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1 Intro to Mermet

Mermet has been a world-leading manufacturer of premium solar screen fabrics since 1976. With more than 40 years of experience mastering the engineering and design of sun control textiles, Mermet’s mission has always been to provide our customers with shading solutions that enhance solar protection, energy savings, durability, aesthetics, acoustical comfort and more.

Our diverse and versatile product range includes high performance, sustainable, decorative, conventional, and privacy screen fabrics that can be used for automated and motorized roller shades, roman shades, panel track, retractable awnings, tensile structures and much more. With installations ranging from the John Hancock Tower in Boston, to the Petronas Towers in Malaysia, our products have been installed in a multitude of applications for thousands of projects across the world. Bring your next project to life with Mermet, Sun Control Textiles.
Yarn & Fabric Properties
2.1 Core Yarn Materials

Woven or knitted fabric can be made up of staple or filament fibers. These filament fibers can be produced from animal, plant, mineral or synthetic fibers. Staple fibers are short fibers spun together to make yarn long enough for weaving. The friction caused by the spinning is what holds these fibers together. Mermet uses long strands of filament fibers that can be used independently or spun together to create extra thickness. Filament yarns have greater tensile strength allowing them to withstand greater pulling tension and making them ideal for solar fabrics.

2.2 Yarn Count & Core Yarn Thickness

Core yarn thickness is measured by weight of the yarn per 1 kilometer, so a kilometer of T-95 thread (95 Tex) weighs 95 grams. The higher the Tex, the thicker and more durable the fiberglass core will be. Mermet produces fabrics that use both 95 Tex and thicker 165 Tex yarns. Yarn count is the number of yarns going in the warp and weft direction within a given square centimeter. (Reference 3.3)

2.3 Yarn Composition

This is based on the percentage by weight of the materials used. For example, if a fabric was made of fiberglass yarn for its core and coated with vinyl, it would have the following: (34% fiberglass / 66% vinyl coating).

2.4 Vinyl Coating

Think of a fabrics core yarn, consisting of fiberglass or polyester, as the skeleton and its coating as the tissues that protect the skeleton. For added strength, the skeleton must be surrounded with tissues, in this case the vinyl coating, to make it more resilient to the outside factors that it is not already affected by. Within this vinyl coating, there are a number of ingredients that formulate the plastisol coating. These include pigments, UV stabilizers, fire retardants and vinyl plasticizers. All of these ingredients add to the fabrics composition and performance.

2.5 Thermoplastic

Otherwise known as a thermosoftening material, it is a plastic material (polymer), that becomes pliable or moldable above a specific temperature and solidifies upon cooling. Fiberglass is not a thermoplastic and therefore does not stretch or shrink. This means fiberglass is not affected by extreme changes in temperature. Fiberglass has the ability to hold its shape better since it has a very low thermal coefficient allowing it to not conduct or retain unwanted heat.
2.6 Dimensional Stability

Dimensional stability refers to a fabric's ability to hold its shape, which in turn, prevents it from developing tracking issues, unsightly buckling and waves. This factor is very contingent upon the entire fabric's composition, weave and structure.
Section 3

 Manufacturing Process
### 3.1 Mixing

Mixing plastisol is the first step of the process that goes into making the fabric. The coating must be made from an exact amount of ingredients. This process varies based on the type of fabric that it is going to be made. These ingredients include UV stabilizers, fire retardants and other additives. All of these have to be mixed together at certain temperatures, rates of mixing, and specified volumes. This also has to occur in the correct sequence and set time frame. After all the pigments and additional substances have been mixed, the batch is tested to ensure it is the correct color, viscosity and free of defects. Once everything passes, then it can be used for coating.

### 3.2 Coating

Thoroughly inspected bobbins of fiberglass yarn are installed on creels in a room that meets a specified temperature and humidity. From this area, the fiberglass yarn is threaded through a series of numbered dyes on the coating tables. The yarn is coated with the desired colored plastisol followed by being strung through the heat set ovens. The yarn is then re-spun into new bobbins until the desired amount is met, roughly 5000 meters. Once the bobbins are removed, they go through their final inspections in the coating process. These final inspections include a visual test, peeling test, weight test, and color verification test to ensure there are not any detectable flaws in the coated fiberglass yarn. Under the contingency that all these tests are passed, the bobbins are then directed to the weaving process for further use.
3.3 **Weaving**
Coated yarns are sent off to create warp beams. A warp beam is a large roller, located on the back of a loom, on which the warp ends are wound in preparation for weaving. These warp beams are loaded onto the loom and continuously run for roughly two weeks straight. The long constant threads that run vertically in the fabric are the warp yarns and the weft yarns run perpendicular to these. Yarn is fed through the warp in the weft direction by a shuttle. A reed pushes the weft yarn back against the woven fabric. This process creates the type of weave that is desired. The fabric is continuously inspected as it is woven to ensure there are no defects.

