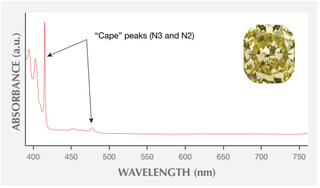
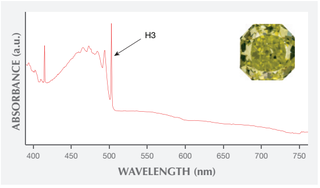
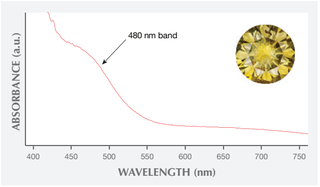
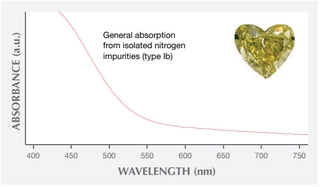
Causes of Diamond Coloration

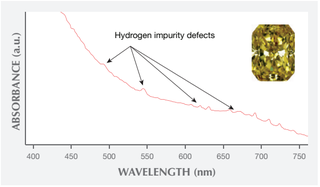
Yellow



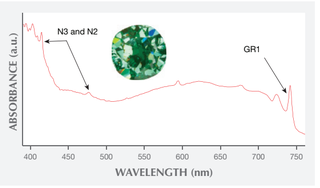


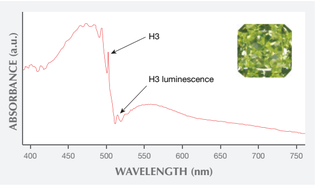


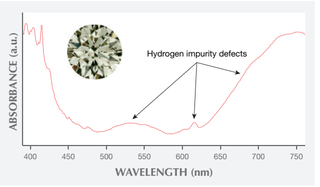


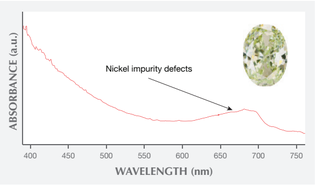


Green

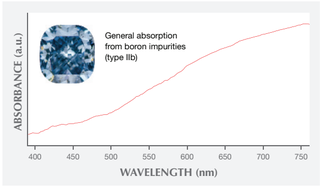


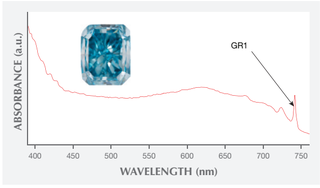


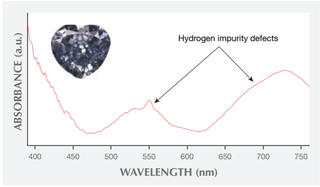


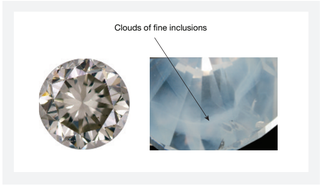


Blue/Gray/Violet

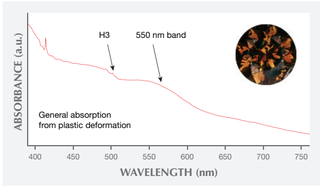


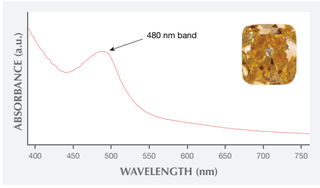


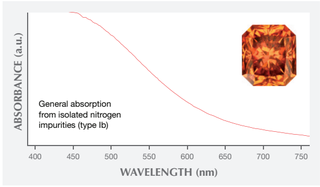


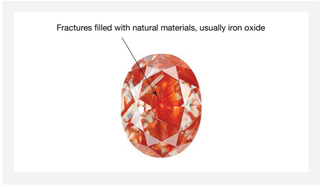


Orange/Brown





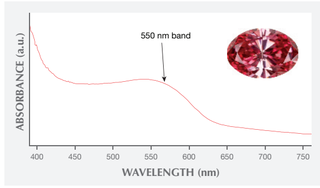


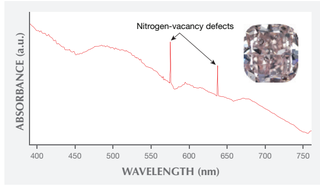


In most cases, transparent gemstones such as diamond owe their coloration to selective absorption of light. With a yellow diamond, the blue portions of the incident white light are absorbed by the diamond, while the remaining portions are transmitted in combination to the eye and interpreted by our vision system as a yellow color. A gemologist uses a spectroscope to detect this selective absorption—the instrument separates light into its component colors, and the portions of the spectrum that are absorbed as they pass through the gemstone appear as dark lines or bands at particular wavelength locations. An alternative method involves recording the absorption with a spectrophotometer, and then depicting the spectrum as a line on a graph. The peaks on the graph correspond to the dark lines or bands seen with the spectroscope.

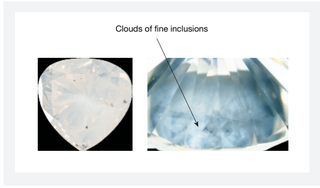
This chart illustrates representative visible spectra and photos of the major color categories of diamond. The graphs are grouped in six columns and ranked in descending order of occurrence. These colored diamonds were selected because their spectra (and colors) are principally the result of one main lattice defect (a disruption of the atomic structure that causes selective light absorption by the diamond).

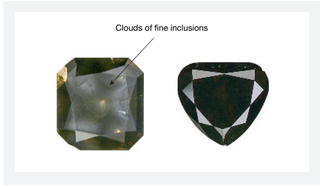
Red/Pink/Purple



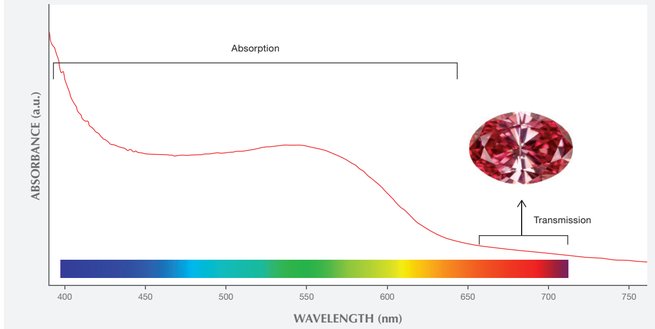


Other Colors





Example Visible Absorption Spectrum



This chart was published in conjunction with J.E. Shigley and C.M. Breeding, "Visible Absorption Spectra of Colored Diamonds," *Gems & Gemology*, Vol. 51, No. 1, pp. 41-43.