RKD Systems
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OMEGAPREP
BASIC SPECIFICATIONS

Dimensions	
Height	425 mm
Width	370 mm
Depth	450 mm
Weight	20 Kg
Shipping weight	28 Kg
Power Requirements	90-250 VAC 49 - 61 Hertz @ 4 amps maximum
CDA requirements	30-70 PSI 0.5 CFM maximum
(Spindle purge option only)	- 40°C dew point, no particulates >3 µm. Zero oil
Operating temperature range	16 - 26°C
Storage temperature range	5-30°C
Operating RH (relative humidity)	10-85%, non-condensing
X axis travel	135 mm (110 mm, usable)
Y axis travel	135 mm (125 mm, usable)
Z axis travel	80 mm
Travel speed	5-600 mm/minute
Spindle speed	2000-10,000 RPM
Axis resolution and repeatability	
X ,Y axis Resolution	0.001mm (1µm)
Z axis resolution	0.00025 mm (0.25µm)
X,Y axis repeatability	+/- 0.001 mm in X or Y (1.0µm)
X, Y axis overall repeatability	+/- 0.003 mm 3.0µm (at constant temperature)
Z axis repeatability	+/- 0.00025 mm (025µm)
Z axis overall repeatability	+/- 0.0005mm 0.5µm (at constant temperature)
Scale resolution and accuracy	
Resolution	0.000488 mm X,Y(0.488µm) 0.000244 mm Z (0.244µm)
Scale accuracy	+/- 0.040 mm/meter
Repeatability	+/- 0.000488 mm X,Y(0.488µm); 0.000244 mm Z (0.244µm)
Hysteresis	< 0.002 mm (2µm) (uncorrected)

Geometry

Spindle axis to X-Y plane	+/- 0.50 milli-radians
X to Y axis	+/- 0.25 milli-radians
Z to X-Y plane	+/- 0.25 milli-radians

Overall Positional Accuracy +/- 0.0005 mm, Z and 0.003 mm, X, Y+ 0.000027 mm (0.027µm)
(per degree change in ambient temperature per millimeter of travel from reference)

Spindle **runout**	0.003 mm
Tool holder	ER-8 Collets
Touchdown repeatability	+/- 0.25 µm typical
Touchdown force	50 gm. typical
Usable die size	0.5 mm to 48 mm per side
Usable machining area	0.25 mm to 55 mm per side
Maximum package size	125 mm X 125 mm, with special fixturing
User interface	
Screen size	145 mm diagonal
Input type	Stylus Touch Screen
Video monitor screen size	7.8 inch (20 mm. diagonal)
Video magnification	X 10, typical for alignment X 20, typical for process observation
Video resolution	NTSC standard

THICKNESS MEASUREMENT SPECIFICATIONS

Available as an option to the OmegaPrep for the measurement of remaining silicon thickness

Thickness range	0.5 - 200 µm. in two ranges
Measurement accuracy	
High range	12 to 200 µm: +/- 1% (+/- 1µm)
Low range	0.5 to 14 µm: +/- 2 % (+/- 0.12207µm)
Measurement resolution	0.12207 µm.
Spot size	
High range	100 µm. typical
Low range	500 µm. typical
Sample tilt range	+/- 2 degrees - from the X-Y movement plane
Measurement time	2 -5 seconds per location
Profiling time	6 minutes typical for a 14 mm X 18 mm die (63 points)

OMEGAPREP SYSTEM FEATURES

Simple and intuitive operator interface similar to UltraPrep I and II

FAST AND EASY SET UP

Video alignment on sample diagonal, or all four corners to eliminate rotational errors
Removable sample holders, allowing removal without re-mounting or aligning
Uses standard part (sample) holders from the UltraPrep I & II

TOUCHDOWN AND TOOL LENGTH MEASUREMENT

Performed without use of a gauge
The position sensing system measures both the tool and surface position
A touch tool is used for profiling
Touchdown force is low and resolution is 0.25 µm.
No leveling required during sample mounting on OmegaPrep

SYSTEM AUTOMATION OF THINNING AND POLISHING PROCESSES

Programmable depth repeatable to +/- 0.25 µm.
Contour tool path for grinding, lapping & polishing
Near zero down force during die thinning
Minimal final sample thickness variation

The thickness measurement system supplied with the OmegaPrep allows thickness measurements on the positions used to measure the surface profile. This allows the software to directly correct the tool path to eliminate most remaining silicon thickness variation.

The system is robust and rigid. Each axis drive assembly is supported by a design that provides exceptional rigidity, whilst keeping the weight to a minimum.

Each axis drive assembly is independently shielded from contamination by sliding metal plates. The all metal construction and a water resistant base allows for easy cleaning whilst limiting the effects of contamination from the process fluids.

OPTIONAL ACCESSORIES

Several kits are available that provide the special tools, fixtures, and supplies for different processes.

FLIP CHIP STARTER KIT

This kit contains the grinding, lapping, and polishing tools necessary to thin flip chip mounted die.

PLASTIC PACKAGE STARTER KIT

This kit contains the machining, grinding, lapping, and polishing tools used to thin die in a plastic package.

DIE DELAYERING KIT

This kit contains the mounting supplies and equipment as well as the lapping and polishing tools used to de-process an unpackaged die. It includes a UV light source, optical flats, and special holding fixtures used for precise mounting of each sample.

SECTIONING AND EDGE POLISHING KIT

The contents of this kit are to be determined.

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