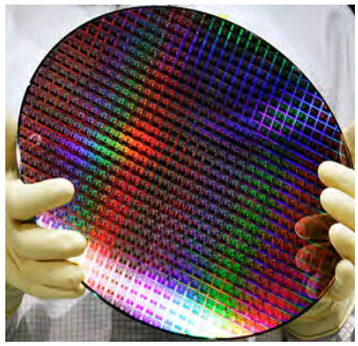
HARDINGE®

CNC UNIVERSAL OD/ID GRINDERS AND SUPER-PRECISION® LATHES



HARDINGE.COM

KELLENBERGER UNIVERSAL OD/ID GRINDERS

Kellenberger's K-Series CNC Grinders are the best machines in the market for super precision and high accuracy grinding applications.

Available in the following sizes:
- K-10
- K-100
- K-1000

WHEELHEADS

- 10 different wheelhead configurations
- Integral motor
- Compact diagonal wheelhead
- Collision-free universal design
- OD Wheel diameter max. Ø20" (Ø500 mm)
- Cutting speed up to 9,800ft/min (50m/s)
- ID grinding spindles 40,000 to 90,000rpm

KEY FEATURES

- FANUC CNC control w/19" touch screen monitor
- Collision-free grinding heads w/integral motors
- Choice of 10 different wheelhead (OD/ID) combinations
- B-axis with direct drive
- Highest profile accuracy and surface roughness
- Plunge, multi plunge, continuous plunge, traverse, contour and angular grinding
- Thread and non-circular grinding (optional)
- Internal grinding spindles with optional grease or oil-air lubrication
- Crowning and cylindricity correction via programming
- 2 workheads with integrated micro adjustment to choose from (Workhead 100, up to 100 kg and Workhead 150, up to 150 kg)
- Tailstocks with integrated micro adjustment
- Intuitive touch screen operation
- Grinding complex forms on ID and OD surfaces in single clamping
- In-process gauging ensures your parts are in spec every cycle
- Self-explanatory screen pages
- "Easy" Programming
- Entry Level Operator
- No programming experience needed
- Integrated technology calculator
- Easily retrofittable options
- Online operating and maintenance instructions

Models	K10	K100	K1000
Specifications			
Distance between centers	40”	23.6”/40”	40”/63”
Center height	7.87”	7.87”	7.87/9.84/11.81”
Workpiece diameter	0-15.7”	0-15.7”	15.7/19.7/23.6”
Max. weight between centers	220 lbs.	220/440 lbs.	330/440/660 lbs.
Max. load on chuck work	73.7 ft/lb.	73.7 ft/lb.	118/236/553 ft/lb.
Travels			
X-axis (wheelhead)	14.37”	14.37”	14.37”
Z-axis (table)	45.3”	29.5/45.3”	46/65.74”
Rapids			
X-axis (wheelhead)	393 ipm	393 ipm	393 ipm
Z-axis (table)	787 ipm	787 ipm	787 ipm
OD Wheels			
Integral motor power	10 HP	15.6 HP	13.4 HP
Wheel speeds	9800 ft/min	9800 ft/min	6890/8860 ft/min
ID Grinding Spindles			
ID device spindle bore	5.9”	5.9”	4.72”
ID spindle motor power	10 HP	10/20/40 HP	10/20/40 HP
Greased ID spindle rpm	40,000/60,000 rpm		
Oil-air lubricated spindle rpm	45,000/60,000/90,000 rpm		

Workhead
- Infinitely variable spindle speed 1-1,000 rpm Integral motor
- MT5 holding internal taper
- Size 5 short taper external
- Concentricity ≤ 0.000016” (≤ 0.4 µm)
- ± 0.01° fine angle adjustment

Internal Grinding Spindles
2 Variants
- greased lubricated
  – 40,000 rpm
  – 60,000 rpm
- oil-air lubricated
  – 45,000 rpm
  – 60,000 rpm
  – 90,000 rpm

Tailstock
- MT 4 holding taper
- Micro adjustment
- Pneumatic retraction for fast movement

USACH
ID, MULTIPLE ID, ID/OD/FACE GRINDING MACHINES

USACH 75
Economical & Compact machine for ID or ID/OD grinding applications
– Swing Ø8.5”

USACH 100
Compact machine for ID or ID/OD grinding applications
– Swing Ø17”

USACH 150XLT4
ID or ID/OD grinding applications
– Swing up to Ø24”

