2330 South Tenth Street
San Jose, CA 95112-4109
Tel: 1-408-441-4600
Fax: 1-408-441-9404
info@zeromicron.com
www.zeromicron.com

WAXLESS WAFER MOUNTING

ZeroMicron has been pioneering improvements to waxless mounting of wafers, chips, disks, optical windows and other components made of silicon, quartz, germanium, silicon carbide, sapphire, glass, etc. since 1996. The waxless mounting was originally called "free mount" and was developed by Wacker Chemical in the late 1960's [1]and subsequently copied by several U.S. firms.

Waxless mounting uses the capillary effect of water on poromeric material, called water adhesion, to retain the wafer, or other suitable material, in the template pocket. No wax, adhesive, glue or other chemical compound is required.

This removes the necessity for the wax application and the wax removal after polishing that is used in many processes. This results in a significant cost reduction and increased productivity. Since only water is used, it also removes the cost of handling the wax as well as the application and removal costs including eliminating the cleaning agents and disposal costs.

The advantages of waxless mounting.

- ✓ All ZeroMicron templates come with an adhesive backing that allow the template to be easily mounted to the polishing head carrier.
- ✓ No wax application tool or wax is required.
- ✓ Wafers are easily installed in the template pockets and only require a light pressure to insure the water adhesion to the poromeric material.
- ✓ Wafers are easily extracted from the template by the standard water jet method, in a bath or by using a Mylar pick, depending on the user process and requirements.
- ✓ No additional clean-up or chemicals are needed, the template pocket can be cleaned out and the next part inserted immediately.

Backside staining. The backside staining problem arises from residual contamination in the wafer pocket. Since the wafer back surface is bonded through water adhesion to the poromeric insert, slurry does not penetrate to the wafer backside. However, slurry will penetrate the wafer edge area and migrate into the wafer pocket. It is advised that the pocket should be carefully cleaned of any residual slurry when the wafers are removed to prevent contamination in subsequent polishing runs.

With ZeroMicron templates, the poromeric material is mounted above the base of the frame. Actively scrubbing the insert to clean it is recommended. However, do not scrub inserts on templates where the frame is bonded directly to the poromeric material as that may weaken the bond and cause the template to delaminate.

[1] Ref: *"A History of Industry Innovation – Ultraflat Polished Silicon Wafers"* by MEMC (www.memc.com)

There are three basic construction designs for waxless mount templates.

1) Milled pockets. This technique actually machines pockets into the template frame. This can be an expensive process even on a mass scale since each piece has to be handled and machined individually.

2) Frame on poromeric backing. This is a lower cost approach where the template frame is glued directly to a backing of poromeric material. Unfortunately, the glue on poromeric material typically forms a weak bond that easily delaminates.

3) Frame on hard backing. This is the technique used by ZeroMicron and involves mounting the template frame to a heavy PET backing for a secure bond. The pocket height is then adjusted to insure proper wafer protrusion by inserting a PET shim. This basic frame assembly is then used as a base for several variations of specialized templates for silicon, sapphire, germanium, etc.

ZeroMicron template variations include:

FI - Poromeric insert fixed in the wafer pocket

RI - Replaceable poromeric insert in the wafer pocket

S3 technology, Shim Spinning System to rotate the wafer in the pocket

S3 – Three piece assembly, template, shim and poromeric insert

SS – Two piece assembly, template and one piece ShimSert

PS – Two piece assembly, template and one piece PadSert (for hard materials)

PP - Two piece assembly PadPocket with poromeric insert (for hard materials)

The FI (Fixed Insert) templates are the simplest version. Clean the carrier plate, remove the backing paper and apply the template to the carrier plate. Wet the surface of the pockets, place the wafers in the pockets and lightly press the air out from under the wafer.

The RI (Removable Insert) template uses a low bond strength adhesive to retain the poromeric insert. Replacement inserts are available and inserts can be removed from the wafer pocket, the low strength adhesive is easily removed and a new insert can be applied.

For further information concerning the construction, durability and cost performance of the ZeroMicron family of waxless templates, please refer to the technical papers and product brochures in our catalog, on our web site or available on request from ZeroMicron at:

info@zeromicron.com

Contact: ZeroMicron Inc. 2330 South Tenth Street San Jose, CA 95112-4109 Tel: 1-408-441-4600 / Fax: 1-408-441-9404 Email: info@zeromicron.com	