GUIDE TO SELECTING FRONT PROJECTION SCREENS

The **POWER** *In*
PRESENTATION PRODUCTS

DA-LITE ®

PRESENTATION PRODUCTS

This manual is designed to help users and specifiers of front projection screens select the appropriate screen fabric for their individual Presentation Media requirements.

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As long as we live in an imperfect world, we will always be faced with presentation problems, such as ambient light, limited room configurations and budget restrictions. All of these problems need a solution. As the educational leader in our industry, Da-Lite is always searching for ways to present solutions. That is why we developed "Guide To Selecting Front Projection Screens."

Da-Lite offers a wide array of screens, each with a choice of projection surfaces. Selecting the right combination to meet your needs is important for optimum results. This manual will guide you through the selection process step-by-step to choose the right screen fabric for any application and projection method. Da-Lite makes it easy by giving you all the information you need to fully understand the requirements of your individual application followed by an exclusive decision matrix that actually recommends the right fabric by answering a few easy questions.

The screen fabric recommendations contained in this manual are based on Da-Lite's years of experience as the leader in projection technology. These recommendations take into account all major projection methods and applications such as home theater. You can expect Da-Lite to add to these recommendations in the future as technology and more options become available.

DA-LITE

Although the thought of choosing the right front projection fabric may seem intimidating, it's actually a straightforward process. Da-Lite makes it easy with its unique matrix approach used in this manual. Please keep in mind that it may be preferable to use rear projection technology depending on your individual application.

There are three basic steps in selecting the right screen fabric:

1 UNDERSTAND THE PRESENTATION MEDIA APPLICATION

Understand the Presentation Media Application that you plan to address. Simply read the first section titled "Typical Presentation Media Applications." Determine which application scenario best describes your situation. Then, analyze the problems and situations identified for your application that must be considered in selecting a screen fabric that meets your special requirements.

2 COMPLETE THE SELECTION CRITERIA CHECKLIST

Complete the selection criteria checklist based on the specifics of your application, projection method, lighting conditions, room setting, audience seating, etc. In all, there are seven important criteria to be addressed.

3 COMPLETE DA-LITE'S DECISION MATRIX

With the completed checklist in hand, answer the questions in Da-Lite's exclusive decision matrix for the projection method involved. This will lead you to a specific or alternative screen fabric that, based on your application and situation, will provide the best results. That's all there is to it. Again, if in doubt, feel free to contact Da-Lite directly. Our experienced Sales Partners are trained to help guide you through the process.

After you have selected the screen fabric, you'll need to choose a screen product by considering the required physical characteristics of the screen such as size, operation (i.e. fixed frame, manual roll-up or electric roll-up), and mounting (i.e. ceiling mounted, wall mounted or floor mounted). Da-Lite offers the largest selection of screen models in the world. Consult any authorized Da-Lite dealer for additional information or contact us directly for the name of the dealer nearest you.

Refer to the section on screen fabric descriptions for further definition of screen fabrics and their properties. Also, consult the glossary for terms commonly used when discussing projection screens and uses in this manual.

Take a projector, put a screen in front of it, turn down the lights and you have a presentation. If only it was that simple. Unfortunately, there are many other considerations, both physical and environmental that affect the quality and viewability of a presentation. We call these Presentation Media applications.

Today's typical Presentation Media applications fall into the following four distinct categories–Each with its own unique requirements and problems. The optimum viewing solution demands that the projection surface fully address these requirements and problems.

If your particular application is not described here exactly, consider the relevancy of problems and special situations identified in other applications as a guide to using the selection criteria list. Choose the application that best describes your situation.

HOME THEATER/ENTERTAINMENT

This growing application brings the realism of the "cinema" home. You'll find a wide spectrum involved in this application, from video enthusiasts who build dedicated home theater rooms to movie fans that convert their living rooms or dens into mini-theaters. Consider these characteristics and problems typically found in Home Theater applications:

HOME THEATER CHARACTERISTICS

• Typically this application uses video or high definition projection. Popular today are LCD, DLP and LCOS projectors combined with surround sound audio equipment.

• The application objective is to attain the highest degree of visual and audio realism. The desire is to make the audiovisual experience as close as possible to the feeling experienced at a modern-day cinema.

SPECIAL PROBLEMS OR SITUATIONS

Typically, you'll find most home theaters have one or more of the following problems.

• Lighting conditions may not always be controllable. For example, windows, skylights, and entry ways can allow stray or direct light into the room, negatively affecting image quality.

• May require wide or narrow angle of view depending on room configuration.

• Screen surface must remain taut to maintain resolution and eliminate disturbing shadows when projecting with video devices like LCD, DLP and LCOS based projectors.

• Could possibly require a variety of projection aspect ratios i.e. HDTV, letterbox, cinemascope, analog broadcast television.

CLASSROOM/BUSINESS TRAINING

This classic application is a key communication method in today's hectic business world. Communicating effectively in mass enables companies to get employees up to speed quickly. Likewise, in the educational setting, educators are finding an emphasis on visual communication is not only favored by students but as importantly, is far more effective in sharing information and concepts.

Although business and educational settings are worlds apart, their Presentation Media characteristics and problems are common.

CLASSROOM AND BUSINESS TRAINING CHARACTERISTICS

• Any setting where a medium size group of people are seated around an instructor using presentation media as the focal point for communicating ideas or information.

• Generally, participants take notes and refer to additional reference materials requiring higher ambient lighting.

• Interaction and eye contact between the instructor and the student is vital in teaching and maintaining audience interest.

SPECIAL PROBLEMS OR SITUATIONS

• Lighting conditions may not always be controllable to the extent desired. In both the educational and business training areas, rooms may be multipurpose and have windows that allow stray light to penetrate.

