Overview of Roll Threading Process Manufacturing

1 Quality In, Quality Out.

Quality starts in house with the OD grind of raw material.

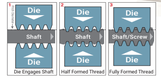
300 series stainless steel.

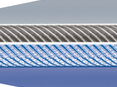
O.D. ground to < 0.0005" (12 µm).

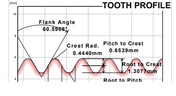
2 Precision German CNC Roll Threader Ensures Strong and Accurate Thread Forms

CNC controlled machinery provides precision process adjustment and control.

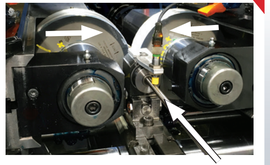
Automated in-feed and out-feed provide consistency over the full length of the screw stock.



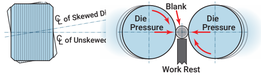




3 Progressive Dies Control Raw Material Flow



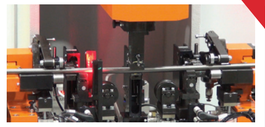
To ensure the highest level of lead accuracy, key process variables such as speed, skew, temperature, and coolant flow, are precisely monitored.



Lead accuracy of 0.003"/ft. (76 µm/300 mm), 3 times better than typical industry specifications.

PBC Linear inspects 100% of the screw length (20,000 points over 72" compared to the competitors data point every 6 inches over the same length).

4 Automated Straightening Process



This process eliminates errors that are inherent to manual processes.

Minimizes runout which can cause vibration, noise, and premature wear.

Automated straightening process yields the highest straightness tolerances available in a lead screw.

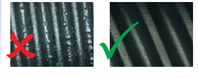
Smoother finish makes for longer product life.

5 PTFE Coating

Coating reduces coefficient of friction, increasing screw efficiency and extending life.

Developed in-house, this custom coating process and equipment increases the quality of finish and eliminates screw flaking.

Each screw is inspected with a digital microscope to ensure there is no flaking or pitting in the coating surface.



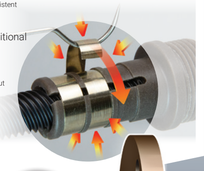
6 Innovative Anti-Backlash Nut

Constant Force Technology nut utilizes a spring that applies uniform radial pressure to the nut at all stages of the motion profile.

Patented Design has:

- Greater than 2 times superior backlash compensation (Confirmed by leading lab automation customer validation testing)
- Consistent preload over life (Key for system level tuning and consistent performance over life)
- 2–4 times better than traditional designs, as validated by customer testing
- Self lubricated (Special PTFE nut formulation developed from 30 plus years of plain bearing knowledge)
- Simple 2-piece design

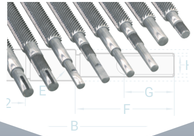
Wide variety of optimized nut geometries
Ability to quickly customize



Nuts and assemblies are inspected to ensure backlash tolerances meet precise specifications .

7 Machined End Journals

Fixed, flat, keyways, and threaded journals can be machined for multiple lead screw uses. PBC Linear offers customers the ability to customize screw journals for specific applications.



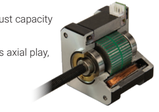
Screw journals can be ground to <0.0005" (12um).

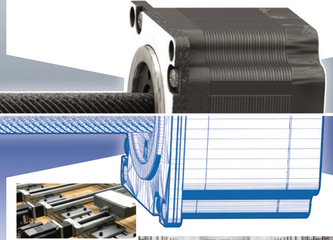
8 Motor and Screw Optimization for Linear Motion

Lead screw is precision mounted and matched to a hollow shaft motor. The hollow shaft concentricity minimizes runout less than 0.003" (75 µm).

Other features include:

- Larger bearings that increase thrust capacity and add longer life
- Preload on bearings that removes axial play, reducing system backlash
- Optional smart motors
- Connection via... EtherNet/IP, EtherCAT P, Modbus





Two dedicated test labs are used to establish high performance characteristics.

One for load and life where assemblies have run in excess of 2,500 miles without failure, and one sound-proofed to analyze noise levels.

Metrology

Microscopic inspections of the surface finishes occurs at each stage of the manufacturing and coating process.

Threadform inspections validate major and minor profile diameters, pitch, flank angle, etc.

Maximum screw runout is < 0.001" (24.4 µm).