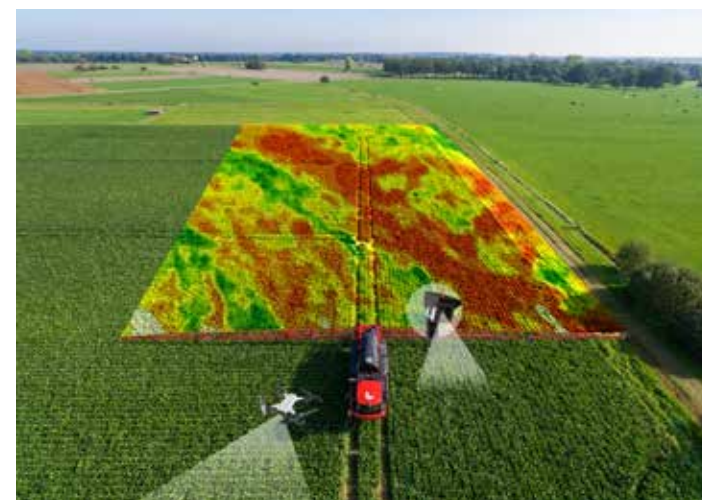


CASE STUDY BREEAM AWARDS 2020



CASE STUDY SUBMISSION FORM



BREEAM Reference: 586-NON-2014
Development Name: Agrifac Machinery B.V.

Category Nominated for: Best Post Construction
Best project West Europe

Case Study Contact Name: Simon Hogenstijn (*BREEAM related*)
Frans Apeldoorn (*Agrifac*)

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f.apeldoorn@agrifac.com

KEY FACTS

About the Building

Building Function: Office, Industry, Common/Rest Areas
Country: The Netherlands
Location: Steenwijk, Eesveensweg 15, 8332 JA
Size (Gross Floor Area): 14.824 m²

About the BREEAM Assessment

Scheme & Version: Construction and Renovation 2014
Certification Stage: Post construction
Rating: Outstanding

(all parts where assessed under BREEAM In-Use)
Overall Score: 97,38%
(all parts where assessed under BREEAM In-Use)

Project team details

Developer / Client: Agrifac Machinery B.V.
Architect: B+O architects
Building Services: Heluto, Bakker TIB
Constructor: Volker Wessels Rottinghuis
Assessor Company: W4Y Advisors (*Expert role Netherlands*)
Adamas Group (*Assessor, Dutch role*)
W4Y Advisors (*Commissioning*)

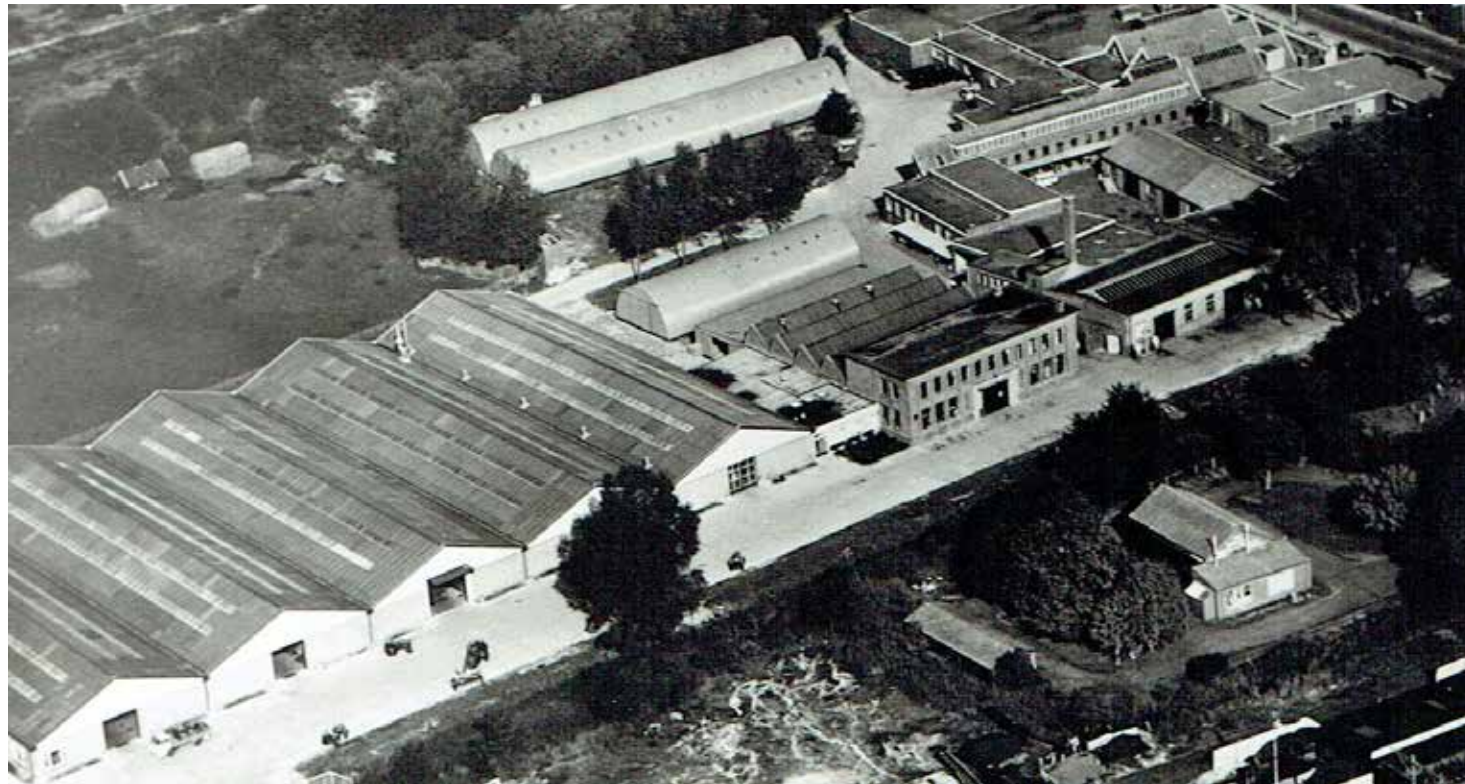
Additional:
Please state role and Company name

