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### WE WANT IT RIGHT

Whether sitting down to watch a movie at home, or viewing high definition content at school or work, you want the picture to look good and look right. If you're watching "Frozen" with your kids and they like Elsa's blue gown, you want to be able to find a gown of that same blue in the store. And if color variations and other issues might affect a medical diagnosis via telemedicine, it becomes more important than ever to eliminate those variations.

You might think this is all obvious, and that flat panels, projectors, and screens show content as it was meant to be seen by its creators.

But it's not that straight forward.

The retina is the light-sensing structure of the eye. It contains two types of cells: rods and cones. Rods handle vision in low light and high resolution details. Cones handle color vision, including reds, greens, and blues. Cones are very sensitive to even the most minute color differentials, but our cones do not see high resolution or fine details. To trick those rods and cones into thinking an image is brighter, manufacturers have played with the color.

### Thus, was born the Imaging Science Foundation (ISF).

"We fool the eye that images are brighter with blue tints," said Joel Silver, ISF president and founder. "The problem is, if you accentuate the blue, that means you aren't getting the greens or reds you need to build a color-accurate image. We want to take whatever the artist created and bring it to the screen with fidelity."

To accomplish that goal the ISF does two things: the organization trains technicians to calibrate the color fidelity and light efficiency of AV equipment, and certifies display products for color reproduction and fidelity.

"We basically tie ourselves into something called a pure white matte screen – a screen that is a reference color," Silver said of testing projection screens for color performance. "Neutral white has no hint of tint to it. The picture you get is what was it was meant to look like from the factory without any tint."

To be certified by the ISF, a screen has to have a flat spectral response, known as color fidelity. In other words, the screen cannot affect the color of the image enough for the human eye to perceive.

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The original image is on the top. The bottom image shows the kind of color shift that may occur when high brightness projectors and screens are not calibrated for accurate image reproduction.



- Nine Draper viewing surfaces — in fact the entire exclusive TecVision® line — have been certified by the Imaging Science Foundation (ISF) for excellent color reproduction and fidelity. All TecVision® screens are 8K ready. These screens are also available with acoustically transparent perforated or nano perforated surfaces in limited sizes.



**TecVision XH700X Grey**

**Extra Wide Viewing Cone/ High Contrast/On-Axis Gain of 0.7**

XH700X Grey viewing surface performs best in moderate ambient light when optimal uniformity is desired, and wide viewing angles (blending and blending on screens with great curvature). Lens/Throw distance ratio for best brightness uniformity: no minimum.

**TecVision XH900X ALR**

**Wide Viewing Cone/High Contrast/On-Axis Gain of 0.9/ ALR: 60%**

XH900X ALR performs very well in spaces where there is moderate ambient light and wide viewing angles. Lens/Throw distance ratio for best brightness uniformity: 1.2:1 or longer.

**TecVision MS1000X ALR**

**Moderate Viewing Cone/Very High Contrast/On-Axis Gain of 1.0/ALR: 73%**

MS1000X ALR performs very well in spaces where there is moderate to high ambient light and moderate viewing angles. Lens/Throw distance ratio for best brightness uniformity: 1.4:1 or longer

**TecVision CS1200X ALR**

**Narrow Viewing Cone/Superior Contrast/On-Axis Gain of 1.2/ALR: 80%**

CS1200X ALR performs very well in spaces where there is high ambient light and narrow viewing angles. Lens/Throw distance ratio for best brightness uniformity: 1.7:1 or longer

**TecVision XT1000X White**

**Extra Wide Viewing Cone/Typical Contrast/On-Axis Gain of 1.0**

XT1000X White is best in controlled ambient light where optimal uniformity and wide viewing angles are required (screening rooms, home theater and blending applications). Lens/Throw distance ratio for best brightness uniformity: no minimum.

We call this 8K-ready surface a “reference” screen because it is extremely close to what Silver and the ISF use as a “reference” for testing.

**TecVision XT1100X White**

**Extra Wide Viewing Cone/Typical Contrast/On-Axis Gain of 1.1**

XT1100X White is recommended when projector brightness and screen size dictate the need for a modest increase in brightness. Lens/Throw distance ratio for best brightness uniformity: 1.0:1 or longer.

**TecVision XT1300X White**

**Extra Wide Viewing Cone/Typical Contrast/On-Axis Gain of 1.3**

XT1300X White performs best in controlled ambient light and projector brightness is slightly lower than desired. Lens/Throw distance ratio for best brightness uniformity: 1.2:1 or longer.

**TecVision XT1600X White**

**Extra Wide Viewing Cone/Typical Contrast/On-Axis Gain of 1.6**

XT1600X White performs best in controlled ambient light and projector brightness is moderately lower than desired. Lens/Throw distance ratio for best brightness uniformity: 1.5:1 or longer.

**TecVision XT1800X White**



**Extra Wide Viewing Cone/Typical Contrast/On-Axis Gain of 1.6**

XT1600X White performs best in controlled ambient light and projector brightness is moderately lower than desired. Lens/Throw distance ratio for best brightness uniformity: 1.5:1 or longer. XT1800X White is perfectly suited for active 3D or color combining passive 3D systems.

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### IMPRESSIVE

What impresses Silver most about Draper's ISF-certified surfaces is the ability of some of the surfaces to deal with ambient light, while preserving color fidelity.

"Finding the color fidelity of high gain materials close to that of no gain materials was wonderful!" Silver said. "Gain without a price to pay is a wonderful thing. I knew from measuring luminance even without the specifications that these screens were high gain, but I wasn't seeing the penalty of color shift.

"It's a great challenge," Silver continued. "Adding gain without paying a penalty in color fidelity requires careful engineering. Compliments to the engineer!"

**"We want to take whatever the artist created and bring it to the screen."**

The goal, according to Silver, should always be to pair standards with solutions. Get the end user the best possible picture no matter the room or circumstances. And to best accomplish that, it takes more than an ISF-certified screen.

"With a compliant screen and calibrated ISF projector, the performance will be perfect," Silver said. "Even without calibration, with a compliant screen and a projector with a good factory calibrated mode, performance will be very good."

Of course, ISF certification is just part of the screen choice equation. Long gone are the days of size and format being the only screen choices to make. Nowadays, projector and screen technology have advanced to the point that there are different solutions available based on viewing conditions and content. With more factors entering into screen choice, it's perhaps natural that the one question Silver most often gets is "What's the best screen?"

"I answer them with a question," he said. "What's the best screwdriver? Projector screens depend on the room. Base it on the standards and on the room. Selection of the screen is an interactive process between dealer and end user to make good pictures in good and imperfect rooms."

Which could pretty much be a job description for TecVision. And it takes us back to the very beginning. ISF certification of Draper projection screen surfaces means that when you are looking at the blue in Elsa's gown, deciphering a medical image, or trying to determine the color of a suspect's eyes via security cameras, there's no need to "let it go." You know you're seeing what you're supposed to see and what you want to see.

Real colors. Tuned perfectly to your rods and cones.

For more information on Draper's Imaging Science Foundation-certified viewing surfaces, visit our viewing surface web page at [draperinc.com/go/ScreenSurfaces.htm](http://draperinc.com/go/ScreenSurfaces.htm).

[draperinc.com/whitepapers\\_casestudies.aspx](http://draperinc.com/whitepapers_casestudies.aspx)