



Vikuiti™ Rear Projection Film

System Design Guidelines for Rear Projection Screens

Product Description

Vikuiti rear projection film is designed to be applied to transparent substrates (glass, acrylic, etc.) for use as a rear projection screen. The film provides excellent contrast and color at all viewing angles under a variety of lighting conditions.

The film is self-adhesive and is easy to apply and remove. The optically-clear adhesive minimizes reflections at the interface of the substrate and film, providing superior optical clarity compared to a separate display behind a transparent substrate.

Vikuiti rear projection film can be cut into any desired shape for a compelling visual display which cannot be duplicated with a standard plasma or LCD display. The film can also be integrated with other window graphic applications.

The film can be applied to a portable or permanent surface using a wet application method: see *3M Product & Instruction Bulletin RPF* for details. Although the film is easy to remove, it generally cannot be removed and reused.

Window Considerations

Location

- Plan the installation for any suitable interior clear surface or portable surface.
- For windows that face outdoors, mount the film on the interior side, taking into account the *Restrictions*, below.
- To maximize the projected image quality, plan to install the film near the top of the glass area because:
 - the projector can be mounted higher while maintaining appropriate projection angles (see *Setting Up a Projector*, page 3).
 - people are able to walk freely near the window without interfering with the projected image
 - the display can be viewed from a greater distance.

Restrictions

- Avoid window locations with direct sunlight or significant reflections.
- Avoid windows with a tint or film that darkens the window.
- If a protective film is on the inside of the window, make sure it does not have a seam or any imperfections in the viewing area.
- Double-glazed windows generally are not recommended as the glazing reduces the quality of the image. A North-facing, double-glazed window *may* be satisfactory since it is not exposed to excessive sun reflection.
- For windows with seams or panes, plan to install separate pieces of film on each side of a seam or on each pane.



CAUTION

To reduce the risk of injury, be aware that heat generated by direct sunlight on dark areas of film can cause thermal expansion that *may* result in glass breakage. Refer to *Product & Instruction Bulletin RPF, Location of Rear Projection Film*, for more information.

Selecting a Projector

The quality of an image on Vikuiti rear projection film is highly dependent on the quality and amount of light being projected. The following information should be used as a guide to selecting the appropriate projector.

As a guideline, the projector should be capable of producing 150 to 300 lumens per square foot on the display. In extreme lighting conditions such as direct sunlight, the lumens per square foot may need to be much higher. The following table shows example display sizes at 4:3 and 16:9 aspect ratios and what projector lumens should be expected to perform well according to this guideline.

Diagonal	Width	Height	Aspect	Square Foot	Projector Lumens					
					1500	2000	3000	4000	5000	10000
35	28.0	21.0	4:3	4.1	367	490	735	980	1224	2449
45	27.0	36.0	4:3	6.8	222	296	444	593	741	1481
60	48.0	36.0	4:3	12.0	125	167	250	333	417	833
80	64.0	48.0	4:3	21.3	70	94	141	188	234	469
35	30.5	17.2	16:9	3.6	413	550	825	1100	1376	2751
45	39.0	22.0	16:9	6.0	252	336	503	671	839	1678
60	52.0	29.0	16:9	10.5	143	191	286	382	477	955
80	69.7	39.2	16:9	19.0	79	105	158	211	264	527

Example

A 60 inch diagonal display with a 4:3 aspect ratio (48 inch wide x 36 inch high) is 12.0 square feet. Using the table, a 3000 lumen projector would have 250 lumens per square foot and may be acceptable. A 4000 lumen projector would have 333 lumens per square foot.

