



BUBBLE QUALITY

Bubbles or inclusions usually develop during the manufacturing process of optical materials. This flaw might cause light scattering and a loss of transmission due to absorption. In most common optical systems, inclusions do not create significant problems. But, for some systems, the presence and size of bubbles can be critical.

The present system for specifying bubbles is size (diameter) of the bubble per cross section of glass with a maximum size restriction. While it is standard in the optics industry not to count any bubble <0.05 mm, note that certain applications are more stringent about bubbles.

INDEX TOLERANCE

Each specific glass manufacturer publishes a listing of the index number for the glasses that they manufacture. Designers frequently place tolerances on these values to insure that the components meet their system specification. The standard value for index is measured at 587.56 nm(nd). The standard Abbe V_d value (dispersion value) is calculated by the following formula:

$$\begin{aligned} \text{Example BK-7 (516.642)} \quad N_d &= 1.51680 (587.6\lambda) \\ N_f &= 1.52238 (486.1\lambda) \\ N_c &= 1.51432 (656.3\lambda) \end{aligned}$$

$$V_d = \frac{N_d - 1}{N_f - N_c} = \frac{N_d (1.51680) - 1}{N_f (1.52238) - N_c (1.51432)} = 64.17$$

Thus, 516 refers to N_d
642 refers to V_d
BK-7 (517.642)