3.4 **Tentering Process**
Following the weaving process, the woven fabric moves on to tentering, which is a process to heat set the final woven fabric. The tentering machine is set on a certain temperature depending on the fabric style. This binds the warp and weft yarn together at all intersecting points resulting in the final stability of the fabric. From here, it is wound back onto a large roll where it awaits final inspection before being cut into a standard length roll.

3.5 **Final Inspection & Packaging**
Each roll is slowly inspected to ensure there are no unacceptable flaws detected in the fabric. If there are flaws, they are marked as a spot defect or a running defect, ensuring that only the top quality product makes it to the customer. Once the rolls are cut to their desired length, they are carefully wrapped and securely packaged so they arrive in pristine condition at their final destination.
Weaving & Knitting
4.1 **Woven Fabrics**

Created by interlacing warp and weft yarns at roughly right angles to one another. The long constant threads which run vertically in the fabric are warp yarns and the yarns that run perpendicular are the weft yarns. Fabrics have high tensile strength in the warp direction because there is constant tension on the yarns during the weaving process. The tensile strength in the weft direction is not as great due to the fact that these yarns are not under constant tension while weaving. The lack of tension in the weft yarns is the reason railroading woven fabrics is not recommended unless the fabric is tested for project specific sizes, applications and orientations before the final shade production.

4.2 **Knit Fabrics**

Knit fabrics consist of rows of loops intertwined around each other. The way the loops are intertwined gives unique patterns to different styles of knit fabrics. Warp knit fabrics wrap these loops around straight warp yarns, which give the fabric structure. Warp knitting is a family of knitting methods in which the yarn zigzags along the length of the fabric, following adjacent columns ("wales") of knitting, rather than a single row ("course"). For comparison, knitting across the width of the fabric is called weft knitting.
Types of Weaves
Section 5: Types of Weaves

5.1 Plain Weave
Created by passing each weft yarn over and under alternating warp yarns. This is the simplest weave pattern, creating no distinct front or back. Examples of Mermet plain weave fabrics: Vienne.

5.2 Rib Weave
Created by using a larger Tex yarn, this fabric style exhibits a “ribbed” line effect in both the warp and weft direction. Examples of Mermet rib weave fabrics: M Screen, Deco Screen, and S-Screen.

5.3 Basket Weave
Another take on the plain weave style, in which even numbers of weft yarns cross over and under alternating yarns of the warp in a 1 to 1 ratio. This pattern gives the best view through of any weave pattern due to the equally sized square openings created in the final fabric. Examples of Mermet basket weave fabrics: E Screen, E Screen with KOOLBLACK® Technology, Natte, and Chroma.

5.4 Twill Weave
Formed when weft yarns are threaded over one or more warp yarns and then passed under another two or more warp yarns. Each yarn row is offset from the previous in order to give a diagonal rib pattern. Each of these diagonal lines is called a wale. This in turn gives the fabric more identifiable room-sides and street-sides. The room-side of a twill fabric is called the technical face. The wale is most visible on the room-side. Examples of Mermet twill weaves fabrics: T Screen Classic, T Screen Fusion.
Section 5: Types of Weaves

5.5 Satin Weave
A weave technique in which four or more weft yarns float over a warp yarn. This means that the warp lies under four or more weft yarns before interlacing over one weft yarn. The satin weave creates a dual sided fabric; one side consisting of more warp color and the other side showing more weft color. All fabrics with a satin weave have a predominantly white warp. This allows for the intended street-side of the fabric to be predominantly white providing excellent solar protection. These fabrics offer the ability to have different interior room-side color schemes while maintaining exterior building uniformity because of the white street-side appearance. Examples of Mermet satin weave fabrics: T Screen Deco, T Screen Naturals, and T Screen with KOOLBLACK® Technology.

5.6 Mock Leno Weave
A weave pattern in which three or more warp and or weft yarns are grouped together so that adjacent groups of threads are separated during weaving. The threads in each group interface with, or float over, intersecting yarns independently, creating a textured weave pattern. The separation of grouped threads causes the overall fabric to have openings that allow for good view through capabilities. Examples of Mermet mock leno weave fabrics: GreenScreen® Reflect

5.7 Fancy Weave
Any weave pattern that does not fall into the category of plain, twill or satin weave and results in a textured surface or pattern. Examples of Mermet fancy weave fabrics: A-Screen
Fabric Orientation
Section 6: Fabric Orientation

6.1 Street-Side
The side of the fabric designed to face towards the outside of the building.

6.2 Room-Side
The side of the fabric that is designed to face towards the inside of the building. This is the side that an occupant would see when looking out from within the building.