Additional Projector Considerations

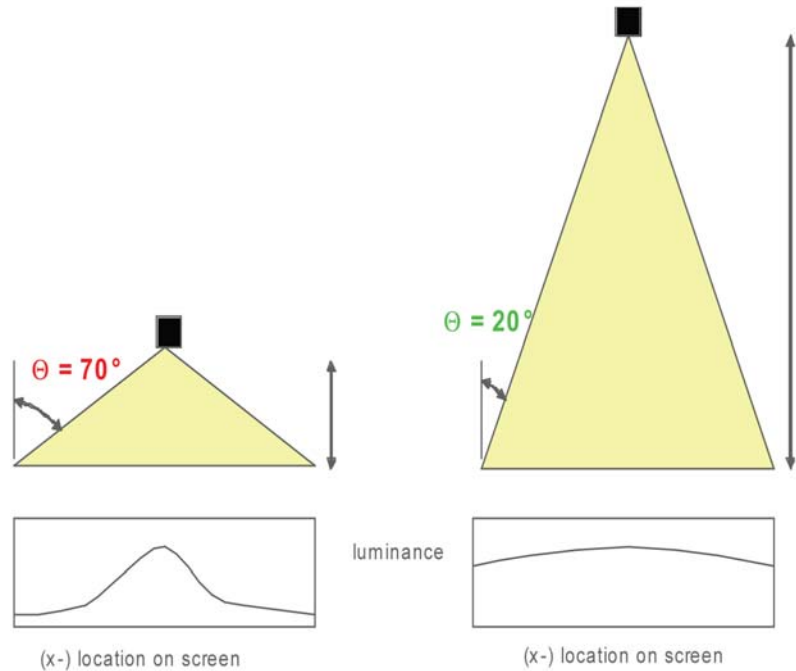
- Lumen rating based on image size and lighting conditions.
- DLP vs. LCD technology: DLP projectors may have more consistent performance and longer life in extended use applications.
- Native resolution and aspect ratio.
- Lens offset and ability to lens shift.
- Throw distance between the projector and the display.
- Hours of operation (24/7 or limited hours to preserve lamp life).
- Ability to control remotely using network communication.
- Ability to adjust image (focus, zoom, lens shift, keystone correction), remote or manual adjustment.

Many companies provide additional information on the world wide web that may be helpful as you specify a projector.

Setting up a Projector

- Position a ceiling mounted projector at least 7 feet from the floor to comply with health and safety standards and to protect it from unauthorized handling.
- To avoid hotspots on the image area, the angle of the light from the projector hitting the display should be less than 20 degrees to the perpendicular. See FIGURE 1.
- Refer to the projector manufacturer’s documentation for throw distances relating to specific relating to the projector you are using. They vary widely depending on projector and lens combinations.

FIGURE 1
Angle of Projector Light
to Avoid Hotspots



As a guideline, the correct minimum throw distance can be estimated from the size of the screen diagonal. This table shows the minimum ratio of throw distance to screen diagonal for displays with 4:3 and 16:9 aspect ratio, and depending on if the installation uses a center throw (where the projector is positioned at the vertical center of the display) or an offset throw (where the projector is positioned near the vertical edge of the display).

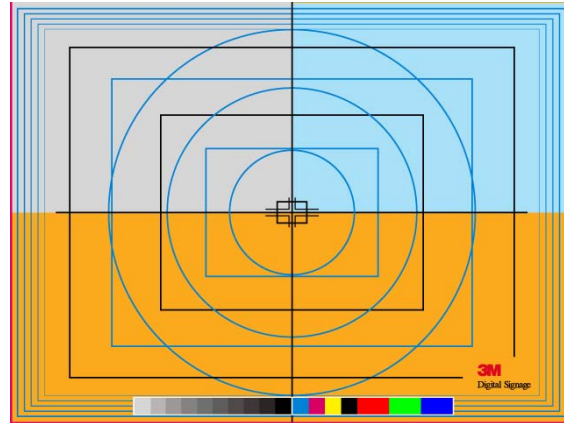
Throw Distance Table

Projector Set Up	Aspect Ratio	
	4:3	16:9
Center throw	1.2 x diagonal	1.2 x diagonal
Offset throw	1.8 x diagonal	1.6 x diagonal

Install the Projector

- Place the projector lens exactly perpendicular to the center line of the display. This is especially critical for projectors without horizontal keystone correction and for alignment on shaped displays.
- Use an alignment grid to check and adjust the projector location and set up. Use outer vertical lines to adjust the vertical keystone if necessary. See FIGURE 2. Use a plumb-bob or a laser level to help with the alignment.

FIGURE 2
Alignment Grid



- Many projectors distort the image when applying a keystone correction. It is best to locate projector in the manufacturer's recommended orientation to the screen.
- Use a mirror to reflect the center line back to the center of the lens to check horizontal center placement.
- Install the projector following the manufacturer's instructions.
- For a shaped display, use a masked white content element to help with the final alignment of the masked shape.
- Use a projector mount with yaw, pitch and roll adjustments. Fine-tune the alignment using the projector mount adjustments and projector zoom to precisely match the image placement.
- Some projectors also have width adjustment.

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Bulletin Change Summary

Please refer to Product & Instruction Bulletin RPF for detailed warranty and durability information, which was removed from this bulletin.



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