

Empowering your chuck

Simple and regular maintenance lengthens chuck life.

Daily preventive maintenance (PM) can dramatically improve the performance and uptime of your CNC equipment. Specifically, consider power chucks. Nearly every machine shop greases them regularly. Unfortunately, many do not understand the basics of chuck lubrication.

To help you “empower” your machine tool’s chuck to work as effectively as possible, here are some answers to common greasing questions from Spencer Hastert, vice president of the Kitagawa Division in Schaumburg, Ill.:

Why is greasing the chuck important?

Most power chuck manufacturers use a so-called “wedge-style” design. This simply means that the power transfer through the chuck is accomplished via an angled wedge arrangement — a transfer of axial forces to radial jaw forces.

Wedge-style chucks offer many advantages including compact design, efficient transfer of forces as well as being rather heavy duty (i.e., “shop friendly”). The one disadvantage of any wedge-style chuck is the larger contact surface areas between the wedge, master jaws and chuck body.

For a wedge-style chuck to be efficient and safe, the internal contact areas must maintain a coefficient of friction within specifications. Should the coefficient of friction be too high, the transfer of forces becomes less efficient. This means that the chuck loses gripping forces, even though the hydraulic pressure remains unchanged. This can result in an unsafe situation; therefore, regular greasing of the power chuck is critical to ensure

the chuck’s efficiency and operating characteristics.

How often should I grease my chuck?

“Regular” greasing of the power chuck is too general a concept. In all cases, a power chuck needs to be greased at least once every eight hours of operation. Should you have short cycle times, high

recommended by the chuck manufacturer.

What type of lubrication is required?

All metal surfaces, regardless of how smooth they appear, are not truly smooth. There are microscopic peaks and valleys that can poke through a lubricating film and create metal-on-metal contact.

Wedge-style chucks can have as much as 8 tons of potential friction being applied to the wedge, master jaws and body. Kitagawa recommends a molybdenum-disulfide-based (moly) lubricant with 20% to 25% moly.

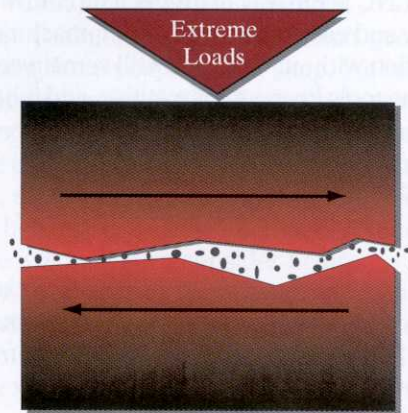
This type of lubrication is vastly superior to the lithium- and mineral-based greases on the market today. Moly is essential to provide the required barrier between the metal guide surfaces — especially under heavy loads. Don’t allow anyone to tell you that “any grease will do.” Insist on the lubrication recommended by the chuck manufacturer.

Is there more to do?

In addition to applying the recommended moly-based grease at intervals that fit your application, other maintenance must be performed.

The chuck should be disassembled, inspected and cleaned every six months. (Refer to the chuck’s manual for disassembly procedures.) This will allow the guideways to be cleaned of contamination, chips and coolant. It will also give you a chance to look for burnishing or galling.

By following these simple and regular maintenance steps, it will ensure that your chucks will safely perform to specifications for many years. ■



Slide surfaces are not really smooth, as this microscopic view indicates. That makes lubrication important in keeping metal surfaces from rubbing on each other. The arrows indicate the two surfaces’ direction of movement.

rpm requirements or use an aggressive coolant, you may need to grease your chuck even more often — perhaps every four hours.

The timing judgment requires some common sense and observation on your part. Should the chuck show signs of efficiency loss between lubrication cycles, try shortening the time between greasings until the chuck maintains its proper functionality. In any case, adhere to the minimum lubrication schedule