6.3 Shade Part Identification
This is a break down of each shade part.

6.4 Parts and Pieces Installation Type
It is important to see the difference that the installation can make.
Section 6: Fabric Orientation

6.5 Standard Roll
This is when the fabric waterfalls off the roll closest to the window. This is also referred to as a “regular roll.”

6.6 Reverse Roll
This is when the fabric waterfalls off the roll away from the window. The “reverse roll” option can be specified for a number of reasons; to project the fabric from the window if there are any obstructions such as handles, or to create a larger ventilation gap between the window and fabric. This venting can be used to prevent the fabric from suctioning to the window due to heat buildup.

6.7 Railroading Fabric
“Railroading Fabric” is a fabricating option that helps you avoid “seam lines” on large windows that exceed the width of the fabric roll. The fabric is installed 90 degrees from the way it comes off the fabric roll to achieve this. Typically, a standard shade’s width is cut from the width of the raw materials roll. However, it is possible and sometimes necessary to “railroad” the fabric to achieve wider width shades (than the raw materials roll width). If a shade is railroaded, then every other shade in that room should be railroaded to avoid pattern inconsistency and a “checker board effect.” Mermet does not recommend railroading any fabrics without additional testing performed by the fabricator based on the project specific applications and system capabilities.
Solar Energy Spectrum
Section 7: Solar Energy Spectrum

7.1 Solar Energy
Radiant energy from the sun having a wavelength range of 10 to 2500nm. (Reference sections 7.2, 7.3, 7.5)

7.2 Ultraviolet Light (UV)
Ultraviolet meaning “beyond” violet and not visible to the human eye. UV can cause damage or fading to interior furnishings and is a contributing factor to skin cancer. UV radiation is broken down into three categories. UV-C (10-280nm) is the least harmful and is absorbed mostly by the ozone in the stratosphere. UV-B rays (280-315nm) do not significantly penetrate glass and are responsible for sunburn on skin. UV-A (315-400nm) accounts for 95% of UV reaching earth’s surface. UV-A rays penetrate clouds and windows. The ability for solar control fabrics to block UV radiation is inversely related to the openness factor of the material, meaning that a 3% openness fabric roughly blocks 97% of UV radiation. (Reference section 9.4)

7.3 Visible Light
Radiant energy in the wavelength range of 380nm to 780nm. Light colors reflect more visible light than dark colors. The human eye is not capable of “seeing” radiation with wavelengths outside the visible spectrum. The visible colors from shortest to longest wavelength are: violet, blue, green, yellow, orange, and red. This is important to know when choosing a fabric color to use for a specific application.

7.4 Color
Perhaps the most important characteristic of visible light is color. Color is both an inherent property of light and an artifact of the human eye. Objects don’t have color, rather, they reflect specific wavelengths within the visible light spectrum that give the object the appearance of a specific color. Human eyes contain specialized cells called cones that act as receivers tuned to the wavelengths of the visible light spectrum. In other words, color is uniquely perceived by each person based on their individual sensitivity to each wavelength of light.

7.5 Infrared (IR)
The infrared energy spectrum, also called heat radiation, is a form of solar energy that we cannot see, but can feel. Infrared means “below” red. Lighter colored fabrics perform better than darker colored fabrics by reflecting more near IR wavelengths, as compared to darker colors. Infrared makes up the 52% of the solar energy which reaches the earth. This is important when determining performance characteristics & design intent of the fabric because it factors in tremendously to occupancy comfort.
Performance Analysis:
Thermal Properties
8.1 Reflection, Absorption, & Transmission Properties (RAT)

It is important to understand that all materials have RAT values. When considering a type of glass or fabric to use in a glazing system, it is important to understand these values are provided by the physical testing of the material.

**Solar Reflectance** is the percentage of solar energy at normal incidence (90° to surface) directly reflected by a material.

**Solar Absorption** is the percentage of solar energy absorbed by a material at normal incidence.

**Solar Transmission** is the percentage of solar energy at normal incidence directly transmitted through a material.

When calculating these properties there is an equation to help determine how a fabric will perform:

\[ Rs + As + Ts = 100\% \text{ of Solar Energy} \]

8.2 Solar Heat Gain Coefficient

The Solar Heat Gain Coefficient indicates how effective a building envelope system is at blocking heat from solar radiation. To calculate a product’s SHGC requires understanding the specific makeup of the entire exterior envelope system (window, glass, frame, and attachment). It is a fraction of the solar energy incident on the glazing system that is transferred indoors both directly and indirectly through the glazing system. The direct gain portion equals the solar transmittance. The indirect gain is the fraction of the solar energy absorbed, re-radiated and convected indoors. Due to the level of complexity with possible glazing and frame combinations, Mermet has simplified the data by referencing SHGC as an approximate percentage improvement when using our fabrics in combination with common window units. The higher the percentage, the more efficient the fabric is at blocking heat. For design purposes, project specific SHGC values can be calculated using the center of glass SHGC and the percentage improvement that the fabric provides when added to that system. For example, if a fabric has an SHGC percent improvement of 59% that means you multiply 0.59 by the SHGC of the project specific glazing (center of glass value). Subtract that number by the original SHGC of the glazing and you roughly have the overall SHGC for the system:

\[ \text{Glass SHGC} - (\text{Glass SHGC} \times \% \text{ Improvement}) = \text{System SHGC} \]

