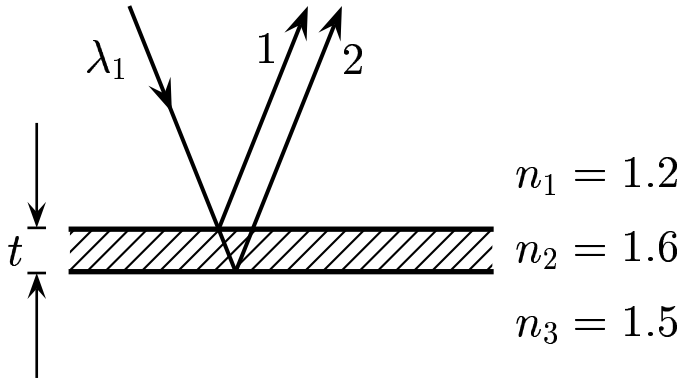
The incident ray is essentially perpendicular to the surface.



Based on $\phi_{path} = 2\,k_2\,t$, find the smallest thickness for a maximum.

A) $t = \dfrac{n_1\,\lambda_1}{4\,n_2}$.

B) $t = \dfrac{n_1\,\lambda_1}{2\,n_2}$.

C) $t = \dfrac{n_1\,\lambda_1}{n_2}$.

D) $t = \dfrac{n_1\,\lambda_1}{3\,n_2}$.

the wavelength in vacuum is $\lambda = n_1\,\lambda_1 = n_2\,\lambda_2$. So $\lambda_2 = \dfrac{n_1\,\lambda_1}{n_2}$. For the present case, $\phi_{refl} = \pi$. The maxima occur at $\phi_{path} = -\pi,\ \pi,\ 3\,\pi,\ \cdots =$ $2\,t \times \dfrac{2\,\pi}{\lambda_2}$. For the smallest thickness, $\phi_{path} = \pi$. So $t = \dfrac{\lambda_2}{4} = \dfrac{n_1\,\lambda_1}{4\,n_2}$.

Answer **A**.

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