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## About LCD display pixel anomalies

This document defines the term "pixel anomaly", explains why such anomalies occur, and describes what to do if you feel your active matrix LCD panel has more than an acceptable number of pixel anomalies.

Many Apple products use active-matrix LCD panels, including the iMac (Flat Panel), iBook, recent PowerBook computers, and Apple Cinema displays. In addition to being slim and light, active-matrix LCD technology provides customers with many visual performance advantages when compared to traditional cathode-ray tube- (CRT) based displays, such as increased brightness, sharpness, and contrast ratio.

Active-matrix LCD technology uses rows and columns of addressable locations (pixels) that render text and images on screen. Each pixel location has three separate subpixels (red, green and blue) that allow the image to be rendered in full color. Each subpixel has a corresponding transistor responsible for turning the subpixel on or off.

There are typically millions of these subpixels on an LCD display. For example, the LCD panel used in the Apple Cinema HD display is made up of 2.3 million pixels and 6.9 million red, green, and blue subpixels. Occasionally, a transistor does not work perfectly, which may result in the affected subpixel being turned on (bright) or turned off (dark). With the millions of subpixels on a display, it is quite possible to have a low number of faulty transistors on an LCD. Therefore, a certain number of subpixel anomalies is considered acceptable. Rejecting all but perfect LCD panels would significantly increase the retail price for products using LCD displays. These factors apply to all manufacturers using LCD technology--not just Apple products.

If you suspect your display contains a high number of pixel anomalies, take your Apple product to an Apple Authorized Service Provider for closer examination. There may be a charge for the evaluation.

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