Linear Motion Components
Inspire Designs

Tom Corey thought he had a better idea for the motion control marketplace. Mr. Corey saw that the marketplace was dominated by a couple of manufacturers' products. He knew he could introduce price and quality competition as well as increasing the array of available linear bearings. In 1990, Tom Corey founded his linear motion components distributorship, Specialty Motions, Inc., in California.

The market responded as he had foreseen, choosing the price, quality and performance they needed from his broad array of slide bush products, slide guides, ball splines, slide shaft, slide way and slide table products.

Adding Value

Next SMI started to combine components into assemblies for its clients. It led to a more complex level of service requiring expansion of its facilities to accommodate machine tools and skilled technicians.

New ideas flowed in the wake of these added capabilities. SMI started to experiment with the linear motion products that it carried. Soon they found slide bush components with unique characteristics that ensured simple motion control solutions would be reliable and easy to maintain.

Machining Capabilities Lead To Original Designs

Necessity is the mother of invention. That's what led SMI to create a simple, reliable X/Y system. It was prompted by a client's need for an inexpensive, easy to maintain system that would be used for loading material into a printing system.

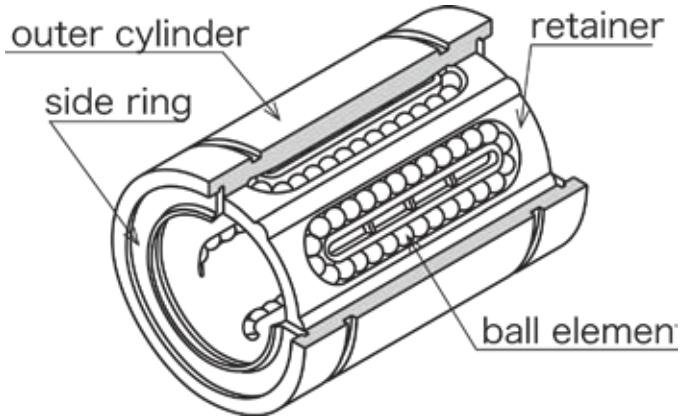
SMI attached aluminum pillowblock slide bush components (*right*) to a custom machined metal plate. To ensure fast, smooth operation, SMI chose a slide bush with raceway surfaces that are precision ground. Since the contact areas between the ball elements and the precision ground raceway surface of the slide bush were minimized, the slide bush provided low friction compared to other linear motion mechanisms. Twin slide bushings with seals at both ends were used. The seals prevent dust from entering the slide bush in order to guarantee motion accuracy, which extends its life. The outer cylinder of this standard type slide bush is made of bearing steel and resin. Its open type housing allows a support from below so that a deflection of the shaft is minimized for high loading or long-stroke applications. The open style allowed easy mounting and removal without dislocating the shaft they rode on, making them very adaptable.

Tom Corey explains his choice, "If something were to happen – say it (a bearing) wears out over time - and everything wears out – it is so easy to replace the bearings inside an NB (NB Corporation is one of the manufacturers that SMI carries) pillowblock as opposed to the competition. With NB, all you do is take four fasteners off the bottom, remove a skip plate and the old bearing slides out. You put the new bearing in place, put four fasteners back in and you're off and running again. With the competition on the other hand, they're pinned in place by a roll pin. You have to either destroy the pillowblock or the roll pin to get this thing apart and typically you can't get the new one back in using the same hole. With the NB product you can replace the bearings internally without destroying the block. With the competition you have to replace the whole block and it is twice as expensive."

