



# TECHPRECISION CORPORATION

**RANOR**  
A Division of TechPrecision

Emerging Industries

Start Here



ISO 9001:2008



## Turn-Key High-Performance Vacuum Chamber Solutions

For more than 55 years, TechPrecision and its subsidiaries have provided precision, large-scale manufacturing engineering, fabrication, machining and assembly/testing services that exceed our customers' tight design tolerances and specifications. With our manufacturing experience and insights, our team delivers a wide range of high-performance vacuum chamber solutions that save you time and cost without compromising the quality of your final product.

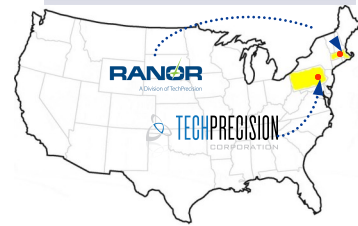
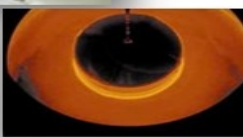
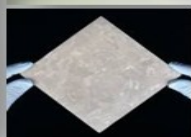
Our global customer base in the renewable energy industry counts on us for:

- Sapphire chambers
- Multi-crystalline chambers
- Mono-crystalline chambers & pull-tubes
- Mono-crystalline cast chambers
- Poly-Si chambers

We provide these premium services to both established and developing companies, when technologies are either mature or in the prototype stage. We evaluate the design and provide suggestions for improving the manufacturability of your components. Customers save time and money by working with our engineering staff to address both the known and unknown manufacturing details, risks and challenges before any metal is cut.



*TechPrecision is your global partner in manufacturing solutions*



**TechPrecision Corporation**

3477 Corporate Parkway - Ste 140  
Center Valley, PA 18034

Phone: 484-693-1700  
Fax: 484-205-2005  
www.techprecision.com



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**Fabrication Shop Capability Summary**

<u>Cutting</u>	Carbon steel:	Up to 22 inches thick
	Stainless steel:	Up to 7 inches thick
	Robotic:	Five axis
<u>Forming</u>	Three press brakes:	Up to 30 feet x 1,500 tons
	Three rolls:	Up to 3 inches thick x 12 feet wide
<u>Fabricating</u>	Maximum weight:	100 tons
<u>Welding</u>	Processes:	MIG, TIG, FCAW, SAW, GMAW
	Positioning:	Up to 35 tons
	Robotic welding:	Five axis, up to 5 tons
<u>Stress Relief Oven</u>	Maximum size:	10 feet x 11 feet x 35 feet
	Maximum weight, temp:	70 tons, 1500°F
<u>Blasting</u>	Fully enclosed blast room with grit recovery and movable cart	
<u>Painting</u>	Two fully enclosed paint rooms, primers and final coats to customer specification	



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**Machining Capacity Summary**

Nine CNC Horizontal Boring Mills

Six axis capability with multi-axis profiling capability  
 Rotary tables  
 Precision tolerances: .001 inch  
 Minimum size: 14 inch cube  
 Maximum size: 12 feet x 12 feet x 30 feet (larger with repositioning)  
 Maximum weight: 100 tons

Seven CNC Vertical Boring Mills

Three axis capability with multi-axis profiling  
 Live axis heads  
 Precision tolerances: .001 inch  
 Minimum size: 14 inch diameter  
 Maximum size: 240 inch diameter x 120 inch height  
 Maximum weight: 40 tons

CNC Five Axis Gantry Mill\*

X - Axis = 480 inches  
 Y - Axis = 168 inches (192 inches between the columns)  
 Z - Axis = 110 inches ram stroke (192 inches under the rail)  
 (Up to 264 inch x 168 inch under the rail when additional pit is utilized)  
 Two axis detachable, programmable milling head  
 Maximum weight: 100 tons  
 \* *Gantry mill will be online September 2011*

Ancillary Machining Department

CNC vertical machining center (30 inch x 60 inch)  
 CNC Chucker style lathe (10 inch chuck)  
 CNC — Bridgeport  
 Manual lathe & mills  
 Automatic surface grinder (18 inch x 24 inch)  
 Full complement of tooling and attachments

**Assembly, Inspection, Testing and QA Summary**

<u>Dimensional Inspection</u>	Mechanical and laser
<u>Mechanical Assembly</u>	Shop assembly (up to 100 tons) and clean room assembly (up to 5 tons)
<u>NDE</u>	Radiography, ultrasonic (flaw detection and thickness gauging), magnetic particle, liquid penetrant, and visual weld inspection
<u>Testing</u>	Load testing (up to 400 tons,) hydrostatic pressure testing, helium leak vacuum testing (10 <sup>-9</sup> ), and complete system performance testing
<u>Quality</u>	ISO 9001:2008, ASME Code Sec III-Div 1, Sec III-Div 3 (N, NA NPT, NS,) Sec I/VIII-Div 1, B31.1 (S, PP, U), NQA-1 compliant, nuclear safety related, MIL-Q/I/STD, NAVSEA



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