Understanding Ortho vs. UV Response Selection

Many times has a confused look crossed the face of the owner a new X-Rite 361T densitometer when choosing between the Orthochromatic and Ultraviolet response. To most of us using such an instrument to control our film process, these two terms hold little to no meaning.

What is a Response?

The response of a transmission densitometer refers to the wavelength of light that it can detect. The densitometer compares the amount of light it shines through the film to the amount of light it collects on the other side of the film. From this information it gives you a Density or Dot Area number. However due to the nature of light sources such as the one used in transmission densitometers, only certain portions of the light passing through the film must be sampled. By limiting the type of light that the densitometer can "see", the densitometer can measure with extreme accuracy and repeatability. The Ortho and UV responses are therefore ways of allowing the densitometer to see different portions of the light that pass through the film you are measuring.

Which response do I use?

In most cases the answer to the above question will be the **ortho response**. The Orthochromatic response looks at a wide band of wavelengths across the visible spectrum. This response looks at almost all the visible light passing through the film except the red light. This is why we use the name orthochromatic. (similar to why we call red light safe film orthochromatic) The orthochromatic response is generally used for all silver halide type graphic arts film.

The UV response only looks at light passing through the film in the Ultraviolet portion of the spectrum, thus named the UV response. This response is used for special non- metallic based films which may appear to be transparent or translucent to the visual eye but in actuality have the ability to block UV light. Films of these type are often used for exposing items not common to he graphic arts industry. One such film, diazo, is used to expose electronic circuit boards. While some of these films may not have much density variation apparent to the eye, a densitometer using the UV response can detect dramatic density changes in the UV portion of the spectrum.

X-Rite World Headquarters
(616) 534-7663 Fax (616) 534-8960
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Why all the Confusion?

Most of the confusion surrounding the use of Ortho response versus UV response comes from the term Orthochromatic. Most of us who work with film know that there are two main types of graphic art film sensitivity. These two types are called Orthochromatic and Panchromatic. Orthochromatic film is sensitive to all colors of light except red light. Panchromatic film is sensitive to all colors of light. This is where some confusion arises.

The Orthochromatic density response selection does not refer to reading orthochromatic sensitive film. The response simply points to the portion of the spectrum that the densitometer "sees." The orthochromatic response is actually used to measure almost all the types of film encountered in the graphic arts process. The UV response is only used for special films that are rare to graphic arts.

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