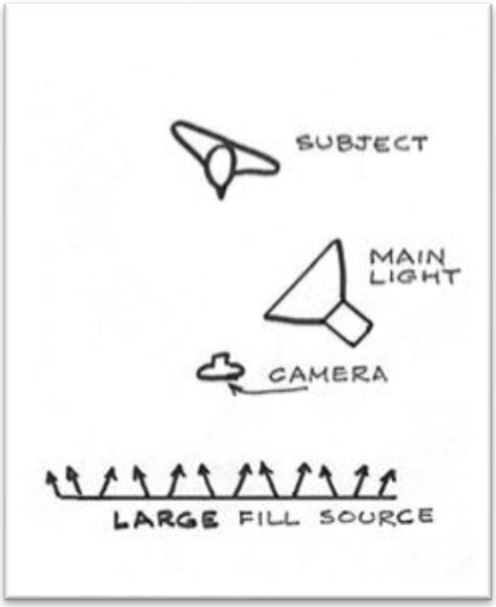
WHAT IS FILL LIGHT?

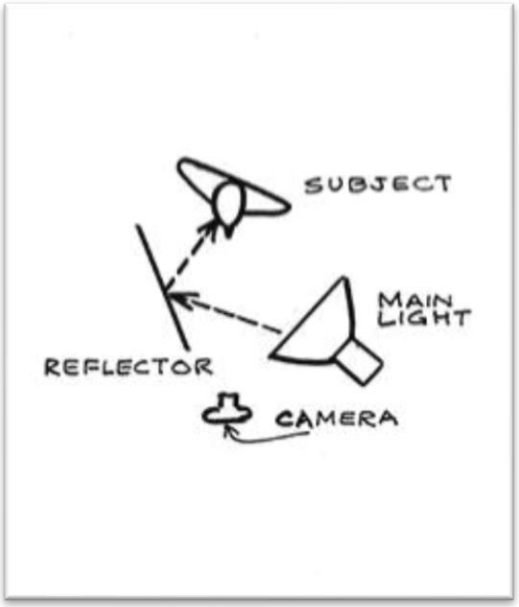
Fill light is any source of illumination that lightens (fills in) areas of shadow created by other lights. Most often, fill light is used to lighten the shadows created by the main (key) light. The fill source is generally indistinct and lightens while not imparting character or noticeable shadows of its own. Some images, especially those requiring a dramatic mood, are best with little or no fill lighting. However, most images will require some form of fill lighting to keep the image shadows and highlights within the dynamic range of the output medium.

In the three images shown below, we have an example of how a main and fill light are combined to produce a finished image. The leftmost image shows a mannequin illuminated solely by a rather hard-edged main light. The main light provides a strong sense of relief, but the shadows are inky black and the overall lighting harsh. The centre image shows the same mannequin illuminated solely by a fill light. The fill light provides flat overall illumination that, by itself, is lacklustre and imparts little sense of depth. The rightmost image shows the combination of the main and fill light. Here the best qualities of both lights are combined to produce an image with open shadows and an increased sense of relief`. The output of the main light in these images is set to be approximately twice that of the fill light, providing a fairly low ratio (3-to-1) lighting.

Main Light Only Fill Light Only Combined Main and Fill

Lights





Selecting a Fill Source

How you provide fill will depend on many factors and your personal preferences.

Reflectors as a Fill Source

Quality portraits, from headshots to full-body shots, can be created using fill from only a reflector. Many well-known photographers prefer this method.

Reflector fill has several advantages:

- Using the modelling light of a strobe, the reflector can be adjusted by eye until the desired fill is achieved.
- Reflectors are less expensive than an additional lighting unit.
- Many reflectors fold down and can also be used for outdoor portraiture
- Reflectors come in a variety of sizes and surfaces, allowing you to vary the amount and specularity of the fill.
- Reflectors can be used close to the subject and require less studio depth than many solutions using an additional strobe.
- When used close to the subject, reflectors can provide very localized lightening and will not significantly affect other areas of the scene. This provides an advantage over more general fill lighting when working in rooms with strongly-coloured walls.

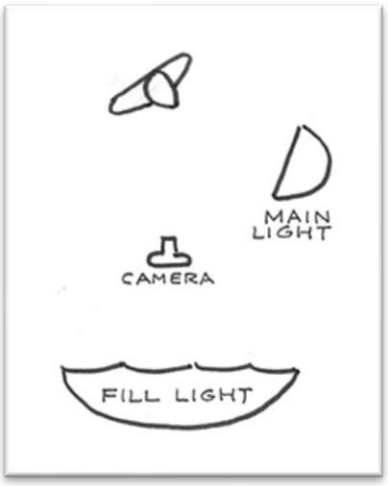
Reflector fill has several disadvantages:

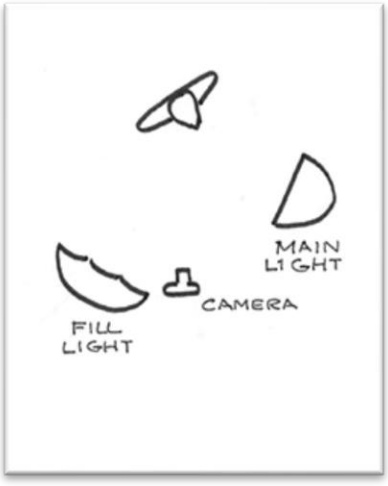
- Reflectors generally require broad-coverage light sources. Lights that have narrow angles of coverage (narrow-beam parabolics, grid heads, etc.) focus most of the light on the subject and provide little that spills over to the reflector.
- Fill reflectors are normally used close to the subject, resulting in a rapid fall-off in fill-light intensity. This makes reflectors a questionable choice when attempting to provide even fill for a large area, as would be needed for group portraiture.
- Adjustments to the main light often require readjustment of the reflector
- It can be very difficult or impossible to assess reflector fill accurately when working in well lighted spaces. Most photographers who work with reflector fill do so in studios with subdued lighting.

Strobes (Flash) as A Fill Source

The use of a separate strobe or flash as a fill source is very common. Many high-volume studios use an additional strobe as a source of fill.

Before covering the general strengths and weaknesses of strobe fill, let's take a look at a few top-view diagrams that depict some common implementations of strobe fill.





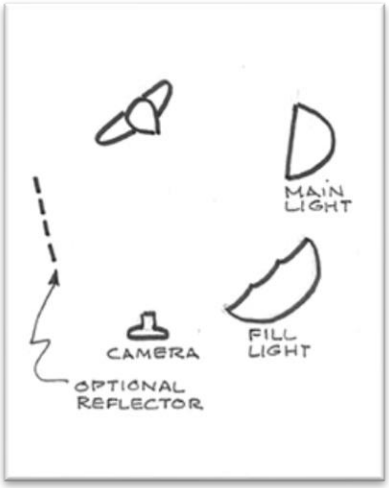


Diagram f.1 (on-axis fill) **Diagram f.2 (opposite-side fill)** **Diagram f.3 (form fill)**

Diagram f.1 shows one of the most common implementations. A large, soft source is placed behind the camera on the camera-to-subject axis. This approach creates a flat fill that illuminates most all of what is visible to the camera. Diagram f.2 depicts another frequently used approach, with the fill and main lights on opposite sides of the camera. In this

implementation, the fill light is often placed closer to the camera-to-subject axis than the main source. Form fill, shown in diagram f.3, is a bit more complicated to use. The form fill generally faces squarely into the subject's face and lights the front (mask) of the face. As the face moves, the form fill follows it. Another way of looking at it is that the subject's nose always points at the form fill. The form fill is often used in conjunction with a main/accent light that rakes light obliquely across the face. When used in the short-lighting configuration, as shown here, an additional reflector or weak fill source may be used to lighten the shadows on the camera side of the head.

Strobe fill has several advantages:

- Unlike reflectors that must be opposite a source of light, strobes can be positioned almost anywhere.
- Some strobe mono-lights/heads provide infinitely adjustable output over a range of several f-stops, allowing for very precise control of the fill.
- Strobes can be fitted to a large number of light modifiers, providing light with different character.
- Strobes, when paired with appropriate modifiers, can provide a source of even fill for a very large area.
- Strobe fill, especially on-axis fill, generally does not require repositioning when changing the main light's position.

Strobe fill has some disadvantages:

- Strobe fill requires an additional lighting unit, making it a more expensive solution than reflector fill.
- Strobe fill often requires more working area, especially when using the on-axis approach.
- Strobe fill may not be as portable a solution.
- Strobe fill is best when broad-area lighting is needed and less effective when select pockets of shadow must be filled.

Fill Light Strength

Providing the optimum amount of fill lighting for your image is probably the most difficult and important lighting task you'll have. The mood and feel of your image can change dramatically with only a small change in the strength of the fill source. And, it's not only your artistic expression that will suffer with incorrect fill. If you are outputting your image to photographic paper or a printing press, you'll want to keep the brightness range (darkest detailed shadow to lightest textured white) of the image to about 1:40 or ~5 f-stops. You'll need the correct amount of fill to accomplish that.

Measuring Light Strength

The best way to accurately measure the strength of your strobe lighting is to use an incident flash meter. If you do not have a flash meter, but have a digital camera which displays a histogram, there is another way to establish correct exposure which will be demonstrated in

another section of this site. The light-meter readings quoted in the examples on this site are based on readings taken with the meter placed as close to the subject as possible with the meter's hemispheric dome pointed directly at the light source.

