



THERMAL FLOATER

The Floating heat hoarder
module

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ABOUT ME

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01

ABOUT US



I am the founder of Incy Tech, and a student from Radiant International School, Patna, Bihar, India. I was encouraged by the idea of upcoming renewable technologies and wanted to develop and research on the same.

THERMAL FLOATER

ABSTRACT

The thermal floater includes a hollow floating structure that is formed of a structurally stable frame, with light rays being diverged and concentrated at the Peltier modules for generating electricity from the thermal heat of the Sun and a cable system for supplying power to utility and an off-grid facility.

PROBLEM STATEMENT

Background of the invention and
the problem statement for the
contraption

02

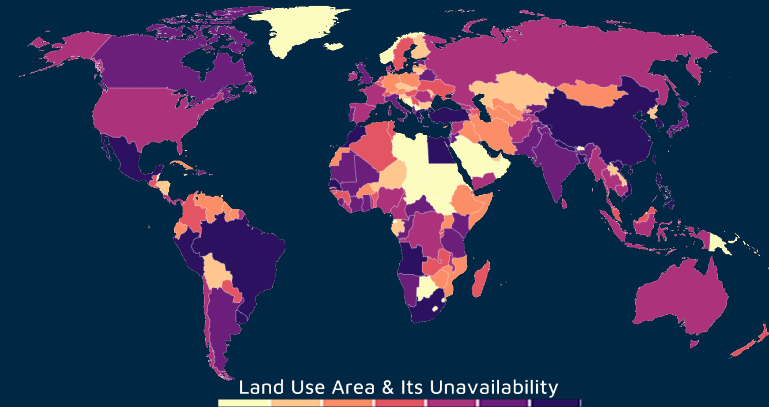
THERMAL FLOATER

WHY DID I CHOOSE TO DEVELOP IT ?

- Among various energy sources, the need for green and clean energy is inevitable given the increasing level of greenhouse gas emissions and depleting conventional resources such as coal and oil.
- Today, the world still heavily relies on fossil fuels and even continues subsidizing them. Meanwhile, the pollution they cause – from climate-damaging greenhouse gases to health-endangering particles – has reached record levels.

THERMAL FLOATER

- It is difficult to spare a substantial land area except for few pockets of unproductive land for purposes like thermal power generation in developing and busy countries.
- The Thermal Floater can take unused space on bodies of water, such as hydroelectric dam reservoirs, wastewater treatment ponds, or drinking water reservoirs reducing the land area usage.
- The long coastline of developing countries offers a vast possibility of installing such modules which can generate a tremendous amount of power to meet the growing energy demand.



PROTOTYPE

The proposed product for
the solution along with its
breakdown

03

The background is a dark navy blue. It is decorated with various geometric elements: small squares in white, orange, and teal, some of which are solid and others are outlines. Thin white vertical lines of varying lengths are scattered across the frame. The text 'ABOUT SOLUTION' is centered in the middle of the image.

ABOUT SOLUTION

THERMAL FLOATER

ABOUT THE IDEA / SOLUTION

- The thermal floater can be installed easily on any inland or stagnant water bodies for a long-sustained period through an easy mooring system. It converts the heat obtained from the Sun to electrical energy using a system of widgets.
- This concept was developed to help support sustainable development globally and help provide renewable and clean energy and make it accessible to everyone. So, it is wise to say that this concept has an environmental theme.

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ABOUT PRODUCT

THERMAL FLOATER

BRIEF WORKING

The thermal floater consists of structurally stable tubes to float on the surface attached to the body's frame. The light from the Sun is captured using a Fresnel lens of appropriate focal length which converges the light rays onto a thermally conductive surface. The following is a list of the thermal conductivity of several potential materials suitable for the same.



THERMAL FLOATER

BRIEF WORKING

Copper sheets were chosen concerning the table due to their high heat conduction range and their affordability. It further conducts the heat down to the thermal paste that act as a thermal compound for the Thermoelectric Peltier and is separated by mineral wool to redirect the heat towards the Peltier.

S. No.	Material	Range for Heat Conduction
1	Stainless steel	16 W/mK
2	Pyrolytic Graphite	50 W/mK
3	Silver	700 – 1750 W/mK
4	Copper	400 W/mK
5	Aluminium	385 W/mK

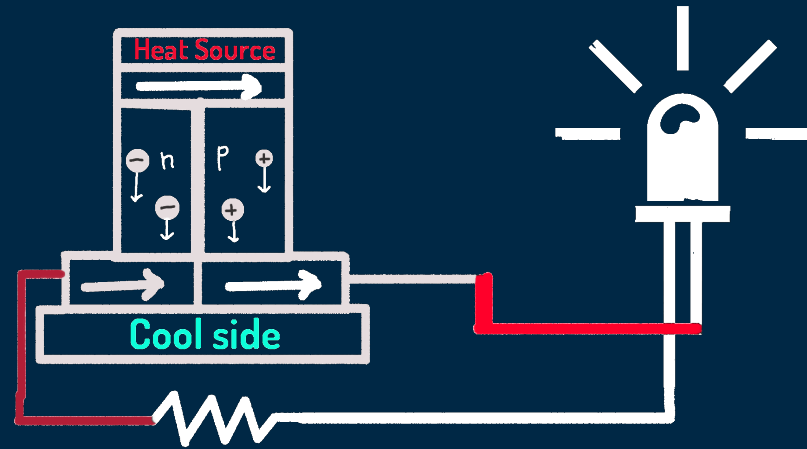
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BREAKDOWN OF PROTOTYPE

THERMAL FLOATER

HOW DOES IT GIVE OUT ENERGY?

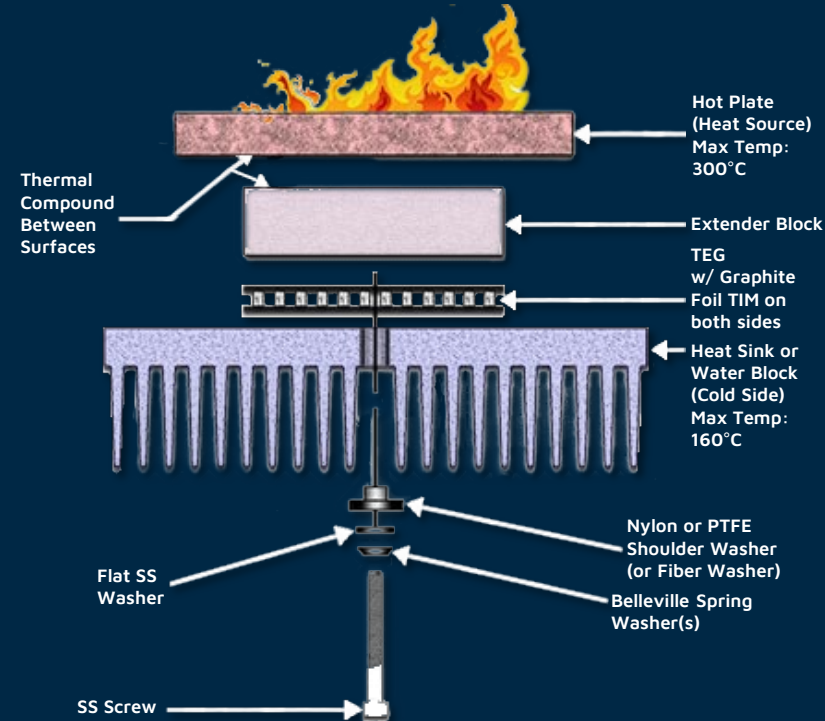
It is known that thermoelectric generators such as Peltier modules, work on the Seebeck Principle which can be used to produce electric current. The Seebeck Effect states that electric current is produced when two dissimilar metals are joined and one side of their junction is cooled while the other side is heated. A thermoelectric power supply converts thermal energy to electrical output.



THERMAL FLOATER

HOW IS IT IMPLEMENTED?

So, the Thermoelectric Peltier converts the thermal energy into a high-power output with voltages enough for powering various household devices. Since the Thermoelectric Peltier needs temperature differential to function and produce electricity, the cooling mechanism is attached to a heatsink that is further in contact with the water body. Following is the mounting implementation in the prototype.



The background is a dark blue field decorated with various geometric elements. There are numerous small squares in white, orange, and teal, some of which are solid and others are outlines. Thin white vertical lines of varying lengths are scattered across the composition, creating a sense of depth and movement.

