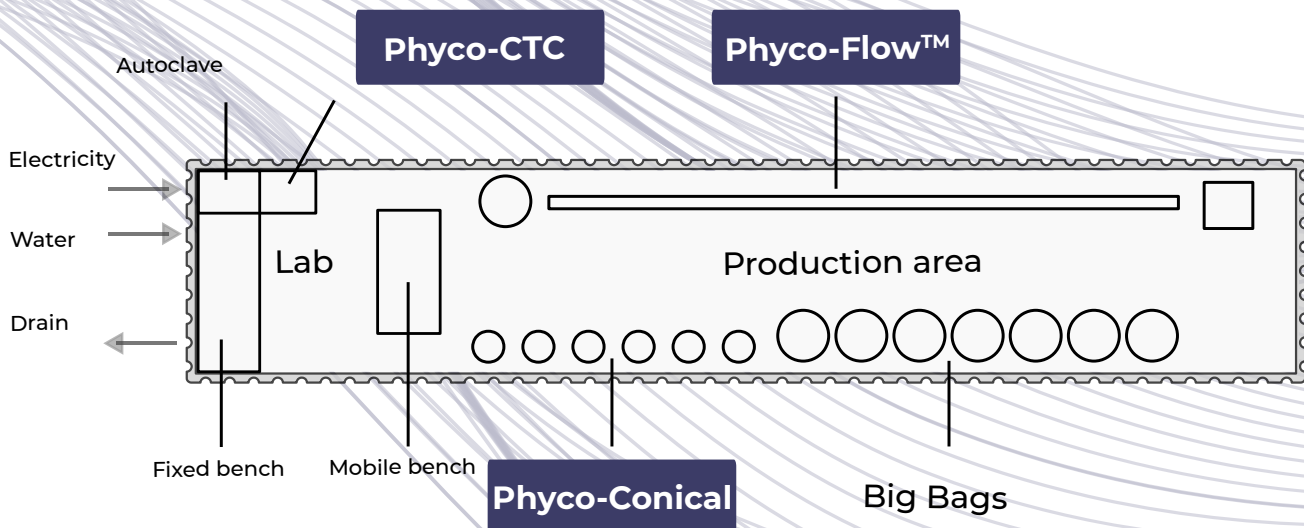


## Phyco-Tainer outline and options

The Phyco-Tainer units comes with 0.1 um microfiltration and UV treatment of al incoming water and can be fitted with most of Varicon Aqua photobioreactors from the Phyco-Line or conventional big bags dependent on requirements. The flexibility of the design allows a fully functional lab, complete with all glassware, an autoclave and a Phyco-CTC for a single unit, to multiple units which can be placed together as building blocks to form a much larger production facility. A range of automation and control options are available.



## Flexibility

The Phyco-Tainer can be fitted in both a 20" or a 40" high bay container with the former the preferred option. A multitude of configurations using the Phyco-Line from Varicon Aqua as production units are possible, even conventional big bags. This allows for the production of single species as well as multi species with outputs determined by the production configuration chosen.

The lab can be made to fit just about any requirement for both research and production purposes. The Phyco-Line covers a variety of species use in both bio-research, aquaculture (shellfish, shrimp and fish) as well as for human food additive production.

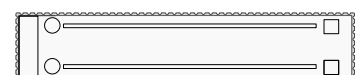
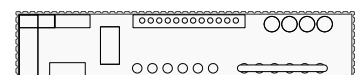
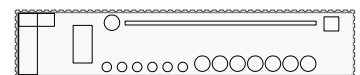
Mix, match and add on

A **single unit** typically consist of a lab area and a production area with masters, upscaling and actual production. It allows for both low and high outputs of multiple species.

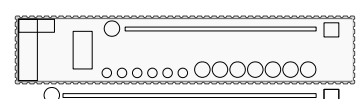
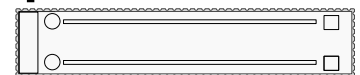
A **dual unit** could have one Phyco-Tainer fitted with a lab including masters and upscaling units with the production installed in a 2<sup>nd</sup> Phyco-Tainer. Outputs would medium to high of 1 or two species.

This set-up can easily be expanded upon by **adding on** more production segments allowing for an increase in production capacity or expand the number of species produced.

Phyco-Tainer furthermore has the possibility, local conditions permitting, of fitting a Phyco-Flow **on the outside** of the Phyco-Tainer, thereby increasing the production volume per unit.



