How Long Should A Diamond Knife Stay Sharp?

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The answer to this question is about as elusive as predicting which way the Dow Jones average will close tomorrow! But seriously, there are the "ten commandments" for a diamond knife to enjoy a long life, the most important ones being as follows:

1) Because of the extreme sharpness of a diamond knife edge, it should not be touched with any solid object, even for cleaning. This is controversial since some manufacturers actually recommend that the edges be cleaned with sticks of varying types. We ourselves believe such treatment accelerates the wear of a diamond knife.

2) Don't let sections or the remains of sections or other debris dry down onto the knife edge. Keep the knife edge wet until it is ready for cleaning before being put to bed for the night.

3) Use a diamond knife cleaner sold by several firms (including ours) specifically for this purpose. Some typical laboratory ultrasonic cleaners can have enough power to be damaging to a knife.

4) Wash the knife edge one last time with distilled water, and then dry with some kind of "blast", such as from a clean duster.

5) Avoid conditions of chatter at all times. Reduce chatter by varying the clearance angle or slowing the cutting speed. Other common causes of chatter are insufficient tightening of the boat in the microtome, an insufficiently tightened block, or an incompletely cured block.

6) Final block trimming with a razor blade can leave metal particles from the blade, which are of course damaging to the knife edge. This can be minimized by using a fresh razor blade each time. Then wash the end of the freshly cut block face with distilled water, followed by drying with a duster blast is the final step before the first cut with the knife. This is a final chance to wash away metal particles that could damage the knife edge.

There are other considerations but these are the most important. They are independent on the knife manufacturer, the type of diamond knife, length of cutting edge, nature of the samples being cut - even the price paid.

Diamond knives in an EM lab have lifetimes that are as predictable as a set of tires. It depends on what kind of road you drive on and how you do your driving, not to mention the beginning quality of the product itself. We run some samples in our own laboratory that wear out a new materials science diamond knife in a week, and we run others, *e.g.*, soft tissue samples, that are cut with a life science diamond knife that will last., in comparison, almost forever. You can't do anything about the deck of cards you have been dealt in terms of the kinds of samples you have to cut, but once having determined that, there are things under your control that can make a big difference in terms of how long your own knife will or will not last in your own environment.

Disclaimer: SPI Supplies offers a full line of diamond knives for EM and LM. Actually we have a vested interest in having knives wear out faster rather than slower. Our favorite customers are those who mistreat their diamond knives and come back sooner for resharpenings or replacements. (Just kidding). ■

COMING EVENTS

✓ **OIM Academy** (TexSEM Labs) Provo, UT, Barbara Matthews: (801)495-2758, fax: (801)495-2758. eMail: tsl@oim.com
June 22/26 '98: OIM Theory and Practice
Sept 28/Oct 2 '98: Advanced OIM Theroy and Application

✓ March 16 (NYC), 18 (Springfield, MA) & 20 (Boston MA): **Optimizing Light Microscopy Lecture/Demonstration** (MM&E), Dr. Ken Piel: (413)746-6913, *eMail: kenpiel@map.com*

✓ April 19/23 '98: **20th International Conference on Cement Microscopy** (ICMA) Guadalajara, Mexico. www.cemmicor.org

✓ April 19/24 '98: **7th Biennial Frontiers of Electron Microscopy in Materials Science** (FEMMS98) Irsee, Germany: http://femms98.llnl.gov, email: weking@llnl.gov

✓ May 9/12 '98: **SCANNING '98: (FAMS)** Baltimore, MD. Mary K. Sullivan:(201)818-0086, Fax: (201)818-0086, email: fams@holonet.net www: http://www.scanning-fams.org

Marine Biological Laboratory Courses: Woods Hole, MA
May 7/15 '98: ***Analytical & Quantitative Light Microscopy***
May 19/26 '98: **Microinjection Techniques in Cell Biology**
Oct 7/15 '98: **Optical Microscopy & Imaging in the Biomed Sciences**
Carol Hamel: (508)289-7401, admissions@mbl.edu

✓ **Practical Aspects Series of Short Courses at Univ of Maryland**
May 18/22 '98 Scanning Electron Microscopy - Session I
May 19/22 '98 Image Analysis
May 25/29 '98 Scanning Electron Microscopy - Session II
May 26/29 '98 X-ray Microanalysis
Tim Maugel: (301)405-6898, eMail: maugel@zool.umd.edu

✓ May 21/23 & 25/27 '98: **Quantitative Image Analysis Workshops.** (North Carolina State University) Raleigh, NC. Alice Warren: (919)515-4195, Fax: (919)515-7614, email: alice_warren@ncsu.edu

✓ June 7/10 '98: **SCANDEM '98** (helsinki Univ. of Technology), Espoo, Finland. http://scandem.hut.fi, eMail: scandem-98@hut.fi

✓ **LEHIGH MICROSCOPY SHORT COURSES - 1998**
June 8/12 '98: SEM and X-ray Microanalysis
June 7 '98: Introduction to SEM and EDS for the new SEM Operator
June 15/19 '98: Advanced Scanning Electron Microscopy with Digital Image Processing.
June 15/19 '98: Quantitative X-ray Microanalysis of Bulk Specimens and Particles
June 15/18 '98: Analytical Electron Microscopy: Analysis of TEM Specimens
June 16/19 '98: Atomic Force Microscopy and Other Scanned Probe Microscopies
For information, contact Sharon Coe at phone: (610)758-5133, Fax: (610)758-4244, eMail: slc6@lehigh.edu

✓ June 17/28 '98: **3D Microscopy of Living Cells** (Univ. of British Columbia) Vancouver, BC, Canada. Prof. James Pawley: (608)265-5315, email: JBPAWLEY@FACSTAFF.WISC.EDU

✓ June 22/26 '98: **14th Annual Short Course on Melecular Microspectroscopy** (Miami Univ) Oxford, OH (513)529-2874, Fax: (513)529-7284

✓ June 30 - July 2 '98: **3D Image Processing** (Univ. of British Columbia) Vancouver, BC, Canada. Prof. James Pawley: (608)265-5315, email: JBPAWLEY@FACSTAFF.WISC.EDU

✓ July 7/9 '98: **MICRO98** (Royal Microscopical Society) London, UK, +44 (0) 1865 248768, Fax: +44 (0) 1865 791237, info@rms.org.uk

✓ July 12/16 '98: **Microscopy & Microanalysis '98.** (Microscopy Society of America) Atlanta, Ga. http://www.msa.microscopy.com

✓ July 26/29 '98: **31st Annual International Metallographic Society Convention** (ASM) Ottawa, Canada. http://www.asm-intl.org

✓ Aug 31 - Sept 4 '98: **ICEM XIV/International Congress on Electron Microscopy.** Cancun, Mexico. (525)553-4507, Fax: (525)553-4500, email: icem@icem.inin.mx WWW: http://icem.inin.mx