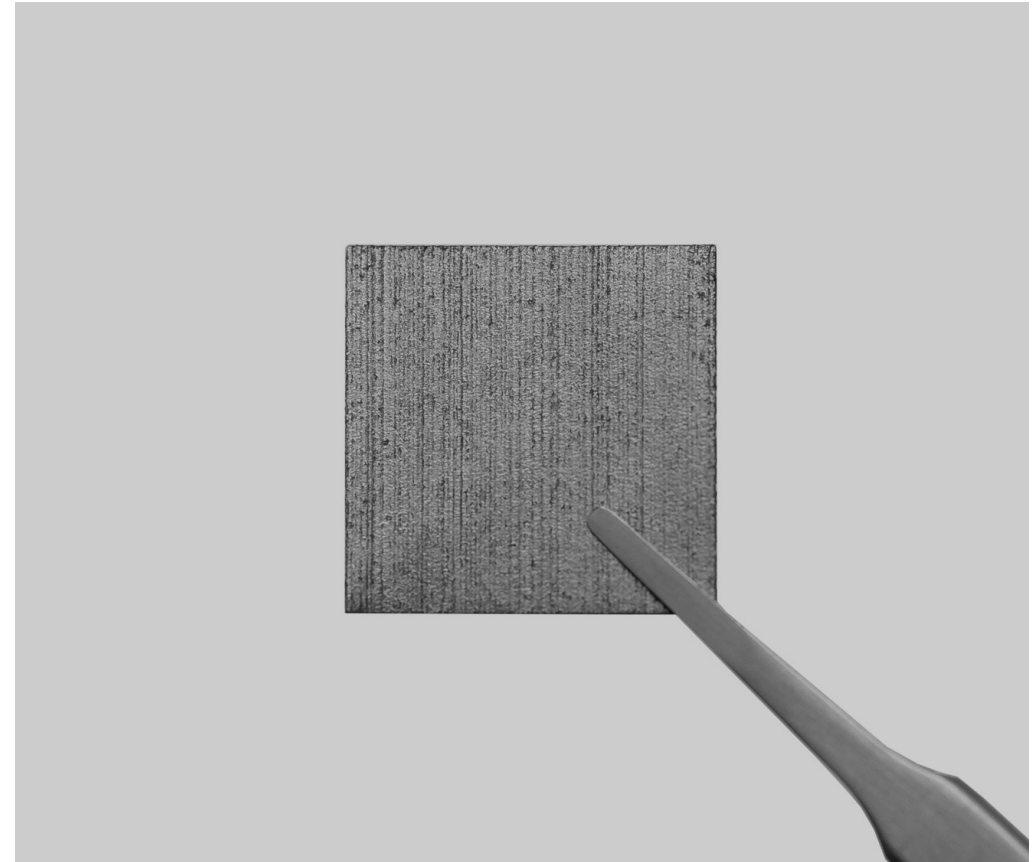


Energy Efficient Cooling Solutions Enhanced by Graphene

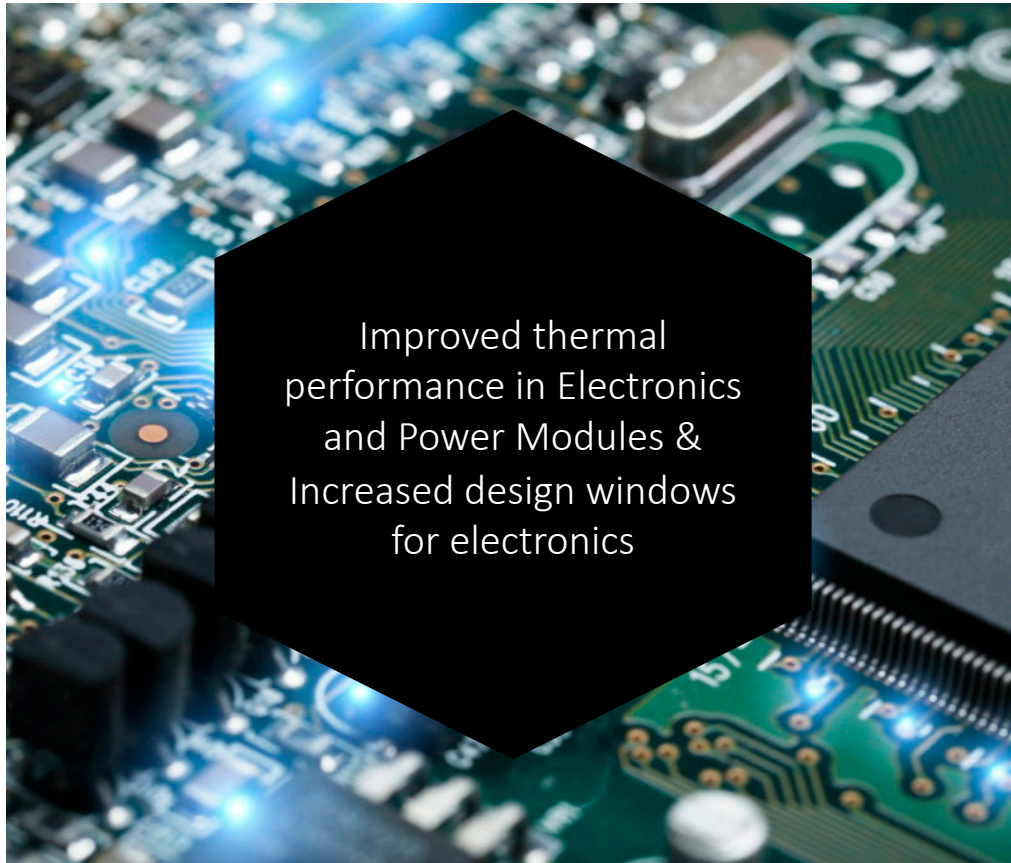
KRISTOFFER MARTINSEN

Our Product Focus

We offer tailor-made graphene enhanced thermal interface materials with low thermal resistance, high thermal conductivity, excellent compressibility, high elasticity and reliability on a cost competitive base for cooling of electronics for High Frequency, Computer Processing Unit, Graphic Processing Unit, Server, Insulated-gate bipolar transistor, Opto- and power module as well as for thermal burn-in testing applications