Social media handles of project team

www.agrifac.com/news/most-sustainable-factory
www.agrifac.nl/over-agrifac/breeam-case-study
www.agrifac.nl/meest-duurzame-fabriek-van-nederland



SCOPE - ABOUT THE BUILDING



Agrifac Machinery B.V.

We can increase yield on less productive farm land where we see huge yield gaps between current production levels and those possible with improved production practices, mechanization, precision farming and farming on plant level, so called **NEED Farming**. Agrifac sprayers are able to achieve more yield with less crop protection, to provide each plant what it needs, helping farmers all over the globe feed the world in a more sustainable manner.

Agrifac likes to be at the forefront when it comes to innovations and sustainability. The most innovative and sustainable machines in the world are being developed and assembled in the most sustainable factory in the Netherlands.

Making a global impact on Agriculture

Agrifac is active in the UK, Australia, Canada and all over Europe. All Agrifac machines are designed and built at the Agrifac factory in Steenwijk, the Netherlands.

Same location since 1938 - Rebuilt and remodelled

Therefore the factory and offices of Agrifac have been extensively rebuilt and remodelled. The factory was very outdated and therefore no longer suitable for current business operations as the producer of the worlds most innovative and sustainable crop sprayers. The remodelling of the offices was done in two phases. The first phase involved the adaptation and expansion of the original office space. During the second phase, the empty offices on the Eesveenseweg were remodelled into usable office spaces.

New Factory on the same location

At the same time, the factory hall was addressed. This has been completely demolished and rebuilt in phases. This was necessary for the new production process, which the factory has implemented. The production line was rotated a quarter of a turn in order to be able to produce more efficiently. The existing façades of the office area had a cultural-historical value and were therefore retained. The façade of the new factory hall is in line with this.

Key facts

- Agrifac is passionate about sustainability. Therefore BREEAM was leading.
- The construction of the building was circular and as much as possible renovated.
- The cultural-historical value is retained.
- The location is the same since 1938
- Next to train station and the city center of Steenwijk
- The building is completely energy neutral; the 5.000m² solar panels are generating more energy than Agrifac uses.
- All Agrifac sprayers are tested with water from the rainwater collection tank (50m³) and it is used for flushing toilets.
- Heating and cooling of the building is done via heat pumps and score a TER (*total energy recovery*) of 6
- The air ventilation per person is higher than required, making it a healthy work place, especially in times such as COVID, this ventilation is more than welcome.
- Another remarkable point is the airtightness, even more so considering the many loading and unloading points. The realized airtightness is a qv;10 value of 0.24.