• Presentations requiring note taking or reference to materials dictate higher ambient room lights.

• May require wide or narrow angle of view depending on room configuration.

• A variety of projection methods i.e. video, data, overhead or slide may be used on the same screen.

BUSINESS/BOARDROOM STYLE MEETINGS

The cornerstone of business is the "meeting". Today, in many boardroom/business settings audiovisual components play a large part in helping to communicate clear and concise messages to members of a given organization. The ability to effectively communicate information is of vital importance in today's fast paced work environment.

In these applications you will find a wide variety of room configurations. Established meeting rooms with integrated audiovisual systems are ideal and commonplace, some rooms are outfitted with portable projection devices with screens made to fit. Either way, the physical and environmental characteristics of both have similar objectives.

BUSINESS/BOARDROOM STYLE MEETING CHARACTERISTICS

• Any group meeting where the main emphasis is imparting information and not for the express purpose of interacting with the audience during the presentation.

• Typically these presentations are made in rooms designed or earmarked for presenting. Lighting and ideal seating arrangements can be controlled.

• Although this application generally involves smaller groups, the size of the audience can vary greatly, limited only by the physical size of the room.

• A wide range of projection media are typically used alone or in combination–including standard video, power point and data projection.

SPECIAL PROBLEMS OR SITUATIONS

• A variety of projection formats (i.e. video or HDTV) may be used on the same screen, requiring a screen to address the needs of all without severely compromising the image quality of any one method.

• Depending on the projection method and room size, image brightness may suffer.

• The audience is typically closer to the screen than optimally recommended, dramatically exaggerating the viewing angle for some audience members.

AUDITORIUM/LARGE GROUP MEETINGS

Presentations to a large group of people can be an exciting and impressive Presentation Media application. Yet, it is in this application more than any other, that selecting the right screen is critical to satisfying all audience members with a quality image.

In this application you'll find auditoriums with built-in permanent projection booths, large multipurpose rooms (like hotel banquet/function rooms) where flexibility requires portable projection methods and impromptu or infrequent presentations in large areas not specifically designed for presentations (typically found in businesses).

AUDITORIUM/LARGE GROUP MEETING CHARACTERISTICS

• Typically large numbers of seated or in some cases, standing audience members where room size usually dictates a wide viewing angle.

• Very limited interaction between presenter and the audience, if any.

• The need for a large image size requires a projection method/source with substantial lumen output.

SPECIAL PROBLEMS OR SITUATIONS

• Depending on seating position, image quality may not be ideal due to wide angle and/or distance from screen.

• Although film projection is generally used with high lumen output, multiple (stacked) video projectors may also be used to accomplish higher light output.

SCREEN SELECTION CRITERIA

Da-Lite Screen has identified seven basic criteria for selecting the right screen surface. Each criteria is designed to provide characteristics a screen must possess to meet the application's objectives as discussed earlier in this manual.

These Presentation Media criteria are as follows:

CRITERIA #1 PROJECTION METHOD

Determine the primary type of projection method to be employed. If multiple projection methods are to be used equally, determine which one has the most demanding requirement and use that as your selection criteria.

VIDEO

LCD Technology – This technology uses a conventional light source to project an image by passing light through three internal liquid crystal displays–one each for red, green and blue. Each image is then combined by a series of mirrors into a single image.

DLP Technology – This technology is based on the Digital Micromirror Device™ (DMD™) which uses microscopic mirrors on an optical semiconductor (DLP chip) to reflect images on screen.

D-ILA Technology – In this technology, light is reflected off a mirror surface located under the LCD pixel layer. This reflective process results in higher brightness and contrast levels.

LCOS Technology – LCOS devices have crystals coated over the surface of a silicon chip, which is coated with a reflective surface. Polarizers are located in the light path both before and after the light bounces off of the chip.

35MM Slide Transparency – Like other film projection methods the slide's continuous tone properties and the projector's high light output (varying from 1000 to 6000 lumens), provide an excellent image–showing fine detail and exceptional color rendition.

OVERHEAD PROJECTION

An overhead projector is utilized in some educational settings. Its high output light sources of approximately 3000 lumens provides a projection method individual presenters can use in their own personal manner.

CRITERIA #2 AMBIENT LIGHT CONDITIONS

Part A – Determine whether or not light conditions are controllable to minimize ambient light when needed. Controlled light assures no substantial stray light is allowed to enter the room that would increase ambient light levels to a point where the projected image is affected.

Part B – Determine if uncontrolled light is directed at the screen causing the projected image to "washout". An example is uncontrolled light from sources such as ceiling lights directed on to the surface of the screen.

CRITERIA #3 DISPLAY BRIGHTNESS

Use the following simple formula to determine the brightness (in foot-lamberts) of your display.

$$\frac{\text{ANSI lumens of projector}}{\text{Square footage of screen}} = \text{foot-lamberts}$$

Example: $\dfrac{1200 \text{ ANSI lumens}}{48 \text{ square feet (6 x 8 screen size)}} = 25 \text{ foot-lamberts}$

CRITERIA #4 ROOM CONFIGURATION/SIZE

Determine if the seating area will require audience members to view the projected image from a narrow (Figure 1) versus a wider (Figure 2) angle of more than 30 degrees from either side of the center of the screen. If the room configuration (i.e. is more wide than deep), forces audience members to view the projected image from an angle greater than 30 degrees, a screen fabric providing a greater viewing angle is required.
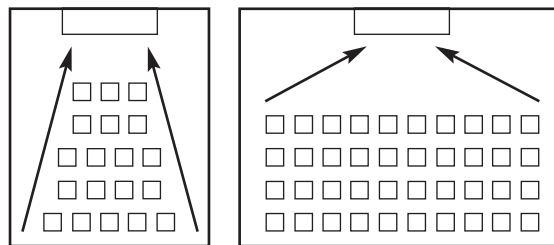
Figure 1   Figure 2

CRITERIA #5 PROJECTED IMAGE MAKE-UP

Determine if the projected image is one or more of the following:

a) NTSC/HDTV video signal – Generally speaking a video signal is made up of moving images in which the visual task at hand is watching rather than reading. i.e. DVD Movies, broadcast television, video conferencing

b) Digital or pixelized data with fine detail (i.e. spreadsheets, charts, CAD drawings) require higher resolution to project characters and detail with clarity.

