

A9ACROMS**Achromatic doublet with $t = 0$**

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

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

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. We chose $f1$ by choosing $r1$ and $r2$

$$r1 := 20 \quad r2 := -30$$

$$f1 := \frac{1}{(n1D - 1) \cdot \left(\frac{1}{r1} - \frac{1}{r2} \right)} \quad f1 = 16.667$$

3. Calculation of $f2$ and f for no chromatic aberration.

$$f2 := -f1 \cdot \frac{V2}{V1} \quad f2 = -30$$

$$f := \frac{1}{\frac{1}{f1} + \frac{1}{f2}} \quad f = 37.5$$