* Glazing performance is based off using Mermet fabrics with common Double Glazing (6 mm / 1/2" air / 6 mm) glass with low E on surface #2 (Guardian SN68, Viracon 1-2 M, PPG Solarban 60).

In the example used, the glazing performance without shades is SHGC (.38) and Tv (68). Variances in VLT reduction and SHGC improvement will occur with the use of project specific glass types and should be calculated using LBNL Window software.
Performance Analysis:
Optical Properties
Section 9: Performance Analysis: Optical Properties

9.1 Visible Light Transmittance

Visible Light Transmission (VLT) is commonly used to represent the amount of visible light that passes through the entire window system. Tv refers to the measured transmission of light through the fabric only. For example, to roughly calculate the overall system VLT (glass + fabric), simply multiply the Glass VLT by the fabric Tv:

Glass VLT * Fabric Tv = System VLT

9.2 Visible Light Reflectance (Rv)

Visible Reflectance is the percentage of visible light at normal incidence (90° to surface) directly reflected by a material. High Rv means more light is bouncing back towards the direction of the light source. This value can be used to evaluate interior lighting needs.

9.3 Visible Transmission (Tv)

The percentage of visible light at normal incidence directly transmitted through a material. The lower the value a fabric has, the greater its impact at controlling glare.

9.4 Openness Factor (OF)

This is the percentage of open holes in a solar shade, otherwise known as weave density. A shade with a high openness factor allows more solar transmittance and better view through. This would also indicate the percentage of visible light that passes through the fabric unobstructed. The openness factor does not determine visibility, glare or thermal control all by itself. Openness is inversely proportionate to UV blockage. (Reference 9.6)
9.5 **Diffuse Transmission Factor**

\[ T_{\text{diff}} = T_v - OF \]

This is the amount of transmitted visible light that does not directly pass through the open holes of the fabric. This references the light that is reflected off the sides of the yarn within the holes of the fabric or by the transmission glow of lighter colors. Darker fabrics will have less diffused light since they absorb more visible light. (Reference 7.3)

9.6 **View Through**

View through is the ability to see what is on the other side of a shade fabric. View through is dependent on multiple variables including, openness factor, color, weave style and dominant light source. Darker colored fabrics have increased view through in comparison with lighter colored fabrics. This is due in part to a darker fabrics ability to reduce glare more substantially by controlling the amount of diffused light and having lower visible transmission values, ultimately giving them greater glare control. Higher openness percentages and even weave patterns assists in creating the best quality view that can be offered. When referring to openness percentage, the greater the openness the better the view through. This factor can also be contingent upon the weave pattern. (Reference 5.3)

9.7 **Privacy**

A fabric with an openness factor less than or equal to 1% can provide privacy by permitting limited or muted views to the interior and exterior. Fabrics that are more open can also provide a level of privacy based on the relationship of the observer to the window system and dominant light source. It is important to note, a fabric that offers great daytime privacy, could also appear sheer at night due to the shade being backlit from the inside. White fabrics offer great daytime privacy on sunny days. (Reference 9.4)

9.8 **Fenestration & Glazing System**

Fenestration is defined as any opening in a building’s “envelope,” including windows, doors and skylights. Glazing refers to furnishing the opening with glass or another material. Incorporating windows and fenestration into a buildings architecture is a fundamental and integrated design activity. Fenestration dimensions and characteristics are increasingly driven by not only aesthetic concerns, but by demands for energy efficiency and design goals. It can be determined by building codes, green design standards, and even the building owner. Fenestration thermal performance can be identified by the Solar Heat Gain Coefficient. Building codes take into account the entire assembly including the frame, insulated glass spacers and the glass itself. This means that the choice of the frame material, being aluminum, wood, fiberglass or vinyl, can be every bit as important as the fabric specification for the glazing system. When shades or other solar control devices are used with the window glass, the combination is referred to as the “glazing system”. The application of solar shades can contribute positively to the glazing system from within the interior and have an even greater impact when installed on the exterior of the building.
Section 10

Measuring Brightness Levels
Section 10: Measuring brightness levels

10.1 **Lumens**
The amount of light that is coming from a light source in all directions is called luminous flux. These are measured in lumens, which is useful for determining how bright a light source is.

