Introduction to Selecting the Proper Projection Screen

Gerriets

Introduction

This document is intended as a brief guide to selecting the proper projection screen as well as to raise a few questions during the selection process.

What is a Projection Screen ?

Projection Screen:
A substrate, usually glass, vinyl or acrylic, used to reflect light or transmit light through its surface.

The Differences between Front & Rear Projection

In order to best choose the proper screen for your application, we must first discuss the differences between front and rear projection.

Front Projection:
The method of bouncing or reflecting light off the front surface of the substrate. Light sources can be from a projector, traditional lighting fixture (ellipsoidal's, fresnel's, parcan's) or from intelligent moving lights. The light source and viewer are on the same side of the screen, thus the viewer is looking at reflected light. Matte-white front projection screens are typically designed to evenly maintain image brightness, clarity and contrast across its surface. High-Gain front projection screens (gain value of over 1.0) typically are brighter on center axis than matte white screens and fall off (lose brightness and clarity) at the sides. As with both front and rear projection, controlling ambient light (all light in the space produced by sources other than the screen) will be crucial when trying to maintain image brightness.

Advantages of Front Projection:
1. No need for projector placement behind screen.
2. Bright, evenly illuminated screens.

Disadvantages of Front Projection:
1. Large, light colored surface attracts ambient light.
2. Shadows can be cast by performers and/or scenery.
3. Typically brighter projectors needed when other lighting is on stage (ambient light) at same time projection is on.

Rear Projection:
The method of transmitting light through the surface of the substrate. Light sources can be from a projector, traditional lighting fixture (ellipsoidal's, fresnel's, parcan's) or from intelligent moving lights. The light source is on the opposite side of the viewer, thus the viewer is looking at transmitted light through the projection surface. There are several types of rear projection screens ranging from very bright, narrow viewing areas to very even, wide viewing areas. Several factors must be considered when deciding which rear projection screen to use such as the type of projector being used, the brightness of the projector, projector placement/distance relative to the screen surface, ambient light level, viewing cone needed and color of the screen.

Advantages of Rear Projection:
1. Bright, crisp and high contrast images
2. Ambient light less of a concern as compared to front projection because color is typically grey or black (does not reflect as much light as a light colored surface).
3. No need to worry about shadows cast from projector.
4. Screen tends to disappear when image is not projected due to darker color.

Disadvantages of Rear Projection:
1. Projector placement behind screen - Sometimes space is not available.
2. Some "hot spotting" may occur depending on screen surface used.

General Information

Screen Sizes

Most Gerriets projection screens are custom manufactured to the customer's specification. Our high-frequency welding process allows the production of screen surfaces in almost any shape and size. There is no limit on the width of a screen, but there are practical and physical limitations on height. For screens that are higher than they are wide, we generally recommend reinforced screen materials to prevent "hour-glassing" on the sides and sagging in the middle. Unfortunately, reinforced screen material is only available for front projection screens. The overall weight of the screen should be considered when planning or purchasing a custom size.

OPTITRANS® 100 x 20 m / Opera "Carmen" South Korea

Screen Production

Gerriets employs a state-of-the-art high-frequency welding process to manufacture top-quality, professional projection screens. This process encompasses several steps which produce nearly invisible seams. This method also allows the production of high-gloss vinyl film and other PVC screens. Inflatable screens with air valves are also available.

Embossing

Most of our projection screens have a slight embossing on one side that helps direct the light that is projected on or transmitted through the screen. For both front and rear projection, the embossing should always face the viewer/audience. (The only exception: HIGH GAIN screens, for which the embossing should be on the back so that the smooth, highly reflective side faces the viewer/audience.) An easy way to identify the embossed side of any custom-made Gerriets projection screen is to look for the grommet/eyelet marked with the Gerriets name.

Front Side with Embossing

Rear Side without Embossing
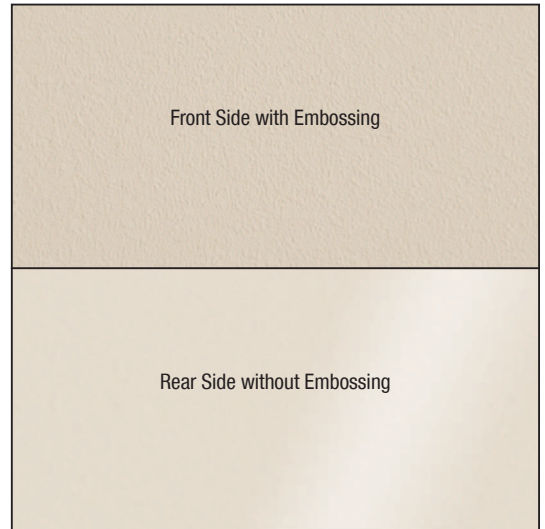
OPERA® creamy white

General Information

Finish

Model 0
Vertically welded panels, no edge finishing.

Model 1
Reinforced (65 mm / 2.55") PVC webbing with grommets (inside diameter 12 mm / 0.47") spaced 200 mm / 8" on center at the top, small (40 mm / 1.57") welded hem on the sides and a 100 mm / 4" pocket on the bottom.

Model 2
Reinforced (65 mm / 2.55") PVC webbing with grommets (inside diameter 12 mm / 0.47") spaced 200 mm / 8" on center on the top and sides, 100 mm / 4" pocket on the bottom.

Model 3
Reinforced (65 mm / 2.55") PVC webbing with grommets (inside diameter 12 mm / 0.47") spaced 200 mm / 8" on center on all sides.

Model 4
Reinforced (65 mm / 2.55") PVC webbing with snaps spaced 200 mm / 8" on center on all sides.
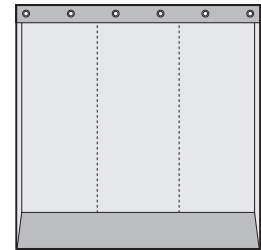
Skirt
Finish as model 1 or 2 with skirt on front side of screen at bottom edge.
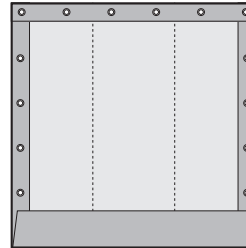
Optional Choices
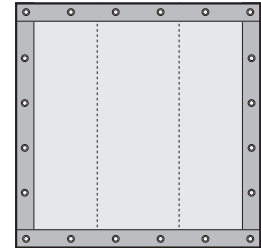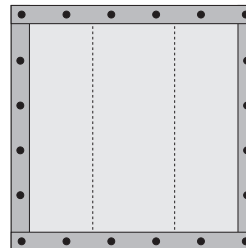Shapes - Circles, Ovals, Trapezoids, Triangles, etc... Velcro
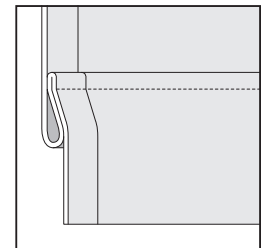
Model 0

Model 1

Model 2

Model 3

Model 4

Skirt

General Information

Mounting Methods

Truss Frame

Aluminium truss
Size: 290 x 290 mm / 12" x 12"
Quick and reliable frame assembly with plug-in type connectors.
Tensioning of screen (with eyelets):
Bungee cord fastener.

Spannfix Bungee Cord:

Length approx.: 270 mm / 11"
Colours:
Art. 4107 0101 white
Art. 4107 0102 black

Hanging

For a projected image to look good, the screen surface must be flat and wrinkle free.
A common misconception is to think that the screen needs to be tensioned on all 4 sides to produce a flat, taught surface.
Gerriets projection screens will hang out flat and wrinkle free in about 8 hours when tied onto a pipe or truss at the top edge and weighted in the bottom with a pipe (typical hanging method for most theatrical drops).
Of course if the screen has an odd shape (circle, triangle, oval), it must be tensioned within a frame system. If there is not a means to hang a screen from the top edge, then a rigid frame system must be used to keep the screen taught to yield the best possible image.

Stapling or Tacking

Usually used to mount smaller size, raw edge screen to flats or wooden frames to be integrated into scenery or exhibits.

290
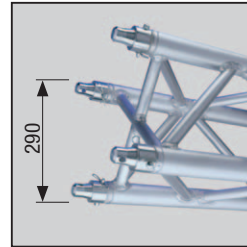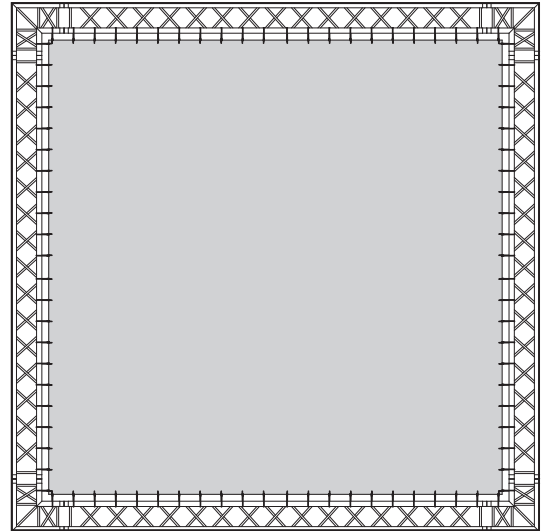
Spannfix Bungee Cord
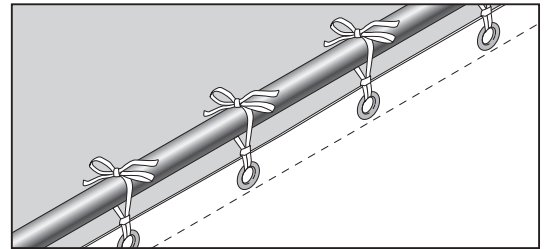
General Information

**What Screen
Do I Use?**

First Question: Am I doing Front or Rear Projection?

Once you decide, your choices become a little easier.

Other Factors That Should Be Considered When Selecting the Screen:

- **What kind of projector / lighting fixtures am I using?**
1. Video Projector
2. Scenic Projector
3. Digital Projector
4. Moving Lights
5. Traditional Theatrical Lighting

- **Am I doing Edge Blending?**
1. Front projected edge blending
2. Rear projected edge blending

- **Is Gain important?**
1. Gain is the ability for the screen to gather light. Technically, it's not a measure of brightness, but the higher the gain of the screen, the brighter the image. It also needs to be considered if edge blending will be used. Generally when edge blending on a rear projection screen, a lower gain screen (1 or less) is best to achieve an even, smooth appearance.

- **What viewing angle to I need?**
1. Is the audience seated in a narrow viewing cone or a wide viewing cone?
2. General Rule: The higher the screen gain, the narrower the viewing cone.

- **Is the physical color of the screen important for the production value?**
1. Does the screen need to blend into the color of the scenic treatment?
2. Does the screen want to be a darker color to "disappear" when it's not being used?
3. Generally the lighter the color of the screen, the more ambient light it reflects and the harder it is to "go away".
4. Generally the darker the color of the screen, the easier it is to visually have it "disappear" when not in use.
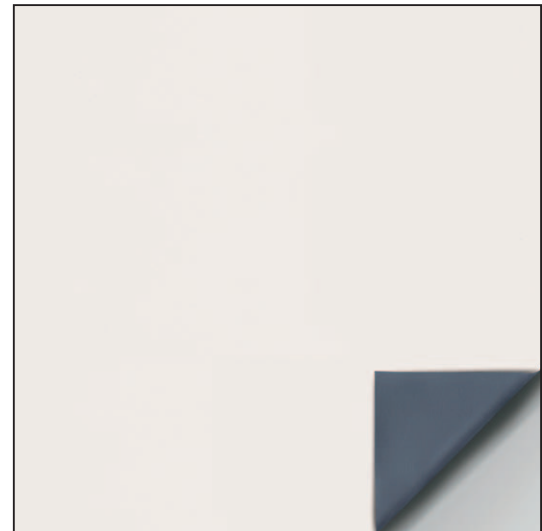
1.1 Front Projection Screens

GAMMALUX® screen, 5,5 m x 5,5 m (18' h x 18' w) / Frankfurt Book Fair 2012   Photo: Uniplan
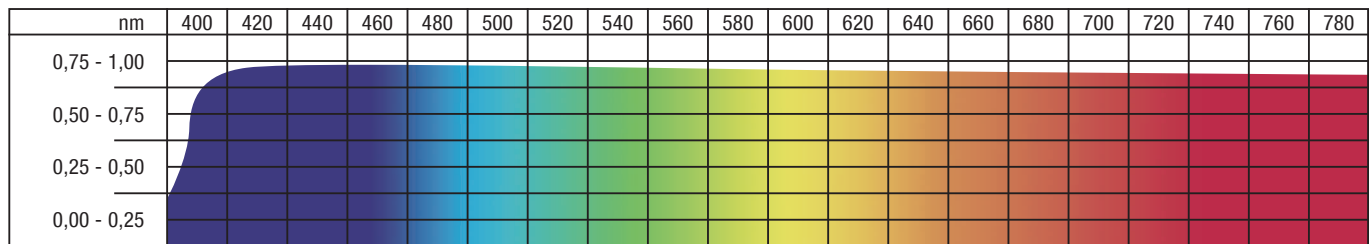
1.1 Front Projection

GAMMALUX®
Art. 2111 0000

Base material:	PVC
Colour:	white, rear: grey
Flame retardant per:	
• European norm	EN 13501-1 B-s3, d0
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	75"
Weight approx.:	12.68 oz/yd^2
Thickness approx.:	12 mil
Roll length approx.:	218.7 yds
Seaming possible:	yes
Application:	
• Front projection	
Screen type:	D
Opaque:	yes
Packing method:	
• Folded; rolled on request.	

Colour Spectrum Degree of Reflection

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				

Front Projection

• Gain: 0.97

GAMMALUX® is a light weight dual laminated PVC front projection screen with a gain of 0.97 and has an opaque grey backing. It works well for all front projection applications and has good edge blending characteristics. It is most often used on snap style frame systems and lace and grommet truss frames. Due to its opacity it can be used in front of large windows with no bleed through of unwanted light. Once tensioned, wrinkles and creases fall out nicely because of its elasticity.
As an added benefit, the grey backing surface can be used to project when darker black levels or higher contrast is needed such as in text presentations. Please note that on the grey side there is no surface embossing to disperse the light.

