HAWKAI

DATA SHEET

PEAK HAWKAI™ LGRIN
REDUCTION IN HAZARDOUS MATERIAL

EXCLUDE TOXIC ELEMENTS

SAFEGUARDING VISION: HAWKAI™ LGRIN TECHNOLOGY – REDUCTION IN HAZARDOUS MATERIALS

Tech and Environmental Risks - Reducing Hazardous Substances in Optics

Peak's optics exclude toxic elements, ensuring lenses that adhere to the highest standards without compromising well-being. Traditional glass lens production contains substances like lead and cadmium, known for enhancing refractive index and color stabilization. However, both substances pose serious health risks: lead can cause neurological damage and developmental delays while cadmium is linked to kidney damage and bone fragility. In optics material science, our innovation prioritizes safety and environmental responsibility.

The symbiotic relationship between humanity and technology has always been marked by continuous innovation, and nowhere is this more evident than in the material science behind optics. The production of glass lenses has traditionally involved various substances that, while beneficial for manufacturing purposes, pose significant health and environmental risks. Lead, for instance, was prized for its ability to increase the refractive index of glass, making lenses denser and more effective at bending light. Cadmium was used in coloring and stabilizing glass lens production. However, both lead and cadmium are toxic heavy metals that can seriously harm the human body. Solvents like arsenic compounds, used to clarify glass, can lead to skin and lung cancers upon prolonged exposure.

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The Hidden Dangers of Traditional Glass Lenses

These substances are bio-accumulative and toxic in the environment, poisoning ecosystems and entering the food chain. The release of such chemicals during manufacturing or as waste products can contaminate air, water, and soil, leading to broad ecological disturbances. As a result, their use in lens manufacturing has come under strict regulations to protect public health and the environment, spurring the industry to adopt safer methods and eliminate the following toxic materials in optics:

- **Bisphenol-A (BPA):** Used in the production of specific lenses, BPA is linked to potential health impacts on the brain and reproductive system, leading to its ban in numerous regions.

- **Nickel (Ni):** Common in metal eyeglass frames, Nickel is known to cause skin irritations and contact dermatitis, prompting stricter release regulations in the EU.

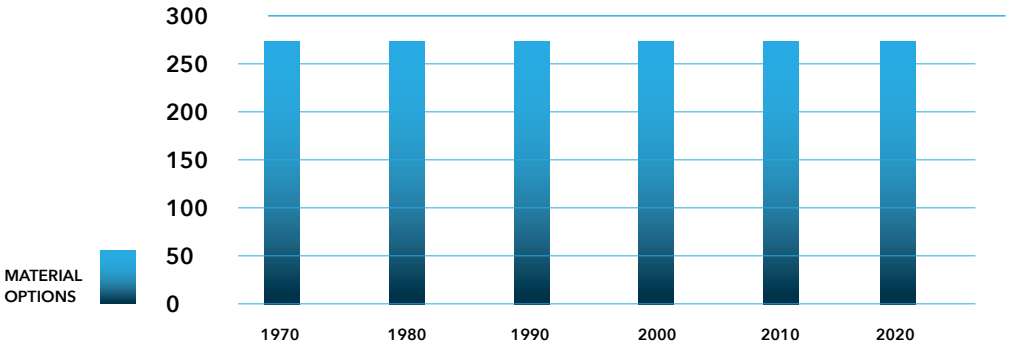
- **Lead (Pb):** Applied to materials in molten state to lower temperature, thereby, extending work time with glass. It enhances the finished product appearance through increased refractive index and density. Heavy metals, like lead, used during this process in eyewear, pose health risks, particularly to children's brain development.

- **Cadmium (Cd):** Cadmium oxide-containing glasses can be used in optoelectronic devices and as photosensitive materials because of their ability to form, high stability and polarizability, high infrared transparency, and specific covalent structure.

EU and US Regulations

The EPA, Toxic Substances Control Act (TSCA), and European Union REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals) regulation have profoundly influenced the defense/DoD optics industry. These regulations have eliminated numerous lenses from the market, affecting the development of optics solutions for night vision, fire control, and other defense-related applications. Manufacturers face challenges in maintaining extensive libraries of specialized optical materials, given their resource-intensive nature and rising costs. Environmental restrictions on commonly used optical components add complexity to maintenance and replacements.

Manufacturers and defense agencies must contend with the dual challenges of sourcing scarce or discontinued optical materials and navigating evolving environmental standards. This dynamic requires a strategic approach to material selection and system design, ensuring longevity and compliance without compromising performance. The accompanying chart illustrates the decline in glass varieties offered by Schott, a world leading optical glass manufacturer, dropping from over 270 in the 1970s to approximately 130 today.



NanoPlex-based LGRIN Optics – Transforming Environmental and Supply Chain Practices.

NanoPlex is a groundbreaking nanoscale metamaterial constructed from safe and recyclable materials, avoiding hazardous substances restricted by U.S. and EU regulations. It serves as the foundational material for HawkAI optics, seamlessly integrated with our AI-driven LGRIN technology.

- **Precise Mass Production** - Peak's cutting-edge nanotechnology, facilitates high-volume production of optics without the use of prohibited hazardous materials
- **LGRIN Designs Reduce Required Materials** - LGRIN technology is made with less material leading to fewer lenses, reduced weight, and streamlined optic assemblies and housing.
- **Extended Support and Service Life Cycle** - Peak Optic materials ensures production for decades including long-term support and maintenance standards
- **Accelerate Optic Performance** - LGRIN optics technology enhances optics performance parameters including color clarity, field of view, and distance with accelerated development through AI simulations, outpacing glass optics development.
- **LGRIN's design adaptability** - Enables the use of cost-effective, readily sourced optical elements, reducing expenses and addressing supply chain challenges effectively.
- **US-driven Supply Chain Excellence** - Peak LGRIN technology is U.S.-based, and our AI-adaptive designs empower us to source all materials from preferred nations.

Summary

Peak HawkAI lenses, based on our NanoPlex metamaterial, are the most viable path to managing regulatory demands, supply chain concerns, and longer-term support and maintenance requirements. Our adaptable AI-based optics will ensure that Peak can always provide solutions today and tomorrow as the market and regulatory concerns evolve.

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