

WHITE PAPER

PROJECTION SCREENS

PROJECTION SCREEN SURFACE PERFORMANCE IN AMBIENT LIGHT



Draper Premier XL Projection Screen
Kettering College – Kettering, OH

WHITE PAPER: PROJECTION SCREEN SURFACE PERFORMANCE IN AMBIENT LIGHT

■ 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

When the surface is still able to achieve 15:1 system contrast ratio which is the viewing category (Basic Decision Making) of the AVIXA Image System Contrast Ratio (ISCR) standard that is most used in commercial applications. More light on the screen than what is listed will not allow each surface to hit 15:1 system contrast ratio.

See page 4 for ISCR standard details.

Values were calculated using the minimum projector lumens required for each surface for a 65"x115 screen with typical training room or conference room lighting at the viewers (38' candles).

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



A typical grey surface is light grey in tint and 0.7 gain. These surfaces would require about 55% more projector lumens to light up a screen than what would be used for a typical matte white screen.

An ALR surface is medium to dark grey in tint, and typically has a gain from 0.9 – 1.1. These surfaces would require 12% - 27% more projector lumens to light up a screen than what would be used for a typical matt white screen. This would depend on tint and gain of the surface.



**It's best to use tools such as the Draper Projection Planner calculator. Scan to visit the Draper Pro Portal for Pro Tools or contact your Draper rep for more information.*

Draper Screen Surface	Surface Type	Gain	Max Ambient Light on Screen for 15:1 System Contrast (ft candles)
Matt White XT1000VB	White	1.0	4
TecVision XH1200X Grey	Grey	1.2	6
TecVision XH700X Grey	Grey	0.7	7.5
TecVision XH900X ALR	ALR	0.9	10.5
TecVision MS1000X ALR	ALR	1.0	16.5
TecVision CS1100X ALR	ALR	1.1	25.5



■ 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).

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■ AVIXA Image System Contrast Ratio (ISCR) Standard

The AVIXA V201.01.2021 ISCR standard defines the minimum image system contrast ratio of an image viewed on a display system required for four viewing categories. These apply to all types of displays.

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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