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,90	0,92	0,94	0,97	0,94	0,92	0,90

Gain (DIN 19045), horizontal ●

Viewing angle in degrees 👁

SCREENS

8
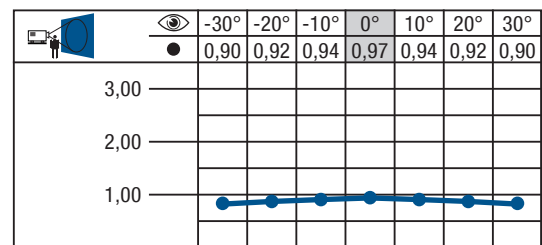
1.1 Front Projection

GAMMALUX® MICRO
Art. 2111 2000

Base material:	PVC
Colour:	white, rear: grey
Flame retardant per:	
• European norm	EN 13501-1 B-s3, d0
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	75"
Weight approx.:	12.68 oz/yd^2
Thickness approx.:	12 mil
Roll length approx.:	218.7 yds
Seaming possible:	yes
Application:	
• Front projection	
Screen type:	D
Opaque:	no
Perforation area:	6 %
Perforation count:	195/in^2
Perforation diameter:	0.50 mm
Packing method:	
• Folded; rolled on request.	

Colour Spectrum Degree of Reflection

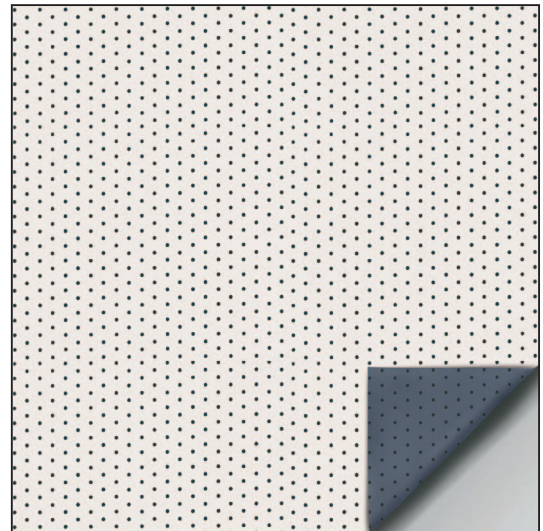| nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
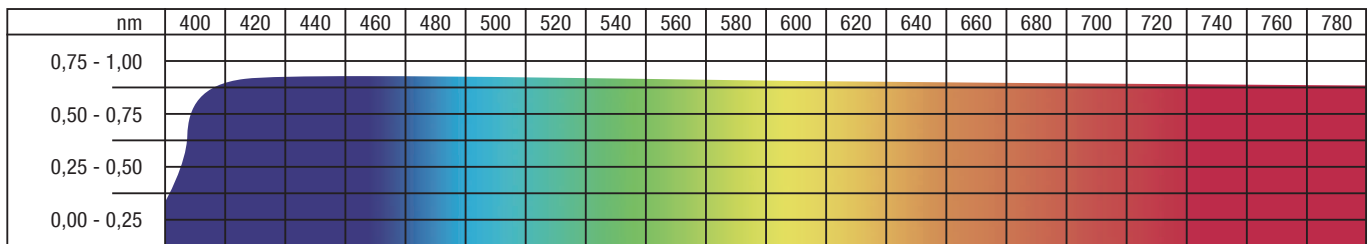
Front Projection

• Gain: 0.95

GAMMALUX® MICRO is a micro-perforated light weight dual laminated PVC front projection screen with a gain of 0.95 and has an opaque grey backing. It works well for all front projection applications and has good edge blending characteristics. With 300,000 holes (0,50 mm diameter) per square meter (195 per square inch) and a perforation area of 7%, it works very well to allow the passage of sound through the screen in the medium to high frequencies. Lower frequencies pass through the PVC naturally. A perfect solution when a perforated screen is needed in close viewing applications such as in screening rooms and home cinemas. When a higher contrast micro-perforated screen is required, the rear side of GAMMALUX® MICRO can be used but there is no embossing on the grey surface to disperse the light. It is most often used on snap style frame systems and lace and grommet truss frames. Once tensioned, wrinkles and creases fall out nicely because of its elasticity.

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,88	0,90	0,92	0,95	0,92	0,90	0,88
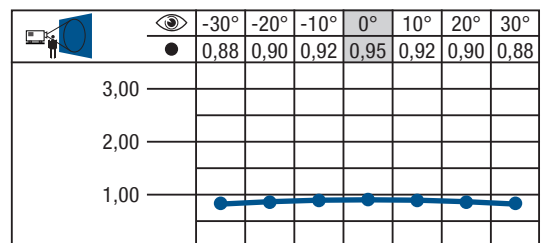
Gain (DIN 19045), horizontal

Viewing angle in degrees

1.1 Front Projection

SCENE
Art. 2113 0000

Base material:	PVC
Colour:	white, rear: black
Flame retardant per:	
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	83"
Weight approx.:	17.14 oz/yd^2
Thickness approx.:	16 mil
Roll length approx.:	218.7 yds
Seaming possible:	yes
Application:	
• Front projection	
Screen type:	D
Opaque:	yes
Packing method:	
• Folded; rolled on request.	

Colour Spectrum Degree of Reflection

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
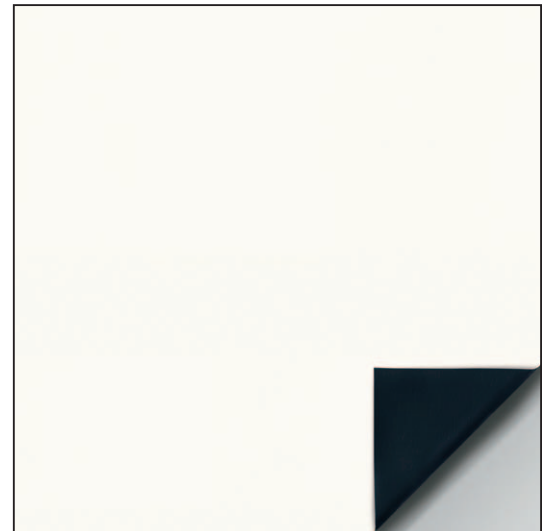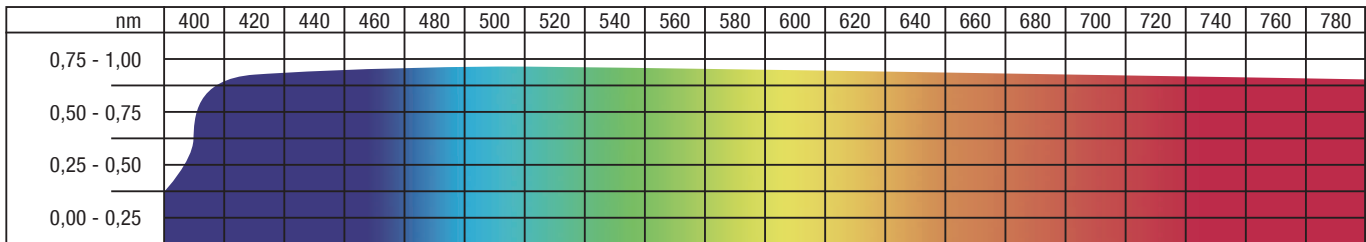
Front Projection

• Gain: 0.96

SCENE is an opaque, dual laminated, heavy-duty front projection screen with a matte white front surface and a black rear surface. With a gain of 0.96, it has a flat viewing cone and works very well for most front projection applications including edge blending due to its dimensional stability it works well when paired with our TUBE carbon fiber top roller system and our carbon fiber bottom roller MEGASCREEN systems. However, in any top roller application the possibility of wrinkles may occur. It also is a good choice for a "lace and grommet" style screen when tensioned within a rigid frame system such as an aluminum truss. Because the back side is a smooth uniform surface, the color black can be used as a special effects front projection surface.

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,86	0,90	0,94	0,96	0,94	0,90	0,86
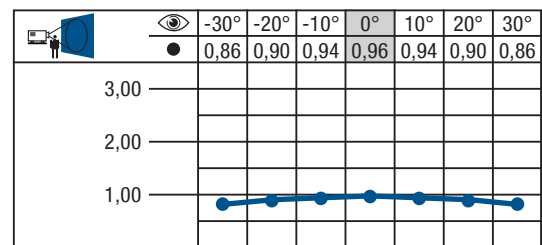
Gain (DIN 19045), horizontal   ●

Viewing angle in degrees   👁

1.1 Front Projection

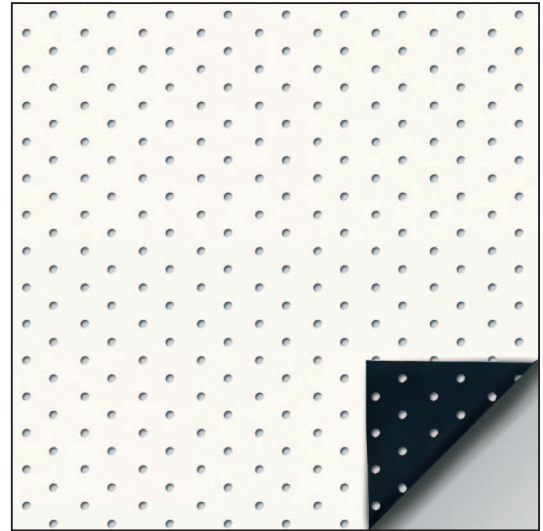**SCENE perforated**
Art. 2113 1000

Base material:	PVC
Colour:	white, rear: black
Flameproofed to:	
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	83"
Weight approx.:	17.14 oz/yd^2
Thickness approx.:	16 mil
Roll length approx.:	218.7 yds
Welding possibility (seaming):	yes
Application:	
• Front projection	
Screen type:	D
Opaque:	no
Perforation area:	7 %
Perforation count:	37/in^2
Perforation diameter:	1.25 mm
Packing method:	
• Folded; rolled on request.	

Colour Spectrum Degree of Reflection

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
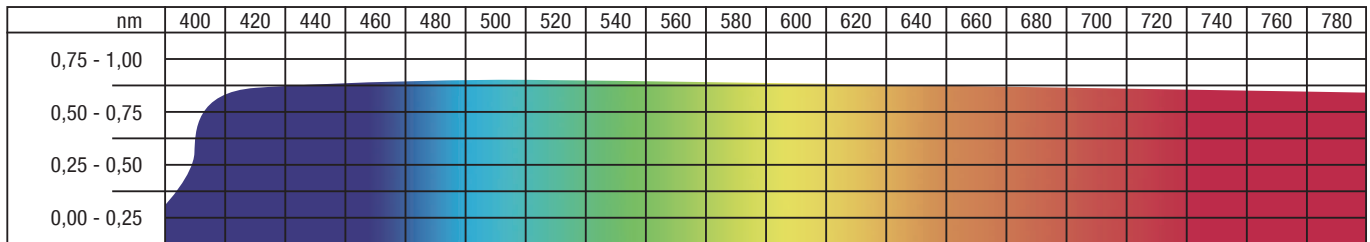
Front Projection

• Gain: 0.88

SCENE Perforated is an ideal screen when a heavy-duty, durable front projection screen is required. Due to the perforation diameter of 1.23 mm and 50,000 holes per square meter, it allows the passage of medium to high frequency sound to pass easily.
Lower frequencies pass naturally through the PVC surface. It has a 7% perforation area which means that when viewed at distances as close as 2 m, it appears to be a flat, non-perforated screen. If light comes from behind the screen it will have a semitransparent quality to it making useful on stage as a special effects projection scrim. With its Gain of 0.88, it's the perfect choice for cinema applications.

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,80	0,84	0,86	0,88	0,86	0,84	0,80
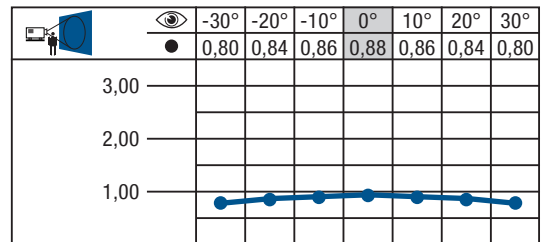
Gain (DIN 19045), horizontal

Viewing angle in degrees

1.1 Front Projection

GREYSCREEN
Art. 2114 0000

Base material:	PVC
Colour:	grey
Flame retardant per:	
• European norm	EN 13501-1 B-s3, d0
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	83"
Weight approx.:	13.10 oz/yd^2
Thickness approx.:	12 mil
Roll length approx.:	218.7 yds
Seaming possible:	yes
Application:	
• Front projection	
Screen type:	D
Opaque:	no
Packing method:	
• Folded; rolled on request.	

