
OXYPHEN[®] AUTOMOTIVE LIGHTING VENTS

The Highest Quality Materials for Safer,
Longer-Lasting Performance

Selecting the appropriate venting material for your automotive lighting systems can present challenges for manufacturers, as they must address a variety of performance inhibiting factors. Whether your lighting system be used in headlamps (headlights) or smaller lamps such as fog lamps (fog lights) or brake lights, each requires a venting mechanism that provides highly controlled airflow, protection against the ingress of contaminants, as well as pressure equalization capabilities to prevent condensation and fogging. Because vehicles are frequently exposed to the harshest of weather conditions including extreme temperature changes, humidity, rain, and

dust among other environmental factors, it is important for automotive lighting manufacturers to consider only the highest quality in venting materials when designing their solution.

Oxyphen's ultra-hydrophobic fiber-based membrane vents provide a high airflow while also preventing liquid, fine dust and particles, and humidity from entering the lighting system. These vents enable the highest quality in appearance paired with the longest-lasting performance to ensure the safety of the driver and vehicle.

Which Lamps to Protect with Oxyphen Membranes

As the membrane specialist, Oxyphen offers various solutions for protecting lighting housings that you can trust for years. These include:



Headlamps



Taillamps



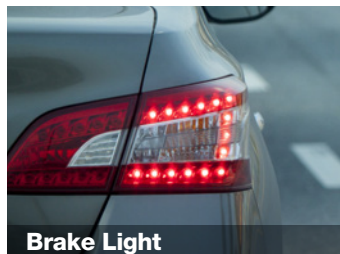
Fog Lamps



Mirror Lamps



Reflectors



Brake Light



Interior Light



Ambient Light

Key Benefits

Provides quality appearance and performance

- Maintains clear crisp headlamp appearance expected with high-end vehicles
- Extremely high airflow equalizes internal system pressure preventing headlamp condensation
- Prohibits condensation with effective moisture vapor transmission

Increases driver and vehicle safety

- Provides effective barrier against dust, debris, and splash water ingress, maintaining headlight clarity
- Reliable performance even in challenging environmental conditions

Extends headlight lifespan

- Reliable hydrophobic protection
- Maintains watertight seal
- Equalizes airflow that reduces housing pressure and temperature

Reduces assembly process with improved performance

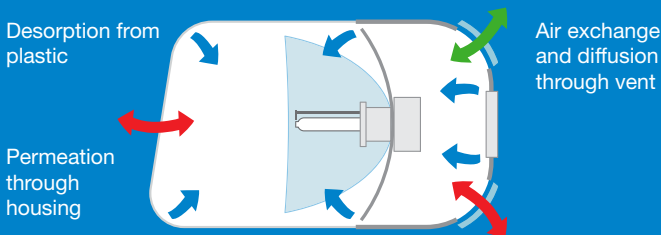
- Customizable adhesive seal designed for easy integration
- Promotes vent application in non-typical areas, instead of high-water exposure areas
- Universal application for all lamp types (Halogen, LED, Xenon), colors and housing materials

100% Free of PFOA: Compliant with (EC) 1907/2006 REACH / Regulation (EU) 2019/1021 POP

Common causes of Moisture in Headlamps

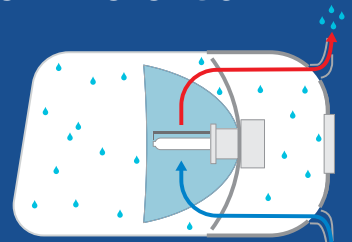


Fogged headlamps can impact overall quality appearance and performance of vehicle

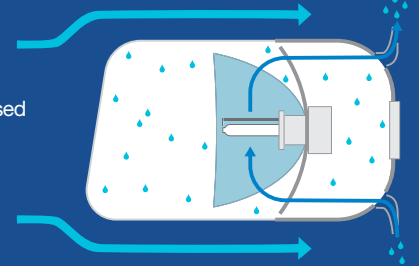


Two Causes of Pressure Differential

Pressure differential caused by **temperature change**



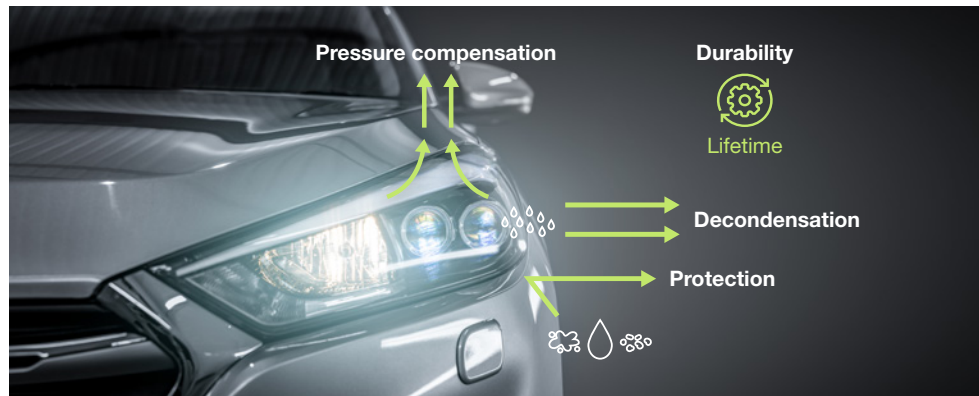
Pressure differential caused by **vehicle motion**



The membrane pad should be placed in a high-pressure spot during driving, with the other opening being in a low-pressure spot. This causes the air to be sucked through the headlight, leading to the fastest and most effective air exchange possible

How the Product Works

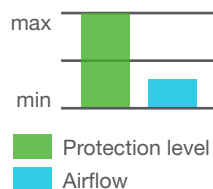
The PFOA free Oxyphen-Membrane protects the housing against dust, water and dirt. At the same time the membrane enables gas exchange for venting and pressure compensation.