CRITERIA #6 PROJECTOR PLACEMENT

Determine if the projector will be placed perpendicular to screen center. Whenever the projector and the audience are on opposite sides of the normal and requires higher gain, use a screen that is reflective. (Figure 1). Whenever the projector and the audience are on the same side of the normal and requires higher gain, use a screen that is retro-reflective. (Figure 2).

Normal to screen center

Figure 1

Normal to screen center

Figure 2
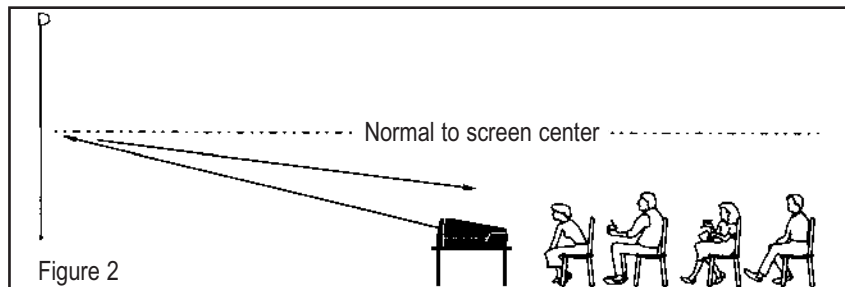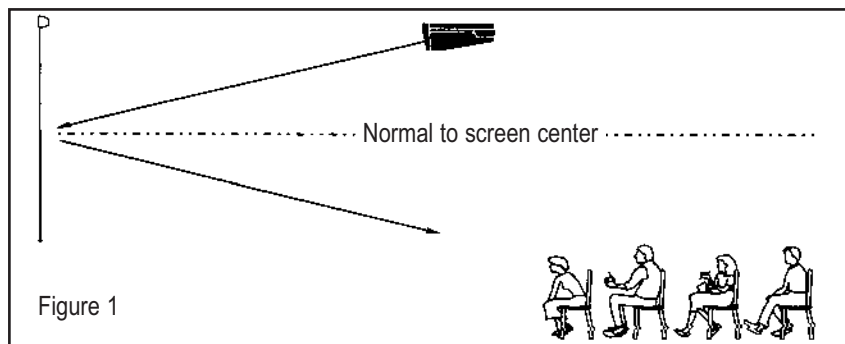
CRITERIA #7 CONTRAST ENHANCEMENT

Determine if a contrast enhancing screen surface is desired.

In many Home Theater applications a contrast enhancing screen is desired to provide greater shadow detail in the projected image and help to combat ambient lighting conditions. Another application where a contrast enhancing screen might be chosen is a video conferencing environment where data or graphics will not be displayed.

For ease in collecting the criteria for selecting the proper front projection screen fabric, use the following checklist to record your answers. Then, use the checklist as a guide in completing the decision matrix that follows.

Application_____ Date_____

Prepared By_____

Complete this checklist for each presentation media application, then refer to pages 19-22 for recommended screen fabrics.

CRITERIA #1 PROJECTION METHOD

Video Technology	Film Technology	Overhead Technology	Three-Dimensional
❏ LCD, DLP, D-ILA, LCOS	❏ Slide Transparencies ❏ Film	❏ Overhead Transparencies	❏ 3D

CRITERIA #2 AMBIENT LIGHT CONDITIONS

Part A

❏ Ambient light **IS** controllable ❏ Ambient light **IS NOT** controllable

Part B

❏ Uncontrollable light **DOES NOT** affect screen image

❏ Uncontrollable light **DOES** affect screen image

CRITERIA #3 DISPLAY BRIGHTNESS

❏ Your display has **25 OR MORE** foot-lamberts ❏ Your display has **LESS THAN 25** foot-lamberts

CRITERIA #4 ROOM CONFIGURATION/SIZE

❏ Audience members will be seated **30º OR MORE** from the center of the screen

❏ Audience members will be seated **LESS THAN 30º** from the center of the screen