Models	75	100	150	200
Max swing diameter	Ø8.5”	Ø17.71”	Ø24"	Ø32"
Max part length	5”	10”	40”	55"
Max part weight	80 lbs	500 lbs	1000 lbs	1600 lbs
X axis stroke	12”	19.68"	15.75"	23.62"
Z axis stroke	10”	11.80"	19.68"	23.62"

KEY FEATURES

Single spindle version for flexible or dedicated production applications

Two spindles side by side for sequential grinding of ID and face, multiple ID’s or ID’s and OD’s

Two spindles side by side for simultaneous grinding of ID and face

Three spindles side by side for sequential grinding of ID and face, multiple ID’s or ID’s and OD’s

Turret version for up to four spindles for grinding ID’s and OD’s

XL version for part lengths up to 40”, available in above configurations

14 axes grinding cell with integrated robot for grinding multiple surfaces in a single clamping

FANUC or Mitsubishi CNC Control

Automation ; Integrated 7 axes robot, post-process gaging and part conveying system

Gaging and Probing ; In-process/Post-process Center Drive System ; Simultaneous grinding from the left and right side of the work-piece

Turret ; Up to four spindles for grinding ID’s and OD’s

USACH Open Architecture System Programming Software

USACH
OD GRINDING MACHINES

USACH 500 OD-L

USACH 200 OD-L

Models	150 OD-L	200 OD-L	300 OD-L	500 OD-L
Max piece weight	2000 lbs	3500 lbs	3500 lbs	3500 lbs
Between centers	47"	80"	138"	200"
Max swing diameter	26"	42"	46.5"	46.5"
Max wheel size	30"	30"	30"	30"

KEY FEATURES

Fully programmable multiple OD &, ID wheelheads combinations

Swing up to 46.5”

Self-centering Steady rests

Simultaneous grinding of multiple diameters and faces using 2 opposing wheelheads

CNC Tailstock

Two synchronized Workheads

Automation grinding system including part probing system, inprocess gaging, 7 axes overhead robot and part conveyors

USACH Open Architecture System Programming Software

SUPER-PRECISION® CNC HORIZONTAL TRUE SLANT BED LATHES

Hardinge T-Series CNC Lathes are the best machines in the market for super-precision and hard turning applications.

Available with three models:
- T-42
- T-51
- T-65

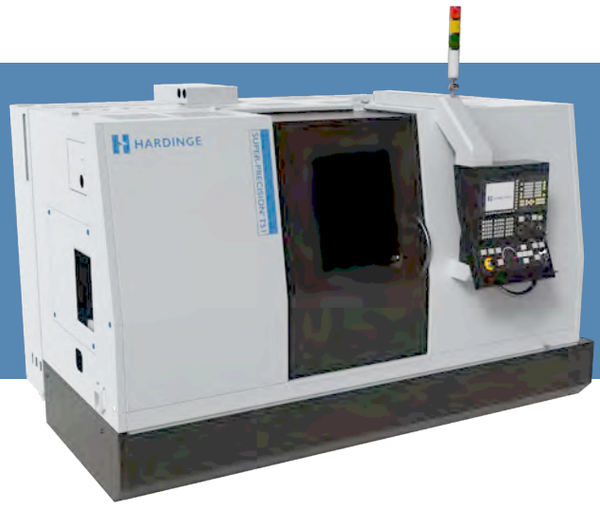
Model	SUPER-PRECISION® T-42
Material	8620 steel 60-62 Rc
High Surface Finish	<8µ inch
Workholding	Hardinge 16C Collet
Cutting tool	Sandvik CBN grade 7015

Material	52100 steel 60-62 Rc
Tolerances on OD & ID	0.0002"
Sphericity of race radius	0.0001"
Part roundess	0.000060"
High Surface finish	8Ra or better

HARDINGE®

KEY FEATURES

- Robust one piece 45⁰ true slant bed
- Maintains 0.00012" total deviation after a short warm-up
- High repeatability accuracy 0.00003" (30 millionths)
- Robust motor/drive package with 0.00001" resolution
- "Soft turning" and "hard turning" on the same machine
- Fanuc 31i CNC Control, Absolute encoders
- High surface finish capability of 8 micro-inch or better
- Integral spindle motor technology to eliminate belt vibration
- High precision spindle bearings
- 45 degree true slant one piece bed design
- Closed-loop linear scale system
- The Hardinge collet-ready spindle
- Available with Live tooling, Sub-spindle, Y-axis 3 models w/ 1-5/8" (42mm), 2" (51mm) and 2.5" (65mm) bar capacity



