GREENHOUSE SOLARDRYER

GREEN HOUSE GLASS DRYER

EFFECTIVE DRYING SOLUTION

Design Overview

Dimension
8m(L) x 5m(W) x 3.3m(H)

Area
40m²

Column
Galvanished metal

Gasket
Durable synthetic rubber (EPDM)

Wall Material
Double glazed glass, Single float glass (4mm), Argon gas gap (6mm)

Structure
Aluminium, Steel frame, Steel I-Beam

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Scan to see Panoramic 360 view of the space (view from entrance)

Scan to see Panoramic 360 view of the space (view from centre)

Benefits

1. **Faster drying time**: at least 50% faster than conventional drying method.
2. Output is approximately **800kg/batch**.
3. Drying duration range between **1 and 3 days per batch**.
4. Higher temperature: **more than 60° Celsius** during hot weather.
5. **Weather resistance:** rain and storm are no longer an obstacle.
6. **Hygienic**: drying in enclosed greenhouse.
7. **Contamination resistance**: no/less contamination from pests, bacteria, viruses, fungus, etc.
8. **Less labour intensive**: manpower to manage the drying process reduced
9. **Improved product quality**: original colour and taste are maintained
10. **Higher profit margin**: lower operational cost and higher product selling price.

Comparison of Drying Duration

Source: Data collected by Silpakorn University
*to prevent mold growth

Normal Weather Condition Data is based on estimation & on-site experiences					
Product	**Roadside drying (Days)**	**Solar Dome Dryer (Days)**	**Efficiency Win**	**Moisture (%) Before Drying**	**Moisture (%) *After Drying**
Banana	7	4	+43%	70-80	7-15
Chili	7	3	+57%	75-80	5-8
Black pepper	7	2	+71%	76-78	8-12
White pepper	3	1	+66%	76-78	8-12

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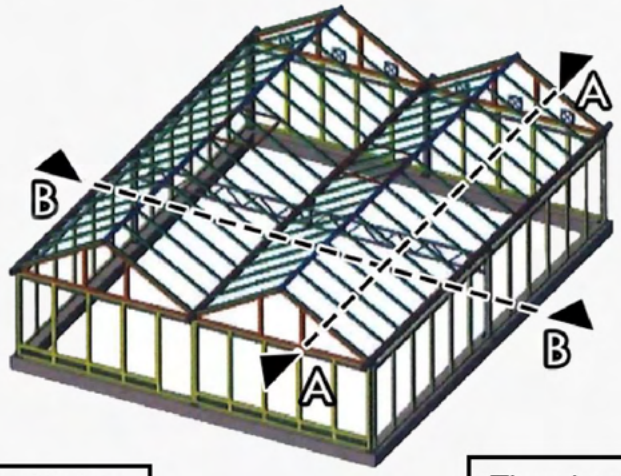
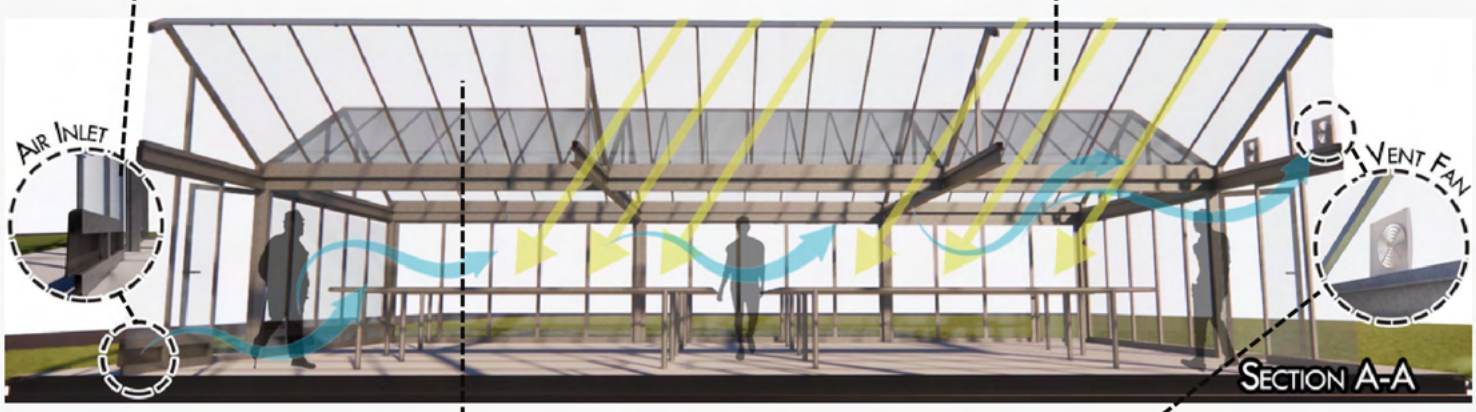
How Greenhouse Glass Dryer Work



Air inlet allow for across ventilation with the opening situated along wind flow path to promote clean air transfer into the space.

