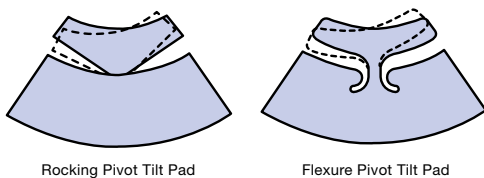




Flexure Pivot® Tilt Pad Bearings

FLEXURE PIVOT RADIAL BEARINGS

Standard tilt pad bearings achieve low cross-coupling through rocking or sliding motion. Flexure Pivot tilt pad radial bearings achieve the same low cross-coupling and high stability through flexure and rotation of the center post while eliminating any pivot wear and high contact stress.



MINIMIZES MANUFACTURING TOLERANCE STACK UP

The integral pad-pivot-retainer design of the Flexure Pivot bearing eliminates most of the manufacturing tolerance stack up (Figure 1). This feature is a critical design parameter that has a direct impact on the rotor's stability, critical speed, and synchronous response characteristics.

ELIMINATES PIVOT WEAR AND CONTACT STRESSES

The Flexure Pivot tilt pad design eliminates the pivot wear and brinelling associated with standard tilt pad bearings. This prevents degradation in performance with time, maintains the desired bearing preload, and provides a narrower spread in the stiffness and damping coefficients.

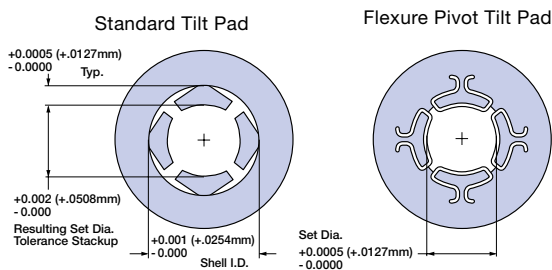


Figure 1

REQUIRES MINIMAL RADIAL SPACE

Flexure Pivot tilt pad bearings can be manufactured with a very low profile (Figure 2). This allows the upgrade of sleeve bearings with drop-in replacements that provide the performance benefits of tilt pad bearings.



Figure 2

ELIMINATES PAD FLUTTER AND SPRAGGING

The rotational stiffness increases the pad natural frequency and eliminates pad flutter and spragging that can be encountered on the unloaded pads in standard tilt pad bearings.

RETROFIT SMALL AND MINIATURE BEARINGS

The advanced techniques used in the manufacture of Flexure Pivot tilt pad bearings make them a good choice for retrofitting small and miniature fluid film and rolling element bearings.



10 mm, 150 krpm

CENTERING CAPABILITY FOR MINIMUM RADIAL PLAY

The Flexure Pivot design provides a means to hold the shaft centered in the bearing at low speeds, thus minimizing the radial play which is critical in some high-speed high-performance turbomachinery.

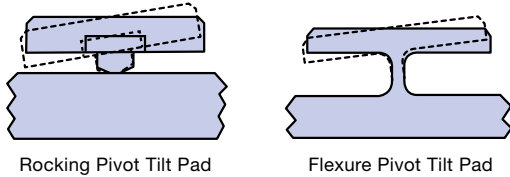


19 mm, 109 krpm

Figure 3

FLEXURE PIVOT THRUST BEARINGS

Standard tilt pad thrust bearings form a converging wedge through the rocking motion of the pad pivot support. Flexure Pivot tilt pad thrust bearings form a wedge through flexure of the post support while eliminating the pivot wear and high contact stresses.



CUSTOM DESIGN OF THE FLEXURE PIVOT POST SUPPORT

The Flexure Pivot post support is designed to provide an optimum wedge ratio at design load conditions (Figure 4). This results in an increase in the load capacity and a significant reduction in the horsepower loss.

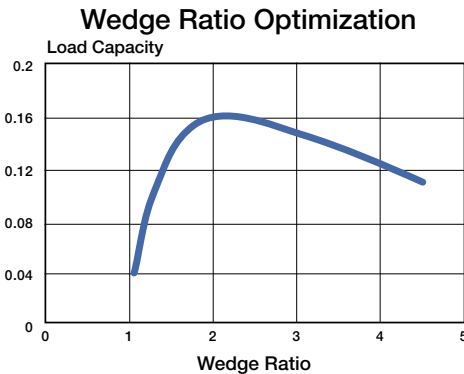


Figure 4

RETROFIT IN SMALL ENVELOPES

The Flexure Pivot thrust pad design permits retrofitting in a small envelope where only taper land or flat thrust plates would typically fit. This is an advantageous design flexibility which allows space saving and load capacity upgrades for existing thrust bearings.

SIMPLE CONSTRUCTION AND MANUFACTURING

The construction of Flexure Pivot tilt pad thrust bearings is simple and contains fewer parts than standard tilt pad bearings. Manufacturing, assembly, maintenance, and inspection are much simpler than with other bearing types. The absence of moving parts eliminates wear and fretting in service.

ELIMINATION OF PAD FLUTTER

The rotational stiffness provided in the Flexure Pivot tilt pad bearing eliminates the pad flutter problem that can be experienced on the inactive side of standard tilt pad thrust bearings.

EASY IMPLEMENTATION OF HYDROSTATIC FEATURE

Offset Flexure Pivot tilt pad thrust bearings can carry higher load capacities in reverse rotation than standard tilt pad bearings, giving them an additional benefit in certain high-load applications. The hydrostatic feature can be utilized through pivot post support.

STATIC AND DYNAMIC MISALIGNMENT CAPABILITY

The Flexure Pivot design provides some amount of axial compliance to give forgiveness of static and dynamic misalignment.

LOWER LUBRICANT FLOW REQUIREMENTS

Special surface preparation and material selection allow Flexure Pivot tilt pad thrust bearings to carry higher loads at lower oil flows, which makes them the bearing of choice for applications where lubricant availability is low.

NO LIMITS ON MATERIAL SELECTION

Any material can be used for Flexure Pivot thrust bearings due to the lack of wear and fretting.

