

O.D. is a unitless ratio of light incident compared to the light exiting a material



Optical Density, OD, is a ratio of light energy entering the filter vs. exiting the filter. To Calculate Transmission from Optical density, use the following equation: T=1/10



## HOW TO CALCULATE OPTICAL DENSITY ?

O.D. is a unitless ratio of light incident compared to the light exiting a material

$$T = \frac{\Phi_e^t}{\Phi_e^i},$$
  

$$O.D. = \log_{10} \left( \frac{\Phi_e^i}{\Phi_e^t} \right) \qquad \text{then } O.D. = -\log_{10}(T),$$
  
and  $T = 10^{-O.D.}$  or  

$$T = \frac{1}{10^{O.D.}}$$

Phi i.e => radiant flux, incident into the material & Phi t.e => radiant flux exiting the material

Ex : Neutral density filters are commonly specified by OD and transmittance : OD1 = 10% Transmission ; OD2 = 1% Transmission OD3 = 0.1% Transmission ; OD4 = 0.001% Transmission