CNC SUPER-PRECISION® HORIZONTAL TRUE SLANT BED LATHES

MADE IN USA
with US and Global Components

Models	T-42	T-51	T-65
Capacity			
Swing over bed (Z cover)	27”	26.5”	26.5”
Max. machining diameter	8.9’	12.35”	12.35”
Spindle			
Spindle nose	A2-5/16C	A2-6/20C	A2-6/25C
Max. spindle speed	6000 rpm	5000 rpm	4000 rpm
Bar capacity	1.625”	2”	2.5”
Chuck size	6”	8”	10”
Spindle motor power	15HP	20HP	35HP
Travels			
X-axis	6.37”	7.76”	7.76”
Z-axis	16”	25”	25”
Rapids			
X-axis	945 ipm	1100 ipm	1100 ipm
Z-axis	1200 ipm	1500 ipm	1500 ipm
Accuracy & Surface Finish			
Surface finish	6 µin	8 µin	8 µin
Roundness	0.000015”	0.000015”	0.000015”
Repeatability			
X-axis	0.00003”	0.00003”	0.00003”
Z-axis	0.00003”	0.00003”	0.00003”
Servo Turret (BMT Type)			
Number of stations (+1/2 station index)	16	12	12
O.D. tool shank size	3/4”	1”	1”
Boring bar holder diameter	1-1/4”	1-1/2”	1-1/2”
Live tooling power	7.5HP	10HP	10HP
Live tooling max speed	8000 rpm	8000 rpm	8000 rpm
Servo Tailstock			
Tailstock travel	16”	23.3”	23.3”
Max. traverse rate	1200 ipm	1500 ipm	1500 ipm
Max. force applied	1500 lb.	1600 lb.	1600 lb.
Morse taper	MT-4	MT-4	MT-4

CNC SUPER PRECISION QUEST-SERIES LATHES (SMALL FOOTPRINT)

QUEST GT 27

- A2-4 5C spindle
- A2-5 16C Big Bore option
- 10HP/7.5kW spindle drive system
- 8,000 RPM spindle (5C
- 5,000 RPM (16C option)
- Part surface finish: 8 micro-inch/.20 micron
- Part roundness: .000015"/.40 micron
- Continuous machining accuracy: .0002"/5 micron

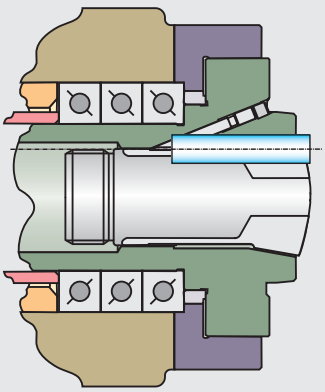
QUEST CHNC 27 & CHNC 42

- A2-4 5C spindle (CHNC 27)
- A2-5 16C spindle (CHNC 42)
- 10HP/7.5kW spindle drive system
- 8,000 RPM spindle (CHNC 27)
- 5,000 RPM spindle (CHNC 42)
- Part surface finish: 8 micro-inch/.20 micron
- Part roundness: .000015"/.40 micron
- Continuous machining accuracy: .0002"/5 micron

KEY FEATURES

MACHINE BED

The super-stable HARCRETE® base is 10% stiffer and more rigid than cast iron for improved dynamic stability and reliability. 1/3 Less vibration at the spindle and 30% or more increased tool life allows high-precision machining while reducing tooling costs.



COLLET-READY MAIN SPINDLE

The collet seats directly in the spindle, the workpiece is held close to the spindle bearings which provides the ultimate in accuracy, rigidity and gripping force. This offers numerous workholding capabilities including solid collets, master collets, dead length collets, step chucks, 3-jaw chucks and FlexC collets systems without the use of an adaptor.

PATENTED INTERCHANGEABLE TOP PLATE-STANDARD

Pre-tooled top plates can be quickly interchanged in less than a minute for a new part or family of parts within .0002" repeatability.

