CINESCREEN®

What is a CINESCREEN?

- It's a diffusion type rear projection screen, consisting of a transparent substrate, either glass or acrylic, with a permanently bonded optical coating.

- This optical coating is an emulsion of microscopic particles, each of which functions as a refractive lens.

- The coating diffuses and distributes projected light, creating a uniform, high-resolution reproduction of the projected image.

- The optical coating may be formulated to provide varying levels of brightness over the desired viewing cone.

- The performance of the optical coating is further modified by the selection of the proper optical tint.

Only From Draper

DRAPER CINESCREENS differ from any other rigid rear projection screens in two *extremely important* respects:

- CINESCREEN optical coatings have been formulated to provide *inherent* abrasion resistance. *No other manufacturer offers you this protection.*

- Only DRAPER offers you a choice of **six different optical coatings**, each of which is available in your choice of **three unique optical tints**.

With a DRAPER CINESCREEN, you can select the *optimum combination* of optical coating and tint based upon your projection equipment, audience seating pattern, desired contrast level, screen aspect ratio, ambient light level and aesthetic considerations. *Only Draper offers you this versatility.* If you need assistance in determining the ideal optical coating and tint for your particular requirement, contact DRAPER or your local DRAPER dealer.

Planning Checklist

When specifying or ordering a CINESCREEN, we need to know the following: ① Dimensions; ② Substrate; ③ Thickness; ④ Optical coating; ⑤ Tint; ⑥ ARMORKOTE® or NONGLARE, if required; and ⑦ Factory-installed framing—system number and finish, if required.

Looking into the Industry Solution Center in "The Zone" at PricewaterhouseCoopers, Philadelphia, PA. Installation by Vistacom, Inc. Flying above the console are four small Cineplex screens flanking one Cineplex screen, 48" x 64". Photo courtesy of Vistacom, Inc.

Substrates—Glass vs. Acrylic

DRAPER uses the finest plate glass and clear acrylic as CINESCREEN substrates. Optical qualities are very similar: today's acrylics have been improved and exhibit slightly better transmission than plate glass. Here are some other distinguishing characteristics:

- *Cineglass®*—Recommended for maximum sound isolation, scratch resistance, and service life. Glass costs less than acrylic, but weighs approximately twice as much, breaks more easily, and must be installed by a glazier. Available in a greater range of sizes than CINEPLEX: through 10´ x 24´. Glass is flatter in larger sizes than acrylic. If your application uses two projectors to converge images onto one screen, choose glass— for it has the flattest surface.

- *Cineplex®*—Lightweight, durable and break resistant. Easier to install. Requires more care in cleaning, as acrylic scratches more easily than glass. Less soundproof than glass. Can be used in VIDEOWALL applications and suitable for all DRAPER INFORMATION DISPLAY SYSTEMS.

Thickness	Cineglass			Cineplex		
	¼″	⅜″	½″	¼″	⅜″	½″
Max. Size	72″ x 96″	120″ x 204″*	120″ x 240″*	108″ x 162″	108″ x 240″	108″ x 240″*
Approx. unframed weight (lbs. per sq. ft.)						
Net	3.5	5	7	1.5	2.5	3.5
Shipping	8.5	10.5	12.5	6.5	7.5	8.5

*Contact DRAPER about availability of screens exceeding these sizes.

What are Optical Coatings?

Cinescreens may be furnished with your choice of optical coatings, each specially formulated for a particular application. The optical coating is chemically bonded to the substrate, guaranteed against flaking and peeling. All Draper Cinescreen optical coatings offer excellent contrast and resolution, with center-to-corner uniformity. Coatings differ in the manner in which they refract projected light, creating a practical viewing cone that determines the audience-seating pattern. Optical coatings are described in terms of "gain," which is the measure of relative image brightness.

Factors which influence the selection of the proper optical coating are:

- *The light output of the projector*—The lower the output, the higher the required gain. Film projectors have relatively high light output. Most video and data projectors are in the medium to lower light output range.

- *The audience seating pattern*—The wider the audience seating pattern, the greater the required light spread, and the lower the gain.

- *The aspect ratio of the screen*—The greater the width of the screen in relation to its height, the greater the required light spread. Wider screens lower the gain.

- *Ambient light levels in the audience area*—The higher the ambient light level, the greater the required gain.

