Client Support

Support is provided directly by Logitech and via an extensive global network of Logitech trained dealers. This enables us to provide a consistently high level of localised support and services from our technical base in Scotland.

A 12 month warranty is provided for all Logitech machines purchased. The client support policy at Logitech aims to resolve any client issues, be it mechanical, electrical or technological, in a fast and effective manner. The “no quibble” policy for replacement of faulty components ensures that any response to client difficulty is immediate.

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**Silicon Processing Systems Range**

<table>
<thead>
<tr>
<th>Order Filing &amp; Design</th>
<th>Process Type</th>
<th>Range</th>
<th>Speed</th>
<th>Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>APD1</td>
<td>y-axis</td>
<td>7.5µm</td>
<td>102mm</td>
<td>45 mins</td>
</tr>
<tr>
<td>APD1</td>
<td>y-axis</td>
<td>7.5µm</td>
<td>152mm</td>
<td>60 mins</td>
</tr>
<tr>
<td>AWS1</td>
<td>0 - 400 rpm</td>
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<td></td>
<td></td>
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<tr>
<td>WSB</td>
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<tr>
<td>SWSB3000</td>
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</tr>
<tr>
<td>LP50</td>
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<tr>
<td>PM5</td>
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<td>LP50</td>
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<tr>
<td>PM5</td>
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</tr>
<tr>
<td>CG-10</td>
<td>Linear</td>
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<td>NCG-2</td>
<td>Measurement</td>
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<td>Fizeau</td>
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<tr>
<td>GI20</td>
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</tr>
<tr>
<td>LG2</td>
<td>Autocollimator</td>
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<td></td>
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</tr>
</tbody>
</table>

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**Complete Systems for the preparation of Silicon**

Where applications demand precise tolerances and optimum surface finish.

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Logitech Limited has a wealth of knowledge and problem solving skills in the processing of silicon. Increasingly R&D and production site worlds are reaping the benefits of using Logitech precision polishing, lapping and polishing machines for accurate silicon processing. Whether for semiconductor or optical applications, such as wafer and chip manufacture or IR and polymer wave production, the exacting design and manufacture of Logitech equipment ensures you achieve the highest quality results.

This brochure provides a brief analysis of how your sample will benefit from the versatility and precision offered by the latest Logitech technology, regardless of whether your application is e-beam polishing, backthinning or delayering. To support our clients we provide comprehensive technology transfer and customer support with every full system purchased.

Precision Materials Processing

Introduction

Logitech offer systems which cover the complete range of production capacities and accuracies. From R&D applications processing a few high accuracy wafers to detailed production units, processing high quantities of ultra-thin high accuracy wafers.

Logitech Systems

Logitech Systems are designed to be flexible with changing production requirements in terms of accuracy and outputs. The family of products enables customers to start with a single workstation machine and add other single or multi workstation machines as necessary. This approach provides two major benefits:

• Low initial investment during the development stages.
• Ability to create a multi-machine production unit.

Lap & polish silicon wafers or devices using the PM5 lapping & polishing machine.

Logitech’s unique consultative approach ensures that customers achieve the best possible results from the advanced Logitech machines and system application process.

Application Analysis

Our technical team work in conjunction, with customers to identify the most relevant system for optimum results on their particular application or polishing process. Initial discussions provide a detailed understanding of production quantity, sample dimensions, surface finish and geometric tolerances requirements.

Typical options in this area are:

• Wafer lapping and polishing
• Preparation of substrates for use in waive manufacture
• Planarization of surface layers
• Cross-sectional polishing (such as physical failure analysis)

Chemical Mechanical Polishing/Planarization/Ultra-thin Wafer Polishing:

This technique allows a damage free and smooth surface to be produced to the required standards of flatness on wafers with a maximum diameter of 200mm (F), Cz and isolated optical electronic chips. An alternative method for planarization using a Logitech system with the use of automatic plate flatness is the PM5 or PPS5 systems.

In addition to planarizing, there is often a requirement to analyse a decoy by lapping and polishing the backside of the silicon substrate. Accurate material removal at the polishing stage can be achieved using the PM5 or PPS5 systems. Ultra-thin wafer polishing is ideal for TEL analysis where optimal surface finish is required. The flexibility of a Logitech system enables you to create repeatable, accurate results. For example: production of ultra-thin wafers of 28µm, whilst achieving sample TTV of +/-2µm.

Chemical Mechanical Polishing/Planarization/Ultimating Ultra-thin Polishing: The Logitech Orbis and Tribol systems have been designed specifically for chemical mechanical polishing and are ideal for the accurate and effective removal of selected layers by planarization.

This technique allows a damage free and smooth surface to be produced to the required standards of flatness on wafers with a maximum diameter of 200mm (F). The machines are based on the standard single workstation PM5 or PPS5 and the multi workstation LP50 or DL4. Versions of the PM5 and LP50 are available with automatic plate flatness control providing greater levels of repeatability and improved sample quality.