FEASIBILITY OF PROTOTYPE

THERMAL FLOATER

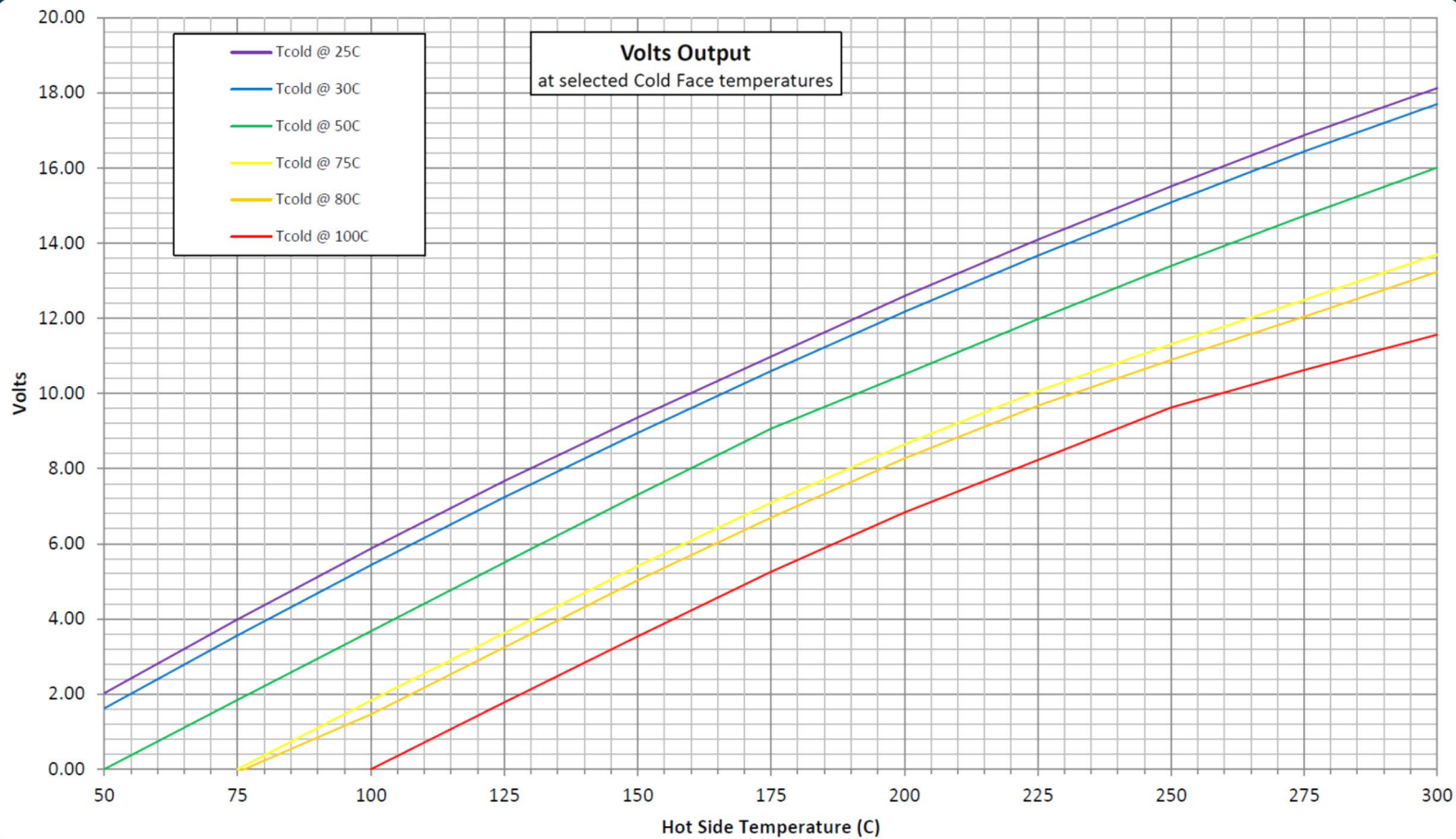
ENERGY GENERATED

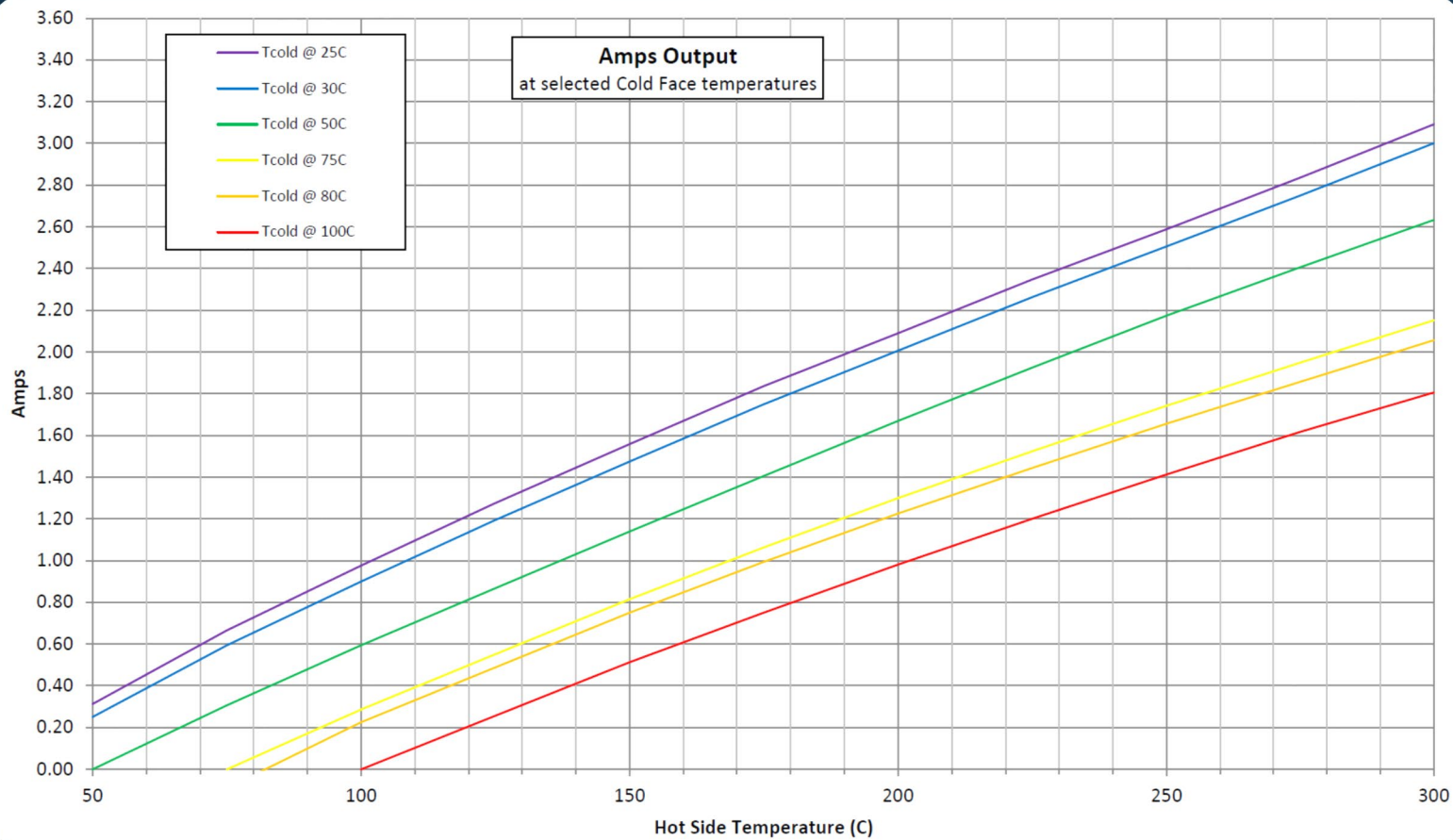
In order to determine the feasibility of using heat from the Sun in a thermal-solar platform, calculations had to be performed. Thermoelectric Peltier used herein such conditions can produce around 682.5 Watts per day. Keeping in mind that this is the power production by a single module which is just 15 cm by 15 cm, while a typical solar panel is 1.5 m by 1.06 m.

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ENERGY GENERATED

It currently produces 3x more energy than a typical solar panel in the same amount of area & the prototype can be even more efficient and applicable for rooftop systems by applying cooling methods such as liquid metal cooling, which will boost its cooling efficiency. Such cooling methods are still in development but will soon be available to use here readily





