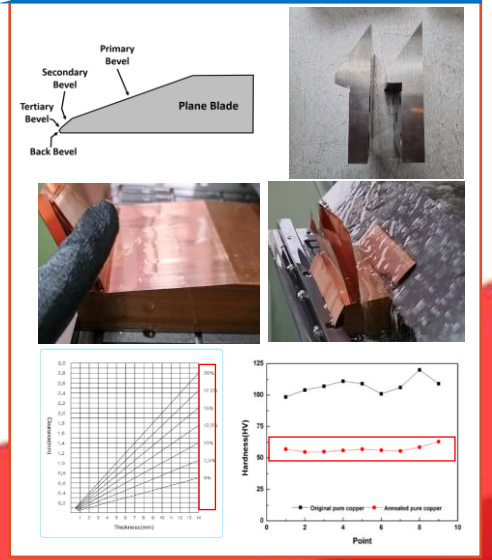
R&D Scale up

Heatsol leads the R&D of the skiving process & the only company specialized in root technology in Korea



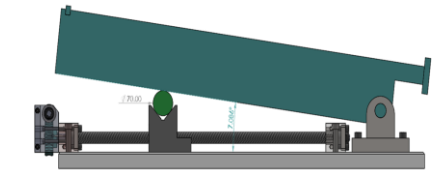
Processing technology research

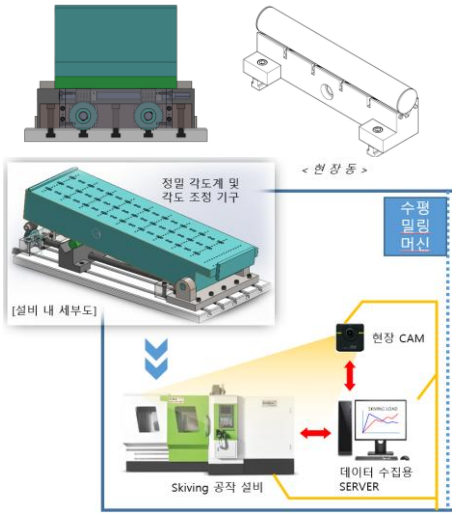
V-Fin

Y-Fin

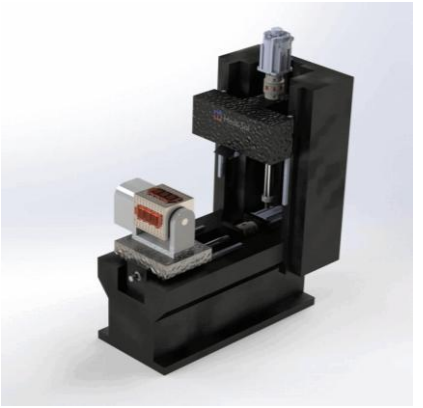
Tree Fin

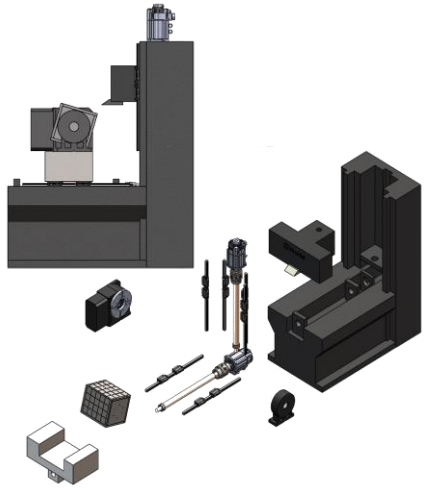
Proprietary Special Shape & patent





CNC machine improvement & Smart load





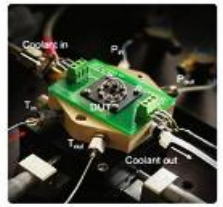
Initiation of Heat-Sol Equipment development

Market opportunity & Target applications


Medical


Laboratory


Wine & Beverage


Chip


Farming


Laser

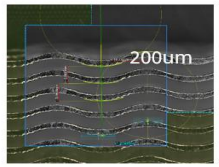

Electronics

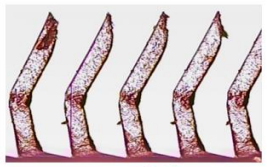

Van & Camping

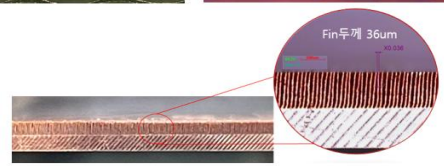

Semiconductor


EV Battery

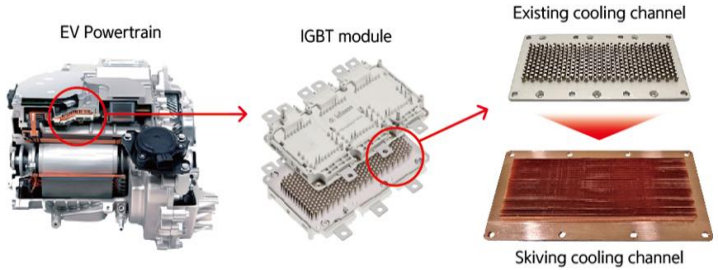
Immersion Cooling solution for AI Data center