Polishing accuracy to nanometer levels for fault isolation
Removal of epi-layers with nanometer level precision
Polishing action is essential for polishing III-V and II-VI semiconductor wafers where minimal crystalline damage, under the polished surface, is required. Equipment used for this process must resist chemical attack and rapidly extract the corrosive fumes. Suitable systems are DP1, DP4, Tribo, Orbis and the PM5, LP50 with optional hood.

Polishing the backface of the silicon substrate. Accurate material removal at the lapping stage can be achieved using the PM5 or PPS5 systems. Ultra-thin wafer lapping is ideal for TEL analysis where optimal surface finish is required. The flexibility of a Logitech system enables you to create repeatable, accurate results. For example, production of ultra-thin wafers of 28µm, whilst achieving sample TTV of +/-2µm.

Wafer Polishing: Processes involving chemical action are essential for polishing III-V and II-VI semiconductor wafers where minimal crystalline damage, under the polished surface, is required. Equipment used for this process must resist chemical attack and rapidly extract the corrosive fumes. Suitable systems are DP1, DP4, Tribo, Orbis and the PM5, LP50 with optional hood.

Wafer Lapping: Optimum geometric control is achievable through the use of high precision fiducials during lapping processes. Fine mechanical lapping is normally used for backthinning or trimming of wafers, such as bulk removal of material using Aluminium. Odissi abrasives. Wafers are mounted using Logitech holding fixtures such as PPS, PPR and PPS 7. Systems are based on the standard single station PSS5 and PPS5 and the multi workstation LP50 or DL4. Versions of the PSS5 and PPS5 are available with automatic plate flatness control providing greater levels of repeatability and improved sample quality.

Before lapping or polishing the section, fine tuning of the sample orientation is necessary. This approach provides two major benefits:

• Low initial investment during the development stages.
• Ability to create a multi-machine production unit.

Water polishing: Due to the expense of crystal growing, saving operations must minimise material waste (kerf loss), making the Logitech ARO range of precision saws ideal. The highly tensioned blades ensure minimal line loss and reduce water damage, enabling users to cut very fine wafers with a high yield per crystal.

Water bonding: High yield polishing of delicate, ultra thin materials (typically below 100µm) normally requires temporary or permanent bonding of wafers to support discs. The techniques and equipment used depend on water thickness, uniformity requirements, sample diameter and whether there are fabricated devices on the wafer. Logitech supply products to meet the most demanding requirements. Options range from hard bonding to high volume precision bonding systems.

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Training and process technology transfer at Logitech cover equipment and wafer handling, cleaning, bonding, gauging and process adjustments, with which the operator needs to be familiar. Logitech are dedicated to complete access and through extensive practical purpose built fault faking facilities at our premises, the team ensures that personal training is provided at a level relevant to the clients process requirements.

Years of experience has identified that instruction manuals alone do not provide operators with the levels of knowledge and success that are achievable through personal training and practical experience. Logitech are so committed to this programme of technology transfer that it provides a full three day training course, with all material processing systems purchased. Courses cover all aspects of system operation, maintenance and customer focused process trials. The unique approach ensures successful installation, optimum saw and maintenance of Logitech systems.

Cross-Sectional Analysis: Shrinking feature sizes and the increasing complexity of multi-layer architecture continue to present challenges for the accurate identification and analysis of defects in both silicon and general silicon wafers. Precision edge polishing of a cross section can reveal, with excellent clarity, micro-features within the epitaxial layers.

The most appropriate system is based on a Logitech PM5 lapping and polishing machine with a PM5 MPS, tooling fixture and APS for initial wafer clamping. The PM5 MPS machine incorporating automatic plate flatness control is also beneficial before polishing or lapping the section. Fine tuning of the sample orientation can be achieved using the angular adjustment plate on the PM5 MPS with a +/-3 degree range.

Delayering: Polishing silicon based multi-layers circuit dies to specific metallized or oxide layers requires a high degree of precision. Logitech systems offer flexibility in polishing different film materials. Oxidized and other layers are removed whilst exposed layers are kept completely planar to the wafer surface.

Using a Logitech CMP system you can maintain nanometer accuracy and uniformity. This allows parallelism over the whole wafer to be maintained, whilst increasing the ability to identify sample defects. Individual die, ICs or wafers up to 200mm (8”) in diameter are retained using the Tribo and Orbis range of carriers, shims and templates. Each process parameter is directly controlled from the automated control panel and saved for future use, thus helping to maintain process uniformity.

Subsequent polishing encompasses the required layer for analysis. This approach allows:

• Removal of die layers with nanometer level precision
• Polishing accuracy to nanometer levels for fault isolation
• Capability to delayer up to 200mm (8”) diameter wafers using the Orbis system
• Surface polishing to sub-micron