

*AI Technology, Inc.*

**ADVANCED MATERIALS FOR**

- Semiconductor*
- Microelectronics*
- Hybrid Circuits*
- Aerospace & Defense*
- Solar Energy*
- Communications*
- Optoelectronics*
- Power Electronics*
- Medical Devices*

[www.aitechnology.com](http://www.aitechnology.com)

## AIT Product Brochure

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AI Technology is a pioneer in the microelectronic materials industry and developed the first flexible and tacky epoxy film adhesives. Over 25 years of experience and research has yielded one of the most comprehensive lines of film and paste adhesives. AI Technology consists of a team of experienced and dedicated engineers, scientists, and service staff to offer optimized electronic and semi-conductor packaging material solutions with ultimate reliability.

AI Technology, Inc. is located in Princeton Junction, New Jersey. Our 16 acre campus includes a 52,000 square foot office, warehouse, and manufacturing complex. AI Technology is recognized by the New Jersey Department of Labor as a top leader in workplace safety. We are an ISO 9001:2008 certified company that is committed to providing products that meet customer's needs and specifications including MIL-STD 883 and NASA OUTGASSING requirement certification.



**ISO 9001:2008 Certified**

## Company Overview



**AI Technology, Inc.**

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[ait@aitechnology.com](mailto:ait@aitechnology.com)

## Unparalleled Service

● Custom Formulations



● No Discontinued Products



● Fast Lead Times



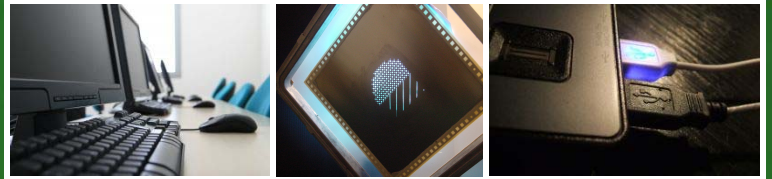
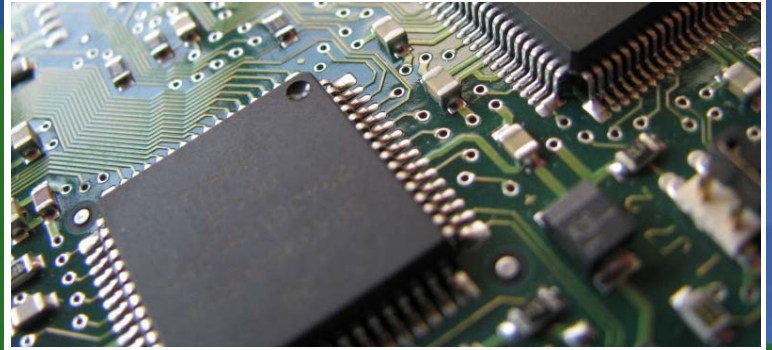
● Low Minimum Orders



● Die Cutting



● Custom Packaging



## Product Line

■ Thermal Interface Materials

● Paste & Film

Gel

Grease

Phase Change

Compressible

■ Adhesives

● Paste & Film

Thermally Conductive

Electrically Conductive

Electrically Insulating

Anisotropic Conductive Epoxy

High Temperature

■ Circuit Substrates

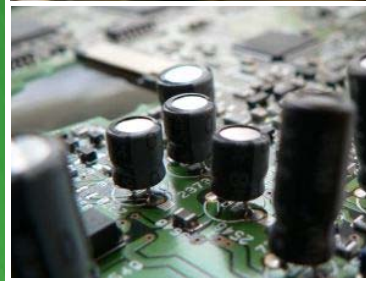
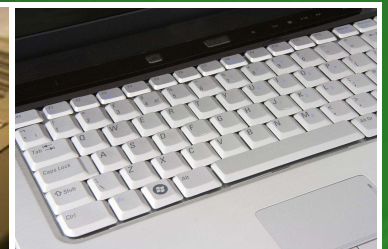
● Coupler™

● Cool-Clad™

■ Dicing Tapes

● High Temperature

● UV Release



AIT Epoxy

Paste

Electrically Conductive

Flexible-Stress Free

High Strength

## ME8650-RCT

Electrical Resistivity  
<  $3.0 \times 10^{-4}$

Glass Transition Temperature  
-20° C/ -50° C Minor

Hardness (Type)  
85 (A)

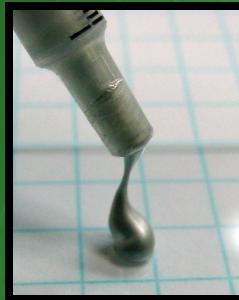
Device Push-off Strength  
> 2000 psi

Thermal Conductivity  
11.5 W/m-k

Average Viscosity (5 rpm, 24° C)  
50,000 cp

Linear Thermal Expansion Coefficient  
100 ppm/C

Typical Cure Schedule  
30 min @ 150° C



Long Pot-Life  
30 days @ 25° C

No Pre-Bake

0% Solvent

## ME8630-RCT

Electrical Resistivity  
<  $5.0 \times 10^{-4}$

Glass Transition Temperature  
80° C

Hardness (Type)  
80 (D)

Device Push-off Strength  
> 2400 psi

Thermal Conductivity  
11.5 W/m-k

Average Viscosity (5 rpm, 24° C)  
50,000 cp

Linear Thermal Expansion Coefficient  
40 ppm/C

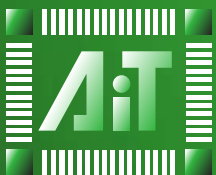
Typical Cure Schedule  
30 min @ 150° C

AIT has a full line of paste adhesives to meet each customer's specific application needs. Solvent free, low stress, conductive epoxies such as ME8650-RCT is just one example of the hundreds of epoxy pastes we have to offer.

AI Technology's paste adhesives are packaged in syringes for automated in-line dispensing or in jars and kits for convenient handling and storage. Our quality department thoroughly tests all outgoing products to ensure performance and consistency. Virtually any critical parameters are adjustable. Curing schedule, pot-life, viscosity and thixotropy can be made to support customer specific manufacturing process.