10.2 **Luminous intensity**
The amount of light that travels in a certain direction from the source is called luminous intensity and it is measured in candelas. The luminous intensity of one candle emits one candela in all directions.

10.3 **Illuminance**
Describes the measurement of the amount of light falling onto (illuminating) a given work surface. For code compliance, illuminance is measured at a surface level of 30 inches above the floor (desk height). Designing a space using daylighting and proper illumination levels is key to providing the correct amount of light needed for the activities being performed in that space.

10.4 **Luminance**
This is the amount of light we perceive when looking at an area. It is the amount of light that is reflected off a surface traveling back to the observer’s eye. The quality and intensity of the light that reaches our eyes depends on the material properties of the surfaces (color, reflectance, texture, etc.). Luminance measurements are useful for understanding light distributions and glare within an area. It is not intended for understanding if the spaces have enough light for the tasks that need to be performed there. (Reference 10.2 & 10.5)

10.5 **Footcandles**
The illuminance cast on a surface by one candela source one foot away falling on one square foot of space.

10.6 **Lux**
The illuminance cast on a surface by one candela source one meter away falling on one square meter of space.
Section 11

Glare
11.1 Types of Glare

The two main types of glare are: direct and indirect (reflected). Direct glare is caused by bright areas, such as luminaries, ceilings and windows that are directly in the field of view. Indirect glare is caused by light that is reflected off surfaces in the field of view and then into the eye - often in a task area such as a computer screen. (Reference 9.5)

11.2 Causes of Glare

The background lighting, or amount of light that the occupant's eye is accustomed to within a given environment, dictates the needed contrast ratio to eliminate glare. Glare is perceived when an overwhelming amount of light enters the eye, causing a decrease in viewing capability. A good rule of thumb is to avoid light levels that have a greater contrast ratio of 10:1. Take for example car headlights on a sunny day. They are barely noticeable since they match the light level around them. Now assume you see the same car headlights at night. They can be uncomfortable to look at because the high contrast ratio of light causes glare. The magnitude of the sensation of glare depends upon such factors as the size, position, and luminance of a source, the number of sources, and the luminance to which the eyes are adapted. Human factors such as age, sex, eye color, or if you wear glasses or contact lenses, can have an effect on how sensitive a person is to light levels. All these factors should be examined when determining which performance characteristics are most important when choosing a fabric.

11.3 Controlling Glare

Due to the reduction of visible light transmission, applying dark colors to the interior or exterior is the best choice for glare control. This is due to darker fabrics having the ability to absorb more visible light than lighter colored fabrics. Light colored fabrics have a higher Tdiff, which ultimately can still be a source of reflected bright light. (Reference 9.5) Applying the right fabric to an area will reduce the contrast ratio by blocking, deflecting or reducing the diffusion of direct sunlight. This reduces the intensity of natural light entering the building while lowering Tv and the likelihood that a glare-causing hot spot will occur. (Reference 9.3)
Acoustical Performance
Section 12: Acoustical Performance

12.1 NRC

NRC stands for Noise Reduction Coefficient and is the average of a product’s ability to absorb sound waves at 4 frequencies (250, 500, 1000 and 2000 Hz). These frequencies are the range of human speech. The rating is the average of absorbed waves, so the higher the number, the more sound is absorbed. NRC can be misleading because 2 products could have the same average, but one could perform better at the 250 and 500 Hz measures, while the other performs better at the 1000 and 2000 Hz points.

12.2 SAA

SAA stands for Sound Absorption Average and is the average absorption of sound waves from 12 octave frequencies ranging from 200 - 2500 Hz. It supersedes the NRC because it has a wider range and more points of measure. It also is better at higher frequencies because of the fact that higher SAA indicates more sound absorbed by the material.

12.3 Acoustical Uses

Acoustic rated fabrics can be used to lessen the noise within a space, such as in a restaurant where sounds reverberate off the walls. The fabric breaks up and redirects the sound waves. They can also be used to reduce noise which enters the interior of a building, as would be needed in an office near a loud street.
Determining Design Intent
Section 13: Determining Design Intent

Design Considerations for Fabrics

- Using a Maximum Daylighting Approach and reduce the need for interior lighting
- Building orientation
- Controlling solar heat gain for thermal performance and reduction in HVAC expenditures
- Occupant comfort
- Glare control
- Superior view through capabilities
- Energy efficiency
- Creating privacy
- Environmental appeal by using recyclable products such as sustainability and health certifications (PVC-Free, Recycled, GREENGUARD, Cradle to Cradle, Lead Free-RoHS, etc.)
- Achieving a specific aesthetic on the interior or exterior of a building’s facade
- Protecting interior furnishings from fading due to UV light damage
Determining Design Intent:
Fabric Applications
14.1 **Roller Shades**

Traditionally used on the interior or exterior of building envelopes. Roller shades can be used in a plethora of building applications with thermal and optical benefits. When not in use, roller shades fully retract and roll up around the tube leaving unobstructed views.