SCOPE - ABOUT THE BREEAM ASSESSMENT

BREEAM is the sustainability standard in the Netherlands. Agrifac's main goal is business wide focus on sustainability. For this project W4Y carried out the BREEAM commissioning in conjunction with the BREEAM expert. B+O Architects created, as much as possible in line with BREEAM standards, the architectural design. Consider, for example, the fact that all the area's where people are working longer than 30 minutes have direct connection with daylight. It applies for both offices and the factorybuilding. Therefore W4Y has adapted the original design of the lighting by introducing daylight controls, partly in combination with presence detection. This solution does reduce the total energy consumption as well.

Management (MAN)

In consultation with all parties, being Agrifac Machinery, B+O Architects, W4Y, VolkerWessels Rottinghuis, VDK Heluto and Bakker TIB, almost all BREEAM credits have been obtained. For this a Life Cycle Analysis was carried out, consultation took place with all surrounding stakeholders, usage of maintenance-friendly materials and solutions and the creation of a very safe building. However, because the choice during construction was made to have an open appearance, unfortunately a equivalent high safetyscore couldn't be achieved due to the lack of a perimeter.

Final score is 87.5%.

Health (HEA)

Various office and factory spaces have been relocated so that every area is connected to daylight, and almost every room has a outside view. The whole building is equipped with daylight controlled LED lighting. One switch has been realized per 40m² and these industry requirements are higher than BREEAM requirements. Everywhere there is more fresh air than required and no VOC emissions. There is a perfect climate, even in the factorybuilding with high heat production. The temperature in the offices can be adjusted per 40m².

Resulting score is 84.95%

Energy (ENE)

The building is energy neutral, but even the production process is. Annually the 634 kWp solar panels are generating more power than the building and process are using. There is a complete facility measurement system where each flow group is measured. In terms of W, all heat and coldness is measured per floor. There are no thermal defects and the airtightness is far better than is required for a new-build house, twice as much!

Score: 100%

Transport (TRA)

The building is perfectly located in terms of public transport accessibility, connecting foot and cycle paths, available parking spaces, maneuverability and real-time information provision in the building concerning public transport, bicylce plan and carpooling.

Score 91.7%

Water (WAT)

All possible water reuse measures have been taken. The water collection tanks with 50,000 litres are the biggest eye-catchers here. But all vegetation can grow without irrigation.

Score 100%

Materials (MAT)

No less than 98.6% of all materials used are certified.

Because in the Netherlands the solar panels score very badly in the Environmental Performance Calculation, the involved score drops to 3 points. Without the solar panel calculation results, the score for the materials chapter would be 100%.

The building is designed in such a way that little damage can occur to the building.

Resulting score is 68.92%

Waste (WST)

All credits have been obtained. The waste is sorted, disposed of responsibly and reused for more than 80%. The rubble granulate that has been used fully consist of recycled material.

Score 100%

Ecology (LE)

The property is built on a site where the old factory used to be. This has been remediated and rebuilt by Agrifac Machinery. Thanks to all the measures, this area now even is suitable for accomodation of protected animal species.

Score 81.82%

Pollution (POL)

All rainwater that falls on the site is infiltrated in ditches next to the buildings. Oil and gas separators are situated everywhere and the heat pumps are equipped with leak detection. There is no light and noise pollution. Finally, a propane-cooled cooling / freezing installation has been chosen which is much more energy efficient and environmentally friendly compared with any other installation.

Score 75%

Innovation points 10%

The maximum number of innovation points has been achieved. Construction is well managed. The building has more daylight. The construction was energy-neutral. The current production is energy neutral as well (gas-free, circular).

BREEAM really has influenced the entire construction.



CHALLENGES - OVERVIEW ENVIRONMENTAL CHALLENGES AND GREEN STRATEGY



The initial aim was to create a building that is as sustainable as possible. But the fact that at the time of delivery the final result according to the BREEAM BRL 2014 guideline was having the most sustainable building in the Netherlands really is a top achievement.

The most striking results:

- Heat pump with COP of 3.4.
- Refrigerators / freezers with propane
- Rainwater is infiltrated on site.
- A 1,000m² garden.
- 634 kWp solar panels.
- Building and production process 100% energy-neutral.
- Usage of 98% certified materials



What has been done in addition to the BREEAM requirements that can be copied:

- More daylight than required, also inside the factory, for example.
- More lighting than the NEN 12464 prescribes.
- Extremely durable LED lighting inside with a maximum failure of 20% after 70,000 burning hours.
- LED lighting industry of no less than 146 lm/W
- No lighting outside.
- Each electrical distribution box is measured (40 E-meters).
- Extra efficient heat pumps.