Venting Concepts

Depending on the application, we recommend two different venting concepts

Low mass transfer micro venting

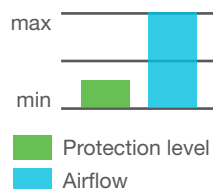


- **Max. protection** against ingressing water and dust
- No inlet/outlet-system
- Limited defogging characteristics
- **Best Vapor Transmission Rate characteristics** compared to other membranes on the market

Heat-/ Mass transfer through:

- Diffusion
- Pressure differences

High mass transfer macro venting



- **Max. airflow**, defogging performance similar to open system
- Inlet special high permeable hydrophobic membrane
- Min. level of protection against water and dust

Heat-/ Mass transfer through:

- Enforced convection
- Natural convection
- Diffusion

Technical Specifications

Available Options	
Airflow	Up to 3,000 l / (bar cm ² min)
Water Entry Pressure (WEP)	Splash water protection up to 30 mbar
Applicable Temperature Range	-40 to + 150 °C ¹
Dimensions	Rectangular or round disc currently up to 55mm
Products	OxyDisc membrane discs OxyPad self-adhesive membrane pads

¹ Actual high temperature range dependent on adhesives, welding, and material used. For more customized solutions, we offer fiber-based membranes that can be used up to 180 °C

Material Options
RoTrac® PET fiber-based membranes
RoTrac® PP fiber-based membranes

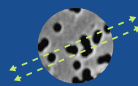
Certifications
UL-94 V-0 rating @ 0.1 mm
LV124 / ISO 16750-5
IATF 16949

PFOA Free Oxyphen Product – Standards for Automotive Lighting

Size of the lamp housing

- Small lamp housing
- Medium lamp housing
- Big lamp housing

RoTrac® Track-Etched Membran



Small Lamps, such as mirror side indicator lamps



Big Lamps, such as headlamps



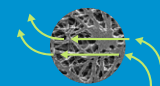
Product	OxyPad®
Outer diameter	8mm
Inner diameter	4mm
WEP* (water entry pressure)	On request
AFR (air flow rate)	On request
Oleophobic grade	8 (DIN EN ISO 14419:2010-08A)

Product	OxyPad®
Outer dimension	40 x 18.5 mm
Inner dimension	30 x 9.5 mm
WEP* (water entry pressure)	On request
AFR (air flow rate)	On request
Oleophobic grade	8 (DIN EN ISO 14419:2010-08A)

Size of the lamp housing

- Small lamp housing
- Medium lamp housing
- Big lamp housing

RoTrac® Membran



Medium Lamps, such as taillamps



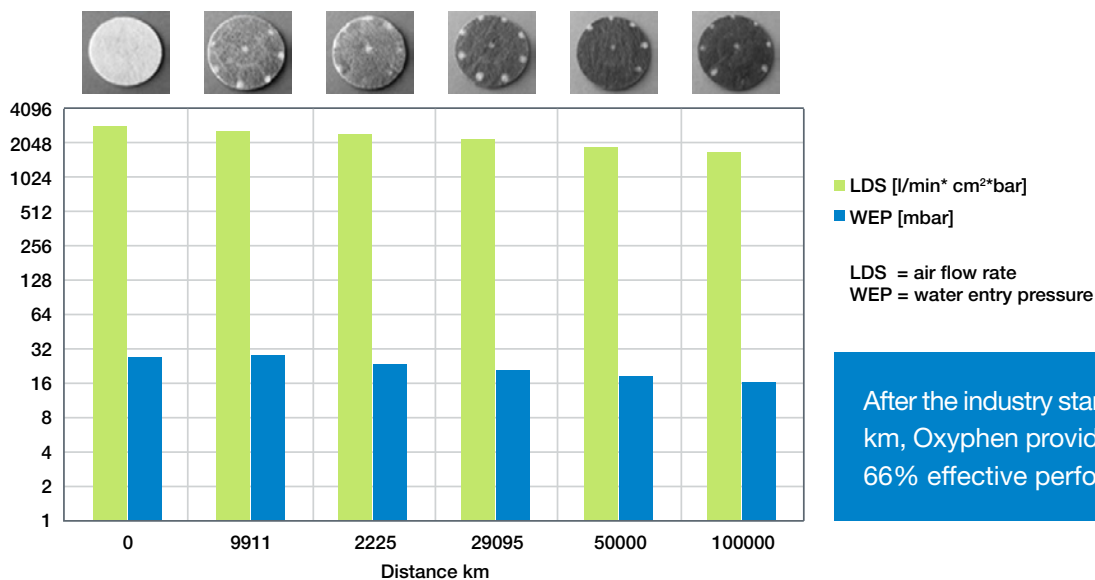
Big Lamps, such as headlamps



Product	OxyPad®
Outer diameter	14 mm
Inner diameter	8 mm
WEP* (water entry pressure)	On request
AFR (air flow rate)	On request
Oleophobic grade	N/A

Product	OxyPad®
Outer dimension	40 x 19.5 mm
Inner dimension	30 x 9.5 mm
WEP* (water entry pressure)	On request
AFR (air flow rate)	On request
Oleophobic grade	N/A

The Impact of High Airflow on Performance Life



After the industry standard of 100,000 km, Oxyphen provides an additional 66% effective performance life



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