Collet Replacement

All of the components mentioned above are critical and should be regularly maintained. Even so, there is a limited life to any colleting system and all collets should be replaced on a regular basis. Collets should be inspected during each tool change for any metal damage such as bellmouthing or inside burrs. If damage is visible, the collet should be discarded and replaced.

Collets can also be damaged beyond useful limits without visible imperfections present. The most common cause of" invisible" damage is metal fatigue. An easy check for metal fatigue is to insert the tool shank into the back of the collet then into the front. If the grip in back is tighter in one location, the collet has lost its memory or is deformed from improper tightening.

The loss of gripping pressure is caused not only by repeated use, but also by heat transfer from the cutting tool and spindle. Cyclical heating and cooling cycles remove the original tempering of the steel resulting in a corresponding loss of elasticity and uniform grip. The smaller the collet, the faster this change happens – especially in air router collets. Over time, a worn collet will require increased tightening pressures to maintain a tool in proper position As the frequency of over-tightening increases, the collets become distorted and create eccentricities in the tool holder.

Instead of over-tightening older collets and creating a number of problems, they should be replaced after every 400-600 hours of operational use. Old worn collets should be discarded to prevent re-use in the future. Often the cost of a new collet can be offset by the cost of broken or underutilized tools in one shift alone.

Miscellaneous Notes

Proper positioning of the tool in the collet is critical. The tool should only be gripped on the shank portion of the tool. At no time should any portion of the flute fadeout be inside the collet.

The collet should be snapped into the nut before tightening or a concentric grip will not be achieved. By not attaching the collet to the nut before tightening, the tapered mating surfaces between the collet and collet holder can be damaged when tightening occurs and the collet is jammed into the seating surface.

ONSRUD

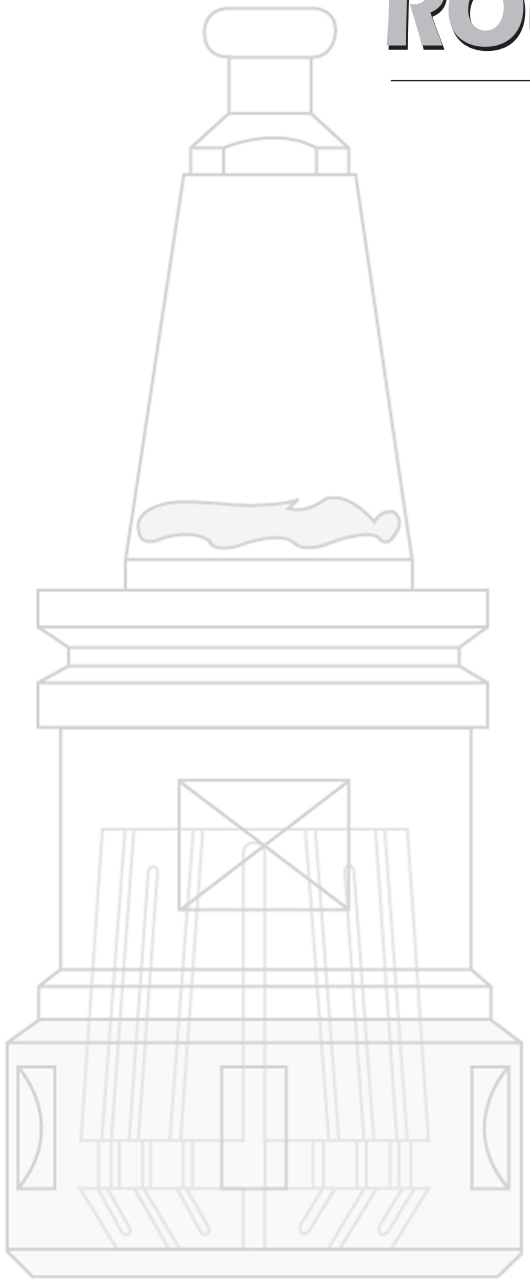
ONSRUD CUTTER LP
800 Liberty Drive
Libertyville, IL 60048, USA
Phone 800.234.1560
Fax 847.362.5028
www.onsrud.com
www.plasticrouting.com

LMT
Leitz Metalworking Technology Group

Edited by Ross Gobble & Kurt Rohde

03/05

THINK SUCCESSFUL ROUTING



through proper Collet Maintenance

THINK ONSRUD

ONSRUD CUTTER LP
800 Liberty Drive
Libertyville, IL 60048, USA
Phone 800.234.1560
Fax 847.362.5028
www.onsrud.com
www.plasticrouting.com

LMT
Leitz Metalworking Technology Group

Collet maintenance is one of the most common causes of inadequate tool life or breakage. There are up to six links in the chain that make up this critical tool holding system and an old adage certainly applies: a chain is only as strong as the weakest link. A router bit can only be as good as the system that holds it properly. The small amount of time spent to regularly inspect and clean the collet system will be more than offset in reduced chatter and tool breakage.

The six critical components of the common tool holding system are:

1. Internal Collet Clamping Surfaces

The most important link in the tool holder chain is the inside of the collet. Resin migrates up through the slits in the collet and then deposits itself on the inside of the collet. This resin build up, if not removed, causes the collet to grip inconsistently on the tool shank. By not applying equal pressure throughout the entire gripping range of the collet, the tool holder allows the tool to resonate inside, causing slippage inside the collet.

