

Re: Kohler illumination question...

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justbeats wrote:

Given that the final step is to hide it behind frosted glass, why is it necessary to get a focussed image of the lamp filament when setting up for Kohler illumination?

I tried to answer this myself by taking images at different powers with the filament defocussed to varying degrees. I couldn't detect any difference in final image quality for any of the settings (as long as the filament remains nicely centered of course).

After unsuccessfully Googling for the answer, I've another (maybe related) question. Is critical illumination considered an old and inferior technique, or a modern and superior one?

Thanks
Beats

There is a very practical consideration when you design a microscope illumination and that is to weigh performance vs cost. Usually the level of correction for the illumination is just as good as it is absolutely required - a frosted glass helps a lot in hiding imperfections. But this frosted glass should be placed as close as possible to an aperture plane and be optically as "thin" as possible to diffuse the light source but not to cut out too much.

A second reason, as already mentioned by another contribution is the shape and radiation unevenness of the light source itself. If you take a filament, then the source is pretty uneven, that's why in the past you got special Halogen bulbs from some high-end manufacturers which had a denser filament structure. If you use a small light source like an arc or a diode, then the optical aberrations of the lamp condenser and the subsequent optical elements are usually far too much to produce a proper image of that light source.

Yes, a perfect microscope would also have a perfectly designed

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illumination system, but this is much too expensive and people would not pay for it. And even if they would pay for it, the marketing aspect of it - selling it as a competitive advantage - would not work, because customers would say - why would I want to pay \$500-1000 more for that illumination system if I can have a similar performance at much lower price by just placing a frosted glass into the lightpath.

A last but not least reason is that the frosted glass increases the nA of the illumination which helps "improving" the imaging performance of the microscope.

Regards George

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