Pad Grooving and Surface Preparation

We can precisely and efficiently remove the ‘skin’ from the surface of the pad, and proceed to groove the pad with novel or conventional patterns:

- Control accuracy = 5 microns
- Processing precision = ± 15 microns

Our experience has shown that ‘skinned’ pads result in much faster removal rate stabilization. They also reduce the burden placed on diamond conditioners to break-in and ‘season’ the pads.

All work is done at Toho Engineering’s world-class clean room facility in Mie (Japan) using the CMP-800C and CMP-1000 patented surface preparation and grooving machine.
## CMP-800C and CMP-1000 Pad Grooving Machines

### Specification

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Toho Engineering Co., Ltd.</th>
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</table>
| **Pad Size**          | CMP-800C: Up to 800 mm in diameter  
                        CMP-1000: Up to 1100 mm in diameter |
| **Capability**        | Front and back surface skinning  
                        Concentric (straight or slanted angle)  
                        Spiral and/or Logarithmic  
                        XY Cutting (to any desired final diameter) |
| **Positioning**       | Control accuracy = ± 5 microns  
                        Processing precision = ± 15 microns |
| **Control System**    | Sequential control |
| **Platen**            | CMP-800C: \( \Phi = 800 \) mm  
                        CMP-1000: \( \Phi = 1100 \) mm  
                        Rotation rate = Up to 400 RPM |
| **W × L × H**         | CMP-800C: \( 240 \times 160 \times 220 \) cm  
                        CMP-1000: \( 320 \times 250 \times 200 \) cm |
| **Weight**            | CMP-800C: 3,000 kg (apprx.)  
                        CMP-1000: 4,850 kg (apprx.) |
| **Electrical**        | 220 V and 50 A |
| **CDA**               | Pressure = 5 kg per cm² |
| **Options**           | Numerical control system  
                        Plural blades (for concentric & XY grooves)  
                        Plural drill and end-mill unit  
                        Dust suction unit  
                        Pad cleaning unit  
                        Platen rotation rate of up to 1,000 RPM |

### US Patent Numbers

<table>
<thead>
<tr>
<th>US Patent Number</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>6,869,343</td>
<td>Turning tool for grooving polishing pad, apparatus and method of producing polishing pad using the tool, and polishing pad produced by using the tool</td>
</tr>
<tr>
<td>7,017,246</td>
<td>Polishing pad and method of fabricating semiconductor substrate using the pad</td>
</tr>
<tr>
<td>7,104,868</td>
<td>Polishing pad and method of fabricating semiconductor substrate using the pad</td>
</tr>
<tr>
<td>7,140,088</td>
<td>Polishing pad and method of fabricating semiconductor substrate using the pad</td>
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