

Integrating Algal Production within the Urban Environment – A Case study from London.

Dr Marco Lizzul* and Mr Joe McDonald

Varicon Aqua, Merebrook Business Park, Malvern, Worcester, WR13 6NP

*e-mail: MarcoLizzul@variconaqu.com

Varicon Aqua is an OEM based in the UK with over 20 years' experience in the design and deployment of algal photobioreactors at both industrial and laboratory scale. We are currently involved in an innovative project with Second Home, an office space located in Shoreditch London. The project will cultivate *Spirulina platensis* for supply into the boutique health foods and cosmetics market. To this end Varicon Aqua are providing a complete turnkey solution for the production of 2-4 kg d⁻¹ of food grade *Spirulina*. This process includes the design, construction and modelling of a façade mounted photobioreactor of 10 m³ based on our Phyco-Flow™ system, complete with reservoir, processing room and 1,500 L h⁻¹ basket centrifuge. The design process required considerable modification of our standard Phyco-Flow™ system to suit an urban environment; and benefitted from the comprehensive knowledge of our design team, fluid mechanics experts, architects and civil engineers. The result was a continuous serpentine PBR with fully automated harvesting system modified to suit the exacting specifications of the client. This included shading of certain building portions, achieved by fabrication of bespoke design elements; as well as minimisation of water pressure within the system through an innovative dual loop configuration. This design also allows for high liquid velocities within the reactor, preventing bio-fouling and minimising dO₂ build-up. Other important design considerations relate to *Spirulina* cultivation within a Northern European context and the associated seasonal challenges. The project has now entered its second phase with the construction of the photo-stage elements for the façade. Post commissioning, Varicon Aqua will provide a full package of support for training and product commercialisation, as well as inoculum and our newly developed Cell-Hi SP nutrient blend for the cultivation of *Spirulina*.

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