

Chap 37: Interference

Example 1: In a double slit experiment the slits are illuminated by 650 nm light. If the third bright fringe is 4 cm from the screen's center, what is the slit separation distance? The screen is 2 m from the slits.

Example 2: 700 nm light passes through two slits that are separated by 1 mm. The light then falls on a screen 3 m from the slits. How far from the central maximum is the first minimum?

Example 3: 425 nm light passes through two slits separated by 0.07 mm. The light then falls on a screen that is 2.5 m from the slits. How far from the first minimum is the second minimum?

Example 4: A material with $n = 1.3$ is used to coat a piece of glass ($n = 1.5$). What is the minimum thickness of the coating if 650 nm light is to have minimum reflection?

Example 5: A thin layer of oil ($n = 1.2$) lies on top of water ($n = 1.3$). What is the minimum thickness of the oil if green light (500 nm) is strongly reflected?

Example 6: A thin layer of oil ($n = 1.2$) lies on top of water ($n = 1.3$). What is the minimum thickness of the oil if green light (500 nm) is strongly transmitted?

Example 7: A thin layer of polymer ($n = 1.7$) lies on top of glass ($n = 1.5$). What is the minimum thickness of the polymer if 550 nm light is weakly reflected?

Example 8: A 280 nm thick layer of oil ($n = 1.45$) lies on top of water ($n = 1.33$). What wavelength or wavelengths are strongly reflected?