Colour Spectrum Degree of Reflection

| nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
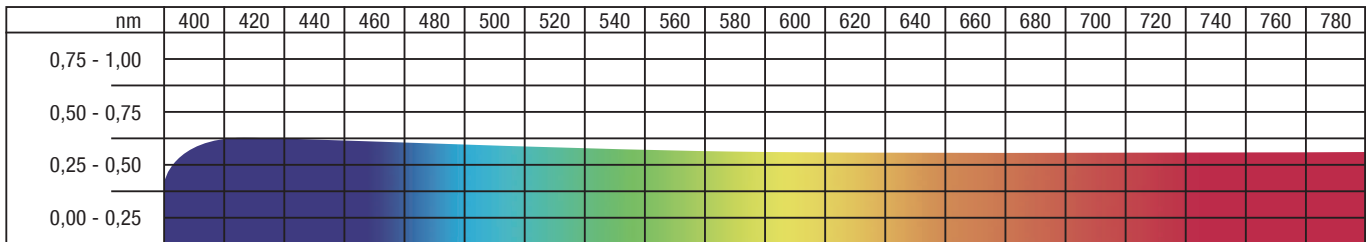
Front Projection

• Gain: 0.61

GREYSCREEN is an ideal screen when the objective is higher contrast. Due to its matte neutral grey color and gain of 0.61, its nearly opaque quality and lower luminance factor works well to boost color contrast and limit the amount of stray unwanted reflective ambient light.
Applications include brighter environments such as conference rooms and lobby spaces

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,45	0,49	0,55	0,61	0,55	0,49	0,45

3,00	
2,00	
1,00	
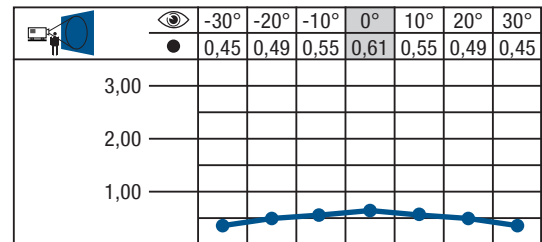
Gain (DIN 19045), horizontal ●

Viewing angle in degrees 👁

1.1 Front Projection

OPERA® white
Art. 2115 0000

Base material:	PVC
Colour:	white
Flame retardant per:	
• European norm	EN 13501-1 B-s3, d0
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	80"
Weight approx.:	11.50 oz/yd^2
Thickness approx.:	12 mil
Roll length approx.:	328.1 yds
Seaming possible:	yes
Application:	
• Front projection	
Screen type:	D
Opaque:	no
Packing method:	
• Folded; rolled on request.	

Colour Spectrum Degree of Reflection

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
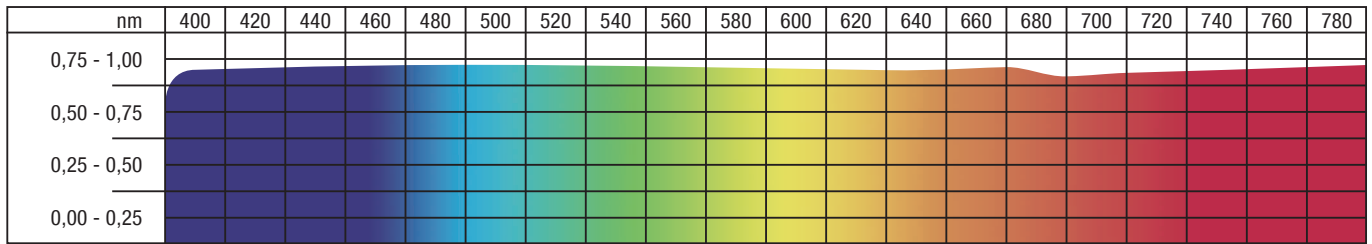
Front Projection

• Gain: 0.98

OPERA® White is an excellent all-purpose affordable front projection screen with a gain of 0.98. With its flat viewing cone and embossed front surface, images are bright and even across the entire surface and works very well for edge blending applications.
As with all our screens in the "OPERA" family, they are well established in the market for over 40 years and have a proven and reliable reputation.

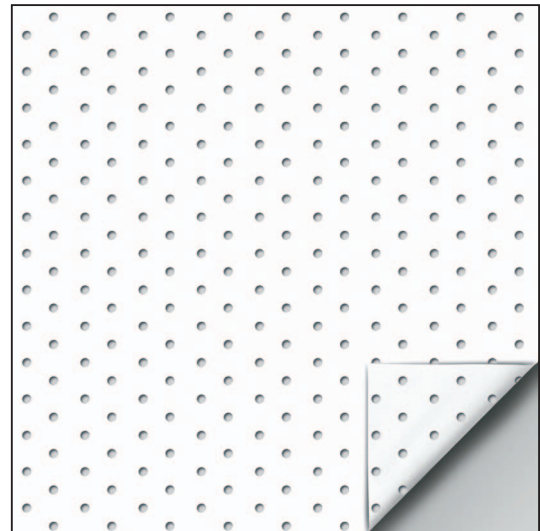| 👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,83	0,87	0,93	0,98	0,93	0,87	0,83

3,00
2,00
1,00
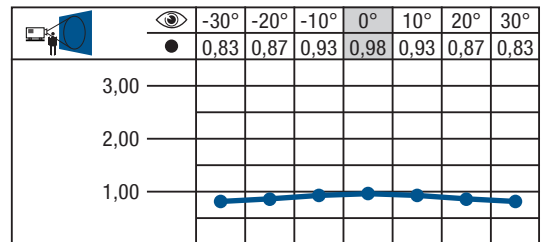
Gain (DIN 19045), horizontal   ●

Viewing angle in degrees   👁

1.1 Front Projection

OPERA® white perforated
Art. 2115 1000

Base material:	PVC
Colour:	white
Flame retardant per:	
• European norm	EN 13501-1 B-s3, d0
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	78"
Weight approx.:	11,50 oz/yd^2
Thickness approx.:	12 mil
Roll length approx.:	328.1 yds
Seaming possible:	yes
Application:	
• Front projection	
Screen type:	D
Opaque:	no
Perforation area:	7 %
Perforation count:	37/in^2
Perforation diameter:	1.25 mm
Packing method:	
• Folded; rolled on request.	

Colour Spectrum Degree of Reflection

| nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
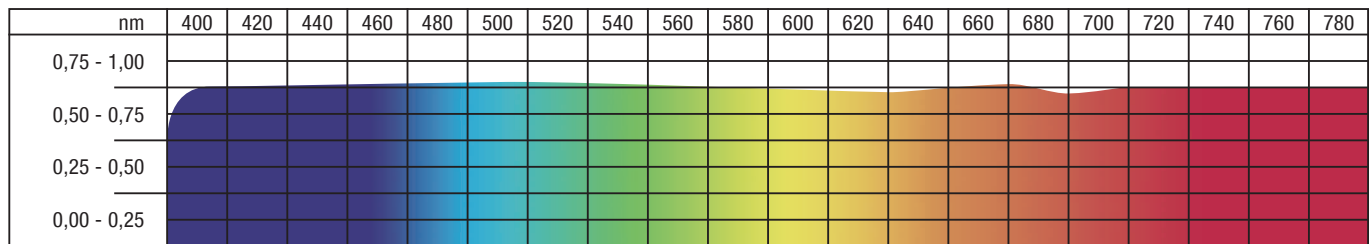
Front Projection

• Gain: 0.90.

OPERA® White Perforated is an ideal screen when an economical perforated front projection screen is required.
Due to the perforation diameter of 1.23 mm and 50,000 holes per square meter, it allows the passage of medium to high frequency sound to pass easily. Lower frequencies pass naturally through the PVC surface. It has a 7% perforation area which means that when viewed at distances as close as 2 m (6'6"), it appears to be a flat, non-perforated screen. If light comes from behind the screen it will have a semi-transparent quality to it making useful on stage as a special effects projection scrim. With its Gain of 0.98, it's the perfect choice for cinema applications.
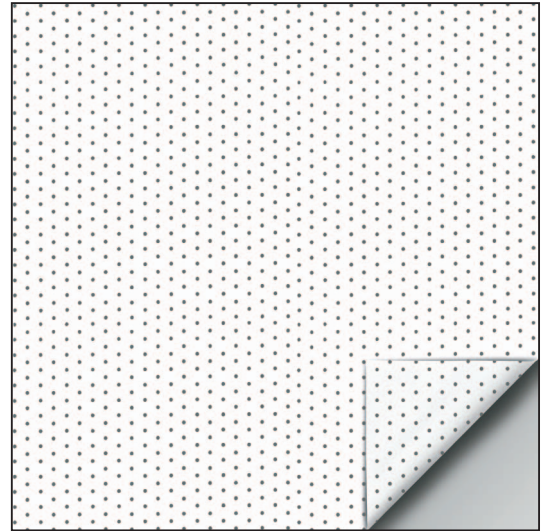
👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,80	0,83	0,87	0,90	0,87	0,83	0,80
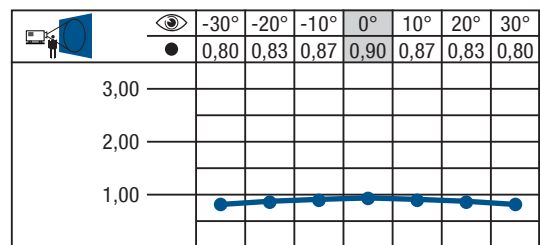
Gain (DIN 19045), horizontal ●

Viewing angle in degrees 👁

1.1 Front Projection

OPERA® white microperforated
Art. 2115 2000

Base material:	PVC
Colour:	white
Flame retardant per:	
• European norm	EN 13501-1 B-s3, d0
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	79"
Weight approx.:	11.50 oz/yd^2
Thickness approx.:	12 mil
Roll length approx.:	328.1 yds
Seaming possible:	yes
Application:	
• Front projection	
Screen type:	D
Opaque:	no
Perforation area:	6 %
Perforation count:	195/in^2
Perforation diameter:	0.50 mm
Packing method:	
• Folded; rolled on request.	

Colour Spectrum Degree of Reflection

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
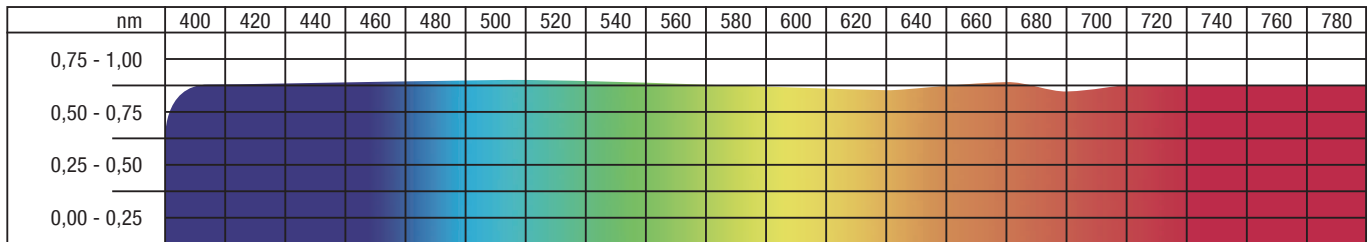
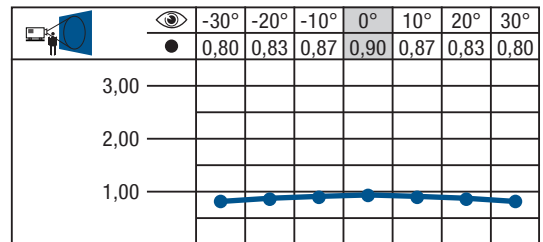**Front Projection**

• Gain: 0.90

OPERA® White Microperforated screen is a micro-perforated light weight PVC front projection screen.
It works well for all front projection applications and has good edge blending characteristics. With 300.000 holes (0,50 mm diameter) per square meter (195 per square inch) and a perforation area of 7%, it works very well to allow the passage of sound though the screen in the medium to high frequencies. Lower frequencies pass through the PVC naturally.
A perfect solution when a perforated screen is needed in close viewing applications such as in screening rooms and home cinemas.

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,80	0,83	0,87	0,90	0,87	0,83	0,80

Gain (DIN 19045), horizontal

Viewing angle in degrees

1.1 Front Projection

HIGH GAIN
Art. 2126 0000

Base material:	PVC
Colour:	pearl
Flameproofed to:	
• European norm	EN 13501-1 B-s3, d0
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	82"
Weight approx.:	12.98 oz/yd^2
Thickness approx.:	15 mil
Roll length approx.:	218.7 yds
Welding possibility (seaming):	yes
Application:	
• Front projection	
Screen type:	D
Opaque:	no
Packing method:	
• Folded, rolled on request.	

Colour Spectrum Degree of Reflection

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
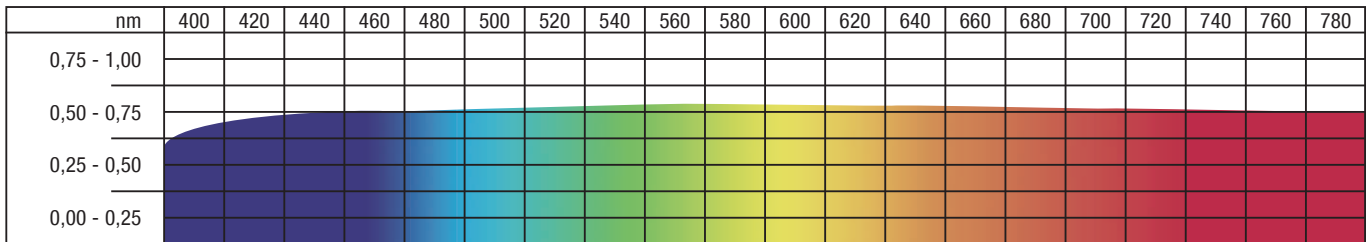
Front Projection

• Gain: 1.89

HIGH GAIN is a specialized screen with a surface finish that optically enhances the brightness of the reflected light in front projection applications and diffuses light very well in rear projection applications.
With a high luminance factor of 1.89, it should be used in front projection applications when the audience has a relatively narrow field of view.
In rear projection applications it works very well as an edge blending screen

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,70	0,95	1,35	1,89	1,35	0,95	0,70

3,00	
2,00	
1,00	
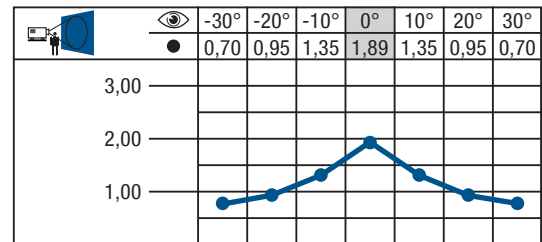
Gain (DIN 19045), horizontal ●

Viewing angle in degrees 👁

1.2 Front & Rear Projection Screens

EVEN Projection Screen, 71 m x 7,96 m (233' w x 26' h) / Bayer AG Annual corporate meeting event   Photos: Bayer AG
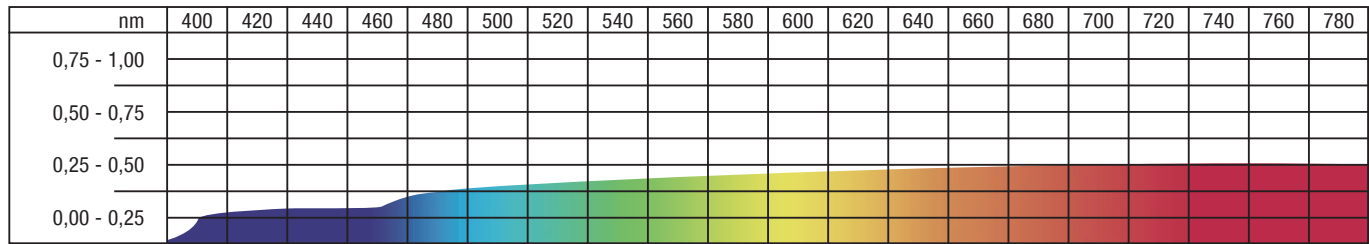
1.2 Front and Rear Projection

**OPERA®
creamy white**
Art. 2121 0000

Base material:	PVC
Colour:	translucent, creamy white
Flameproofed to:	
• European norm	EN 13501-1 B-s3, d0
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	80"
Weight approx.:	11.50 oz/yd^2
Thickness approx.:	12 mil
Roll length approx.:	328.1 yds
Welding possibility (seaming):	yes
Application:	
• Front projection	
• Rear projection	
Screen type:	D / R
Opaque:	no
Packing method:	
• Folded, rolled on request.	

