

# Hydrostatic Machine Tool Components and Systems

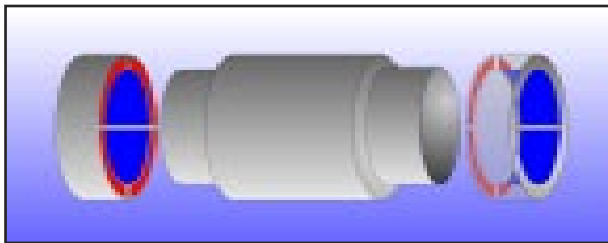
**Hydrostatic components and easy-to-integrate, complete engineered hydrostatic systems for new and existing machine specifications.**

## INNOVATIVE, PATENTED PM-FLOW CONTROLLER

- Assures consistent, high accuracy and performance over the life of the machine.
- Allows practical and efficient use of hydrostatic components in place of mechanical slideways, rolling elements and bearings prone to wear—a contributing factor in reduced machine accuracy, poor part quality, scrapped parts, and lost productivity.
- Maintains a steady-state oil pressure in hydrostatic pathways regardless of cutting or grinding stress, part weight, or part location.
- “Play” and starting friction are practically eliminated to assure precise positioning.
- Enables virtually “friction-free” table axis movement.
- Low cost, self-contained, wear and trouble-free mechanical design.
- Electrical controllers or external feedback are not needed for operation.

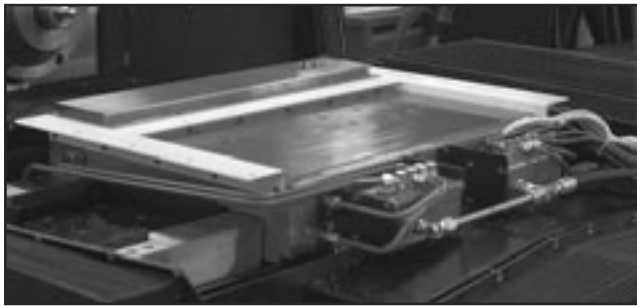
## HYDROSTATIC COMPONENTS

- Clamping Spindles
- High Speed Spindles
- Angle-Cut Spindles
- Table Guideways
- Linear Motor Guideways
- Lead Screws
- Round Tables

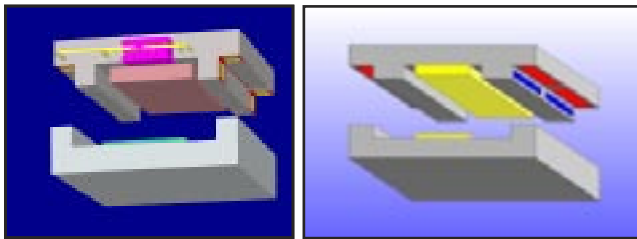


## HYDROSTATIC CLAMPING SPINDLES

For workpiece or tool clamping on grinding machines, lathes, milling machines or ultra-precision machines.



**HYDROSTATIC GUIDEWAYS FOR LINEAR MOTORS**



**HYDROSTATIC GRINDING SPINDLE SYSTEM**

In most modern lathes and grinding machines, the spindles are supported by ball bearings. As an alternative for machines that require better damping, runout, long-term precision, or heat dissipation, Hyprostatik has developed hydrostatic spindles for lathes and grinding machines.

The hydrostatic spindles “float” on hydrostatic oil pads, resulting in an interface that is wear-free. As a result, the extremely good run-out and high stiffness characteristics of the spindle do not deteriorate over the life of the machine, regardless of the operating forces and speeds. The excellent damping and smooth operation of the ball-free bearing can be seen in the better workpiece finish quality and also through reduced tool wear. Since the friction of the hydrostatic bearing is so low, over 95% of the motor power goes to the workpiece and the spindle temperature will increase less than 10°C, even at maximum force and speed. In addition, bearing prestress, unbalance, and cutting force can be directly measured by monitoring the hydrostatic pocket pressure.



The hydrostatic lathe and grinding machine spindles are suitable for applications on horizontal or vertical machines. They are available for belt-drive, direct drive, or as a motor spindle.



