



Del Norte High School, Albuquerque, New Mexico. Clutch XD FlexShades with Phifer SheerWeave SW2703 3% Oyster/Pewter. Photographer: Matt Oberer, Albuquerque, New Mexico.



Draper's View-Through Simulator lets you see how different colors and openness factors would appear in a window.

- Fabric choice is the most difficult and important part of shade selection. The choice you make depends on your desired outcome. Draper can assist to get everything you need in your shades.

Choosing the correct window shade fabric is an important part of shade selection. The choice you make will depend on your desired outcome. Do you want a certain look, or is obtaining a specific performance outcome your goal? There are hundreds of options from which to choose. Differences in color, openness factor, material, and weave all determine the look and performance of each fabric, and the different combinations mean that, whatever your desired outcome, there is a fabric solution for you.

To determine what fabric is the right solution, consider the following:

LOOKS VS. PERFORMANCE

First, ask yourself a simple question: What is more important— aesthetic considerations or performance? If your concern is mainly to fit in with a specific design scheme, then the choice is probably a simple one. By looking at sample swatches, or using Draper's online Window Shades View-Through Simulation Tool (draperinc.com/windowshades/viewthroughsimulator.aspx), you can identify the look you want.

Even if you are more interested in aesthetics, however, you should take some time to think about performance. Shade fabrics have a big impact on the room. They can reduce glare, keep solar heat gain to a minimum (reducing

utility costs), allow or restrict view-through to the outdoors, or provide privacy. So, even if the choice of a certain color or pattern and weave gives you the look you want, does it create other problems, such as too much glare at certain times of day, or too much of a view into the space from the outside?

THE ROOM CONDITIONS

When selecting shade fabrics, it's important to consider the space, including the conditions, how and when it will be used, and its location.

Is glare an issue? Take into account not only glare from direct sunlight on interior surfaces, but also from sunlight on exterior surfaces, such as other buildings or nearby water.

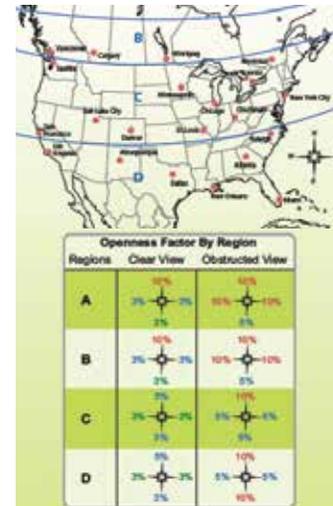
Also, think about solar heat gain. Depending on how the building is oriented, there will be times of the day and year that could see a lot of solar radiation hitting the windows. Energy from the sun is short wave and carries little heat. Heat is only produced when the solar energy is absorbed by a surface, such as carpeting or furniture, and is radiated as long wave infrared (IR) energy. Reflected solar energy is not an issue, so for the best performance in this area, you want a fabric that will reflect more solar radiation and transmit or absorb less.

