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# Operators Manual

Circular Spin Chucks



  
Cost Effective Equipment

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## 1. Introduction

### 1.1. Confidentiality Statement

Information supplied is for the use in the operation and/or maintenance of Cee equipment. Neither this document nor the information it contains shall be disclosed to others for manufacturing or any other purpose without written authorization from, Cost Effective Equipment, LLC.

### 1.2. Types of Spin Chucks

- **Circular Vacuum** – For coating/developing/cleaning standard wafers and pieces
- **Recessed** – For coating rectangular substrates
- **Captive** – For developing/cleaning substrates
- **Porous Ceramic** - For coating/developing/cleaning thin substrates (<250µm)
- **Film Frame** - For developing/cleaning substrates mounted on film frame
- **Custom** - Perimeter Vacuum, Non Vacuum, Multi Substrate

## 2. Circular Spin Chuck Use

Circular spin chucks are used for processing standard wafers and pieces. With standard-thickness (275-750 µm) substrates that are centered properly, a maximum spin speed range of 3,000 to 6,000 rpm and accelerations of 3,000 to 6,000 rpm/s are recommended. As substrate size increases, the use of a centering device, and/or verification of optimal centering of the substrate, becomes increasingly critical for maintaining positive contact between the substrate and the vacuum surface. As thickness increases, the maximum speed and acceleration must be decreased for safe operation. To process beyond these parameters, captive or recessed spin chucks are recommended.

### 2.1. Choosing a Chuck for the Substrate

Standard circular vacuum chucks are capable of processing substrates with a diameter of no more than twice the spin chuck surface diameter. For example, a 4 inch chuck would not be recommended for substrate sizes larger than 8 inches (200 mm) in diameter or 8 inches square.

#### **Cee® Recommended Sizes for Width of Substrates**

<b>Physical Chuck Diameter</b>	<b>Recommended Substrate Width Range</b>
1/8" (0.125") External O-Ring	3 mm-9.5 mm/0.125"-0.375"
5/16" (0.312") External O-Ring	9 mm-26 mm/0.375"-1.0"
0.75" Circular Vacuum	25 mm-38 mm/1.0"-1.50"
1.0" Circular Vacuum	32 mm-50 mm/1.25"-2.0"
1.5" Circular Vacuum	45 mm-77 mm/2.0"-3.0"
2.25" Circular Vacuum	77 mm-127mm/3.0"-5.0"
4.0" Circular Vacuum	125 mm-200 mm/5.0"-8.0"
6.188" Circular Vacuum	200 mm-300 mm/8.0"-12.0"

### **2.2. Spin Chuck Removal and Installation**

1. If equipped, locate the spin chuck screw (located in the center of Vacuum chuck) and remove with a hex key wrench. If chuck has porous ceramic insert, locate the push pins on the back side of the chuck and use to lift the ceramic insert out in order to access screw.
2. Grasp the spin chuck and pull up and remove vertically.
3. Place new spin chucks in the same orientation as old and ensure that the spindle pin/key aligns with chuck slot.
4. Use a hex key wrench to secure spin chuck screw in the center of new chuck.

### **2.3. Substrate Placement and Removal**

1. Place the wafer onto the chuck surface.
2. Center the substrate onto the chuck. The larger the substrate the more important this step. Cee offers centering devices to aid in this step for common substrates.
3. Start the recipe and follow the centering step instructions.
4. Once the process is complete, the vacuum automatically turns off and the substrate can be removed.

### 3. Preventative Maintenance

This maintenance manual provides personnel with procedure and guidelines for maintaining a Cee® spin chuck. Below is a chart of recommend maintenance scheduling.

Maintenance Section	Maintenance Schedule
Safety Checks	Before daily tool use
Cleaning	After daily tool use
Mechanical Checklist	See Section Below Details

#### 3.1. Safety Checks

Inspect spin chuck lid for the following defects:

- (a) Loose assemblies
- (b) Damage to the surface
- (c) Dirty surface

#### 3.2. Mechanical Checklist

1. **Spin chuck cleanliness:** If any material has built up on the spin chuck, it can be wiped clean with most organic solvents isopropyl alcohol, or acetone. For major buildup of material, a glass slide can be used to gently scrap the material away. Follow by wiping clean. A dirty spin chuck could cause vacuum errors. See section below on detailed cleaning instructions. **Daily**
2. **Spin chuck flatness:** This can be seen visually with a straight edge. Small uniformity issues such as a burr can be gently removed with a razor blade or a glass slide. Larger deformations such as a damaged area from dropping can be removed with fine sandpaper. A non-uniform spin chuck can cause vacuum errors. **Quarterly**

#### 3.3. Cleaning

For cleaning, it is good practice to use the mildest solvent possible such as most organic solvents, acetone, isopropyl alcohol, or N-methylpyrrolidinone (NMP). Caustic acids or bases should not be used.

Keep solvent from getting into the vacuum system. When cleaning the spin chuck, remove it from the equipment.