SPECIFICATIONS QUEST SERIES

	QUEST GT27	QUEST CHNC 27/42
COLLET-READY SPINDLE		
Spindle Configuration (ANSI)	A2-4/5C	A2-4/5C (27) A2-5, 16C (42)
Round Collet (through capacity)	1.062"/27mm	1.062"/27mm / 1.625"/42mm
Step Chuck (gripping capacity)	6"/150mm	6"/150mm
AC Digital Spindle Drive System	10hp/7.5kW	10hp/7.5kW
Speed Range (1-RPM steps)	80 to 8,000 RPM	80 to 8,000 / 50 to 5,000 RPM
Spindle Orient	One-degree	One-degree
Chuck Size	4" (101.6mm)	4" (101.6mm)/ 6" (150mm)
16C "BIG-BORE" SPINDLE OPTION 1, 2		
Spindle Configuration	ANSI A2-5	————
Round 16C Collet (through capacity)	1.625"/42mm	————
16C Step Chuck (gripping capacity)	4.0"/101.6mm	————
AC Digital Spindle Drive System	10hp/7.5kW	————
Speed Range (1-RPM steps)	50 to 5,000 RPM	————
Chuck Size	6" (150mm)	
CAPACITY		
Swing Diameter Over Way Cover (max.)	11.760" (298.7mm)	17.94" (455.6mm)
Square Shank Tool Size (max.)	1/2" (12mm)	1/2" (12mm)
Round Shank Tool Size (max.)	3/4" (20mm)	3/4" (20mm)
Bi-Directional Indexing Time (station to station)	————	.25 sec.
Traverse Rate X-Axis (max.)	708ipm/18mpm	472ipm/12mpm
Traverse Rate Z-Axis (max.)	945ipm/24mpm	630pm/16mpm
Travel X-Axis	11.968"/304.0mm	12.76"/324.2mm
Travel Z-Axis 5C Spindle	11.062"/281.0mm	11.5"/292.1mm
Travel Z-Axis 16C Spindle	10.412"/264.5mm	11.8"/299.7mm

	QUEST GT27	QUEST CHNC 27/42
5C AND 16C SPINDLES		
Collet Closer Stroke	.50"/12.7mm	.50"/12.7mm
Hang Weight with Device and Part (max.)	75lb/34kg	75lb/34kg
Spindle Centerline Height	42.40"/1077mm	44.84"/1138mm
Operator's Reach to Spindle	22.84"/580mm	22.84"/580mm
PARTS CATCHER—OPTION		
Workpiece Length (max.)	3"/76.2mm	3"/76.2mm 4"/101.6mm
MISCELLANEOUS		
Power Supply Requirement	230v/33FLA/ 3 phase	230v/33FLA/ 3 phase
Coolant Tank Capacity	20gal/76liter	20gal/76 liter
Compressed Air Requirement	70-90 psi, 5-6 scfm	70-90 psi, 5-6 scfm
MACHINE DIMENSIONS		
Length w/Chip Pan	77.00" 1956mm	77.00" 1956mm
Length w/Chip Conveyor	120.61" 3063mm	117.80" 2992mm
Depth	60.13" 1527mm	60.13" 1527mm
Height	68.5" 1739mm	68.5" 1739mm
Floor Area	31.3ft/3m	31.3ft2/3m
Approx. Machine Weight	5,230lb 2,370kg	5,220lb 2,376kg
INSPECTION SPECIFICATIONS		
PART SURFACE FINISH		
5C Spindle	8 micro-inch .20 micron	8 micro-inch/ .20 micron
16C Spindle	12 micro-inch .30 micron	12 micro-inch .30 micron
PART ROUNDNESS		
5C Spindle	.000015" .38 micron	.000015" .38 micron
16C Spindle	.000025"/ .63 micron	.000025"/ .63 micron
Continuous Machining Accuracy (Dia.Variation)	.0002" 5 micron	.0002" 5 micron