AIT Product	Characteristics	Electrical Resistivity (ohm-cm)	Thermal Conductivity (watt/m-C)	Die-Shear (psi)	Tg [C]	Viscosity (kcps @ 0.5 rpm)
EG8020	One or Two Part Component	$2.0 \times 10^{-4}$	5.7	1,700	50	150
EG8050-LV	Solder Replacement Stress Free	$4.0 \times 10^{-4}$	7.9	1,500	-20	129
EG8050	Solder Replacement Stress Free	$4.0 \times 10^{-4}$	7.9	1,800	-20	190
ME8155	Solvent Free Stress Free	$4.0 \times 10^{-4}$	7.9	1,500	-20	354
ME8452-A	Stress Free Solvent Free Large Area Die Attach	$4.0 \times 10^{-4}$	7.9	2,000	-20	255
ME8456	Stress Free Large Area Die Attach	$4.0 \times 10^{-4}$	7.9	2,000	-20	130
ME8456-00	Designed to Resolve Mismatched CTE	$4.0 \times 10^{-4}$	15	1,500	-20	60
ME8512	Designed to Eliminate Bleeding Solvent Free	$4.0 \times 10^{-4}$	7.9	1,600	50	91
ME8550-DA	Moisture Resistant High Green Strength	$4.0 \times 10^{-4}$	7.9	1,000	-55	20 kcps @ 5 rpm
ME8650-RC	Solvent Free Stress Free High Green Strength	$4.0 \times 10^{-4}$	7.9	1,000	-20	15 kcps @ 5 rpm
ME8630-RC	Rapid Curing Solvent Free Fine Pitch	$5.0 \times 10^{-4}$	8.6	2,400	80	15 kcps @ 5 rpm
MC8880	Rapid Curing Solvent Free 300° C Continuous Use	$4.0 \times 10^{-3}$	8.6	2,500	240	20 kcps @ 5 rpm



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AIT offers many other paste adhesives not featured in this catalog. Please visit [www.aitechnology.com/analysis](http://www.aitechnology.com/analysis) to have an application engineer analyze your bonding challenge and recommend a solution.

AIT Epoxy

Paste

Electrically Insulating

Screen Printable &  
B-Stageable

Ultra High  
Thermal Stability

## LESP7550-LV

Electrical Resistivity  
 $> 1.0 \times 10^{14}$

Glass Transition Temperature  
0° C

Hardness (Type)  
90 (A)

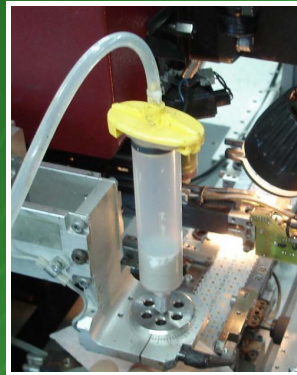
Device Push-off Strength  
2000 psi

Thermal Conductivity  
0.3 W/m-k

Average Viscosity (0.5 rpm, 24° C)  
5,000 cp

Linear Thermal Expansion Coefficient  
190 ppm/C

Typical Cure Schedule  
8 min @ 150° C



## ME7863

Electrical Resistivity  
 $> 1.0 \times 10^{14}$

Glass Transition Temperature  
240° C

Hardness (Type)  
95 (D)

Device Push-off Strength  
> 2500 psi

Thermal Conductivity  
1.0 W/m-k

Average Viscosity (0.5 rpm, 24° C)  
7,000 cp

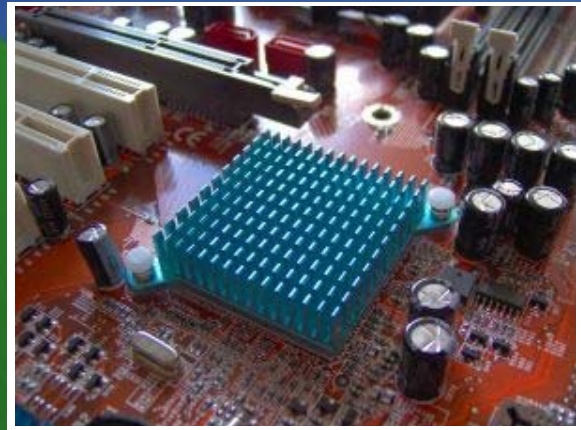
Linear Thermal Expansion Coefficient  
30 ppm/C

Typical Cure Schedule  
30 min @ 225° C

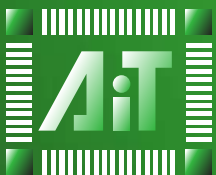
Withstands up to 350° C without thermal degradation

AI Technology's insulating epoxy adhesives empower manufacturers to build advanced electronics without worrying about reliability. For two decades, AIT's low outgassing NASA qualified and MIL-STD883 certified adhesives have been managing heat and stress, while bonding critical components within satellites, particle accelerators, airplanes, as well as cell phones and memory modules.

From die attach in microelectronic applications to large heat sink attach in power electronic applications, AI Technology's line of insulating, thermally conductive adhesives provide ultimate device reliability.



AIT Product	Characteristics	Electrical Resistivity (ohm-cm)	Thermal Conductivity (watt/m-C)	Die-Shear	Tg [C]	Viscosity (kcps @ 0.5 rpm)
EG7655	Stress Free One or Two Component Large Bonding Areas	$1.0 \times 10^{14}$	1.7	1,800	-20	300
EG7658	Substrate Attach Large Bonding Areas Bonding Mismatched CTE's	$1.0 \times 10^{14}$	3.67	1,800	-25	337
ME7155	Solvent Free Stress Free	$1.0 \times 10^{14}$	1.7	1,800	-25	276
ME7155-AN	Solvent Free Stress Free	$1.0 \times 10^{14}$	3.6	1,800	-25	245
ME7156	Solvent Free Mismatched CTE's	$1.0 \times 10^{14}$	1.7	2,400	-25	144
ME7158	Stress Free High Power Die Attach	$1.0 \times 10^{14}$	3.6	1,800	-25	250
ME7159	Stress Free Diamond Filled	$1.0 \times 10^{14}$	11.4	1,800	-25	310
ME7656	Stress Free Fast Curing	$1.0 \times 10^{14}$	3.6	1,200	-10	200
ME7556-DA	Stress Free Moisture Resistant	$1.0 \times 10^{14}$	3.6	1,600	-55	20 kcps @ 5 rpm
ME7665-DA	Solvent Free Low Temperature Curing	$1.0 \times 10^{14}$	1.7	2,000	80	20 kcps @ 5 rpm
ME7857-SC	Solvent Free High Green Strength	$1.0 \times 10^{14}$	2.9	1,200	-60	60 kcps @ 5 rpm
MC7888	300° C Continuous Use	$2.0 \times 10^{14}$	3.5	2,000	240	60 kcps @ 5 rpm



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AI Technology's pastes are available premixed and frozen in single component syringes (1 cc, 3 cc, 5 cc, 10 cc, or 30 cc) and cylindrical containers (4 oz, 8 oz, 16 oz, 32 oz). EG products are also available in two component kits.