Colour Spectrum Degree of Transmission

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				

Front and Rear Projection

• Front Projection: Gain: 0.77
• Rear Projection: Gain: 0.32

OPERA® Creamy White is our classic front and rear projection screen that was developed over 45 years ago in collaboration with Josef Svoboda, the famed Czech scenographer, for the Opera Garnier. Still to this day, it is the standard that all other front and rear screens are measured against. It represents great value as it combines both front and rear projection and lighting possibilities that give the designer limitless choices for layering light and creating stunning visual images. It has a nearly even light distribution and no "hot-spotting" when rear illuminated. Applications include full stage illuminated and projected backdrops as well as good rear projected edge blending properties due to its rear gain of 0.32.
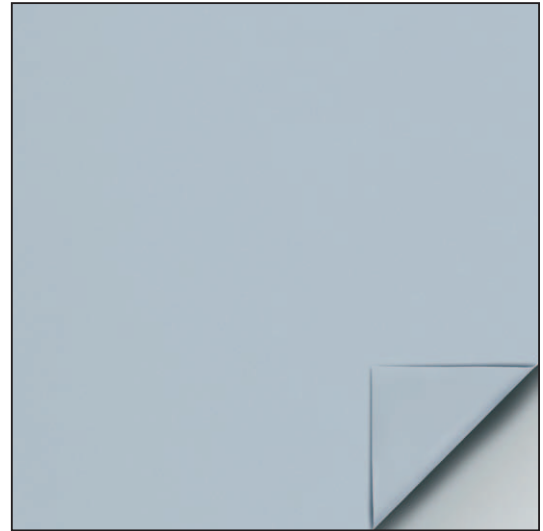
	-30°	-20°	-10°	0°	10°	20°	30°
	0,66	0,70	0,74	0,77	0,74	0,70	0,66

3,00
2,00
1,00

	-30°	-20°	-10°	0°	10°	20°	30°
	0,31	0,31	0,32	0,32	0,32	0,31	0,31

3,00
2,00
1,00
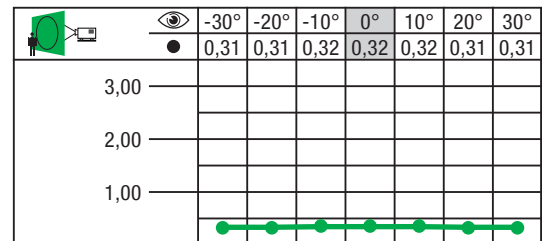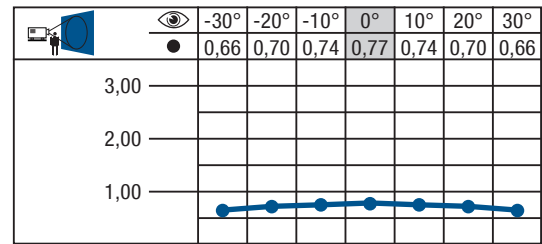
Gain (DIN 19045), horizontal ●

Viewing angle in degrees 👁

1.2 Front and Rear Projection

OPERA® grey blue
Art. 2122 0000

Base material:	PVC
Colour:	translucent, grey blue
Flame retardant per:	
• European norm	EN 13501-1 B-s3, d0
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	80"
Weight approx.:	11.50 oz/yd^2
Thickness approx.:	12 mil
Roll length approx.:	328.1 yds.
Seaming possible:	yes
Application:	
• Front projection	
• Rear projection	
Screen type:	D / R
Opaque:	no
Packing method:	
• Folded; rolled on request.	

Colour Spectrum Degree of Transmission

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
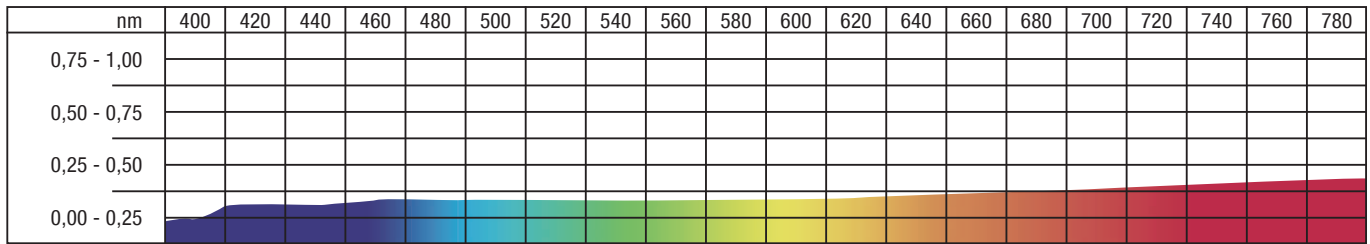
Front and Rear Projection

• Front Projection: Gain: 0.49
• Rear Projection: Gain: 0.26

OPERA® Grey Blue has the same quality and characteristics as our classic OPERA® Creamy White but with a slightly cooler color temperature. Its front projection image quality is slightly less bright but the viewing angle remains equally as good.
As a rear projection screen, the gain (0.26) is slightly less than OPERA® Creamy White, but works very well in edge blending applications.
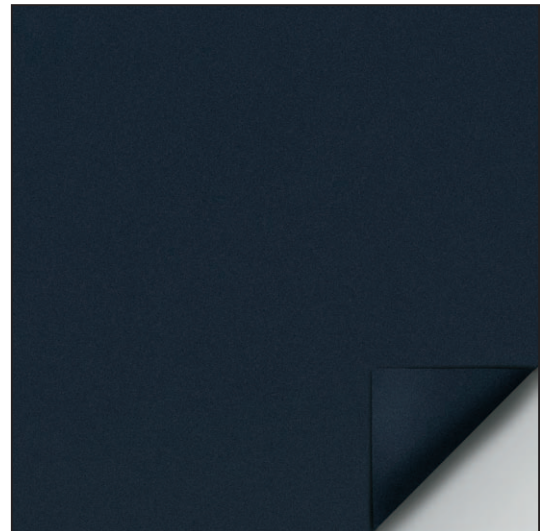
	-30°	-20°	-10°	0°	10°	20°	30°
●	0,41	0,44	0,46	0,49	0,46	0,44	0,41

	-30°	-20°	-10°	0°	10°	20°	30°
●	0,25	0,25	0,25	0,26	0,25	0,25	0,25
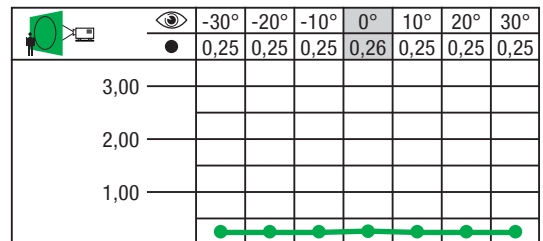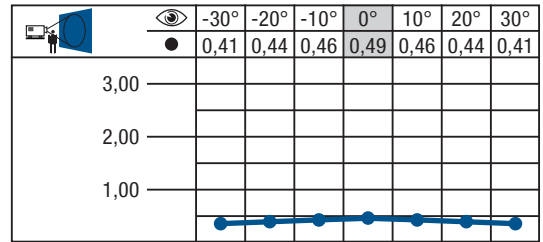
Gain (DIN 19045), horizontal

Viewing angle in degrees

1.2 Front and Rear Projection

SHOW®
Art. 2123 0000

Base material:	PVC
Colour:	translucent, black
Flameproofed to:	
• European norm	EN 13501-1 B-s3, d0
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	80"
Weight approx.:	11.50 oz/yd^2
Thickness approx.:	0.30 mil
Roll length approx.:	328.1 yds
Welding possibility (seaming):	yes
Application:	
• Front projection	
• Rear projection	
Screen type:	D / R
Opaque:	no
Packing method:	
• Folded, rolled on request.	

Colour Spectrum Degree of Transmission

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
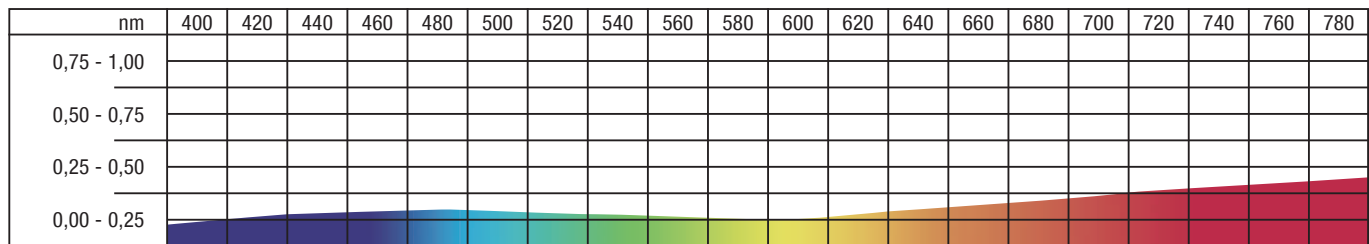
Front and Rear Projection

• Front Projection: Gain: 0.14
• Rear Projection: Gain: 1.25

SHOW is a nearly black rear projection screen with limited front projection capabilities. Due to its dark color, it absorbs unwanted stray ambient light very well thus producing brilliant color contrast and depth of field. It has a narrow field of view and can "hot-spot" when illuminated from behind with a strong light source.
Due to its dark color, it is most often used as an effects screen for laser projections and in rear projected applications when the screen wants to "disappear" when not projected upon. Not recommended for edge blending. Rear screen gain is 1.25.

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,07	0,10	0,13	0,14	0,13	0,10	0,07

(3,00 / 2,00 / 1,00)

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,11	0,26	0,66	1,25	0,70	0,26	0,11

(3,00 / 2,00 / 1,00)
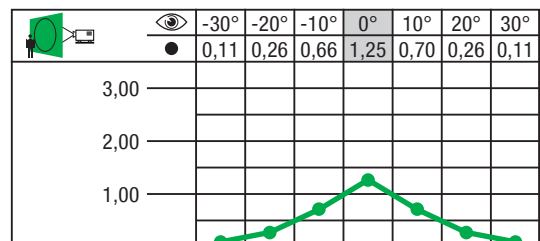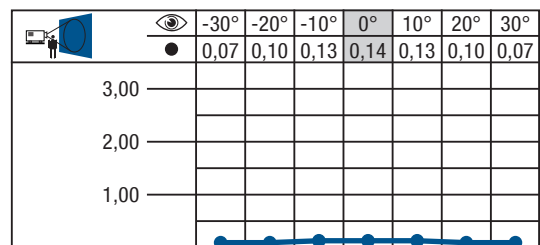
Gain (DIN 19045), horizontal   ●

Viewing angle in degrees   👁

1.2 Front and Rear Projection

STUDIO®
Art. 2124 0000

Base material:	PVC
Colour:	grey
Flame retardant per:	
• European norm	EN 13501-1 B-s3, d0
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	80"
Weight approx.:	11.50 oz/yd^2
Thickness approx.:	12 mil
Roll length approx.:	328.1 yds
Seaming possible:	yes
Application:	
• Front projection	
• Rear projection	
Screen type:	D / R
Opaque:	no
Packing method:	
• Folded; rolled on request.	

Colour Spectrum Degree of Transmission

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
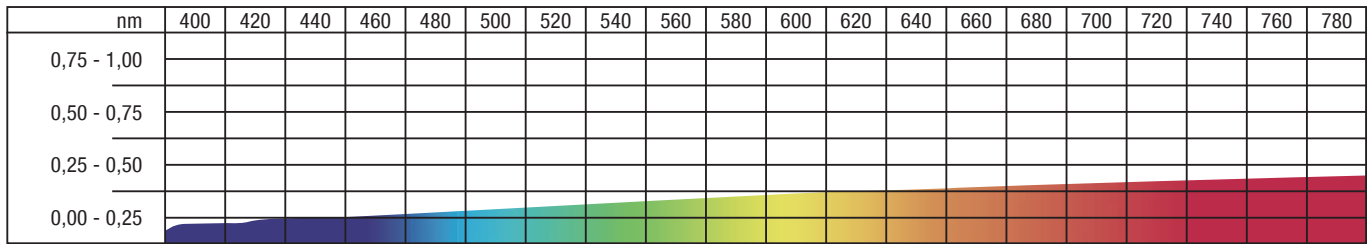
Front and Rear Projection

• Front Projection: Gain: 0.31
• Rear Projection: Gain: 0.24

STUDIO® is a good all-purpose neutral grey rear projection screen originally developed for theatrical use onstage.
It is an affordable screen as it works very well for rear illuminated color washed backdrops with some front projection capabilities.
Due to its light scattering quality, it is well suited for rear projected edge blending applications.