Cooling solution for EV Inverter

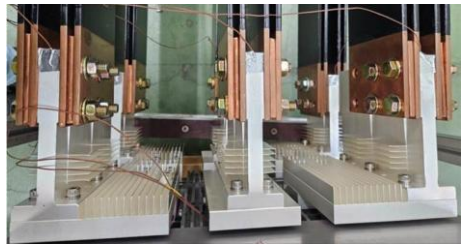


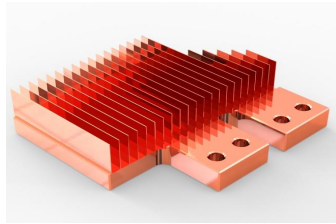

For Hi-Power 800V EV Inverter


For Thin-Type EV Inverter


For Motor Integrated Inverter

Cooling bar for Circuit Breaker



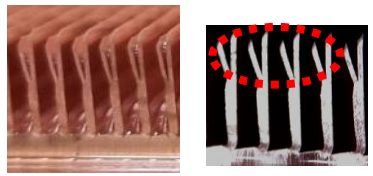


Sustainable Competitive Advantage

V-Fin

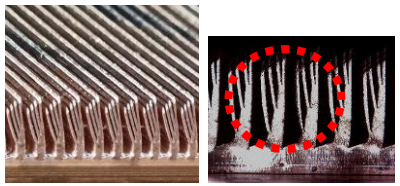
Suitable for forced air cooling

Y-Fin

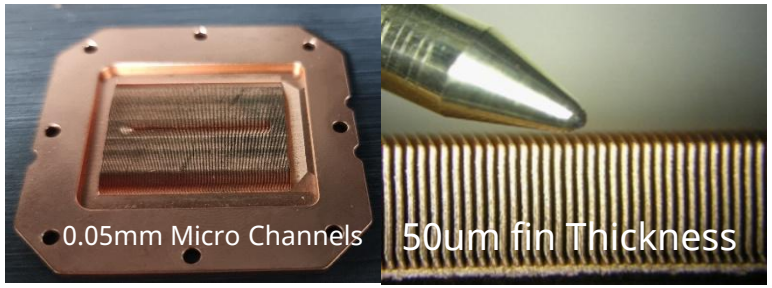


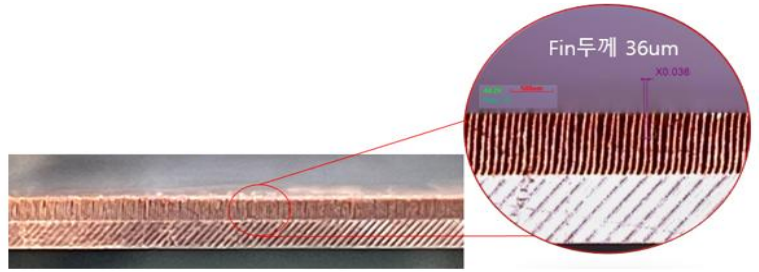
Suitable for Natural Convection cooling

Tree Fin



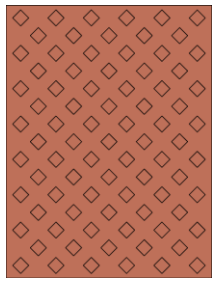
Suitable for forced water cooling





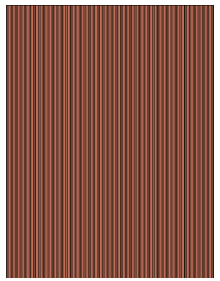
Sustainable Competitive Advantage

Pin-Fin

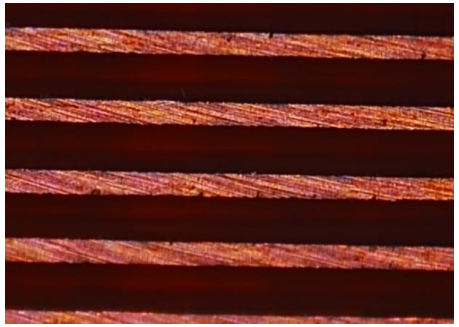


T	1.5	mm
P	3.3	mm
H	4.0	mm
Surface Area	4,076	mm^2
Volume	1,726	mm^3
Thermal Resistance	0.07984	℃/W

Skiving Straight Fin

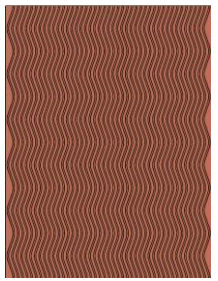


T	0.2	mm
P	0.6	mm
H	4.0	mm
Surface Area	15,406	mm^2
Volume	2,304	mm^3
Thermal Resistance	0.04404	℃/W

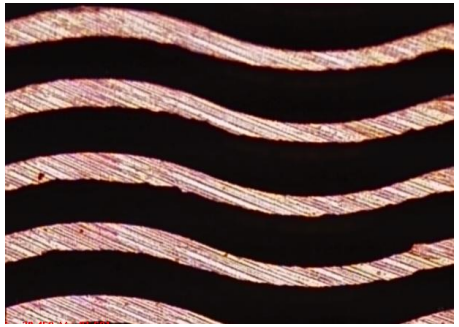


15x Actual (実測)