14.2 **Awnings**

External extrusions that protrude from the building providing shade and added sun protection; especially in summer months when the angle of the sun is high. Awnings are great for reducing solar heat gain.

14.3 **Skylights**

This style of application can be installed on the exterior or interior of the building. It can be used as tensioned shades for skylights, angled areas, and even bottom-up applications. Skylights are excellent for passive solar heat gain can be easily combined with light shelves.

14.4 **Printed Shades**

These can be made from solar fabrics that are compatible with printing options. Custom patterns, corporate branding, signage, architectural style and visual impact and can be printed on most shades.

14.5 **Dual Shades**

Dual shade systems consist of fabrics, which aid in room darkening ambient light control. Both rollers are housed either in a site-built pocket with a dual bracket or on combined brackets that can be concealed with fascia. There is also the option to have two different fabrics on one roller. Many rooms serve more than one purpose and this sort of option caters to those needs. A common example of this is using blackout and transparent fabrics to achieve varying levels of privacy and thermal control.
14.6 **Innovative Designs**

Fabrics can be used for a plethora of advanced designs such as room dividers, tensile structures, projection screens, acoustics, signage, lighting and printing. Even though some of these sound unconventional, there is no lack of what cutting-edge designs may come next.
15.1 Interior Fabrics
All of Mermet’s fabrics can be installed on the interior. Every product offered is compatible with this application. One benefit of interior mounted shades is that there are more varieties on how they can be controlled. (Interior fabrics are good at protecting furnishings from fading, adding privacy and controlling sun glare.)

15.2 Exterior Fabrics
All of Mermet’s vinyl coated fiberglass fabrics can be used on the exterior. Note that some of Mermet fabrics are specifically designed to withstand outside applications and have a 10-year exterior warranty. These include Natte and Vienne. These fabrics are more resistant to the outdoor elements because they are constructed of thicker fiberglass cores. Exceptions for this are any 100% polyester fabrics, blackout fabrics or metalized fabrics. Exterior shades, which are more prevalent in Europe, are becoming more popular in North America because of the increased performance benefits provided when compared to interior shades.
Fabric Styles:
High Performance
High Performance

Mermet high performance fabrics bridge the gap between solar heat control, view through capabilities, glare control and seamless building design. These fabrics have been enhanced with material properties that allow them to outperform normal fabrics.

Fabrics with KOOLBLACK® Technology have enhanced a darker fabric’s capability to reflect as much solar energy as to that comparable of a white fabric. Available in E Screen with KOOLBLACK® Technology and T Screen with KOOLBLACK® Technology, architects and designers can provide a unified building solution, by combining E Screen with KOOLBLACK® Technology with regular E Screen. Now, a building can have the same appearance around its entirety while having added solar protection on the sides where it is needed most. T Screen with KOOLBLACK® Technology provides a uniformed white exterior appearance while allowing for a multitude of darker interior color options that provide optimal view through capabilities and even stronger solar heat control.

Other enhanced Mermet fabrics include GreenScreen Reflect and Chroma. These fabrics performance properties have been heightened with the addition of a highly reflective ultra-fine layer of halogen-free aluminum coatings. These aluminum backings allow for a substantial increase in solar energy reflectance giving them more solar heat control.
16.1 **E Screen with KOOLBLACK® Technology 1%, 3%, 5%**

Unlike standard dark color fabrics, E Screen with KOOLBLACK® Technology knows how to resist heat. The fabric’s balanced basket weave provides a clear and sharp view in addition to maximized energy savings through reduced cooling costs. Combine with E Screen Original, in coordinating colors, to achieve a seamless exterior design appearance while providing a cost savings solution. This fabric is perfect for maintaining glare control in areas that received unwarranted direct and indirect sunlight. This allows for increased occupancy comfort throughout the building.

16.2 **T Screen with KOOLBLACK® Technology 1%, 3%, 5%**

T Screen with KOOLBLACK® Technology is the best performing fabric in its category. Compared to similar dual-sided screen fabrics, it has significant advantages in heat blockage and glare control. Position the dark side of the fabric to the interior for superior glare control and the white side to the exterior for superior heat reflectivity.
16.3 Chroma™ 2%

Chroma’s 2% openness and unique construction of aluminum coated fiberglass makes for a strong and stable fabric that provides excellent glare control, thermal comfort and privacy.
Fabric Styles:
Sustainable Fabrics
Sustainable Fabrics

Mermet’s sustainable fabrics are some of the industry’s most advanced screens for recyclability, performance plus human and ecological health. The make-up of these fabrics can range from recycled water bottles to abundant resources like sand. GreenScreen® fabrics possess attributes that can include being 100% Recyclable, Cradle to Cradle Certified™, and PVC-free. Mermet recyclable solar shade fabrics include GreenScreen® Evolve, and GreenScreen® Revive.