Graphene Enhanced Cooling Technology

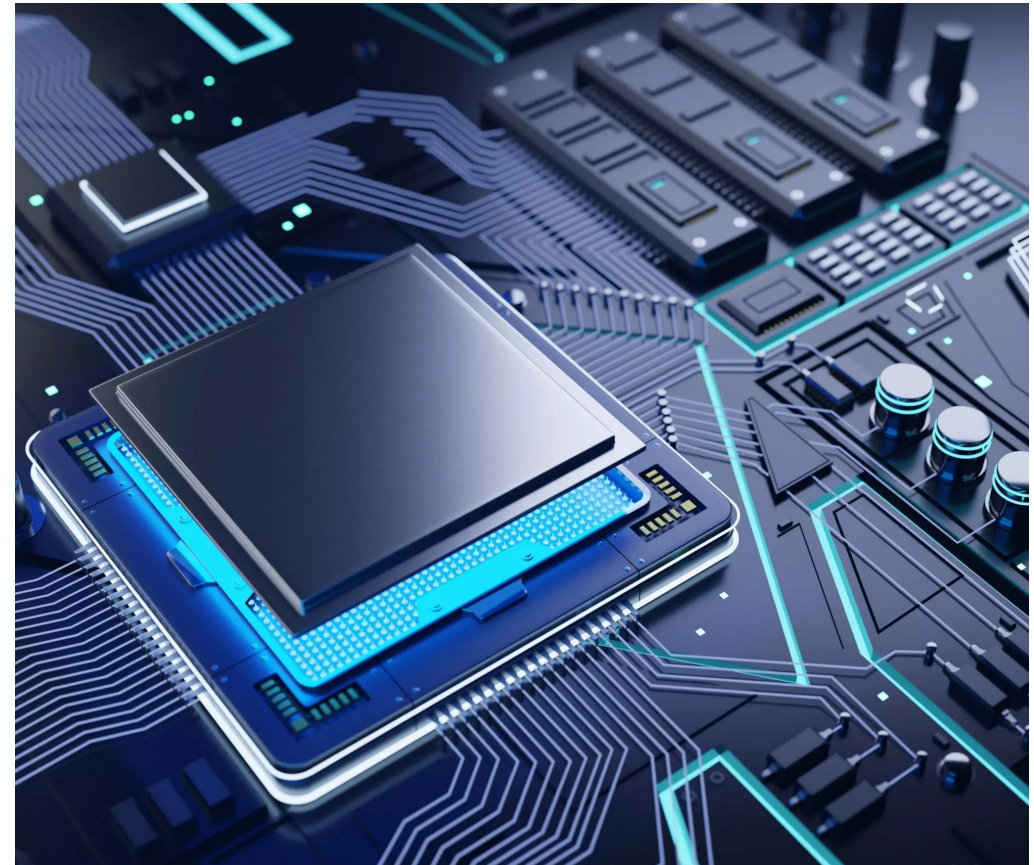


Our proprietary solution

- Up to 100 times better bulk thermal conductivity than competing materials
- Up to 5 times effective thermal resistance compared to competing materials at the same bonding pressure
- Over 50% compression at modest pressure (200 KPa)
- Over 70% recovery degree after compression
- Passed extensive reliability qualification according to industrial standard
- We control both production and material design

Vision

SHT is the world leading graphene enhanced electronics cooling solution provider that boost performance, increases lifetime and reduces energy for electronics for a more sustainable world



The Team

STAFF



Thien Laubeck
CEO



Lars Alnhem
COO



Prof. Johan Liu
CTO



Mats Ekberg
CFO



Dr Yuanyuan Wang
VP Research



Martin Palmqvist
IR and Marketing
Director



Jin Chen
VP of technology



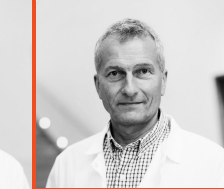
Dr Murali Murugesan
Sales & Project
Manager



**Tech Lic.
Kristoffer Martinssen**
Project leader Graphene



Amos Nkansah
Production Manager



Arto Ahtonen
Quality Manager

BOARD



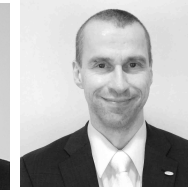
Prof. Johan Liu
Founder, Chairman



Anders Andersson
CEO Hörle Wire Group



Mats Augurell
CEO Alektum Group AB
Formerly CFO for the
Swedish National 6th
Pension Fund



Dr Henric Rhedin
Head of External research
Volvo Cars

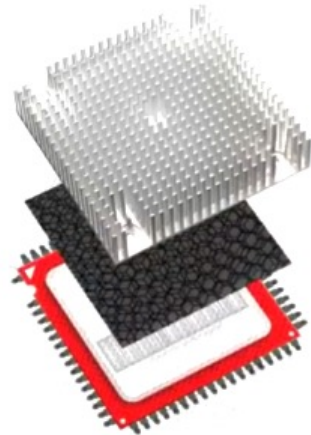
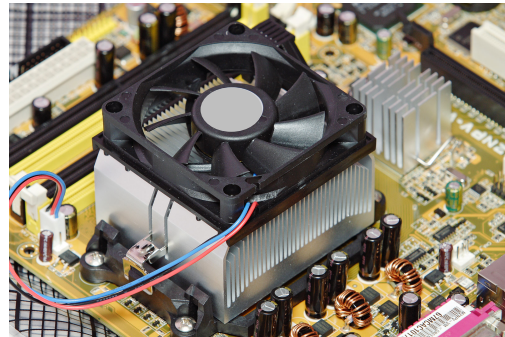
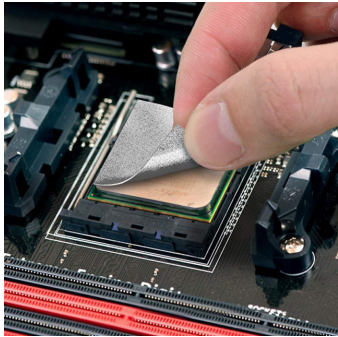


