WHITE PAPER

PROJECTION SCREENS

PROJECTION SCREEN SURFACE PERFORMANCE IN AMBIENT LIGHT

Northwestern University Technical Institute, Evanston, IL
Photographer: Rich Sistos Photography, Itaska, IL

Performance of Draper screen surfaces in ambient light.

The chart below compares how some Draper viewing surfaces perform in the ambient light of a typical training room or conference room environment. The maximum amount of ambient light on the screen surface is listed at which the surface can exceed two of the most used InfoComm Projected Image System Contrast Ratio (PISCR)standards: “Basic Decision Making” at 15:1 and “Analytical Decision Making” at 50:1. *See page 4 for PISCR details.*

Values were calculated for a reasonable amount of screen brightness in this environment for each surface to exceed these two PISCR standards: 75 foot lamberts for white; 80-85 foot lamberts for grey; 85-90 foot lamberts for dark grey.

Because Ambient Light Rejecting (ALR) and grey materials have a darker grey tint that absorbs more light from a projector than a white material, a projector should be selected that is 15%-18% brighter than one that would be used with a typical matte white material. This will compensate by bringing image white levels up to an appropriate level while the material will help to produce better black levels. Grey materials improve contrast moderately due to the darker tint and ALR materials improve contrast due to the darker tint and reject ambient light away from the audience with their reflective components.

Draper Screen Surface	Gain	Grey Tint	Reflective Components	Max Ambient Light on Screen for 15:1 PISCR (foot candles)	Max Ambient Light on Screen for 50:1 PISCR (foot candles)	Ambient Light Rejection	Maximum Image Height	Screen Types
Matt White	1.0	None	None	5.5	1.5	Poor	178”	Any
Contrast Grey XH800E	0.8	Light Grey	None	10.5	3	Fair	118”	Non-tensioned
Grey XH600V	0.6	Grey	None	11.5	3.5	Fair to Good	142”	Tensioned
TecVision XH900X Grey (ALR)*	0.9	Grey	Yes	12	3.5	Good	276”	Tensioned
TecVision MS1000X Grey (ALR)*	1.0	Dark Grey	Yes	21	6	Excellent	276”	Tensioned

*ALR surfaces with reflective components reject ambient light best.

DePauw University, Greencastle, IN

Typical Ambient Light Levels Found in Various Room Types.

The light levels noted below are for reference only and are to give examples of ambient light conditions in various types of rooms.

Application	Ambient Light On Screen (foot candles)	Ambient Light At Viewer (foot candles)
Theater	<1	<1
Auditorium	<5	20-25
Control Room	<5	30
Training/Conference Room (controlled directional lighting)	<5	30-40
Training/Conference Room (fluorescent lights with front bank off)	7-8	30-40
Training/Conference Room (fluorescent with all on)	10-15	30-40
Conference Room with Video Conferencing	10-15	50
Classroom (fluorescent lights with daylight and little or no window shades)	15-25	40-60

*Note: For projection, light at the screen and light at the viewer are measured on a vertical plane (i.e., Sensor facing away from screen for light on screen and facing away from the viewer for light on the viewer).

continued on next page

InfoComm Projected Image System Contrast Ratio (PISCR) Standards.

The InfoComm 3M-2011 PISCR standards define the minimum projected image system contrast ratio for four categories of viewer requirements and image content. These apply to all types of projection.

Viewing Category	Minimum System Contrast Ratio	Viewer's Requirements	Environment Example Characteristics	Examples
Passive Viewing	7:1	• Images and text distinguishable from background • Passive engagement with content • Assimilation and retention of detail not required • Informal viewing of video and data	• May have little control of ambient light • Ambient light may be high • Task lighting may not be ideal • Windows may have insufficient blinds or curtains • May be reflective surfaces (e.g., furniture) • Projector light output may be inadequate	Retail stores, family (TV) rooms, presentations of non-critical or informal information
Basic Decision Making	15:1	• Actively engaged with content • Assimilation and retention of detail • Images and text are legible to the extent that basic decisions can be made • Decisions based on content itself, not resolution of detail	Improvements relative to the above category are often in evidence	Information displays, presentations containing detailed data and images (e.g., classrooms, boardrooms, multipurpose rooms, product illustrations)
Analytical Decision Making	50:1	• Images and text contain finest detail • Assimilation, retention and analysis of finest detail • Analytical image assessment • Mission-critical image displays • Professional analysis of detail	• Highly controlled environment • Controlled ambient light • Focused task lighting • No ambient light directly affecting screen, black-out window treatments	Engineering and architectural drawings, electrical schematics, forensic evidence, failure analysis, photographic evaluation (e.g., courtrooms, medical galleries)
Full Motion Video	80:1	• High level of engagement with content • Films below movie theater distribution standard	Precisely controlled ambient light	Controlled viewing environment (e.g., home theater, business screening room, broadcast post -production)

*Draper recommends a system contrast ratio of 25:1 or higher for a "mixed use" application (i.e., mix of large font text, small font text, high definition video, etc.).

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Draper, Inc. | 411 S. Pearl St. Spiceland, IN 47385
draperinc.com | 765.987.7999 | 800.238.7999
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