Aluminum pillowblock slide bushings

X And Theta

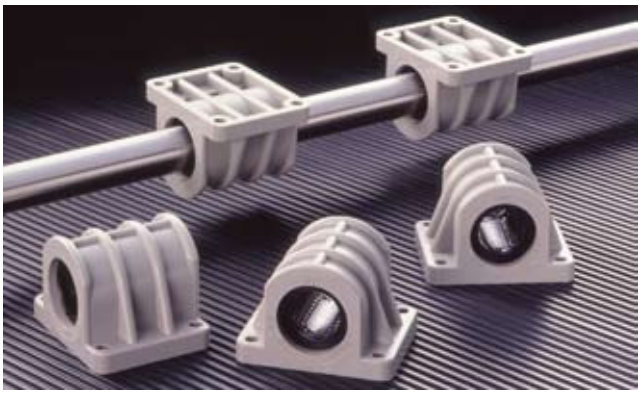
Another inexpensive custom solution gave a different client the linear/rotational movement he needed - the ability to move X as well as Theta. This was accomplished by putting a flat washer on a slide bush, slipping a needle bearing on the outside of the very smooth steel housing then putting another flat washer on the top. SMI incorporated this particular slide bush because there is a ring groove at the end of it. Mr. Corey says the NB SW8 type was best suited to the application, "I couldn't use the competition because it is not smooth. The NB SW8 type is extremely smooth on the outside, very round and very hard. It lent itself to be a perfect bearing surface. The competition's style has indentations in it."



Spectroanalyzer Problem Solved

Consistency problems were plaguing the manufacturer of spectroanalyzers for laboratories and clinics. The cause was the analyzer's cartridge bearing that positioned samples. The cartridge bearing, which was in a bore, was not stable while the machine was running so the results were not stable. This bearing was composed of a thin walled tube with two bearings in it. The ends of the tube were crimped. The walls were just too flimsy to provide the needed stability.

To solve the problem, SMI used a doublewide slide bush that has a resin retainer. It incorporates two bearings in a single container that keeps everything aligned. In addition, it was less expensive than the cartridge bearing it replaced. SMI's founder sites its ease of use, "You can slide this whole cartridge into a housing and you are pretty much done. Our customer has been using it for fifteen years." The double width slide bushings were specified for their greater load capacity – necessary especially because a moment load was to be applied. For moment load, double or triple wide type slide bushings are recommended.

