



Filter

Vent

AUTOMOTIVE TAIL-LIGHT VENTING

Meet Pressure Compensation & Protection Requirements

CHALLENGE

Automotive tail lights are closed enclosures in which there is a continuous expansion and contraction cause by temperature differences of the air inside the unit while it is in operation. These resulting pressure differences must be accounted for through small openings in the housing which facilitate adequate air permeability. The risk with the openings, though, is that undesirable particles or substances such as water, dust, dirt and even insects can make their way inside the enclosure which can lead to malfunctioning or reduced illumination. A potential solution to this problem is the use of **hydrophobic or oleophobic treated** membranes which act as a vent, allowing the exchange of airflow while also acting as a barrier against contaminants. They also can enable ventilation which expels vaporous water from the housing.

Oxyphen was contacted by the customer, a manufacturer of automotive lighting equipment, to develop and design a hydrophobic membrane venting solution which would address these design concerns, specifically looking at three key areas:

Protection

The membrane should protect the housing from the ingress of water, dust, oil, and other harmful particles.

Temperature

The membrane should meet customized temperature stability requirements specific to the application.

Air Flow

The membrane should maintain adequate air flow to avoid condensation caused by diffusion.

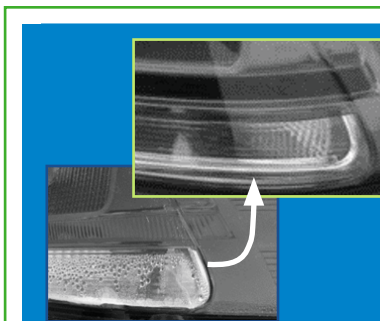
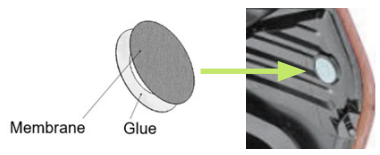
Chemical Compliance

The membrane should meet PFOA free properties without compromise in liquid repellence performance

SOLUTION

Oxyphen worked with the customer to determine that OxyPad® self-adhesive membrane pads would be the best solution for their automotive application. The component was designed as a combination of a membrane and glue ring, mounted on a flat area, and installed from inside the vehicle. This ensured the highest possible protection of the membrane. No splash guard or external labyrinth were necessary.

The membrane component is sized as a pressure compensation element and customized properties which allow it to equalize pressure differences caused by thermal effects in the unit relating to temperature change and the environment. It also prevents against the ingress of water droplets, dust, and dirt and provides additional condensation protection by mixing saturated air inside the lighting unit with unsaturated air from outside – for example when cooling down.



RESULTS

Once Oxyphen's OxyPad® venting solution was implemented, the customer was able to observe distinct benefits compared to the previous design including:

A Two-in-One

benefit by balancing pressure and protecting against contaminants

Eliminated

thermally induced cracks

Greater protection

against condensation

About Track-Etched Membrane Technologies

For nearly 70 years, Oxyphen has specialized in the production of microporous track-etched membranes and membrane products, serving customers around the globe with 60 employees located between two manufacturing facilities in Switzerland and Germany.

Oxyphen has two core competencies: Developing and producing track-etched membranes and processing and assembling complete membrane devices through large volume production. Our wide network of qualified suppliers, particularly those with injection molding expertise, and highly qualified team work together to build a dedicated enterprise that is focused on delivering an unmatched level of service and performance to our customers.



Oxyphen has two manufacturing facilities – one in Germany and another in Switzerland. Both are ISO 9001:2008 and ISO TS 16 949:2008 certified and have full clean-room capability.



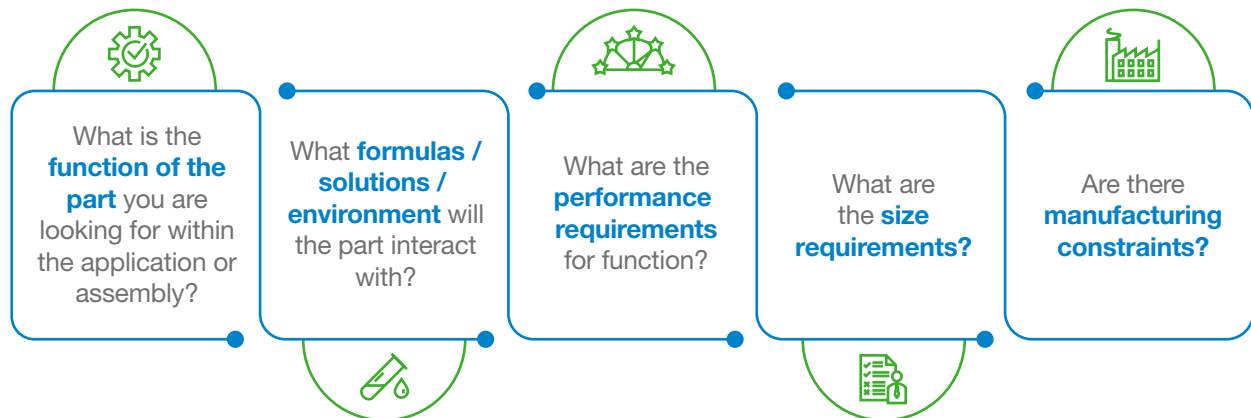
Automotive Solutions

In the challenging automotive environment, protection against liquids and dirt as well as reliable pressure compensations are critical to avoid damage to sensitive electronic and lighting components throughout the vehicle's lifetime. Oxyphen's automotive membrane products are designed to ensure continuous functionality of critical components such as battery packs, radar systems, and lighting equipment being used in next generation automotive designs.

Oxyphen technologies and products comply to existing and upcoming regulations without compromising performance needs. With decades of experience in tailored venting solutions, we like to be your partner for sustainable and cost-effective solutions that you can trust on for years.

Getting Started with Oxyphen

As you think about your design project, consider the below questions and then reach out to us for a design consultation with one of our engineers. It's easy to reach someone at www.oxyphen.com/about-oxyphen/contact-us or click this QR code.



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