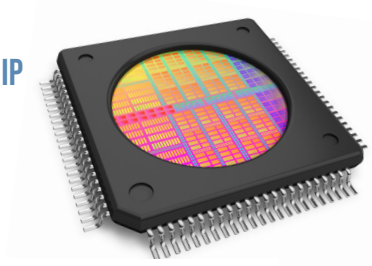
HARDINGE®

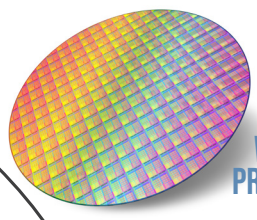
STATE OF THE ART CNC GRINDERS

FOR ADVANCED CERAMICS IN THE SEMICONDUCTOR & AEROSPACE INDUSTRIES

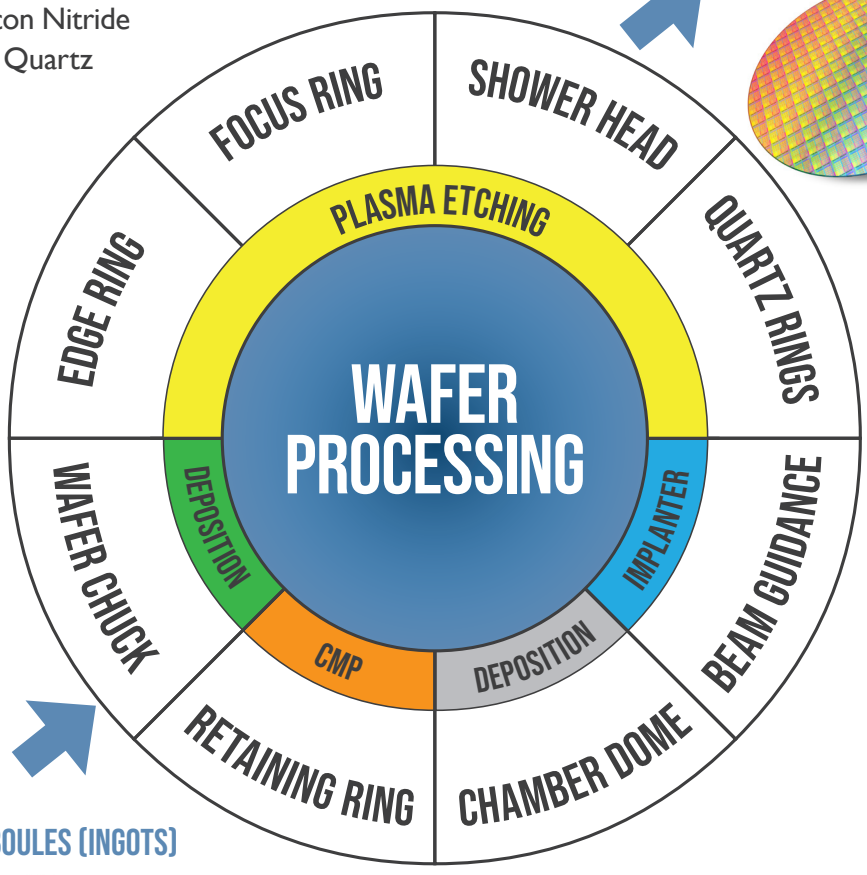
We have extensive knowledge in building **Multi-Tasking CNC Grinders and CNC Special Purpose Machines** to grind / mill / drill components such as Silicon & Silicon carbide boules, wafers, silicon electrodes, edge rings, focus rings, electrostatic & vacuum chucks, chamber domes made from **advanced ceramic materials** including single or multi-crystal silicon (Si), Alumina (Al_2O_3), Aluminum Nitride (AlN), Silicon Nitride (Si_3N_4), Silicon Carbide (SiC), Quartz Glass (SiO_2) and Ferrites.

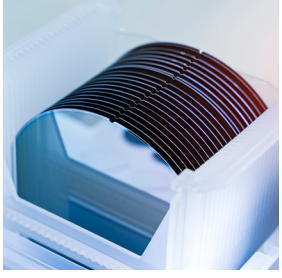
MICROCHIP





WAFER WITH PROCESSOR CORES





BLANK SILICON WAFERS WITH NOTCHES

BOULES (INGOTS)

THE RESULTS OF HARDINGE SMART CNC GRINDING CONCEPT:

- CYCLE TIME REDUCTIONS OF UP TO 70%
- SCRAP REDUCTION OF 45%
- MACHINE UPTIMES ABOVE 95%
- REDUCED NUMBER OF OPERATORS
- SMALL FOOT PRINT

CNC GRINDING APPLICATIONS

METAL INDUSTRIES

Grinding non-circular tool holders

Machine : K1000 w/auto loading

Due to their non-round,oval/polygon shape, these tool holders exert a stronger torque and therefore need a high precision machine.

Cycle time : 2min.
Savings : $497k / year

2.1 YEARS PAY BACK[2]

Guide-pillars

Machine : K100
Cycle time : 3.8min. Savings : $294k / year

K100 reduces the cycle time and decreases the number of FTEs needed .

2.8 YEARS PAY BACK[2]

CNC Machine Spindle

Machine : K1000

Cycle time : 1.2hr.
Set up time reduced by 40%

Savings : $163k /year

Enables less supervision to be required (only 0.75 FTEs)

Synchronous tailstock requires one less operation saving 30 mins in setup time

Beverage Can dies

Machine : K100

Tooling for can manufacturing applications quires micrometer tolerances, smooth profiles, and sharp cutting edges

Savings : $339k / year

Performed several machining steps (ID/OD, taper, non-round) in one combined operation, reducing set-up and transfer steps

HARDINGE®

CONTACT US TODAY:
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