Prof Bill Brox
Formerly CEO
Imego AB

Graphene Enhanced Thermal Interface Material Products

Physical Properties	GT-25	GT-70S	GT-90S	Units	Measurement standard
Thickness range	0.25-2	0.3-1	0.3-1	mm	Micrometer
Pad size	Up to 65×65	Up to 50×50	Up to 55×55	mm	Micrometer
Roughness (Ra)	5	5	5	um	Wyko NT1100 optical profilometer
Roughness (Rz)	30	30	30	um	Wyko NT1100 optical profilometer
Compressibility	> 30	➤ 50	> 50	%	Micrometer
Recovery	> 50	> 70	> 60	%	Micrometer
Temperature Range	-40 to 150	-40 to 150	-40 to 150	°C	°C
Bulk Through-plane thermal conductivity	25±5	70±10	90±10	W/mK	ASTM5470
Effective thermal resistance	30±10(100 KPa)	25±5(100 KPa)	20±5(100 KPa)	Kmm ² /W	ASTM5470
	12±1(275 KPa)	10±0,5(275 KPa)	6.7±0,5(275 KPa)		
Flammability	V-0	V-0	V-0		UL94
Pressure value of response at 50% compression after 10 minutes relaxation	1100±50	200±50	2500±50	KPa	ASTM5470
Density	0,25±0,05	0,30±0,05	0,43±0,03	g/cm ³	Balance and micrometer
Color	Grey	Grey	Grey		

FrostSheet GT-TIM



- 5G technology thermal management
- Gaming computers
- Mining
- Electronics chips
- Power modules

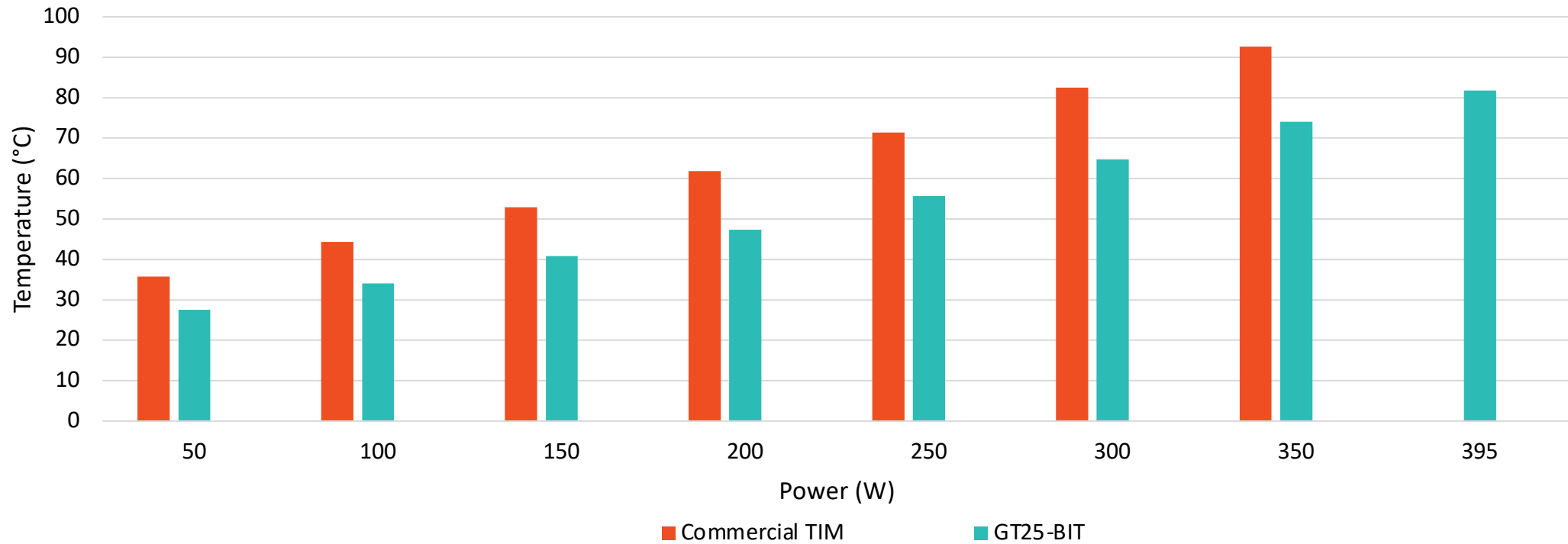
Graphene enhanced thermal interface materials (GT) for electronics and power module cooling.



