK**. The industry standard is a high molecular weight PPS. If you want to know more on the current products development and applicative tests done in the external lab, click on this [presentation](#).