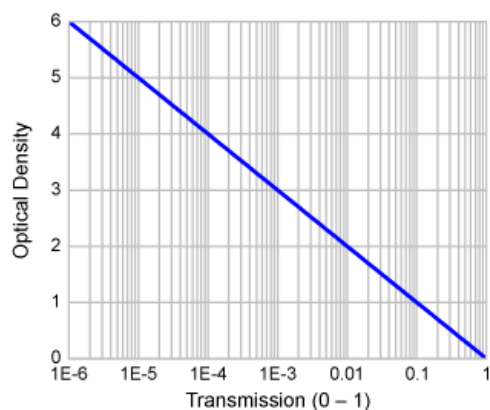




**Technical Information:**  
**Working with Optical Density**

Optical Density – or OD, as it is commonly called – is a convenient tool to describe the transmission of light through a highly blocking optical filter (when the transmission is extremely small). OD is simply defined as the negative of the logarithm (base 10) of the transmission, where the transmission varies between 0 and 1 ( $OD = -\log_{10}(T)$ ). Therefore, the transmission is simply 10 raised to the power of minus the OD ( $T = 10^{-OD}$ ). The graph below left demonstrates the power of OD: a variation in transmission of six orders of magnitude (1,000,000 times) is described very simply by OD values ranging between 0 and 6. The table of examples below middle, and the list of "rules" below right, provide some handy tips for quickly converting between OD and transmission. Multiplying and dividing the transmission by two and ten is equivalent to subtracting and adding 0.3 and 1 in OD, respectively.



Transmission	OD
1	0
0.5	0.3
0.2	0.7
0.1	1
0.05	1.3
0.02	1.7
0.01	2
0.005	2.3
0.002	2.7
0.001	3

- The "1" Rule**  
 $T - 1 \rightarrow OD - 0$
- The "x2" Rule**  
 $T \times 2 \rightarrow OD - 0.3$
- The "÷2" Rule**  
 $T \div 2 \rightarrow OD + 0.3$
- The "x 10" Rule**  
 $T \times 10 \rightarrow OD - 1$
- The "÷ 10" Rule**  
 $T : 10 > OD | 1$