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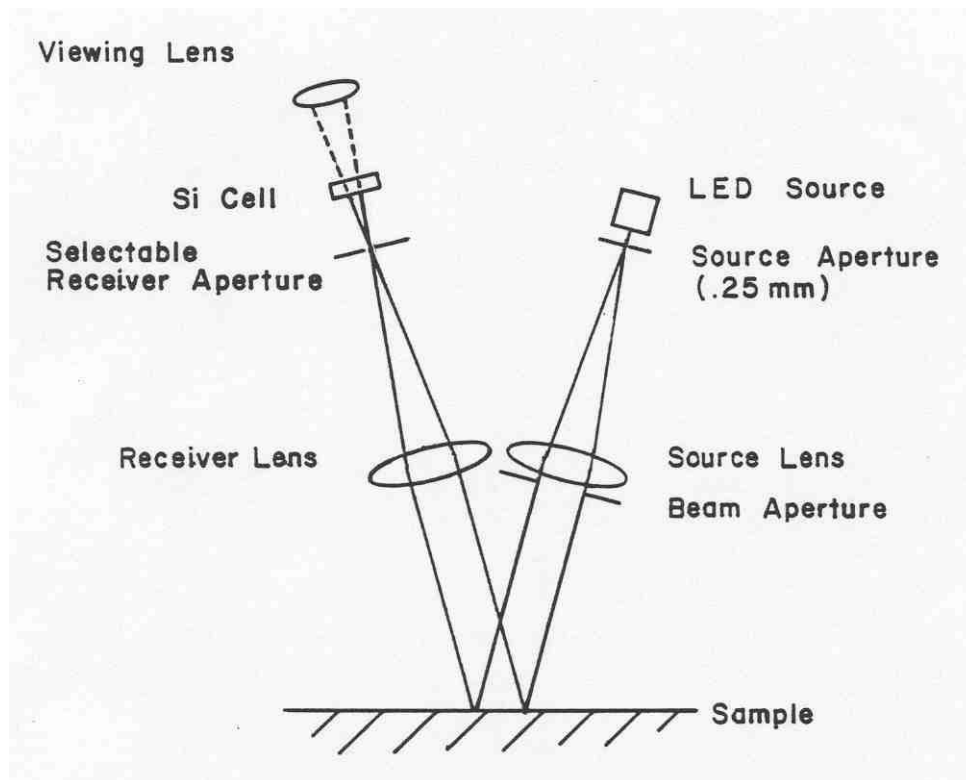
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D&S Technical Note 10-1

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Checking Alignment of the Reflectance Standard for the 15R Specular Reflectometer

The model 15R Specular Reflectometer utilizes an optical configuration as shown below. A pinhole LED source is collimated into a beam that is reflected from the test mirror and then focused through an aperture for measurement.



To make a reflectance measurement it is necessary to adjust the alignment of the instrument so that the focused image of the source passes completely (or most completely) through the receiving aperture. The reflectance standard for the instrument attaches to the base and is factory adjusted to a fixed orientation so that the reflected image should appear near the center of the aperture. For proper calibration of the instrument the alignment of the reflectance standard must remain accurate. This technical note describes a simple method of checking the alignment.

With the viewing port that is available on the 15R reflectometer it is easy to verify that the reflected image from the standard mirror is passing cleanly through the aperture. Just by viewing the image it is possible to see that the circular dot of light is not being clipped by the edge of the aperture. However, it is usually not possible to see the circular aperture to ensure that the image is roughly centered. The LED source is bright enough so that all that can be seen is a bright dot on a black background. There is not enough scattering from the reflectance standard mirror to illuminate the area around the source dot so that the edge of the aperture is delineated.

In order to see the aperture edge, some scattering can be introduced by laying a small piece of lens tissue over the mirror.



The tissue scatters light to provide illumination of the aperture edge and reduces the intensity of the source image. The reflected image with the tissue in place appears as shown below.



Note that the image of the source pinhole need not be perfectly centered in each aperture. Due to mechanical limitations the image will possibly be off center in each aperture and not off in the same direction.