THERMAL FLOATER

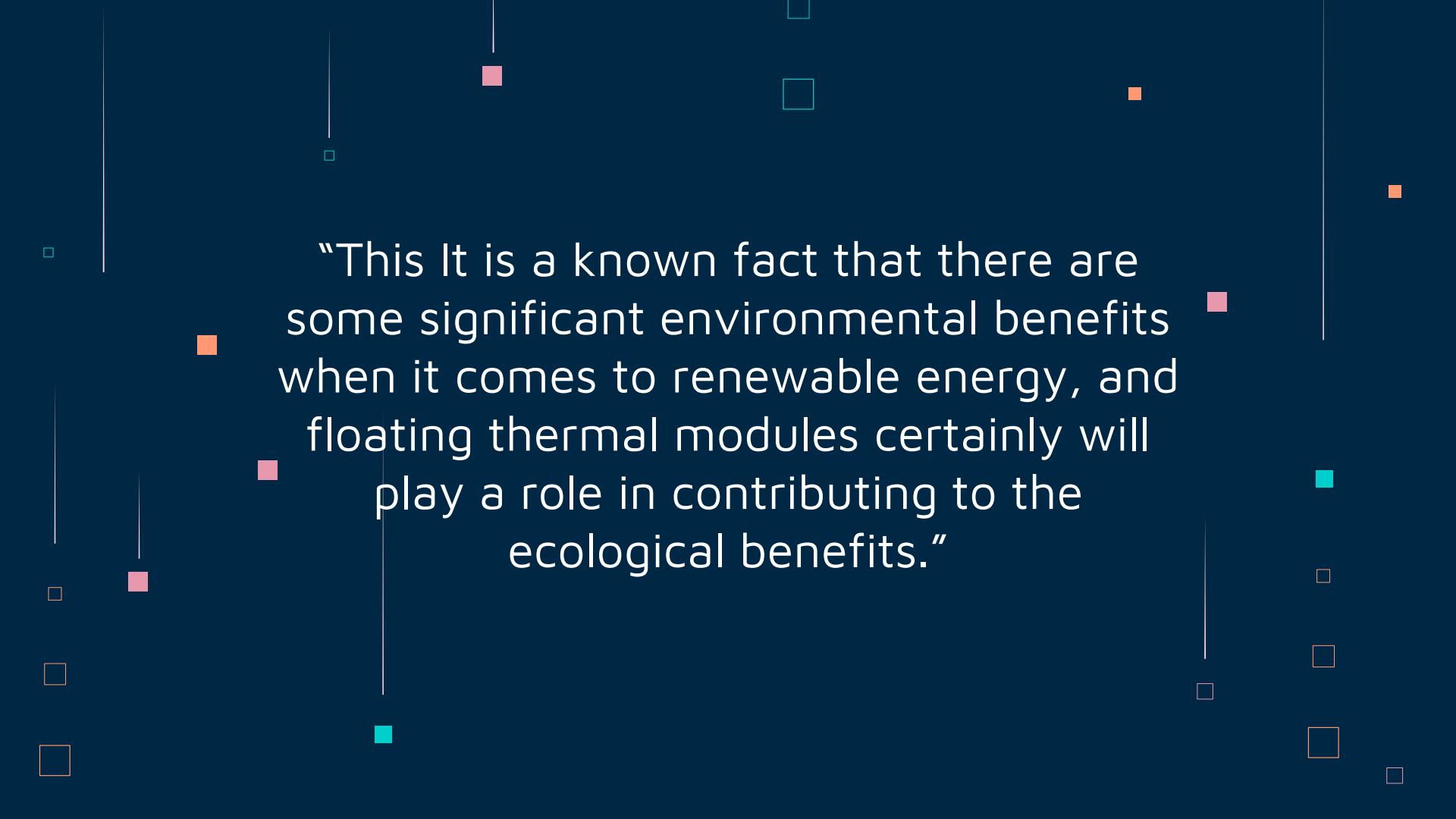
MARKET COMPETITION

Converting its dimensions to match its output with its competition, with a ratio of 70.5 in dimensions to a single solar panel that produces 300W per hour and 3 kWh per day, the energy generated by an array of the same size will come out to be about 10 kWh per day.

This has many other benefits compared to other competitors. It's more environmentally friendly as most of its materials are recyclable & non-toxic, and the materials used here are more durable than the materials used in Solar Panels.

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BENEFITS OF PROTOTYPE

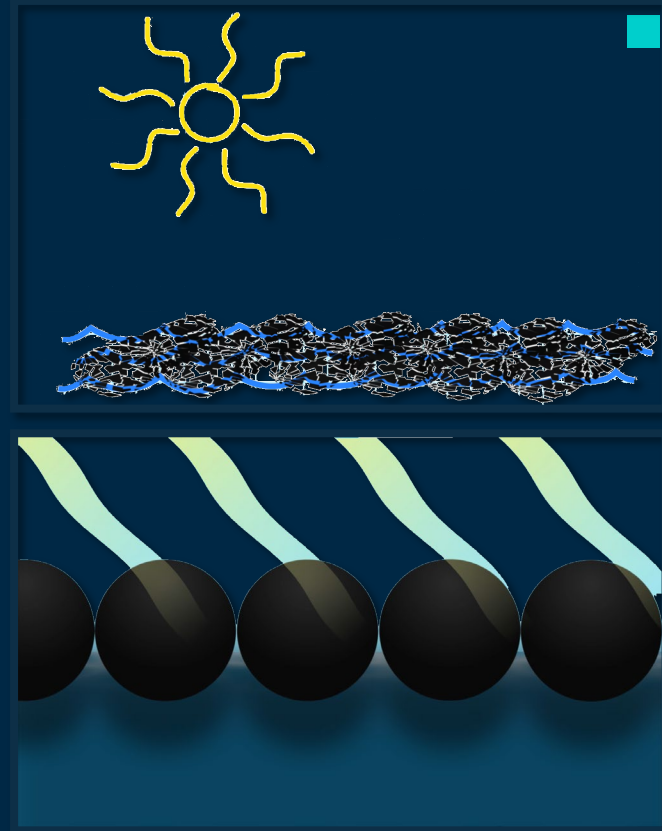


“This It is a known fact that there are some significant environmental benefits when it comes to renewable energy, and floating thermal modules certainly will play a role in contributing to the ecological benefits.”

THERMAL FLOATER

BENEFITS OF PROTOTYPE

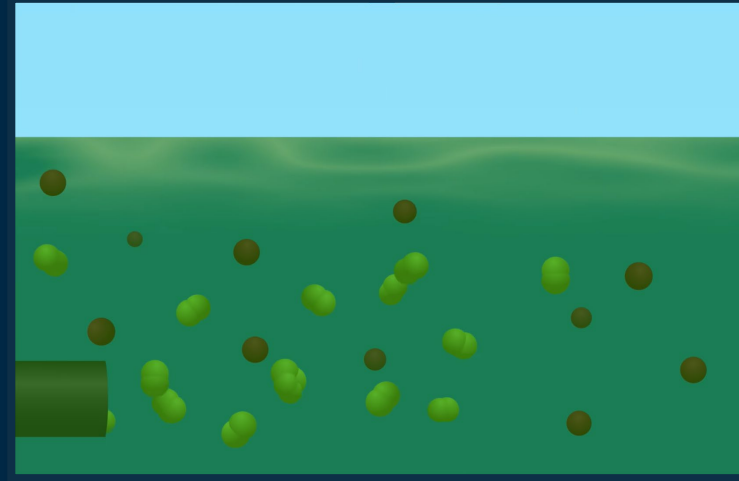
- With floating thermal module installations, the water doesn't only have a cooling effect on the solar-thermal-powered systems, but it works the other way as well. The floating thermal module installation provides shade to the body of water.
- It reduces the evaporation from these ponds, reservoirs, and lakes. This is an excellent environmental benefit of solar-thermal energy in areas that are more susceptible to droughts, as water loss due to evaporation can add up over time and contribute to a shortage.



THERMAL FLOATER

BENEFITS OF PROTOTYPE

- The shade that the floating thermal modules produce can help reduce algae that bloom in the freshwater. The algae can be dangerous for human health if they occur in a source of drinking water, and it can also lead to the death of plants and animals that live in the water.
- The Thermal Floater is a clean source of renewable energy. The use of renewable energy technologies helps reduce greenhouse gas discharges and all of the other pollutants embedded in the atmosphere, positively impacting the environment and human health.



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PRICING OF PROTOTYPE

THERMAL FLOATER

MARKET PRICE

By taking in consideration, the cost of its components, the price of a single small module can be brought down to a pretty affordable range when bulk manufactured.

S.No.	Component Name	Price per pcs [in ₹]	Price per pcs in Bulk Amount (1000 pcs) [in ₹]
1	Copper Plates x2 [13 cm by 13 cm]	113.00	88.65
2	Fresnel Lens	150.00	103.00
3	Thermal Paste	120.00	74.38
4	Thermoelectric Peltier	184.85	92.54
5	Rubber Casing and Wiring	53.84	35.89
6	Heatsink	132.50	89.00
Total		₹754.20	₹483.50

BUSINESS CANVAS

Target Audience, Market Size,
Revenue Model & Selling Points

04

BUSINESS CANVAS

Key Partners



Project Based
Partners



Government, Institutions
and Power Utilities



Investors

Key Activities



Building a Global Network



Creating Momentum

Key Resources



Track Record in Project
Organization & Development



Team

Value Propositions



Projects & Services



Cost-Friendly, Reliable,
Renewable & Clean Energy



Thermal Floater
(Solar-Thermal Energy)

Customer Relationships



Co-Creation &
Co-Development

Channels



Local Supply Chain

Customer Segments



Utilities, Governments,
Institutions & Private
Developers

Cost Structure



Outsourcing
Non-Core Services



Technology
Development



Project
Management



Revenue Streams



Project Development
Rights & Funds



Consultancy & Project
Management Fees



Thermal Floater &
Associated Tech



THERMAL FLOATER

KEY PARTNERS & ACTIVITIES

The key partners here would be the power facility grids and utilities, institutions, governments and investors, and project-based partners to help achieve the key activities and deliver value to the customers. I would plan for a vision to spread green and renewable energy throughout the world by the end of the decade by building a global network and creating momentum.

