Lighting for Spin-coater/Mask Aligner (MA-6) Room.

Introduction.

Materials (mainly photoresists) used in the proposed Spin-coater/Mask Aligner Room are light sensitive. Therefore, the light entering the room from outside (adjacent rooms and corridor) needs to be filtered to remove the undesirable wavelengths. In addition, the lighting in the room should also be designed to avoid these same wavelengths.
The photoresists are sensitive in the ultra-violet range from approximately 200nm up to around 450-475nm. Visible light typically ranges from 400nm to 700nm and so some of the shorter wavelengths need to be removed.

Windows.

To avoid the undesirable wavelengths entering the room, the windows should be covered with an appropriate filtering material. Elsewhere on-site the chosen film is EncapSulite G10 Gold film (also known as G10 Yellow) and we would therefore like to use this or an equivalent approved material to ensure consistency. This has been used for many years and works well. The spectral limit is 475nm and is shown in Figure 1.

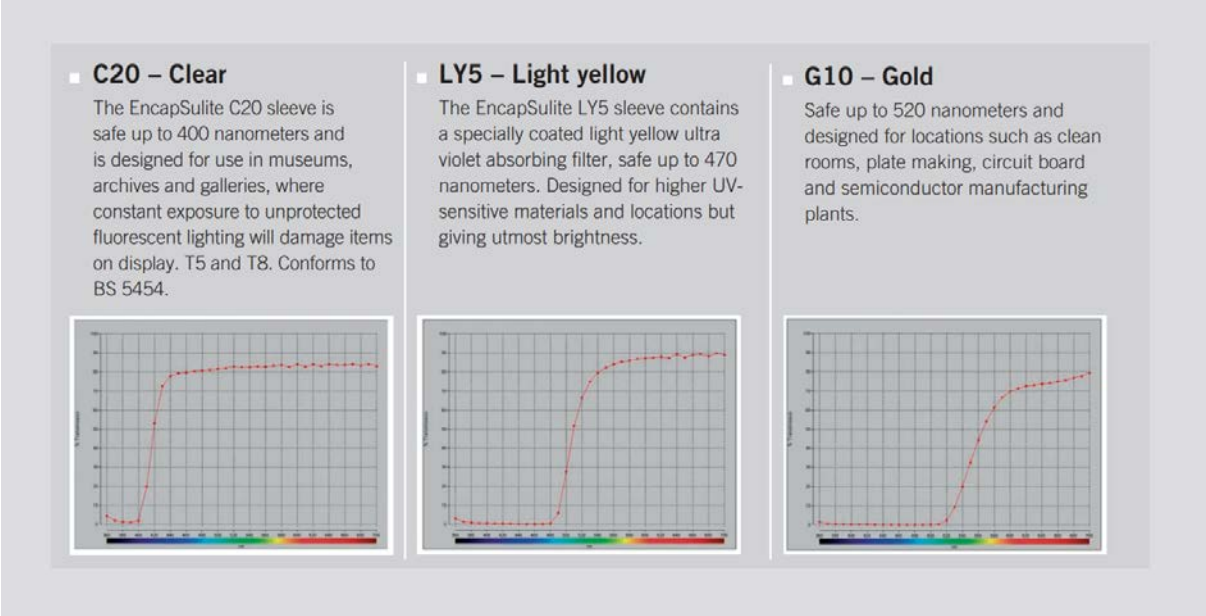

Figure 1. Spectral transmission of various films, including G10 Gold (right)

Lighting.

Traditional fluorescent tubes emit a significant amount of light into the UV. However, these have largely been replaced by T5 and T8 LED replacements. These LED versions emit much less UV light - see Figure 2.

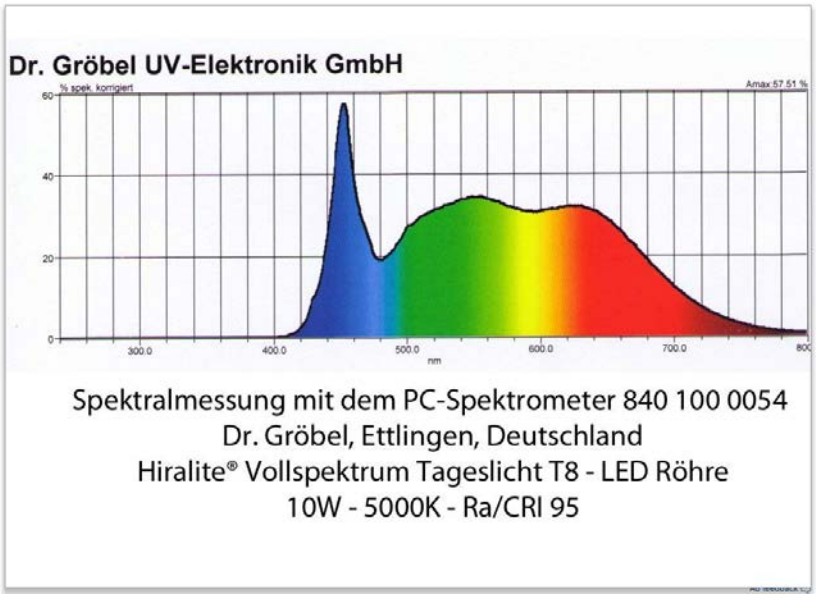

Figure 2. Light emitted from T5 and T8 LED tubes.

As can be seen there is no emission below 400nm. However, there is still enough light from 400nm to 450nm to affect the photoresists in use. There appear to be several possible solutions:

1. Installation of luminaires which block the UV.
2. Fitting of UV-blocking sleeves to T5 or T8 LED tubes.
3. Application of G10 Gold film over existing luminaires (if permitted).

Solutions 2 and 3 could also be easily applied to traditional fluorescent tubes.

Of these solutions, one might suppose that #3 is the lowest cost, followed by #2 and then #1.