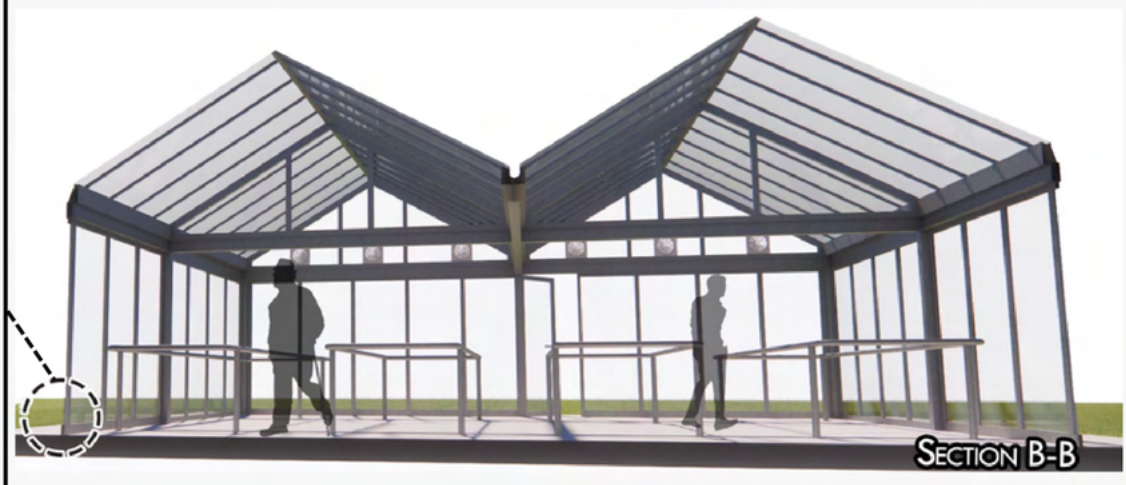
The glass sheet material retains nutrient; filters UV light that causes loss of vitamin and important nutritional values.



The glass sheet solar roof material promotes higher transparency and enhance drying performance in the drying area.

Vent fan to promote clean air transfer inside the greenhouse dryer space from the air inlet outdoor air intake towards the vent fan through cross ventilation wind transfer.

Double Glazed Glass traps an insulating air gap, boosting thermal and noise insulation.



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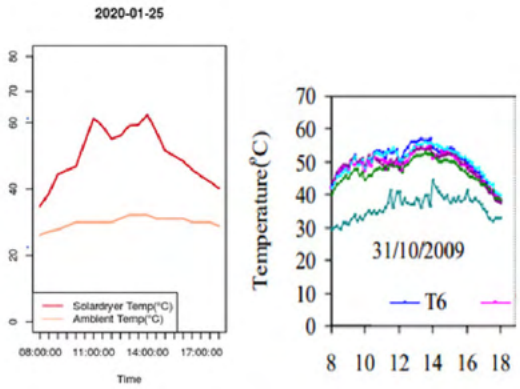
Case Study

A customized smart solar dryer was built in Kuching, Sarawak, Malaysia. This technology allows clients to have access to data management and Internet of Things (IoT) technologies. The system was built to remotely monitor and control the temperature and humidity of the solar dryer. Clients have the option to adjust parameters like temperature & humidity thereby maintaining quality and increase production yield.

Fig 1. Temperature vs Time Graph



(a) Glass Solar Dryer (b) Polycarbonate Solar Dryer

Figure 1 shows the temperature inside the solar houses. The glass solar dryer data was collected from the internet of things (IoT) system at Kuching, Sarawak. The polycarbonate solar dryer was built in Thailand and the data was obtained during drying of osmotically dehydrated tomatoes. Comparing the graphs from both solar dryers in Figure 1, the temperature inside the glass solar dryer is higher than the polycarbonate solar dryer. Moreover, this data is taken during the monsoon season and achieved 60°C during the rainy season.

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