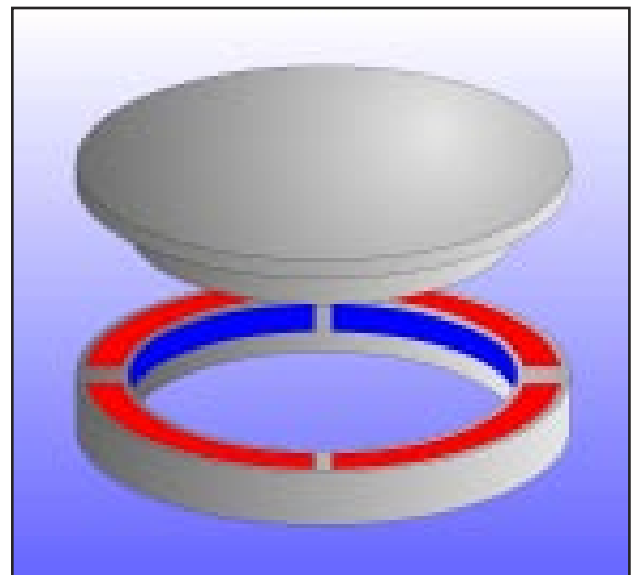
**HYDROSTATIC LEADSCREWS:  
ADVANTAGES OVER BALLSCREWS**

- Very low friction when machining, virtually frictionless during positioning
- Steps in the 0.1 micron range are possible
- No backlash when reversing direction
- Slip-stick effect is eliminated
- Wear is eliminated because there is no metal-to-metal contact during operation
- No loss of accuracy or stiffness even under full load and oscillating motion
- Friction does not vary when reversing direction
- Very long service life

**UNIQUE TECHNICAL FEATURES**

- High accuracy when transferring rotary motion into linear motion
- Nut is suspended on hydrostatic oil pockets
- Internal flow control
- Only one hydraulic connection required
- Dimensions of leadscrew similar to ballscrew size
- No seal wear or friction
- Adaptable to a machine's parameters:
  - Axial load (can be different in both directions)
  - Maximum RPM
  - Required stiffness
  - Viscosity and temperature of hydraulic oil

**HYDROSTATIC GUIDEWAY / TABLE**





### HYDROSTATIC BEARINGS FOR LEADSCREWS: ADVANTAGES OVER BEARINGS

- Frictionless even at minute revolutions
- Transmits minute rotating motion
- No backlash when reversing direction
- Slip-stick effect is eliminated
- Wear is eliminated because there is no metal-to-metal contact during operation
- No loss of accuracy even after years of operation under full load
- No vibration as possible with bearings when ball direction is reversed
- Insensitive to dirt and contamination

### UNIQUE TECHNICAL FEATURES

- Handles axial, radial, and torque forces
- Ideal for one-sided guidance of the leadscrew
- Highly precise bearing system for the leadscrew
- Integral volume regulation
- Only one hydraulic connection needed
- Input and drain lines are on the flange
- Optional seal on one side, or labyrinth air purge
- Adaptable to a machine's parameters:
  - Axial, radial, and torque loads
  - Maximum RPM
  - Required stiffness
  - Viscosity and temperature of hydraulic oil

### CONTACT US FOR INFORMATION REGARDING HYDROSTATIC SYSTEM IMPLEMENTATION.

Transatlantic Connection, Inc. is a Sales and Engineering Representative of Hyprostatik Schöfeld GmbH of Göppingen, Germany. The Hyprostatik PM-Flow Controller and hydrostatic components have been implemented in over 4,000 varied types of precision machine tools and components including grinding machines, measuring machines, high-speed machines, CNC lathes, machining centers, and milling machines, as well as large bearings and spindles.

Hyprostatik can engineer a hydrostatic system to nearly any machine design requirement. A complete hydrostatic system from Hyprostatik uses the PM-Flow Controller and engineering specifications and instructions for a series of strategically placed pockets which are machined into moving surfaces of the machine by the machine builder. Variables such as pocket surface area, oil viscosity, pump pressure, and flow control are taken into account when designing for a defined gap size, load capacity and stiffness requirement.

The oil used in the hydrostatic system is the same oil that is used in the hydraulic system on the machine. Very little oil is used in the hydrostatic system, and a collection system designed into the machine recirculates the small amount of accumulating oil through an oil filtration system. The PM-Flow Controller maintains a steady-state oil pressure in the hydrostatic pathways necessary to support a load, regardless of grinding or cutting stress, the weight of a workpiece, or its location.

### CONTACT US:

Transatlantic Connection, Inc., 1438 Collingswood Drive, Rockford, IL, 61103  
Telephone: 815-282-6070, FAX: 815-282-4656