- *Brightness & Uniformity*—The charts (above right) are useful for evaluating the gain (brightness) and uniformity of Draper Cinescreen optical coatings. The flatter the curve within the cone where the audience will be seated, the greater the uniformity of the image they will see. Since many current projectors are much brighter in the center of the image than at the edge, this is a critical factor in the success of your installation. The higher the curve the brighter the image at center.

Cinescreen optical coatings offer the opportunity to customize your rear projection screen for a precise fit to your room and projection equipment. Select the optical coating for brightness and uniformity, choose the optical tint that meets your contrast needs, and specify the desired substrate.

Cine 10

Cine 13

Cine 15

Cine 18

Cine 20

Cine 25

Gain Charts

The gain charts above indicate gain values at various points, measured horizontally (level with screen center) and vertically, in degrees from projection axis. Gain is a measure of brightness as compared to a block of magnesium carbonate, which serves as a standard for gain of 1.0.

Optical Coatings

Cinescreens may be furnished with your choice of six optical coatings:

- *Cine 10*—Ultra-wide angle coating for maximum center-to-corner uniformity of projected image: gain 1.0. Best for wide screens, wide seating patterns, multi-image projection and shorter focal length lenses. Suitable for very high output CRT and light valve projectors. Best if used under controlled lighting conditions.

- *Cine 13*—Gain of 1.3, with extremely broad viewing cone and uniform distribution of projected light. Best for wide screens, wide seating patterns, multi-image projection and shorter focal length lenses. Best if used with medium to high-luminance video and data-graphics projection.

- *Cine 15*—Benchmark wide-angle coating. Gain of 1.5, with uniform distribution of projected light. For all formats, including higher-luminance video projectors.

- *Cine 18*—For medium to wide-angle viewing, with on-axis gain of 1.8. Suitable for all projection formats, including video.

- *Cine 20*—Peak gain 2.0, with a somewhat broader viewing cone than Cine 25. Suitable for relatively high ambient light conditions. For all projection formats, including data, graphics, and video.

- *Cine 25*—Suitable for narrow rooms with narrow viewing cones. Compatible with lower output projectors. On-axis gain 2.5. Good image resolution and color reproduction.

Optical Characteristics

Coating	Cine 25			Cine 20			Cine 18			Cine 15			Cine 13			Cine 10		
Tint	HC	NG	W	HC	NG	W	HC	NG	W	HC	NG	W	HC	NG	W	HC	NG	W
Peak Gain	2.50	2.50	2.60	2.00	2.00	2.10	1.80	1.80	1.90	1.50	1.50	1.55	1.30	1.30	1.35	1.00	1.00	1.10
Half-Gain Angle	23°	25°	28°	24°	26°	29°	26°	28°	32°	28°	30°	34°	36°	38°	42°	48°	50°	53°
Transmission	55%	62%	76%	49%	56%	68%	47%	54%	65%	45%	52%	61%	42%	49%	58%	40%	47%	52%
Reflectance	3%	3%	4%	3%	3%	4%	3%	3%	4%	3%	3%	4%	3%	3%	4%	3%	3%	4%

CINESCREEN®

Optical Tints

The optical tint is an important modifier of the optical coating. Tint influences image contrast and color value. All six DRAPER optical coatings are available in three optical tints (NG, HC, W), to allow the specifier to select the optimum combination of brightness, viewing angle, and contrast level for the planned installation. Be sure to specify NG, HC, or W along with the required optical and protective coatings.

HC—High Contrast (e.g. CINE 13HC)—Dark grey tint. Exceptional contrast and color rendition. Excellent light dispersion properties. The most popular choice for multiscreen VIDEOWALL applications. Enhances legibility of computer generated data displays with light or bright text against a dark background: dark colors and black are reproduced with remarkable accuracy. HC tint performs equally well with static and moving displays.

NG—Neutral Grey (e.g. CINE 13NG)—Standard formulation. Medium grey tint. Normal contrast levels and good color reproduction. Brightness levels are uniform throughout entire viewing cone. Multipurpose coating suitable for all projection formats and images.

W—White (e.g. CINE 13W)—Neutral white tint. Low contrast levels with some loss in color reproduction. Perfect for video and video conferencing. Requires lower light level in audience area. Not recommended for computer graphic/data displays when ambient light is present. Recommended for viewing 3-D applications. Reflects a laser pointer beam. White is the best tint to reproduce white backgrounds, so it's best for viewing spreadsheets.

Factors which influence the selection of the proper optical tint are:

- *Type of projection equipment*—Neutral Grey was originally developed for film projection, and remains the recommended tint for that medium. High Contrast is strongly recommended for video and data/graphics projection. White is recommended for viewing spreadsheets.