CRITERIA #5 PROJECTED IMAGE MAKE-UP

❏ NTSC/HDTV Video Image ❏ Digital Text or Pixelized Data
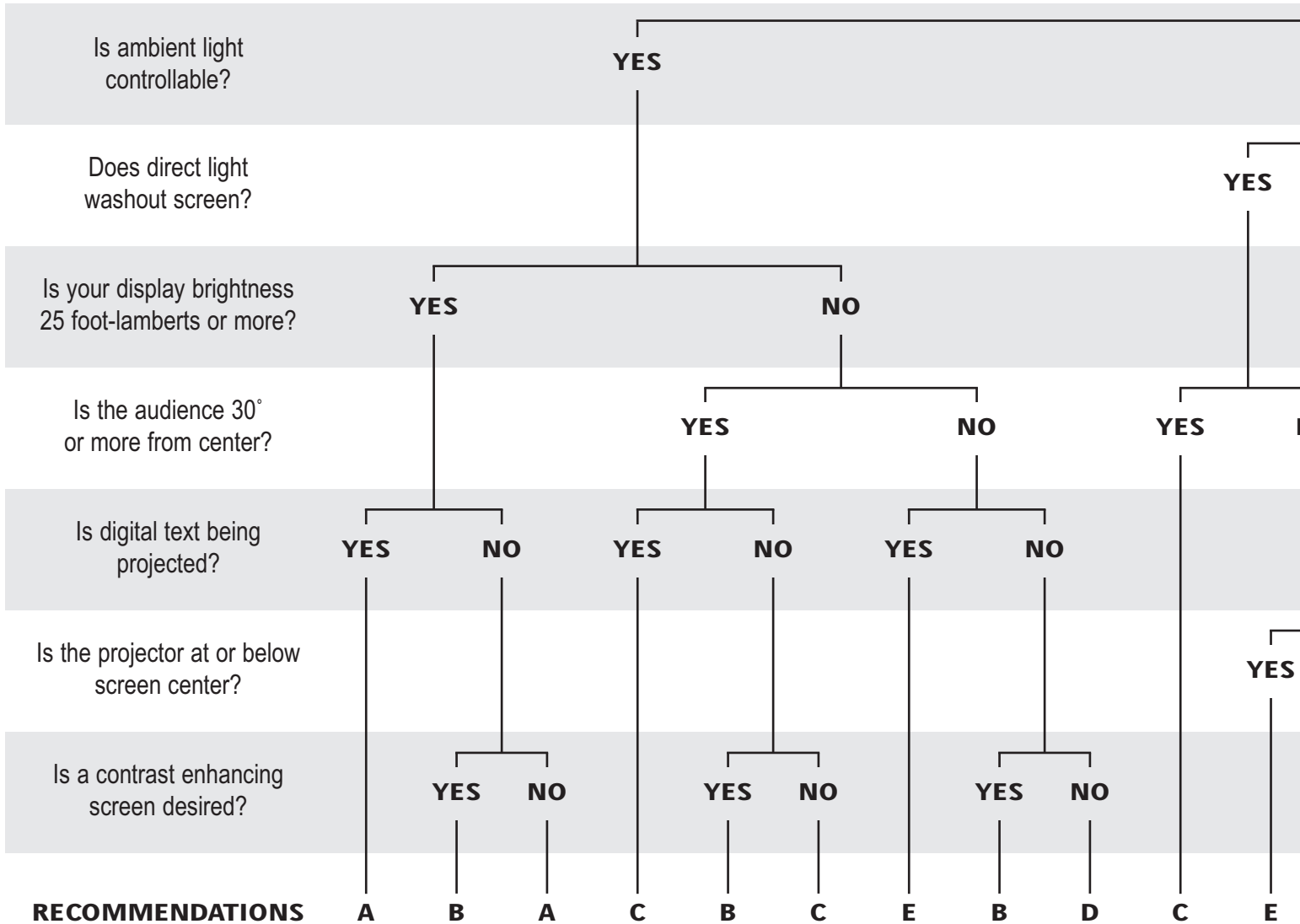
CRITERIA #6 PROJECTOR PLACEMENT

❏ Projector and audience **ARE** on the same side of the normal

❏ Projector and audience **ARE NOT** on the same side of the normal

CRITERIA #7 CONTRAST ENHANCEMENT

❏ A contrast enhancing screen **IS** desired

❏ A contrast enhancing screen **IS NOT** desired

To select the proper Front Projection Screen fabric, simply answer either Yes or No to each question asked and follow the lines to subsequent questions. When questions are skipped, these have no relevance in this situation or are overridden by previous criteria.

VIDEO PROJECTION — LCD,
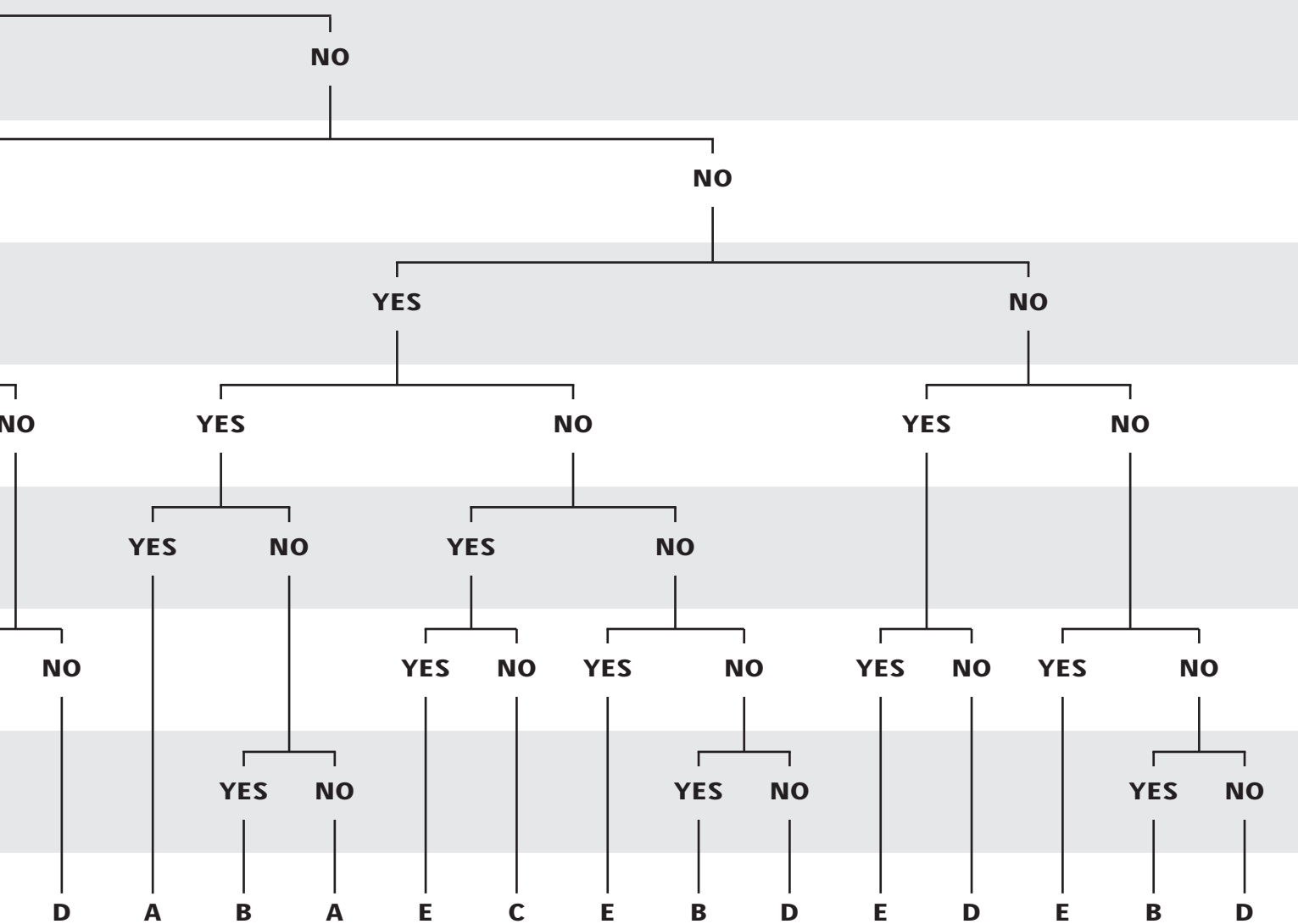
Is ambient light controllable?			YES						
Does direct light washout screen?							YES		
Is your display brightness 25 foot-lamberts or more?		YES		NO					
Is the audience 30° or more from center?				YES		NO	YES		
Is digital text being projected?	YES	NO	YES	NO	YES	NO			
Is the projector at or below screen center?								YES	
Is a contrast enhancing screen desired?		YES	NO	YES	NO	YES	NO		
RECOMMENDATIONS	A	B	A	C	B	C	E	B	D	C	E

