Static vs. Dynamic Contrast Ratio
Static contrast ratio

The “static contrast” describes the contrast ratio of the luminance of the brightest color (white) to that of the darkest color (black) at a fixed display setting, i.e. without any modification of the parameters during the measurements but merely a switch of the video content from full white to complete black.

Due to the characteristics of the technology, projection systems based on a single DLP chip come with a “static contrast” of 1,000:1 to 2,000:1.

Dynamic contrast ratio

In contrast to the static contrast ratio there is the “dynamic contrast”.

Due to its measuring methods it results in much higher values than the “static contrast” and is therefore preferred by manufacturer of consumer LCDs.

The measurement of the dynamic contrast is based on modification and individual settings for each color, the brightest (white) and the darkest (black). I.e. for white all display parameters are set to maximum whilst they are reduced to minimum for black.

Significance for video walls

Transferred to LED-based systems, that means that you turn the LEDs to full peak for white and dim them down as much as possible for black. The result is a very high contrast ratio that fits perfectly in any brochure.

Manufacturers of consumer LCD utilize this principle by applying some electronics that measures and defines the average brightness of each provides frame and adjust the brightness of the LED or backlight accordingly. This feature works pretty well if you simply watch an action movie from DVD (and if you don’t have a too close look) but can lead to a “pumping” image because of the steadily changing brightness.

But it is a totally different story when it comes to video wall applications where a picture is displayed over multiple screens.
It isn’t hard to imagine what happens. Each image has brighter and darker areas. If you split this picture into portions because you’re going to feed each into a separate displays (video wall), each portion has a different average brightness. Now, if each display adjusts the brightness accordingly to its individual average brightness level without taking the other LCDs/portions into consideration, the result is everything but homogenous.

For TV/Broadcast studios it’s even worse because such adjustment means don’t feature colour fidelity.

Infinity contrast
If you switch the LED / backlight off for the measurement if black, you reach a contrast ratio of \( \infty : 1 \).

**Brightness**

The measure of luminous flux (luminous flux unit= ANSI LUMEN) doesn’t exist for rear projection cubes but only for the integrated projectors. The eyevis LED projectors used in the cubes come with 600-800 ANSI Lumen.

The brightness of a rear projection cube is stated in luminance (luminance unit cd/m²). This value depends on one hand of course on the luminous intensity of the used projectors but on the other hand also on the size and kind of the projection screen.

Given an equal luminous flux of the projector, the luminance of the cube decreases the more the size of the projections screen increases. Furthermore a BlackBead screen (BB) provides less luminance than a CrossPrism screen (CP) of the same size, because the BB screen scatters the light in a wider angle (=better viewing angle).

Therefore for rear projection cubes the luminous flux of the projector doesn’t mean much and is hence of no real relevance. The achieved luminance on the screen is of much more significance.
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