# Light Transmission Information

Light transmission is the percentage of incident light that passes through a film. ExxonMobil generally evaluates this property for OPPalyte films.

**Relevance to performance**

This property is significant to the performance of opaque films like OPPalyte. Customers expect these products to obstruct light transmission in a predictable way, which is important for the appearance of printed graphics and protecting light-sensitive packaged products. OPPalyte film light transmission values range from 15% to 50%, depending on the product design and film thickness.

NOTE: *Metallized films are very effective at blocking light transmission, but the preferred test for these films is optical density.*

**What affects light transmission**

In OPPalyte films, light transmission is determined mostly by pigment and cavitation characteristics, which are controlled by proprietary resin formulations and film-making process conditions.

Since light transmission is usually a critical property for white opaque films, it is measured regularly. Product will be rejected if values are outside the specified tolerance limits.

**Test principles**

A unidirectional perpendicular light beam is directed onto the film specimen, and a photo detector measures the total light transmitted by the specimen after it enters an integrating sphere. Commercial hazemeters are typically used for this testing, but ASTM D 1003 also allows for the use of a spectrophotometer, provided that it meets the procedure requirements.

ExxonMobil uses the BYK-Gardner XL-211 haze-gard and haze-gard plus hazemeters consistent with ASTM guidelines.

The hazemeter when set up to measure light transmission will display the final result as a percentage to the nearest tenth.

$$\text{Light Transmission (\%)} = \frac{\text{Total light transmitted by specimen}}{\text{Incident light}} \times 100$$

The same test equipment with a different setup is also used to measure and display haze.

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**Related terminology**

Luminous transmission: Luminous transmittance refers to the same thing as light transmission. It is a more technical name used in the ASTM D 1003 test procedure title.

Haze: Haze is the scattering of light by a specimen, which results in a cloudy appearance or poorer clarity of objects when viewed through the film.

Translucent: Translucent is an attribute used to describe material that transmits light, but also diffuses it so that objects cannot be seen clearly.

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