Skiving Wave Fin



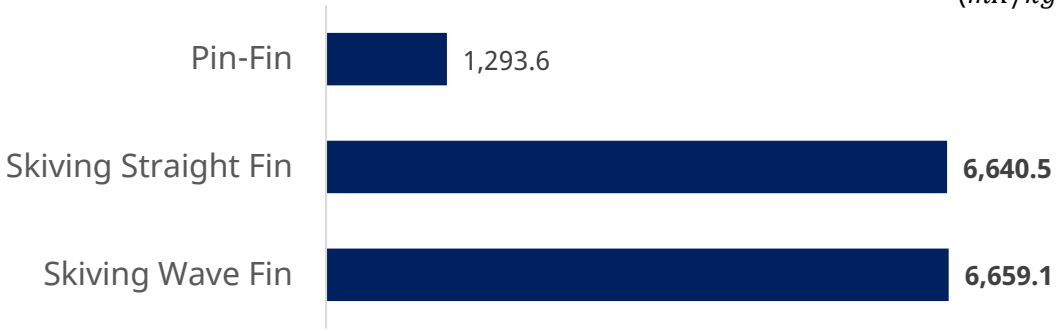
T	0.2	mm
P	0.6	mm
H	4.0	mm
Surface Area	15,339	mm^2
Volume	2,298	mm^3
Thermal Resistance	0.04384	℃/W



15x Actual (実測)

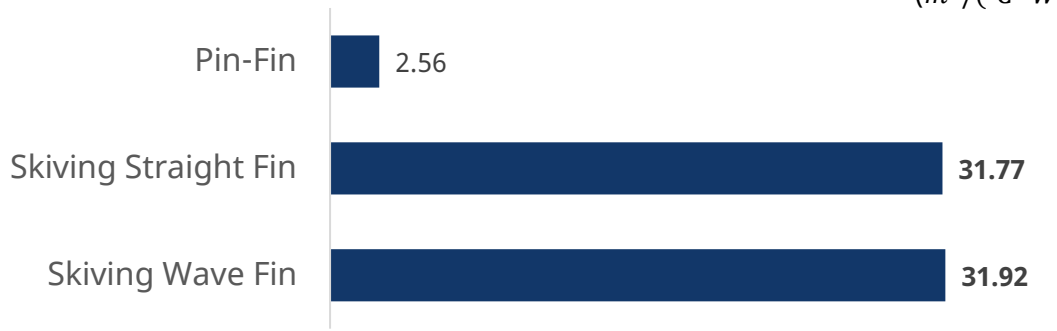
TPI (Thermal Performance Index)

$(mK/kg \cdot ℃)$

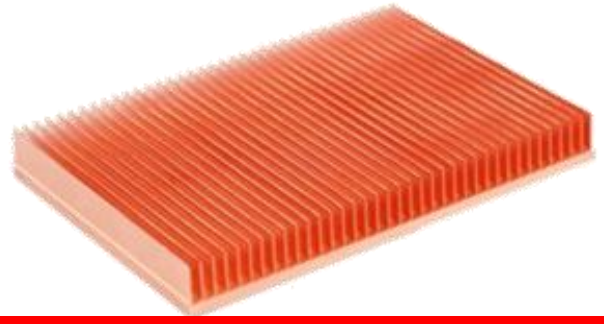
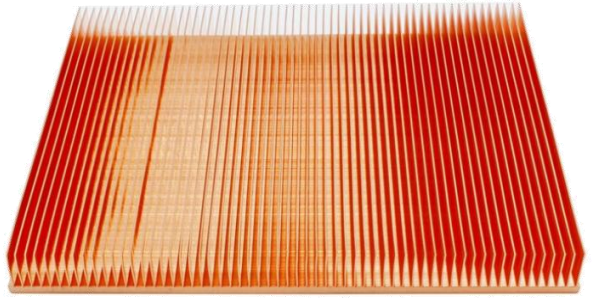


TEI (Thermal Efficiency Index)

$(m^2/(℃ \cdot W))$



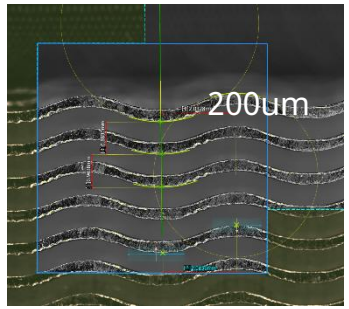
Skiving vs Convetional

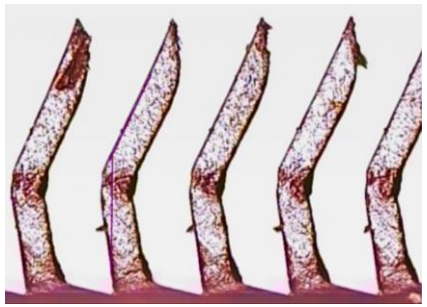
Processing		Traditional Metod	Skiving Method(Same size)	Skiving Method (High performance)
Raw material	Thickness	 15mm	 7mm	 8mm
	Weight	1.4kg	0.6kg (57%↓)	0.7kg (50%↓)
Finished goods	No. of fin	 39fin	 39fin	 **101fin**
	Processing time	33min	2min (94%↓)	5min (85%↓)
	Surface area	100,390mm^2	100,390mm^2	220,320mm^2(219%↓)
	Product price	US$ 40~44	USD$ 21~25 (41%↓)	USD$ 27 (about 35%↓)
	Cooling performance	100	100	120~200(20%~100%↓ deponds on ΔT)
	Shape			