- *Contrast and legibility*—Information from data/graphics projectors, which typically consists of light colored characters on a dark field, is more legible to the human eye with High Contrast tint.

- *Ambient light level in the audience area*—The darker the tint, the higher the permissible light level in the audience area.

- *Aesthetic considerations*—When not in use, the screen will be neutral grey, dark grey, or white, depending upon choice of tint.

- *Laser pointers*—White tint reflects light from a laser pointer more effectively. However, the same is true of any type of ambient room light. If white tint is selected, the light level in the audience area must be much lower.

Fakespace WorkWall in automotive application. Installation by Fakespace Systems.

Special Coatings

DRAPER offers optional protective and anti-reflectance coatings for your delicate screen—

- **ARMORKOTE®**—While DRAPER's reformulated optical coatings are inherently abrasion resistant, you can further insure your CINESCREEN against damage by adding ARMORKOTE treatment. A breakthrough in rear screen protection. Highly resistant to improper cleaning with solvents or abrasives, and normal impacts of pointers, chalk, markers, fingernails, pencils and pens. While ARMORKOTE will be damaged by repeated or willful abuse through impacts of sharp objects, use as a writing surface, etc., it is an excellent "insurance policy" against accident and error. Virtually impervious to grease, oil, and ammonia; very resistant to most solvents, even permanent markers and chalk. ARMORKOTE is invisible, does not affect image quality, and is by far the toughest rear screen protective coating available.

- **NONGLARE**—Applied to the front (or viewing side) of the screen for anti-reflection properties. Slightly diminishes resolution. NONGLARE is needed only when the optical coating is being installed toward the projector.

Mounting and Framing

DRAPER CINESCREENS may be framed at the job site or shipped with a factory-installed CINEFRAME (see pages 14 & 15). When framing a single screen, select DRAPER's SYSTEM 100, 200, 300 or 400 framing systems.

- SYSTEM 100 is suitable for CINEPLEX ¼″ thick in sizes through 100″ diagonal, and CINEGLASS ¼″ thick in sizes through 4′ x 5′ overall size.

- SYSTEM 200 is suitable for CINEPLEX ¼″ and ⅜″ thick in all sizes, and CINEGLASS ¼″ and ⅜″ thick through 96″ x 120″ overall size.

- SYSTEM 300 is suitable for CINESCREEN ⅜″ and ½″ thick in all sizes.

- SYSTEM 400 is suitable for CINEPLEX ¼″ thick in all sizes and ⅜″ thick through 9′ x 12′, and CINEGLASS ¼″ and ⅜″ thick through 91″ x 121″ overall size.

CINESCREENS are usually installed with the coated side facing the audience. The coated side may be installed toward the projector when there are concerns about abuse, with only a slight reduction in image quality, but may result in annoying reflections from lights or windows.

Sumitomo Corp. of America conference room (NYC). Designed by the Walters-Storyk Design Group (Highland, NY). Equipment, including Draper Cinescreen 115" x 65", provided by Audio Video Systems (AVS), WSDG-AV. Photography by Robert Wolsch.

Install CINESCREENS only after all construction has been completed, including painting and cleanup. When factory-installed frames are not used, qualified glaziers should make the installation according to standard indoor glazing practices. Only use pre-finished framing materials, and screen must be isolated from load bearing. Top clamp large acrylic panels. Only use suction cups and other glass handling equipment on the uncoated side.

Maintenance

Protect screen at all times from paints, oils, solvents, abrasives, and waxes. Use a drape, shade, or similar covering to protect panel when not in use. When necessary, clean CINESCREENS only with mild soapy water and a soft, lint-free cloth. Blot dry.

Ten-Year Warranty

All DRAPER CINESCREENS are covered by a limited ten-year warranty against defects in materials and workmanship. Complete warranty terms will be furnished upon request.

Financial Ideas Exchange, Andersen Consulting, New York City. Optical engineering by GAVI. Installation by VideoSonic and Rathe Productions. Draper products include 7, 120" diagonal rear projection screens each with an RPS unit and System 200 frames, an ElectraMount Model G, and a Signature front projection screen. Photo courtesy of VideoSonic.

Complete Cinescreen specifications appear on page 22.

