

Application Process Example.

6" GaAs Wafer Backthinning is a highly used process within the semiconductor industry. Logitech has a full range of tried and tested products aimed at this process. The use of a DL system for the lapping process and DP system for the polishing process are ideal for this activity.

The use of a Logitech bonding unit is recommended for bonding glass substrates to the wafers. Once bonded the wafers are mounted by vacuum chucking on to the jigs. A digital gauge indicator on the jig shows the material removal during the process. This enables the user to process wafers to a predetermined, programmed thickness without the need to supervise. The system described here provides the user with the capability to take their materials from the initial lapping stages straight through to the final polish using a Logitech system that has been produced especially for their processing needs.

Expected results from a Logitech 6" GaAs Wafer Backthinning System are:

- Thickness Uniformity: +/- 3µm over a 152mm (6") diameter wafer
- Flatness: 5 µm over a 152mm (6") diameter wafer
- Surface Roughness: Within 5nm Ra over a 500µm trace
- Minimum Thickness: Typically 80- 100µm

(process results will vary slightly according to the quality of sample being used)



Chuck face examples

Accessories, Components & Consumables

A comprehensive range of accessories, components and consumables are available to support these systems, enabling optimum results and longevity of the machines. A selection of supporting products can be found below, for a more comprehensive listing please go to www.logitech.uk.com

Accessories & Components

- Micrometer angular adjustments heads
- Substrate stack clamping fixture for PP5
- Rotary vacuum adapter with tubing
- Programmable sample monitor (PSM), model available for NaClO processing
- Sample load gauge

Consumables

Logitech supply a vast range of consumables for lapping and polishing purposes. These tried and tested products ensure you achieve optimum results and maximum life-span from your Logitech products and systems.

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Jigs

Range of Precision Lapping & Polishing jigs

Logitech has a wide range of precision jigs, used to hold a diverse range of sample sizes and material types during lapping and/or polishing.

These jigs allows precise control of the sample orientation and fine adjustment of the load applied during processing.

Logitech jigs are precision made and hand finished to ensure the highest levels of accuracy. Planar adjustment of the samples is achievable through the use of an angular adjustment plate, sample retention is possible through either mechanical fixing, direct wax mounting or vacuum. Sample load can be easily varied from 200g to 9.5kg, depending on the jig used, catering for both fragile and hard material samples.

Logitech jigs are also available for use with sodium hydrochlorite based polishing solutions, such as Logitech 'Chemlox' solution.

Easy Operation & Accuracy

All Logitech jigs have an easy to read LCD digital display gauge that is accurate to within 1µm. The digital display and visual/audible alarm system informs the operator when the required amount of material has been removed from the sample.

Suitable Applications

Research and development work usually involves the processing of small numbers of specimens, often differing in shape and size. Logitech jigs enable specimens to be conveniently mounted for this type of work.



Precision Materials Processing

Jig Range Specifications

| Jig with vacuum chuckface | Outside diameter | Total thickness variation (TTV) of sample post process | Range of jig loads applied to samples | Angular adjustment range | Total jig mass | Standard jig information | | | | | | |
|---------------------------|------------------|--|---------------------------------------|--------------------------|----------------|--------------------------------------|---------------------|-------------------------------|--|---|--|------------------------------------|
| | | | | | | Dimensions height x outside diameter | Standard leg length | Standard drive ring thickness | Total thickness standard drive ring assembly | Max sample thickness on standard jig with angular adjustment plate | Max sample thickness on standard jig without angular adjustment plate | Angular adjustment plate thickness |
| PP5 | 83mm | +/-1.5µm | 0.2 - 2.8 kg | +/-1.5° | 5.4kg | 220 x 127mm | 32mm | 11mm | 43mm | 7.65mm | 14mm | 6.35mm |
| PP6 | 112mm | +/-2µm | 0.2 - 4.8kg | +/-1.5° | 8.4kg | 233 x 152mm | 42mm | 11mm | 53mm | 9.75mm | 19.75mm | 10.00mm |
| PP8 | 160mm | +/-3µm | 0.2 - 6.7kg | +/-1.5° | 14.4kg | 275 x 210mm | 32mm | 23mm | 55mm | 16.5mm | 24mm | 7.5mm |
| PP9 | 210mm | +/-4µm | 0.2 - 9.5kg | NA | 19.9kg | 220 x 260mm | 32mm | 20mm | 52mm | NA | 17mm | NA |

Jigs can be customised for specific sample dimensions. PP5 and PP6 Jigs can be supplied with extended legs to accommodate thicker/longer samples.

| Jig with fixture | Specimen parallelism achievable | Jig load with mounting pot fixture | Total jig mass with mounting pot | Angular adjustment range | Jig load with mounting pad fixture | Standard jig information | | | | | | | | | | | |
|------------------|---------------------------------|------------------------------------|----------------------------------|--------------------------|------------------------------------|--|--|--|---|---------|--------|--|---------|---------|---------------------------------------|---------|---------|
| | | | | | | Total jig mass with mounting pad fixture | Jig load with mounting plate & spacer ring | Total jig mass with mounting plate & spacer ring | Max sample thickness on standard jig with angular adjustment plate | | | Max sample thickness on standard jig without angular adjustment plate | | | Max sample diameter on a standard jig | | |
| | | | | | | | | | Pot | Pad | Plate | Pot | Pad | Plate | Pot | Pad | Plate |
| PP5 | <2" of arc | 1.823kg | 4.42kg | +/-3.0° | 2.21kg | 4.81kg | 2.763kg | 5.36kg | 14.10mm | 14.15mm | 6.55mm | 20.45mm | 20.50mm | 12.90mm | 14.00mm | 56.00mm | 83.00mm |
| PP6 | <2" of arc | 2.900kg | 6.50kg | +/-3.0° | 3.289kg | 6.89kg | 4.68kg | 8.28kg | 18.80mm | 18.85mm | 8.65mm | 28.80mm | 28.85mm | 18.65mm | 14.00mm | 56.00mm | 83.00mm |

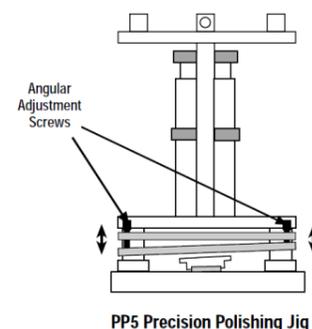
Lapping of larger wafers up to 200 mm (8") can be carried out using Logitech DL1 or DL4 systems with integrated PP9 jig.

Sample Alignment on Logitech Jigs.

Once the sample has been successfully mounted on the jig, it is necessary to ensure that the sample is aligned with the jig's drive ring. The sample and drive ring must be aligned prior to starting the processing, to ensure the sample is not polished at an angle.

All Logitech jigs are equipped with angular adjustment plates that allow the mounted sample to be moved either up or down, changing the angle of alignment between the sample and the jig's drive ring.

The drawing opposite highlights the plate and screws that should be turned in order to achieve the desired angle of alignment (in this case the jig, a PP5, has an IC mounted on the angular adjustment plate).



Vacuum Chuck Mounting Blocks

These mounting blocks are ideal for holding samples for polishing, where no thickness control or angular adjustment is needed.

Our precision engineered vacuum chucking facilities, VCB2 and VCB7, provide a choice of chuckface patterns. The supplied weights provide polishing speed control over a range of materials and polishing media.

Vacuum chuck mounting blocks are ideal for polishing thin sections such as soils, coals, rocks, concretes and wafer planarization.