A: MATTE WHITE/DA-MAT

B: HIGH CONTRAST MATTE WHITE/HIGH CONTRAST CINEMA VISION

C: CINEMA VISION

D: VIDEO SPECTRA 1.5/PEARLESCENT

E: HIGH POWER®

DLP, D-ILA AND LCOS TYPES

High contrast (gray) surfaces and acoustically transparent surfaces also available. See pages 19-22 for fabric specifications. These screen recommendations are based on certain assumptions and known characteristics of projection devices. If your application involves other variables not covered here, contact your Da-Lite Sales Partner for assistance in selecting the proper screen surface.

To select the proper Front Projection Screen fabric, simply answer either Yes or No to each question asked and follow the lines to subsequent questions. When questions are skipped, these have no relevance in this situation or are overridden by previous criteria.
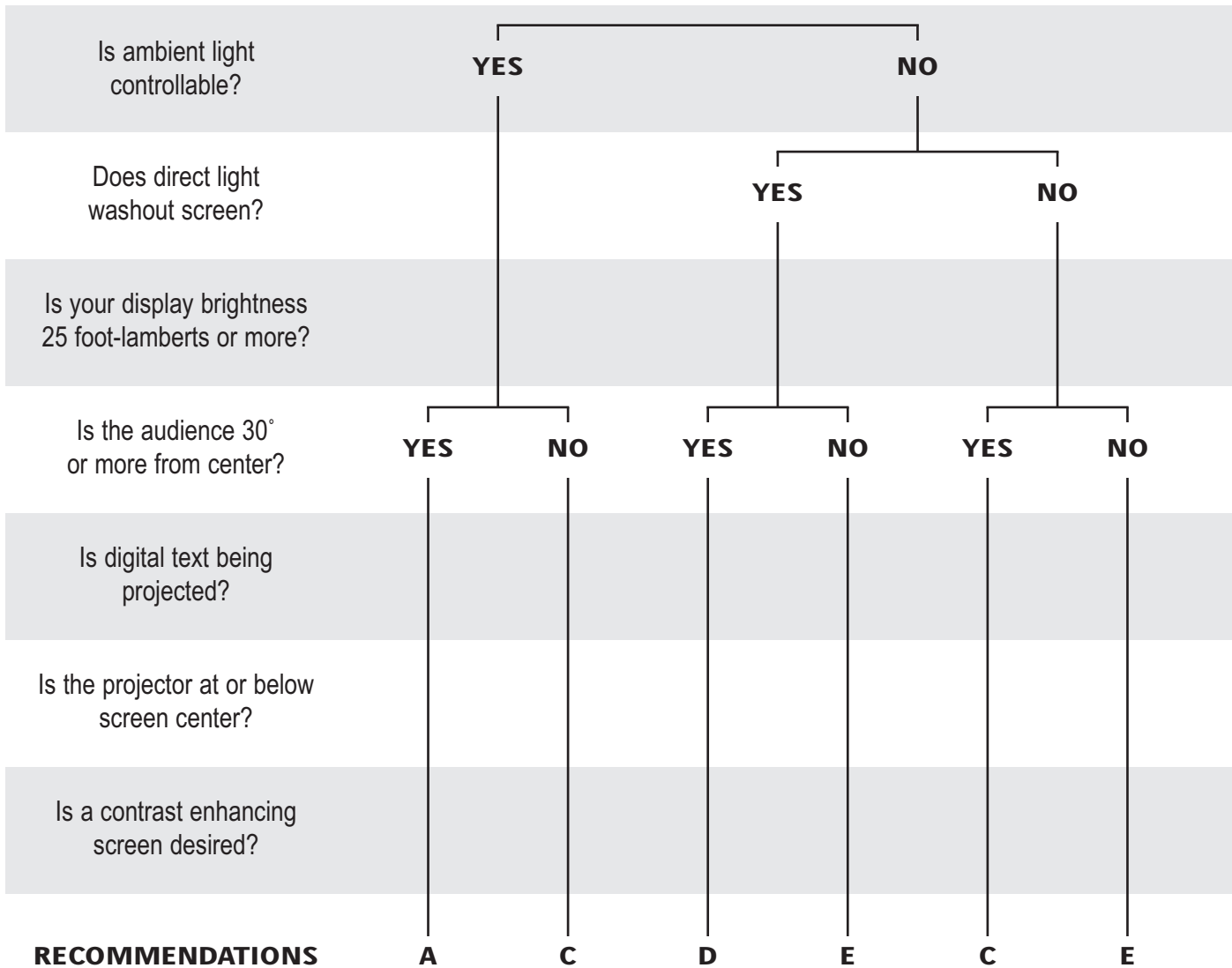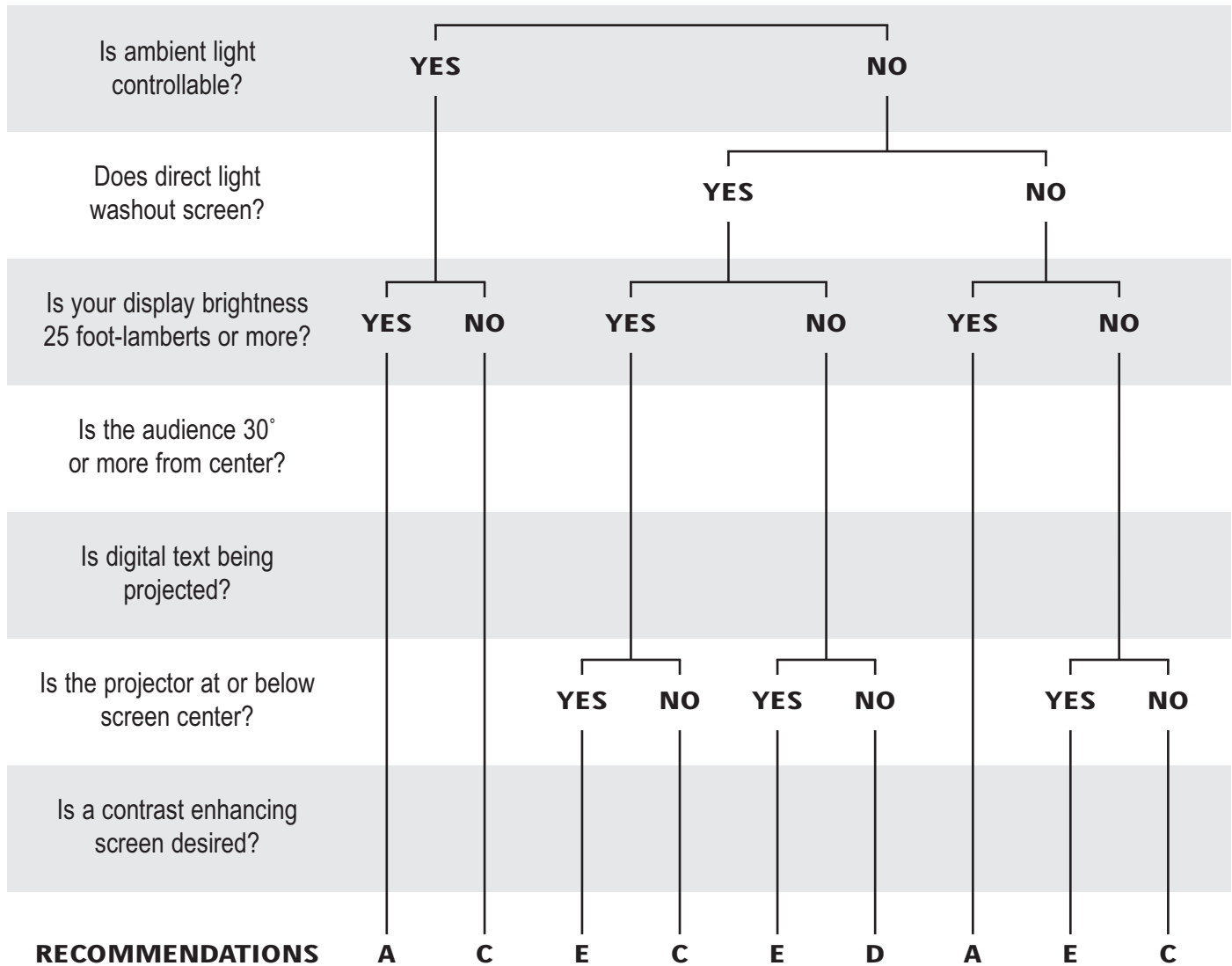
OVERHEAD PROJECTION

Question						
Is ambient light controllable?	**YES**			**NO**		
Does direct light washout screen?			**YES**		**NO**	
Is your display brightness 25 foot-lamberts or more?						
Is the audience 30° or more from center?	**YES** / **NO**		**YES** / **NO**		**YES** / **NO**	
Is digital text being projected?						
Is the projector at or below screen center?						
Is a contrast enhancing screen desired?						
RECOMMENDATIONS	A	C	D	E	C	E

A: MATTE WHITE/DA-MAT

B: HIGH CONTRAST MATTE WHITE/HIGH CONTRAST CINEMA VISION

C: CINEMA VISION

D: VIDEO SPECTRA 1.5/PEARLESCENT

E: HIGH POWER®

High contrast (gray) surfaces and acoustically transparent surfaces also available. See pages 19-22 for fabric specifications. These screen recommendations are based on certain assumptions and known characteristics of projection devices. If your application involves other variables not covered here, contact your Da-Lite Sales Partner for assistance in selecting the proper screen surface.