Draper's Innovative Solutions at Work for You

Established in 1902, DRAPER is one of the world's largest and foremost manufacturers of front and rear projection screens. Since 1985, DRAPER has developed a particular expertise in the design and manufacture of custom rear screen videowalls, projector support structures and related products for electronic information display. With installations in more than 70 countries, DRAPER is the acknowledged world leader in the most demanding area of the projection screen industry.

With more unique types of rear projection screens, videowall framing systems, projector mounting systems, and more combined years of design experience than any other projection screen manufacturer, DRAPER's highly skilled engineers can provide an optimum solution for any information display requirement. Both human and technological factors are always carefully considered. All proposals are supported by CAD generated dimensional drawings.

DRAPER rear projection screens and Information Display System products are used in a wide range of applications, including:

• Command and Control Centers
• Network Operation Centers (NOC)
• Board Rooms, Conference and Training Rooms
• Commercial Simulation
• Product and Process Design
• Sports and Gaming Venues
• Virtual Reality Entertainment Venues
• Broadcast and Teleconferencing
• Point of Purchase Advertising.

Which Screen is Right for My Installation?

Each rear projection system has a unique set of parameters which define what screen is required: room size; ambient light level; audience seating pattern (primary location, viewing cone and angles); projection equipment (brightness of the projector, resolution, aspect ratio, direct throw or mirrored reflection); what is being projected onto the screen (resolution, character size, video or data); desired framework around the screen; price point; and which of the above factors you consider to be the most important for the situation. DRAPER is the industry leader in the development of rigid rear projection screens. Only DRAPER can provide three unique rear projection screen technologies to satisfy any requirement, and the staff to help you select the proper one for your individual applications.

AT&T Network Operations Center, Bedminster, NJ. Installation by Vistacom, Inc. The project included five Retro/QA units, each with a 67" diagonal DiamondScreen. Photo courtesy of Vistacom, Inc.

Draper's Three Unique Rear Screens

• **IRUS—INFINITE RESOLUTION UNIFORMITY SCREEN—** Pages 4-5. New proprietary technology, available only from DRAPER. The IRUS is designed specifically for use with high-resolution LCD and DLP projectors. Provides a crisp, clear image with high resolution displays.

• **CINESCREEN®**—Pages 6-9, is DRAPER's diffusion coated projection screen. Our wide range of optical coatings and tints allows you to select a combination that's customized to fit your exact application. Suitable for use with CRT, LCD and DLP projectors, as well as traditional audio-visual projection formats.

• **DIAMONDSCREEN™**—Pages 10-13, is DRAPER's optical rear projection screen. The DIAMONDSCREEN provides an extremely bright image with a 180° viewing cone, making it perfect for use with CRT or low light output LCD and DLP projectors.

DRAPER dealers and personnel will be pleased to give you personal assistance in selecting a rear projection screen to fit your requirement.

CINEFRAME® and IDS equipment information many be found on pages 14-21.

Planning for Effective Rear Projection

Thorough planning is essential for a satisfactory rear projection system installation. It is important to select the proper size and optical qualities, and to position the screen correctly in the room. Devote careful attention to planning the projection area and equipment.

Size: For legibility and most installations, we suggest:

• L = distance from screen to furthest row of seats;
• Screen width = L÷4 for 4:3 aspect ratio. (For dual image presentations, use L÷3. For Command/Control centers, use L÷2).

The front row of seats should be set back at least twice the width of the screen.

Screen height is based largely on the projection formats to be used. Below are the aspect ratios of the most popular formats:

• 1.00:1.00   Overhead and opaque projection
• 1.00:1.33   (or 3:4) NTSC video and most LCD and CRT video and data-graphics projection
• 1.00:1.48   (OR 2:3) 35mm slides oriented vertically and horizontally*
• 1.00:1.78   (or 9:16) High Definition Television/ HDTV
• 1.00:1.85   WideScreen (also known as Letterbox and Panavision)
• 1.00:2.35   CinemaScope
• 1.00:1.25   (or 4:5) High-end data graphics

Note: Vertical presentation of a slide reverses its aspect ratio. To allow for this, use a square 1:1 aspect ratio for any type slide.

Installation: Install the rear projection screen high enough for all members of the audience to have an unobstructed view, but screen's center should not be more than 20° (10° with DIAMONDSCREEN) above the eye level of any viewer. In a room with a level floor, the bottom of a projection screen is usually be 36″ to 48″ above the floor (20″ to 30″ in a home theater).

For optimum brightness and minimum distortion (keystoning), set the projector(s) with lenses perpendicular to the center of the screen. Raising the floor of the projection room may help with installing and operating the projectors.

