PHILIPS

Fashion lighting

White paper

Maximum attractiveness of window displays

Compiled by Signify & Guardian Glass[1]
the storefront experts in lighting and glazing

Discover endless possibilities with **optimized glazing and lighting**

When it comes to attracting the attention of passersby, store fronts have to battle with a true kaleidoscope of competing sensory impressions. In addition to the attractive design of the display and the interior design behind it, the glazing of the windows and the natural and artificial lighting decisively determine whether and how potential customers perceive the offered goods and whether they accept the invitation to pause and perhaps even enter the store.

[1]Signify (Signify Netherlands B.V., High Tech Campus 48, 5656 AE Eindhoven (formerly Philips Lighting) and Guardian Glass (Guardian Europe Sarl,, 19, rue du Puits Romain - L-8070 Bertrange – Luxembourg, and its affiliates) are independent parties, Signify has provided information as to lighting applications and Guardian Glass has provided information as to glass application (with the glass performance values shown being nominal and subject to variations due to manufacturing tolerances). Both parties have provided it not as any advice, but for information purposes only, without granting any warranty not assuming any responsibility for any other party's use of this information.

Taking advantage of opportunities with glass and light.

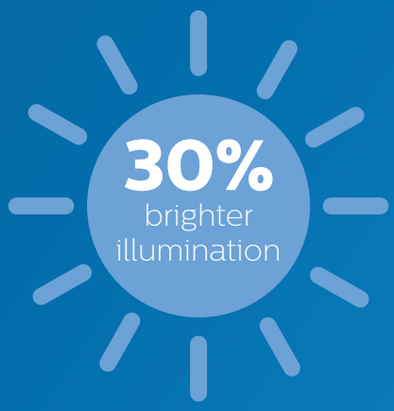
Both the glazing and the lighting offer a variety of individual design options in order to turn the initial, second-long optical stimulus into real interest. Here clear, but in fact reflective panes of glass that show more of the surrounding area than the contents of the shop window are just as much relics from the past as lighting systems in which the light irritates and dazzles passers-by, falsifies colors or steers the eye in the wrong direction. Thanks to the state of the art, shopkeepers now no longer have to tolerate either. Glass and light are no longer a reason for missed opportunities if they are optimally matched to each other and to the ambience of a retail store. An optimized key for the retail sector is the combination of Guardian Glass' glazing products with Signify's lighting concepts. Both can be adapted within wide limits to the respective specific requirements so that the window of the store acquires maximum attractiveness.

This article gives some fundamental information about the functionality of different lighting and glazing concepts and gives examples of how different variants may affect the perception of passers-by and potential customers. Shopkeepers and architects thus may find it as a helpful aid in a decision making when selecting the best possible combination of lighting and glazing for their individual situation with regard to the brand message.

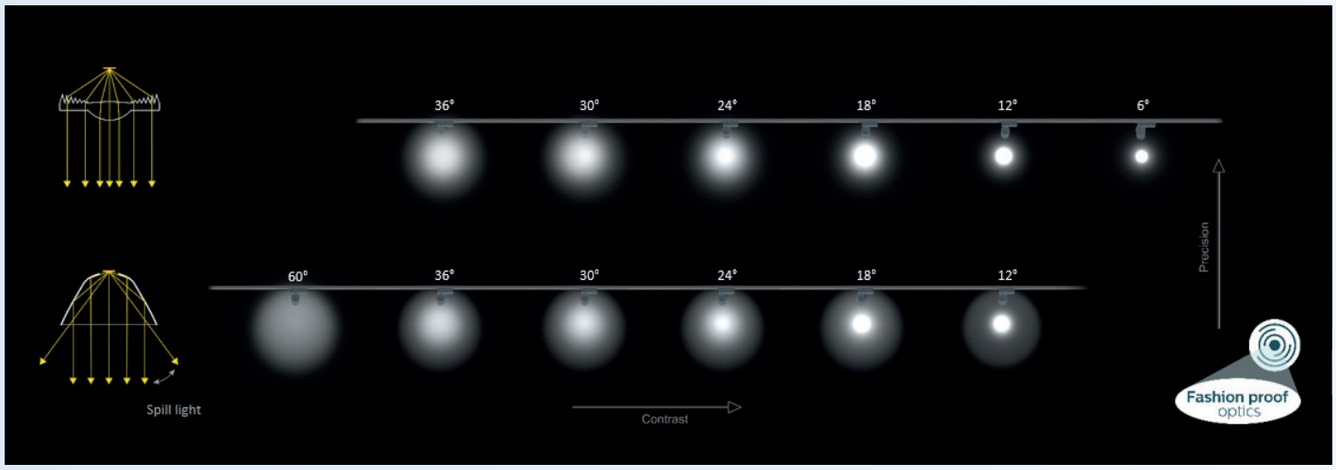
Light transports messages

Light helps retailers increase sales and retain customers. The lighting situation significantly influences how passers-by perceive the presentation of goods in a shop window display. This applies not only to shop fronts in more or less continuously illuminated shopping malls but also to shop windows that are exposed to the changing conditions of daylight. In all cases, shop window lighting has two central tasks - to make the individually targeted brand message a tangible and recognizable experience and to attract the attention of passers-by. It uses a variety of variables, including the shape of the light beam, brightness, contrast, color temperature and color rendering.

Brightness and contrast are basic parameters that determine the effect of lighting. Especially for the presentation of clothing, Signify developed Philips Fashion Proof Optics (FPO), a lens system for energy-efficient LED spotlights, such as the Philips TrueFashion series. Spotlights equipped with Philips FPO focus the light without a halo, creating a 30% brighter illumination of the product compared to standard LED spot lighting with reflectors with the same specifications (CRI/ lm output /CCT) ,whilst minimizing the stray light also doubles the contrast. The higher contrast and improved directionality of the beams ensure, that the displayed product appears particularly three-dimensional and the presentation becomes more lively. This applies to clothing in particular, but of course not only to clothing.



While reflector-based LED lighting systems cause a lot of stray light (left), the Philips Fashion Proof Optics system (FPO, right) focuses the light in a contrast-enhancing manner to show more detail of the product and make it more playful .



The Philips TrueFashion line of spotlights, equipped with Philips FPO lenses, provide halo-free spotlighting (picture 2).

Apart from the contrast, the shape of the cone of light determines the effect of the illumination. Here, the Philips TrueFashion portfolio offers a wide range of variants that cover almost every conceivable requirement. For example, systems equipped with conventional reflectors allow beam angles of 12° to 60° in combination with a softer stray light, while spotlights with Philips FPO lenses, which are advantageous for shop-window lighting, offer a choice of beam angles from 6° to 36° without any stray light (note that for shop window we typically recommend beam angles of 18° and smaller).

Philips Standard 930

Philips LED flavor PremiumColor

The Philips LED flavors stand for enhanced saturation of colors, without changing the CRI number, and thus for the color presentation and impact of product displays.

In addition to brightness and contrast, the color rendering of the light determines whether a presentation is perceived as pleasant and thus whether it benefits sales. For Fashion stores, attractive and natural rendering of the colors and textures of the fabrics is essential. The color rendering index (CRI) is used to classify lighting on this aspect. However, CRI is based on an old definition that excludes saturated colors such as red, blue, green, yellow, as well as white and black. A CRI value of 90 or more is typically specified for fashion lighting, and it is important to realize that different qualifying light sources can have very different appearance of those saturated colors. To also open up optimization possibilities here, Signify has developed the line of LED flavors. A selection of color spectra meets a variety of requirements, making white more brilliant, black crisper, colors more vivid, and also making color differences and textures appear more pronounced.

Mix of lighting for open shop fronts

The trend is towards open shop fronts that provide a view deeper into the store, creating an inviting atmosphere. In order nevertheless to place sufficient focus on the shop window display, several (often 2 to 3) luminaires per object are usually required, in order to produce sufficient brightness despite intense lighting in the background. Here, too, the advantages of Philips Fashion Proof Optics come into their own.

With a particularly narrow beam (beam angle 6 °), which is therefore highly intense (light intensity 60 kcd), spotlights create the necessary contrast and draw the attention of the potential buyer to the object in question. Supplementary luminaires with somewhat wider beam angles like 12° - 18° up to 35 kcd create an attractive mix of light accents, and dynamic light sources also help make passers-by pause to take a look.

These measures have an optimal effect if they are carefully matched in terms of intensity and color to the lighting in the store and thus create a natural transition into it. Particularly high demands in this regard are made by shop windows that are only partially closed in the rear area by walls or design elements. The attention of the customer is directed to the objects presented in the windows, without completely obscuring the view into the shop. Here, it is important to carefully analyze design elements and lighting solutions and then to balance out each other in order to achieve the set goals. A perfect presentation of the product without troublesome reflections on the design elements can usually be achieved here by using lights with medium or narrow beams.

Use supplementary lights with beam angle 12°-18°/ 35kcd **for attractive mix of light accents.**

Use spotlights with beam angle 6°/60kcd for setting highlights.

Maximize protection and attractiveness at the same time

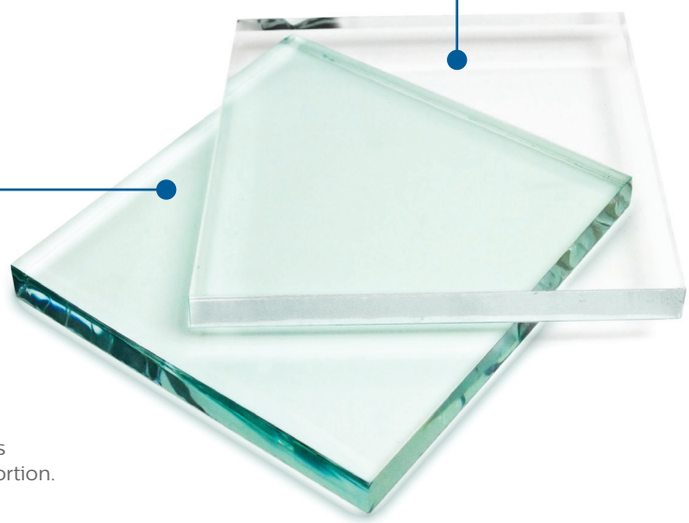
From color-neutral to almost invisible

Even if all the suggestions for an optimized, sales-promoting lighting of the display are followed, there will always be a glass window between the display and the potential customer. Badly selected, this can destroy a large part of what could have been achieved. Properly specified, however, it can significantly increase the attractiveness of shop windows and thus the shopping experience.
The original and main task of glazing is to protect the interior of a shop from external influences. The type of expected impacts on the glass determines the required safety properties and thus the structure of the glazing. In addition to elementary protection against the effects of the weather, the requirements range from protecting passers-by in the event of an unintentional impact, to defending the store against massive attacks during attempts to break in. Higher levels of protection counteract per se the second requirement for maximum transparency. With a multitude of developments, Guardian Glass offers architects and shop owners attractive options for combining high levels of protection with largely unobstructed viewing without glare and reflection, while at the same time incorporating additional features such as sound insulation, UV filtering and thermal insulation.

A first step in the direction of unimpeded transparency takes us from standard clear glass to low-iron glass. The standard version has a greenish hue in which the color-distorting intensity increases with the thickness of the glass. Typical characteristics for 10 mm thick clear glass are a color rendering index (CRI) of 97% (sunlight: 100%) at a light transmission of 87%. In contrast, a significantly more color-neutral low-iron glass (e.g. Guardian UltraClear™) with the same thickness offers a CRI of 99% at 91% light transmission. Thicker low-iron glass therefore has less influence on the transmitted color. The light reflection of both types of glass is 8%. This relatively low figure is nevertheless enough to produce a glare effect in the presence of daylight or to reflect foreign light sources such as neon signs from the store opposite so intensely that an unobstructed view and thus the intended effect of the shop window display are severely limited.

10mm
UltraClear™
CRI 99% / 91%
light
transmission

10mm
Clear glass
CRI 97% / 87%
light
transmission



Low-iron glass (upper one) has a much lower green color than standard clear glass and thus allows the use of thicker glass without noticeable color distortion.

Optimizing visual experience and maximizing transparency

Before
with disturbing reflections

Guardian Clarity™ impressively prevents reflections – not only in the area of the shop windows – making them virtually invisible

> **Guardian Clarity™ glass ensures crystal-clear visibility** into your shop and helps to make you more approachable."

Impressively better results are achieved by using Guardian Clarity™, a low-iron glass with a double-sided high reflection-reducing coating. Because its light reflection of 0.7% is lower by about a factor of 10, this glass appears almost invisible. At the same time, its light transmission of 97% is higher than that of Guardian UltraClear™, while the CRI attains the same high value of 99%. This antireflective glass minimizes unwanted glare and reflections while optimizing visual experience and maximizing transparency. Troublesome reflections that originate, for example, from neon signs on the shop window front opposite are virtually unnoticeable.

After
without reflections

Laminated safety glass: **Plastic interlayers maximize safety**

Glass is a brittle material that fractures abruptly as soon as its load limit is exceeded. This produces sharp-edged shards with a high risk of injury - an exclusion criterion for use in store fronts. Toughened safety glass goes through an additional heat treatment process in which mechanical stresses are frozen into the pane. As a result, it shatters into thousands of tiny parts with non-hazardous edges. But what may be a useful advantage over conventional glass in the private sector is not sufficient for commercial applications, because after the break there is no protective effect left - the glass has fallen out of its frame, the products in the window are freely accessible.

The solution is offered by laminated safety glass (LSG), in which two or more glass panes are joined to each other with a plastic film. In the event of damage, the glass fragments stick to these interlayers instead of falling out. Thus, they shall not be a source of danger to passers-by, and because the pane as a whole remains in the frame, it shall retain a good part of its protective effect – not only from the wind and weather but also from burglars - until the pane can be replaced.

In general, laminated safety glass is a recognized safety glazing material according to BS EN ISO 12543 Part 2 (glass in construction, laminated glass and laminated safety glass) for use in areas where it is required by the Building Regulations. LSG must meet strict requirements for use in shop windows with their increased protection requirements. For example, DIN EN 356 (Glass in construction - Safety glazing - Test method and classification of resistance to manual attack) defines different classes for the break-in protection of safety glass. In the classification, an attempt is made to hit a defined hole in the pane using a machine-guided, 2 kg axe. The classification P6B stands for the resistance against 30 to 50 strokes, P7B for 51 to 70 strokes and P8B for more than 70 strokes.

Both the number and thickness of the glass panes integrated into the laminated safety glass and the mechanical properties of the interlayers determine the degree of protection and thus the classification. In general, shop window classification from P6B to P8B requires relatively thick laminated safety glass. Using conventional clear glass would result in unacceptable darkening and green coloration. One solution with surprisingly high aesthetics - regardless of the interlayer and for all safety classes - is a combination of Guardian Clarity™ antireflective glass with Guardian UltraClear® glass, which, thanks to its low iron content, is color-neutral.

Guardian Clarity™ impressively prevents reflections – not only in the area of the shop windows – making them virtually invisible

Protection against **noise and UV radiation**

Depending on the location of the store, the noise from the surrounding area may be so massive that without additional measures both the well-being of the staff and the customers' shopping experience would suffer. As early as the planning phase, it is therefore advisable to take into account the use of sound-insulating glass such as Guardian's LamiGlass® Sound Control. Here, an optimized interlayer made of PVB (polyvinyl butyral) provides a distinct increase in noise protection without compromising the other advantages of laminated safety glass.

Another undesirable environmental impact is UV light. Large glazed shop fronts let in plenty of natural daylight that contributes to the well-being of customers and staff. At the same time, however, its UV content leads to premature fading of fabrics, floors and furniture. Again, Guardian's LamiGLass® LSG solutions provide the necessary protection by blocking 99.9% of the sun's harmful UV rays.

Sustainable use of energy

Shop windows, which are not part of large, air-conditioned shopping centers, make a significant contribution to the heat balance of the shops concerned, which increases with the temperature difference between the inside and the outside. Heat-insulating glazing such as Guardian ClimaGuard® can help reduce the need for energy used for heating or cooling. This makes it easier to comply with local regulations regarding thermal insulation and thus contributes to greater sustainability. Unfortunately, conventional heat-insulating glass often involves the problem of troublesome reflective properties due to their low-emissivity coatings, which can negate the positive influence of optimized illumination. With the combination of Guardian Clarity™ antireflective glass and ClimaGuard Premium, Guardian Glass offers a heat-insulating solution, which is optimized for shop fronts. With an external reflection of only 2%, it minimizes any disadvantageous effect on the lighting concept.

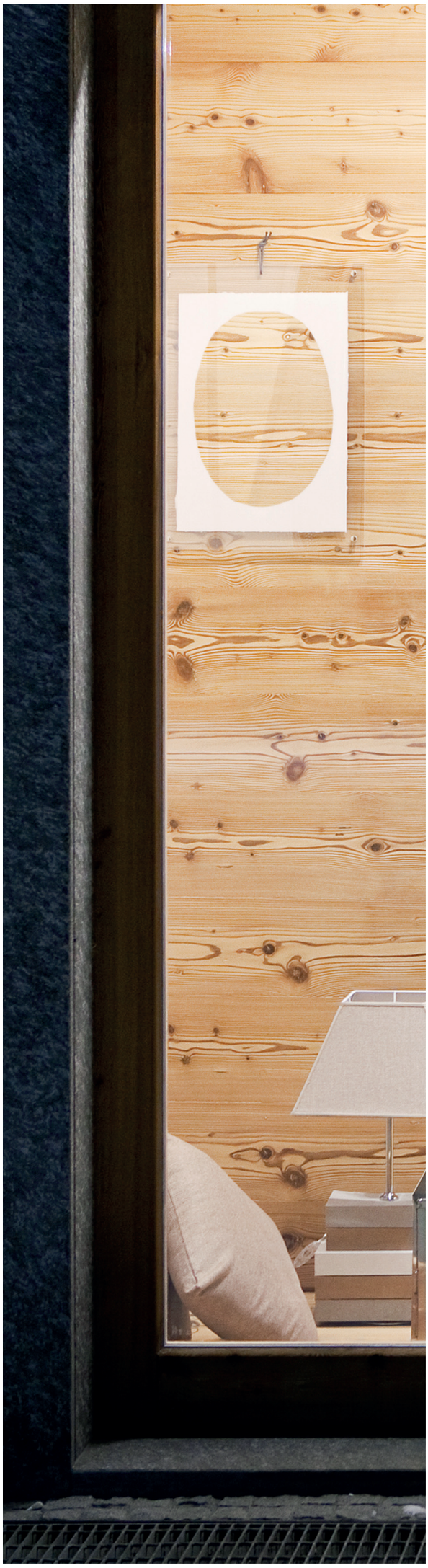
Create a relaxed atmosphere with sound-insulating glass

Block 99.9% of the sun‘s UV rays

Heat-insulating glass with external reflection of only 2%

Solution to maximize attractiveness of shop windows with **optimized lighting and glazing**

Shop windows encourage passers-by to pause and persuade them to enter a store. An optimized combination of glazing and lighting as well as the display itself dictate the extent to which they actually do so. With intensity and contrast, Philips Fashion Proof Optics (FPO) defines the look, feel and identity of retail stores. In combination with this, Guardian Glass glazing solutions ensure that the intended effect reaches their audience by ensuring good color rendering, eliminating reflections, cutting out noise, protecting them from UV rays, helping to maintain a comfortable temperature and thus optimizing energy consumption, while at the same time protecting the displayed goods from theft and guarding customers and staff against injury. Perfectly coordinated, the combination of light and glass creates the unique appeal that matches the high quality and brand image of the presented goods. Planners who incorporate the interaction of these different components into their considerations at the early design stage can create a strong basis for a high customer frequency and thus for the targeted business success.



“**Emphasise the high quality** and brand image with perfectly combined light and glass.”

www.philips.com/fashionlighting