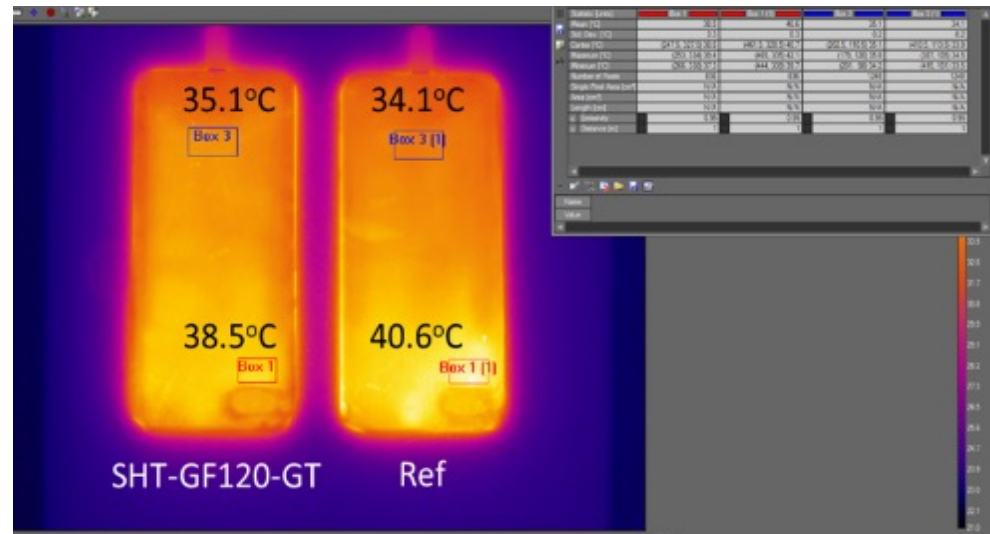
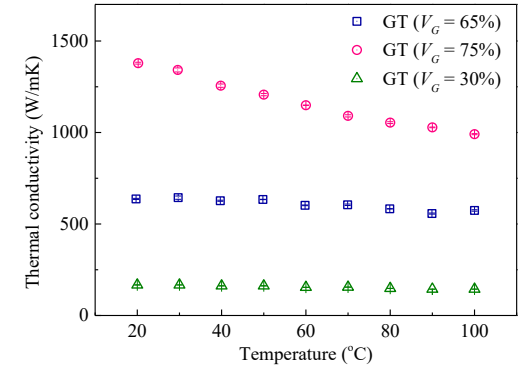
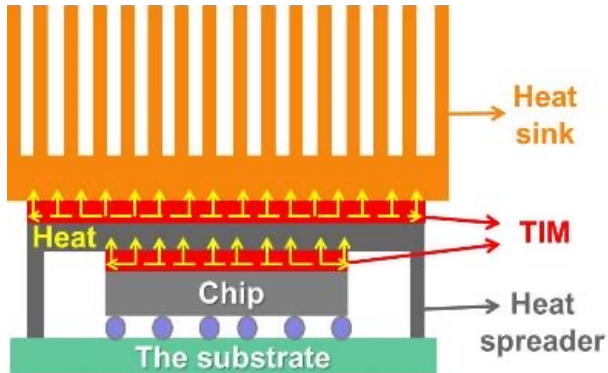
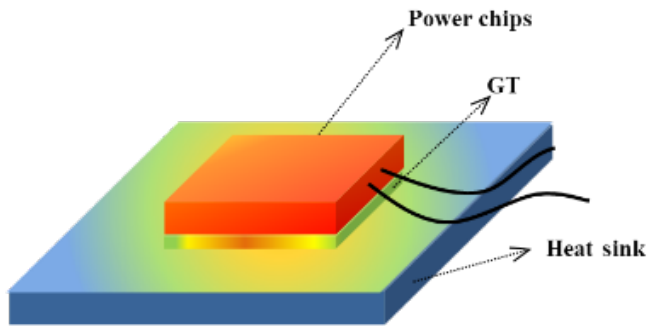
(5x5 cm²)