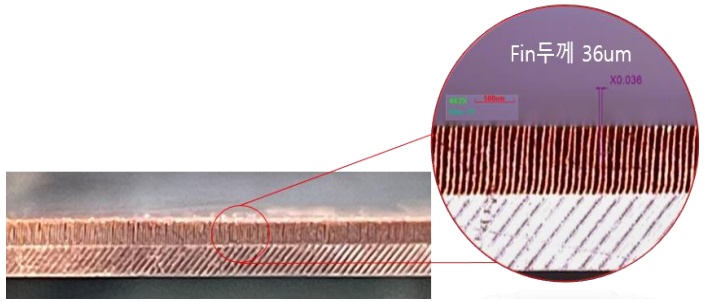
Same surface area

Maximize surface area

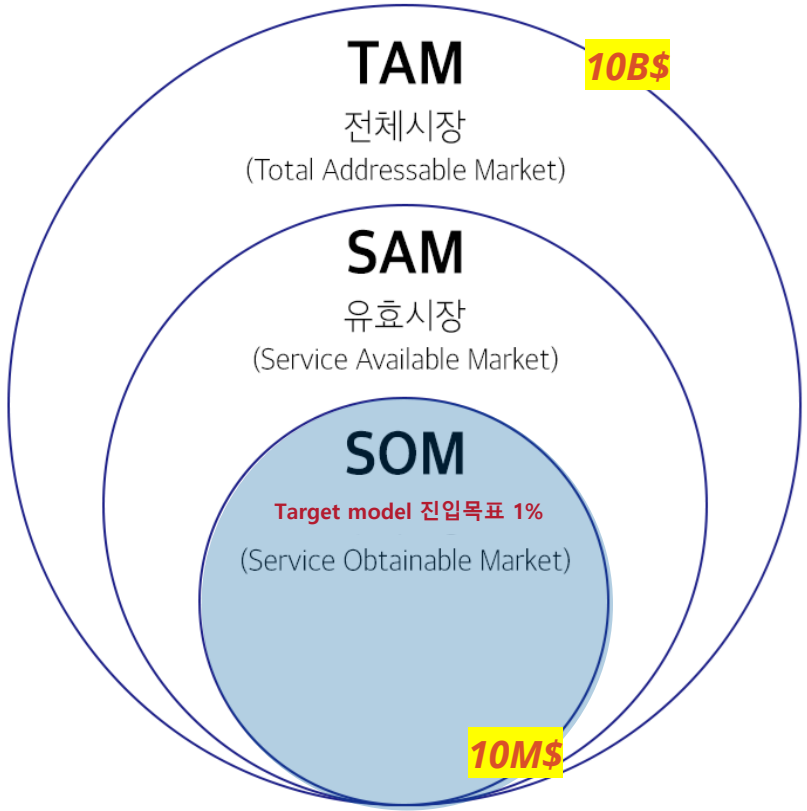
Target market & scalability







Immersion cooling Market, 2030



Immersion cooling is a type of liquid cooling used to moderate data center equipment temperature by submerging it in a cooling fluid

