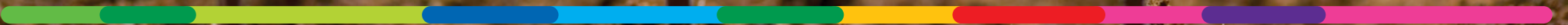




ENGIE Climate chambers

ENGIE Refrigeration Netherlands



Virtually all climatic conditions for seed breeding, seed testing, the development of crop protection measures and seed storage, can be emulated in our climate chambers. ENGIE Refrigeration combines wide scope of application with a very narrow tolerance, considerable stability and high reliability.



This means emulating a natural day and night rhythm is possible without any unnatural fluctuations in light and relative humidity. Controlling airflow speeds yields the best possible air circulation. Oxygen and CO₂ are released very precisely, so that researchers can adjust for photosynthesis and the processing of assimilates, for

instance. Tests conducted in our climate chambers are one hundred per cent reproducible. Not only do we test all specifications in advance, such as temperature, humidity, CO₂ management, light intensity, air movement and watering. We also validate our constructed climate chambers together with clients.



“ENGIE combines a wide scope of application with a very narrow tolerance, considerable stability and high reliability.”

We design climate chambers in very close consultation with our clients. We select the best components, technologies and materials so as to fulfil their wishes entirely. So, for example, in automating the climate chambers we use a recognised and reliable industrial open-source platform. This platform offers the best possibilities for linking the control of climate chambers with other ICT systems in your company.

Reference: Bayer CropScience



The request from Bayer CropScience Vegetable Seeds (formerly Nunhems Netherlands)

Develop climate chambers to achieve the best possible yield from the correct handling of seeds.

Cultivating vegetable seeds under extremely uniform conditions. Where the conditions also need a precise ability to be set, reproduced and repeated. To be able to secure the leading market position in this way.

With high-quality climate chambers for seed-technology research, R&D is now ready for the future.

That's the reason Bayer CropScience Vegetable Seeds contracted ENGIE Refrigeration to provide the Seed Technology R&D department with new climate chambers. With high-quality climate chambers for seed-technology research, R&D is now ready for the future.

Authoritative

Bayer CropScience Vegetable Seeds in Limburg's Nunhem (Leudal municipality) is one of the largest suppliers of vegetable seeds in the world. It is a subsidiary of Bayer CropScience. It has a broad range:

28 crops and around 2,500 varieties. Developments in this market are rapid. To keep innovating, Bayer CropScience Vegetable Seeds built a new R&D centre.

Combined expertise

On the basis of a relationship going back years, ENGIE was asked to create fourteen climate chambers. In close consultation with Bayer CropScience Vegetable Seeds, ENGIE developed climate chambers based on the very latest technologies. This led to combined expertise for achieving the best possible yield from the correct handling of seeds. It applied the latest technologies for, among other things, the uniform distribution of light, humidity and temperature. Using the latest technologies (including remote control), within the fourteen climate chambers. ENGIE ensured that the conditions would always be constant, but could also be adjusted, reproduced and repeated with precision.



ENGIE solution

Optimum research conditions.



Reference: Universiteit van Amsterdam



Request by the University of Amsterdam

Develop climate chambers for the greatest possible number of different experimental conditions. Variables such as light, air, heat and nutrition to be easily set, logged and archived.

The University of Amsterdam needed a wide range of climate chambers, incorporating as many different technologies as possible. ENGIE Refrigeration developed climate chambers with advanced technologies, enabling a wide variation of experiments with the essential variables of light, air, heat and nutrition, to optimise and research the growth of young plants.

ENGIE's intelligent control ensures the easy management of variables like light, air, heat and nutrition.

Meticulous research

One of the teaching and research units of the University of Amsterdam (UvA) is the Faculty of Mathematics, Physics and Information Technology (FNWI in its Dutch acronym). A number of specific disciplines have been set up within the FNWI to research plant pathology and physiology. Several aspects are crucial in this research. To be able to guarantee the accuracy of the research, the experiments must always be conducted under exactly the same conditions, and the diversity of the elements must be able to be attuned to each other correctly. It is also important that the experimental conditions, such as settings

and conditions created, can be logged and archived. ENGIE was able to achieve all of this with new and improved technologies. These new technologies, such as LED and fluorescent lighting, ensure the plants' optimum growth.