Thermal Test Report of GT-25

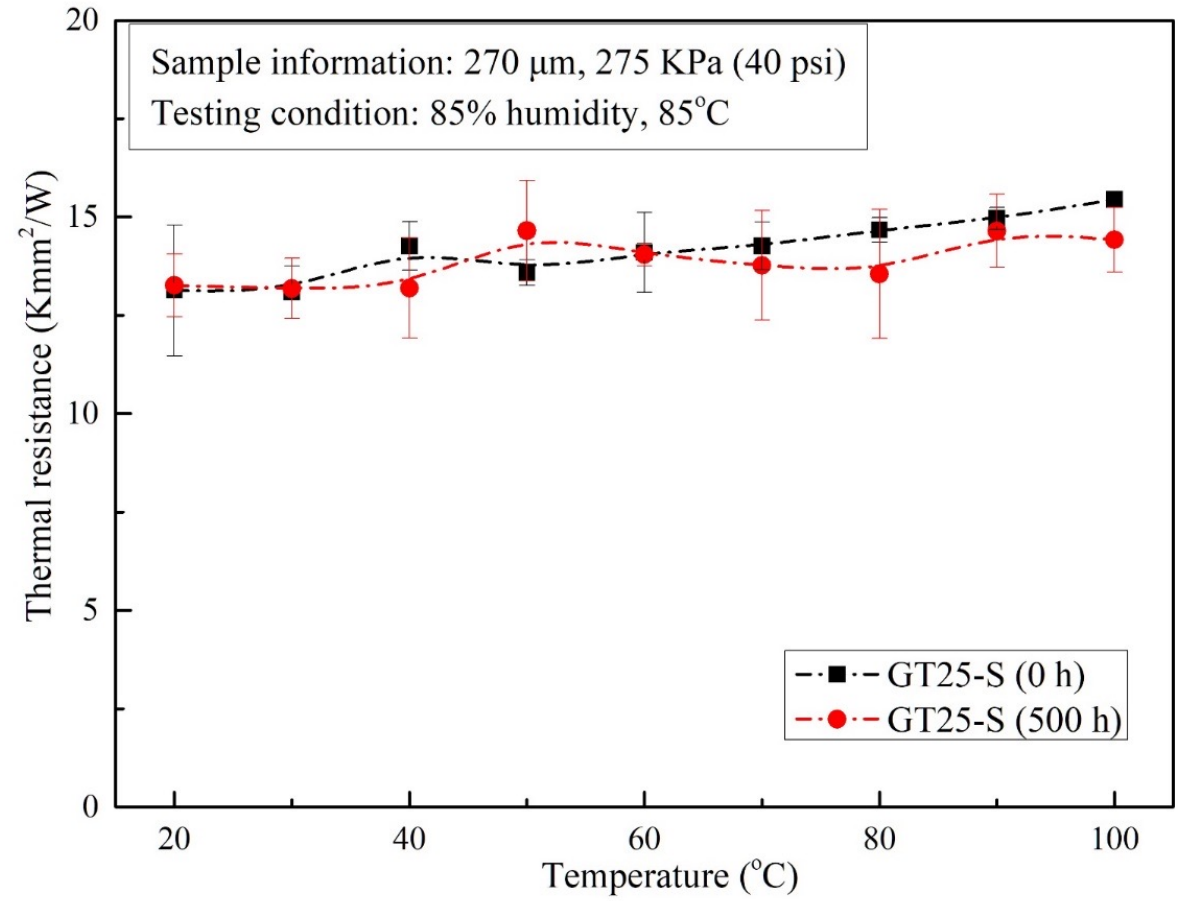
Commercial TIM vs GT Power performance



