

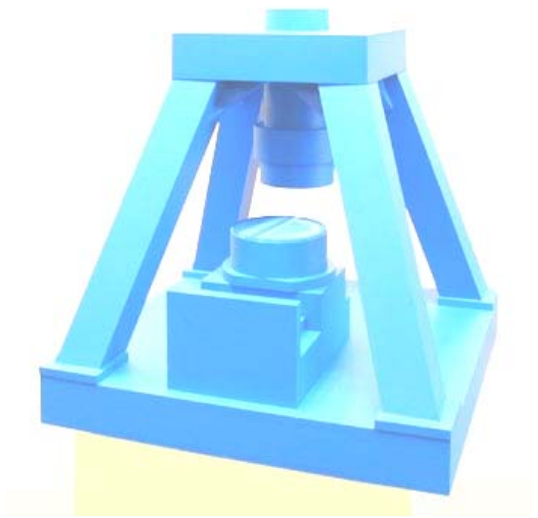


PicoAce is an ultra precision grinding machine for producing optical quality surface finishes and low levels of sub surface damage on a range of hard and brittle materials. It is suitable for traverse grinding of flat or convex work surfaces up to a maximum of 305 mm diameter or plunge grinding of flat surfaces to a maximum diameter of 200 mm. The general arrangement of PicoAce is shown below, the principal machine elements: cup wheel grinding spindle, rotary work table, X and Z slideways are mounted in a closed loop structure. The structure takes the form of a pyramid shaped frame fixed to a solid rectangular base. The cup wheel spindle has a vertical axis and is arranged to slide up and down in a cylindrical Z slideway positioned centrally over the base. Directly beneath the wheel spindle is the rotary table mounted on the X slideway.

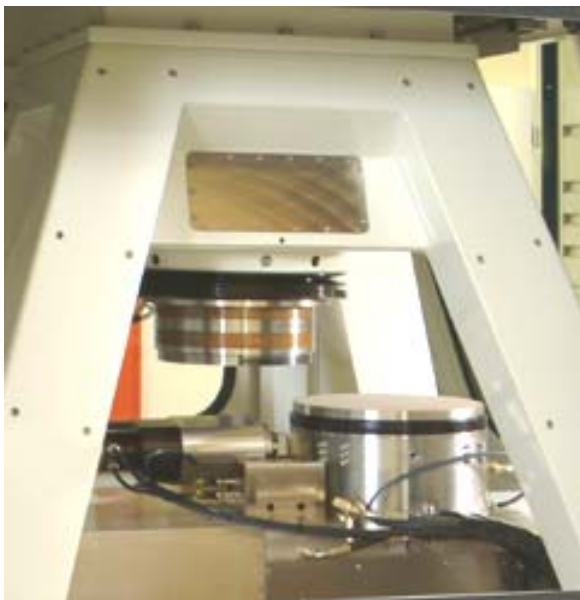
PicoAce features:

- High dynamic loop stiffness for damping
- High static loop stiffness
- High resolution motion control system, 1 nm in Z axis
- Low motion errors on the wheel spindle, work table and slideways.
- In process grinding wheel conditioning

PicoAce © principles have been proved on Tetraform C machine that has ground 6 angstrom Ra surfaces on quartz and 1.06 Nanometre Ra surfaces on glass



The PicoAce's pyramidal space frame structure has been proved to be extremely stiff. All the key elements operate within the space frame that has been designed for maximum damping effect. The resonant frequency is very high, Ultra high stiffness hydrostatic oil bearings are used on all axes and an ultra high performance Loadpoint air bearing is used for the grinding spindle



The grinding area incorporates the rotary table and ancillary in process blade



PicoAce has a substantial Granitan base for maximum damping effect



The Siemens 840D control features full polar axis control



PicoAce

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Brief specification of the PicoAce's performance. (Provisional)

Work Capacity	305 mm diameter x 55 mm high
Wheel Spindle	Type – Aerostatic bearings with integral drive Wheel size - 120 to 250 mm diameter Speed range - 100 to 6000 rpm Maximum continuous torque - 7.0 Nm Motion error - less than 50 nm peak to peak
Work Table	Type – Hydrostatic bearings with integral drive Maximum work diameter - 305 mm Maximum speed - 200 rpm Maximum continuous torque - 7.0 Nm
Truing Spindle	Type – Aerostatic bearings with integral drive Maximum wheel diameter - 125 mm Maximum speed - 5000 rpm Maximum continuous torque - 3.0 Nm
X Slideway	Type – Opposed pad hydrostatic bearings Maximum travel - 310 mm Resolution - 0.1 um Maximum speed - 100 mm/s
Z Slideway	Type – Hydrostatic sleeve Maximum travel - 90 mm Resolution - 1 nm Maximum speed - 10 mm/s
Loop Stiffness	100 N/um in vertical direction
Control System	Siemens 840 D
Loadpoint in process dressing (LIPD)	Type – Unipolar pulsed current Maximum voltage - 90 V Maximum current - 10 A
Machine Size	- 1.4 x 1.4 x 2.6 m high
Weight	- 6,000 kg
Auxiliary Equipment	Total floor area - 2.0 x 1.5 m approx. Control cabinet Hydraulic power pack Coolant supply Chilled water cooler
Services	Air - 6.0 Bar Power - 10.0 kW, 3 phase, 415 Volts
Environment	- 20 °C +/- 1 °C, 50% relative humidity

(PicoAce 118 Lit 10) 07/04/04)