

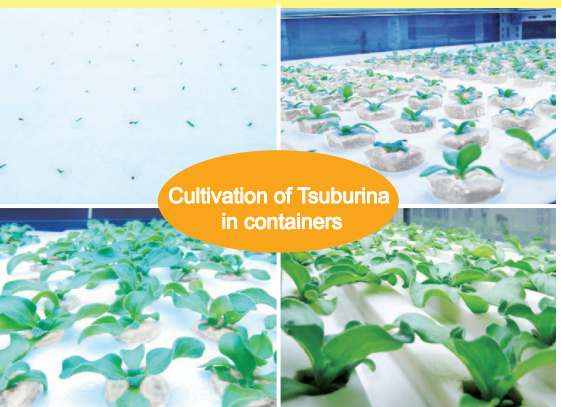
New lighting source [HEFL®] realizes ideal agriculture

New Model

HEFL® Lighting Unit

Hybrid Electrode Fluorescent Lamp

[HEFL] is a new fluorescent lamp for agricultural application modified back light lamps used for large scale LCD TV set.



Cultivation of Tsuburina in containers



HEFL lighting unit 5 advantages

Thin (Dia. 3.4mm Lamp)

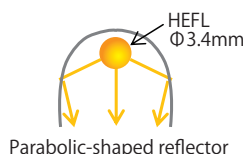
Nearness lighting More tiers

Longer life (Over 40K Hrs)
Low maintenance cost

Level lighting

Multi wave length available
Healthy vegetable farming

The latest HEFL lighting unit with newly designed reflector realized less electricity consumption, more lighting energy under the lamp (150ppf)



- 23% less electricity consumption
- 30% brightness increased
- 23% vegetable weight increased

Business example

Functional vegetable of
Mama's Farm

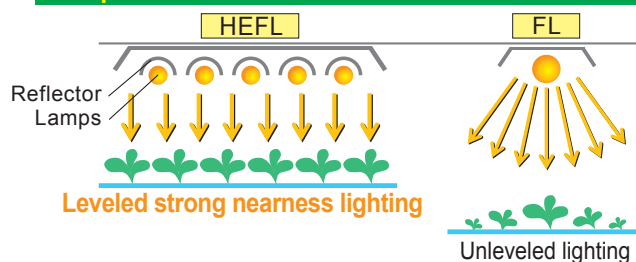
Tsuburina

The anti-aging vegetable Tsuburina (ice plant) is grown using HEFL light at the Nagahama Vegetable Factory of Nihon Advanced Agri Co., Ltd. Packed and head forms of Tsuburina are available. We also sell Tsuburina seeds.

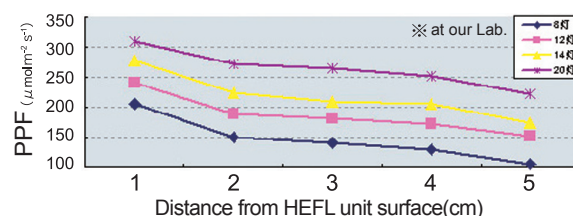


Anti-aging vegetable Tsuburina
<http://mama-farm.jp/>

Comparison of HEFL and traditional fluorescent lamp



Relation between lighting distance vs PPF



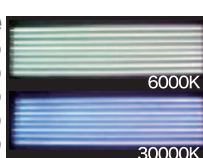
※ Leaf vegetable require 150PPF, strawberry and tomo require 200PPF

Lamp colors

Tube Length : 450~1100mm Φ3.4/4mm
Custom color order available

White

4200K
5000K
6000K
9000K
30000K



Red

610nm
660nm



Blue

450nm



Far infrared 740nm

740nm + 3wavelength

Green 550nm



UV UV-A



Mixture



Optical wave length characteristic of HEFL

In vegetable farming, it is said that Blue wavelength influences stem and leaves forming and blooming, and Red wavelength makes photosynthesis better.

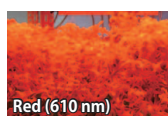
Also, it was revealed that high vitamin and high poly-phenol contained vegetable can be produced by applying ultraviolet rays and Blue wavelength rays.