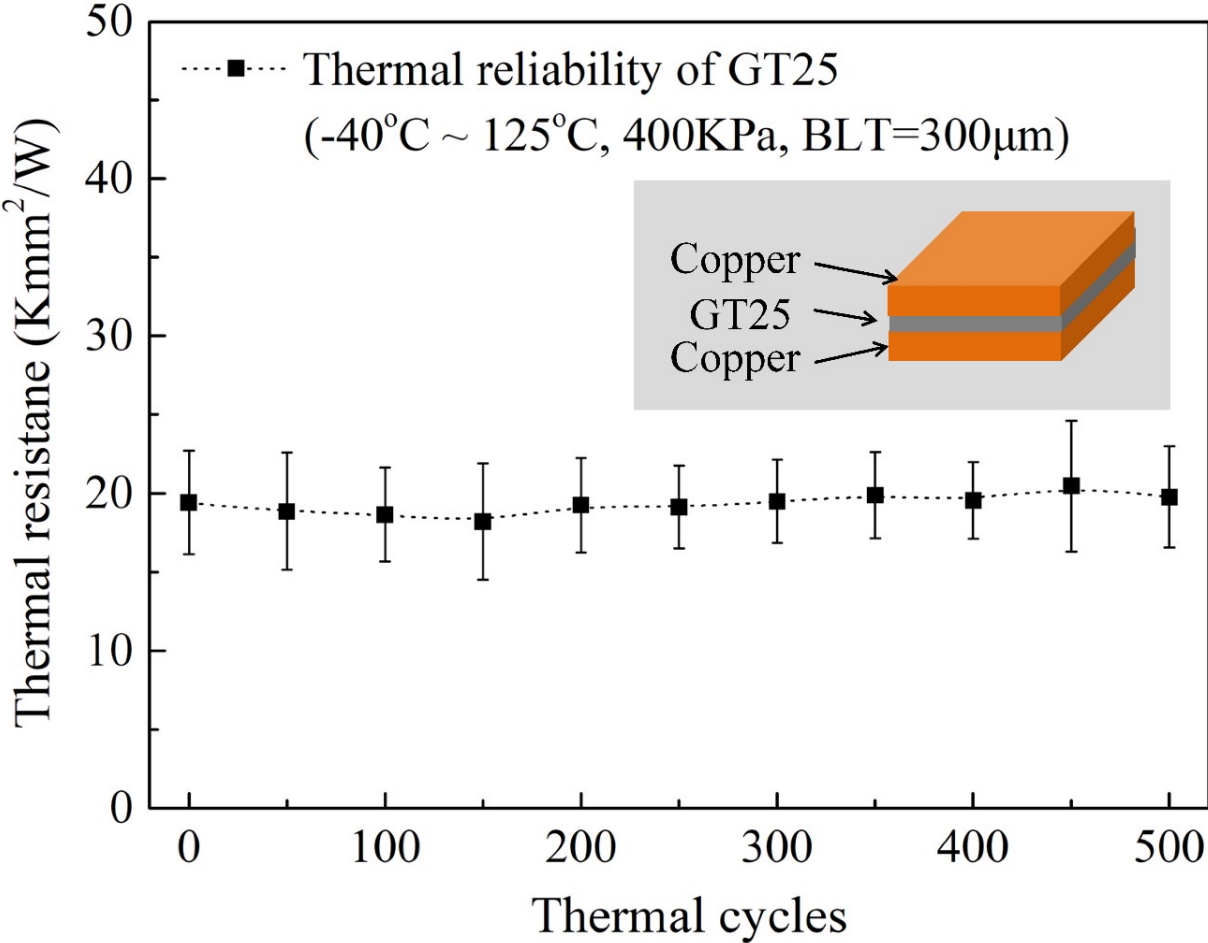
Outstanding Thermal Performance for Mobile Cooling