CINESCREENS are usually installed with the coated side toward the audience. The optical coating helps control glare for the best viewing conditions.

Audience Seating: If possible, all members of the audience should be seated within 30° of the projection axis, and never more than 45° off axis. CINESCREEN optical coatings offer progressively wider viewing cones, through CINE 10, which offers uniform light

	LCD/DLP Video/Data Projection	CRT Video/Data Projection	Slide/Film Projection
IRUS	✪	●	●
CINESCREEN/CINE 25*	●	●	●
CINESCREEN/CINE 20*	●	●	●
CINESCREEN/CINE 18*	●	●	●
CINESCREEN/CINE 15*	✪	●	●
CINESCREEN/CINE 13*	✪	●	●
CINESCREEN/CINE 10	✪	●	●
DIAMONDSCREEN	●	✪	✪

✪   This projection surface is ideally suited to this projection medium.

●   This projection surface is frequently recommended for use with this projection medium.

* The relative brightness of a diffusion-coated rear projection screen should be balanced with the light output of the projector used. While high-output and super-bright video projectors are often used with lower-gain screens, low-luminance projectors may require a brighter surface. Additional factors include ambient light level and audience seating pattern. Talk to a DRAPER dealer or audiovisual consultant for assistance in making a selection.

Word of Life, Marrow, LA. Installation by Creative Presentations. Two Cinescreens. Photo courtesy of Creative Presentations.

distribution over a 90° cone. See pages 6–9 for more information on CINESCREEN. Lenses with short focal lengths reduce the available viewing area.

Audience Illumination: DRAPER rear projection screens are designed for use in lighted rooms. However, optical qualities will be enhanced if lighting is controlled so that direct or reflected light does not strike the screen—particularly when a CINESCREEN is installed with its coated side toward the projection room. All windows need a room darkening covering, such as DRAPER FLEXSHADE SYSTEMS (request more information). Control of ambient light is especially important with a CINESCREEN with a white optical coating.

Projection Area: Ideally, the depth of the projection room should be 2x the screen width. If this is not feasible, high quality first surface mirrors may be used to fold the projection path, thereby achieving the desired image dimensions within a shorter distance (see page 16). A REAR PROJECTION SYSTEM from DRAPER is an easy, convenient way to achieve this: we design and engineer the complex optics for you (see page 17-18). A mirror is almost always necessary for motion picture projection, unless the film is printed right-left reversed for rear projection. The projection area should be carefully protected against light spills, which will ruin the projected image. Contact DRAPER or your audiovisual consultant for assistance in planning a properly equipped projection room.

CINEFRAME®

Factory–Installed Frames for Single Rear Screens

Rigid rear screen installation costs and problems are virtually eliminated with factory-installed Cineframes. Cineframes may be used with a single IRUS, Cinescreen or DiamondScreen, within limitations listed below. Simply place the screen in the finished wall opening, shim into position, and trim as desired. No need to hire a glazier. Four styles available. All are extruded of 6063-t5 alloy-anodized aluminum.

System 400

System 400 simplifies your installation. Cut a rough opening ¼″ larger than the overall frame size*, slide the screen in and bolt into place. No finish carpentry required. System 400 has a 1¾″ wide dress trim that hides the opening. The audience only sees an attractive frame around a rear screen. Suitable for Diamond-Screen in sizes through 135″ diagonal, all IRUS, Cineplex ¼″ thick in all sizes and ⅜″ thick through 9′ x 12′, and Cineglass ¼″ and ⅜″ thick through 91″ x 121″ overall size. Black finish. Weighs 1 lb., 7 oz. per lineal foot. Reduces clear viewing area by 1″ in each dimension.

*Add 1⅝″ to overall screen size to calculate the overall size of that portion of the System 400 Cineframe which fits within the rough opening.