HEFL has optical wave length required for vegetable farming.

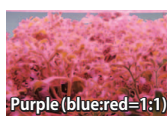
At vegetable artificial farming, high mineral, high vitamin and high poly-phenol but less nitrate nitrogen contained vegetable can be produced by controlling liquid fertilizers mixture and optical wave length.

Experiment of optical wave length affection

Examples of Tsuburina (ice plant) experiments



- The weight per head is high.
- The stalks are not very crisp.
- The leaves grow and become dense.
- The taste is weak.



- As a whole, both the stalks and leaves grow in a balanced manner.
- The taste is good.



- The weight per head is low.
- The stalks are tall but firm and hard.
- Many of the leaves are small and light.
- The taste is strong.



- As a whole, the stalks are thick and the leaves are large.
- Crispy.
- The taste is good.

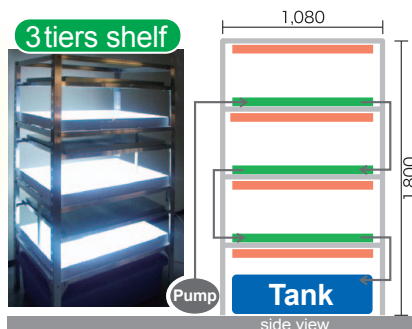
Note: Red LED lamp has 660nm peak normally due to the material (GaAlGe), but HEFL has 610nm peak. And 610nm has twice PPF (Photosynthetic Photon Flux Density) than 660nm. It has confirmed that 610nm can produce better vegetable growth than 660nm by our experiment.

Vegetable farming system Modify the system to meet your requirement

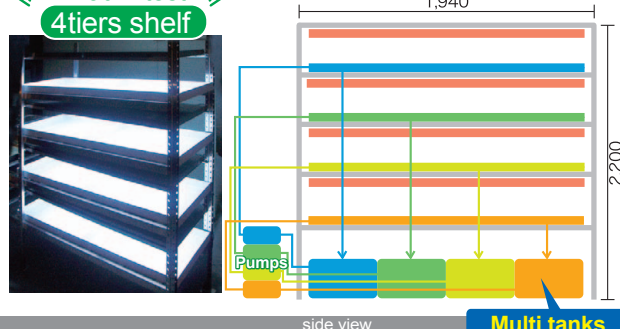
Compact farming system

Compact system and healthy seedling production

- You can produce quality seedlings with thick stalks and uniformly colored leaves.
- Light strength can be controlled.
- Short-term shipping and stable supply are possible.



Good for fertilizer matrix test



Pre-production system

For verification before full production system installation.

Harvest **18 heads** every **4days** (lettuce)

HEFL unit : 100V 80-90W x 12units



1tier
Seedling



2tiers
Infancy



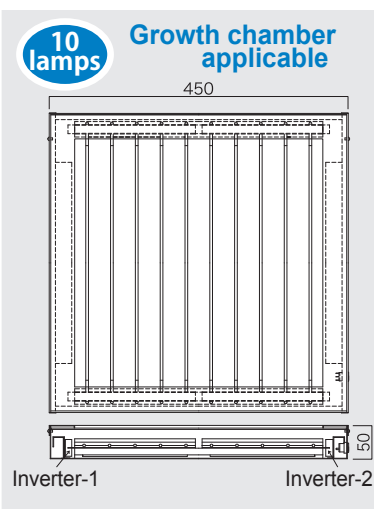
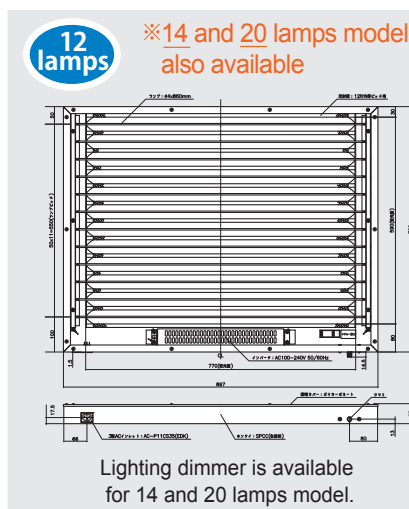
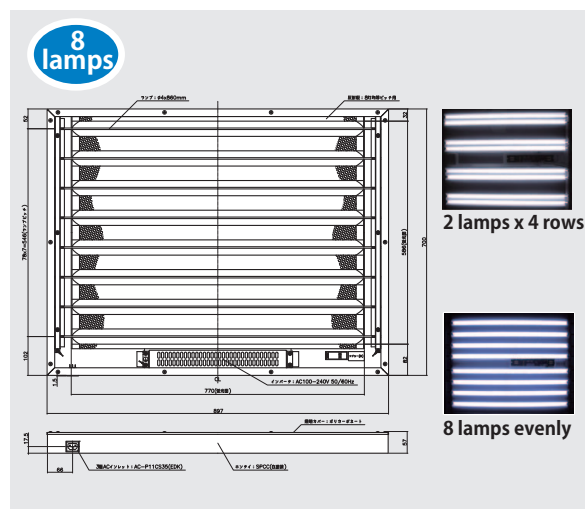
3~5tiers
Farming

