



## Sustainability program

Group MAM embraces a culture of sustainability from top to bottom. We continue to improve the energy efficiency of our facility, our packaging materials contain a significant percentage of recycled content and are 100% recyclable. Most significantly, the energy savings and corresponding reduced environmental impacts realized by our products far exceeds the environmental impacts required to make, distribute and install the film in most cases.

Also, for the **ULTILITE** filters a 'Life-Cycle Assessment of Energy and Environmental Impacts' was conducted. With the publication of our Environmental Product Declaration we choose to quantify, validate, and transparently communicate our impacts and the resulting benefits.

The creation of those EPDs will allow consumers and architects in the building, construction and greenhouse industry to make better-informed decisions about the environmental impacts associated with the products they choose.

WE INNOVATE WITH INDUSTRIAL COATINGS

**We improve the comfort and carbon footprint of buildings all over the world, thanks to the development, manufacturing and sales of superior window films.**

Umiscreen, part of Group MAM, is the first 100% European window film producer.



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# ULTILITE<sup>®</sup> greenhouse filters

innovative & advanced light control



**INCREASE THE YIELD AND QUALITY OF GREENHOUSE CROPS THROUGH SPECTRAL FILTERING**



## > Fotosynthese 2.0

The world population increases every day. So, we need to overcome future food and water shortages. Continued advances in modern greenhouse agriculture and plant growth practices can be part of the solution.

**ULTILITE filters improve the photosynthesis process in greenhouses**, which increases the yield of agricultural crops. This may bring extra answers to the table on how to conquer the world food dilemma and stimulate renewable energy sources or even CO<sup>2</sup> reduction.

## > Increase crop production and profitability

Control of photosynthetic active radiation (PAR), in directionality, intensity, and color, is vitally important for attaining ideal growth conditions.

The transparent **ULTILITE filters increase crop production and profitability**, enhancing their nutritional value and appearance.

## > ULTILITE filters

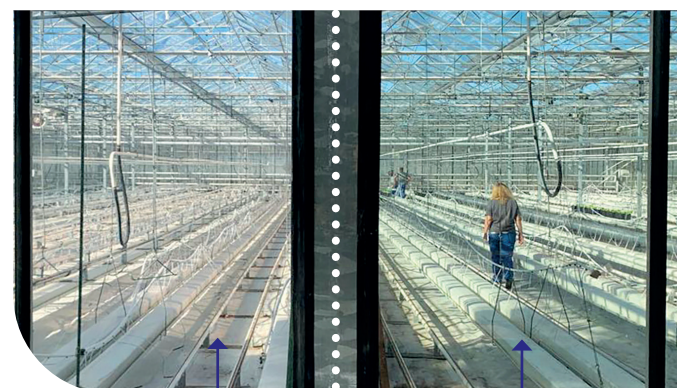
The **ULTILITE** dichroic filters **allow the solar spectral components needed for crop growth to pass through**. At the same time, they reject other unwanted radiations.

The filter alternates thin metal-dielectric layers with different refractive indices. By controlling the thickness and number of the layers, the frequency of the different passbands of the filter can be tuned to produce the optimized spectrum.



without **ULTILITE**

with **ULTILITE**



without **ULTILITE**

with **ULTILITE**

## > Create the 'Ideal Greenhouse' using **ULTILITE**

- > **Better photosynthesis and crop yield improvement.**
- > **Substantial energy savings (cooling and heating).**
- > **Reduction of water consumption (average of 25%).**
- > **Temperatures decrease.**
- > **Considerably improved work conditions for greenhouse workers, especially in more southern countries.**
- > **Better biomass conversion leading towards CO<sub>2</sub> reductions.**
- > **Prevent direct excess sunlight radiation and heat stress.**
- > **Much lower leaf and fruit temperature and transpiration.**



## > Tested technology

- The **ULTILITE** filter can be applied on existing glass of greenhouses or be integrated in new glazing.
- The technology is passive and doesn't require the installation of additional light sources or installations that consume energy.
- Variations per climate zone or type of crop available.
- Compatible with other technologies like LED lighting, A/C, etc.
- Technology tested according to applicable standards and validated in small-scale and large-scale demo-installations.

## > Years in the making, 3 years of monitoring

The **ULTILITE** filters are the result of 10 years of extensive research & development. Over the last 3 years different crops were monitored and compared in greenhouses with and without **ULTILITE** filters:

- On lettuce, large increases were measured on leaf development (34,48%) and Leaf Area Index (23 to 74%).
- On soya plants, similar increases were measured on leaf size distribution and number of leaves.
- Several crops (lettuce, savoy cabbage and Chinese cabbage) were also compared using LED lighting. **ULTILITE** showed time and again better yield and crop quality.