Key customer

LG Electronics

GRC

submer

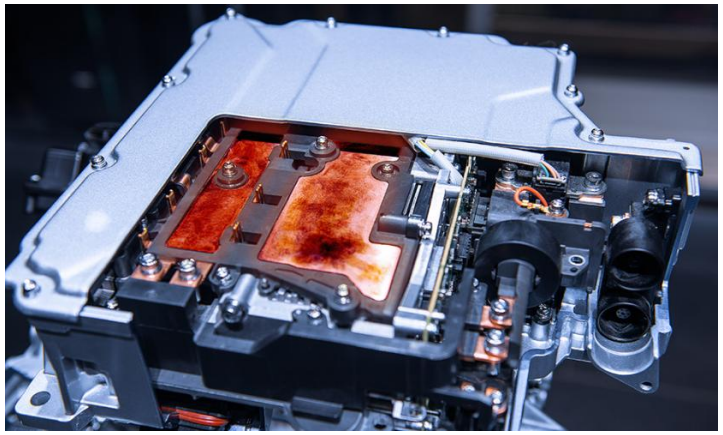
liquidstack

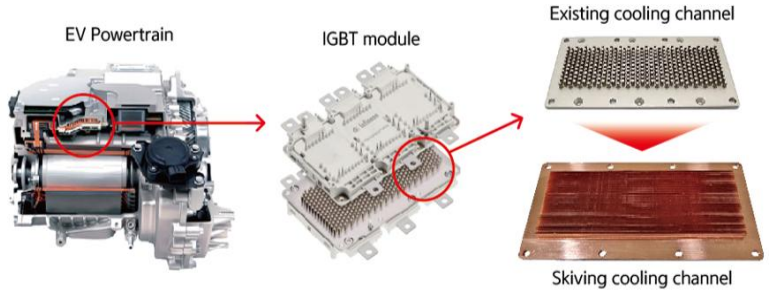
MIDAS IMMERSION COOLING

DCK

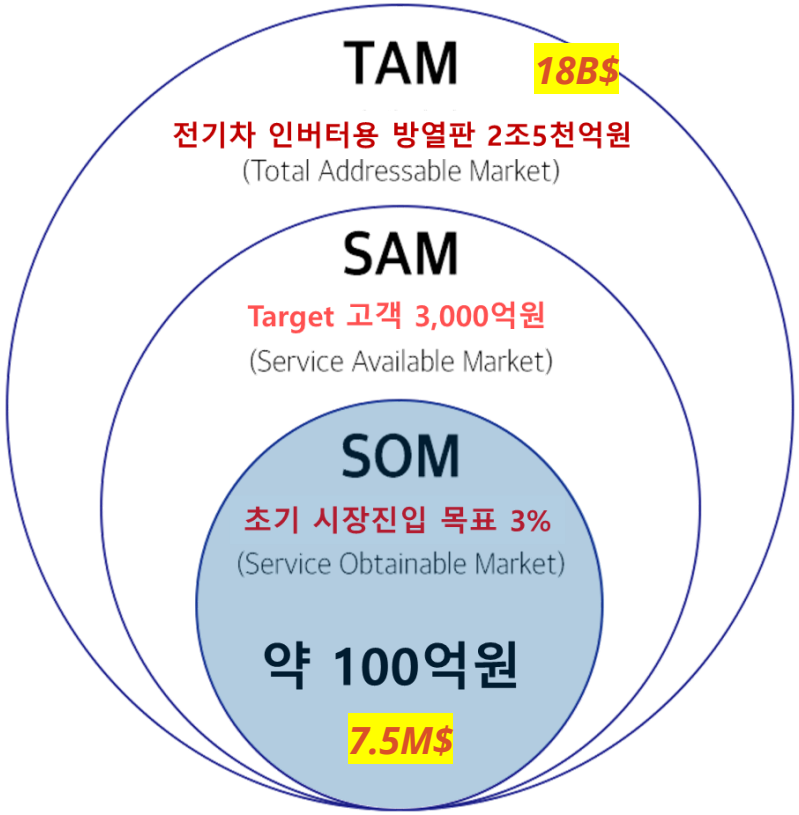
LiquidCool SOLUTIONS

Target market & scalability





EV inverter cooling Market, 2030



Key target customer

LG-MAGNA

HYUNDAI MOTOR GROUP

SL Corporation

HITACHI Astemo

STELLANTIS