AIT Epoxy

Paste

Electrically Conductive

Tack Film - Stress Free  
Reworkable

Wafer Lamination  
Die Attach Film

## TC8750

Electrical Resistivity  
 $>5.0 \times 10^{-4}$

Glass Transition Temperature  
0° C

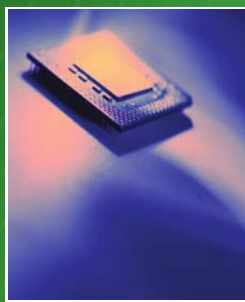
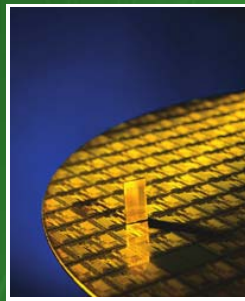
Hardness (Type)  
82 (A)

Device Push-off Strength  
2400 psi

Thermal Conductivity  
6.4 W/m-K

Linear Thermal Expansion Coefficient  
110 ppm/C

Typical Cure Schedule  
60 min @ 150° C with 3 - 5 psi



## ESP8680-W

Electrical Resistivity  
 $>5.0 \times 10^{-4}$

Glass Transition Temperature  
80° C

Hardness (Type)  
88 (D)

Device Push-off Strength  
> 3300 psi

Thermal Conductivity  
6.4 W/m-K

Linear Thermal Expansion Coefficient  
40 ppm/C

Typical Cure Schedule  
1 second tacking @ 80° - 200° C @ > 5 psi  
30 min @ 150° C



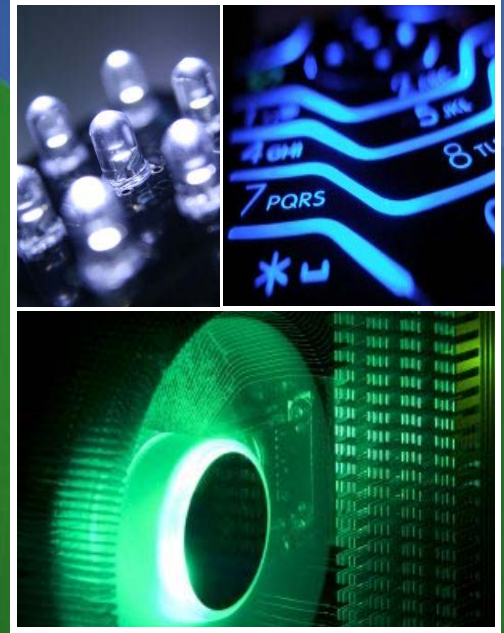
Electrically conductive film adhesives provide versatility and processing flexibility. Films can be made into preforms and used in automated pick-and-place assemblies.

Film adhesives can be laminated onto various substrates including silicon wafers for LED die attach, EMI shielding, metallic heat spreaders for thermal management and ground plane interface.

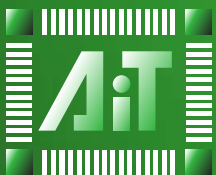
AI Technology's products can be diced using rotating metal die, pressure die, water jet, and many other cutting methods in its pre-cure, B-staged form.

Lamination process is simple:

- Initial tack pressure is applied for 1 second at approximately 80° C
- Curing time is adjustable for optimal processing ease
- Most film adhesives cure at 150° C in under 60 minutes



AIT Product	Characteristics	Electrical Resistivity (ohm-cm)	Thermal Conductivity (watt/m-C)	Die-Shear (psi)	Tg [C]	Film Type
ESP8450-WL	Instant Melt-Tack > 120° C (< 10 psi) Curing Without Fixture & Pressure Withstand > 150° C Wire-Bonding Low Moisture Absorption	$4.0 \times 10^{-4}$	6	1,500	-45	Tack Free Dry Film Self Supporting
ESP8350	Instant Melt-Tack > 80° C (< 10 psi) Curing Without Fixture & Pressure Withstand > 150° C Wire-Bonding Low Moisture Absorption Meets MIL-STD-883 5011.4	$4.0 \times 10^{-4}$	6.4	1,200	-25	Tack Free Dry Film Self Supporting
RTC8750	Tacky for Instant Placement Without Fixture Withstand High Temperature Excursion Molecularly Flexible for Low Interfacial Stress	$4.0 \times 10^{-4}$	6	1,500	-45	Tacky Film Preforms Self Supporting
ESP8680-W	Wafer Level Lamination Withstand High Temperature & Moisture Meets MIL-STD-883 5011.4	$4.0 \times 10^{-4}$	6	3,000	80	Dry Film Self Supporting
CXP8880	300° C Continuous Use Moisture Resistance Low CTE	$5.0 \times 10^{-3}$	6	2,000	240	Dry Film Self Supporting



AI Technology, Inc.

AI Technology's film adhesive reliability has been proven through success in aerospace and military electronics for over two decades. ESP Die Attach Films have provided uniform bondline thickness with controlled flow for over 10 years.

AIT Epoxy

Paste

Electrically Conductive

Stress Free  
Reworkable

Wafer Lamination  
Die Attach Film

## ESP7450

Electrical Resistivity  
 $>1.0 \times 10^{14}$

Glass Transition Temperature  
- 60° C

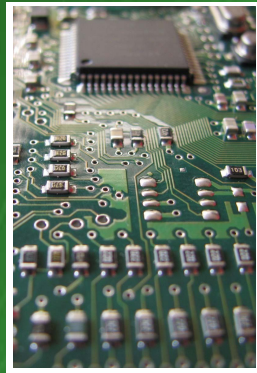
Hardness (Type)  
65 (A)

Device Push-off Strength  
> 2000 psi

Thermal Conductivity  
0.17 W/m-K

Linear Thermal Expansion Coefficient  
110 ppm/C

Typical Cure Schedule  
15 min @ 150° C with 5 - 10 psi



## ESP7675-W

Electrical Resistivity  
 $>1.0 \times 10^{14}$

Glass Transition Temperature  
190° C

Hardness (Type)  
88 (D)

Device Push-off Strength  
> 3000 psi

Thermal Conductivity  
1.7 W/m-K

Linear Thermal Expansion Coefficient  
30 ppm/C

Typical Cure Schedule  
1 second tacking @ 80° - 200° C @ > 3 psi  
60 min @ 150° C

Insulating Film Adhesives combine reliable adhesion with ease of handling, storage, and usage. Dry films have pot life ranging in months instead of hours or days.

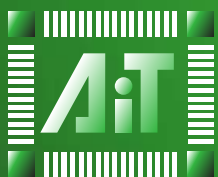
Insulating Film Adhesives can be submerged under water, diced with wafer, and released from UV-release dicing tapes to provide a reliable bond, thermal management, and stress relief to the package.

In die attach applications, AI Technology's insulating films are used to create a stress free bond to a wide variety of materials. Wire bonding and solder reflow processing temperatures are no problem for most AIT films.

AI Technology's die attach film adhesives have been proven in stack-chip applications. AIT's films are easily laminated and provide excellent adhesion as well as electrical isolation. Films can be customized to fit your process, equipment, and specifications. AI Technology's standard film thickness is 3 mils (~75 microns).



