	ISO 13406-2	Guidelines for LCD Pixel defects
	LCD Pixel defect	Marine & industrial monitor

## ISO 13406-2 Guidelines for LCD Pixel defects.

### Introduction.

TFT 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. Therefore the manufacturing of glass substrate is a very complex case.

Due to the nature of the manufacturing process, occasional defects can occur. Pixel defects or failures can not be fixed or repaired and can happen at any stage in the TFT's life time.

To regulate the acceptability of defects and protect the end user, ISIC A/S follow the ISO 13406-2 standard. This standard recommends how many defaults are acceptable in a display, before it should be replaced, within the terms and conditions of warranty.

### Monitor Classification.

ISIC A/S delivers TFT Monitors in accordance to ISO 13406-2 Class II.  
Special agreements can be made between ISIC A/S and customer.

#### ISO 13406-2

Allowed pixel defects per type per million pixels			
Pixel defect	Type 1	Type 2	Type 3
Class: I	0	0	0
Class: II	2	2	5
Allowed Cluster defects per million pixels			
Cluster defect	Type 1	Type 2	Type 3
Class: I	0	0	0
Class: II	0	0	2

### Measure method/control conditions for pixel defects.

In observance to the ISO 13406-2 standard, the following conditions are granted:

- Final control for pixel fault done right after Burn-in, i.e. pre-heating of display.
- Surrounding temperature = 25 gr. C +/- 5 gr. C
- Relative air humidity 40-70 %
- Dark room test.

### Pixel definition:

Every pixel consist of three Sub-pixel (red, blue, green)

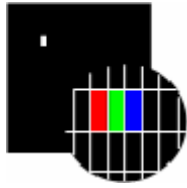
Every Sub-pixel has its own transistor.

All three Sub-pixels must be seen as one unit.

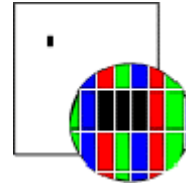


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**PIXEL:**



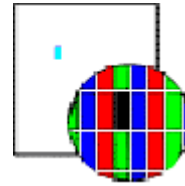
**Pixel defect type 1:** Pixel constant lightning



**Pixel defect type 2:** Pixel constant dark



**Pixel defect type 3a:**  
Sub-pixel (red, blue, green) constant lightning



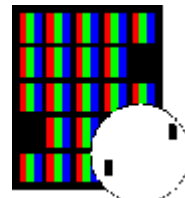
**Pixel defect type 3b:**  
Sub-pixel (red, blue, green) constant dark

**CLUSTER:**

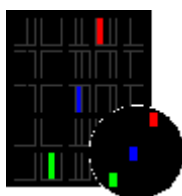
A cluster consists of 5 x 5 pixels.



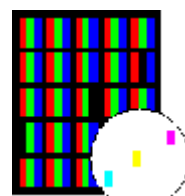
**Cluster Pixel defect Type 1:**  
Pixels in a cluster area, constant lightning



**Cluster Pixel defect type 2:**  
Pixels in a cluster area, constant dark



**Cluster Pixel defect Type 3a:**  
Sub-pixels in a Cluster area, constant lightning



**Cluster Pixel defect Type 3b:**  
Sub-pixels in a Cluster area, constant dark

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