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TARGET AUDIENCE

The product would appeal to targeted customers, the power utilities, governments, institutions, and private developers. It can also be quite useful for generating electricity in remote parts/military bases/ research bases in islands where delivering electricity is highly expensive and producing electricity locally can have detrimental effects on the environment.

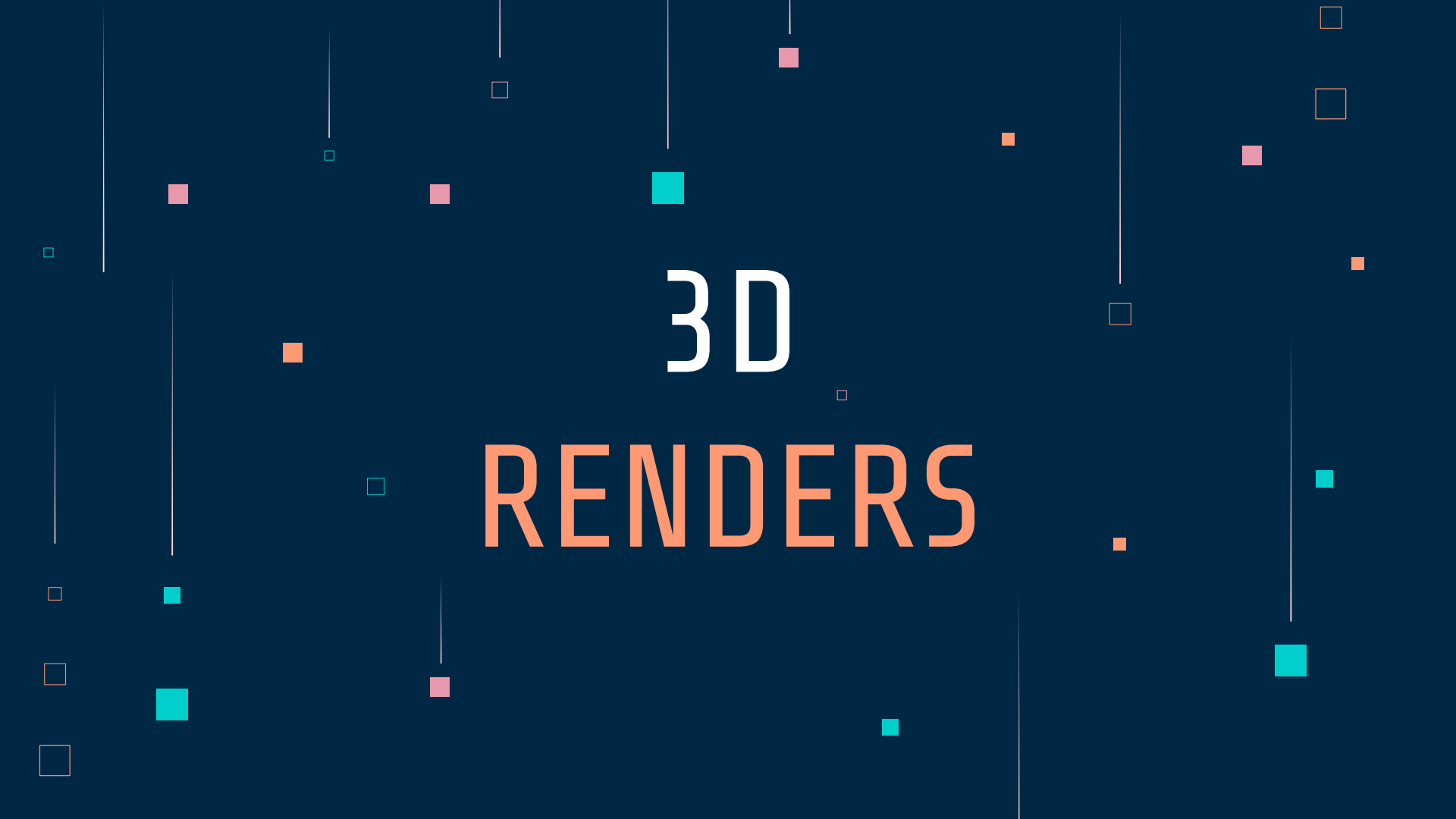
The customers will interact throughout the entire supply chain to make renewable energy successful and actively build a global network supplemented with strong local partners.

THERMAL FLOATER

MARKET COMPETITION

As the thermal floater would consist of various modules, the prices would be significantly low when bulk manufactured rather than individual manufacturing. And by using industrial-level techniques, the cost would be even lower, which puts it at a significant advantage compared to the rest of the renewable technologies in the market.

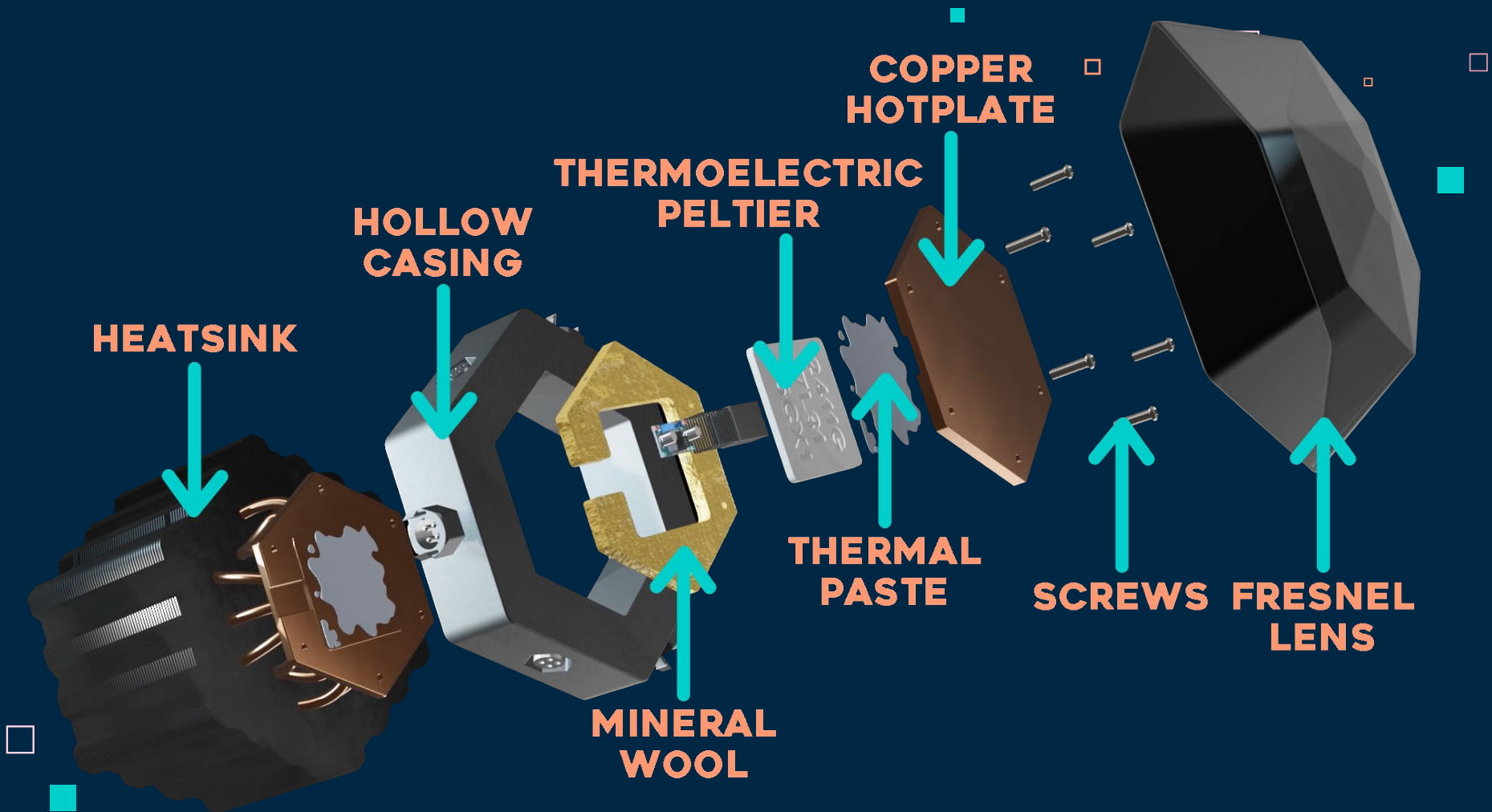
Moreover, the price of the small modules would be pretty low to be affordable even for the middle-class people, which will allow us a large user base. The product would also be desirable to compel the existing users to be satisfied with the product, leading other users to buy it.