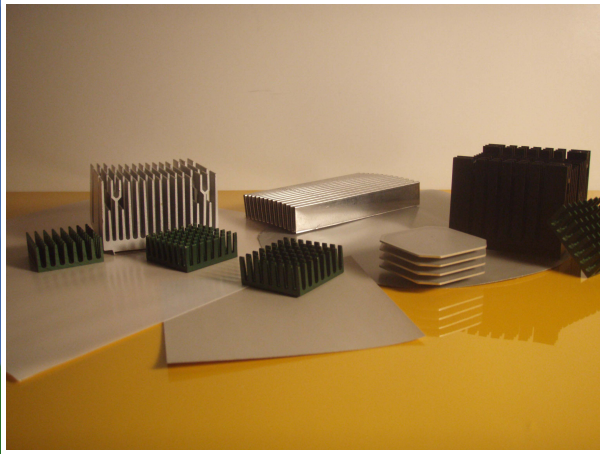
AIT Product	Characteristics	Electrical Resistivity (ohm-cm)	Thermal Conductivity (watt/m-C)	Die-Shear (psi)	Tg [C]	Film Type
TK7758	Tacky for Instant Placement Without Fixture Withstands High Temperature Excursion Molecularly Flexible for Low Interfacial Stress Meets MIL-STD-883 5011.4	$1.0 \times 10^{14}$	3.6	1,500	-20	Tacky Film Preforms
ESP7455	Instant Melt-Tack > 120° C (< 10 psi) Withstand > 300° C Short-Term Exposure Low Moisture Absorption Quick Curing Proven Reliability for Large Area Substrates	$1.0 \times 10^{14}$	1.71	2,000	-60	Tack Free Dry Film Preforms
RTK7659	Instant Melt-Tack > 80° C (< 10 psi) Curing Without Fixture & Pressure Withstand > 250° C Wire-Bonding Low Moisture Absorption Passes NASA Ougassing Requirement Proven Reliability for Large Area Substrates	$1.0 \times 10^{14}$	11.4	2,000	-60	Tacky Film Preforms
CXP7868	Instant Melt-Tack > 80° C (< 10 psi) Curing Without Fixture & Pressure Withstand > 250° C Wire-Bonding Low Moisture Absorption Passes NASA Ougassing Requirement 300° C Continuous Use	$2.0 \times 10^{14}$	3.6	2,000	240	Dry Film



AI Technology, Inc.

Custom thickness are available down to .5 mil. Beyond die attach applications, film adhesives are used for thermal interface-heatsink attach, large thick film attach, and multilayer flexible PCB bonding.

# Thermoplastic Film Adhesives

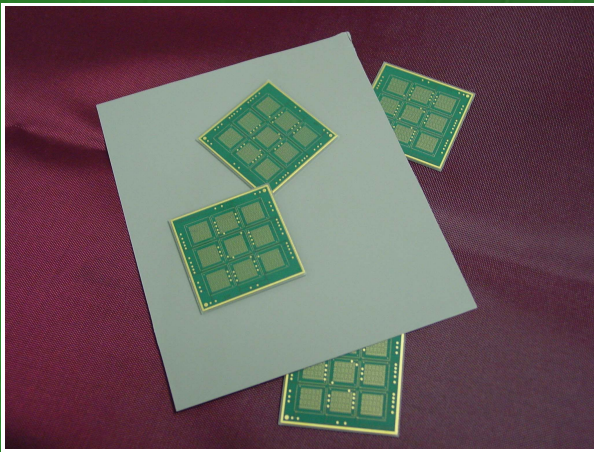


## Cool Bond Films

Cool Bond films provide a hot melt bonding solution with improved thermal transfer. Many cool bond films are UL 94V-O/UL 746A Rated. Cool Bond films are available in a range of reflow temperatures with medium bond strengths.

AI Technology's in-situ adhesive films eliminate the need for mechanical fasteners. Using heatsink adhesive pads simplifies the assembly procedure and reduces manufacturing time and cuts cost. Adhesive pads cure over time from the operation temperature of the device. Thermal film adhesive pads are available in slitted tape form, preforms, or standard sheets.

AIT Product	Characteristics	Electrical Resistivity (ohm-cm)	Thermal Conductivity (watt/m-C)	Die-shear (psi)	Tg [C]	Reflow Temp
CB7068	Low Reflow Temperature	$> 1 \times 10^{14}$	4	> 600	-55	> 60° C
CB7135	>1000 V Insulation @ 3 mil	$> 1 \times 10^{14}$	2	> 800	-55	> 135° C
CB8080	Bond Strength up to 70° C	$< 4 \times 10^{-4}$	8	> 400	-55	> 80° C
CB8133	Silver Coated Copper Filled	$< 5 \times 10^{-2}$	8	> 800	-55	> 135° C



## Thermoplastic Film Adhesives

Thermoplastic adhesives offer advantages of room temperature storage, instant bonding and extreme reworkability.

AI Technology's thermoplastic materials offer flexibility, moisture resistance, and are available in a wide range of reflow temperatures for nearly any application.

B-Stageable pastes also available for printing or dispensing applications.

AIT Product	Characteristics	Electrical Resistivity (ohm-cm)	Thermal Conductivity (watt/m-C)	Die-shear (psi)	Tg [C]	Reflow Temp
TP7090	> 97% Optically Transparent	$> 1 \times 10^{14}$	0.16	1000	-55	> 120° C
TP7858	High Temperature	$> 1 \times 10^{14}$	3.6	600	-70	> 325° C
TP8550	Mil Std Approved	$< 4 \times 10^{-4}$	6.4	900	-70	> 160° C
TP8650	Mil Std Approved	$< 4 \times 10^{-4}$	6.4	900	-70	> 200° C

# Thermal Gel & Grease

AI Technology's thermal greases and gels deliver the best thermal performance in the industry. Cool Grease® CGR7016 or CGR7018 is applied in between heatspreader and heatsink, microelectronic package, or wafers for DRI Etching for MEMS applications. Cool-Gel® CGL7018 is used for thermally conductive potting. Cool Silver™ offers outstanding performance in cooling CPUs and GPUs in personal computers.

## Thermal Gel

AIT Product	Characteristics	Electrical Resistivity (ohm-cm)	Thermal Conductivity (watt/m-C)	Dielectric Strength (volt/mil)	Die-Shear (psi)	Tg [C]
COOL-GEL® CGL7019	Non-Silicone Thermal Gel	$1.0 \times 10^{14}$	5.7	300	300	-60
COOL-GEL® CGL7056-XT	Interface/Potting Gel	$1.0 \times 10^{14}$	4.1	500	300	-65
COOL-GEL® CGL8050	Non-Silicone Thermal Gel	$1.0 \times 10^{-4}$	8.6	N/A	300	Gel
COOL-GEL® CGL8503	Thermal Potting Gel	$1.0 \times 10^{-2}$	8.3	N/A	300	Gel

## Thermal Grease

AIT Product	Characteristics	Electrical Resistivity (ohm-cm)	Thermal Conductivity (watt/m-C)	Dielectric Strength (volt/mil)	Die-Shear (psi)	Tg [C]
COOL-GREASE CGR7015	Non-Silicone Thermal Grease	$1.0 \times 10^{14}$	2	N/A	N/A	Grease
COOL-GREASE CGR7016	Non-Silicone Thermal Grease	$1.0 \times 10^{14}$	4	N/A	N/A	Grease
COOL-GREASE CGR7018	Non-Silicone Thermal Grease	$1.0 \times 10^{14}$	4	N/A	N/A	Grease
COOL-SILVER™	Lowest Thermal Resistance Non-Silicone Thermal Grease	Non-Conductive	16	N/A	N/A	Grease

## AIT Mart

AITMart.com is AI Technology's online store offering a new level of convenience when ordering some of our most popular items along with our line of consumer products.

