



Darkroom Lighting Basics



Requirements:

1. Darkroom lighting for each film product follows safelight "Darkroom Recommendations" in published product technical data. When a mix of product types is used in a particular area, the most conservative (least chance of fogging) lighting recommendation should be used.
2. Use of "task lighting" (light on only while performing specific task) and "guide lighting" (e.g., LED strip lighting outlining walkways and objects) is preferred to overall illumination (e.g., yellow sodium vapor room illumination). Darkroom lighting should not shine directly on unprocessed film, except as required for safety.
3. Machine control, computer, and data entry systems should use designed "task lighting" concepts to minimize product exposure.
4. Use of hand-held "safelights" are discouraged except for emergency use.
5. Infrared sensors, cameras, and scopes may be used to monitor operations and are checked to be sure there is no film sensitivity (ideally no spectral energy below 800 nanometers).
6. Luminous watches, cell phones with indicator lights, laser pointers, matches, cigarette lighters, hand-held video games, flashlights (torches), and other light-emitting devices are prohibited in areas handling unprocessed films to minimize risk of accidentally fogging customer film.

7. "White Light" and clean-up lighting systems have failsafe procedures to avoid accidentally fogging unprocessed film.
8. Machine film sensors are appropriate for the film product being handled.
9. Laboratory runs periodic checks of darkroom lighting systems to verify that film is not being fogged under any normal operating condition. A check should be done anytime darkroom lighting is changed or if light leaks are suspected.

Examples:

1. Unprocessed camera films should be handled in total darkness. For safety, very dim green guide lighting (LED strip lights) may be used to outline walkways, walls, and darkroom hazards. Safe task lighting may be used for reading labels or data entry. In no case should light shine on the film itself (even after dark accommodation, you should not be able to see the film itself with any guide light or task lighting in use).
2. Unprocessed intermediate film, print films, and blue-sensitive or ortho-sensitive films may tolerate some overall "safelight" illumination (see "Darkroom Recommendations" in published product technical data) if required for safety and efficiency. Every effort should be made to avoid any light shining on unprocessed film, especially for an extended time.

3. Use of “guide lighting” is strongly encouraged, instead of overall room illumination. LED strip lights may be used to outline darkroom walkways, walls, doorways, objects, and hazards. Guide lighting should NOT shine on the film, and the film should never be brought into close proximity with the guide lighting.
4. Use of “task lighting” is strongly encouraged, instead of overall room illumination. Machine controls and gauges may be dimly lit with appropriate “safelights” that do not shine on the film itself. Data entry, label reading, and roll end splicing may be done under a “safelight” that is directed only to accomplish the task, and on only when the task is being done. Film exposure to any light source should be held to a minimum.
5. Overall darkroom “safelights” should only be used when required for operator safety. For example, a high-speed printer room with raw stock elevators may be dimly illuminated by a low-pressure sodium vapor lamp. Wherever possible the light should not shine directly on the film, and time of exposure should be held to a minimum. For example, rolls of unprocessed film should not be left for prolonged periods in areas with overall darkroom “safelights”, and any film elevators exposed to illumination should be filled with leader before stopping.
6. Hand-held “safelights” are discouraged, except for emergency use. Even with proper training, operators tend to misuse the lights, leading to random fogging of unprocessed film.
7. Any non-essential light emitting devices should be prohibited from darkroom areas, as they may lead to accidental fogging of customer film (e.g., opening up a cell phone with a luminous display, reading a luminous watch, using a penlight to find a dropped article, etc.).
8. White light and clean-up lighting should have fail-safe procedures to avoid accidentally turning on lights when unprocessed film is in the room. Key-operated lights, door interlocks, machine interfaces, “lights on” warnings, etc. may be used to facilitate proper use.
9. On a quarterly basis, or every time darkroom lighting conditions are changed (e.g., sodium

vapor lamp replaced), the lab should run an evaluation of film fogging under normal operating conditions. This is usually done by running a log time series exposure (e.g., 1, 2, 4, 8, 16, 32, 64 minutes) on the film emulsion under the darkroom illumination conditions the film is normally exposed to. After processing, any fog can be noted visually or by densitometry. Light intensity should be adjusted to provide at least a 2X time safety factor before measurable fogging occurs. (e.g., if fog occurs after 32 minutes, the film exposure to that condition should be limited to only 16 minutes). Note this test should be run in “worst case” areas, for example, in a location that is normally the closest the film gets to the light source.

Laboratories should train workers in proper darkroom lighting practices

Examples:

1. Safety glasses are ALWAYS worn in darkroom areas.
2. Darkroom workers follow proper darkroom safety procedures: No loose clothes or hair to get caught in moving machinery, call out presence, “buddy” system to guide workers who are not dark-adapted, maintain clutter-free work area to minimize tripping or impaling hazards, etc.
3. Workers understand that improper use of darkroom lighting will fog film, and do not modify darkroom lighting (e.g., do not remove or fade safelight filters or increase lamp size, do not bypass or defeat “task lighting” time limits, etc.).
4. Workers do not bring potential light-emitting devices that could fog film into darkroom areas (e.g., cell phones with illuminated displays, flashlights, etc.).
5. Workers certified to carry hand-held safelights for emergency use fully understand the potential for fogging film by improper use.
6. Workers have a general knowledge of suitable darkroom lighting for the film they handle (e.g., camera films need total darkness, and should not be seen by any stray light).