Recyclable Designer Shade Fabrics: GreenScreen® Evolve™ & GreenScreen Revive®

Eco-Efficient and High Performing Reflective Fabric: GreenScreen® Reflect™
Section 17: Fabric Styles: Sustainable Fabrics

17.1 **GreenScreen® Evolve 1%, 3%, 5%, 10%**
GreenScreen Evolve is a 100% recyclable, zero-waste, designer shade fabric. Being PVC-free and constructed with polyester, the fabric is made from recycled water bottles and is Cradle to Cradle Certified™. Evolve qualifies for the GreenScreen Recovery Program.

![Fabric Style: Warp Knit](image1)

17.2 **GreenScreen® Revive 1%, 5%**
GreenScreen Revive is constructed with 100% polyester yarn made from recycled water bottles and post consumer plastic waste. Revive is PVC-free, Cradle to Cradle Certified™ and qualifies for the GreenScreen Recovery Program.

![Fabric Style: Warp Knit](image2)
17.3 **GreenScreen® Reflect 5%**

Enhance the performance of windows with eco-efficient GreenScreen® Reflect. Made from fiberglass with a coating of aluminum on one side, this PVC-free fabric addresses material content requirements integral to today's sustainable health and building initiatives. It is fireproof, VOC free, and halogen free. This fabric reflects up to 76 percent of solar radiation and blocks up to 96 percent of all visible light for optical comfort.
Fabric Styles:
Decorative Fabrics
18 Decorative Fabrics

These decorative fabrics can be distinguished by their unique textures and weaves. The aesthetic appeal created by the diverse patterns and color palettes resonates with a multitude of building designs. These fabrics have been molded around the latest trends in solar screens.

18.2 Deco Screens 3%, 5%

Deco's multi-colored yarns of linen and rich browns provide the illusion of texture. The colors of this fabric further enhance its beauty and provide a versatile and natural looking fabric.

18.3 T Screen Deco 3%, 5%

T Screen Deco decorative shade fabrics offer a unique style, texture and coloring that enhance both the beauty and shading performance of any application. Constructed with multi-colored yarns and featuring a white street side appearance, the fabric’s coffee-house colors are beautiful and excellent for solar control.
18.4 **T Screen 3%**

T Screen is a beautifully woven, dual-sided fabric. The material has a diamond knit pattern, uniquely integrated with varying street-side colors that provide enhanced dimension and solar control.

![T Screen Image](image1.png)

**Fabric Style:**
Twill Weave (5.4)

18.6 **S Screen 4%**

This durable woven shade fabric has the look and feel of a high end natural textile. Undulating yarns are woven to create depth, texture and interest in this modern and easy to maintain fabric.

![S Screen Image](image2.png)

**Fabric Style:**
Rib Weave (5.2)
Fabric Styles:
Conventional Fabrics
Conventional Fabrics

Featuring clean weaves for exceptional view through, durability, and dimensional stability, conventional screens are some of Mermet's most popular fabrics. They continue to be widely accepted in the commercial architecture community.

19.1 E Screen 1%, 3%, 5%, 10%

E Screen is a popular fabric known for its simplicity of design, proportional weave, application versatility and excellent performance. It is an optimal choice for any installation, residential or commercial, that is looking for good view through capabilities.

19.2 M Screen 3%, 5%

A traditional weave, M Screen is a high-quality solar protection fabric made from coated fiberglass yarn and woven to maintain view-through capability. With a 1x2 basket weave construction and extensive color range, M-Screen blocks approximately 95% of UV rays, making it ideal for harsh climate conditions.
19.3 **Natte 5%, 10%**
Offering excellent mechanical resistance and high dimensional stability for extra-wide roller shades, Natte fabrics are great for high traffic walk areas or exterior applications due to its strength and weather resistant attributes.

19.4 **T Screen Naturals 3%, 5%**
T Screen Naturals decorative shade fabrics are elegant and smart. Designed for solar energy and heat control while maintaining an excellent appearance in the window. Similar to T Screen Deco, Naturals also feature a white street side appearance for enhanced solar performance.
19.5 **Vienne 5%, 10%**

Offered in 5% and 10% openness, Vienne provides high visibility and attractive views. Its basketweave construction offers a clean, unmuted appearance while reflecting heat and glare.
Fabric Styles:
Privacy Fabrics
20 Privacy Fabrics

Privacy fabrics provide complete light blockage or illuminated glow with limited or no view to the interior or exterior of the building. Not all privacy fabrics are alike and some allow for different levels of glow. These can range from complete glow to complete blackout. Each fabrics illuminance is measured using a light box allowing Mermet to report these values as a percentage. The openness range of these fabrics extend from 0% to 1%. These fabrics provide the maximum light blockage available.