To select the proper Front Projection Screen fabric, simply answer either Yes or No to each question asked and follow the lines to subsequent questions. When questions are skipped, these have no relevance in this situation or are overridden by previous criteria.

FILM/SLIDE PROJECTION

Is ambient light controllable?		**YES**			**NO**			
Does direct light washout screen?				**YES**		**NO**		
Is your display brightness 25 foot-lamberts or more?		**YES**	**NO**	**YES**	**NO**	**YES**	**NO**	
Is the audience 30° or more from center?								
Is digital text being projected?								
Is the projector at or below screen center?				**YES** **NO**	**YES** **NO**		**YES** **NO**	
Is a contrast enhancing screen desired?								
RECOMMENDATIONS		A	C	E C	E D	A	E C	

A: MATTE WHITE/DA-MAT

B: HIGH CONTRAST MATTE WHITE/HIGH CONTRAST CINEMA VISION

C: CINEMA VISION

D: VIDEO SPECTRA 1.5/PEARLESCENT

E: HIGH POWER®

High contrast (gray) surfaces and acoustically transparent surfaces also available. See pages 19-22 for fabric specifications. These screen recommendations are based on certain assumptions and known characteristics of projection devices. If your application involves other variables not covered here, contact your Da-Lite Sales Partner for assistance in selecting the proper screen surface.

Screen surface can be cleaned. Flame retardant. Mildew resistant. Indicates Goniophotometer reflectance readings. The higher the number, the greater light transmitted to the audience. Number shows the optimal width of the ideal viewing half angle.

MATTE WHITE
One of the most versatile screen surfaces and a good choice for situations when presentation material is being projected and ambient light is controllable. Its surface evenly distributes light over a wide viewing area. Colors remain bright and life-like, with no shifts in hue.
60˚ 1.0

HIGH CONTRAST MATTE WHITE
Designed for moderate output DLP and LCD projectors, this screen surface is a great choice when video images are the main source of information being projected and where ambient light is moderately controlled. With its specially designed gray base material and reflective top surface, this screen material is able to provide very good black levels without sacrificing the white level output.
50˚ 1.1

VIDEO SPECTRA 1.5
This screen surface is specially designed with a reflective coating, which provides an increased amount of brightness with a moderately reduced viewing angle. The increased gain of this surface makes it suitable for environments where ambient lighting is uncontrollable and a projector with moderate light output is utilized.
35˚ 1.5

SILVER MATTE
A uniquely designed screen surface with a specially designed silver finish. This surface is perfect for situations where a silver surface is necessary for polarized 3-D projection. The matte finish of this surface successfully rejects ambient light.
30˚ 1.3

HIGH POWER®
This screen surface is a technological breakthrough, providing the reflectivity and optical characteristics of a traditional glass beaded surface with the ability to clean the surface when necessary. Its smooth textured surface provides the highest gain of all front projection screen surfaces with no resolution loss. The moderate viewing angle and its ability to reflect light back along the projection axis make this surface the best choice for situations where there is a moderate amount of ambient light and the projector is placed on a table-top or in the same horizontal viewing plane as the audience.
30˚ 2.8

DA-MAT
A screen surface with a smooth, white vinyl finish for precise image reproduction that provides an exceptionally wide viewing angle with no resolution loss. It is a highly flexible fabric that may be folded or rolled. Its versatility makes it a great choice for situations with good control over ambient light and where an exceptionally wide viewing angle is necessary.
60˚ 1.0

CINEMA VISION
A unique non-supported vinyl fabric that offers a bright, uniform image with no color shift at any viewing angle. This surface is designed to provide a higher amount of brightness for lower output projector types such as CRT. Its increased reflectivity will help enhance the image brightness in situations where a low level of ambient light is present. This surface is a good choice when producing video images.
45˚ 1.3

PEARLESCENT

A non-supported vinyl fabric, offering a higher degree of reflectivity and brilliance without loss of image quality or resolution. This surface is a good choice when producing video images with a lower output projector and where there is a high amount of ambient light present.

⬚ 🔥 💧 📢 40˚ ☀ 1.5

AUDIO VISION

Designed for applications where a more realistic soundstage is desired, this fabric allows for the installation of speakers to be placed behind the surface. With virtually no sound loss and good image quality, this fabric provides the same optical characteristics as the Da-Mat surface with specially designed perforations to allow sound to pass through the screen material.

⬚ 🔥 💧 📢 60˚ ☀ 1.0

HIGH CONTRAST DA-MAT

With a special gray surface, this screen material is designed for use with today's high output LCD, DLP and D-ILA projectors. By lowering the black levels of the projected video image, this surface creates a more film-like image and is a good choice when video is the main source of projected information. This screen surface is best used when there is good control of ambient lighting and a moderately wide viewing angle is desired.

⬚ 🔥 💧 📢 45˚ ☀ 0.8

HIGH CONTRAST CINEMA VISION

Designed for today's moderate output DLP and LCD projectors, this screen surface is a great choice when video images are the main source of information being projected and where ambient lighting is moderately controlled. With its specially designed gray base surface and a reflective top surface, this screen material is able to provide very good black levels without sacrificing the white level output. With its enhanced black levels and brilliant white levels, this screen surface provides deep life-like colors and greater detail and sharpness to the image.