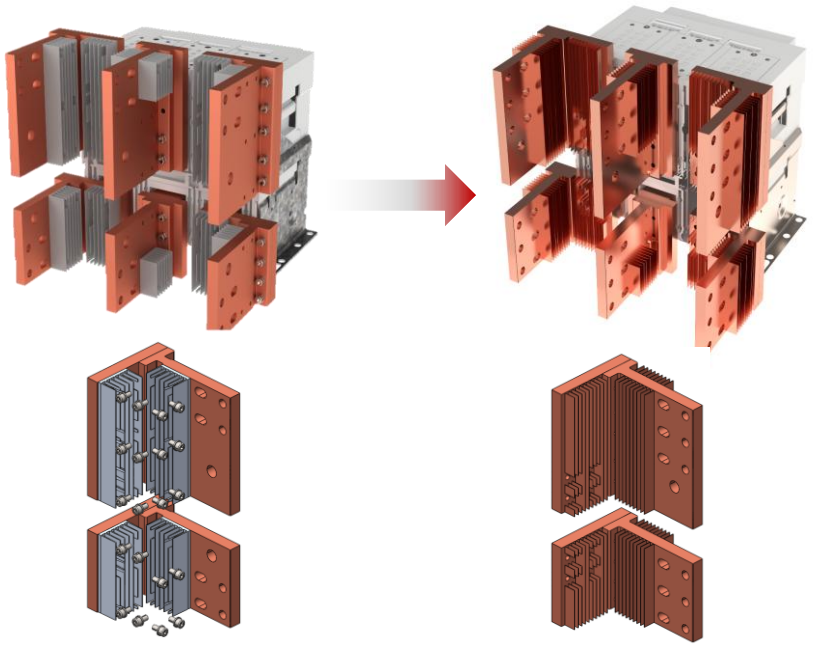
vitesco TECHNOLOGIES

DENSO

AISIN

MITSUBISHI MOTORS

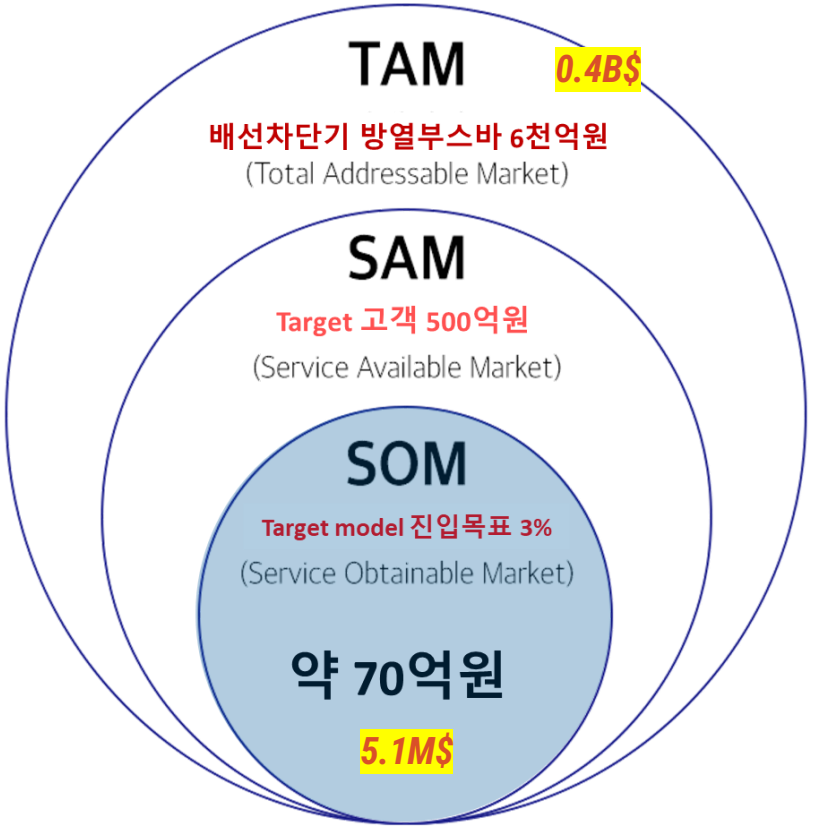
Cooling busbar for Circuit breaker



General Busbar

Integral Cooling Busbar

Circuit Breaker Market, 2030



The existing method of attaching a heat sink to a bus-bar has some disadvantages such as thermal interface joint, low design flexibility in limited spaces