20.1 Avila Twilight 0%

Avila Twilight fabrics are PVC-free and completely opaque (≥96%), providing advanced light blockage and privacy. They are perfect for boardrooms, media rooms, or any other application requiring control of light blockage. The Avila Twilight comes with a white or matching backing. The matching backing is offered in the colors black, charcoal and pewter making this fabric ever more versatile.

20.2 Vizela 1%

PVC free and constructed with 100% textured fiberglass, Vizela's lustrous coloring and tight weave provide muted views to the outside, with a 100% glow. Color coordinate with matching Flocké privacy fabrics for spaces that require complete light blockage.
20.3 Flocke® 0%

Texturized with a soft cotton backing, Flocké offers a high-end look and feel for turning the most common spaces into elegant ones. PVC-free and available in five colors, Flocké may be color coordinated with Mermet’s Vizela to achieve daylighting goals for specific applications.
Common Certifications
Types of Certifications
Certified materials meet specific controls or standards used to check the quality of products, validate analytical methods and serve as a particular form of measurement standard. The evolution of building construction has led to the development of codes and standards that mandate structurally sound, energy efficient and environmentally conscious buildings. Many of the standards and codes apply directly to fabrics. Listed in the section below are the current certifications applied and tested on Mermet products.

21.1 Fire Level NFPA 701
This test measures the ignition resistance of a fabric after it is exposed to a flame for 12 seconds. Ten samples are tested and cannot have an average weight loss of 40% or an average flaming drip of 2 seconds or more to pass.

21.2 CA Title-19 (California Fire)
California’s testing standard measuring the ignition resistance of fabric. 10 samples are tested for the parameters of the char length, which cannot exceed 6 inches for any individual sample, and after flame, which cannot exceed an average of 4 seconds.

21.3 RoHS
RoHS is the acronym for Restriction of Hazardous Substances. RoHS, also known as Directive 2002/95/EC, originated in the European Union and restricts the use of specific hazardous materials found in electrical and electronic products. (Lead, mercury, cadmium, hexavalent, chromium, PBB and PBDE.)

21.4 GREENGUARD
Simply put, GREENGUARD Certification ensures that a product has met some of the world's most rigorous and comprehensive standards for low emissions of volatile organic compounds (VOCs) into indoor air.

21.5 ASTM G21 • Fungal Resistance
This test method is designed to evaluate (quantitatively) the antimicrobial effectiveness of agents incorporated or bound into or onto mainly flat (two dimensional) hydrophobic or polymeric surfaces. It measures samples over 4 weeks that have been exposed to fungi and are rated on a scale of 0 (no growth) to 4 (60-100% coverage).

21.6 ASTM E2180 • Bacterial Resistance
The ASTM E2180 method is designed to quantitatively test the antimicrobial effectiveness of incorporated antimicrobial agent(s) in polymeric or hydrophobic materials. The test measures samples exposed to bacteria for 24 hours with untreated control. A log reduction of 1 (90% reduction to 5 (99.9999% reduction) is determined based on the reduction of bacteria. Anything with a reduction less than 90% is considered a 0 log reduction.
21.7 **Dry Heat | High Humidity**

This procedure is designed to determine the durability of materials when exposed to conditions of extreme heat. It is tested by hanging the specimen fabric for 125 hours at a predetermined temperature and reporting the outcome if there are any changes. The procedure for the high heat humidity test is designed to determine the durability of materials when exposed to conditions of extreme heat and high humidity. It is performed by hanging the specimen fabric for 500 hours (unless otherwise specified) in a climate controlled chamber.

21.8 **Breaking Strength & Elongation ASTM D5035**

5 samples are tested in the warp direction and 5 in the weft direction on the tensile tester.

21.9 **NRC | SAA Acoustical Tests**

There are 2 types of sound absorption tests to be familiar with, NRC and SAA. The Noise Reduction Coefficient is the average of a product's ability to absorb sound waves at 4 frequencies. The SAA is Sound Absorption Average. It is the average absorption of sound waves from 12 octave frequencies ranging from 200 - 2500 Hz

21.10 **UV (Light Fastness) Testing**

Used to measure resistance to color fading in a materials composition, samples are placed in a UV Weather-O-Meter and pulled at 500, 1000 and 1500 hours. A gray scale is used to rate any changes in color.

21.11 **Peeling Test**

Determines the amount of peeling of coated fabrics using three different types of tape. Evaluation is visual and based on a 1-5 scale. The fabric is tested at 24 hours and 7 days.