AAGUN®

PCM BASED EFFICIENT **24X7 DRYING.**

(n) **[aa-goo-n]** *Derived from, Agni, of Sanskrit origin, meaning fire in Bengali.*

INCREASE YOUR INCOME
MINIMIZE WASTE

With Integrated Thermal Energy Storage Solution based on savE® Phase Change Materials

PLUSS®

TECHNOLOGY FOR A BETTER WORLD

Established in 1994, Pluss Advanced Technologies Pvt. Ltd. (formerly Pluss Polymers Pvt. Ltd.) is a materials research and manufacturing company involved in the field of speciality polymeric additives and Phase Change Materials. Research and innovation has been the focus of the company since inception. The company bears the distinction of pioneering and creating cost effective and innovative products and applications that provide impacting solutions. Experience, interdisciplinary thinking and practical skills form the growth guidelines for PLUSS®. The company has an equity infusion from Tata Capital Innovations Fund.

About Aagun®

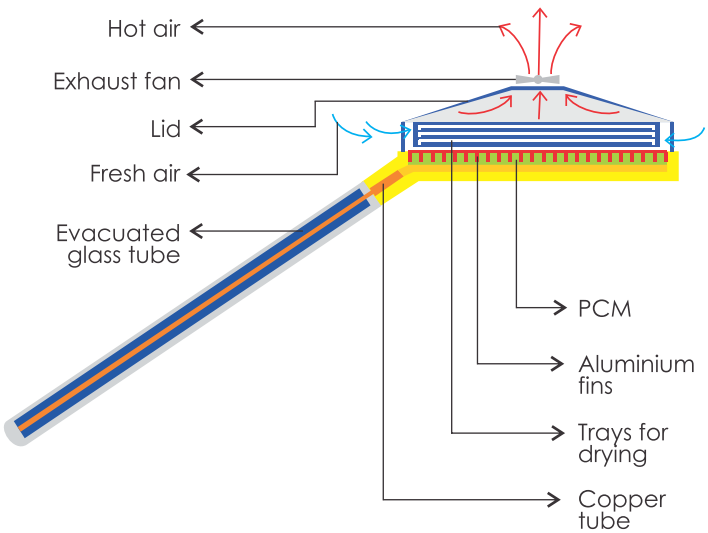
Aagun®- the PCM based 24x7 dryer enables consistent drying, even after sundown. It has the potential to alter the landscape of food drying by replacing inefficient fuel based drying for industrial food processing units, and improving value proposition of solar drying for commercial and domestic drying units.

Thermal Storage - Revolutionizing Solar Dryer Utilization

PLUSS® innovative efficient 24x7 dryer - Aagun®, helps preserve the environment, provide higher remuneration to farmers, create entrepreneurship opportunities for women and control food inflation.

The Technology

Phase Change Material (PCM) integrated solar dryer offers an advantage of 24×7 consistent drying. PCMs are products/ chemicals which enable energy storage during sunshine hours in the form of latent heat. Efficient system design of Aagun® allows storage of solar energy in PCM which gets harnessed during non-sunshine hours. Aagun® uses low wattage fans for its efficient working. The thermal energy transfer occurs when the material changes phase from solid to liquid or vice versa. The latent heat of these materials is typically 100 times the specific heat. This enables large amounts of energy storage in relatively small spaces.



Copper heat pipe sleeve is soldered to the aluminium container with PCM. The container has a low profile so heat distribution throughout it will be even. The container has an aluminium lid that serves as the heating surface for the fresh air entering the chamber.

Aagun® Applications

Fruits, Vegetables & Herb Drying

35% of the fruits and vegetables produced in India do not reach the consumer and are lost due to a lack of adequate cold storage and food drying infrastructure. The spoilage translates into lost income for the farmers and results in higher prices for the consumers. In a country stricken with farmer poverty and persistent food inflation, reducing this loss is of immediate importance.

Dried fruits and vegetables have shelf lives of 1-2 years and sell at significantly higher prices. The processed food market is currently at 10% in India and has the potential to reach 25% by 2020. The dried fruits and vegetables may be eaten plain as a wholesome snack, incorporated into baked goods or sweets or seasoned to make pickles. Additionally, they can be reconstituted by soaking in water.

A co-operative business model with adequate market linkages can be established in village clusters, wherein farmers aggregate dried produce using low cost, small independent units. Individual farmers would not have to bear the capital costs and the drying centers would provide entrepreneurship opportunities to women.

The controlled drying provided by Aagun® would result in a better quality dried product with higher nutritional value as compared with conventional solar drying.

Fish Drying

With a coastline of over 8000 kms, India produces 12 million MT of fish per year of which 30% is exported. Fresh fish rapidly deteriorates and 20-25% of this production is lost to rotting. Drying is the most common method for fish preservation that works by removing the water from the fish. Currently the market for dried fish is 6% of the $8.5 billion domestic fish market and 8% of the $4.0 billion export market. Dried fish maintains its original nutritional value and is a rich source of protein. It also fetches a higher price for the fishermen.

Current usage of open sun drying is most often inefficient, unhygienic, and results in a poor quality product.

Use of Aagun® for fish drying would provide excellent quality dried fish and reduce the drying time from 5-7 days to less than a day.

Advantages over conventional solar dryer

Continuous 24/7 drying operation with significantly higher drying efficiency.

Shorter Drying Duration: Drying time is up to 1/4th of conventional solar dryers. This results in reduced food loss – enabling farmers to dry over twice the quantity before roduce is spoilt.

Better quality dried product with higher nutritional value, aroma and taste due to controlled drying with no temperature fluctuations.

Reduced capital cost per unit of dried product resulting in a shorter pay back period and higher profits.

Maximizes system productivity leading to efficient resource utilization and a reduced carbon footprint.

How we achieve higher collector efficiency

Use of evacuated tubes with a selective coating that enhances absorption and reduces emissivity.

Reduced radiation & convective losses due to controlled temperature.

Storage of excess heat eliminates wastage of heat during peak day time hours.

Optimized collector design using extensive heat transfer and computational fluid dynamics analysis.

Transfer of heat to and from the PCM storage directly via finned plate.

Recognition for PLUSS®

Supply Chain Innovation Award for Celsure®- shipping solution for pharmaceuticals

Cold Chain innovation of the year - 2016 for Celsure®- shipping solution for pharmaceuticals

CII Industrial Innovation Award - 2014 & 2017

Innovative Technology Award - 2015 Healthcare category

FICCI- DST Lockheed Martin Award - 2015

MIT Innovators under 35 India Award - 2016 & 2017

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