Key target customer

LS ELECTRIC

Schneider Electric

SIEMENS

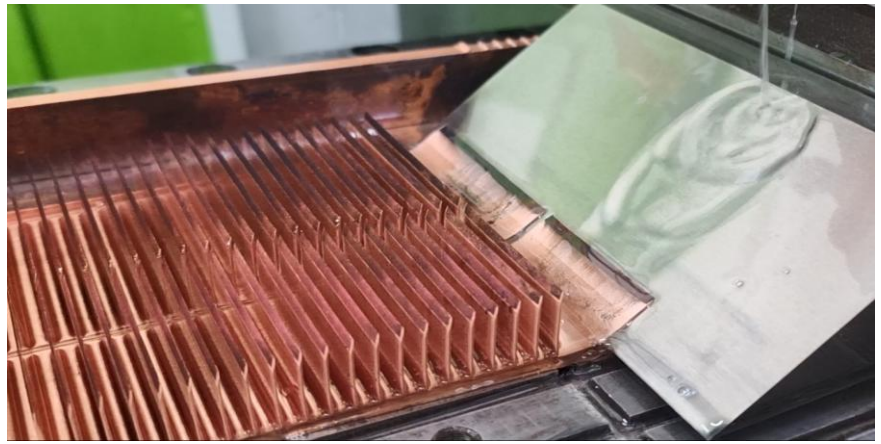
HD HYUNDAI ELECTRIC

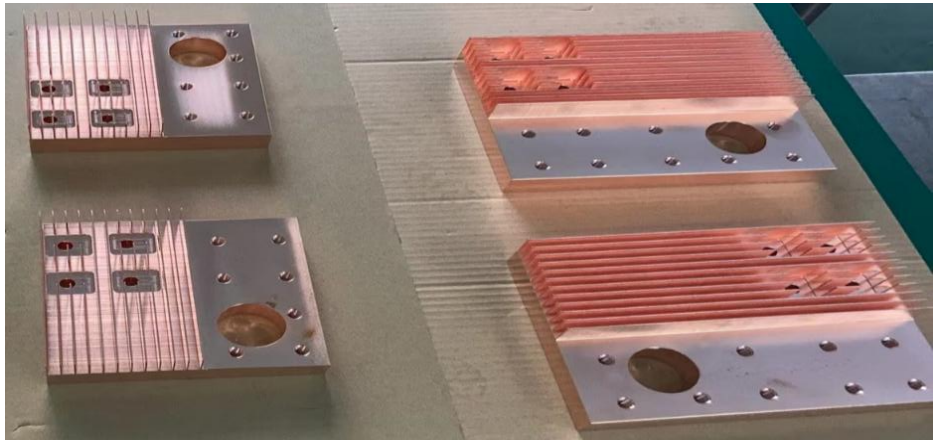
EATON

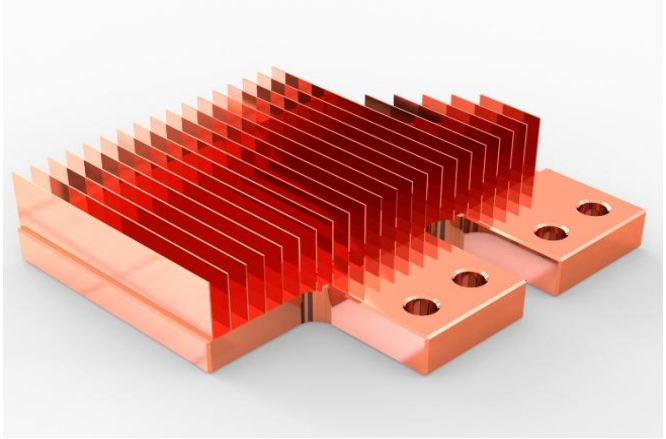
ABB

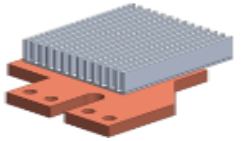
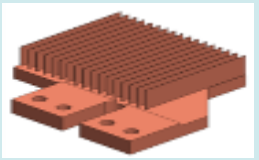
MITSUBISHI ELECTRIC

Circuit Breaker Cooling Bus-bar







Existing type	**Heat-sol solution**
	
Extruded Heatsink + Copper busbar	Integral(single block) cooling busbar

Heat-sol is the world's first developer to apply Skived technology to Circuit Breaker Bus-bar.
We provided samples to a Circuit breaker manufacturing company in Korea to conduct verification tests.
The test result showed an approx. 10% improvement compared to the previous type.

Heat-sol’s achievement as the First Mover

Benefits of Skived Cooling Busbar

1) One-time forming with no need of further assembling or machining
- Easy assembly as an all-in-one unit(single block), reduce assembly/manufacturing process

❖ Traditional method is attaching the heat sink to the bus bar

2) It is a firm structure with no risk of getting loose or falling apart

3) No gap or Interfacial thermal resistance between joint and bolt that restricts proper heat-flow

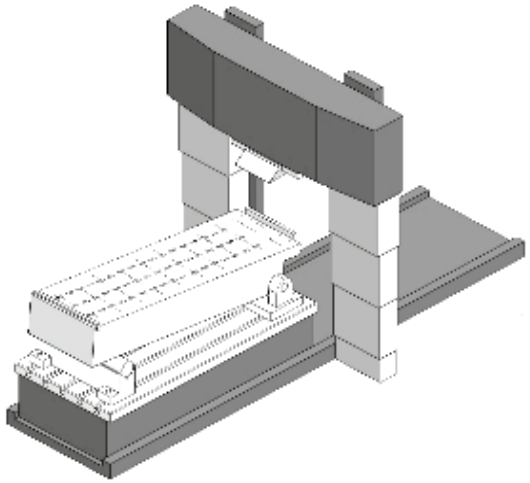
- The existing products customer uses have a thermal resistance from the use of thermal grease/bolt to attach the fins
(The use of solder is also relevant to the thermal resistance)

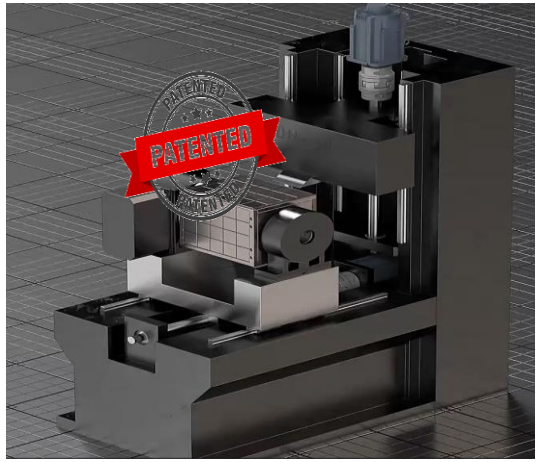
4) Customizable to the needs of any designs offers
- Rapid prototyping of new designs

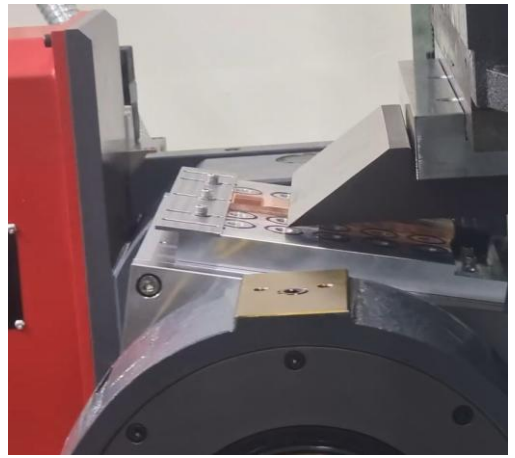
5) Compact structure and effective use of space