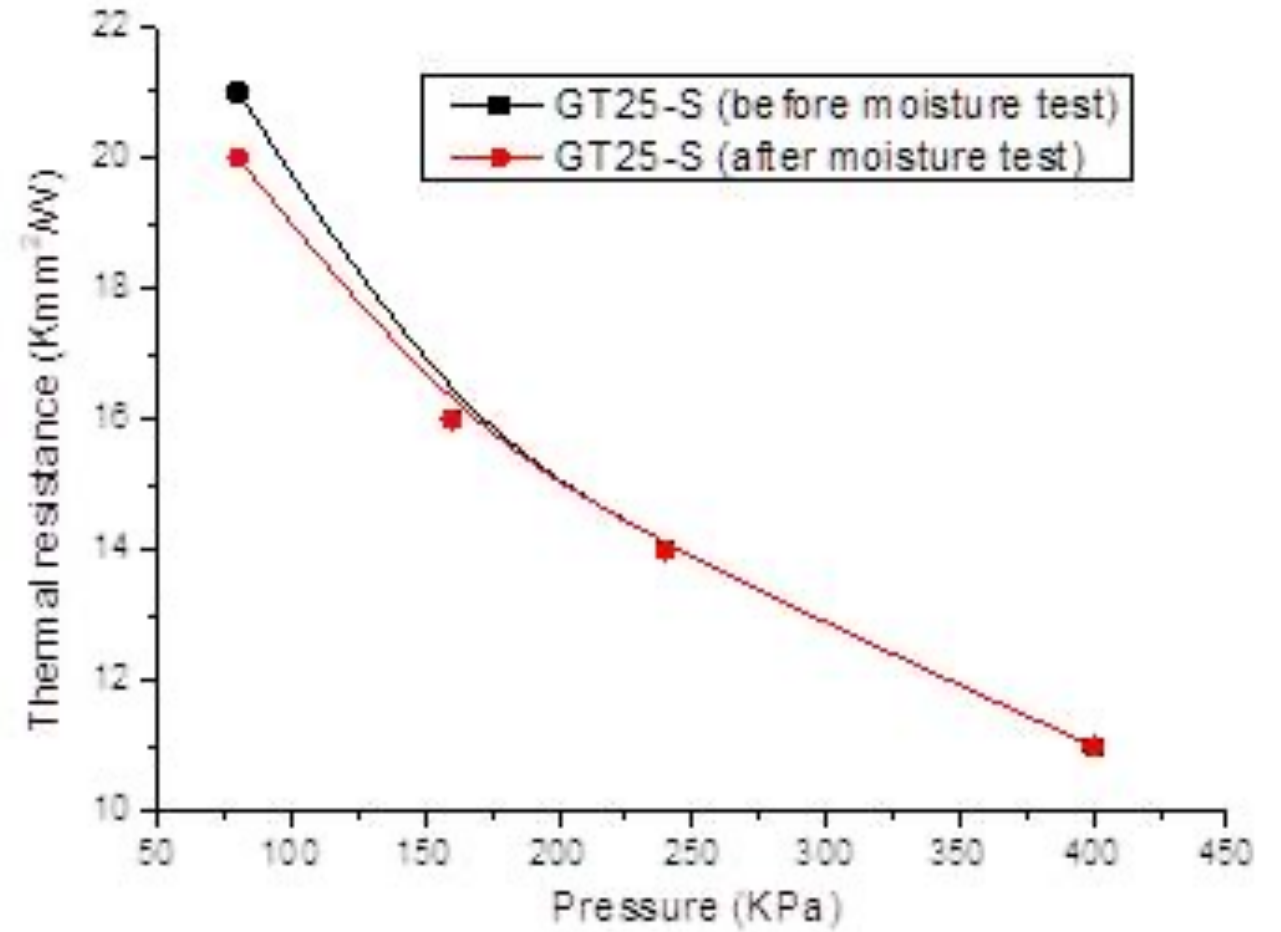
Outstanding performance compared to the existing thermal interface materials in humidity test about 500 hours



Temperature cycling performance of GT-25
(Internal evaluation by SHT)



Moisture absorption test of GTT-S
(Internal evaluation at SHT)



A Big Step Forward in the Thermal Management Design

× 100

Bulk thermal conductivity 10–100 times better than the current commercial products

× 5

Effective thermal conductivity
2–5 times better

× 2

Effective Thermal resistance 2–5 times lower than the current commercial products

Longer lasting life

High elasticity

Compressibility

Recovery

Sustainability

Energy saving using efficient thermal management solutions enhanced by graphene

KEEP
YOUR
COOL

GRAPHENE
COOLING.
SWEDISH
TECHNOLOGY.

BYE
BYE
HEAT

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