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WHITE PAPER: HOW TO CHOOSE THE RIGHT SHADE FABRIC

SHEERWEAVE INFINITY2 3% SOLAR OPTICAL PROPERTIES	SHEERWEAVE INFINITY2 3% SOLAR OPTICAL PROPERTIES				SHGC/G VALUE G-TOT (GLASS & BLIND)					
	Solar Transmittance	Solar Reflectance	Solar Absorption	Visual Transmittance	SINGLE			INSULATING		
					1/8CL	1/4CL	1/4HA	1/2CL	1CL	1HA
Infinity2 1% PG1 Cotton	20	68	12	18	0.29	0.29	0.28	0.27	0.27	0.22
Infinity2 1% PG2 Almond	15	61	24	12	0.32	0.31	0.29	0.30	0.30	0.23
Infinity2 1% PG3 Wheat	12	54	34	10	0.36	0.35	0.30	0.34	0.33	0.25
Infinity2 1% PG4 Stone	13	55	32	11	0.35	0.35	0.30	0.33	0.32	0.24
Infinity2 1% QG1 Barley	18	52	30	15	0.38	0.37	0.32	0.36	0.35	0.26
Infinity2 1% VG1 Nickel	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Infinity2 1% VG2 Midnight	1	63	93	2	0.62	0.59	0.44	0.58	0.53	0.37
Infinity2 1% VG3 Bark	3	7	90	5	0.62	0.58	0.44	0.58	0.53	0.37
Infinity2 1% VG4 Slate	2	9	89	4	0.61	0.57	0.43	0.57	0.52	0.36
Infinity2 3% PG1 Cotton	20	70	10	19	0.27	0.28	0.27	0.25	0.26	0.21
Infinity2 3% PG2 Almond	17	61	22	15	0.32	0.32	0.30	0.30	0.30	0.23
Infinity2 3% PG3 Wheat	12	52	36	9	0.37	0.37	0.31	0.35	0.34	0.25
Infinity2 3% PG4 Stone	12	52	36	11	0.37	0.37	0.31	0.35	0.34	0.25

Chart above shows solar optical properties for SheerWeave Infinity 2. Map and chart to the right show openness factors based on building location and orientation.



Information on how much solar radiation is transmitted, absorbed, and reflected by fabrics used on Draper shades is available on swatch cards, or online at draperinc.com/windowshades/fabriclist.aspx. When you click on individual colors, numbers are provided for solar transmittance, reflectance, and absorption. Taken together, these numbers make up what's called the "Solar Heat Gain Coefficient." The lower the coefficient, the better.

If your concern is preventing light pollution—light escaping out of the space at night—then an opaque fabric or perhaps 1% openness would be the best choice.

Views through to the outdoors are very important—they increase worker comfort, helping to improve productivity and employee well-being. Certain fabrics will allow a better view out, but might then allow more solar radiation in.

Whatever your choice, and whatever your reasoning, shade fabric selection must be part of an overall daylighting strategy that makes use of all sorts of tools—exterior shading products, interior shades, light shelves for bouncing light further in, and other methods. It's not about keeping the sun out; it's about utilizing it in a way that increases comfort and conservation.

COLOR AND OPENNESS FACTOR

These two characteristics are the most important in getting the right fabric solution. Woven shade fabrics are made with coated yarns with space between the fibers. Openness factor is the percentage of that space in the weave. The smaller the openness factor, the less light gets through. The higher the openness factor, the more space there is. Obviously the higher the openness factor, the better the view-through characteristics will be. However, that also means more solar radiation getting through into the room.

Color also has a major impact on both view-through and solar heat gain. The darker the fabric, the easier it is to see through, and the lighter the color, the harder it is to see through. Generally the darker a fabric is, the less solar radiation is reflected, so it can sometimes be difficult to find a happy medium between view-through and thermal comfort.

There are a couple of fabric technologies that help make this choice a little less difficult. There are duplex fabrics available with a light exterior and a dark interior. In addition, fabrics are available that are treated in a special process that provides high-reflective values on darker colors.

THE WEAVE

The weave is the pattern of yarns as they are woven together. There are several types of weave and the differences are more than just aesthetic. The weave has a big impact on the performance of the fabric.

The **basket** weave is the most common pattern. It is typically a two-by-two pattern—that is, two strands of yarn, not just one, woven in an over-under pattern. Because this weave is non-directional, it will look the same no matter which direction the fabric is hung. That means wider windows can be covered.

A **twill** weave is a diagonal pattern that results in fabrics that are light on one side and dark on the other. This is accomplished by displacing the yarns so the vertical and horizontal threads (known in the fabric industry as warp and fill) are disproportionately separated.

A **jacquard** weave allows unique designs and custom patterns. This is made possible by individually controlling each yarn on the loom.



Examples of (from left to right) basket, twill, and jacquard weaves.

