

Hard Surfacing of Collets, Collet Pads And Feed Fingers

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With the emphasis today on productivity, the collet must be included among those tools which are given close scrutiny in order to find ways to improve their usable life. Collets provide gripping functions for different manufacturing operations, particularly secondary machining.

The main problem with collets and collet pads is wear on the gripping or holding surfaces. This difficulty is also shared by feed fingers which are used to move the bar stock or workpiece into position for machining. When gripping is not maintained at a constant and uniform pressure, slippage occurs which results in scratched bar stock and rapid deterioration of the collet, pad, or feed finger. Once these become undersized or lose their initial gripping texture, they are normally discarded as scrap.

The machine operator generally first becomes aware of collet wear when the workpiece starts to slip while being machined. The collets upon observation after removal, display bands of scratched lines on their bore areas. To reclaim undersized collets, pads, and feed fingers, it is necessary to restore the original tolerance and requisite texture for reutilization. This is accomplished by electronically impregnating and depositing wear-resistant material to the undersized or worn area.

Rocklin Manufacturing Company, 110 South Jennings St., P.O. Box 1259, Sioux City, IO 51102, manufactures the Rocklinizer line of electronic equipment which applies tungsten carbide, titanium carbide, and proprietary Rockhard electrode material where needed to salvage worn collets and accessories. This equipment has the capability of building up worn collets using dial adjustments to control depth of deposit in 0.0001" increments.

The worn bore area of the collet should be measured to determine how much it is undersized. Where the desired buildup is less than 0.002" (approximate), the wear surface area should be Rocklinized using the tungsten carbide electrode. For buildup in excess of this amount to a maximum of 0.004" (approximate) and/or for a rougher gripping surface, the Rocklin proprietary Rockhard Electrode is recommended. If the machine operator is careful not to allow collets and accessories to get undersized by more than 0.004" (approximately), these collets, pads, and feed fingers can be repeatedly restored to tolerance.

New collets, pads, and feed fingers can also be Rocklinized to protect their wear surface by initially applying, before use, a lesser deposit of tungsten carbide. This prevents the collet and accessories from wearing in the first instance, and also provides insurance against these tools becoming so undersized that they cannot be reclaimed. This deposit may be controlled in thousandths of an inch. After the collets, pads, and feed fingers are Rocklinized, no further operations are necessary before putting them in use.

If the machine operator can be assured that the collet won't slip, he can increase the speed of his screw machine or lathe. As an example the machine operator may take a torque reading with his torque wrench to determine the amount of energy in foot-pounds to perform the machining operations. If prior to Rocklinizing he is using a 2" round-smooth collet for gripping with 140 ft.-lbs. of torque, the collets after being Rocklinized with Rockhard Electrode material have greater gripping capacity of approximately 600 ft.-lbs. of torque. With the resultant greater gripping of the

Rocklinized collets, the bar stock may be held in place without slipping, thus allowing the machine speed to be increased significantly.

The end result of this surface treatment is to increase productivity and reduce the costs of machining, including the costs of perishable cutting tools and accessories. If the collets, pads, and feed fingers can remain in place, without replacement due to wear, there will be less: down time; idle time for the operator; set-up time for insertion of collets, pads, and feed fingers required; inspection time; and fewer collets, etc. need be purchased for any given production run. All of this adds up to cost savings sufficient to cost justify the purchase of equipment to protect and restore tolerances of collets, pads, and feed fingers.

As an example, Eaton Corporation at Roxboro, NC, was using 263 new sets of collets (with three or four pads per set), per month before Rocklinizing. Six sets of large collet feed pads normally had to be replaced every day and one-half requiring approximately 30 minutes down time; but, pads coated with tungsten carbide electrode material remained in the machine in operation for seven days. Additionally, after Rocklinizing with tungsten carbide electrode material, the purchase of new collet pad sets was substantially reduced due to their longer run time and reclamation of what would have been scrapped pads. This savings cost justified the purchase of the Rocklinizer equipment and allowed a pay back period of less than one year.

Collets have a universal wear problem that can be successfully solved by the Rocklinizing process of hard surfacing. Collets, too, can contribute their share to increasing manufacturing productivity.

Closeup of Rocklin Beamed Thunderbolt Gun using tungsten carbide electrode being applied to bore area of worn collet pad.



Closeup of Rocklin tungsten carbide electrode being applied to face area of worn collet pad to restore tolerance.