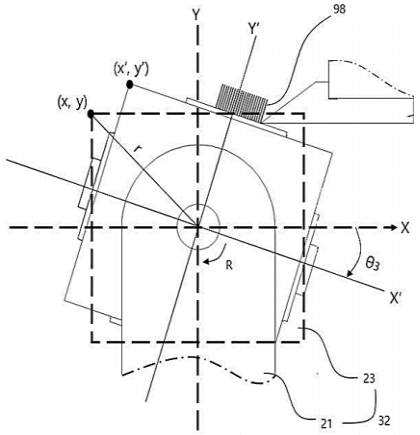
Heat-Sol's Advanced Smart CNC Machine (Brand Name: HCT)

Launching 2026





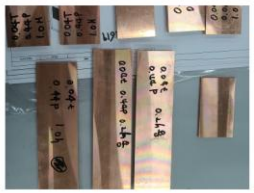


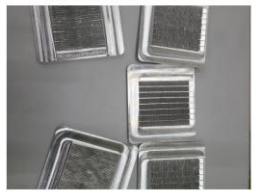


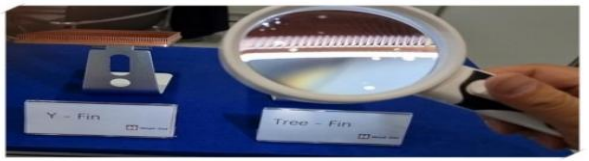
Conventional Skiving CNC Machine

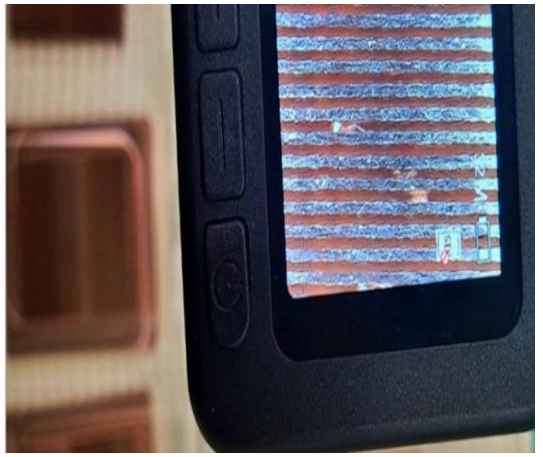
Heat-Sol's brand : HCT(Heatsink CenTer)

- **Conventional machines** require manual bed adjustments, limiting inclination range and long tilted beds cause significant deviations in ultra-fine machining
- **Heat-Sol's model** is engineered to endure mechanical stress while providing enhanced precision, productivity, and processing capabilities.









Strong points

Heat-Sol

1. The new model being developed by Heat-Sol with goverment R&D program is half the size,
yet delivers faster and more precise performance and higher productivity than existing skiving machines.

2. The vacuum beds(fully automated) installed on all four sides enable quick replacement
and allows for products of various shapes to be processed simultaneously.

3. The rotating bed at the center of the machine is built to withstand the mechanical rigidity generated
while skiving. Enhanced mechanical stability over long production runs

4. Our machine enables ultra-fine pin processing upto 40μm thinner than human hair (100μm)
which is not possible with semi-automatic CNC machines

5. Unlike conventional machines with typical angles of approximately 5°–18°, our HCT can operate at inclinations ranging from 1.2° to 55° and 360° rotatable

- It offers a wider machining range, enabling ultra-fine pin-shaped and specialized feature fabrication

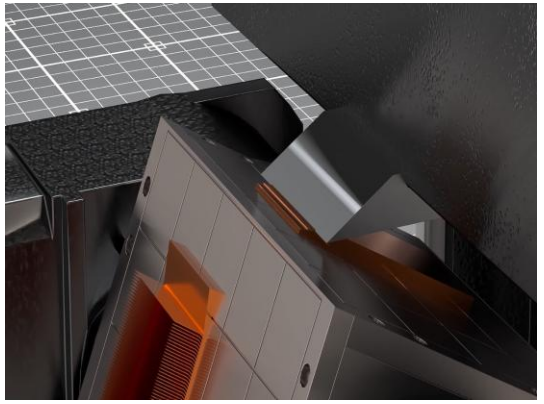
Category	Existing equipment(China)	Heat-Sol's solution
Processing scope	5°≤θ≤18°	1.2°≤θ≤55°
Fin Thickness	Minimum ~250㎛	Minimum 40㎛

6. Precision and automatic angle adjustment minimize defects and material loss

7. Safe Operation

- Automation reduce manual work and workplace accident risk

8. Enhanced mechanical stability – Enhanced bed absorbs mechanical stress, ensuring precision and durability over long runs.



Benefits of HCT

1. Space-saving
- Requires less installation space, allowing more flexible factory layout

2. Ease of transport and installation
- Easier to move or reposition the equipment

3. Improved energy efficiency
- Reduced power and cooling requirements due to smaller size

4. 360° Skiving Capability
- Allow nearly unlimited rotational angles, adapting to complex heatsink designs and maintaining consistent quality

5. Scalable Production & high productivity in compact size
- Enable high-volume manufacturing

6. Easier production line integration(Space optimization)

7. Full automation : Faster setup & changeover