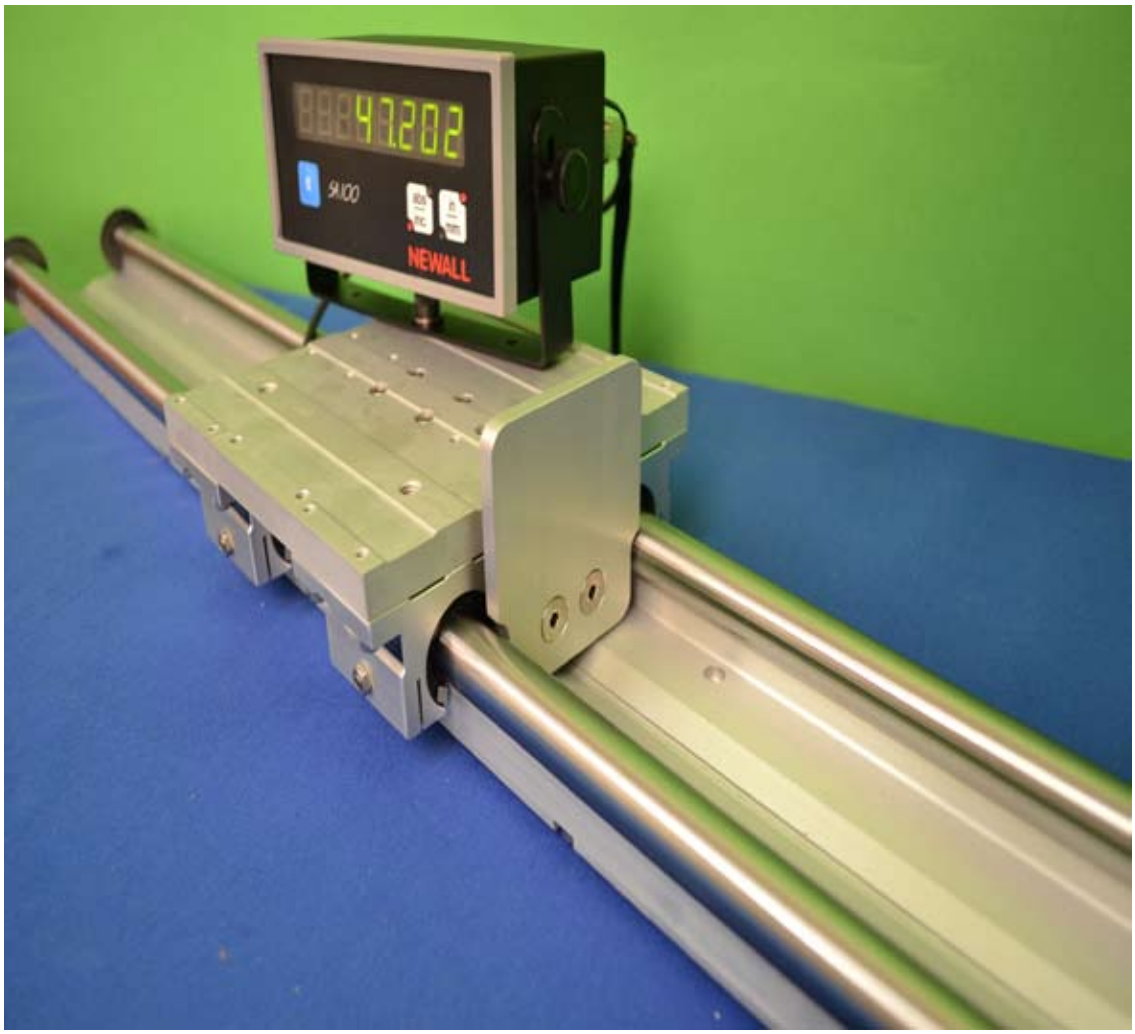


Resin Block Housing Slide Bushings

TOPBALL Self-aligning Slide Bushings

A New Proprietary Product

Once SMI had set up its own machine shop, they encountered the need to measure long materials, such as shafts, right at the shop floor – a need they shared with many of their customers. The materials being measured could be round, flat or square material. Often the lengths were much longer than the typical vernier caliper could measure at a reasonable cost. To construct the measuring device, they used the open pillowblock slide bush type TW8UU, which is part of NB's TOPBALL self-aligning slide bush line. TOPBALL's floating wiper seal makes this unrestricted self-alignment possible. Its floating load plate adjusts clearance. SMI combined a half-inch slide bush with a shaft (SMI calls the combination a 'Simple Slide'), and incorporated a linear scale . This was accomplished by adding a Digital Read Out (DRO). This slide is 120 inches long. By sliding the carriage all the way to the end, the DRO is reset to 'zero'. Then, as the carriage is moved out, the DRO consistently reads where the carriage is relative to that end plate. The material to be measured is laid flat in the Simple Slide's base and butted against an end stop. The carriage is then moved into position to touch off on the end of the shaft (or whatever is being measured) and the length reading is read directly from the DRO. The DRO display can be mounted to the carriage itself or fixed in a different location for convenience and protection. The Linear Digital Measuring Device (LDMD) is capable of accuracies up to +/- .001" and any length up to 110" (currently). The LDMD can be mounted as a fixed unit using the Simple Slide base mounting holes or it can be attached to any rigid structure with wheels for a transportable measuring device. The center of the Simple Slide has been modified with a "VEE" groove to allow the material being measured to accurately nest for measurement.

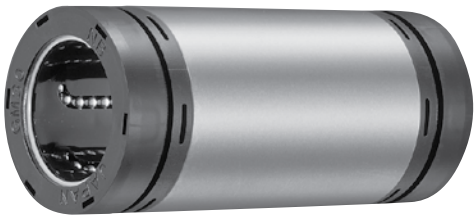


Unparalleled Variety Of Slide Bush Products That Inspire Design Solutions

NB's Slide Bushings, are available in an extensive array of configurations, such as lightweight, standard, clearance adjustable and open. NB bushings offer extremely smooth, precise movement. Their wiper seals are the highest quality precision grade. And, NB's round, square or two-side cut Flange Slide Bush line offers the best of both worlds - the benefits of a slide bush with the mounting ease of a

flange. Choose from single, double-wide, or center mount. They are available in inch, Asian or European metric dimensions. The three shaft grades have diameters ranging from 3.175mm - 50.8mm; .125 - 2 inches. Slide bush lengths range from 12.7mm - 203.2mm; .5 - 8 inches.

Contact: Larry Hansen
Director and General Sales Manager
NB Corporation of America
www.nbcorporation.com
1-800-521-2045



The GM type slide bush uses resin subparts to reduce overall weight by 30% to 50% compared to a standard slide bush.