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Tooling Specialists For The Woodworking Industry Since 1985

Grinding of Carbide Knives, BAK-PAK® and Double-Back™ Knives

Description:

Carbide inlay consists of a tool steel body with a brazed carbide face. BAK-PAK® and Double-Back™ are two piece systems with separate solid carbide knife and steel backer. These two pieces are then fit together and clamped in the cutterhead knife slot as a unit. These "sandwich" systems allow the use of a higher grade carbide to offer increased life expectancy and give improved finish quality.

Profile Grinder Recommendations:

Run the grinding wheel at maximum wheel speed of not more than 3,000 RPMs. As carbide is a much harder material than standard HSS, a faster wheel speed will allow more efficient grinding. Allow the grinding wheel to do the work, as forcing the wheel will create unnecessary heat buildup. Heat buildup can cause the carbide to crack or delaminate.

Wheel Recommendations:

We highly recommend using a specialized diamond wheel for this application. A standard diamond wheel will create unnecessary heat buildup when coming into contact with the steel body or backer. Our CDX diamond wheel is designed to greatly reduce this heat buildup, while allowing grinding of both carbide and backer simultaneously. Grit size recommendations on CDX wheels are as follows: 80 grit for heavy stock removal; 150 or 180 grit for standard stock removal and good finish; 400 grit for extremely fine finish situations, such as profile wrapping. In extreme hogging situations, a black silicon carbide wheel can provide very rough material removal. However, the trade off is a very short wheel life and extremely limited finish capabilities.

Clearance Angle Recommendations:

Back-Pak 45° primary angle/40° secondary angle
Back clearance: 12° to 15°. More than 15° does not allow enough backing material to provide adequate knife strength.
Jointed knives: 18°.

Side clearance:

Never exceed 5°. Use only when necessary.

Finish Expectations:

Carbide knives generally produce a less acceptable finish than HSS knives. Improvements in carbide manufacturing; and in particular BAK-PAK® knives, offer better finish results than standard brazed carbide tipped knives. As carbide is recommended to machine MDF and other man-made materials, (in addition to most exotic hardwoods) the use of BAK-PAK® knives to achieve good knife life and very acceptable finish quality is advised. Call us with your particular application for best recommendations.

Jointing of Carbide Knives

There is more than one way to properly joint carbide knives. All techniques described below are assuming either carbide inlay knives, BAK-PAK®, or Double-Back™ type knives are being jointed.

Selection of Jointing Stone

As in grinding, individual operator techniques will greatly influence which stone will work. Here are some parameters for proper stone selection. In general, silicon carbide stones work better on machines with 3,600 RPM spindle speed. On 6,000 RPM machines; depending upon your application, either silicon carbide or a specialized aluminum oxide stone can be used. Since each application is slightly different, a few different stones may have to be used to determine the best stone for your application. Please call Wood Tech Enterprises, Inc. customer service department at **1(800)TOOLING (866-5464)** to help determine what stone will work best for you.

Preparation of the Jointing Stone

First, layout the stone using the pattern knife to be jointed. It is most important to maintain as accurate a mirror image fit as possible to the profile being jointed, as the jointing stone will in effect re-profile the knife if not properly formed. Now pre-shape the stone as accurate a fit as is possible.

Taper the stone on both sides at a 45° angle. This angle allows faster chipping-in of the stone. Insert the stone into the holder on the machine, and chip the stone in for exact fit. The use of only one knife in the chipping-in process results in a better fit. After the stone is chipped-in to fit, start the spindle and bring the stone into the knife at a slow to moderate speed. One technique is to bring the stone in and out in 1 second intervals, making minor adjustments at each interval. Another technique is to bring the stone in and hold it in slight contact with the knives. Depth control adjustments are made while contact is being made. This technique is tricky as extended time of contact can cause the stone to glaze or the carbide to overheat and crack.

Please remember the following:

- Different grades of carbide joint differently.
- Proper fit of stone to knife is mandatory.
- Jointing of carbide is tricky; please allow time for trial and error to learn the technique which works best for you.
- Wear a mask to prevent dust inhilation.

As in any joint stone forming process, use ONLY a wheel to form the stone that has not been used to grind ANY knives. It is important to note that allowing a grinding wheel that has been in contact with knives to be used in forming a jointing stone will result in small metal particles to be impregnated into the jointing stone. This foreign matter will adversely affect the stone performance by nicking the knives.