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,23	0,26	0,29	0,31	0,29	0,26	0,23

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,19	0,21	0,24	0,24	0,24	0,21	0,19
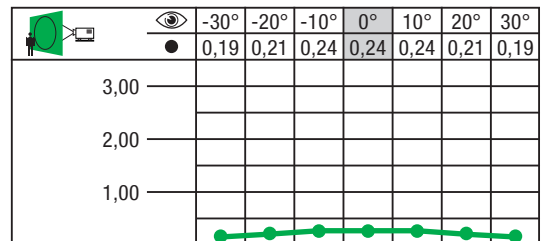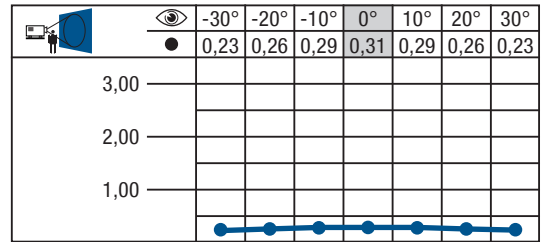
Gain (DIN 19045), horizontal   ●

Viewing angle in degrees   👁

1.2 Front and Rear Projection

REVUE
Art. 2125 0000

Base material:	PVC
Colour:	translucent, frosted

Flame retardant per:
- European norm — EN 13501-1 B-s3, d0
- German norm — DIN 4102 B1
- USA norm — NFPA 701

Width approx.:	80"
Weight approx.:	11.50 oz/yd^2
Thickness approx.:	12 mil
Roll length approx.:	328.1 yds
Seaming possible:	yes

Application:
- Front projection
- Rear projection

Screen type:	D / R
Opaque:	no

Packing method:
- Folded; rolled on request.

Colour Spectrum Degree of Transmission

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
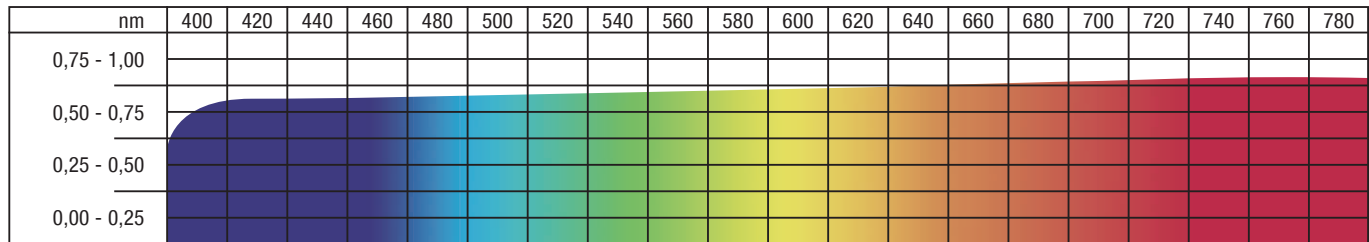
Front and Rear Projection

- Front Projection: Gain: 0.67
- Rear Projection: Gain: 6.21

REVUE is a frosted transparent front and rear projection screen which is ideal as a diffusion screen in front of low definition LED screens or as an effect screen in theatrical applications. Due to its very narrow viewing cone and high gain, it works well in rear projected applications in high ambient light conditions such as daylight. In lower light conditions such as interior spaces or stage, it tends to "hotspot" when rear projected and thus consideration must be given to the lumen output of the source to avoid excessive " hot-spotting". Other applications include diffusers under lighting fixtures or ceiling elements and as a rear illuminated digital print.

	-30°	-20°	-10°	0°	10°	20°	30°
●	0,19	0,23	0,40	0,67	0,40	0,23	0,19

	-30°	-20°	-10°	0°	10°	20°	30°
●	0,59	1,01	2,98	6,21	2,98	1,01	0,59
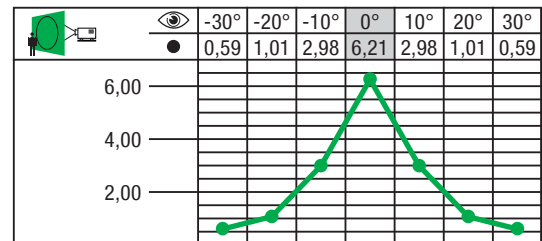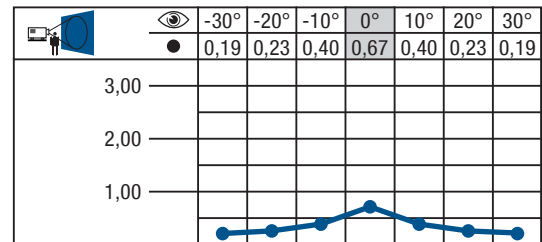
Gain (DIN 19045), horizontal   ●

Viewing angle in degrees

1.2 Front and Rear Projection

EVEN
Art. 2127 0000

Base material:	PVC
Colour:	white
Flame retardant per:	
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	83"
Weight approx.:	13 oz/yd^2
Thickness approx.:	15 mil
Roll length approx.:	218.7 yds
Seaming possible:	yes
Application:	
• Front projection	
• Rear projection	
Screen type:	D / R
Opaque:	no
Packing method:	
• Folded; rolled on request.	

Colour Spectrum Degree of Transmission

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
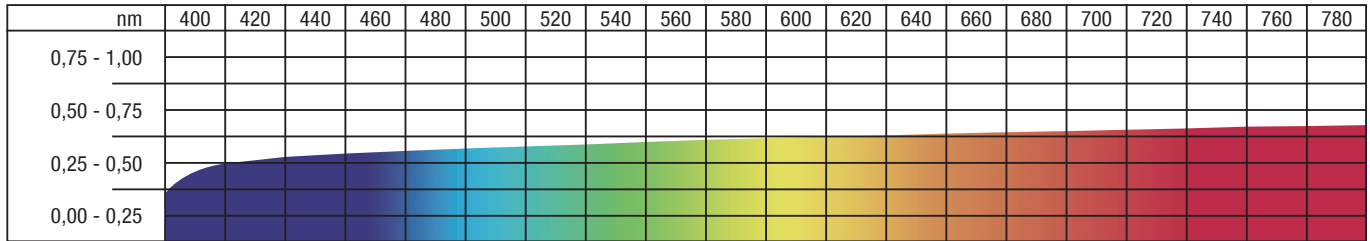
Front and Rear Projection

• Front Projection: Gain: 0.55
• Rear Projection: Gain: 0.58

EVEN is a front and rear projection screen with a flat viewing cone and nearly identical luminance on both front and rear surfaces. As compared to OPERA® Creamy White and OPERA® Grey Blue, it is a brighter screen due to its higher gain of 0.58 and, due to its diffuse white color, is well suited for edge blending applications. It has been used extensively in museum applications and other public viewing exhibitions where the viewer sees both sides of the screen.

	-30°	-20°	-10°	0°	10°	20°	30°
●	0,50	0,52	0,54	0,55	0,54	0,52	0,50

	-30°	-20°	-10°	0°	10°	20°	30°
●	0,53	0,55	0,57	0,58	0,57	0,55	0,53
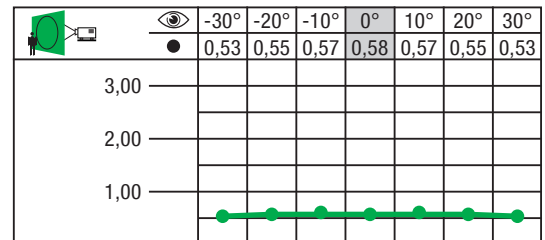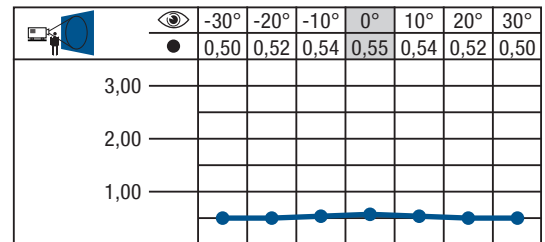
Gain (DIN 19045), horizontal

Viewing angle in degrees

1.3 Rear Projection Screens

OPTITRANS Projection Screen, 100 m x 20 m (328' w x 65' h) / Open Air Production of Opera "CARMEN", Seoul Olympic Stadium   Photos: Gerriets

1.3 Rear Projection

OPTIBLACK
Art. 2128 0000

Base material:	PVC
Colour:	black
Flameproofed to:	
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	84"
Weight approx.:	12.21 oz/yd^2
Thickness approx.:	12 mil
Roll length approx.:	218.7 yds
Welding possibility (seaming):	yes
Application:	
• Rear projection	
Screen type:	R
Opaque:	no
Packing method:	
• Folded, rolled on request.	

Colour Spectrum Degree of Reflection

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
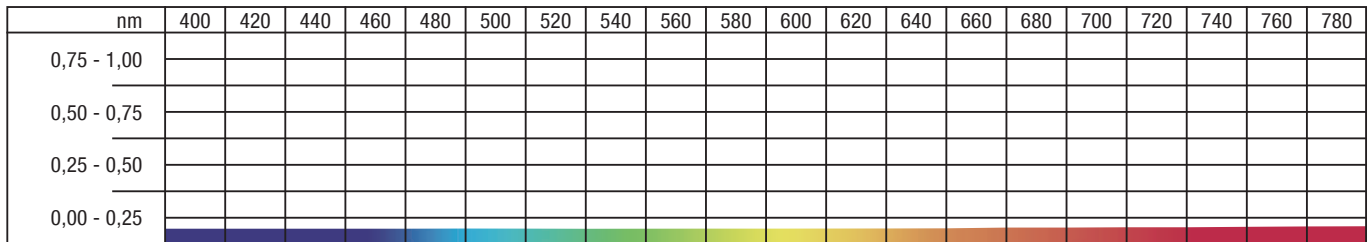
Rear Projection

• Gain: 0.27

OPTIBLACK is a dark colored rear projection screen with a gain of 0.27. It has excellent diffusion properties making it ideally suited for rear projected edge blending applications. Due to its dark color, it "disappears" when projection is off and "magically reappears" when projection is turned back on. Not intended for front projection

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,19	0,23	0,26	0,27	0,26	0,21	0,19
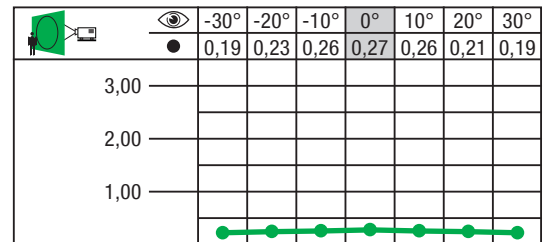
Gain (DIN 19045), horizontal

Viewing angle in degrees

1.3 Rear Projection

PANORAMA
Art. 2131 0000

Base material:	PVC
Colour:	grey
Flame retardant per:	
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	120"
Weight approx.:	9.91 oz/yd^2
Thickness approx.:	11 mil
Roll length approx.:	99.5 yds
Seaming possible:	yes
Application:	
• Rear projection	
Screen type:	R
Opaque:	no
Packing method:	
• Folded; rolled on request.	
Please note: folding may cause crazing (small white crease marks).	

Colour Spectrum Degree of Transmission

| nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
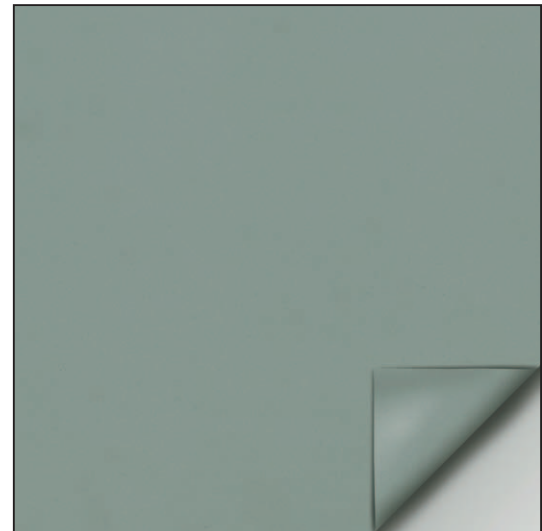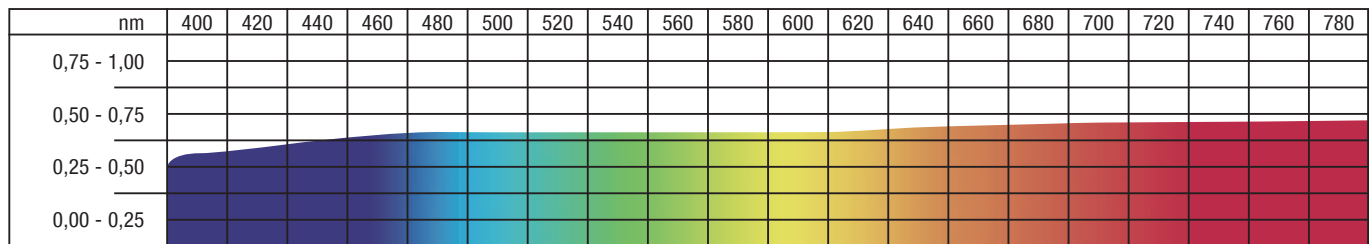
Rear Projection

• Gain: 2.42

PANORAMA is a wide width grey rear projection screen yielding bright images.
Due to its 305 cm (120") width, it is a good choice for exhibition displays in close up viewing scenarios with no seams.
Not recommended for edge blending applications and care should be considered when selecting lumen output of projectors as this screen will "hot-spot" at too close of a range due to its higher gain of 2.42.

