

# Recommendations for measurement of luminance distribution according to DIN 6868-57

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# SOLUTIONS display

- Testpattern
- Measuring method



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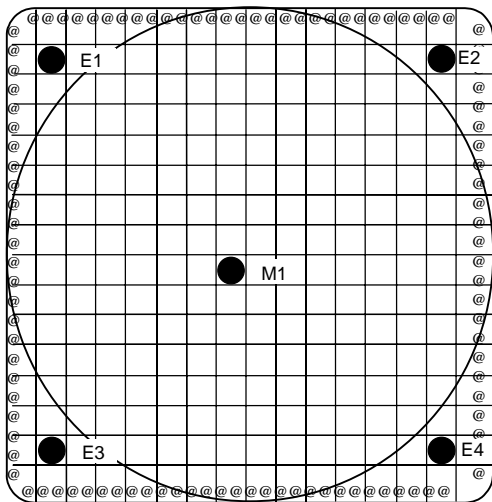
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## 1 Test patterns

DIN 6868-57 permits the use of two different test patterns to measure the luminance Distribution. Either the SMPTE or the DIN test pattern can be used. The DIN test pattern is better in principle for the measurements, but is not available in all medical imaging equipment. The SMPTE test pattern is more widely, available in medical imaging equipment, and has therefore also been approved. Unfortunately the locations of the test points for the two patterns are not arranged at the same positions on the monitor.

**Note:** DIN 6868-57 does not require that the luminance distribution meets the standard with both test patterns. It is sufficient to satisfy the requirements either with the DIN test pattern or with the SMPTE test pattern.

### 1.1 DIN test pattern



#### 1.1.1 Advantages

The measured fields are arranged symmetrically on the screen. The test pattern has a homogenous gray area, therefore scattered light from adjacent fields will not impact the testing. This test pattern is used by the monitor manufacturers during the production process to determine DIN conformity. The results of the manufacturer's test can therefore only be repeated with this pattern. When measured by the manufacturer, a fixture is used so that the sensor directly contacts the screen. This assures that the measurements are directly perpendicular to the screen. It is very difficult to guarantee a perpendicular measurement when measuring at a distance.

#### 1.1.2 Disadvantages

This pattern is not available with all modalities.



## **2.1 Direct contact measurements with shadow mask**

### **2.1.1 Advantages**

The influence of ambient light on the luminance distribution is eliminated. The sensor can be positioned exactly on the measured fields. The angle of the sensor on the monitor can only vary slightly.

Therefore measurement of the luminance distribution is more reproducible with this method, thus facilitating the consistency test.

The direct contact measurement means that only the monitor properties are considered. Only these properties can be guaranteed by manufacturers since they have no influence on the location in which the unit is used.

### **2.1.2 Disadvantages**

Ambient lighting is superimposed on the image during use. If the ambient lighting is not taken into consideration in the measurement, negative influences on the image resulting from light sources acting at specific points on the monitor are not detected.

### **2.1.3 Recommendation**

Despite this disadvantage, we recommend the direct contact measurement for the luminance distribution (see above). Only with this method can the monitor property guaranteed by the manufacturer with respect to luminance distribution be verified. Light sources which generate reflections on the monitor should always be avoided anyway.

## **2.2 Distance measurement**

### **2.2.1 Advantages**

The influence of ambient light on the luminance distribution is taken into account in the measurement.

### **2.2.2 Disadvantages**

The measurement is difficult to reproduce because of the influence of ambient light, the dependence of the measurement on the angle used, and the strong influence of scattered light.

### **2.2.3 Recommendation**

With the distance measurement, the result is dependent on a large number of factors. We therefore recommend that you do not measure the luminance distribution by means of a distance measurement.