How important is contrast ratio in business and home theater projectors?

Contrast ratio is a specification that customers ask about when buying a projector. And contrast ratio is important for a projector's perceived image quality. However, if the customer is buying for a dedicated home theater, the contrast ratio needs are very different than if the customer is buying a projector for business or school.

"With this much light in a room, there is no difference between 500:1 and 10000:1 contrast ratio!"[2]

Did You Know?

Many customers believe that the higher the contrast ratio, the better the projected image. However, contrast ratio is influenced by many factors: ambient light, lamp brightness, and even the human eye! But the most important influence on contrast ratio is ambient light.

How is contrast ratio measured?

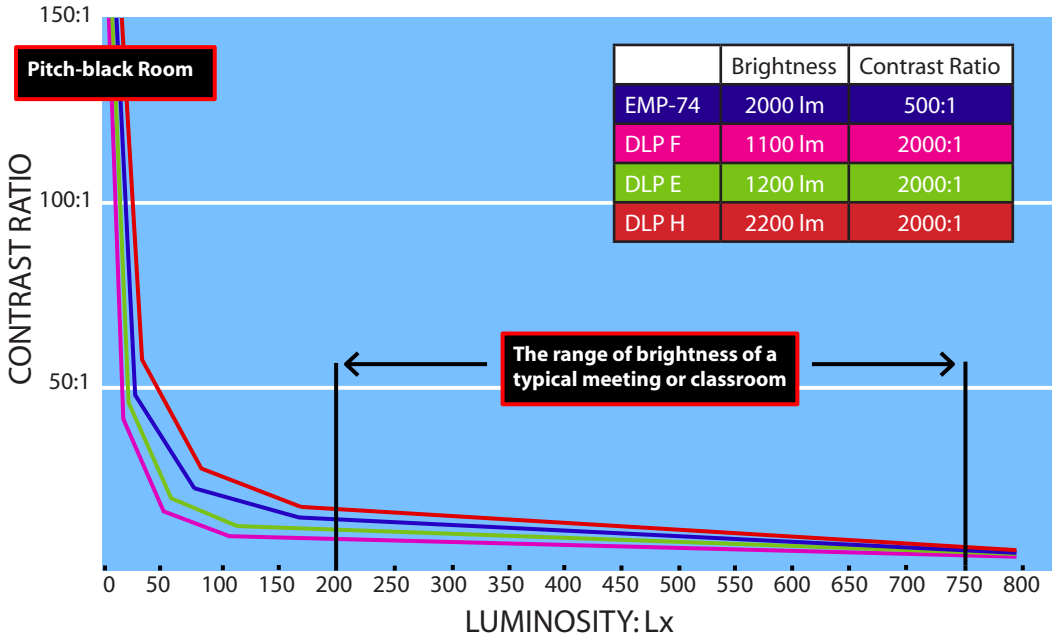
The projector contrast ratio specification, the ratio of white to black, is measured in total darkness "... with the light sensor directly in the beam. This creates a specification that will give you a good idea of how the projector will perform in a totally dark theater environment."[1] However, "some manufacturers of DLP projection displays and projectors, would carry out this contrast ratio measurement with the 'white segment' of the color wheel turned on. This would increase the measured figures for the white, hence inflating further the end result."[2]

Ambient Light

So, if a customer is buying a projector for a dedicated home theater, one with black walls and no windows, the contrast ratio is very important. But what happens when the projector is set up in a living room, a classroom, or a training room?

Because we look at a screen, instead of staring into the projector beam, the contrast ratio includes the ambient light reflected by the screen. "In a real world environment the darkest black that we can see is the screen ambient with the projector turned off."[1]

Take a look at the chart below which compares contrast ratios of four projectors. Notice how the projectors' contrast ratio is affected by the light of a typical meeting room or classroom, which moved the perceived contrast ratio for all four projectors to well below 50:1.



[1] "Projectors in Business & Education, a Lumita Labs Report—The Contrast Ratio of a Digital Projector in a Classroom or Business Environment is Irrelevant", Lumita Lab Report, October 2, 2007, Lumita Imaging & Color Science

[2] "The Contrast Ratio Game" Practical-Home-Theater-Guide.com