System 400
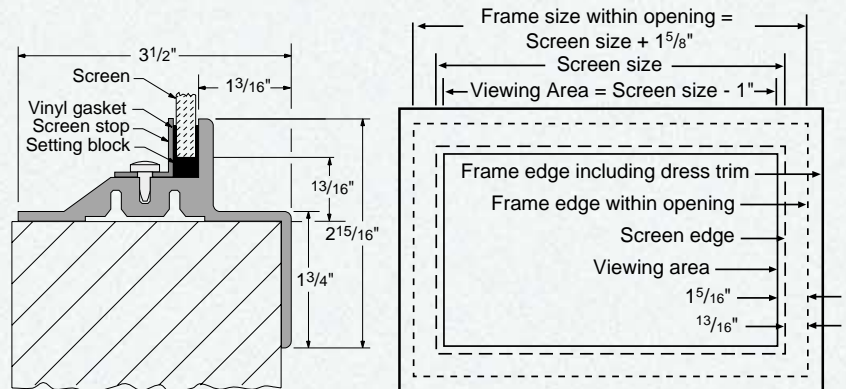
Michigan Virtual University, Lansing, MI. Installation by AXXIS Incorporated. Two 6′ x 8′ IRUS with Draper RPS units behind the screens.
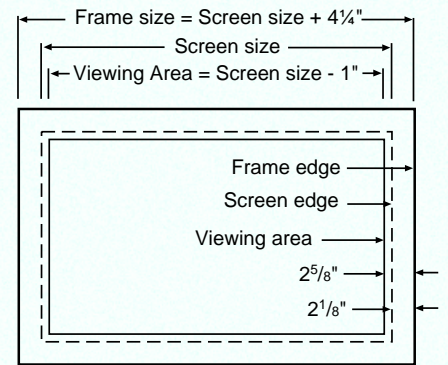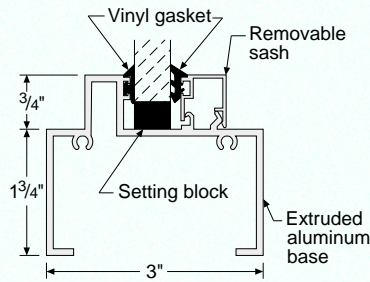
System 300

Adds 4¼″ to overall size of screen; reduces clear viewing area by 1″ in each dimension. Suitable for Cinescreen ⅜″ and ½″ thick in all sizes. Select clear anodized or black anodized finish. Weighs 1 lb., 5 oz. per lineal foot.

System 200

Same sturdy design as the System 300, extruded to a slightly thinner wall. Adds 4¼″ to overall size of screen; reduces clear viewing area by 1″ in each dimension. Suitable for DiamondScreen in sizes through 160″ diagonal, all IRUS, Cineplex ¼″ and ⅜″ thick in all sizes, and Cineglass ¼″ and ⅜″ thick through 96″ x 120″ overall size. Select clear anodized or black anodized finish. Weighs 1 lb. per lineal foot.
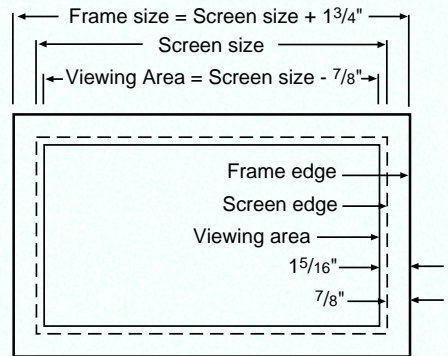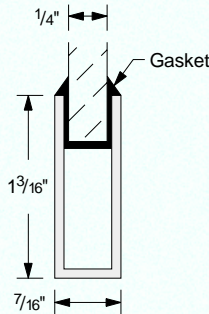
System 300 & 200

Frame size = Screen size + 4¼"
Screen size
Viewing Area = Screen size - 1"

Frame edge
Screen edge
Viewing area
2⁵/₈"
2¹/₈"

System 100

Simple, clean frame for smaller rear screens. Adds 1¾″ to overall height and width of screen; reduces clear viewing area by ⅞″ in each dimension. Suitable for DiamondScreen in sizes through 100″ diagonal, IRUS in sizes through 100″ diagonal, Cineplex ¼″ thick in sizes through 100″ diagonal, and Cineglass ¼″ thick in sizes through 4′ x 5′ overall size. Select clear anodized or black anodized finish. Weighs 3 oz. per lineal foot.

System 100

Frame size = Screen size + 1¾"
Screen size
Viewing Area = Screen size - ⅞"

Frame edge
Screen edge
Viewing area
1⁵/₁₆"
⅞"

Large Screen System

This extruded aluminum frame is required and furnished with any DiamondScreen that is 170″ diagonal through 200″ diagonal. The frame ships disassembled. When assembled, it adds 1⅝″ to the overall screen height and width. Not available on smaller sizes or other screen models. Black finish.

Large Screen System

Frame size = Screen size+1⅝"
Screen size
Viewing Area = Screen size-1½"

Frame edge
Screen edge
Viewing area
1⁹/₁₆"
13/₁₆"