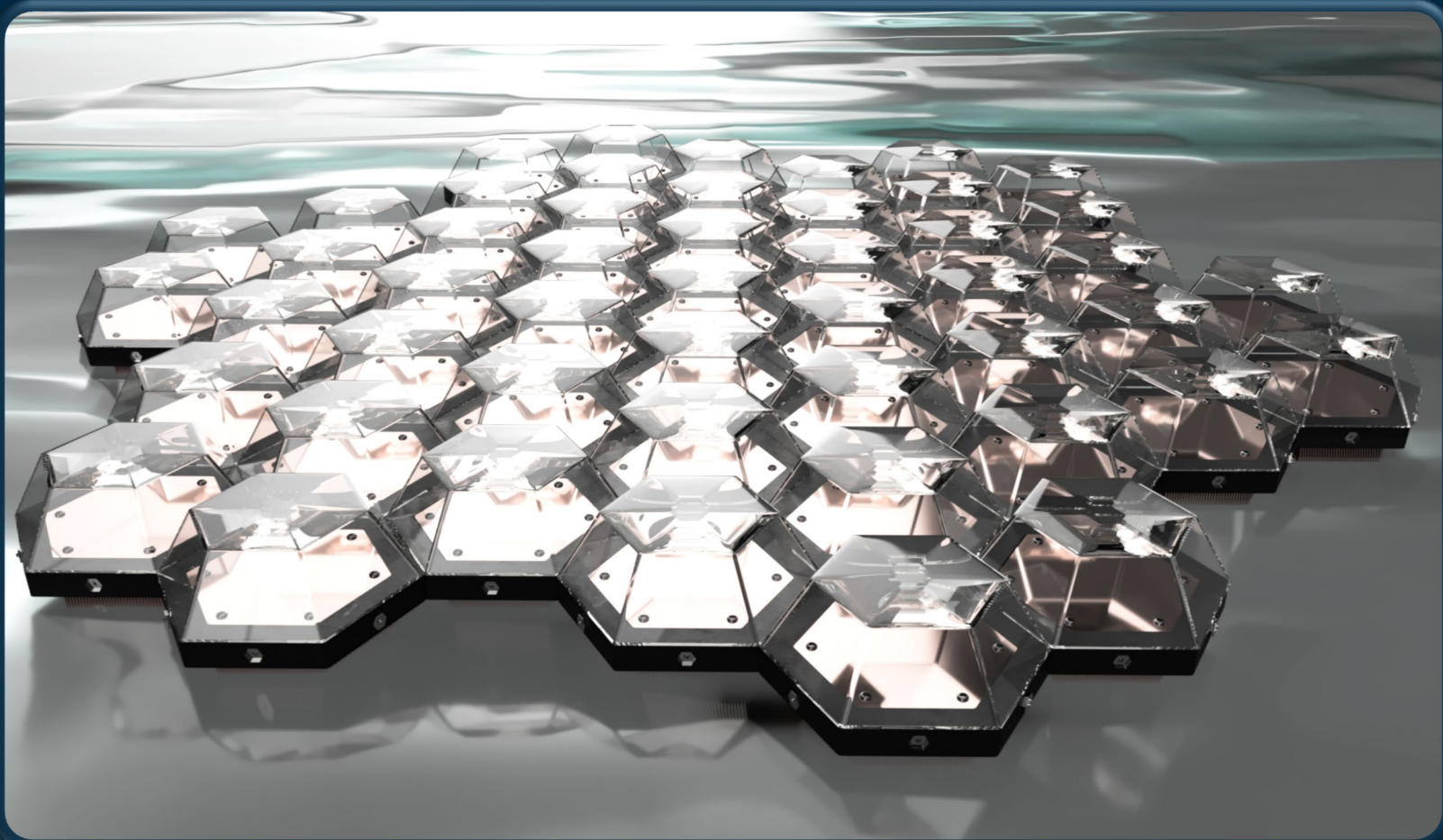
The background is a dark blue field populated with various geometric elements. There are numerous small squares in white, orange, and teal. Some of these squares are connected to the top edge of the frame by thin, vertical white lines, creating a sense of depth or suspension. The overall aesthetic is modern and minimalist.

3D RENDERS

THERMAL FLOATER

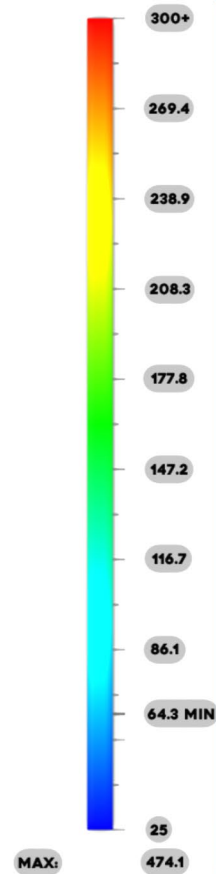
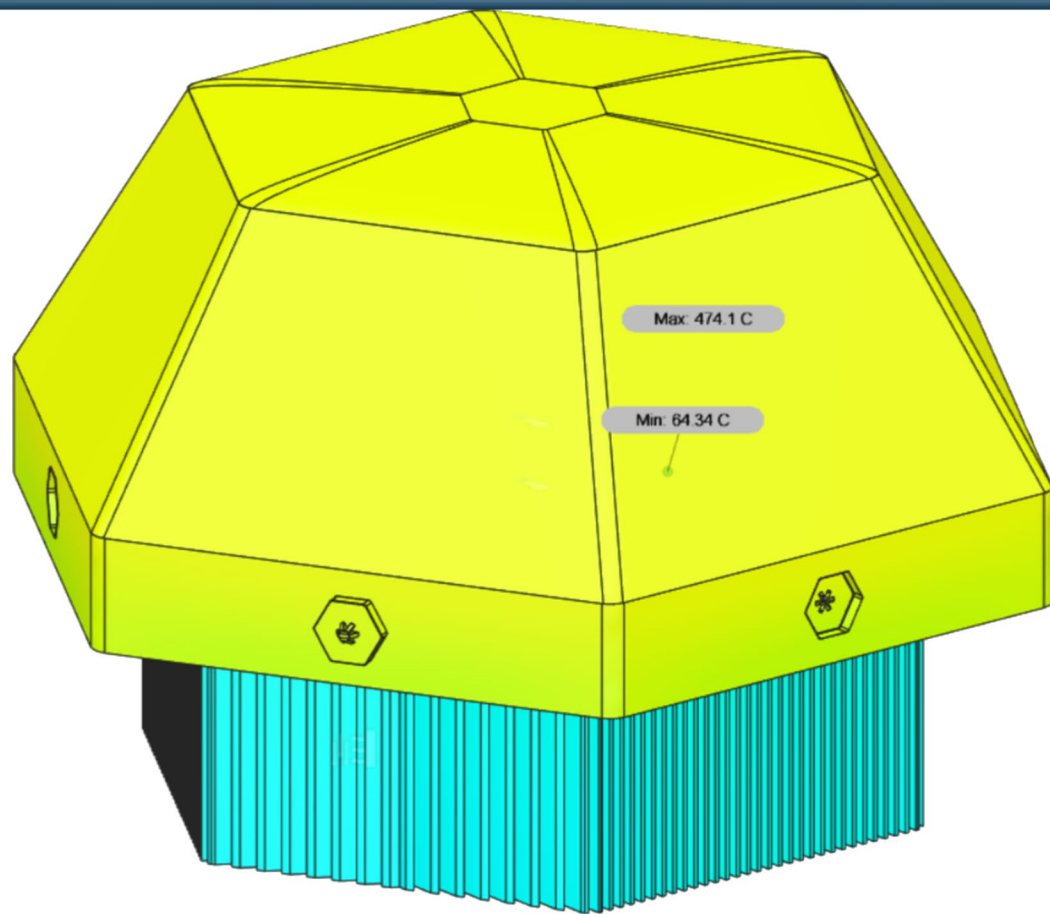


