

We hope the information in this booklet has been of assistance, either in educating or reinforcing your knowledge of tungsten carbide knives' use. The work in our laboratories is not the only source for the information contained here. Our satisfied customers have contributed to the contents of this manual.

Your contributions regarding applications, techniques and care of the tungsten carbide knives are welcome also.

We take special pride in the results you get with our products. If we can ever assist in improving your results, please use our toll free number to call and be sure to look for additional Applied Diamond products in the future.

If these methods don't eliminate your problems, contact Applied Diamond at 1-800-222-5143. We can recommend other cleaning materials and techniques compatible with your sapphire knife.

We maximize the physical properties of diamond, sapphire and tungsten carbide to produce precise edges through exceptional craftsmanship, sophisticated equipment and customized engineering.

We provide you with:

High Quality Products

Each edge is rigorously tested to meet the requirements of your specific application.

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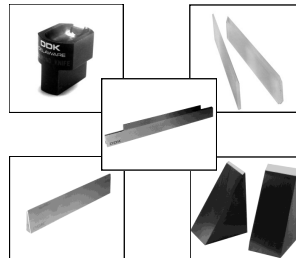
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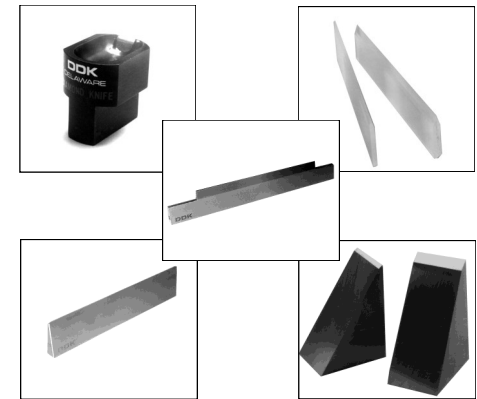
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Our unconditional guarantee allows you to see the benefits of our unique products without risk.



A Care & Use Guide For Sapphire Knives



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Please Be Careful!!

Your new sapphire knife is made from synthetic single crystal sapphire. We can create a remarkably sharp and uniform edge on sapphire because it is extremely hard and its crystalline structure is very regular.

These characteristics also result in an edge that can be very delicate. To prolong the life of this edge, never touch it with any solid object.

1. Avoid touching the edge when inserting or removing the knife.
2. Don't contact the edge with any tools when sectioning.
3. Safely store the blade in its box when not in use.

The best sectioning comes from a clean environment. Keep your knife clean by:

1. Using clean water, buffers for reagents in your microtome
2. Rinsing and wiping the reservoir and stage of your microtome between uses.
3. Preventing sections from drying on the knife.

Hints for Using Your Sapphire Knife

Sectioning problems usually come in three forms: chatter, compression and knife marks. As a general rule, vibratome sectioning with a sapphire knife is done with high amplitude, slow approach speed and a knife angle setting of about 23 degrees. You should spend some time learning the effects that changes in these operating parameters have on section quality.

Chatter is the result of vibration during cutting and appears as regularly spaced thick and thin lines on the section perpendicular to the direction of cut. Too low a clearance angle, too fast an approach and too hard a specimen are several causes of chatter.

Compression is a crushing of the section as it is cut resulting in a section that is shorter than the original block face and thicker than the microtome setting. Too high a clearance, too soft a specimen and a dull knife can cause compression.

Knife marks are lines that appear on the section parallel to the direction of cut. A dirty or damaged knife edge causes knife marks.

Care of Your Sapphire Knife

If you have sectioning problems, especially knife marks, a dirty knife may be one of the causes. Clean the edge by:

1. Soak a tissue of Kim-Wipe with reagent alcohol
2. Gently drag a corner of the tissue along the side of the knife, parallel to the edge.
3. Repeat on the other side of the blade and allow to air dry.

Alternatively, a high-density polystyrene rod, available from Applied Diamond and many EM disposables suppliers, is a safe tool to use for sapphire knife edge cleaning. Sharpen it to a chisel edge of 45° using a double-edge razor blade. **DO NOT USE DRY.** Dip the rod into reagent alcohol and shake or blot on filter paper to remove excess.

View the knife edge under a dissecting microscope and press the chisel end of the stick against the edge of the sapphire knife as though to split the stick. Using little force, wipe the stick parallel to the cutting edge, never obliquely or at a right angle. Move across the entire length of the knife edge then use a fresh part of the stick and repeat in the opposite direction.

