

# CONTROLLING CONTRAST

## GUIDE



Ontario Police College  
Identification Training

Module P-6

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## LIGHT CONTRAST - Reflectors

### Highest Contrast:

These are lights which incorporate polished reflectors and condensers (spot lamps). This light system produces directional illumination at a high level over a relatively small area and normally yields shadows with hard edges. A harder than normal edge to the illumination can be obtained with the addition of a *snoot*. This is an excellent type of illumination for low contrast two dimensional subjects of modest size, such as fingerprints found in dust at a crime scene, footprints on paper or on floors, etc. To soften this type of illumination a diffuser can be added to the system.

### Medium High Contrast:

Lamps with polished reflectors.

### Medium Contrast:

Lamps with matte reflectors. Useful for copying two dimensional originals and portraiture, etc.

### Low Contrast:

Lamps with matte reflectors using diffusers or umbrellas from which to bounce light, produce the softest type of light with soft-edged shadows and the broadest form of evenly dispersed illumination. This lighting is useful in portraiture, copying, and small and large object photography.

*Note: Most reflectors tend to create a level of illumination that is greater (in varying degrees) at the centre than at the outer limits of their designed angle of coverage. Awareness of this condition is important for balancing lights for copying, in flash photography and in all situations where artificial light sources are used.*

## LIGHTING CONTRAST - Direction

Lights, because of type, shape or size, whether spot, polished, matte or diffused, have already been *typed* as to their effect on contrast. The **placement** of the *best light type* for a particular photographic assignment can also affect the real contrast of the subject as normally viewed.

**Highest Contrast:**

Oblique lighting. A small spot lamp is preferred, directed so that the light is nearly parallel to the subject. Useful for indented writing, footprints on paper or flooring, tool impressions, some fingerprints and most subjects that are low in contrast. This type of lighting will necessitate exposures that are longer than *normal*.

**Moderate Contrast:**

Light(s) at 45° to lens axis, is excellent for copying two dimensional objects, small object photography or when the subject is of normal contrast.

**Low Contrast:**

Light(s) at an angle approaching 0° to lens axis (nearly parallel to lens axis) produces minimum shadow and contrast. This type of lighting is normally associated with flash on camera photography and specular reflections from the light source are most common.

**Lowest Contrast:**

Light(s) at an angle of 45° (as for copying) is used to illuminate a diffusion material such as a translucent "tent" wherein the subject has been placed. The resultant light product is well diffused, evenly distributed and does not produce any shadow.

The judicious selection of light type and direction of that light is important for maximum lighting flexibility and optimum quality of the photographic product. Lighting can be used to increase or decrease the apparent contrast of some subjects as compared to the *normal* viewing situation and is the first method to be considered in most photographic assignments.

**CONTRAST CONTROLS IN PHOTOGRAPHY**

It would seem appropriate to deal with all of the contrast controls that have been discussed and list them in this section.

1. Type of Light
2. Type of Lighting
3. Film Selection
4. Developing Time
5. Type of Developer

6. Dilution of Developer
7. Filter on Camera
8. Paper Grade

## **EXPANDED REVIEW:**

### **1. Type of Light:**

**Flood:** Associated with less contrast than a spot because of a diffuse reflector and a broad distribution of light which results in soft, diffuse shadows.

**Spot Lamp:** A light unit which provides the greatest degree of contrast. Because of a reflector and lens system, it projects light in a tightly controlled spot and produces sharp, well defined shadows.

### **2. Type of Lighting:**

**Tent Lighting:** The least degree of contrast by lighting. Tent lighting provides illumination which is multi-directional and evenly distributed. Insofar as the illumination is flat and shadowless there is minimal contrast.

**Oblique Lighting:** The greatest degree of contrast by lighting. Oblique lighting is nearly parallel to the surface of the subject. As a result, the uppermost characteristics of the surface are illuminated and the lower characteristics are in shadow providing a higher contrast situation than can be achieved with any other lighting method.

### **3. Film Selection:**

Films such as FP4/Plus X; Tri X/HP5, are films of continuous tone and as such record a broad range of brightness and record flat subjects as flat and contrasty subjects as contrasty. Copy films in this category are commercial and ortho. Films such as Contrast Process Ortho, Contrast Process Pan and Technical Pan are capable of yielding very high contrast and as such exaggerate tonal differences.

### **4. Developing Time:**

Extending developing time, broadens negative contrast by increasing negative density in the mid-tone, highlight area and having little effect on shadow areas (continuous tone film). Shortening developing time, reduces negative contrast by decreasing negative density in the mid-tone, highlight area and having little effect on the shadow areas (continuous tone film).

- Increase developing time when a subject is recognized as having low contrast or it is realized that the film being used would ordinarily produce a flat negative.
- Decrease developing time when the subject is recognized as having high contrast or it is realized that the film being used would ordinarily produce a negative with too much contrast.

**Doug: Read pp 102-103, BASIC PHOTOGRAPHIC MATERIALS AND PROCESSES**

**5. Dilution of Developer:**

Whenever a developer has the potential of being used with a variety of dilution ratios such as 1:1 or 1:7 or 1:9 or 1:19 it usually follows that the highest contrast will be realized with the least dilution, i.e. 1 to 1, and the lowest contrast will be realized with the a dilution of i.e. 1 to 19.

**6. Filter on Camera:**

Filters on the camera can be used to modify the apparent tonal value (or colour or brightness) of a coloured object in relation to another object, i.e. a red filter may be used to darken green to enhance the contrast between the green surface and a grey fingerprint impression.

**7. Paper Grade: As 0 - 1 - 2 - 3 - 4 - 5**

It is generally acknowledged that a negative of normal contrast will print well on a grade 2, negatives with indeterminate low contrast may print on a grade 3 - 4 or 5 to increase contrast. Negatives of higher than normal contrast will print on a 0 or 1 to reduce contrast.

**Inverse Square Law**

The intensity of light falling on a subject from a reflectorless light source varies with the light to subject distance. The illumination diminishes with distance and is expressed by the inverse square law: *When a surface is illuminated by a point source of light, the intensity of the illumination at the surface is inversely proportional to the square of its distance from the light source.*

The diminishing rate of light is inversely proportional to the square of the distance from the light source as illustrated.

i.e., at surface *A*, light source from subject is one unit of measure, 1, (or  $1/1 = 1$ ).

at surface *B*, light source from subject is two units of measure, 2, (or  $2/1 = 2$ ).

### **APPLYING THE INVERSE SQUARE LAW**

Light intensity at (b) is diminished by the inverse of the square of its distance from the source, i.e., the inverse of  $2^2$ , which is  $1/2^2$  or  $1/4$

The light source from (b) is twice the distance as the light source from (a). **Doubling** the distance, however, has **quartered** the intensity of the light.