



Surface testing in the Draper Lab

- When a company is providing a projection solution and not just a commodity, it's more important than ever that the products involved perform as advertised. We want to make sure every viewing surface we send out performs like we say it will. That's why truth in test reporting is of the utmost importance to Draper.

TESTING

Modern premium projection screens are formulated to work under certain room conditions. Actual specifications—such as screen gain, viewing cone, ambient light rejection value, and more—should fall within acceptable tolerances or the solution won't perform.

Draper has two labs set up specifically for testing projection screen viewing surfaces. Our quality engineers put every screen lot through a battery of tests—around 30 in all. Characteristics that are tested include gain, viewing angle, contrast ratio, color uniformity, color shift, ambient light rejection, diffusion, emboss, and gloss. Physical attributes, such as fabric weight, stretch, shrink, and flame resistance, are also tested.

For some of these characteristics, there are no standards or industry practices in place for how to test and what to measure. Our quality technicians developed specialized testing procedures. For example, to measure plasticizer migration—common to any pliable vinyl material—and to

test for yellowing of screen surfaces, Draper developed tests and built the equipment necessary to conduct those tests.

For other standards, testing procedures have been defined and published. For those tests, Draper uses the most up-to-date equipment and procedures. For example, three standards of comparison may be used for gain testing: calcium carbonate, barium sulphate, and Teflon®. We've chosen Teflon® because it is not vulnerable to discoloration and decay over time. We know that our comparison standard is always the pure white it is supposed to be.

In some cases, we have even improved on the industry practice. For example, ambient light testing is normally based on testing for ambient light from just one location. We've developed new test equipment that allows us to test for ambient light from a variety of angles, tracking the consistency of our surface's performance throughout the viewing cone.

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Selected Standards & Equipment Used in Draper Test Labs

Characteristic	Standard / Method	Equipment
Gain	SMPTE RP 94-2000/Draper test method	Gossen Mavo-Spot 2 Light Meter, BaSO4 reference standard, 3W LED light, Draper Custom Gain Test Fixture, or Konica Minolta LS 100, Avian reference standard, 3W LED light, Draper Custom Gain Test Fixture*
Viewing Angle	Calculated using Gain data	Gossen MAVO-SPOT 2 light meter, BASO4 ref std & 3W LED light, or Konica Minolta LS 100, Avian reference standard, 3W LED light*
Gloss	ASTM D 523	BYK Micro-Gloss 60 Gloss meter
Contrast Ratio	InfoComm 3M-2011 DS1	Christie HD6K-M projector, Gossen Mavo-Spot 2 Light Meter, or ISF recommended Epson PowerLite Pro Cinema Projector, Konica Minolta LS 100*
Color Uniformity	Draper/SpectraCal test method Draper test method	Christie HD6K-M Projector, Photo Research PR-655 SpectraScan Spectoradiometer, or Data Color 650*
Color Shift	Draper/SpectraCal test method Draper test method	Photo Research PR-655 SpectraScan Spectoradiometer, Halogen light source, Draper Custom Gain Test Fixture, BaSO4 reference standard, or Data Color 650*
Ambient Light Rejection	Draper/SpectraCal test method Draper test method	Christie HD6K-M projector, Gossen Mavo-Spot 2 Light Meter, or Konica Minolta LS 100, Avian reference standard, 3W LED light, Draper Custom Gain Test Fixture*

* Results are cross-verified, identical whichever equipment is used.

THE REAL MEANING IN NUMBERS

Just as important as the actual testing is what a company does with those numbers. For Draper's standard projection viewing surfaces, there are very tight parameters applied. Those parameters differ depending on the characteristic being measured. If a viewing angle measures more than 3 degrees off a published spec, the material fails the test. If the gain is off by more than 0.1, it will be rejected.

Our standards for TecVision are even more exacting. There is no tolerance allowed. If a TecVision surface tests outside of the published spec at all, it is rejected. We continue testing TecVision formulations weeks and even months after they were produced to make sure nothing changes over time.

We are diligent with testing our own projection surfaces, but we don't stop there. When possible, we obtain samples of competitors' projection surfaces and we test those, too. The results of this testing versus published performance specifications has been less than impressive. In fact, we have observed that published test data for some competitive materials is significantly inaccurate.

A recent round of testing involved products manufactured, sold, and shipped by three of our competitors. One

manufacturer's products failed 47.6% of our tests, and that was actually the top performer. Another failed 50%, while the third failed 66.7% of the time.

Of the tests conducted, ambient light rejection was where the most failures were noted. One manufacturer's tested ALRV numbers were more than 5% out of spec 71% of the time. Products from another competitor were out of that tolerance 86% of the time.

There are several possible reasons for this huge difference in advertised versus tested specifications. There could be differences in testing procedures or equipment, for instance. However, it is important to remember Draper tests our own viewing surfaces using the same equipment and methodology, and many of those tests have been verified by outside labs.

Draper takes testing and integrity seriously. It is our goal to provide the best solution possible, and to deliver what we promise. Our testing labs and the diligence of our quality technicians ensure that's exactly what happens—100% of the time.

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