- **Next Business Day Shipping**
- **No Minimum Order**
- **Secure Credit Card Checkout**

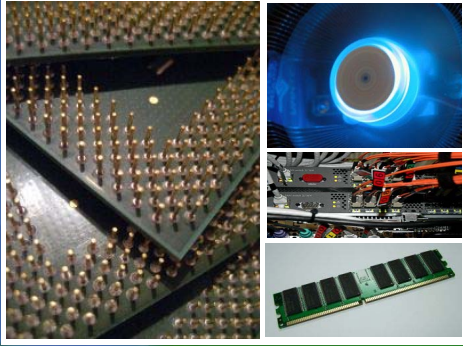
Products Include Our Most Popular Thermal Epoxies:

- **EG7635**
- **EG7655**

and Thermal Interface Materials:

- **CGR7018**
- **CGR7016**
- **COOL-SILVER™**
- **COOL-SILVER™ PAD**

# Thermal Pads & Films



AI Technology's patented compressible, phase change film technology provides superb and reliable thermal performance by combining gap filling properties of a compressible gasket with melt-flowing, void eliminating characteristics of conventional Phase Change Material. Engineered to minimize interfacial thermal resistance while maximizing the bulk thermal conductivity, AI Technology's various thermal films and pads provide solutions to thermal management challenges in LED lighting, Multichip Modules, Power Modules, PC memory and CPU cooling.

## Electrically Conductive Thermal Interface Films

AIT Product	Characteristics	Electrical Resistivity (ohm-cm)	Thermal Conductivity (watt/m-C)	Die-Shear	Tg [C]
COOL-PAD™ CP8503	Cost Effective Melt Flow@ 250° C	$5.0 \times 10^{-2}$	> 8	< 100	-55
COOL-PAD™ CP8550-HFT	Electrical & Thermal Ground Plane Interface	$4.0 \times 10^{-4}$	9	100	-60
COOL-PAD™ CP8550	Non-Curing Compressible Pad	$5.0 \times 10^{-4}$	9.4	N/A	-60
COOL-PAD™ CPR8853	Non-Curing Compressible Pad Lower Cost	$5.0 \times 10^{-3}$	9.4	N/A	-60

## Electrically Insulating Thermal Interface Films

AIT Product	Characteristics	Electrical Resistivity (ohm-cm)	Thermal Conductivity (watt/m-C)	Dielectric Strength (volt/mil)	Die-Shear	Tg [C]
COOL-PAD™ CP7066	Thermal Gasket Replacement	$1.0 \times 10^{14}$	4	550	100	-55
COOL-PAD™ CP7138	Flexible Phase Change Dry Pad	$1.0 \times 10^{14}$	4	550	700	-55
COOL-PAD™ CP7508	Phase Change Thermal Pad	$1.0 \times 10^{14}$	4	550	100	-55
COOL-PAD™ CP7155	Compressible Thermal Pad	$1.0 \times 10^{13}$	2	300	N/A	-65
COOL-PAD™ CP7158-RTB	1 Side Tacky 1 Side Dry	$1.0 \times 10^{14}$	3	300	N/A	-60

# Thin Bondline Thermal

As the density of electronic devices increases the need for improved thermal materials designed for today's ultra thin bondlines. AIT has enhanced a wide range of their industry proven thermal materials to meet this challenge. The film and paste epoxies, along with thermal gels, greases and pads are designed to simplify your product assembly while providing a more robust, longer lasting device.

## Ultra-Low Thermal Resistance Thin Bondline Adhesives

AIT Product	Bond-line After Set-in (microns)	Thermal Resistance (-in /watt @ 0.0005 inch layer)	Bond Strength (psi)	Characteristics
ESP7679-LB	< 10	0.003	3000	Enhanced from one of the most proven film adhesives Diamond Filled
ESP7676-LB	< 10	0.004	3000	Enhanced from one of the most proven film adhesives Boron Nitride Filled
ESP8680-LB	< 10	0.003	3000	Enhanced from one of the most proven film adhesives Silver Filled

## Ultra-Low Thermal Resistance Thin Bondline Paste Adhesives

AIT Product	Bond-line After Set-in (microns)	Thermal Resistance (-in /watt @ 0.0005 inch layer)	Bond Strength (psi)	Characteristics
ME7159-LB	< 10	0.0025	2000	Enhanced from one of the most proven diamond filled flexible adhesives Measurably lower in thermal resistance against all known diamond filled products in the industry
ME7156-LB	< 10	0.003	2000	Enhanced from one of the most proven flexible adhesives Boron Nitride Filled
ME7659-LB	< 10	0.03	2000	Rapidly curable one component field proven flexible epoxy Diamond Filled
ME7656-LB	< 10	0.004	2000	Rapidly curable one component field proven flexible epoxy Boron Nitride Filled

## Ultra-Low Thermal Resistance Thin Bondline Interface Materials

AIT Product	Bond-line After Set-in (microns)	Thermal Resistance (-in /watt @ 0.0005 inch layer)	Bond Strength (psi)	Characteristics
CGR7019-LB	< 10	0.0025	NA	Enhanced from one of the most proven diamond thermal greases Measurably lower in thermal resistance against all known diamond filled products in the industry Diamond Filled
CGL7019-LB	< 10	0.0025	NA	Measurably lower in thermal resistance against all known diamond filled products in the industry Diamond Filled
CGR7016-LB	< 10	0.003	NA	Enhanced from one of the most proven thermal greases Boron Nitride Filled
CGL7016-LB	< 10	0.003	NA	Boron Nitride Filled
CGL7159-LB	< 20	0.003	NA	Enhanced from of the most proven and patented compressible phase change pad Measurably lower in thermal resistance against all known diamond filled products in the industry Diamond Filled
CPR7156-LB	< 20	0.0035	NA	Enhanced from of the most proven and patented compressible phase change pad Boron Nitride Filled

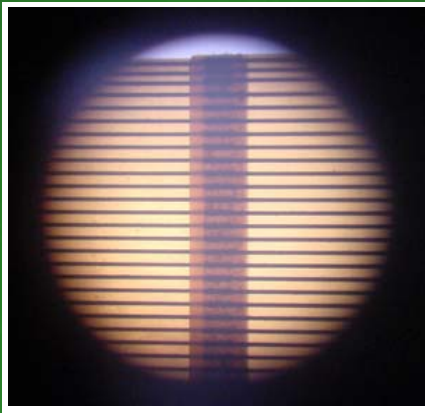
# Z-Axis Adhesives & Encapsulants

## Applications:

- Connector Bonding
- Solder Replacement Bonding
- TAB/TCP Outer Lead Bonding
- LCD Interconnection

\* Pitch, viscosity, and modulus can be customized.