Slippage can cause “fretting”, a condition in which resins are deposited on the shank of the tool. This resin buildup can be easily removed from the inside of the collet with Rust Free™ and a brass tube-type brush (available from Onsrud Cutter). These brass brushes are non destructive and in conjunction with Rust Free™ can adequately remove the deposits high pressure air guns cannot. Rust Free™ should be sprayed on and quickly brushed and wiped completely dry. Do not let the liquid sit and air dry.

2. Internal Spindle & Collet Taper

The inside taper of the spindle and tool holder is a critical surface which accumulates resin build up and should be cleaned at each tool change to maintain best concentricity. Felt brushes are available to fit most taper sizes and provide a quick means of removing short term buildup.

3. External Collet & Tool Holder Tapers

The outside taper on the collet and tool holder require regular inspection and should be cleaned of all deposits each time the tool is changed. Brass brushes work well for this application, but felt cloths can also be used if the tapers are regularly maintained and the buildup is minor.

4. Clamping Nut Surfaces

The inside taper of the nut should be clean and free of burrs on the surface. Any surface burrs or contamination will not only skew a collet but can also permanently ruin a new collet. The clamping nut should be cleaned with a brass brush and/or high pressure air during every tool change. Special care should be taken to examine the clamping nut threads on a regular basis to ensure there is no long term buildup inhibiting their function.

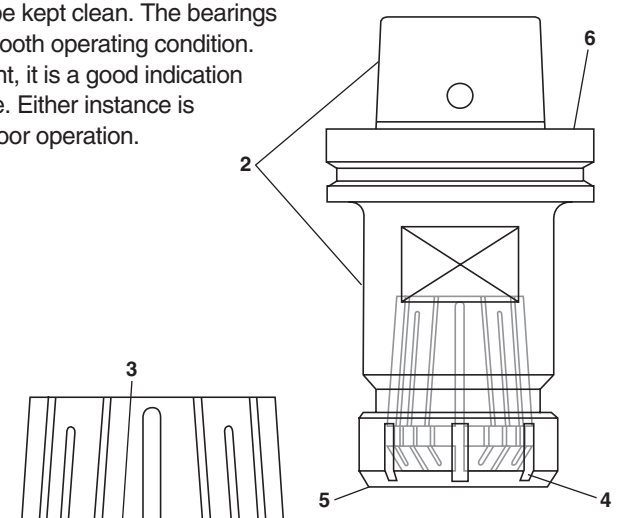
5. Thrust Bearings

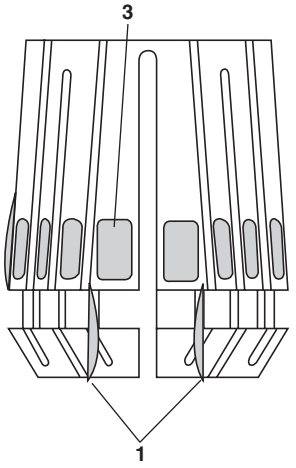
Some collet nuts have an integrated thrust bearing connected to the inside taper. This bearing serves to reduce friction wear between the collet and nut as the nut is tightened. The bearing’s seating surface is the most critical feature and must be kept clean. The bearings should also be kept in smooth operating condition. If there is rough movement, it is a good indication of contamination or abuse. Either instance is indicative of runout and poor operation.

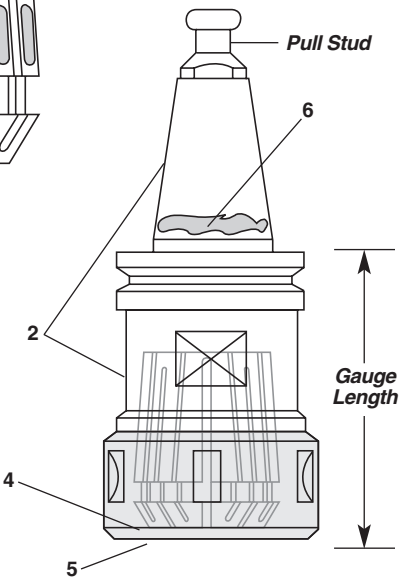
6. Tool Holders

Tool Holders such as BT/ISO 30 and HSK 63F have additional matching and mating tolerances beyond those of the older tapers. Because of their unique design, these tool holding systems can be more prone to runout caused by resin buildup. ”Fretting” or ”Bronzing” will cause inconsistent gripping in the taper and/or the flat mating surface and reduce consistency of tool life. If ignored, this condition can eventually premature spindle failure. The mating surfaces should be cleaned with Rust Free™ and hand dried immediately afterwards.

HSK63F Tool Holder







BT/ISO 30 Tool Holder

Additional Critical Tool Holding Components with Pneumatic Routers:

Some air routers contain a tool support bearing inside the nose cone. These bearings are critical for tool stability and require a longer shank tool to seat properly. The router bit cutting edge diameter must be undersize to pass through the bearing and the tool should have enough shank length to fill at least 75% of the collet depth. Standard router bits will cause the collet to collapse and create substantial runout. This runout will shorten both collet and tool life.