Why consider silicone optics to boost horticultural quality and yield potential?

The global greenhouse horticulture market is currently experiencing significant growth. It is expected to expand considerably by 2030, leading to additional growing challenges and search for innovative solutions.

LEDs play a pivotal role in driving the growth of the horticultural lighting sector due to their ability to emit specific wavelengths of light that match the extended Photosynthetically Active Radiation (ePAR) spectrum, facilitating year-round crop cultivation, and safeguarding against diseases and imperfections. Combined with high energy efficiency, LEDs **allow growers to customize light spectra** to the specific needs of various plants and growth stages. This versatility not only maximizes yield but minimizes energy consumption and environmental impact, making LED horticulture lighting an indispensable tool for modern agriculture.

Did you know that integrating LEDs with secondary optics (in horticultural lighting) enhances light uniformity, enabling consistent plant development and yield across cultivation spaces? By guiding the emitted photons directly onto plants, optics reduce wasted energy and minimize light pollution, contributing to more sustainable farming practices. Additionally, optimized light distribution improves crop quality and accelerates growth cycles, resulting in increased productivity and profitability for growers.

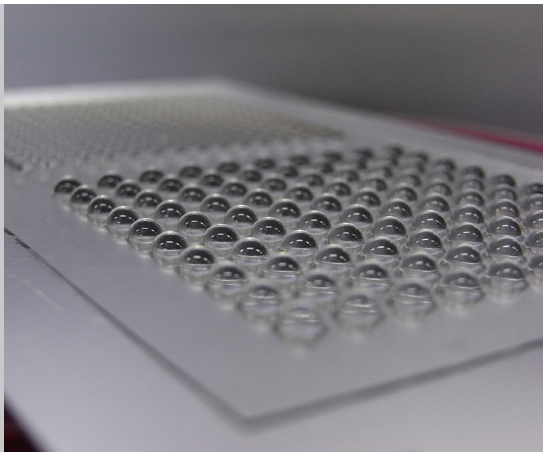
Have you considered using silicone optics to unlock growth potential?

Silicone optics offer **exceptional optical transparency** across a broad spectrum from UV to IR, and the lower refractive index results in **reduced reflection losses** in comparison to frequently used plastics such as PMMA and Polycarbonate offering the opportunity to engineer optics with **enhanced light output, resulting in improved plant yield**.

Silicone's inherent properties allow for **exceptional stability of the transparency under intense photothermal conditions** across the PAR spectrum and beyond, ensuring prolonged operational lifespan and offering **greater flexibility in luminaire** electronic and thermal **design**.

Silicone optics offer design flexibility for luminaire developers:

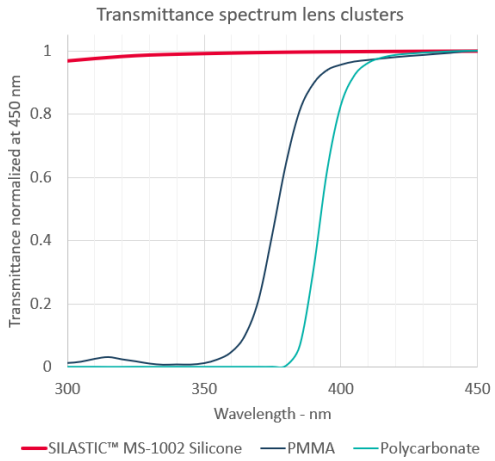
- Higher photothermal load on the optics without compromising long-term performance
- Higher LED drive currents to increase the photon flux density per light-unit
- Higher LED density resulting in smaller units
- Simplified thermal management due to silicone optics withstanding higher operating temperatures
- Glass cover removal increasing light output



Plant growth efficiency and luminaire longevity

Compared to plastic lenses, optics created with SILASTIC™ Optical Silicones can yield **a gain in photosynthetic photon flux (PPF) of over 3% across the entire PAR spectrum**, with even greater improvements noted for the blue and ePAR into the UV-A. Removing the protection cover and integrating this with sealing functionality into the silicone lens part will **add another 10%* gain in PPF while meeting IP and IK standards**.

This increase of photon flux effectively hitting their target enhances overall plant growth efficiency. SILASTIC™ Optical Silicone also has minimal degradation and maintains transparency for over 100k hours of operation, which extends the lifetime of the luminaire, **reducing reinvestment or downtime during maintenance**.



Silicone optics boost crop productivity:

- Highly transparent at all wavelengths in PAR and ePAR
- Higher light output potential
- Smaller footprint of the luminaire
- Long lifetime of the transparency over 100k hrs
- Possibility for extended warranties of the luminaire

*Optical reflection losses for PMMA with glass cover is estimated 17% vs. 6% for a silicone that combines the optic and front cover functionality.

While the global horticulture industry is seeking maximum efficiency for sustainable growing at the lowest cost possible, the use of optics made from SILASTIC™ Moldable Optical Silicones meet the challenges of today and enhance the growing potential and crop yields of tomorrow.

Contact us

engage.dow.com/lmcontactus

Want to learn more?

Dow offers proven process and application expertise, a network of technical experts, a reliable global supply base, and world-class customer service. To learn more about SILASTIC™ Moldable Optical Silicones and their benefits in horticulture lighting, visit dow.com or contact us at **engage.dow.com/lmcontactus**.

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