+

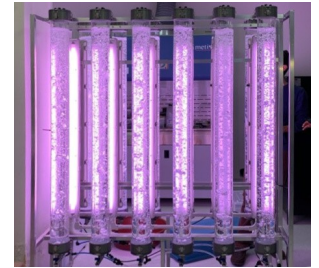


## Any Phyco-Line product can be fitted in the Phyco-Tainer

### Phyco-Bubble

The Phyco-Bubble photobioreactor, an airlift system, provides a fully controllable laboratory scale column reactor system. The Bubble is available in sizes from 5 - 15 L, and lighting that can be tailored to requirements. Photostage from Schott Duran® grade borosilicate.

Suitable for multispecies - output volume small.



### Phyco-Conical

The Phyco-Conical range of photobioreactors are suited to laboratory and inoculum production. With tubes of 2 m it comes in sizes from 60-370 L. Fabricated in borosilicate glass, acrylic or polycarbonate. Lights and control system are mounted on the frame and has a variety of I/O ports and sensors.

Suitable for multispecies - output volume small/medium.



### Phyco-Lift

The Phyco-Lift range of airlift-column photobioreactors are robust lab or pilot plant sized solutions for both commercial or research purposes. The Lift reactor is built in borosilicate glass or plastic in a modular design. Operates in both airlift or column mixing configurations.

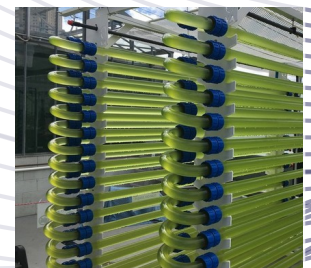
Suitable for single species - output volume medium.



### Phyco-Flow™

The Phyco-Flow™ photobioreactor, an innovative serpentine system superseding our BioFence PBR, can easily meet production requirements at both pilot and commercial scale (0.6 - 1500 m<sup>3</sup>). Comes with a propriety cleaning system. The photostage is in Schott Duran® grade borosilicate. Process control with a VAS control unit.

Suitable for single species - output volume medium to large.



### Phyco-Pond

The Phyco-Pond high-rate algal open pond (HRAP) is manufactured in-house. Smaller systems (0.1-1 m<sup>3</sup>) are fabricated from a fibreglass mould, whilst larger systems (>1 m<sup>3</sup>) has a solid matrix with steel support and an impermeable geotextile. The process flow is mixed via a motorised paddle wheel.

Suitable for single species - output volume medium.



### Phyco-CTC

The Varicon Aqua CTC's range of high efficiency temperature controlled incubators are designed for scientists and production specialists. Specific light requirements can be met. The CTC can be supplied for either plate or flask culture and is designed to incorporate a range of individual gas flow inlets.

Suitable for multispecies.



## Specifications

Microfiltration of incoming water  
 UV sterilisation of incoming water  
 Temperature control  
 LED lights source with optimal light spectrum  
 Wet lab standards  
 Plug and play (water in, electricity, drainage)  
 Container type and size optional  
 (recommended is 40" high bay/high cube)  
 Lab area configuration optional  
 Including glassware and lab consumables.  
 Process control and monitoring options  
 Minimal client set-up for truly remote placing

## Algae often produced in Phyco-Line

*Isochrysis galbana* (Tahitian)  
*Pavlova lutheri*  
*Tetraselmis* sp.  
*Chaetoceros mueruli*  
*Chaetoceros calcitrans*  
*Nanochloropsis* sp.  
*Skeletonema* sp.  
*Rhodomonas* sp.  
*Chlorella* sp.

## Phyco-Tainer is



Compact



Easy to Install



Flexible



Secure



Mobile



Trusted Quality

In addition to our photobioreactor systems we also specialise in providing the auxiliary equipment for process monitoring and control, LED solutions and downstream processing. As a one-stop shop for algae production we have a full range of nutrient mixes from our **Cell-Hi All-in-One** line.

## Our guarantee.

As with all Varicon Aqua systems we pride ourselves on the high level of pre- and after sales support we provide to our clients which is backed up by decades of 'hands on' hatchery experience in finfish, shellfish and crustacea production. We are highly approachable. Come talk to us about your needs!

## Phyco-Tainer typical outputs

### Continuous Production

500 L – 2,000 L harvested daily

**Species** (million cells/ml)

150 *Nanochloropsis* sp.  
 30 *Thalassiosira pseudonana*  
 25 *Chaetoceros muelleri*  
 25 *Isochrysis* sp.  
 5 *Tetraselmis* sp.

