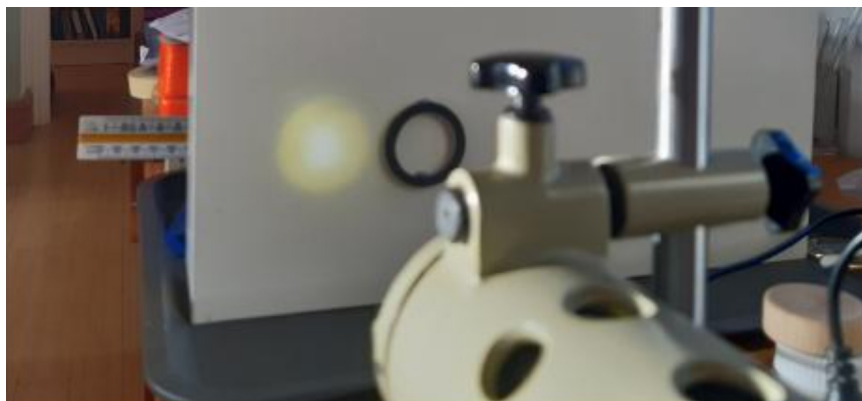


A comparison of two different star LED's in the LOMO OI – 19 illuminator

I like many others have started to use LED lighting in my microscopes as to get around the heat and availability of incandescent bulbs. But there's a lot of chips to choose from. I started out using anonymous and cheap 1 Watt star chips as these looked to be bright enough and indeed they were. There is also the bonus of fairly simple and very smooth control of the lighting intensity without the colour changing together with the possibility of using batteries or simple 5V supplies. I use the current limiting control circuit from Frank Weithoener's site.

But the 1 Watt LED also had a relatively small luminous area not entirely compensated for by the inbuilt lens even when it appeared to incorporate some diffusion. Not a real problem with a total internal reflection lens or for use as top lighting on a stereo microscope, you're replacing the mirror with a completely new assembly or if you're sensible and use something like the Q5 torches in David Jewsbury's article. I was trying to replace the lamp cassette unit in the OI-19 illuminator which needs a 3-4mm diameter source to replicate the original bulbs. In case you've ever wondered what the practical differences between the two star LEDs look like here's what I found.

With the 1 watt LED this is what I got at the 20cm working distance set by the LOMO 'plank':



I then bought a genuine Cree Xlamp XM L2 10W chip after re reading Forbes Pettigrew's article on converting a 12V 60W Zeiss illuminator. It looked to be the ideal size but capable of producing far more light than I needed (!) Here it is in exactly the same set up dimmer settings and all:



The black ring Blu Tacked into place in each photograph is 35mm outside 28mm inside diameter, so similar to the filter holder on many substage condensers. Better for Köhler illumination I think.

No surprises here. Much better and just as controllable as the 1 watt version, it produces a 3.5 cm square image at 20 cm. What you do not see well but can infer from the previous photograph is that the grid here fills the projected diagonal field of view of the lens so it's pretty much as good as you'll get or need. Also it's a simple matter to alter the control circuit should I ever want more illumination than the 200mA limit set by the controller circuitry at the moment. (See Frank Weithoener's original article or David Jewsbury's for another circuit and explanations of how they work). My controller runs very well from an Amazon Fire 9 watt power supply at all lighting levels. Or 4 NiMH cells in a holder.

The LED holders were machined from 70×25mm pieces of aluminium rod. However 7/8" or 22.2mm round bar is a standard stock size and providing you can drill a hole through it and cut the end smooth and square you could manage without a lathe. I did machine mine undersize to fit using a layer of tape to stop the metal to metal grinding of the original lamp housing during adjustment and keep it nicely in place. You'd just need more tape. No one need ever know.

(Note 18th July 2023.

I have just noticed on the RafCamera website an adapter for the Zeiss NG illuminator which looks like it ought to fit and work fine in the OI-19 for those of you not endowed with workshops or fancy sheds. Also uses the tape to fit or 'colour code your lights for identification' in my case. I have some of his adapters for camera lenses and cannot fault them.)

References (with my thanks for saving me a lot of time, messing about and most of all – money!)

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