SOLUTION AND BENEFITS

“Our client Agrifac Machinery has the ultimate motivation to be sustainable. As a result, during the whole project choices were made leading to a much longer or even no payback period, something that other clients normally do not consider at all. In that sense our client Agrifac Machinery really distinguished itself positively among most of the BREEAM processes I have supervised so far.”

Simon Hogenstijn (BREEAM Expert)



SOLUTION AND BENEFITS

“Making Agriculture more and more sustainable is key in all challenges that we are facing. No short term solutions. This is a challenge that Agrifac was, is and continues to be involved in. Agrifac has an 80 year long history of developing innovative tools and sustainable solutions. We invested in our factory in the Netherlands in 2018 making it the most sustainable in Europe (Breeam), developed machines using Artificial Intelligence, Deep Learning and Software as a service which reduce the footprint in agriculture enormously whilst enabling increased output. We will continue to drive these innovations towards the future.”

Wim van den Bosch
CEO
Agrifac Machinery B.V.



LESSONS LEARNED

Do work with experienced consultants and rely on their expertise.

At a very early stage, have conversations with neighbours, municipality, users and other stakeholder and keep them closely and regularly informed during the whole project.

Aim to score maximum or even beyond maximum BREEAM credits really making clear the sustainable ambition.

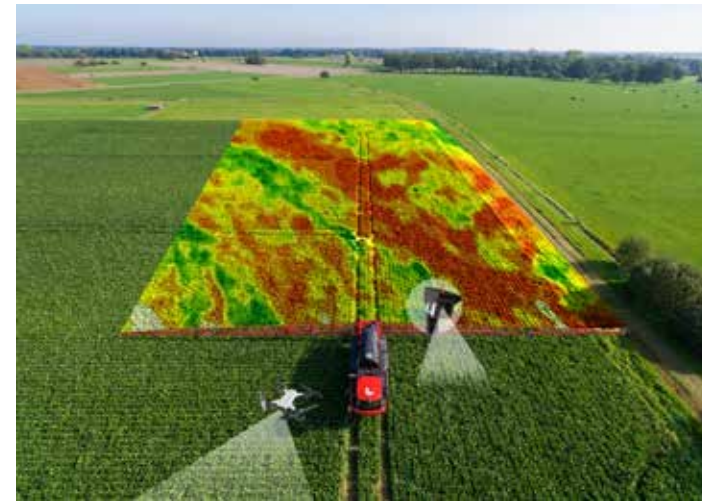
Continuously be open to new innovative technologies in order to achieve even better and more sustainable results.

Provide and secure a well-defined assignment at the start of a project so avoiding any discussion afterwards.

Frans Apeldoorn
Director Operations (COO)
Agrifac Machinery B.V.



WHY SHOULD THE AGRIFAC FACTORY WIN A BREEAM AWARD?



- Agrifac Machinery B.V. wants to make an impact on agriculture. Agrifac makes machinery which will give a higher yield while using less water and less chemicals. To make the next steps in this development, we needed a place where we could produce these machines and even go forward to the next step. Sustainability is in our DNA. Saving water is not only important for our machines, but then also for our production site. As was the wish to be green and energy neutral. Our new factory and the rebuild made our company DNA and claim for sustainable farming even stronger.

- Agrifac offers an unique location. It is probably the only industrial complex in the world that is so close to railway station, the city centre (both within walking distance) and close to the highway. This reduces CO² for transport and travelling.



- For renovating and rebuilding most of the material was actually upcycled (cradle to cradle), a small part was recycled. The construction of the building was circular and energy neutral.
- Agrifac makes a global impact with our agricultural machines, which need less water and chemicals. All over the globe our machines already deliver this promise .
- Also important, the cultural-historical value is retained. The location is the same since 1938. The old buildings are remodeled and made energy neutral while keeping the historical ambiance. Next to that we make a positive impact on the community of Steenwijk; the municipality of Steenwijk is really proud of Agrifac Machinery B.V.



HAS THE BUILDING WON ANY OTHER AWARDS? - NOT YET.