**Dry weight productivity**

200 – 500 g / d  
 0.2 – 1 g / L / d

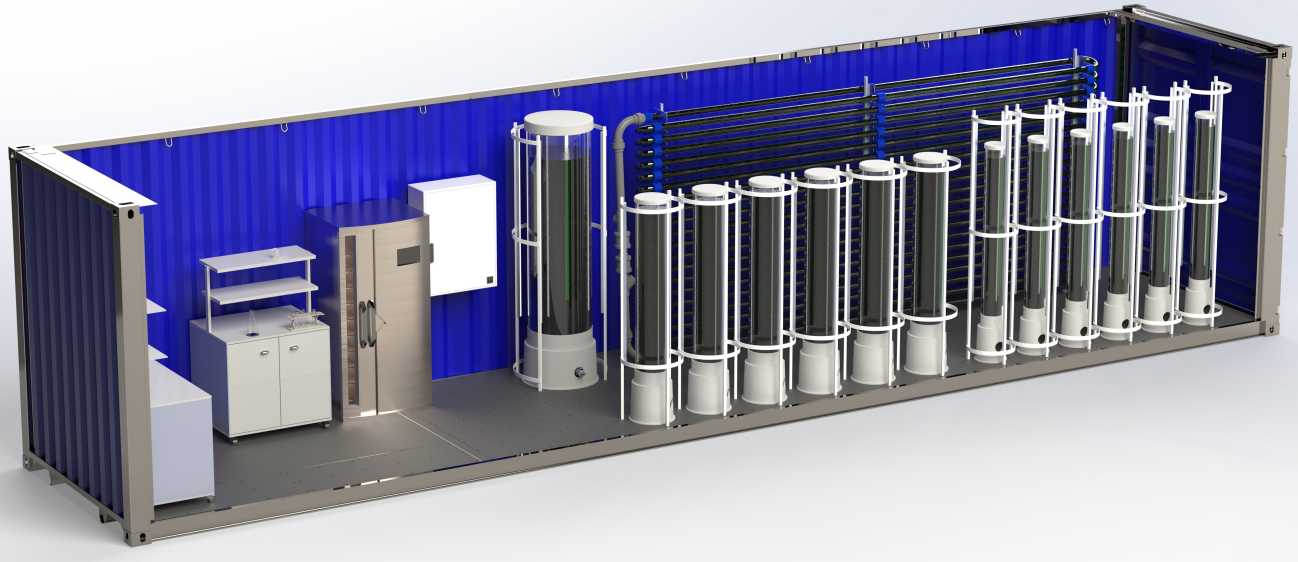
### Also Suitable for

*Asparagopsis* sp.  
*Chlamydomonas* sp.  
*Chlorella* sp.  
*Chaetoceros gracilis*  
*Chaetoceros calcitrans*  
*Haematococcus pluvialis*  
*Karenia brevis*  
*Pavlova* sp.  
*Phaeodactylum tricornutum*  
*Rhodomonas* sp.  
*Spirulina* sp.  
*Skeletonema* sp.  
*Thalassiosira weissflogii*

**MAKING ALGAE EASY**

# Phyco-Tainer

## Compact Multispecies A-Systems



## MAKING ALGAE EASY

**Varicon Aqua** are specialists in the design, construction and deployment of algal growth platforms. With over **30 years of experience** and over **270 photobioreactor systems** deployed across the globe we are recognised as global leaders in the sector. Our close client engagement and supply chain relationships allow us to provide bespoke photobioreactor and cultivation systems for a broad range of applications; we have provided systems ranging in scale from **5 litres to 400,000 Litres**.

Our key algal growth platforms are represented within the **Phyco™** line including the **Phyco-Flow™**, **Phyco-Pond** systems, **Phyco-Lift**, and **Phyco-Bubble**, each designed to meet specific needs and deliver optimal results in algal cultivation.

The **Phyco-Tainer** system is a complete algae production facility fitted inside a single or multiple containers. This allows for a quick, flexible and mobile solution where microalgae are needed for research purposes or commercial production of either shellfish, fish or shrimp. The system can be single species or multi species according to the chosen figuration. Building on our experience with clients who opted for the **Phyco-Tainer** suite, we have expanded our offering to include our complete range of production solutions like big bags and the entire **Varicon Aqua Phyco-Line**, like the **Phyco-Flow™**, **Phyco-Bubble** and **Phyco-Conical**. Lighting that can be tailored to specific photosynthetic requirements with a lab area being optional. The system is designed and equipped to wet lab standards using only tested, tried and industry grade materials. The **Phyco-Tainer** unit is easy to place on site and comes with an easy "client-on site" installation process in a plug and play format which only needs to be connected to water, electricity and a drain to be fully functional.