Important target characteristics are the size and luminance contrast of the target and the colour difference between the target and the immediate background. All three factors interact. For example, the visual acuity for a low luminance contrast, achromatic target will be much larger than for a high luminance contrast, achromatic target when expressed as minutes of arc but will be reduced if there is a colour difference between the target and the background.

As for the effect of the background against which the target appears, the important factors are the area, luminance and colour of the background. As a general rule, the larger the area around the target that is of a similar luminance to the target and neutral in colour, the smaller will be the threshold measure.

2.7 Colour Threshold

Figure 18 shows the MacAdam ellipses, ten times enlarged, plotted in the CIE chromaticity diagram. Each ellipse represents the standard deviation in the chromaticity coordinates for colour matches made between the two parts of a 2–degree bipartite field with the reference field having the chromaticity of the centre point of the ellipse. The lighting industry uses four-step MacAdam ellipses as its tolerance limits for quality control in lamp manufacture.

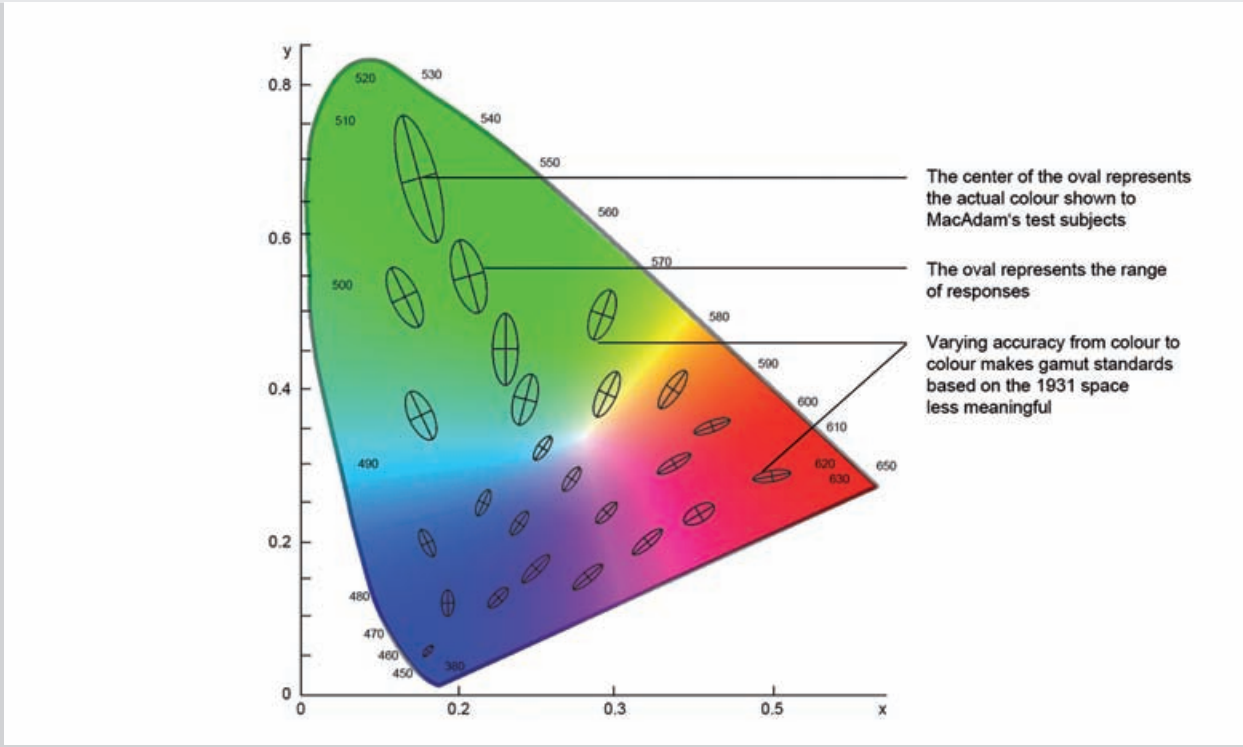

Figure 18
The CIE 1931 chromaticity diagram with the MacAdam Ellipses displayed, multiplied by ten times.