

## A10ACHRTWOS

**Achromatic doublet. Calculation of separation of lenses for no chromatic aberration.**

**1. We assume that the refractive indices of two material for a chosen wavelength interval are**

$$\begin{array}{ll} n1B := 1.7 & n2B := 1.525 \\ n1R := 1.66 & n2R := 1.475 \\ n1D := 1.72 & n2D := 1.500 \end{array}$$

The corresponding values of V1 and V2 are

$$V1 := \frac{n1B - n1R}{n1D - 1} \quad V1 = 0.056 \quad V2 := \frac{n2B - n2R}{n2D - 1} \quad V2 = 0.1$$

**2. The lenses are made of different materials and have the radii of curvature**

$$\begin{array}{ll} r1 := 10 & r2 := -10 \\ rr1 := 12 & rr2 := -12 \end{array}$$
$$f1 := \frac{1}{(n1D - 1) \cdot \left( \frac{1}{r1} - \frac{1}{r2} \right)} \quad f2 := \frac{1}{(n2D - 1) \cdot \left( \frac{1}{rr1} - \frac{1}{rr2} \right)}$$

**3. Distance t for no chromatic aberration**

$$t := \frac{(V1 \cdot f2 + V2 \cdot f1)}{V1 + V2}$$
$$t = 8.75$$