Uniform test results

To be able to apply the greatest possible number of experimental conditions, the UvA asked ENGIE to build a total of 46 climate chambers. The majority (24) consisted of gallery rooms, containing racks with test trays. For each of the test trays, the micro-climate is absolutely identical in each place. In this way the various experiments can be conducted under uniform environmental conditions within one climate chamber. Another seven chambers with solar ceilings were realised plus 15 cold or freezer stores.



ENGIE solution

Optimum research conditions.

Reference: NIOO-KNAW



The Request from NIOO-KNAW

Develop intelligent climate chambers in line with our sustainability aims

The Netherlands Institute of Ecology (NIOO-KNAW) needed thirteen climate chambers for its new building in Wageningen. They had to be not only high tech and meet the academic needs, but also to be sustainable. ENGIE Refrigeration surpassed every expectation. "I never felt that we had asked the impossible."

Researchers use the NIOO-KNAW climate chambers to study the effect of changing conditions on plants, animals and micro-organisms. And therefore what is happening in the natural world. "For example, the effect of global warming on plants", says Gregor Disveld, who as phytotron manager bears responsibility for the NIOO-KNAW climate

chambers. "We were not only looking for cultivation facilities, but also for climate chambers to store material, including fungal preparations and soil from the field."

Light conditions

"Because we are dealing here with scientific research, the conditions in the climate chambers must be completely traceable. This places high demands on the research conditions. For instance with respect to the stability of the light conditions. The lamps radiate considerable heat and need to be cooled. But this has to be done uniformly, so that the temperature in the entire chamber remains the same."

We never felt that we had asked the impossible.

The organisation wanted more than an academically satisfactory product. As an ecological institute, NIOO-KNAW attaches great value to sustainability. For instance, the building is as energy neutral as possible and an important principle is the reuse of resources and materials. One of the aims was to reuse as much of the heat as possible that is released when performing research. Therefore, ENGIE designed the climate chambers so that the water used to cool the cooling compressors is used to heat the building.

[Read more >](#)



(Continuation of) reference: NIOO-KNAW



Sustainability ambitions

“However, we did not have a very clear picture of the technology that is required for the climate chambers”, says Disveld. “We therefore looked for a party that could help us realise our ambitions in the area of academic dependability and sustainability.”

ENGIE quickly stood out. “We saw that ENGIE had constructed technically intelligent climate chambers at the University of Amsterdam. For instance, by positioning the pumps on the outside, so that you do not need to enter the climate chambers to perform maintenance. The result is that there is no risk of disturbing the research.”

Log in from home

The question was whether ENGIE would also be able to meet all of Wageningen’s wishes. “The ENGIE team listened to our questions

and thought with us to establish exactly what we needed. Their ideas were clear. The climate conditions in the chambers were regulated without additional costs. We never felt that we had asked the impossible.”

For instance, ENGIE installed a monitoring and control system to which the phytotron manager can log in, also from home. “We can control many things ourselves: light intensity, temperature and air humidity. The box containing the measuring instruments hangs in the middle of the climate chamber, instead of in the corner. This means that we can measure the air humidity and the temperature in the heart of the chamber, at the location where the research is conducted.”

But there is more. “Here we can imitate a situation of unobstructed daylight as well as shadowy conditions. In the first case,

the light contains a relatively large amount of red light, in the second case a large amount of far-red light. The fact we can achieve this using LEDs is in line with our environmental philosophy. Our climate chambers are truly innovative.”



ENGIE solution

Innovative climate chambers.



Why ENGIE?



ENGIE's climate chambers offer:

- Simulation of virtually all climatic conditions
- Simulation of a natural day-night rhythm without major fluctuations in light and relative humidity
- Regulation of air velocity for the best possible air circulation
- Focused control of photosynthesis and the processing of assimilates, for instance
- Hundred per cent reproducibility of conducted tests
- Climate chamber control which is linked to other ICT systems
- Wide scope of application
- Very narrow tolerance
- High stability
- High reliability

The choice of leading organisations

Research departments of the University of Amsterdam and Bayer CropScience Vegetable Seeds commissioned ENGIE Refrigeration to create the latest generation of climate chambers.

Leading companies like Monsanto, Max Planck Institutes, INCOTEC, NIOO-KNAW, Groningen University and Plant nursery Gitzels opted for our technology and dozens of years of experience in this specific field.

Companies and research organisations which want to be best in class, do not take risks. They opt for ENGIE's proven performance and strong track record.

More information?

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