



Effects of Weather

Awning Fabrics and the Elements

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Introduction

Residential and commercial awnings may seem like decorative architectural elements that are only added for aesthetic or design purposes; Architects, designers and business owners know that **the value of an awning goes much further than aesthetics**. The appearance and functionality of an awning can play an integral role in the way a building operates on a day-to-day basis and how well it is received by the community or potential customers.

As an architectural element, awnings all share a similar basic design. No matter their use, most awnings are simply made from a metal frame that is wrapped with a sturdy membrane of awning fabric. Whether you are designing a new building with awnings or are looking to replace old awnings, it is imperative that the right kind of fabric is used. In order to make the appropriate decision in regards to the type of fabric to use for your awnings, it is important to understand the differences between their construction and how they are affected by weather patterns.

Throughout the year, awnings are exposed to diverse climate conditions. From the freezing cold temperatures and heavy snow of the winter to the onslaught of UV rays and heat during the summer, nearly every region has at least one extreme season. Whether you are building, designing or purchasing an awning, paying a higher initial cost is often well-worth the long-term savings a durable fabric provides by withstanding the elements outlined below.



Spring: Impact of Rain and Moisture

Moisture protection is considered to be one of the most crucial functions of an awning. That means the fabric must be fully waterproof without so much as a single leak. Unfortunately, very few fabrics are able to honestly make this claim; the truth is most awning fabric is merely water-resistant. In order to avoid irreversible damage to your awnings during the wettest months of the year, seek out material that is legitimately and permanently waterproof.

For restaurateurs, a fabric-and-metal canopy provides a welcoming area for potential diners to queue while waiting for a table or as a cover for your outdoor dining area. Awnings also give retail establishments, hotels, apartment buildings and offices an inviting appearance that offers pedestrians protection from harsh elements and also draws them towards your storefront. But if the fabric is soiled with unappealing mildew stains or is dripping water due to leaking seams, it may repel potential customers.

It may be surprising to learn that **the majority of materials that are used as awning fabric are not waterproof.** Fabrics made from woven natural fibers such as cotton have no water-resisting capability, though they can be treated with products that allow them to repel moisture to some degree. Natural fiber fabric awnings may seem cost-beneficial due to a lower barrier of entry, but they will inevitably need replacement when their water-resistant abilities fade.

You can tell a fabric is not water resistant if it is wet to the touch when exposed to moisture; this means it is absorbing the water as opposed to wicking it away. Besides the immediate issue of dripping leaks, water absorption is what leads to unattractive mildew stains, unpleasant odors and deterioration of the material.



Natural woven fibers are not the only material that isn't inherently waterproof; many other materials are simply water resistant as well. Woven synthetic fibers such as acrylic and polyester, offer more protection against moisture than natural fibers, but still do not completely guard against leaks and water absorption. Typically, synthetic fibers are treated with a fluorocarbon formula, which is able to repel water for a given period of time. As the treatment wears off, the synthetic fabric loses its water-repellant quality and will be subject to leaks.

It's easy to assume the difference between the waterproofing capabilities of synthetic materials lies in the quality of the fluorocarbon treatment. While that is a factor, **no woven synthetic material is able to measure up to the waterproofing abilities of vinyl-based polyester composite synthetic fiber.** This material, while also given a waterproofing treatment, is inherently more waterproof due to its construction.

A major difference between composite material and woven synthetic fibers is its ability to be dielectrically heat sealed. The synthetic fiber is usually made from PVC composite or vinyl fabric, a material which can be heat-sealed. These heat-sealed bonds are completely and permanently waterproof. Even the best waterproofing treatment cannot compensate for the fact that woven synthetic fibers must be stitched together, leaving small gaps that allow water to enter.

If you live in a region that experiences less precipitation than average, using woven synthetic fiber fabric may be enough to prevent water damage and leaks. As long as you keep up with the waterproofing treatments as advised by the manufacturer, it is unlikely you'll experience catastrophic damage from sporadic precipitation. But if your building is in a locale with heavy rainfall, no option beats fully waterproof composite synthetic fiber fabric.



Summer: Shade and Solar Heat Gain

Moisture protection is the most obvious advantage of an awning, but they play another equally important role: creating shade. By providing reprieve from the beating rays of the sun, awnings make your guests feel comfortable dining outside and provide a cooling effect that lowers energy bills. However, a fabric that keeps your doors, windows and visitors shaded from harmful UV rays will inevitably be damaged by those same rays on a daily basis.

Luckily, there are ways to mitigate the damage to your awnings that is caused by long-term exposure to strong sunlight. The best way is to select an appropriate fabric, one that will not degrade rapidly in places that get copious amounts of sunny (such as the Southwestern United States). It may be tempting to buy on a lower-quality fabric that requires a smaller initial investment. However, their life expectancy will be significantly shorter than high-quality fabric that is able to withstand the impact of the summer sun.

Those that live in areas with less intense average sunlight still must be wary of the damaging cumulative effects of the sun. This phenomenon is known as photo-degradation and can lead to a host of issues including [discoloration](#), [fading](#), [cracking](#), [tearing](#) and [brittleness](#). This in turn leads to more problems when the weather does change, increasing the fabric's susceptibility to leakage during heavy rain or even worse, collapsing when it takes on too much snow.



Awnings are also a surprisingly effective way to **cut down on your energy costs** during the summertime. As LEED-certification becomes more and more commonplace in the architectural and design world, awnings have grown increasingly in-demand. It may seem surprising, but these simple architectural elements are tremendously efficient at limiting the heat gain of a building.

“ Studies have shown that one great way to limit the level of solar heat gain in your home or business is through the use of awnings. ”

Heat gain is a term that refers to the measurement of solar radiation and the amount that is absorbed or directly transmitted and released as heat. It is conventional wisdom that during the summer months when air conditioning costs soar, building designers and small business owners will want to limit their structure's heat gain. Studies have shown that one great way to limit the level of solar heat gain in your home or business is through the use of awnings. The Department of Energy has found that in the summer, awnings are able to reduce heat gain by 65% on windows that face to the south and 77% on windows that face the west.

The best awning fabrics for limiting heat gain are those which are the most opaque. Cotton and other natural fibers are not very opaque, and therefore do not limit heat gain to the level which a woven synthetic fabric can. Vinyl-based polyester composite fabrics are the most opaque on the market, and therefore are the best choice for limiting a building's solar gain.



Autumn: Falling Debris and Cleanability

As the weather starts to cool down from the warm summer months, a new issue can arise during the autumn season. Falling leaves, dirt, debris and other detritus from overhead can threaten the pristine appearance of your awning fabric. Add in the fact that many regions experience a great deal of precipitation during the fall and you are looking at a recipe for a mess. While there are other considerations to take into account when looking for the easiest-to-clean awning fabric, the difference is largely with the type of material from which it is made.

“Clean awnings are important for both designers and business owners”

Clean awnings are important for both designers and business owners. Even the most beautifully designed building will look decrepit and uninviting when the first thing a passerby sees is stained awnings. Clean awnings are an even more important consideration for business owners; fairly or unfairly, a dirty awning projects to customers an aura of lower-quality products or services.

Because natural fibers are so difficult to clean, business owners will be forced to continuously hire cleaners to remove the offending dirt. Despite the temptation to save money with cotton or other natural materials, in the long run you will end up paying more for these cleaning services or even a full replacement.



Woven synthetic material is an improvement over difficult-to-clean natural-fiber constructed awning fabric. However, by virtue of its woven construction, dirt and other debris becomes easily trapped within the crevices of the synthetic fibers, making it very difficult to remove without the assistance of a professional cleaner.

If you do choose woven synthetic awning fabric, it is crucial that it be regularly treated with waterproof coating as directed by the manufacturer. When woven synthetics have not been treated recently, it can make scrubbing them clean even more arduous of a task. While it is more likely you'll be able to get the woven synthetic fabric close to its original condition, it is nearly impossible to clean it to the point of looking brand-new.

“ Unlike woven synthetic and natural fibers, this composite material has a smooth surface that only requires a spray of water to shed dirt and dust.”

The easiest awning materials to clean are those that are made from vinyl-based polyester composite fiber. Unlike woven synthetic and natural fibers, this composite material has a smooth surface that only requires a spray of water to shed dirt and dust. Look for composite fabric that is treated with a topcoat such as RainKleen® or polyvinylidene fluoride (PVDF), as these materials are even easier to clean than their untreated competition.

One consideration to take when choosing a fabric for your building or business's awnings is the color choice. Lighter colors stain more easily and can be more difficult to clean. Therefore, if you are planning on using a light shade for your building, it is all the more essential to use a quality fabric like composite fiber.



Winter: Fabric Strength and Snow Load

The summer tests the durability of your awning fabric against the rays of the sun; the fall tests its ability to be cleaned when soiled with dirt and other debris; the precipitation-heavy springtime tests its water resisting qualities. During the winter, especially in snowy locations, [the strength of your awning](#) and its fabric will be put to the test.

As snow accumulates atop your awning, the ability to bear heavy loads becomes increasingly important. If the awning frame or the fabric has experienced damage over the course of the year or is made from lower-quality materials, the risk of a snow-load causing a collapse increases.

“As snow accumulates atop your awning, the ability to bear heavy loads becomes increasingly important.”

While the most significant factors are the strength of the frame and the pitch of the awning, fabric quality matters too. Much like the previous examples, there's one fabric that stands above the competition: vinyl-based polyester composite synthetic fiber. Just as this composite material is able to wick away water with ease, the smooth, non-woven surface does the same for snow, sleet and other wintery precipitation.

The gold-standard for determining fabric strength is the Mullen burst test. This decades-old quality-assurance test is also referred to as the Mullens test. It gauges the ability of a single sheet of



material to withstand pressure and penetration from the human elbow. While it may seem like a simplistic way to learn the strength of a fabric, it has been employed by the manufacturing industry for decades and is endorsed by the U.S. Department of Commerce.

These days the test does not use actual elbows, instead deferring to a [specialized testing machine](#). While all fabric will eventually burst after a certain amount of pressure is applied, composite synthetic fabric material is able to handle a greater amount of pressure per square inch (PSI) than woven synthetic and natural fiber fabric.

Another test of particular relevance during the wintertime is what is known as the “hydro low pressure” test or a “leak test.” This test is particularly relevant to business owners and building designers in areas with heavy snowfall, as it measures waterproofing abilities when the fabric is under pressure. The fabric is clamped into place with a pneumatic plate while pressure measured at 5 PSI is applied to the material’s face. After five minutes are up, the fabric is checked for moisture; if there is any moisture present, it fails. If you are concerned about the effects of moisture, particularly during a snowy build-up, be sure the fabric you use has passed this “leak test.”

Conclusion

[Herculite awning fabrics](#) are made from vinyl-based polyester composite synthetic fiber and provide a distinct advantage over the competition. Compared with fabrics made from natural fibers or woven synthetic fibers, this composite material is well-suited to battling the elements year round.

Whether it is preventing the cracking and fading that result from long-term exposure to the sun's UV rays or staying mildew free and keeping customers dry during the wet winter season, Herculite composite fabric is the right choice to withstand extreme weather conditions.

Herculite uses superior topcoatings such as RainKleen® and PVDF, allowing the company to offer extended warranties on their products; these materials will in fact save you money and hassle over the long-term with its superior strength, function and durability.

Weather factors are a crucial consideration when choosing a fabric for your building's awnings. If you are a designer or architect working on a building that features awnings, it is important to understand the weather patterns of the project site. Small business owners who are in the market to replace a damaged awning must look to the previous fabric and recognize how it became damaged; noting its failure is the first step in identifying the correct material to use with your new awning.

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