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,58	1,19	1,85	2,42	1,85	1,19	0,58
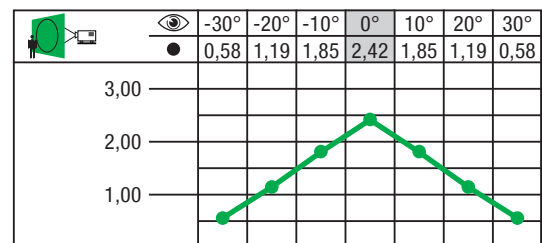
Gain (DIN 19045), horizontal ●

Viewing angle in degrees 👁

1.3 Rear Projection

OPTITRANS®
Art. 2132 0000

Base material:	PVC
Colour:	grey
Flameproofed to:	
• European norm	EN 13501-1 B-s3, d0
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	84"
Weight approx.:	11.80 oz/yd^2
Thickness approx.:	12 mil
Roll length approx.:	218.7 yds
Welding possibility (seaming):	yes
Application:	
• Rear projection	
Screen type:	R
Opaque:	no
Packing method:	
• Folded, rolled on request.	

Please note: small white crease marks may occur when folded.

Colour Spectrum Degree of Transmission

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
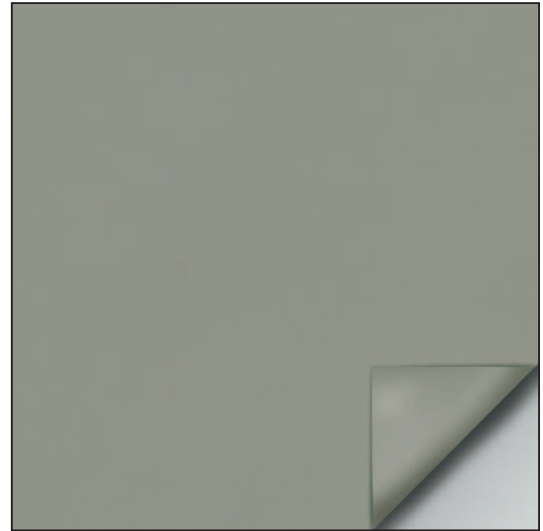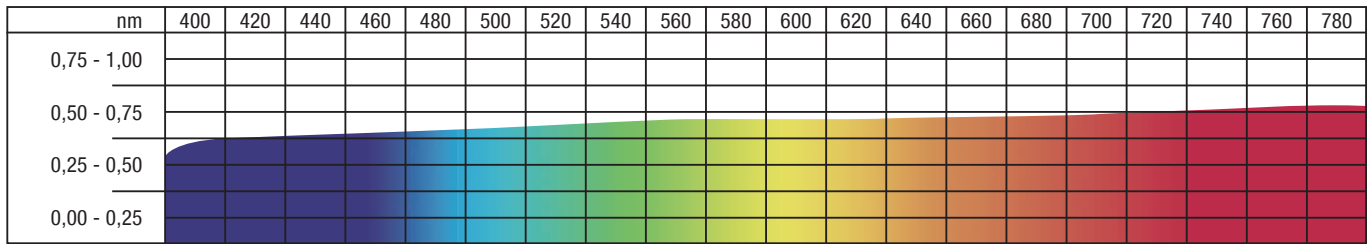
Rear Projection

• Gain: 1.61

OPTITRANS® is an excellent quality rear projection screen that yields bright images within a fairly wide viewing cone.
It has very good diffusion qualities and still maintains good color contrast. It works impressively well for large scale projection producing stunning results. Suitable for edge blending but sufficient distance must be used. It's also a good choice for weaker projectors, still producing nice results due to its higher luminance factor (Gain 1.61).

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,79	1,09	1,46	1,61	1,46	1,09	0,79
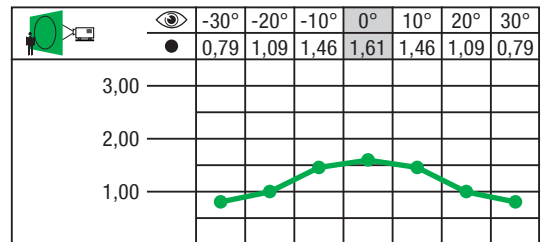
Gain (DIN 19045), horizontal

Viewing angle in degrees

1.3 Rear Projection

OPTILUX
Art. 2133 0000

Base material:	PVC
Colour:	grey
Flame retardant per:	
• European norm	EN 13501-1 B-s3, d0
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	83"
Weight approx.:	12.21 oz/yd^2
Thickness approx.:	12 mil
Roll length approx.:	218.7 yds
Seaming possible:	yes
Application:	
• Rear projection	
Screen type:	R
Opaque:	no
Packing method:	
• Folded; rolled on request.	

Please note: folding may cause crazing (small white crease marks).

Colour Spectrum Degree of Transmission

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
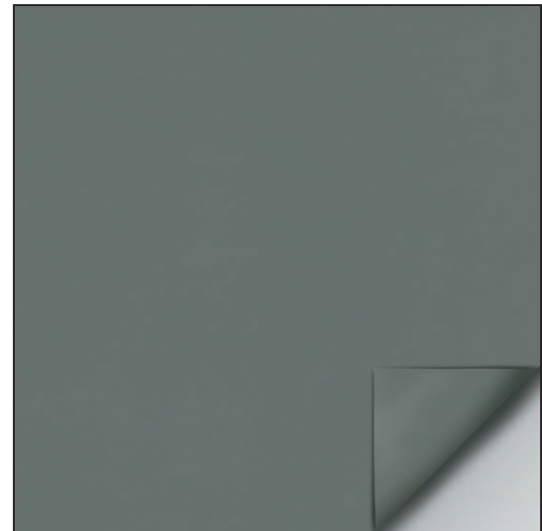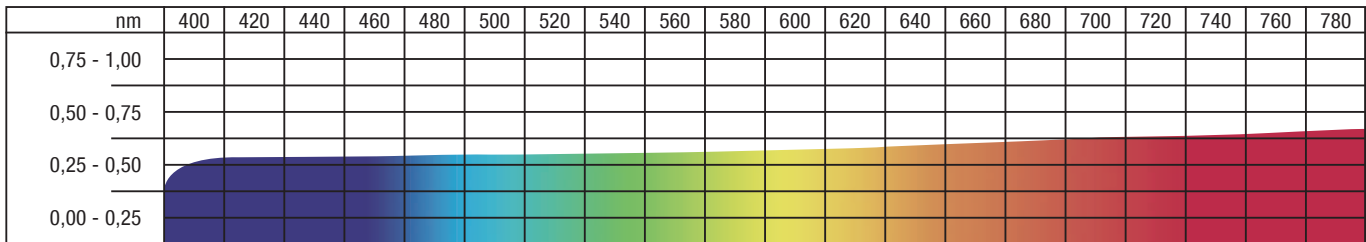
Rear Projection

• Gain: 1.48

OPTILUX is a more economical choice as compared to OPTITRANS®. It has similar characteristics but is slightly darker in color thus making it less sensitive to unwanted stray ambient light. Color contrast is good but brightness (Gain 1.48) is a little less compared to OPTITRANS®. Suitable for edge blending but sufficient distance must be used.

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,66	0,99	1,30	1,48	1,30	0,99	0,66
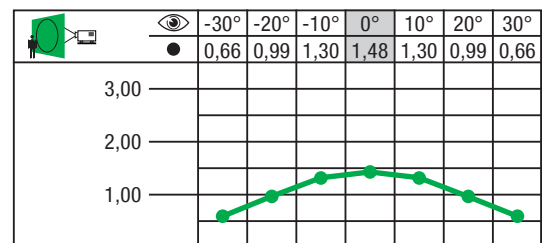
Gain (DIN 19045), horizontal   ●

Viewing angle in degrees   👁

1.3 Rear Projection

TRANSMISSION
Art. 2135 0000

Base material:	PVC
Colour:	cream
Flameproofed to:	
• European norm	EN 13501-1 B-s3, d0
• German norm	DIN 4102 B1
• USA norm	NFPA 701
Width approx.:	84"
Weight approx.:	11.06 oz/yd^2
Thickness approx.:	11 mil
Roll length approx.:	218.7 yds
Welding possibility (seaming):	yes
Application:	
• Rear projection	
Screen type:	D
Opaque:	no
Packing method:	
• Folded, rolled on request.	

Colour Spectrum Degree of Transmission

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
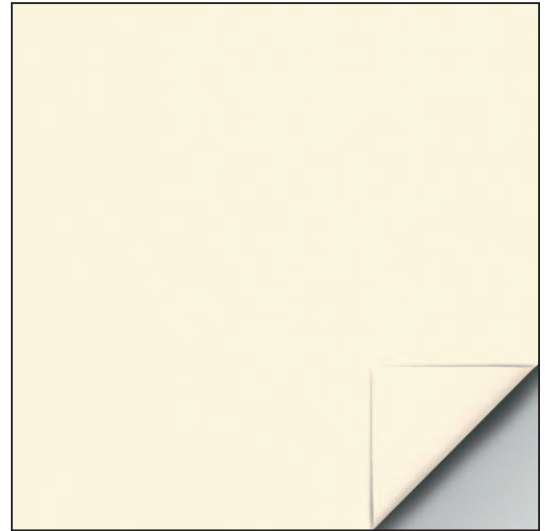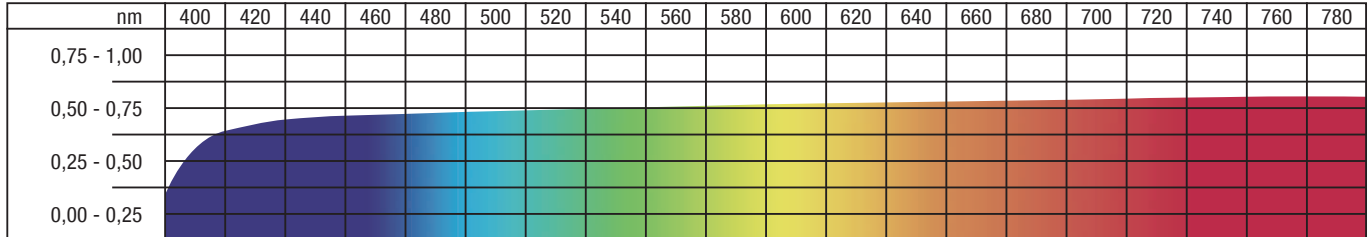
Rear Projection

• Gain: 1.13

TRANSMISSION is a nearly transparent diffusion screen specifically designed for LED back-lighting.
With only a minimal distance of between 10-15 cm (4"6") required, excellent diffusion of LED panels and walls are possible due to its nearly even gain of 1.13. It is used in most new studios that have large LED panels for scenic and lighting effects.
It can even be used for Chroma Key (greenbox or bluebox) applications providing the correct LED system is in place. It works well as a traditional rear projection screen, however edge blending results can vary and therefore at the discretion of the user.

◉	-30°	-20°	-10°	0°	10°	20°	30°
●	0,84	0,97	1,09	1,13	1.08	0,97	0,84
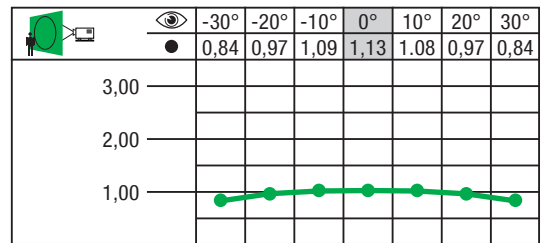
Gain (DIN 19045), horizontal

Viewing angle in degrees

1.4 Special Application Screens

ARENA 86
Art. 2141-

Base material:	Polyester / PVC
Colour:	white or dark grey
Flame retardant per:	
• German norm	DIN 4102 B1
• French norm	M1
• USA norm	NFPA 701
Width approx.:	
• Colour white	
Art. 2141 0000	70"
• Colour dark grey	
Art. 2141 0100	70"
• Colour white	
Art. 2141 1000	16'4"
Weight approx.:	11.21 oz/yd^2
Thickness approx.:	17 mil
Roll length approx.:	54.7 yds
Seaming possible:	overlap seam
Application:	
• Front projection	
Screen type:	D
Opaque:	no
Packing method:	
• Folded; rolled on request.	

Please note: screen must be rolled to guarantee no wrinkles or creases.
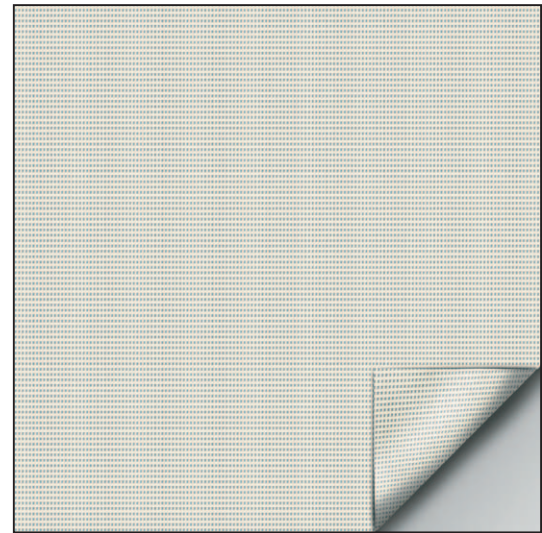
Art. 2141 0000

⚠️ 70" and 16'4" wide material vary slightly in colour.

Colour Spectrum Degree of Reflection

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
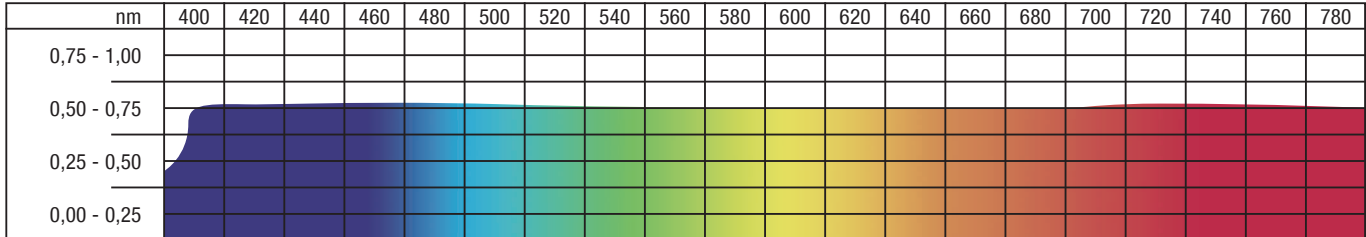
Front Projection

• Gain: 0.71

ARENA 86 is a fiber reinforced special application projection screen.
Originally developed for exterior applications due its exceptional strength and durability, it also is used quite successfully for traditional front projection interior applications. Due to its open "weave" like construction, it works quite well as a projection scrim on stage.
It offers very good brightness and a wide viewing angle. Other applications include loudspeaker masking and it can be digitally printed and used as large outdoor banners.