\*\*Translucent, easy to handle and align.



Ai Technology's Anisotropic Conductive Adhesives (ACA) provide all the adhesive reliability of AiT's film epoxy with excellent electrical conduction along z-axis for use in surface mount component attach.

Even distribution of conductive vias throughout epoxy or thermal plastic film enables an inexpensive time-saving process alternative for linking flexible connectors or building up multi-stack flip-chip package.

AiT's ACA couples the advantages of Z-Axis electrical conductivity with the unique "stress-free" technology of AiT's standard epoxy.

## Film Z-Poxy™: ZEF8450

Pitch: 200 microns

Contact Resistance < 5 milli-ohm/mm<sup>2</sup>

X-Y plane dielectric strength: 300 Volt/ 5 mils

Device Push Of Strength: 2000 psi

Linear thermal expansion coefficient: 110 ppm/C

Cure time: 5 seconds @ 150° C with contact pressure of 5 -10 psi

## Paste Z-Poxy™: ZME8450-FP

Pitch: 150 microns

Average viscosity at 24° C: 150,000 cp @ 0.5 rpm using Brookfield

DV-1, spindle CP-51

## Epoxy Encapsulant

- Low Modulus
- Fast Curing

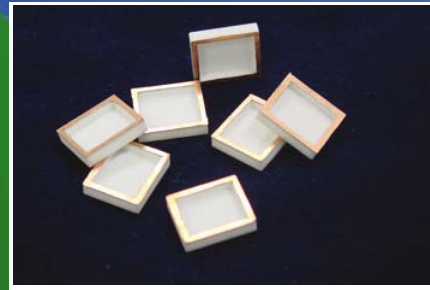
AiT Product	Resistivity (ohm-cm)	Thermal Conductivity (W/m-C)	Dielectric Strength (volt/mil)	Die Shear (psi, @ 25° C / 150° C)	Tg [C]	Shore Hardness	Modulus (psi) / Poisson Ratio	Viscosity (kcps, @ 5 rpm)	Curing Conditions
MEE7650-5	1.0 x 10 <sup>14</sup>	0.2	750	1,000/50	-30	50 (A)	6,000/0.45	8	125° C 10 min
MEE7655-5	1.0 x 10 <sup>14</sup>	1.6	750	5,000/50	-30	60 (A)	9,000/0.45	60	125° C 10 min



# Lid Sealants & Optical Adhesives

**Hermeticity:  $< 5 \times 10^{-8}$  cc/s at 1 atm**

AI Technology's near-hermetic adhesives are available in screen or stencil printable pastes or in film preforms. Affordability and process flexibility, combined with high hermeticity, make AiT's lid sealants ideal for bonding glass, ceramic, or metal lids for optoelectronic packages in automotive and aerospace industry. Electrically conductive lid sealants are also available.



AIT Product	Process & Characteristics	Minimum Lid Width (mils)	Gross Leak & Fine Leak	Dielectric Strength of Insulating Layer (volt/mil)
ESP7675-LS	Wafer or Panel of Devices B-Staged High Flow Preforms Ambient Storable for 6 months Ease of Customization Withstand 300° C Soldering	6	Pass	> 1000
ESP8680-HF	Wafer or Panel of Devices B-Staged High Flow Preforms Ambient Storable for 6 months Ease of Customization Withstand 300° C Soldering	6	Pass	N/A - Electrically Conductive - Resistivity: $5.0 \times 10^4$ ohm-cm
MC7883	Needle Dispensable B-Stageable & Screenable 300° C Continuous Use	3	Pass	> 1000

## Optically Clear - UV Curing Adhesives

UV Curing Adhesives offer additional flexibility by their low temperature, fast curing properties. AI Technology's UV curing adhesives are optically transparent and exhibit outstanding bonding with glass, plastics, ceramics, and metals. The curing is auto-catalytic with full thermal curing of shadow areas at any temperature above 80° C. These electrically insulating materials are available in rigid or stress free variations.



AIT Product	Characteristics	Bond Strength (psi)	Optical Transmission (> %, > 3200 nm)	Refractive Index	Curing Schedule (J/cm <sup>2</sup> )	Viscosity (kcp)
UVA3130	High Clarity, Good Bond Strength, Excellent Toughness & Flexibility	2000	99	1.49	1	0.5
UVA3150	High Clarity with Good Water Resistivity, Flexibility, & Toughness	3000	99	1.49	1	2
UVA3550	Elastic, Flexible, Hydrophobic Coating with a Low Tg. - 53° C. for Sealant or Encapsulant	N/A	97	N/A	0.5	50

# Dicing Tapes



AI Technology's Dicing Tapes are made of proprietary adhesives and linear material that can be adjusted to withstand high temperature, provide electrostatic protection, and give elongation beyond conventional dicing tapes. The UV releasing dicing tape, UVR-500 can be customized to release at higher or lower peel strength and also work in combination with AI Technology's Die Attach Films (both variety - electrically conductive or electrically insulating). AiT's dicing tapes are 100% silicone free, and engineered to leave no residues on the parts they hold. The tapes are available in one square foot sheets, or in 8", 10", and 12" wide rolls. Typical lengths are 10' (sample only), 30', 100'. Custom length rolls are available by request.

## UVR - Ultraviolet Release

AIT Product	Peel Strength Before UV Exposure (Peel, gm/in)	Peel Strength After UV Exposure (Peel, gm/in)	Adhesive Thickness (microns)	Substrate Thickness (microns)	Elongation (%)	Tensile Strength (Kg/cm)	Substrate Type
UVR 500-HT	500	20 *Adjustable	25	75 - 100 * Adjustable	150	> 200	AIT HT Substrate: Continuous Operation @ 100° C
UVR 500	500	20 *Adjustable	25	75	100	> 200	PVC Substrate
UVR 250-HT	250	20 *Adjustable	25	75 - 100 * Adjustable	150	> 200	AIT HT Substrate: Continuous Operation @ 100° C
UVR 250	250	20 *Adjustable	25	75	100	> 200	PVC Substrate

## HTCR - High Temperature Control Release Series: Dicing & Grinding

AIT Product	Peel Strength (g/in)	Adhesive Thickness (microns)	Substrate Thickness (microns)	Elongation (%)	Tensile Strength (Kg/cm)
HTCR 250 (Single-Sided)	250	25	100	> 100	> 200
HTCR 500 (Single-Sided)	500	25	100	> 100	> 200
HTCR 250-DS (Double-Sided)	250	25	100	> 100	> 200
HTCR 500-DS (Double-Sided)	500	25	100	> 100	> 200

