



Figure 1.5 Enlarged cross section of a piece of film (not drawn to scale).

of silver halide crystals suspended in a gelatin substance. Exposure to light causes a chemical change in the silver halide crystals and forms what is called a *latent image*, meaning an image that is not yet visible. When the film is developed and processed at the laboratory, it is exposed to various chemicals, forming a visible image. The emulsion layer of a piece of color film is made up of many layers so that it can record all of the colors in the scene. These layers include filters and separate layers that are sensitive to one of the three primary colors of light. Figure 1.6 shows the many layers that make up the emulsion layer of color motion picture film stock.



Figure 1.6 The various emulsion layers of color motion picture film.

## Base

The *base* is the flexible, transparent support for the emulsion. In the early days of filmmaking, it was made up of highly flammable cellulose nitrate. Not only is nitrate highly flammable, but it can decompose over time to a flammable gas, which increases the chances of it bursting into flames. When Kodak first introduced 16mm film in 1923, it was the first film to use the cellulose acetate base instead of nitrate. Around 1952 Eastman Kodak began manufacturing all motion picture film with the more stable cellulose acetate base, which is still used today. Prior to that time almost all major motion pictures were shot using nitrate-based film. The cellulose acetate base is much more

durable and long lasting. The base does not play a part in forming the image on the film but acts only as a support for the emulsion.

## Anti-halation Backing

The *anti-halation backing* is the dark coating applied to the back of the base. It is there to prevent light from passing through the film, reflecting off of the pressure plate, and then passing through the film again, causing a flare or flash in the image or a double exposure.

## TYPES OF FILM

Two main types of film are available for shooting: negative and reversal.

### Negative Film

*Negative film* produces a negative image when it is developed, in which blacks are white, whites are black, and each color is its opposite or complementary color. A positive print must be made from the negative so that you have something that is suitable for projection and viewing. It is very common to directly transfer the negative to videotape for editing purposes. During the transfer process, the colors are switched back to their positive image electronically. One of the primary advantages of using negative film is the ability to make any exposure corrections during the laboratory printing process. Negative film is also better suited to making a large number of copies, as is done for feature films that are being shown in many different theaters at once. For all professional cinematography, negative film is most commonly used.

### Reversal Film

*Reversal film* produces a positive image when it is developed, and the camera original can be projected without making a print. A good example of reversal film is Super 8mm home movie film or slide film. It is possible to make a print from reversal, but it is not as well suited as negative film for making multiple copies.

### Single Perf or Double Perf

16mm film may be classified as either single perf or double perf. Single-perf film indicates that there are perforations along one edge