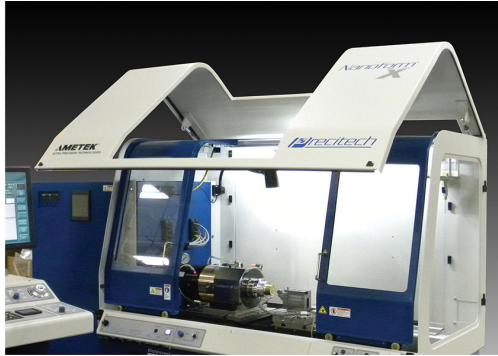


# Nanoform® X



Upper enclosure opens for cleaning and maintenance

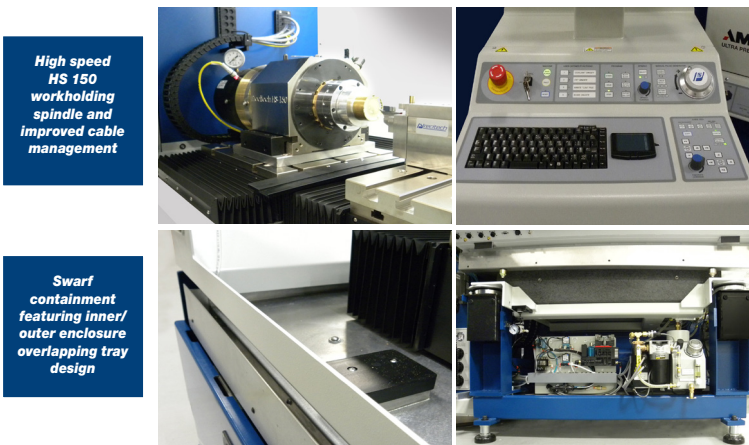


## Nanoform® X Small Frame Diamond Turning Lathe

The Nanoform X is designed to increase productivity and ease of use in the diamond turning, milling, and grinding of optical lenses, mold inserts, mirrors, and precision mechanical components. The machine can be configured from 2 to 4 axis to produce spherical, aspherical and freeform surfaces of up to 440 mm diameter.

Since 1962, Precitech has delivered complete ultra precision solutions and maintains an installed base of over 1,500 systems worldwide. We continue to define the state-of-the-art, enhancing accuracy, productivity, and ease of use. **Precitech is ultra precision machining solutions.**

- ▶ **Fully-opening upper enclosure and lower work envelope allows easier access for setup and cleanup**
- ▶ **Unique inner compartment design improves Swarf containment**
- ▶ **Operator console enhancements lead to greater ease of use**
- ▶ **Innovative suite of productivity tools reduces part and tool setup time**
- ▶ **HS 150 spindle provides for 5x improvement in thermal stability**
- ▶ **Dual frame design with TMC MaxDamp® isolation reduces sensitivity to vibration**
- ▶ **Industry leading surface finish less than 1 nm Ra**



High speed HS 150 workholding spindle and improved cable management

Swarf containment featuring inner/outer enclosure overlapping tray design

User-friendly control console features

Lower work envelope and integral TMC MaxDamp® vibration isolation system

### Key Specifications

Turning performance	Surface roughness < 1 nm Ra Form accuracy < 0.1 micron P-V
Programming resolution	0.01 nm linear / 0.0000001° Rotary
Ultimate load capacity	136Kg (300 pounds) @100 PSI
Swing capacity	Max swing 440 mm diameter

Machine Base and Control	Description	
Machine Base	Sealed natural granite base provides exceptional long term machine tool stability	
Machine Type	Ultra precision, two, three or four axes CNC contouring machine	
Vibration Isolation	FEA optimized dual sub-frames and integral self-leveling TMC MaxDamp® isolators	
Control System	UPx™ Control System with optional Adaptive Control Technology	
Operating System	QNX real time operating system	
Programming Resolution	0.01 nanometer linear / 0.0000001° Rotary	
File Transfer/Storage	USB, CD, Ethernet, On-board data storage backup	
Performance	Surface Roughness (RA) < 1.0nm, Form Accuracy (P-V) < 0 .1 micron	
<b>Linear Hydrostatic Slideways</b>		
Type	Hydrostatic oil bearing slideways with liquid cooling capability	
Travel	X and Z: 220 mm (8.6 in.)	
Maximum Feedrate	4,000 mm/min. (157 inch/min.)	
Drive System	AC linear motor	
Position Feedback Resolution	16 picometers (0.016 nanometers)	
X-axis Straightness	Horizontal: 0.2 micron (8 micro inch) full travel	0.05 micron/25 mm (2 micro inch)
Z-axis Straightness	Horizontal: 0.2 micron (8 micro inch) full travel	0.05 micron/25 mm (2 micro inch)
Vertical Straightness	0.375 micron (15 micro inch) full travel	
<b>Workholding/Positioning Spindle</b>		
	<b>High Speed HS 75 Spindle</b>	<b>High Performance HS 150 Spindle</b>
Air Bearing Type	Slot-type thrust bearing	Slot-type thrust bearing
Material	Steel shaft/Bronze journal	Steel shaft/Bronze journal
Motor	Integral brushless motor	Integral brushless motor
Ultimate Load Capacity	45Kg (100 lbs) @100 PSI	136Kg (300 lbs) @100 PSI
Axial Stiffness	105N/micron (600,000 pounds/inch)	230N/micron (1,314,000 pounds/inch)
Radial Stiffness	35N/micron (200,000 pounds/inch)	130N/micron (743,600 pounds/inch)
Motion Accuracy	Axial/Radial ≤ 20nm (0.8 micro inch)	Axial/Radial ≤ 15nm (0.6 micro inch)
Thermal Control Optional	Liquid cooled chiller +/- 0.1C Accuracy	Liquid cooled chiller +/- 0.1C Accuracy
C-axis Feedback Resolution	0.018 arc-sec 9,000 line encoder	0.010 arc-sec 16,200 line encoder
C-axis Position Accuracy	+/- 1 arc-sec	+/- 1 arc-sec
C-axis Max Speed	2,500 RPM	1,500 RPM
Work Holding Spindle Max speed	18,000 RPM	10,000 RPM
<b>Rotary B-axis</b>		
	<b>HydroRound Rotary B-axis</b>	
Type	Bi-conic, self compensated, oil hydrostatic bearing, DC Brushless direct drive motor	
Tabletop Size	330 mm (13 inch)	
Standard Swing Capacity	222 mm (8.75 inch) diameter	
Load Capacity	225 Kg (500 pounds)	
Maximum Speed	10 RPM continuous / 50 RPM intermittent	
Motor Torque	36 inch-pounds/ 4.0 N-m	
Position Feedback Resolution	0.004 arc-sec	
Radial Error Motion	0.10 micron (4 micro inch) @ 1 inch above table	
Coning Error	1.0 nm/mm (1.0 micro inch/inch)	
Radial Stiffness	225 N/micron (1,280,000 pounds/inch)	
Axial Stiffness	600 N/micron (3,428,000 pounds/inch)	
Moment Stiffness	3.4 N-m/micro radian (30 inch-pounds/micro radian) (144 in.-pounds/arc-sec)	
Positioning Accuracy	+/- 1 arc-sec	
<b>Facility Requirements</b>		
	<b>Nanoform® X</b>	
Power	208 +/-10% or 230 +/-10% VAC - 3.0 KVA 1 phase - 50/60Hz	
Air Supply	Typical: 12 SCFM @100 PSIG	
Machine Footprint (W x L x H)	929 mm x 2152 mm x 2301 mm (36.6 inch x 84.8 inch x 91 inch) when fully opened	