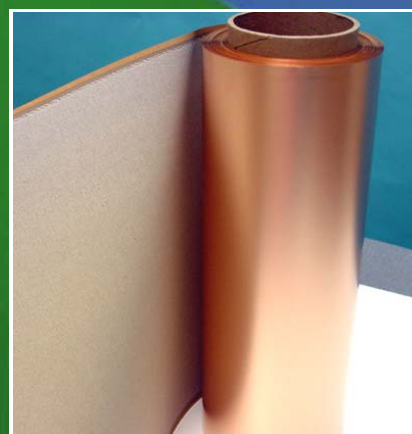
# Circuit Substrates

## Coupler™

AIT Technology's Coupler™ is a proprietary, non-polyimide, molecularly flexible material. Offers outstanding moisture resistance to eliminate moisture induced degradation, usually associated with polyimide based circuit boards.

AIT Coupler™ is a lower cost option for solar projects.

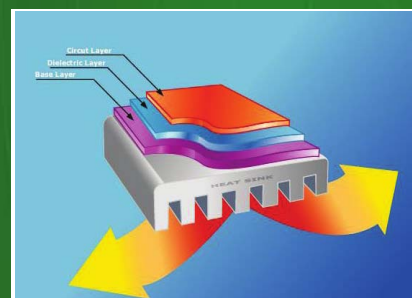
- Same ease of processing as FR-4 & BT boards.
- Lower temperature multi-layer processing from as low as 125°C.
- Proprietary low dielectric constant, 3.0 @ 1 KHz with less than 0.01 dielectric loss & high insulation strength (> 1000 VDC/3-mil thickness).
- Withstands soldering temperature as high as 300°C.
- RoHS compliant.
- UL-94-V0 fire-retardant rating.
- Custom copper and dielectric thicknesses available.



## Cool Clad™ - Insulated Metal Substrate

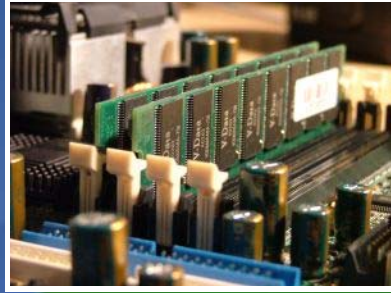
FR-4 circuit boards are poor thermal conductors. To overcome the thermal limitations typical printed circuit boards (PCBs) place on surface mount technology (SMT), we offer Cool Clad™ as a solution.

Cool Clad™ is a circuit board that has thermal management built right in. The board is actually a thin layer of electrically insulating material coated on aluminum layer. Cool Clad™ is designed for high power SMT applications such as LED lighting, solar energy, and power modules.



AIT Product	Thermal Conductivity	Dielectric Strength	Operating Temperature Range	Circuit Layer	Insulating Layer Thickness	Base Layer
Cool Clad™	2.8 w/mK	1000 volts/mil	- 50° C to 200° C	1/2 oz, 1 oz, 4 oz Copper Standard (other thickness available)	3 mil Standard (other thickness available)	5052 or 6061 Aluminum, 60 mil standard (custom thickness available) Copper (custom thickness)

# EMI Shielding & Static Protection Materials



## EMI Shielding

AIT has been supplying EMI/RFI shielding adhesives, caulks, and specialty coatings for military applications for more than 30 years. These room temperature curing materials provide over 120dB of shielding.

### Conductive Gasket

AIT Product	Characteristics	Electrical Resistivity (ohm-cm)	Thermal Conductivity (watt/m-C)	Tg [C]
SPG8055	Compressible EMI Gasket High Temperature Stability	$< 4 \times 10^{-4}$	2	-55

### Conductive Coating

AIT Product	Characteristics	Electrical Resistivity (ohm-cm)	Thermal Conductivity (watt/m-C)	Tg [C]	Cure Schedule
EG8020-MM*	Corrosion Resistant	$< 5 \times 10^{-4}$	2.6	50	25° C 44 hours

\* Sprayable or Brush on.

### Conductive Caulks

AIT Product	Characteristics	Electrical Resistivity (ohm-cm)	Thermal Conductivity (watt/m-C)	Cure Schedule
SR8850-1	Silicone Lower Cost Option	$5 \times 10^{-3}$	1.4	25° C 24 hours
SR8850-3	Silicone Silver Powder Filled	$5 \times 10^{-3}$	1	25° C 24 hours
PIS9006	Non-Silicone	$5 \times 10^{-3}$	1	25° C 24 hours

## Static Protection Materials

AIT's antistatic materials offer moisture resistance, room temperature curing and 20 years of proven success.

AIT Product	Characteristics	Electrical Resistivity (ohm-cm)	Thermal Conductivity (watt/m-C)	Die-shear (psi)	Tg [C]	Cure Schedule
EG9095	2 Part Epoxy	$10^5 - 10^9$	0.86	> 1000	45	150° C 30 minutes
EDC9150	Static Dissipative Coating	$10^5 - 10^9$	0.3	> 2000	-40	Air Dries
EDC9260	In-situ Curing > 90° C	$10^5 - 10^9$	0.3	> 4000	135	100° C 2 hours

# NASA Outgassing and MIL-STD 883

## NASA Outgassing

Most AI Technology products will meet NASA Outgassing requirements. AIT recommends a post cure bake procedure using the same conditions as the outgassing test to ensure the lowest possible outgassing in your application.

AIT Product	Cure Profile	%TML	%CVCM	%WVR
EG7635	48 hours @ 25° C	0.38	0.01	0.19
EG7635	8 hours @ 65° C	0.38	0.02	0.2
EG7635	3 hours @ 93° C	0.92	0.03	NR
EG8050	2 hours @ 121° C	0.9	0.1	0.2
ME7155	8 hours @ 80° C, 16 hours @ 80° C	0.44	0.09	0.12
ME7158 *	0.5 hours @ 65° C, 4 hours @ 100° C	0.54	0.04	NR
ME7159 *	0.5 hours @ 65° C, 8 hours @ 100° C	0.26	0.03	NR
ME8456 *	5 hours @ 102° C, 24 hours @ 125° C Vacuum	0.25	0.05	0.05
ESP8350	16 hours @ 150° C	0.08	0.01	0.01
RTK7659	2.5 hours @ 150° C	0.55	0.08	0.05
TC8750	8 hours @ 80° C	0.38	0.04	NR
TC8750	30 mins @ 150° C	0.28	0.07	0.06
TC8750	2 hours @ 150° C	0.31	0.08	0.04
TK7755 Epoxy Foil Sandwich	3 hours @ 100° C	0.34	0.08	0.12
TP7205	Post Cure Bake, 30 mins @ 150° C	0.78	0.08	0.08
TP7209	Non-Curing	0.38	0.08	NR
TP8205	Non-Curing	0.54	0.04	0.5



\* Recommended for Thin Bondlines. Please contact AI Technology for your specific application.

