

In addition to top-quality Phalaenopsis, Dutch family-owned company Ter Laak puts sustainable innovation high on the agenda. In 2018, working with partners including Priva and Stolze Installatietechniek, the company established the very first "Daylight Greenhouse" covering an area of over five hectares.

The unique feature of a Daylight Greenhouse is its ability to convert incoming sunlight into energy that can be used to heat the entire greenhouse complex. This principle, devised ten years ago by Technokas and Wageningen University, is starting to bear fruit for Ter Laak. Not only is the company making energy savings of up to 50%, but plant quality is even better than before. "For this complex project, we found the right partners in Stolze and Priva to share ideas about how best to control the climate in the Daylight Greenhouse."

The principle of the Daylight Greenhouse, devised ten years ago by Technokas and Wageningen University, is that not a single beam of sunlight is lost. The roof on the south side of the Daylight Greenhouse consists of special Fresnel lenses that focus incoming sunlight on two black-painted collector pipes mounted under the greenhouse roof. These collectors track the position of the sun, which heats up the water inside them. The resulting hot water is then transferred to an overground buffer or stored in the soil, for use in heating the greenhouse at a later time. This system enables Ter Laak to use all the sunlight entering the greenhouse.

#### **A complex project calls for close cooperation**

Phalaenopsis prefers to be out of direct sunlight, which is why this crop is exceptionally well suited to this type of greenhouse. The system ensures that the sunlight not required by the plants is used efficiently and does not go to waste.

"In the summer months, most of the sunlight – about 70% – falls on the collectors and only the remaining 30% reaches the crop," explains Ewald de Koning, Manager Operations at Ter Laak. However, the system is not entirely without risk: the amount of light reaching the plants should not be too high. Light levels are measured continuously using [Priva PAR sensors](#) and the [Priva Connex](#) process computer. "When a PAR sensor detects that the limits of the light settings have been exceeded, it automatically sends a signal to the computer, which triggers the preset measures such as closing the screens. We also receive a direct notification on our phone via the [Priva Alarms App](#)," says Ewald. "For this complex project, we found the right partners in Stolze and Priva to share ideas about how best to control the climate in the Daylight Greenhouse."



*Fresnel lenses and black-painted collector pipes*

### **A process of trial and error**

Ter Laak is the first grower in the world to use a Daylight Greenhouse. Ewald: “It took over a decade of research before we were able to apply this technology and we are now three trial models further down the line.” Initially, Technokas worked with Wageningen University on a prototype at the university. A few years later, Technokas built a pilot greenhouse in Bleiswijk to implement the concept on a larger scale. It was during the Bleiswijk trials that Ter Laak joined the project. Ewald: “We took our plants to Bleiswijk to participate in trials with the Daylight Greenhouse. These went so well that five years ago we decided to build a small Daylight Greenhouse of our own at Ter Laak, covering 4,000 square meters.” In 2014, additional parties including Stolze and Priva came on board in order to steer the project in the right direction and ensure that all the technical systems were properly interconnected. “Now, more than five years later, the Daylight Greenhouse has increased its surface area by a factor of ten and everything is running smoothly, thanks in part to the ambitious project team,” says Ewald proudly.



*Ter Laak's Inspiration center*

### **Experience Phalaenopsis!**

Ter Laak sees nature as a source of inspiration for its innovations in sustainable cultivation. “Essentially, what we are doing in the greenhouse is replicating the plant's natural environment,” says Shirley Barendse, who was closely involved in setting up Ter Laak's inspiration center through her marketing and communication role. “In the rainforest, the original habitat of Phalaenopsis, factors such as water, humidity, light and shade combine to help the plant grow. We mimic this with special, perfectly coordinated techniques including misting, LED lamps and screens. All entirely obvious to us, but not everyone thinks about these things.” Ter Laak's inspiration center tells the story of Phalaenopsis in detail. Shirley: “We show in our own way what we have to offer. We want to tell the story behind the plant and inspire our customers.”

## **WANT TO ASK YOUR QUESTION?**

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