⬚ 🔥 💧 📢 50˚ ☀ 1.1

HIGH CONTRAST AUDIO VISION

With the same optical characteristics as the High Contrast Da-Mat material, this surface is designed to provide the viewer with a more realistic soundstage by placing speakers behind the screen and allowing the sound to be transmitted through the material. This screen surface is best used when there is good control of ambient lighting and a moderately wide viewing angle is desired.

⬚ 🔥 💧 📢 45˚ ☀ 0.8

HIGH CONTRAST CINEMA PERF

With the same optical characteristics as High Contrast Cinema Vision, this surface is perforated to allow placement of a center channel speaker behind the screen surface while allowing the sound to transmit through the material. Ideal for use in environments with moderate control of ambient light.

⬚ 🔥 💧 📢 50˚ ☀ 1.1

SILVER VISION

This screen surface is uniquely designed with a specially formulated silver finish. This surface is perfect for situations where a silver finish is necessary for polarized 3-D projection. The matte finish of this surface successfully rejects ambient light. It is a highly flexible fabric that must be tensioned.

⬚ 🔥 💧 📢 30˚ ☀ 1.5

One important aspect of front projection screens often minimized or overlooked, is black masking borders or more commonly known as screen borders. This feature provides a crisp edge to any screen surface and is almost always constructed of a non-reflective black material.

Borders are used for a number of different reasons. One, perceived brightness of an image on a screen is relative to the light projected on the screen when compared to the surrounding background. For example, if you placed a screen up against a white wall in a darkened room, the image would likely appear dull and lifeless. However, by incorporating a black border around the screen, the human eye perceives the image to have more contrast and a sharper picture with brighter colors. The eye is comparing the projected image with the black border, not the background.

In an ideal world, projection equipment would project an image to the exact dimensions of a screen without keystoning. Unfortunately, that's not the case. Borders help to hide flaws in a projected image by masking out unevenness caused by out-of-level equipment, images improperly framed due to focus limitations or distance from the screen, and slight keystoning caused by the projection image not being aligned 90 degrees to the screen. Serious keystoning as typically found in overhead projectors however, can only be corrected by either raising the height of the projector or purchasing a screen that tilts slightly downward. Screens with keystoning correction devices are widely available.

Depending on the screen surface, borders are available for all four sides of a screen or just on the vertical sides. If the screen surface is to be used exclusively for a projection method with a set aspect ratio (i.e. video format 1.33), then, if available, purchase a screen surface with borders on all four sides. If the screen will be used for a differing range of projection methods with a variety of aspect rations (i.e. slides), then purchase a screen with borders only on the vertical sides and adjust the screen drop to reduce the unused portion of the screen surface.

The special terms used in this manual and those common in discussing front projection screens are described below:

Ambient Light – All light in a viewing room produced by sources other than the screen.

Aspect Ratio – The numeric relationship between a screen's height and width. This ratio is often defined by the selected projection medium. Hence, NTSC Video (U.S. television) has an aspect ratio of 3:4.

Bend Angle – The angle through which a projected light ray must be diverted from its original path to reach a viewer's eyes.

Borders – The black portion surrounding the viewing area of a screen.

Brightness – A viewer's subjective response to luminance.

Contrast Ratio – The numeric relationship between the brightest and the darkest portions of a display expressed in foot-lamberts as a ratio of Max:Min.

DLP Technology – This technology is based on the Digital Micromirror Device™ (DMD™) which uses over 500,000 microscopic mirrors on the SVGA chip to reflect images on screen.

Drop – The area between the top, or the bottom, of the viewing area and the screen housing. Drop is typically located at the top of the screen to lower viewing area closer to the floor.

Foot-Candle – The fundamental unit of illumination representing the light intensity over a 1 square foot surface which is 1 foot away from a standard candle.

Foot-Lambert – A unit of luminance equivalent to 1 lumen per square foot.

Gain – A measurement usually made perpendicular to screen center of the luminance transmitted by the screen, divided by the luminance radiating from the projector.

HDTV – Acronym for High Definition Television.

Keystone – The distortion of the projected image when the screen is not perpendicular with the center line of the projected image.

LCD – Liquid Crystal Display. Commonly used in digitized projection.

**Luminance –** The measured brightness of a screen, expressed in foot-lamberts.

Projection Axis – The direction of an imaginary line extending from the center of the projection lens through the screen's center.

SVGA – Super Video Graphic Array. Common computer screen resolution. (800 x 600.)

Throw Distance – The length of the projection beam necessary for a particular projector to produce an image of a specified size.

VGA – Video Graphic Array. Common computer screen resolution. (640 x 480.)

Viewing Angle – The angle from a specified viewing position to the center of the screen. It is usually measured on the horizontal or on the vertical axis. Specified in this brochure as optimum screen brightness from screen center to either side.
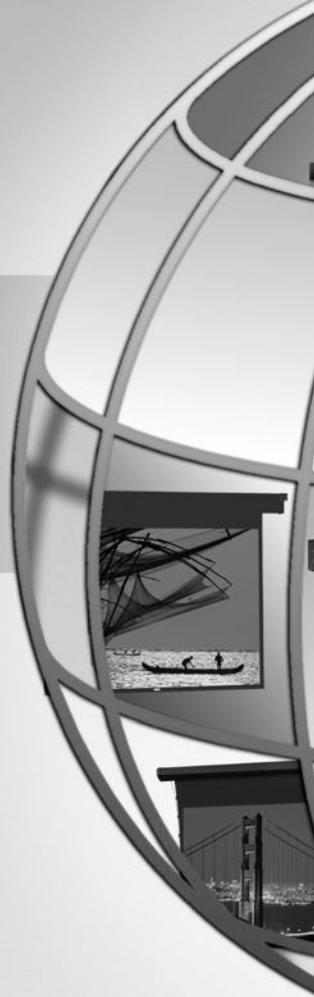
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