### Acceptability

Total Mass Loss (TML) < 1%  
 Collected Volatile Condensable  
 Materials (CVCM) < 0.1%  
 Water Vapor Regained (WVR) NR

### Test Procedures

ESA: PSS-01-792  
 NASA: ASTM E595-90

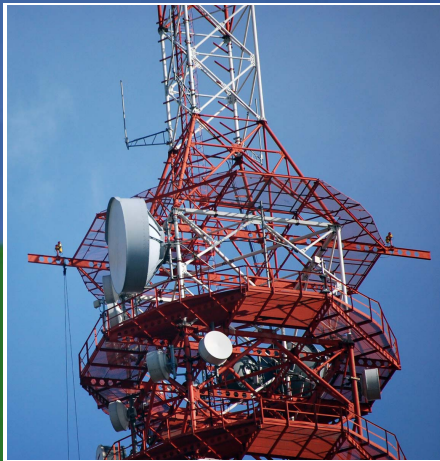
### Test Conditions

125° C for 24 hours @ 10 - 3 Pa (< 10-5 Torr)

AI Technology is committed to your success. We are here to put things together for the future.

## MIL-STD 883 5011.4

AIT Product	Characteristics	Electrical Resistivity (ohm-cm)	Thermal Conductivity (watt/m-C)	Die-shear (psi)	Tg [C]
ESP8350	Flexible Ambient Storage Dry Epoxy Film	$1.0 \times 10^{14}$	1.7	2000	-60
ME7155	1-Component Flexible Epoxy Paste	$1.0 \times 10^{14}$	1.7	1000	-25
ME7156-NG	1-Component Flexible Epoxy Paste	$1.0 \times 10^{14}$	1.7	1000	-25
ME7159	1-Component Flexible Epoxy Paste Diamond Filled	$1.0 \times 10^{14}$	11.4	1000	-25
ME8412	1-Component Rigid Epoxy Paste	$5.0 \times 10^{-4}$	7.9	2000	130
ME8456	1-Component Flexible Epoxy Paste	$4.0 \times 10^{-4}$	7.9	1000	-20
ME8456-GE	1-Component Flexible Epoxy Paste	$5.0 \times 10^{-4}$	5.7	1800	-25
ME8456-00	1-Component Flexible Epoxy Paste	$4.0 \times 10^{-4}$	15	1500	-20
TC8750	Tacky Epoxy Film	$5.0 \times 10^{-4}$	6.4	2400	-25
TP8550	Dry Thermoplastic Film	$4.0 \times 10^{-4}$	6.4	900	-70
TP8650	Dry Thermoplastic Film	$4.0 \times 10^{-4}$	6.4	900	-70



## Polyimide Laminates

High power unfortunately comes with high heat. To remove the heat from your high power devices while keeping them electrically isolated, AIT has a proven line of polyimide laminate thermal adhesives and interface materials.

These laminates combine the low thermal resistance and superior wetting of AI Technology materials with the dielectric and physical strength of a polyimide film.



## Ambiant Cure Epoxies

There are various applications where the sensitivity to heat requires the use of an ambient cure material.

AIT has had several requests for these materials and has developed two electrically insulating materials with high thermal conductivity.

AIT is currently working on an Electrically Conductive version as well. These 2-part epoxies will cure into an epoxy that will meet most industry requirements.

## Silver-Palladium Filled Conductive Epoxy: ME 8647



In humid environments silver reacts with moisture and causes electrically conducting growth on leads. This phenomenon known as silver migration causes electrical shorts in circuits with fine pitch traces.

In applications where performance reliability is mandatory, silver migration is controlled by substituting silver with silver-palladium alloy.

AI Technology's ME8647 is a silver-palladium filled epoxy with high conductivity (less than 5 milliohms-centimeter), long pot life (2 days at room temperature of 25° C), and optimized rheology for screen printing.

# New Products

## Flip-Chip Direct Attach

AIT is continuing their material pioneering with new products designed for contact bonding of dies bumped with gold studs and substrates with configured gold-plated contacts. These stringent applications require materials that have:

- **Low Ionic Impurities**
- **Low Moisture Absorption**
- **Low CTE**



AIT Product	Characteristics	CTE	Max Operation Temperature	Die-Shear	Viscosity
MC7880	Single Component Paste Ideal for Hermetically Sealed Packages	30	300	> 2500	20000
CXP7680-UF	Flip Chip Underfill Film Tack-Free	30	150	> 3600	N/A

## Flip-Chip & Component Underfill

AIT has created a unique underfill chemistry that offers ultimate temperature stability, Low ionic impurities, high flow for capillary movement and a low CTE.

AIT Product	Characteristics	CTE	Max Operation Temperature	Die-Shear	Viscosity
MC7883	Low Moisture Absorption	30	300	> 2500	9000

## Glob Top

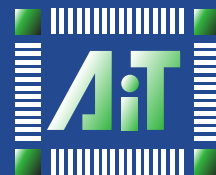
For the ultimate in die protection AIT has created a high temperature stable Glob-Top Encapsulant. This Low CTE, Low ionic impurity material applies and cures easily for simple processing.

AIT Product	Characteristics	CTE	Max Operation Temperature	Die-Shear	Viscosity
MC7883-GT	Black Colored High Strength	23	300	2,500	80000

## Patents\*

- 7,154,046 Flexible dielectric electronic substrate and method for making same
- 6,973,716 Electronic circuit construction method, as for a wireless RF tag
- 6,938,783 Carrier tape
- 6,717,819 Solderable flexible adhesive interposer as for an electronic package, and method for making same
- 6,581,276 Fine-pitch flexible connector, and method for making same
- 6,580,035 Flexible adhesive membrane and electronic device employing same
- 6,580,031 Method for making a flexible circuit interposer having high-aspect ratio conductors
- 6,496,373 Compressible thermally-conductive interface
- 6,432,253 Cover with adhesive preform and method for applying same
- 6,428,650 Cover for an optical device and method for making same
- 6,409,859 Method of making a laminated adhesive lid, as for an Electronic device
- 6,406,988 Method of forming fine pitch interconnections employing magnetic masks
- 6,376,769 High-density electronic package, and method for making same
- 6,316,289 Method of forming fine-pitch interconnections employing a standoff mask
- 6,399,178 Rigid adhesive underfill preform, as for a flip-chip device
- 6,297,564 Electronic devices employing adhesive interconnections including plated particles
- 6,136,128 Method of making an adhesive preform lid for electronic devices
- 6,108,210 Flip chip devices with flexible conductive adhesive
- 4,695,404 Hyperconductive filled polymers

\*Listed patents are available for licensing



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