PRESS RELEASE

RÖHM
TRADITIONALLY INNOVATIVE

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For cyclists and rescuers

Lupine produces bright bicycle and outdoor lights with precision lenses made from PLEXIGLAS®

- **The brand PMMA by Röhm is a proven high-performance plastic for complex lens systems**
- **Lupine, a technology leader for outdoor lighting systems, produces extremely bright lamps for mountain bikes with lenses made from PLEXIGLAS®**
- **Röhm delivers PLEXIGLAS® molding compounds that meet the most important standards for e-bike and bike lighting**

Whether during a sled dog race in Finland, rescue operations in the mountains, while jogging in the dark or when riding a bicycle in everyday life – lights from the Lupine brand with lenses made from PLEXIGLAS® molding compounds from Röhm are used wherever bright, precise light beams are needed. Even during the spectacular arctic expedition of the “Polarstern” research ship, expedition members used Lupine headlamps. Manufacturer Lupine Lighting Systems is a technology leader for outdoor lighting systems, such as e-bike and bike lights, headlamps and helmet lights, as well as flashlights.

“We have transferred our expertise from the mountain bike segment to other areas and build lights with a broad range of applications. We develop a unique lens system for each of our lights, thereby creating optimal beam properties for the respective applications,” says Joshua Koch, Online Marketing Manager at the German SME in Neumarkt in der Oberpfalz, which international customers often entrust with custom designs for research, civil protection or military applications.

But a light is only as good as its lens. As part of a long-term and efficient partnership, lighting technology service provider opsira calculates the parameters for the high-performance lenses, which are then injection-molded by UPT Optik in Nuremberg for Lupine. Virtually all lenses for Lupine lights are made from PLEXIGLAS® molding compounds, the brand polymethyl methacrylate (PMMA) from Röhm. “PLEXIGLAS® is unmatched in its transparency and ability to conduct light,” says Heinz Schubkegel, Senior Business Manager in the Molding Compounds business unit at Röhm. “The optical properties and the ability to precisely process the product in injection molding applications make our molding compounds a proven material for all types of optical components, from floodlights for sports stadiums to safe, high-quality bike lighting.”

More complex than car headlights

See and be seen is not just an empty phrase for cyclists, it is critical for their safety. Nobody should venture onto the road or uneven forest trails in the dark with just a flickering light powered by a shaky tire dynamo. This is especially the case when it comes to pedelec or e-bike users who can travel at high speeds, as their safety depends heavily on reliable bright lighting.

LED bike lights for road traffic, such as those from Lupine, can compete with car lights when it comes to functionality and performance: Conventional car headlights put out between 1,500 and 3,000 lumen. The Lupine SL X model for e-bikes has an output of 1,800 lumen, while the version for pedelecs has an output of 2,100 lumen.

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A modern bike light offers the same functions as car headlights at the push of a button: daytime running light, low beam, high beam. The lens system needs to be capable of reproducing these different lighting functions, which is why it comprises individual lenses for close-range, medium and long distances respectively. “But optical components for bike lights are much more compact and complex which makes them more complicated to produce as we have only a quarter of the size of a car headlight to work with,” says UPT Managing Director Horst Wodak, describing the challenge. His company specializes in ultra high-precision plastic optics. “We precisely calculate the delicate facets of the lenses and produce them to an accuracy of 10 micrometers. This is only possible with high-performance plastics, such as PLEXIGLAS® molding compounds, which ensure precise mold surface reproduction for even the finest structures.”

UPT manufactures the Lupine lenses using PLEXIGLAS® molding compounds and values their good moldability and flowability and, of course, the extraordinary light transmittance of up to 92 percent. This value is only reduced by the physically induced reflection loss of 4 percent each on the light entry and exit surfaces. The material itself lets light pass unhindered. “PLEXIGLAS® ensures high luminous efficiency thanks to extremely low losses in the optical path,” says Wodak.

PLEXIGLAS® molding compounds certified for road traffic

In Germany, bike lights for road traffic need to conform to the regulations of the StVZO (Road Traffic Approval Order). To ensure that other road users are not blinded, a clear distinction between light and dark is required. “This makes developing lenses for lamps that comply with the German StVZO particularly laborious,” says UPT Sales Manager Martin Rümmelein. “In this context, Röhm offers another benefit, besides high purity and consistent product quality: PLEXIGLAS® molding compounds comply with all important ECE regulations for applications in vehicle lighting, such as the SAE J576 on the AMECA list. This saves manufacturers from having to issue expensive material inspections during approval.”

One of the brightest mountain bike lighting systems

Off-road, in rough terrain, mountain bikers push lighting technology to its limits, as the lumen values of bike and helmet lights are somewhat of a status symbol for ambitious outdoor athletes. However, the extremely bright lights used here are not allowed in road traffic. “The Lupine Alpha is the most powerful bike light for racing we have ever built,” says Koch, listing its properties: “7,200 lumen, perfect illumination and an enormous range of up to 460 meters. For comparison, the searchlight attached to a rescue helicopter has about 14,500 lumen.”

“Lupine is unique in this regard,” emphasizes optics specialist Wodak. However, you shouldn’t let yourself literally be blinded by the lumen value: “A high value by itself does not mean anything. The decisive factor is that the lens directs the light precisely without scattering it.” This is only made possible by combining the following three aspects: exact calculations, a material with the best optical properties and extremely precise processing, explains Rümmelein. “Producing a lens with such accuracy that the calculation leads to the desired result requires a lot of experience in injection molding.”

PLEXIGLAS® for robust, durable lenses that do not yellow

Lupine not only values the excellent optical properties of the lenses, but also the robustness and durability of all installed components. For example, the outdoor lights need to survive falls or impacts without damage and withstand both extreme cold in polar regions and

intensive solar radiation in the mountains. The brand PMMA from Röhm meets these requirements as it has a high surface hardness, as well as excellent UV and weather resistance without yellowing or becoming brittle. As such, the material from Röhm contributes to the sustainability claim of the light manufacturer. “I am not familiar with any material other than PLEXIGLAS® that has these diverse properties,” says Joshua Koch, Online Marketing Manager at Lupine.

[pictures]

See and be seen: Lupine Lighting Systems GmbH specializes in high-performance bike and helmet lights and headlamps. All lights are equipped with highly precise lenses made from PLEXIGLAS® molding compounds from Röhm.

For unique light experiences: Thanks to the excellent UV and weather resistance of the PLEXIGLAS® lenses, the outdoor lights from Lupine are suitable for use in extreme cold, as well as locations with intense solar radiation.

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Small and extraordinarily bright: The Lupine SL Nano e-bike light has a lens made from PLEXIGLAS® and has an output of 900 lumen for its high beam and 600 lumen for its low beam on the streets, ensuring cyclists are safe when riding their e-bike.

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A masterpiece of precision: UPT Optik in Nuremberg produces the lenses for Lupine in an injection molding process using the brand PMMA from Röhm. The material is unsurpassed in its transparency and light guiding properties.

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The extraordinarily bright headlamps and helmet lamps from Lupine with precision lenses made from PLEXIGLAS® molding compounds have proven their worth in sports and during rescue operations.

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About Röhm
With 3,500 employees and 15 production sites worldwide, Röhm is one of the leading manufacturers in the methacrylate business. The medium-sized company with branches in Germany, China, the USA, Russia, and South Africa has more than 80 years of experience in methacrylate chemistry and a strong technology platform. Our best-known brands include PLEXIGLAS®, ACRYLITE®, MERACRYL™, DEGALAN®, DEGAROUTE® and CYROLITE®.

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