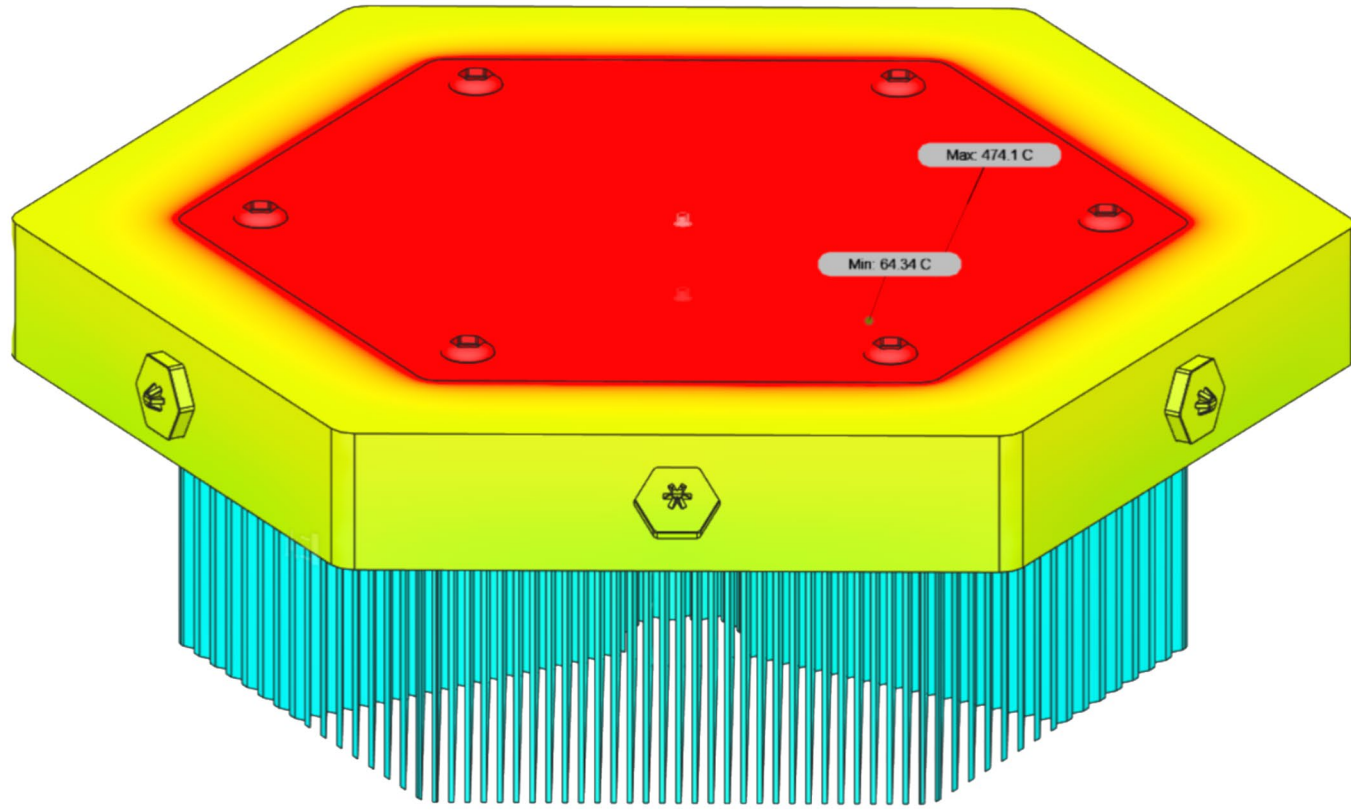




The background is a dark blue gradient. It is decorated with various geometric elements: thin white vertical lines of varying lengths, small squares in teal, orange, and pink, and larger squares in teal and orange. The text '3D' is centered in the upper half in a large, white, sans-serif font. Below it, the word 'SIMULATIONS.' is centered in a large, orange, sans-serif font.

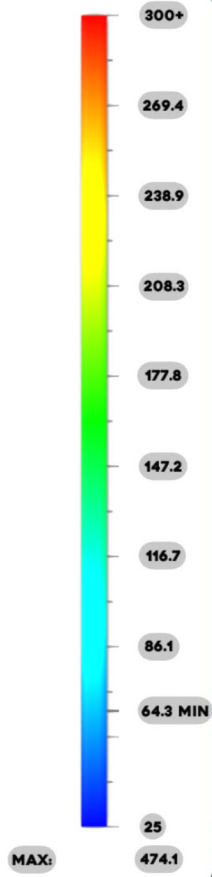
3D SIMULATIONS.





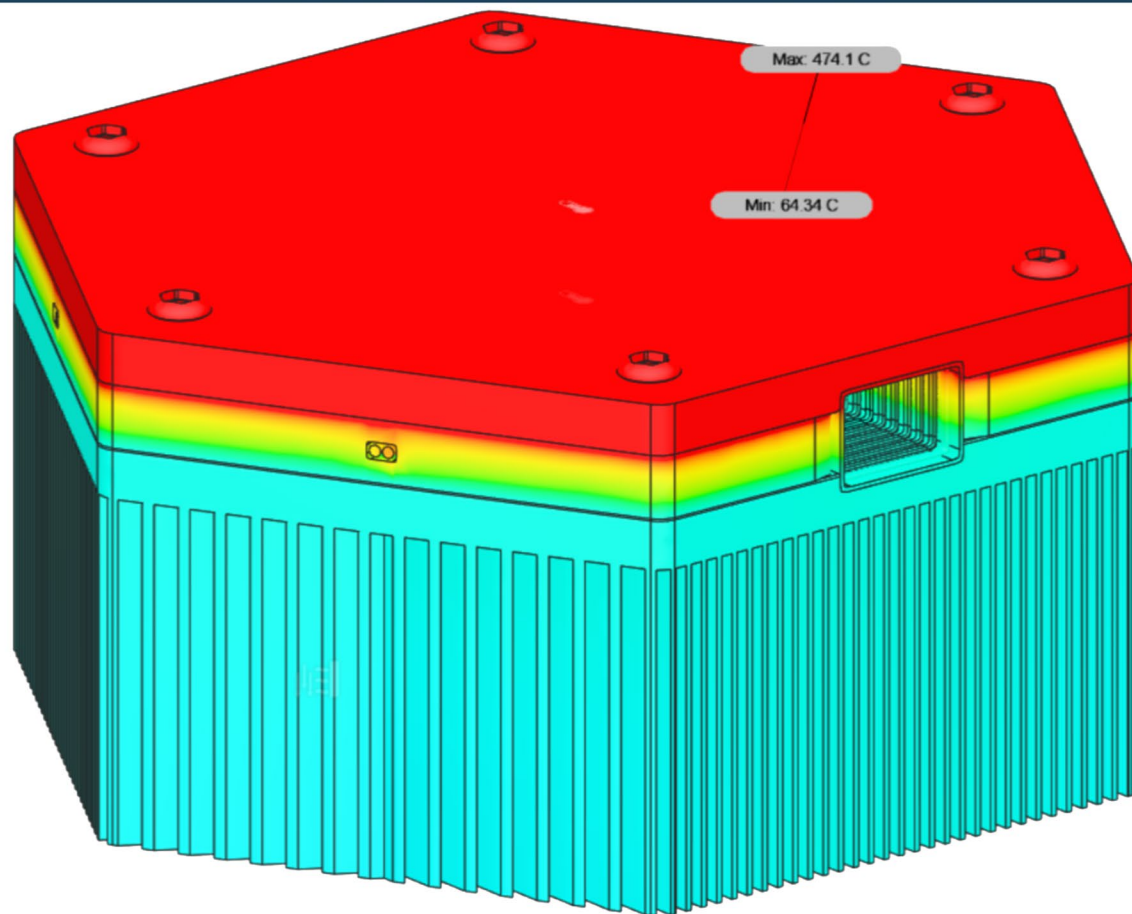
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Min: 64.34 C

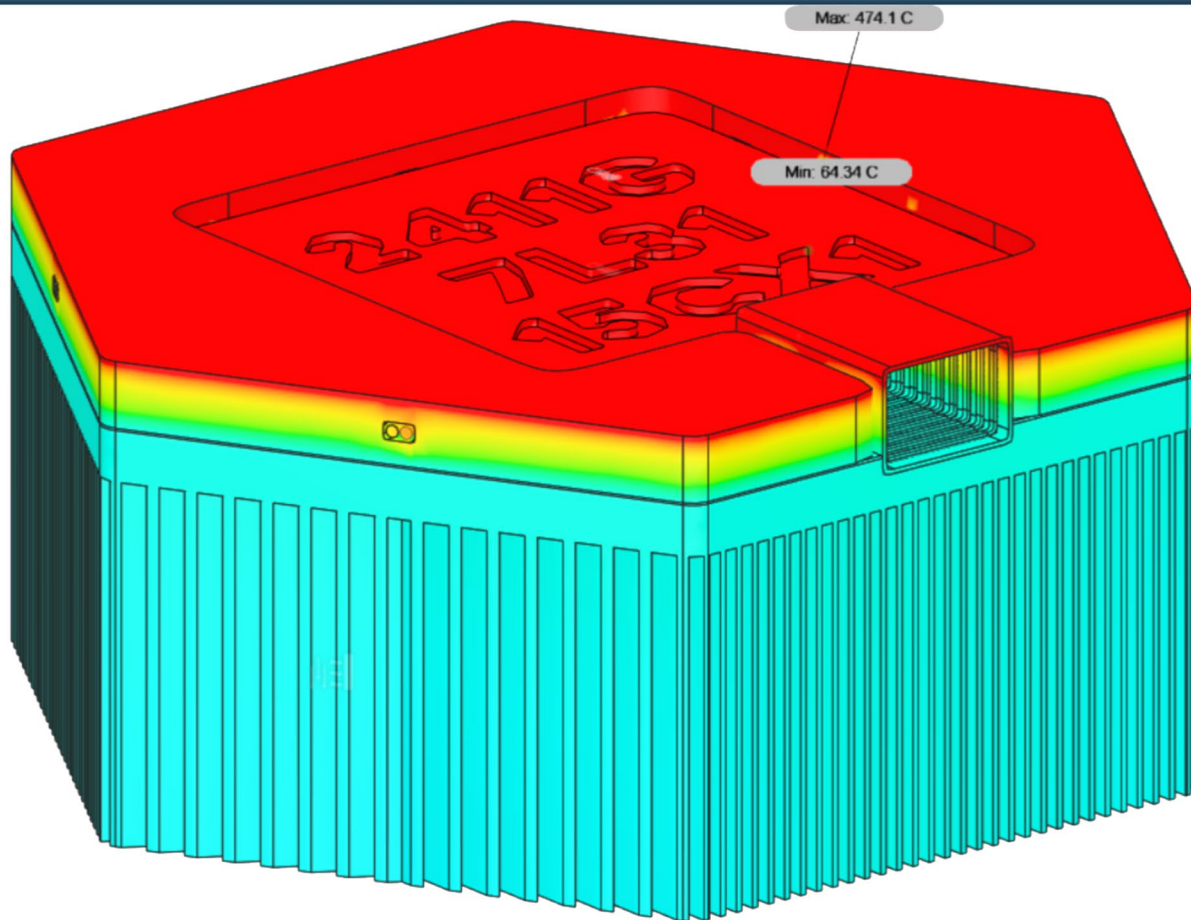


MAX:

474.1



MAX:



Max: 474.1 C

Min: 64.34 C

300+

269.4

238.9

208.3

177.8

147.2

116.7

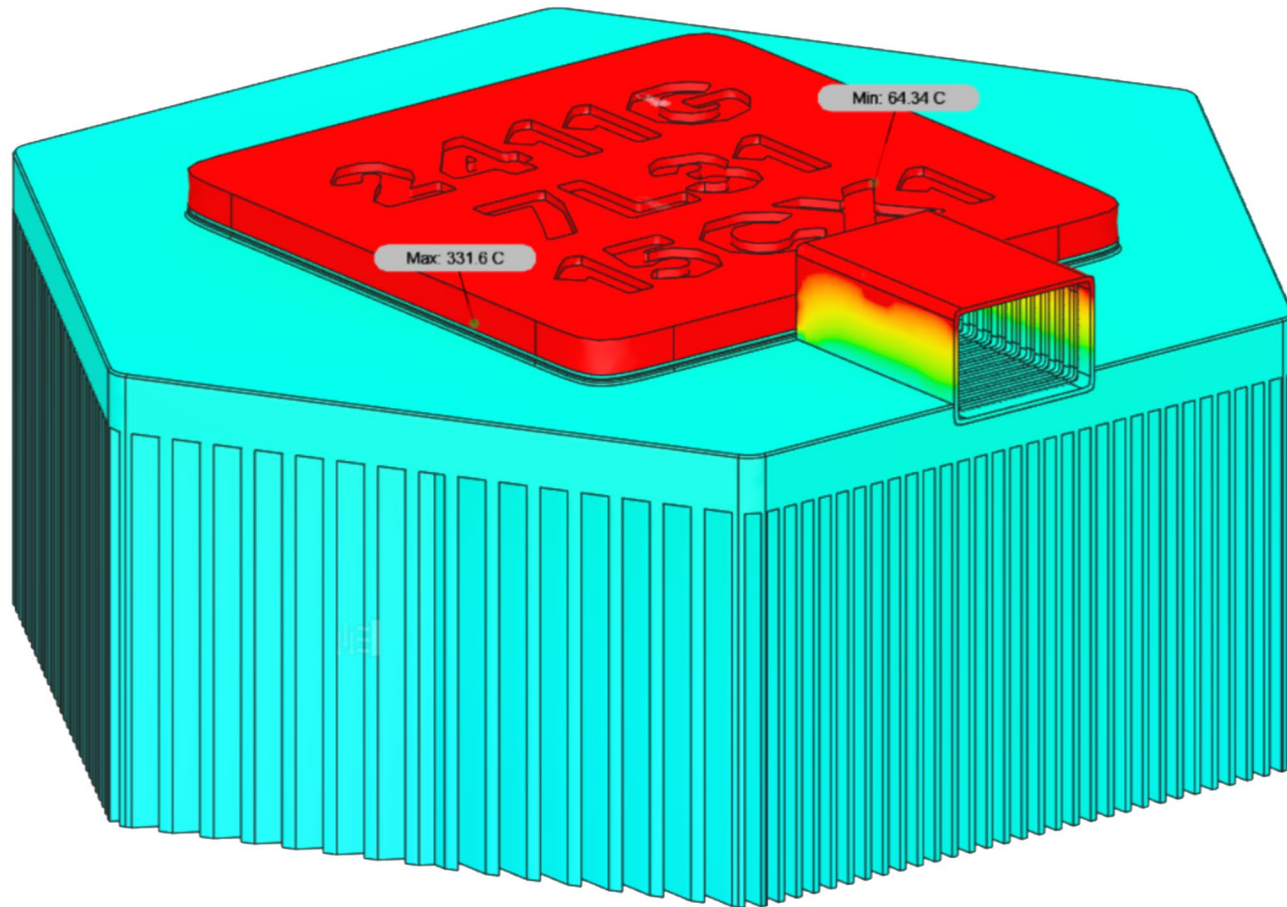
86.1

64.3 MIN

25

MAX:

474.1



MAX:

25

474.1

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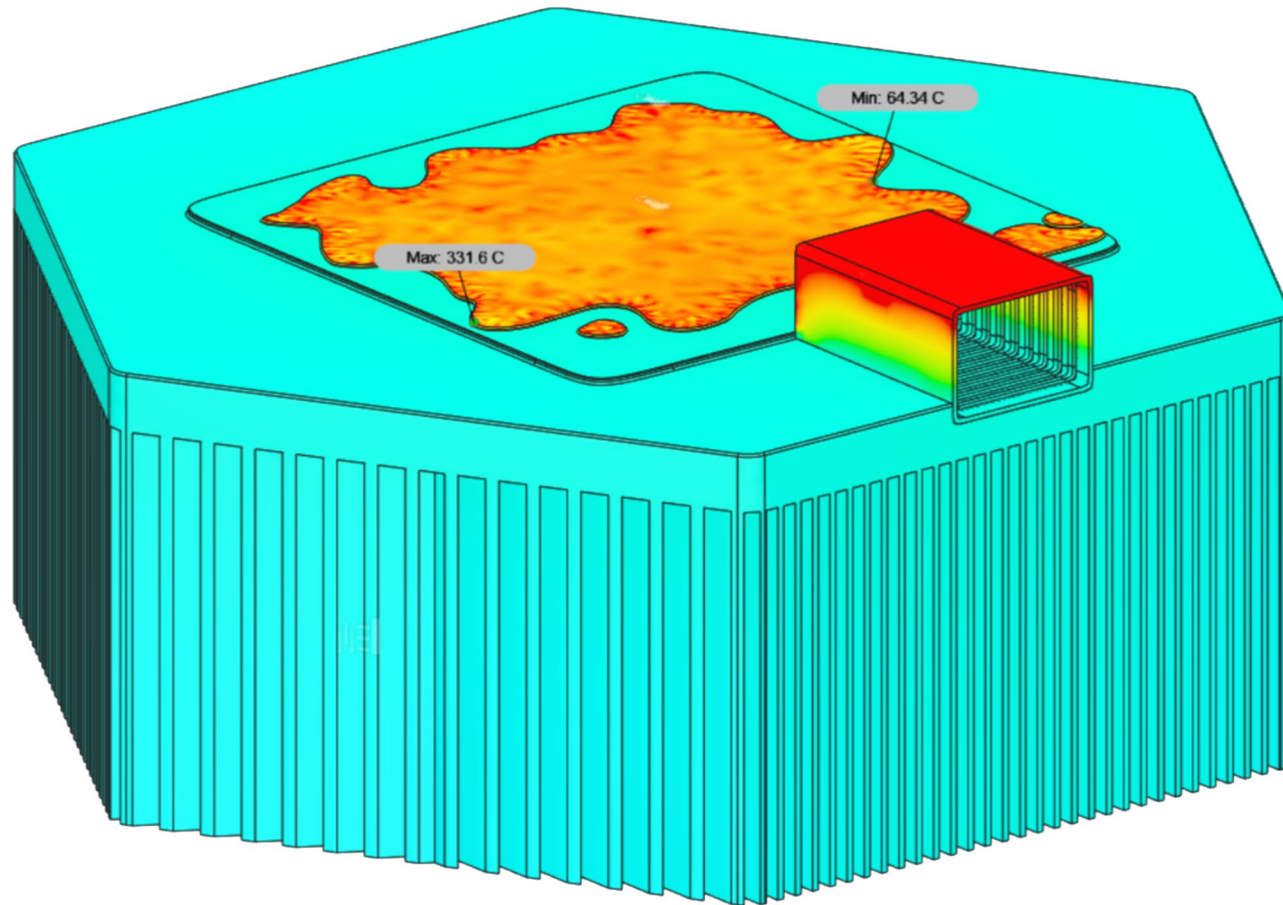
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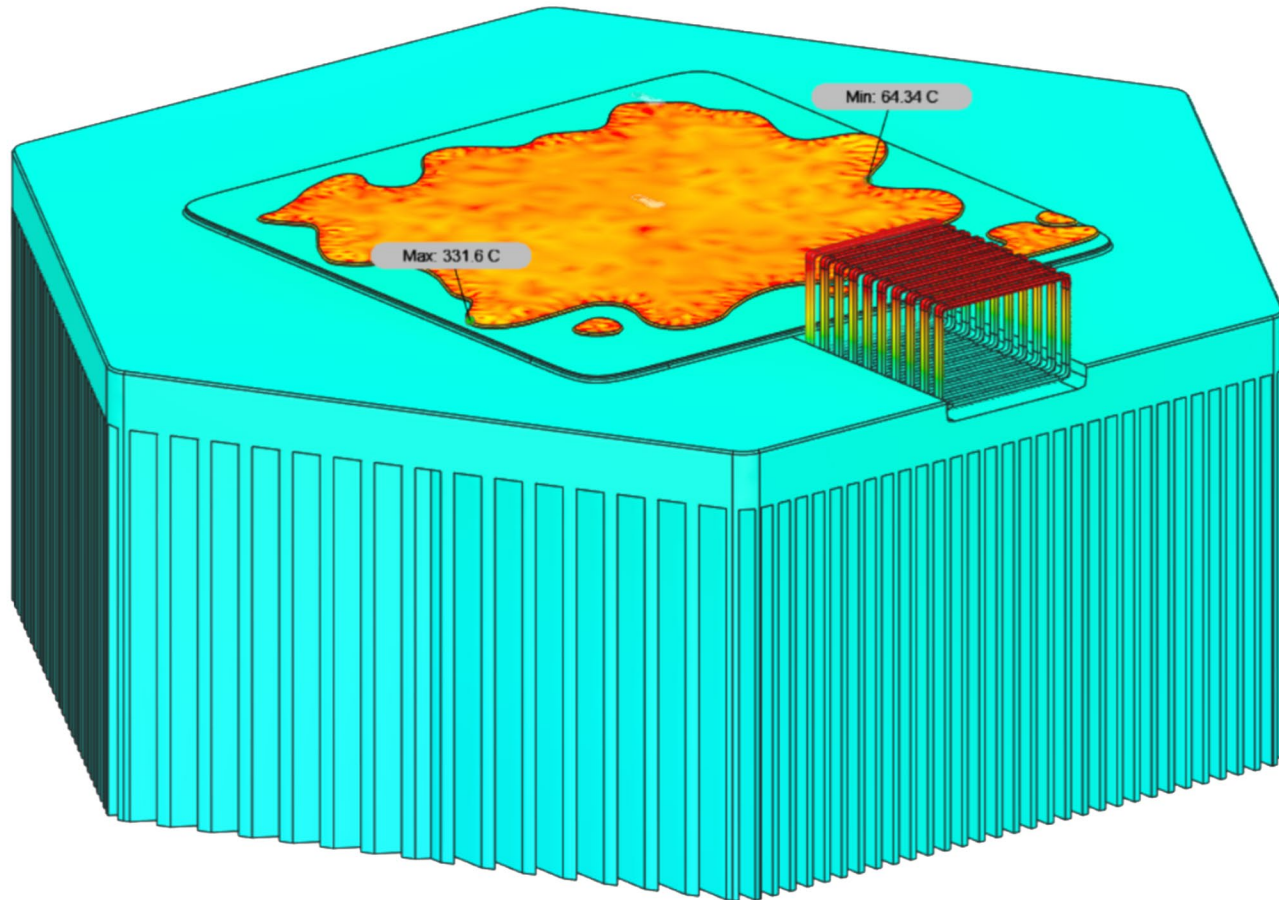
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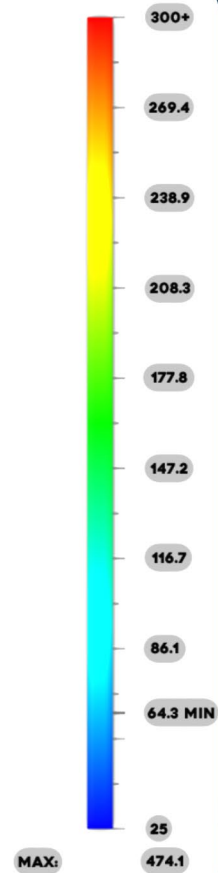
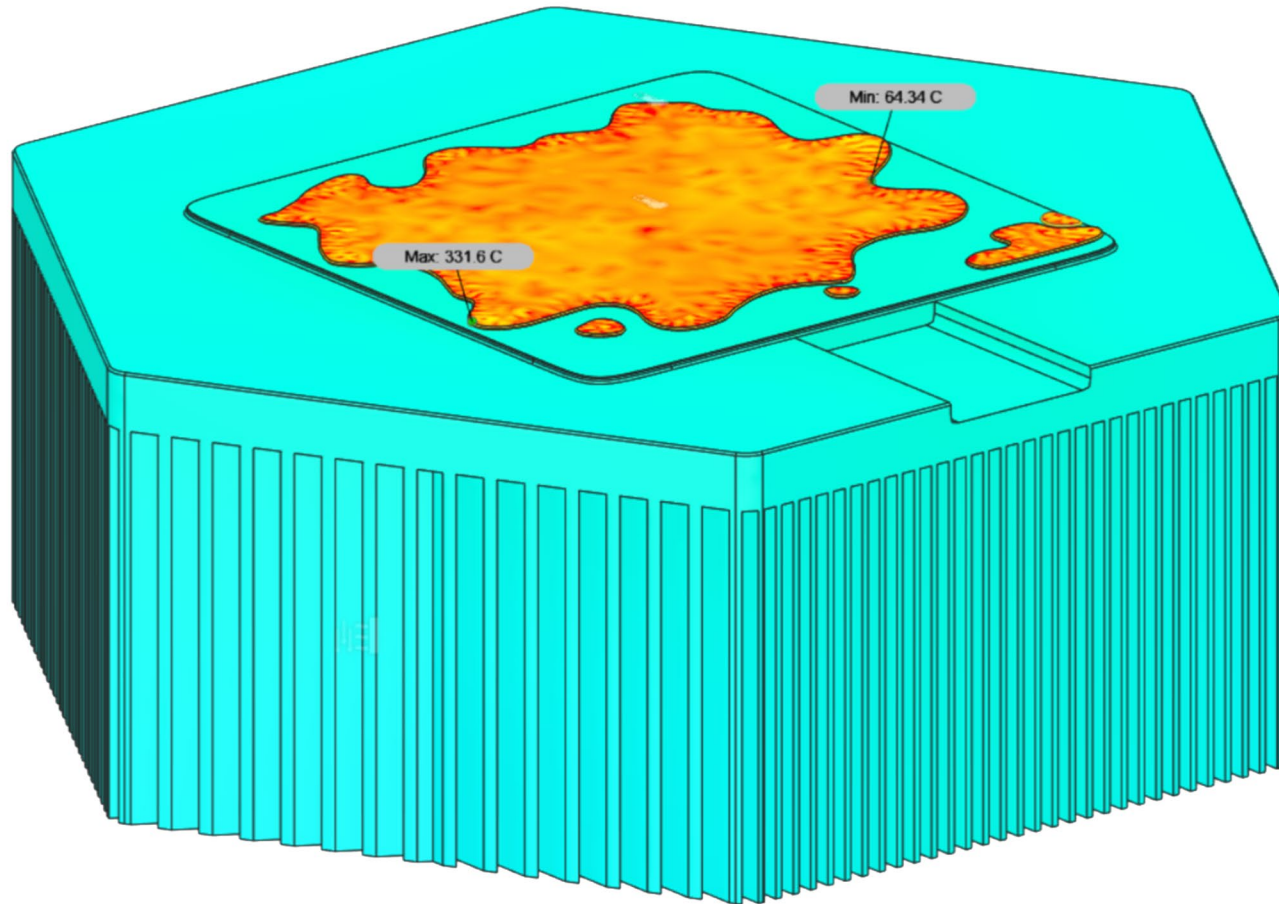
177.8

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300+



AWARDS

Previous achievements and
awards received by the team

05

ACHIEVEMENTS



Selected as one of the top 10 Finalists amongst 5000 students from all over India

ATL INNOVATION MARATHON



Selected and declared as the winner of IISER Tirupati Virtual Science Fair

IISER VIRTUAL SCIENCE FAIR



Winner of Ideate For India and awarded by Hon'ble Minister of IT and Electronics, Mr Ravi Shankar Prasad and the Head of Intel India, Ms. Nivruti Rai

IDEATE FOR INDIA



Shortlisted as the top 10 finalists amidst entrepreneurs from all over the world

GRAND IDEA CHALLENGE



Winner of the Most Popular Award amidst thousands of shortlisted students from all over India

AVISHKAAR



Shortlisted and chosen as the State Winner of Youth Ideathon

YOUTH IDEATHON 2021

I will try to develop our idea as soon as possible if I receive funding. This would help me a lot in gaining further knowledge, and I would also like to experiment with a few other designs and fabricate them to give our user(s) the best experience.



THANKS



Do you have any questions?

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thermal-floater.github.io