

ISO 13406-2 guidelines for pixel defects

Introduction

LCD displays are made up of a set number of pixels and each pixel is made from 3 sub-pixels; one Red, one Blue and one Green. Every sub-pixel is addressed by its own transistor and so the manufacture of a glass substrate is very complex. Due to the nature of the manufacturing process, occasional defects can occur. Pixel defects or failures cannot be fixed or repaired and can happen at any stage in the LCD's life.

To regulate the acceptability of defects and to protect the end user, ISO have created a standard for manufacturers to follow. ISO 13406-2 recommends how many defaults are acceptable in a display before it should be replaced, within the terms & conditions of warranty.

All reputable manufacturers conform to and support the ISO 13406-2 standard.

Pixel defaults

The table below shows the allowable number of malfunctioning **pixels** that are acceptable, depending on the native resolution of the LCD and allowing for 2 malfunctioning **pixels** per million **pixels**.

Native Resolution	No. of Pixels	No. of Million Pixels	Allowable Defects
1024 x 768	786,432	0.79	2
1280 x 1024	1,310,720	1.31	3
1600 x 1200	1,920,000	1.92	4
2048 x 1536	3,145,728	3.15	6

The table below shows the allowable number of malfunctioning **sub-pixels** that are acceptable, depending on the native resolution of the LCD and allowing for 5 malfunctioning **sub-pixels** per million **pixels**.

Native Resolution	No. of Pixels	No. of Million Pixels	Allowable Defects
1024 x 768	786,432	0.79	4
1280 x 1024	1,310,720	1.31	7
1600 x 1200	1,920,000	1.92	10
2048 x 1536	3,145,728	3.15	16

The table below shows the allowable number of malfunctioning **sub-pixels** that are acceptable within a 5 x 5 block of **pixels**, depending on the native resolution and allowing for 2 malfunctioning **sub-pixels** within a 5 x 5 block, per million **pixels**.

Native Resolution	No. of Pixels	No. of Million Pixels	Allowable Sub-pixel Defects Within 5 x 5 Block
1024 x 768	786,432	0.79	2
1280 x 1024	1,310,720	1.31	3
1600 x 1200	1,920,000	1.92	4
2048 x 1536	3,145,728	3.15	6

The above is relevant to Class II LCD panels.