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,65	0,66	0,68	0,71	0,68	0,66	0,65

3,00	
2,00	
1,00	
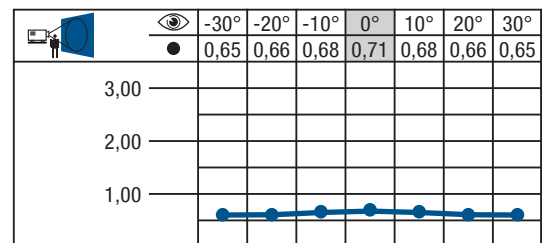
Gain (DIN 19045), horizontal ●

Viewing angle in degrees 👁

1.5.3 Reinforced Projection Screens

ATREX
Art. 2153-

Base material:	Polyester/PVC
Colour:	white
Flame retardant per:	
• German norm	DIN 4102 B1
Width approx.:	16'9"
Weight approx.:	24 oz/yd^2
Thickness approx.:	0.90 mil
Roll length approx.:	27.34 yds
Welding possibility:	no
Application:	
• Front projection	
Screen type:	D
Opaque:	yes
Packing method:	
• Rolled.	

Colour Spectrum Degree of Reflection

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
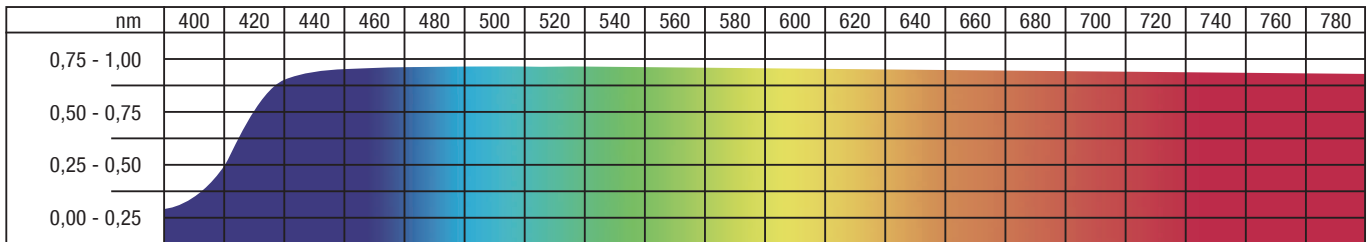
Front Projection

• Gain: 1.15

Heavy-duty, tear-resistant, fiber-reinforced screen surface.
Recommended for permanent top roller applications and scrolling painted banner systems.

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,88	0,95	1,07	1,15	1,06	0,94	0,89
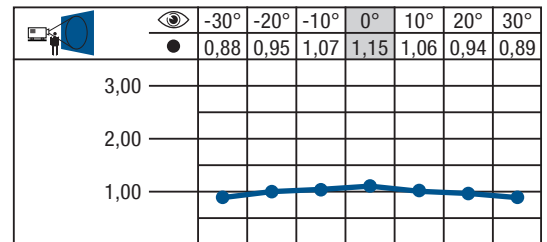
Gain (DIN 19045), horizontal ●

Viewing angle in degrees 👁

Reference Section

Repair Kit

A PVC repair kit is available to repair minor damage such as rips or tears. The repair kit consists of high-strength PVC adhesive and a 0.25 m² (10" x 10") piece of screen. Please indicate specific screen when ordering. Please note that repairs will always be visible, especially on rear projection screens.

Adhesive Tape OPERA® TAPE

Rip-resistant tape for repairing small tears in our projection screens.
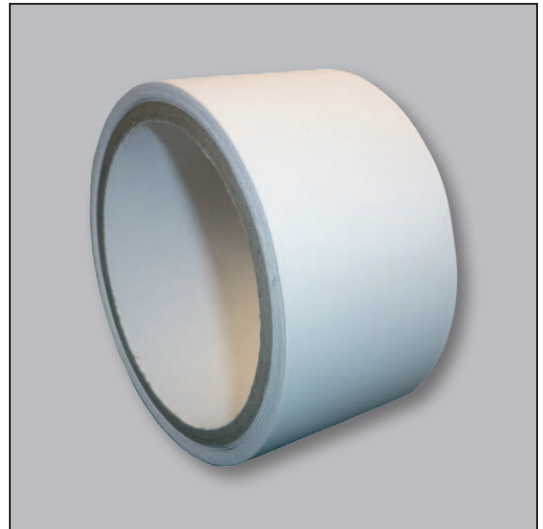
Installation

Gerriets' trained and experienced installation personnel are happy to assist you with the installation of your projection screens.

SCREENS

Reference Section

Perforation and Microperforation

Perforation or microperforation is typically used to help alleviate acoustic pressure through a projection screen, particularly middle to high range frequencies. Standard perforation is 57,000 holes/m² (37 holes/in²) with an open area of approximately 7%; micro-perforation is 300,000 holes/m² (195 holes/in²) with an open area of approximately 6%.

For a relatively close viewing distance, a microperforated screen such as GAMMALUX® MICRO is recommended.

For farther viewing distances, a standard perforated screen such as OPERA® white Perforated is recommended. Under proper viewing distances and conditions, perforation is not visible.
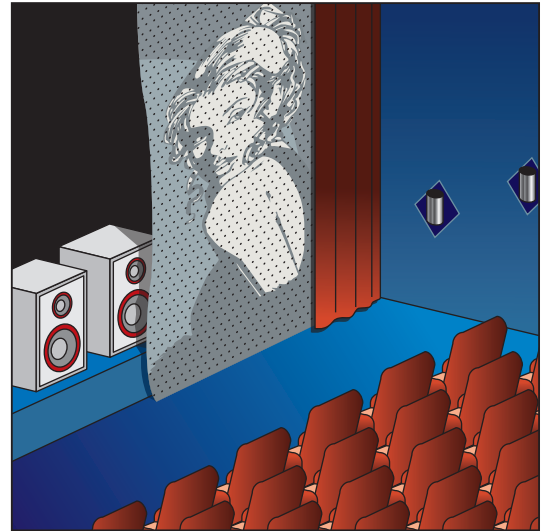
Frame Projection

Projection of data or images with a projector that illuminates the entire screen surface or "full frame."

Cleaning

It is recommended to clean PVC projection screens with a special solvent-free cleaner and microfiber cloth to ensure long life and durability.

Reference Section

**Formulas to
Calculate Screen
Size and Formats**

Panorama Format 2 : 1

Height	= Width	÷ 2.000
Height	= Diagonal	÷ 2.236
Width	= Diagonal	÷ 1.118
Width	= Height	x 2.000
Diagonal	= Width	x 1.118
Diagonal	= Height	x 2.236

Panorama Format 3 : 1

Height	= Width	÷ 3.000
Height	= Diagonal	÷ 3.162
Width	= Diagonal	÷ 1.054
Width	= Height	x 3.000
Diagonal	= Width	x 1.054
Diagonal	= Height	x 3.162

Slide Format 3 : 2

Height	= Width	÷ 1.500
Height	= Diagonal	÷ 1.803
Width	= Diagonal	÷ 1.802
Width	= Height	x 1.500
Diagonal	= Width	x 1.202
Diagonal	= Height	x 1.803

Video Format 4 : 3

Height	= Width	÷ 1.333
Height	= Diagonal	÷ 1.666
Width	= Diagonal	÷ 1.250
Width	= Height	x 1.333
Diagonal	= Width	x 1.250
Diagonal	= Height	x 1.666

Cinema or HDTV Format 16 : 9

Height	= Width	÷ 1.777
Height	= Diagonal	÷ 2.040
Width	= Diagonal	÷ 1.147
Width	= Height	x 1.777
Diagonal	= Width	x 1.147
Diagonal	= Height	x 2.040

WUXGA Format 16 : 10

Height	= Width	÷ 1.600
Height	= Diagonal	÷ 1.887
Width	= Diagonal	÷ 1.179
Width	= Height	x 1.600
Diagonal	= Width	x 1.179
Diagonal	= Height	x 1.887

GAMMALUX® Front projection screen / 7,92 x 6,05 m / 26' wide x
20' high Roller Screen System TUBE, 8 m wide
Celine Dion concert • Photo: Joel Robison

Reference Section

Soft-Edge Projection

With soft-edge blending, media software is used to control the intensity of projected light in the overlapping portion of a picture being projected from two or more projectors.

This ensures a smooth seamless image. Media software can control only the projectors, not the surface. The overall success of any system depends as much upon the projection surface as it does on the media software.

Variables such as the luminance factor (gain) and viewing angle are critical to smooth, blended images. Soft-edge projections work best when the screen delivers uniform luminance across the entire viewing angle. Screens with a high gain and unfavorable luminance distribution will result in darker, uneven areas at the image overlap.

Both OPERA® creamy-white (gain 0.32) and OPERA® grey-blue (gain 0.26) work well due to the very even luminance distribution across the entire viewing angle.

Even better is TRANSMISSION rear projection screen, with its combination of high luminance (gain 1.13) and even luminance distribution across the entire viewing angle.

Projection screen

1. Projector

2. Projector

3. Projector
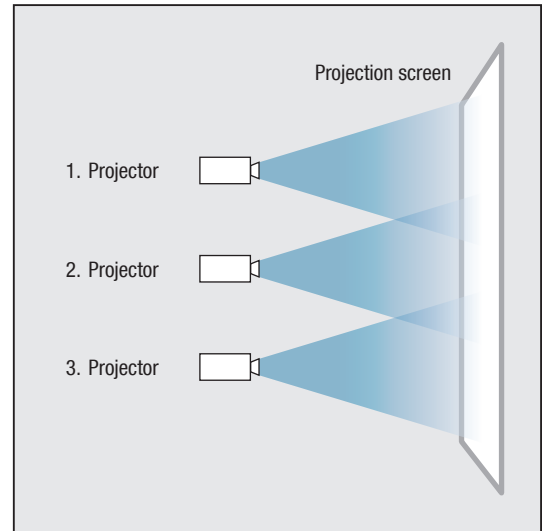
Top view

EVEN / Bayer AG: General meeting • Photo: Bayer AG

Reference Section

Colour Spectrogram and Colour Reproduction

The colour spectrogram shows the reflection or transmission of the visible spectrum (approx. 380 - 780 nm) over the entire screen surface. The reflection and transmission of visible light on a projection surface can vary significantly across the entire colour range. Compared to the luminance factor, the colour spectrogram indicates the average value, in nanometers, of the entire visible spectral range over the entire screen surface. Low reflection or transmission values are not necessarily associated with a low luminance factor.

The actual colour reproduction of a projection screen has less to do with the degree or the intensity of reflection and/or transmission and more to do with the evenness of the various wavelengths.

The more even the measured values are, the more even the colour spectrogram will appear and the better the actual colour reproduction of the screen will be.

Projection Surface Reflectance Properties
OPERA® white Front Projection Screen
Official Test Results (Certificate #015124-3-1)

Wavelength [nm]	Degree of Reflection
400	0,800
410	0,817
420	0,822
430	0,838
440	0,840
450	0,843
460	0,843
470	0,842
480	0,843
490	0,842
500	0,837
510	0,833
520	0,829
530	0,825
540	0,819
550	0,811
560	0,806
570	0,806
580	0,805
590	0,795
600	0,791
610	0,789
620	0,791
630	0,800
640	0,811
650	0,817
660	0,821
670	0,814
680	0,784
690	0,780
700	0,803
710	0,817
720	0,818
730	0,821
740	0,818
750	0,813
760	0,815
770	0,812
780	0,809

Colour Spectrum Degree of Reflection

nm	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720	740	760	780
0,75 - 1,00																				
0,50 - 0,75																				
0,25 - 0,50																				
0,00 - 0,25																				
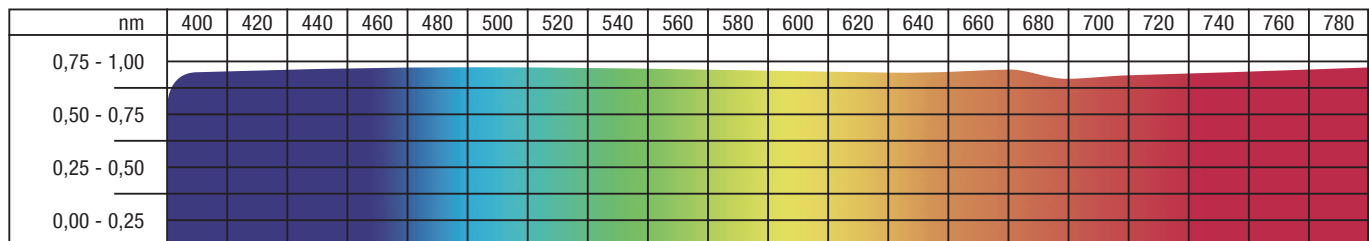
OPERA® white

Reference Section

Screen Size according to DIN 19045

As a rule of thumb, the width of the screen should be more than 1/6th of the maximum viewing distance and the minimum distance to the screen should not be less than 1.5 times the screen's width. The height of the screen is determined by the preferred format (e.g. 4:3 or 16:9).