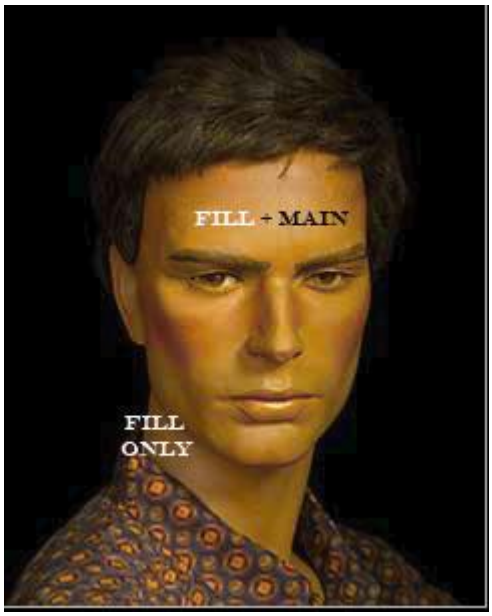
Relative Vs. Actual Strength

It is extremely useful to think in terms of the relative strength when setting the output of your various lights and, in particular, the relative strength of the main and fill lights. Now, don't get me wrong, the actual strength of your lighting is important. It will determine what lens aperture you will use and this has a very important impact on the look of your images, as it affects the depth of acceptable focus. But, it is the relative strength of the lights that ultimately affects the look of the lighting. Increase the strength of all lights by a factor of 4 and the lighting will look the same, just brighter. Decrease all lights by one f-stop and the lighting will look the same, just darker. A shorthand for expressing the relative strength of illumination is commonly used in photography and is known as a lighting ratio.

Lighting Ratios

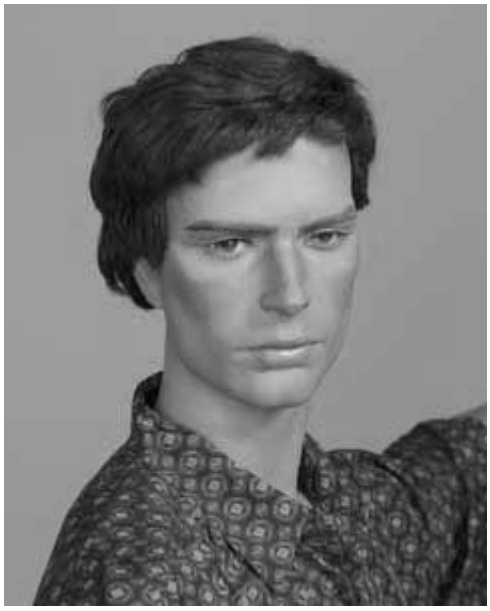
Lighting ratios are used to express either the relative intensity of the illumination in two areas of an image or the relative intensity of two sources of light. In cinematography, it is the latter ratio that is most often used, but in still photography, it is usually the former. In still portraiture, the lighting ratio is usually used to represent the relative strength of the light that falls in the fully lighted area (main light + fill light) to that in the shadows (fill light only). Though one might be able to establish a lighting ratio for a main light and its associated reflector fill, ratios are usually used only when a separate main and fill light are employed.

On this site, lighting ratios are used to express the ratio of the intensity of the illumination that falls in the areas lighted by both the main and fill lights, to the intensity of the areas illuminated solely by the fill light. This is shown graphically below.



Ratio = Fill + Main: Fill only

The following images show the same scene shot at various lighting ratios. All were created with an on-axis fill light and a main light fitted with a 16" parabolic reflector with barn doors. This particular main-light source produces a fairly distinct shadow edge. If you use a larger lighting modifier, such as an umbrella or soft-box, expect your shadow transitions to be more gradual for similar ratios. These images were produced at approximately the same contrast/gamma; your images shot at the same ratios may exhibit more or less contrast.



Main & fill equal strength (2:1)

Main twice strength of fill (3:1)

Main four times strength of fill (5:1)

Main eight times strength of fill (9:1)

The following table shows lighting ratio calculations for a hypothetical lighting example where the fill light is set to a fixed strength (f4 as measured by the flash meter) and the main light's strength is adjusted incrementally (f4, f5.6, f8, f11 and f16). Keep in mind that each f-stop increase in the light meter reading is equivalent to a doubling of the light's intensity.

Fill f-stop	Main f-stop	Fill Light Units	Main Light Units	Fill + Main Units	Lighting Ratio
f 4	f 4	1	1	2	2:1
f 4	f 5.6	1	2	3	3:1
f 4	f 8.0	1	4	5	5:1
f 4	f 11	1	8	9	9:1
f 4	f 16	1	16	17	17:1

Other Sources of Shadow Illumination

When selecting your fill-light strength, you may have to keep in mind several common factors that affect the final density of your shadow areas. Some of these factors are:

- Stray Light - Small studios with light-coloured walls can reflect about a significant amount of light and may require a reduction in fill-source strength. Large dark spaces may require more fill.
- Clothing Choices - Light-toned clothing can reflect a lot of light, reducing the amount of fill needed.
- Lighting Modifiers - Large soft sources create gradual shadow transitions and, depending on placement, often wrap a sizeable portion of light into the shadow areas. You may want to use less fill lighting with these sources. Smaller, harder sources produce distinct shadow edges and wrap little light into the shadow areas, often necessitating an increase in fill lighting. Additionally, because of their broad coverage, large sources often contribute more to stray light than most smaller sources.
- Diffusion - All diffusion filters reduce overall image contrast and bend some light from the highlights into the shadows. Black-dot and black-netting diffusers, which rely primarily on diffraction for diffusion, appear to cause the least amount of shadow lightening. Other filter types can have a significant effect on shadow density.