Most blackout shades are woven, and the fabric is coated or laminated, but some are made of another material, such as vinyl. A blackout shade is just what the name implies: 0% of solar radiation gets through the fabric. With the use of side and sill channels, a complete blackout with no light leakage can be accomplished. This can be advantageous for privacy, and for maximum reflectance of solar heat, but can also be inconvenient, since the only way to see out or allow daylight in is to raise the shade.

BEST OF BOTH WORLDS

There is a way to get the advantages of two different types of shade fabrics on one window. Perhaps you want to have a fabric that allows view through during the day, but you want the privacy of a blackout shade at night. With a dual roller system, two shades are built into the same headbox. Either or both can be lowered as needed.

VINYL COATED FIBERGLASS AND POLYESTER YARNS

Vinyl coated fiberglass and polyester fabrics are popular and widely used materials to make shade fabrics. Each of these materials has its individual benefits and advantages.

For an in-depth look at the differences between fiberglass and polyester fabrics, read our white paper titled *Screen Fabric Choice: Fiberglass vs Polyester* that can be found here: draperinc.com/whitepapers_casestudies.aspx.

SUSTAINABILITY

Quite often a major factor in determining what shade fabric to use is how “green” it is, and what impact it has on the indoor environment.

The majority of woven shade fabrics are made from fiberglass or polyester yarns. There are fabrics available that are both 100% recycled and 100% recyclable, while

others will contain some percentage of recycled material. That information is found on swatch cards and technical information on fabric web pages.

Because lead can be a cheap way to improve flame retardancy and UV stability in shade fabrics, it's also important to check product information about heavy metals and other chemicals. There are various ways fabric manufacturers indicate their products are free of lead. Look for fabrics that are certified to either U.S. Consumer Product Safety Commission Section 101; ANSI/WCMA A 100.1-2007 for lead content; REACH (EC 1907/2006 compliance; or RoHS Directive 2002/95/EC.

Vinyl coated fiberglass and polyester fabrics—and vinyl blackout fabrics—usually contain PVCs. All PVCs contain plasticizers, which in turn contain phthalates. Fabrics that utilize bio-based plasticizers are becoming available. This greatly reduces the amount of petroleum used, contains no phthalates, and lowers greenhouse gas emissions. More than simply having bio-based plasticizers, fabrics where the yarns themselves are 100% plant-based are also being introduced. There are also several fabrics which are PVC-free.

SAFETY AND THE INDOOR ENVIRONMENT

Speaking of emissions, fabrics can emit volatile organic compounds (VOCs) into the air. This is known as off-gassing. To reduce this risk, utilize fabrics that are Greenguard or Greenguard Gold certified by UL that emission levels meet the EPA standard for low emitting products, and that the product does not release toxins or carcinogens into the air.

In some situations, such as health care, schools, home, and hospitality, there also may be a concern about mold and mildew developing on shade fabrics. Shade fabrics that include antimicrobial protection to inhibit the growth

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Ursuline Arts Center, Louisville, Kentucky. Motorized LightBloc FlexShades.
Photographer: Kenneth Hayden, Louisville, Kentucky.

of bacteria, mold, and mildew are available. Antimicrobial technology—such as Microban—is infused into the fabric. Certifications to look for include ASTM 2180, ASTM G22, ASTM D 3273, and the Greenguard Mold and Bacteria Standard ASTM 6329.

Another major safety factor to consider is flame retardancy. Although there are no national requirements for flame retardancy in residential applications, there are national and local requirements in commercial areas. CA Title 19, considered the most stringent in U.S., and NFPA 701 are the most common standards, along with ASTM E 84 and NFPA 101. Most Draper fabrics meet one or more of these standards.

These are all factors in determining the best solution for conditions and aesthetic requirements.

For a complete list of fabrics available on Draper shades, including descriptions, selection tools, openness and fenestration data, and more, go to draperinc.com/windowshades/fabric.aspx.



A sampling of some green labels to be found on shade fabric literature.

draperinc.com/whitepapers_casestudies.aspx