Screen Types D and R

Screen type D (diffuse) describes a projection screen in which light is cast and reflected, and the reflected light is not controlled.
Screen type R (rear projection) does not reflect the light that is cast on it, but rather transmits light through its surface from behind. Type R controls the percentage of light that passes through the surface, but not the direction in which the light is transmitted. Projection screens categorized as D/R reflect and transmit light simultaneously.
Type B projection screens have a crystal glass coated surface which helps focus light, as do Type S projection screens which have a silver metallic coated surface.

Screen type D: OPERA® white • Photo: AIRSCREEN

Screen type R: OPTITRANS® • Photo: RBB

Reflection, Transmission and Absorption

Degree of reflection indicates the ratio of reflected spectral flux to the projected spectral flux. Degree of transmission represents the ratio of penetrated radiation flux to absorbed spectral radiation flux.
The value of 1 (100%) represented in the color spectrogram consists of the reflection, transmission and absorption of the projection screen. Loss of spectral radiation through absorption is very minimal.
Reflection factor and transmission factor are often mistaken for gain, but the method and significance of the measurement is fundamentally different.

Projection Screen (cross-section)

Transmission

Absorption

Reflection
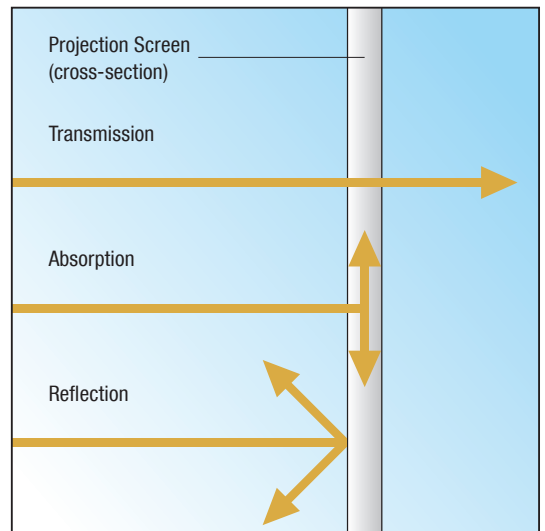
Reference Section

Luminance Diagram

The luminance diagram shows the luminance factor at each particular viewing angle.
A flat curve progression indicates a uniform luminance distribution on the screen.
A high rising curve indicates that the screen may have a tendency to hot-spot and may not be suitable for certain applications such as soft-edge blending projections.

OPERA® white: Luminance Diagram

👁	-30°	-20°	-10°	0°	10°	20°	30°
●	0,83	0,87	0,93	0,98	0,93	0,87	0,83
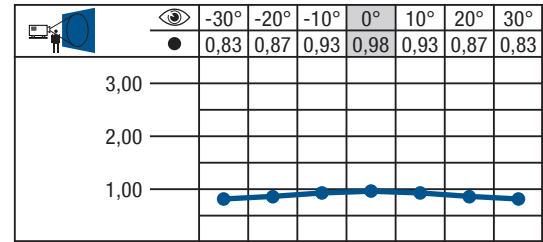
👁 Viewing angle in degrees

● Gain (DIN 19045), horizontal

ANSI-Lumen

ANSI-Lumen is the measurement of the luminosity of a projector. It is used to compare projector performance.
Luminosity is determined by the intensity of light (in lux) and the size of the illuminated projection surface (in m²). (ANSI = American National Standards Institute, the U.S. authority for standardization of industrial procedures. Its counterpart is the German Institute for Standardization, or DIN. Both are members of the International Organization for Standardization or ISO).
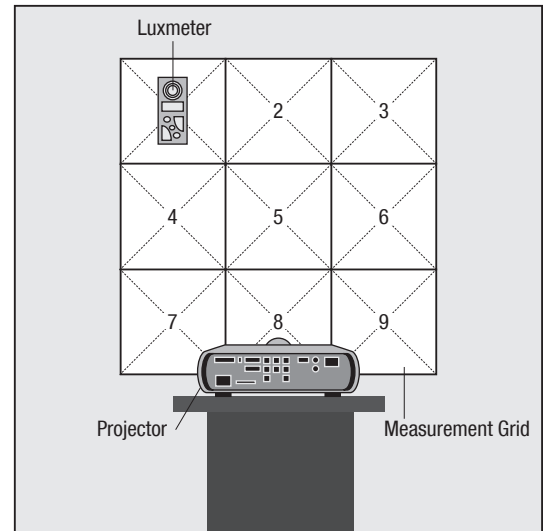
ANSI-Lumen Test

Picture Format

The picture format is the width-to-height ratio of a defined picture.

- Square Format   1:1
- Panorama Format   2:1/3:1
- Slide-Format   3:2
- Video Format   4:3
- Cinema or HDTV Format   16:9
- WUXGA Format   16:10
  (for Full-HD Projection with
  1920 x 1080 Pixels)

When planning for a projection screen, it is useful to know what format will be used most often.
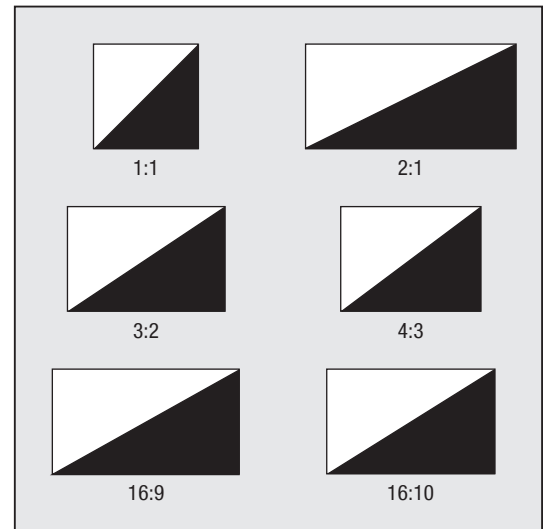
Reference Section

Luminance Factor (Gain)

The luminance factor, also called gain, describes the efficiency of the screen and its ability to gather light. The criteria for establishing the gain of a projection screen as compared to a defined reference material (standard white DIN 50339) is described in DIN 19045. This reference material is made from barium sulphate, a white chalk tile that has a standard gain of 1.0.

When a measurement has a gain greater than 1.0, it reflects (front projection) or transmits (rear projection) more light than barium sulphate. Gain is measured at different angles and is greatest at a 0° axis, when both the projected light and the viewer are parallel to the viewing surface. Gain decreases as the viewing angle becomes wider.
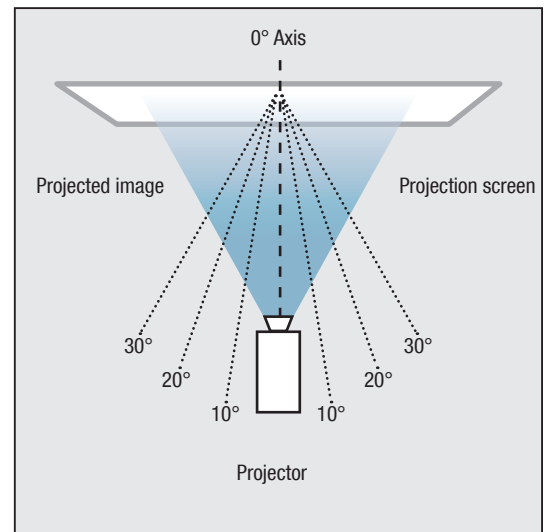
Viewing Angle, top view
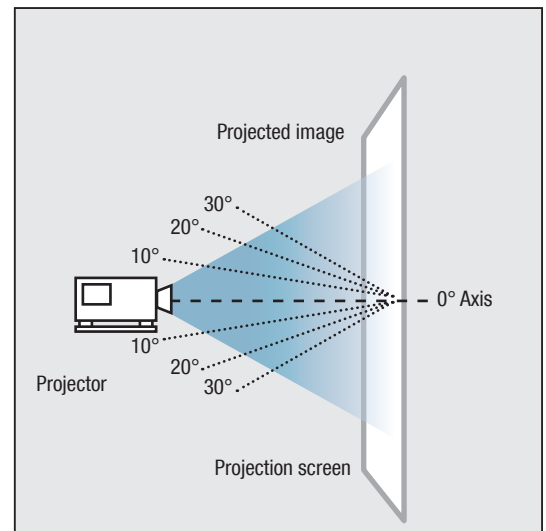
Viewing Angle, side view

Scatter Angle and Half-Gain Angle

The scatter angle of a projection screen indicates the outside limit of the viewing cone per DIN 19045.

This limit is defined as 40° left and right of the 0° projection axis. The half gain angle refers to the limit at which the gain falls to 50% of the 0° center gain. Half gain is not usually mentioned as an additional criteria for measuring the effectiveness of a projection screen.

Reference Section

Contrast

Contrast is simply the ratio between black and white. Picture contrast is considered good when black areas are perceived as highly distinct from white areas. To determine the contrast ratio of a projection screen, we use a checkerboard grid of eight black and eight white squares and an NIT meter that calculates the average values of the black and white squares. For projection under normal conference room conditions, the following is a contrast guideline: a ratio from 6:1 to 10:1 is considered bad; 20:1 and up is considered good.
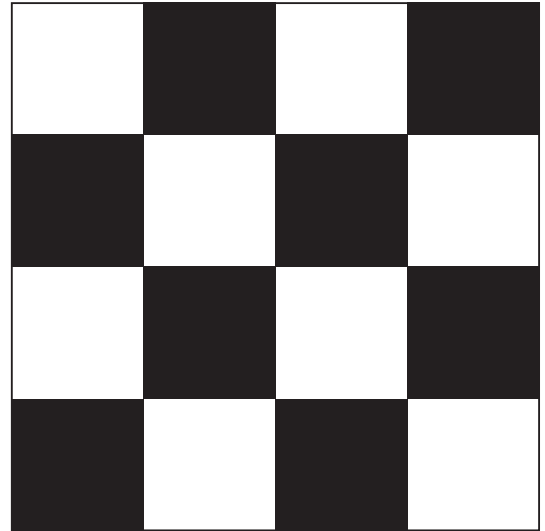
Black Level

The black level is the intensity of the color black when projected onto a projection surface. The black level is influenced by the projection source and the projection screen. Optimal black level would assume a theoretical 0% reflection and transmission of the incident light in the black image areas.

1 Text projection of scattered light on a white projection screen.
2 Text projection of scattered light on a GREYSCREEN projection screen.
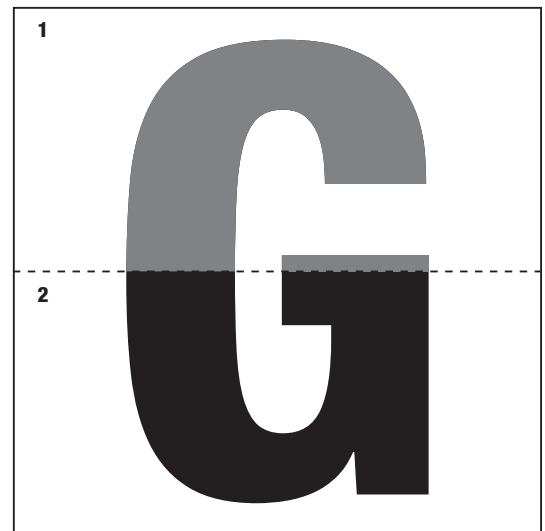
Image Quality

The quality of a projected image is dependent not only upon the screen material but many other factors, including projector brightness, ambient light, reflected light and distance from the projector to the projection screen. Projection in daylight situations is possible only under very specific and controlled conditions.

San Francisco, AIRSCREEN classic 16 x 8 m • Photo: AIRSCREEN

Projection Cyclorama

OPERA® Print

OPERA® Print and REVUE Print

Gerriets OPERA® creamy white and REVUE projection screens can be digitally printed to produce visually stunning, translucent backdrops.
They can be used as innovative advertising media or as scenic elements in opera, dance, theatre, television, events and exhibition applications.

The combination of high frequency welding and a specially designed digital printing process allows the reproduction of large scale scenery or works of art with nearly invisible seams.

Ever-changing atmospheric backgrounds are possible simply by changing the front or rear illumination of all or part of the screen.

When vast expanses of illuminated backdrops are brought to life with lighting effects, audiences are transported to a different world.

Gerriets representatives are ready to assist you with the numerous possibilities of these products.

Details
- Photorealistic image quality.
- Brilliant, luminous backdrops.
- Flameproofed to DIN 4102 B1 and NFPA 701.

OPERA® Print

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SCREENS

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Important information regarding warranty, packing, handling and installation

1 | Custom manufactured Gerriets projection screens are delivered folded in a box / crate as standard. Folding may cause crease marks or wrinkles which generally disappear in use. Gerriets assumes no responsibility if all wrinkles do not fall out for reasons beyond our control such as delivery method or length of time in storage. To assure wrinkle-free delivery, we offer screens rolled on a tube as an option. There is an additional charge for rolling and should be specified at time of order. Due to the practical limitations of shipping, not all projection screens can be rolled.

OPERA® white / Oper Frankfurt: Cinema show „Metropolis"

2 | Most Gerriets projection screens are designed for hanging on a pipe, tensioned within a rigid frame or for use on the MEGASCREEN and MEGASCREEN TOUR roller systems.
If used on top roller screen systems such as RUNWAY or TUBE, waviness and unevenness can occur. For these systems we recommend ATREX® or PLANA projection screens.
Details for these screens can be found in the RUNWAY roller screen system brochure or the CARBON roller screen system brochure.
The use of other screens is the customer's own risk and should be done only for a short time and will not be accepted as a reason for complaint or rejection.

REVUE / Exhibition • Picture: Zinser

3 | Screen warranty is void if used with roller screen systems or any other systems from suppliers other than Gerriets.

4 | Projection screens are sensitive to cold and should be unpacked and handled only at ambient room temperature.

5 | The PVC screen material is thermo elastic. Dimension changes can occur due to temperature and atmospheric fluctuations.

6 | Our dimension information always refers to the outside dimensions of the screen. If tensioning the screen, please subtract one percent of the untensioned dimension to allow for stretch.

OPERA® creamy white / Exhibition • Picture: Zinser

Notes: