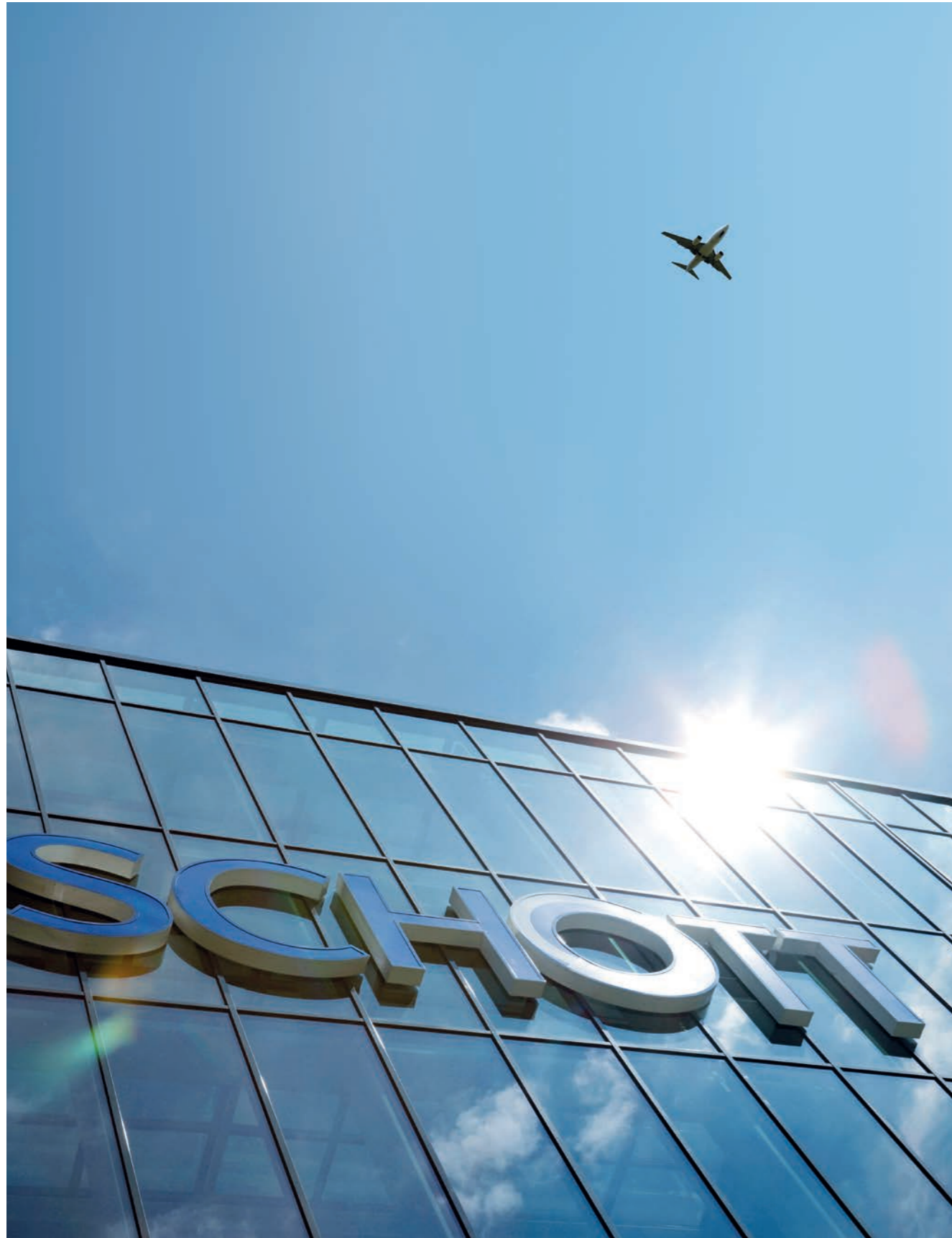


A photograph of an airplane cabin interior. The ceiling is illuminated with a starry pattern, creating a night sky effect. The cabin is filled with rows of seats, each with a white headrest and a white pillow. The lighting is soft and blue, creating a calm and relaxing atmosphere. The text 'SCHOTT glass made of ideas' is overlaid in the top right corner.

SCHOTT
glass made of ideas

Perfect Lighting
Perfect Atmosphere

Cabin and Seat Illumination



SCHOTT is a leading international technology group in the areas of specialty glass and glass-ceramics. With more than 130 years of outstanding development, materials and technology expertise we offer a broad portfolio of high-quality products and intelligent solutions that contribute to our customers' success.

SCHOTT's Lighting and Imaging division has been active in the area of aircraft cabin illumination since the 1990s. Based on our extensive know-how in optical technologies, the expertise has been extended into the field of fiber optics. Especially the connection of fiber optics with modern LED technology enables fascinating lighting solutions in aircraft cabins that provide passengers with an unmatched on-board experience.



Perfect lighting creates perfect atmosphere

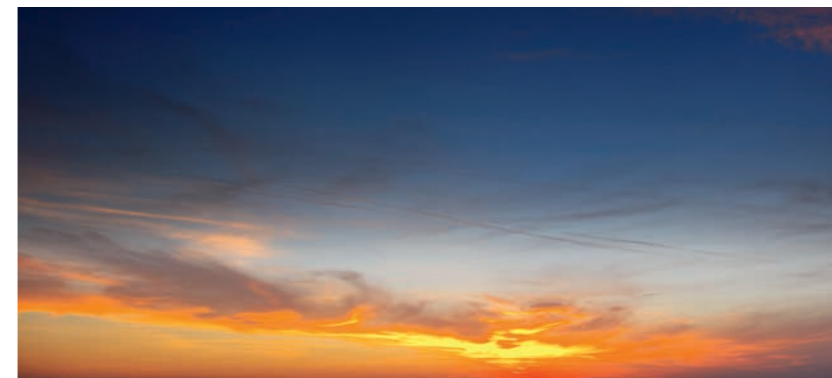
There is nothing more perfect than natural light. Nature creates the perfect atmosphere and SCHOTT aims to enable the perfect lighting to set the stage in aircraft cabins.

The beauty of natural light becomes most obvious when light intensity and color shades merge together to make a perfect mix, which creates an unmatched overall impression and a stunning atmosphere.

At SCHOTT Aviation we aim to create light scenes that present striking moments. As with nature, we not only provide light for the sake of beauty, we enable airlines and passengers to experience the right setting both during the day and night while on board.

SCHOTT is the only cabin lighting specialist that is able to realize a holistic approach that orchestrates different light elements into one cabin lighting scenario. Our products offer unique possibilities due to the combination of fiber optic and LED technology.

This brochure shows our spirit. We are dedicated to gathering inspiration from nature and turning your cabin into a very special place. All day and all night.



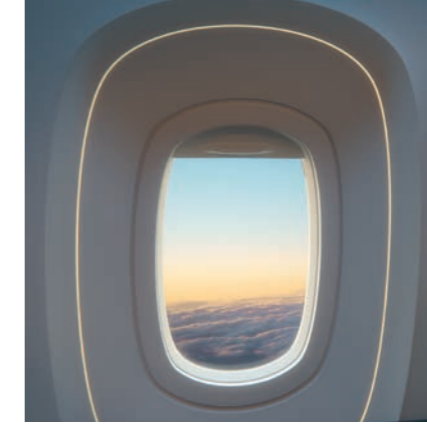
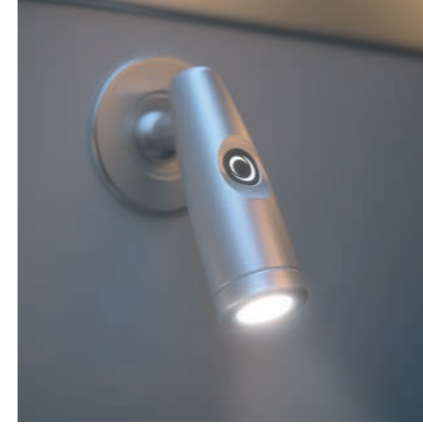
Morning has broken

The day slowly breaks the night and energizes human life with soft and clear color shades.

We are very sensitive when switching from night to day mode. An abrupt awakening from harsh penetrating lights has a very negative effect on the start of your day. SCHOTT lighting provides passengers with a soft and quickened start into the day.

SCHOTT® Reading Lights bring the light exactly to the spot where it should be. The combination of fiber optic and LED technology enables reading lights to be customized and placed even in very limited spaces. Our unique modular system, with components that are already approved by major aircraft manufacturers, ensures the realization of projects fast and efficiently.

SCHOTT® HeliLine is another unique lighting product. The side-emitting optical glass fiber offers almost unlimited possibilities to realize situational lighting features, which connect design and functional aspects.



A perfect start into the day with a SCHOTT® Reading Light and SCHOTT® HeliLine ambient contour illumination





It is lunchtime: “Bon Appétit!”

One might guess that lighting does not matter much when it is bright as day. Not quite true. You eat with your eyes!

SCHOTT® HelioJet® Spectrum^{CC}, the advanced LED cabin lighting system, sets completely new standards in ambient as well as in daytime functional lighting. The unique HelioJet® technology secures homogenous light in the entire cabin very close to natural daylight.

HelioJet® technology enables a superior LED performance, which creates a high quality of lighting. It is nature’s light, which reveals the appearance to everything around us: the seat we sit in, the carpet we look at, or even the glossy magazine we read. Passengers on board have the time to enjoy the surroundings. And airlines should create an environment where this can happen. HelioJet® technology manages human impressions and your passengers will appreciate it.



It is light that makes the difference.



Restaurant owners are particularly sensitive to using the correct light to display their food. Why is this? Because we all “eat with our eyes.” With HelioJet® you can spot exactly the light that puts your cabin into natural colors. Anytime and over the entire lifetime of an LED.

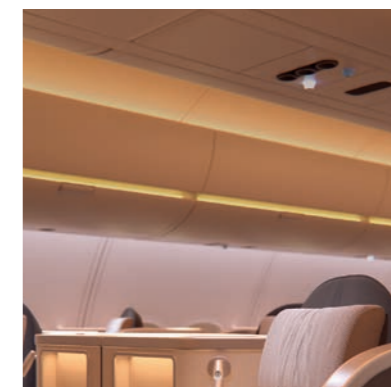
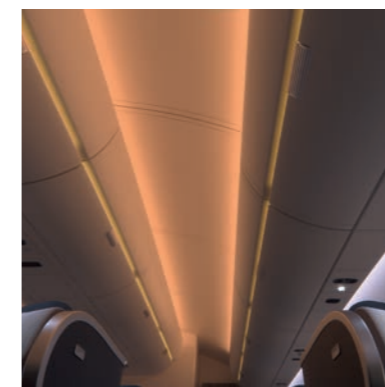


The sun goes down. The mood goes up.

Natural light reveals its warmest tones when the sun is about to set. On board we can capture such perfect moments.

Passengers appreciate it when they can relax and recharge on board. Light is a strong tool for fostering impressions and influencing perceptions. Our holistic lighting approach orchestrates different light elements in one coordinated cabin scenario.

Decorative and functional Helioline sidelight elements join into the scenario of the overall HeliJet® Spectrum^{CC} cabin lighting. No other lighting system allows for a comparable, coordinated approach. HeliJet® technology continuously manages every single LED to avoid even the smallest drift in color and intensity. Unfortunately, it is natural for LED colors and intensity to drift over time. It can not be avoided. But thanks to HeliJet® technology you can manage it.



Holistic mood lighting:
Different lights. One look.

You can program the perfect setting for recreation. And different from nature, you can capture these moments and conjure them up whenever you want. Magic.



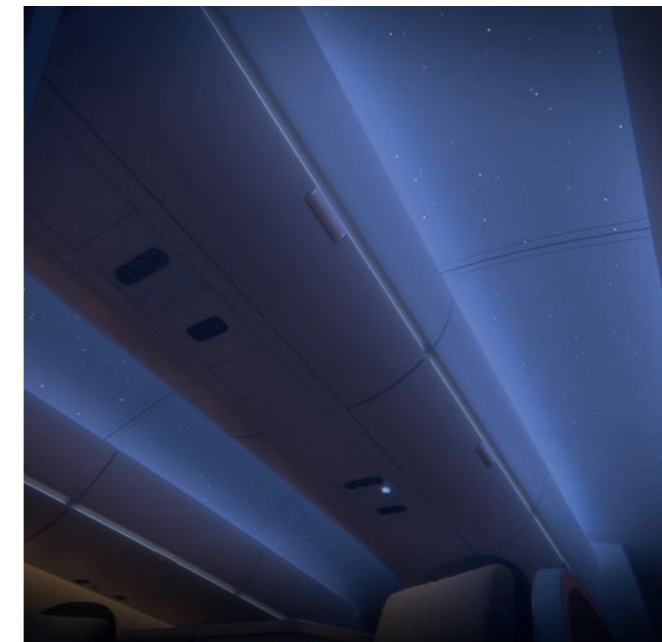
Wish upon a star

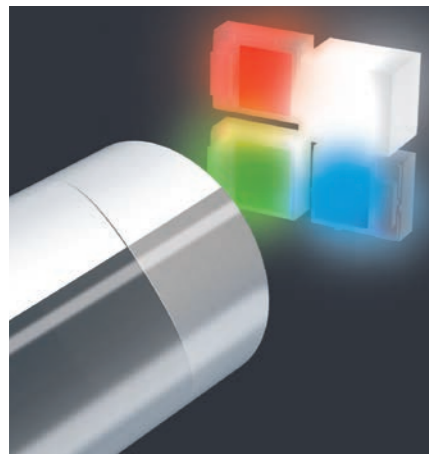
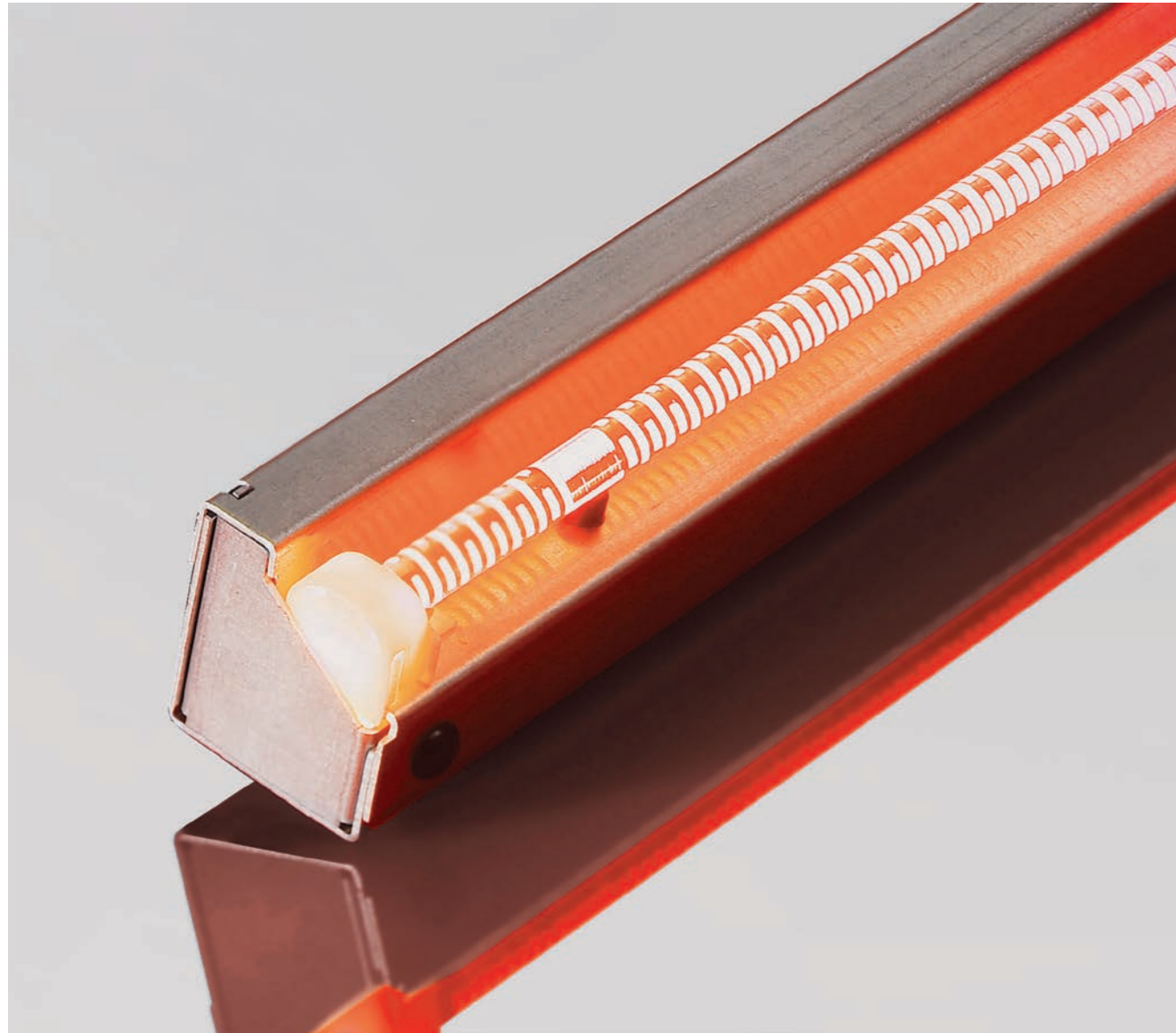
When the night comes, it is time for the beauty of light impulses to take the stage.

A starry night reveals its own charm. It is silent and impressive at the same time. We see the world in another light. For those who do not sleep yet, they may rest and relax quietly for a while.

HelioFlex turns the cabin ceiling into a night firmament. Fiber optic light guides sparkle like stars in the sky embedded by soft light rays from HelioJet® Spectrum^{CC} cabin light. Focussed light spots from single reading lights show that not everyone on board has gone to sleep yet.

HelioFlex fiber optic light guides powered by an LED light source turn the cabin ceiling into a starry firmament.

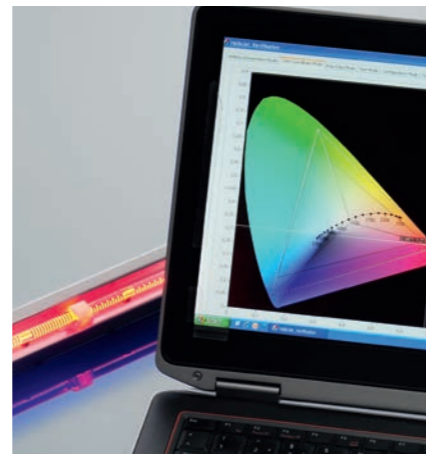




Four LEDs (RGBW) at both ends of HelioJet® Spectrum^{CC}



The unique Color Control ensures perfectly accurate colors.



Unlimited possibilities for mood lighting scenarios

HelioJet® Spectrum^{CC} – ultimate LED color stabilization for cabin lighting

A unique sensor technology secures the upmost homogeneous light over the entire lifespan of every LED.

Some LEDs change their color sooner or more intensively than others. Since it is the nature of LEDs there is no way to avoid such color drifts. This drift can result in strange light effects that can present the cabin in an unnatural and potentially offensive way.

HelioJet® technology manages the phenomenon of aging LEDs for the sake of permanent homogeneous light performance. Unique sensor management controls each single LED. When LEDs start drifting, they are automatically corrected to the defined chromaticity coordinate. This way the entire cabin is bathed in a uniform light. Even when new LEDs are brought in by an exchange of single light units they are automatically managed to the defined color tone. HelioJet® Spectrum^{CC} is able to create all white tones as well as more than 16 million colors, and thus provides almost unlimited possibilities for functional light and mood light scenarios.

Different from cabin light systems, which work with LED stripes where several LEDs are lined up close to each other, HelioJet® technology feeds in four LEDs (red, green, blue, white) in an optical light converter that takes advantage of fiber optic principles. The light is mixed and evenly distributed. Therefore, HelioJet® Spectrum^{CC} uses fewer LEDs than lighting systems that work with LED stripes and, due to the light converter, provides fully balanced light output. No "light dots." No color drifts. Just perfect light. HelioJet® Spectrum^{CC} is compatible with different cabin management systems.

Benefits for our customers:

- True colors, fresh food, and nice appearance
- Passengers are rested due to reduced jet lag
- Cost savings as no obsolescence or product aging occurs

HelioJet® is certified and flies on various Airbus platforms with, e.g., Scandinavian Airlines (SAS).

Fiber optic light guides – beautifully safe

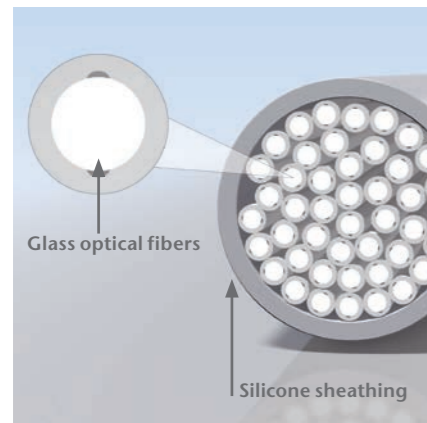
Your unique solution to connect design and functional aspects in aircraft cabins

HelioLine, the side-emitting optical fiber solution from SCHOTT empowers airlines to create an unrivaled atmosphere where passengers feel safeguarded and comfortable at the same time.

From seat contour illumination to toe-kick, there are many areas in planes that deserve special attention. HelioLine can connect literally every object and every surface to the overall on-board light scenario. The optical fiber permits use even in environments with very limited space or depth.

HelioLine has excellent color characteristics and high light output, which goes along with an exceptional high light homogeneity. Due to the fiber optic system, where a light source feeds into the glass optical fiber, you will be able to work with a non-electrical light emitter – a big safety advantage especially in working and wet areas like bathrooms, for example.

HelioLine is powered by the SCHOTT light sources HelioBasic or HelioIntense, which can be placed under the seat or in any compartment.



Numerous glass optical fibers are fitted into a silicone sheathing. The light is emitted homogeneously to the side.



HelioLine glass fibers are powered by a separate light source. There are two main advantages: A: The light source can be placed away from the point where the light is emitted. B: The glass fiber does not carry any electrical power.



HelioLine fits into places where there is only very limited space. Tailor-made mounting profiles facilitate a smooth installation.

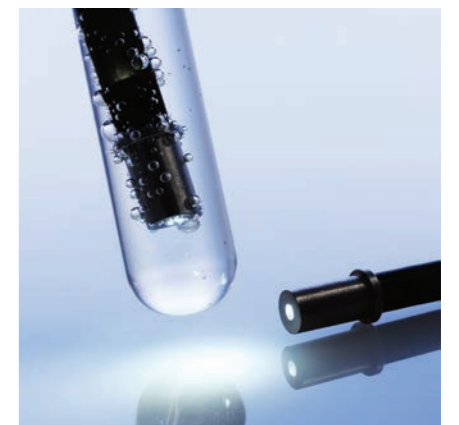


HelioFlex: The sky is the limit! Night sky simulation with fiber optic harnesses and LED light sources creates a subtle “starry sky” in the cabin ceiling. Highly flexible fiber bundles in combination with LED light sources are used to achieve high MTBF (mean time between failure) figures and to reduce the installation and maintainability times. Up to 30 light dots can be created through one single LED light source. The cable consists of a fiber bundle with Kevlar fixation and is protected by braided glass silk as sheathing, which is impregnated by blackened silicone.

HelioFlex is also used for spot applications, in-seat lighting features, or aisle illumination. The fiber optic system, which enables the separation of the light source from the point of light emission, offers several benefits. Safety: The glass fiber does not carry any electricity. Heat: Glass fibers do not heat up when serving light. Flexibility: The multi-fiber construction allows convincing design solutions even when space is very restricted.

One light source powers several light spots.

Fibers do not carry electrical power. No heat. And no problems even in very wet areas.

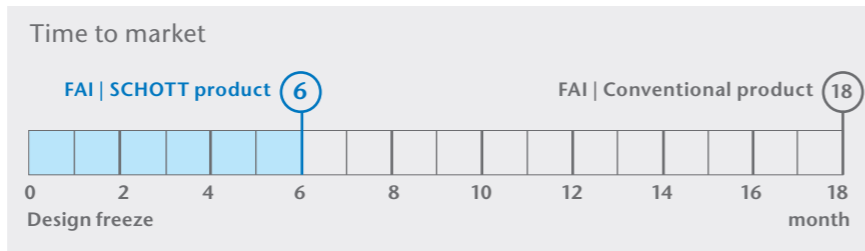


Seat illumination – highly customizable and qualified

Maximum design freedom for airlines while saving time and money as well as minimizing risks to fail tests. Choose from our broad product range of qualified seat illumination systems

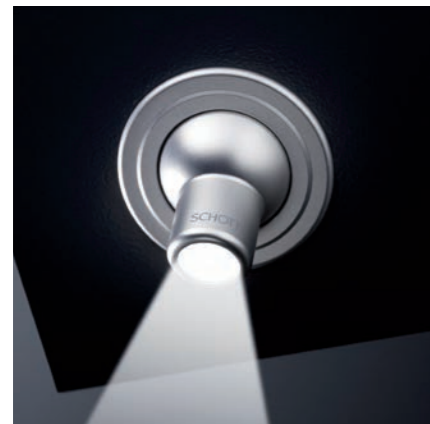
At SCHOTT, we understand that your time is too precious to spend it on “reinventing the wheel.” Our seat illumination concepts allow airlines to customize its lighting in any seat class without putting risk on the overall project.

Fiber Optic Reading Light
SCHOTT® Horizon



There are two technical options to design lighting:

- A pure LED solution
- A combination of LED and fiber optics



Compact LED Reading Light
SCHOTT® Orbit



Compact LED Reading Light
SCHOTT® Discus



Compact LED Reading Light
SCHOTT® Polaris

Your custom design decides the technology. In other words, we enable you to create seat illumination solutions for your entire fleet. Already qualified by major aircraft manufacturers.

Fiber optics enable smart design solutions. Today’s LED and fiber optic technologies provide endless customizable solutions for design, color, material, dimensions, and light intensity that transform the overall cabin design and interior concept. Through the technical approach of having light guides and light sources separated, customized illumination can be created even if space is limited.

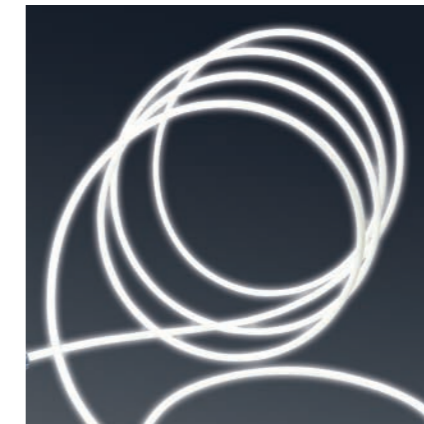
One LED light source can cover several applications on the seat. The visible part of the light spot can easily be customized to meet the overall seat and cabin design.

Furthermore, this system significantly reduces maintenance costs as the light is built up in modules that can be replaced apart from each other. Thus you never have to replace the complete light.

Fiber optic for spotlight
SCHOTT® HelioFlex



Fiber Optic Reading Light
SCHOTT® Cirrus II

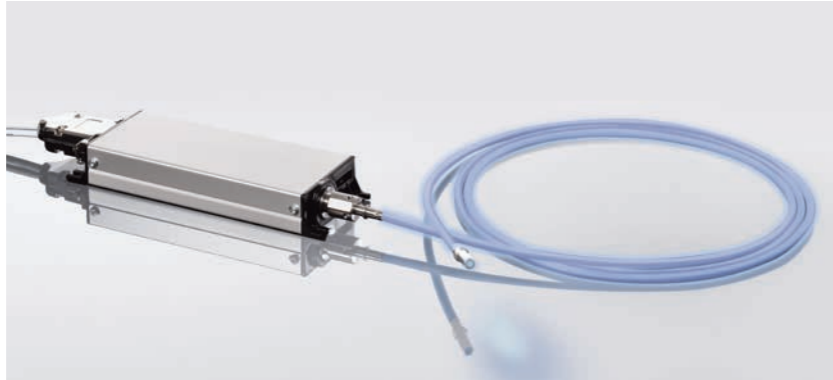


Side-emitting fiber optic for line lights:
SCHOTT® HelioLine



Fiber Optic Reading Light
SCHOTT® Focus

SCHOTT® HeliolIntense Spectrum^{CC}: High brightness and color stabilized light output



Light it right with SCHOTT LED light sources

All our light sources combine LED technology with fiber optics. They thus provide excellent light properties to power our range of lighting products for cabin and seat illumination.

SCHOTT® HeliolIntense Spectrum^{CC} light source is an efficient and very strong LED light source that features full color capability with both color and brightness control. As the name Spectrum^{CC} indicates this light source has features in common with our HeliolJet® Spectrum^{CC}. It works with a unique true-color sensor. Over the entire lifetime, all light sources are reliably pegged to exactly the same light performance in order to facilitate our promise: Different lights – one look.

Typical applications are:

- Homogeneous mood lighting scenarios realized with SCHOTT® HeliolLine, HeliolFlex, or HeliolRod
- Functional cabin lighting realized as spot or line lights with SCHOTT® HeliolLine, HeliolFlex, and HeliolRod
- Edge or contour lighting in seats or monuments realized with one light source and SCHOTT® HeliolLine

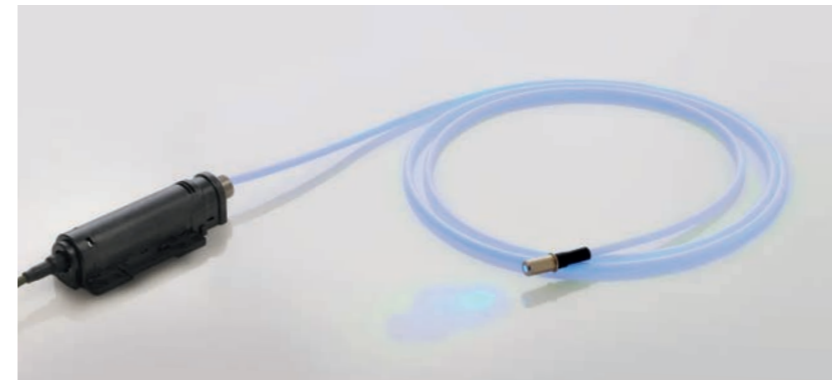


SCHOTT® HeliolIntense: Bright single color light source for various applications

SCHOTT® HeliolIntense is a single color LED light source that offers a data interface. That makes it a suitable option for many customers' demands.

Typical applications are:

- Multiple spots in seats and monuments that are realized with one light source and SCHOTT® HeliolFlex
- Flat and slim shell mounted reading lights – functional cabin lighting realized as spot or line light
- Homogeneous mood lighting scenarios realized with SCHOTT® HeliolLine



SCHOTT® HeliolBasic II: The ideal solution when space is limited

SCHOTT® HeliolBasic II is a small and lightweight light source that is especially useful when space is limited.

Typical applications are:

- Star ceilings as well as for seat and monument lighting realized with SCHOTT® HeliolFlex
- Edge or contour lighting in seats or monuments realized with one light source and SCHOTT® HeliolLine
- Fiber optic reading lights



Somewhere over the rainbow

Light can create perfect moments. SCHOTT can help you to create a perfect atmosphere in your aircraft.

Of course it takes more than perfect lighting to generate a stunning cabin impression. However, if the light is not perfect, the atmosphere never will be. In SCHOTT Aviation you will find a committed and reliable partner. Our lighting solutions are based on unique technologies that will provide you with unmatched results.

Perfect Lighting. Perfect Atmosphere.



Lighting and Imaging

SCHOTT AG

Hattenbergstraße 10

55122 Mainz

Germany

Phone: +49 (0)6131/66-7911

Fax: +49 (0)6131/66-7850

info.aviation@schott.com

www.heliojet.aero