Specifications (reference)	Model number	W (mm)	D (mm)	H (mm)	HEFL	Pump	Wattage
1tier	SLT 111	1,080	730	1,200	1	1	126
2tier	SLT 221	1,080	730	1,400	2	1	226
3tier	SLT 331	1,080	730	1,800	3	1	326
	SLT 361	1,940	730	1,800	6	1	626
3tier(3tanks)	SLT 363	1,940	730	1,800	6	3	682
4tier	SLT 481	1,940	730	2,200	8	1	839
4tier(4tanks)	SLT 484	1,940	730	2,200	8	4	920
5tier	SLT 5101	1,940	730	2,400	10	1	1,039

※Pan and gutter bed available ※Customization available

※ph meter,EC meter, PPF meter are optional ※Wattage is typical

HEFL lighting unit line-up



	Basic model				Growth chamber
	8 lamps	12 lamps	14 lamps	20 lamps	10 lamps
Size	700mm x 900mm	T: 57mm	750mm x 900mm	T: 57mm	450mm x 450mm T: 50mm
Lamp spec.	852mm, Φ3.4/4mm				420mm, Φ3.4/4mm
Power consumption	70~90W	100~115W	120~160W	175~225W	60W
Voltage	100V~240V				100V (W/A C adpt.)

- Standard equipment... Parabolic-shaped reflector to deliver light vertically downward
- Option : Dimmer (Adjustable 30-100%) ● Light weight...8 lamps: 7 kg12 lamps: 8 kg

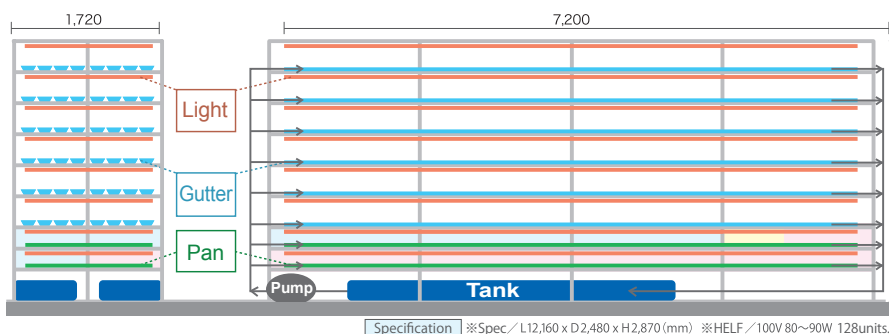
Tubes can be replaced.

As of April 2011

Utilize your space or basement

With this system, leafy vegetables such as ice plant (Tsuburina) and lettuce (red fringe) can be cultivated and harvested in a planned manner in places such as empty warehouses, vacant buildings, and basement rooms.

(Additional construction of a class 100,000 cultivation room, air conditioning equipment, and a CO₂ controller is required.)



Hanging type



Fixed type

Inquiry

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