Solar Energy Adhesive Solutions

Insight®
Adhesives Research®
Insight®

Adhesives Research designs, develops, and manufactures one-of-a-kind, customized products in pressure-sensitive adhesives, tapes, specialty films, coatings, and laminates. These solutions enable our customers to do extraordinary things with their products.

As an independent, multinational company, we bring a unique passion to the process of creating the essential component that will satisfy your specific need and help your product development process succeed.

Ours is a focused, disciplined approach that has been practiced for five decades. Insight is spurred by fresh, innovative thinking and is driven by the desire to be our industry’s most effective developer and producer of specialized products.

The result is a keen understanding of design requirements and a firm grasp of our ability to support your product development, which leads to the key technology solution that ensures a successful, timely launch of your product.

In a word – Insight®

We are an organization capable of seeing into a situation and sharing with you our people, technology, and processes.

Adhesives Research takes your product further

Our proven adhesive technologies deliver reliable bonds with enhanced performance characteristics to increase the functionality of thin film photovoltaics, polysilicon photovoltaic modules, and concentrated solar thermal applications. While we offer a wide range of proven standard products, our expertise and capabilities in polymer formulation, cutting-edge manufacturing, and customization give us the ability to quickly develop highly specialized adhesive components that match our customers’ exact needs.

Product Development & Manufacturing Capabilities

The Adhesives Research R&D and ISO-9001 certified manufacturing facilities located in Glen Rock, Pennsylvania and Limerick, Ireland provide extensive product development capabilities backed by complete in-house analytical testing, quality, and certification support.

We offer equivalent formulation and manufacturing capabilities at each facility including polymer synthesis, mixing and compounding, casting and drying, slitting and packaging, as well as custom release liner development.

bonding applications

Crystalline Silicon Photovoltaic
- Bus bars and coverlay
- Junction box bonding
- Interconnection
- Wafer positioning
- Module and frame assembly

Thin Film Photovoltaic
- Bus bars and coverlay
- Junction box bonding
- Interconnection
- Barrier adhesives
- Module and frame assembly

Building Integrated Photovoltaic
- Bus bar
- Interconnection
- Encapsulation
- Barrier adhesives

Concentrated Solar Thermal
- Assembly tapes
- High-temperature silicone adhesives
Electrically Conductive Adhesives

Our electrically conductive pressure-sensitive adhesives (PSAs) feature our homogenous conductive adhesive technology that forms stable conductive bonds to electrical contact points under a wide range of environmental conditions. The adhesive can be provided in a transfer adhesive format, or coated onto a tin-plated copper foil backing as an alternative bus bar material for delivering highly-reliable conductivity in thin film photovoltaic modules.

Mechanical Bonding & Assembly

The broad range of high-performance double-coated PSA foams or films, transfer, and thermally conductive adhesives available from Adhesives Research offer significant advantages over mechanical fasteners, liquid adhesives or epoxies for general assembly. Easy-to-apply and clean to process, these PSAs require no cure time and are solvent-free. They offer consistent application thickness, allow for thermal expansion and contraction, and are ideal for bonding irregular or dissimilar surfaces.

Electronically Clean, Low Outgassing Tapes

ARclean® electronically clean adhesives are acrylic, acid-free, organotin-free, have low extractable ions, pass leak tests when used as seals and offer excellent resistance to corrosion and environmental aging.

Optically Clear Tapes

The ARclear® line of defect-free optically clear adhesives offers low haze, high clarity and light transmission while reliably bonding flexible-to-flexible or flexible-to-rigid optical components. These adhesives are environmentally durable to resist temperature extremes, humidity and UV exposure.

Flexible Encapsulation and Barrier Systems

Our adhesive technologies form strong, flexible bonds while providing moisture and oxygen barrier properties required for dependable encapsulation.
Photovoltaic Bonding Applications

- Module and frame assembly
- Wafer positioning
- Bus bars and coverlay

Crystalline Silicon Photovoltaic technology, and processes.

In a word –

Insight

An independent, multinational company, Adhesives Research designs, develops, and manufactures one-of-a-kind, customized products as well as custom release liner development.

We offer equivalent formulation and manufacturing capabilities at each facility including polymer synthesis, mixing, and Limerick, Ireland provide extensive product development manufacturing facilities located in Glen Rock, Pennsylvania.

The Adhesives Research R&D and ISO-9001 certified exact needs.

Our focused, disciplined approach that supports your product development, which leads to the key technology solution that ensures a successful, timely launch of your product.

Insight

Our ability to create the essential component that will satisfy your specific need and help your product development.

As an independent, multinational company, Adhesives Research has been practiced for five decades. Insight is our industry's most effective developer and producer of specialized products.

Inspiration has been spurred by fresh, innovative thinking and is driven by the desire to be our industry's most effective developer and producer of specialized products.

Our solutions in pressure-sensitive adhesives, tapes, specialty films, coatings, and laminates. These solutions in thin film photovoltaics, polysilicon photovoltaic modules, and enhanced performance characteristics to increase the functionality.

Adhesives Research offers UL-rated products and we work directly with customers to obtain the proper certifications for their products as necessary.

I n s i g h t

ARclad®

- 92708: Demonstrates UV and environmental stability
- 92734: Delivers uniform adhesive thickness
- 92486: Bond instantly to low surface energy surfaces

ARclad®

- 9032: Facilitate in-line process/roll-to-roll manufacturing
- 90038: Demonstrate reliable and stable conductivity
- 90039: Resist corrosion with electronically clean formulations

ARclad®

- 90031: High-performance, low-outgassing acrylic adhesive. Secures cell in place during lamination processes and is also compatible with encapsulants.
- 90033: A 2 mil polyester film coated with a low-outgassing acrylic adhesive for bus bar protection.
- 90035: A 40 mil high-temperature tolerant foam coated both sides with electrically-conductive acrylic adhesive. Withstands elevated adhesion to many common barrier films such as FEP and Tedlar.
- 90036: A 1 oz electronic-grade, tin-plated copper foil coated with 1 mil of highly conductive acrylic adhesive. Withstands elevated adhesion to many common barrier films such as FEP and Tedlar.

Armed with our comprehensive knowledge of polymer formulation, cutting-edge manufacturing, and range of proven standard products, our expertise and capabilities give us the ability to quickly develop highly specialized adhesive components that match our customers' customization needs.

Polyphenylene sulfide (PPS) barrier adhesives

- Demonstrate UV and environmental stability
- Deliver uniform adhesive thickness
- Bond instantly to low surface energy surfaces

R tape engineered to meet customer needs.

ARclad®

- 90037: Electrical Interconnect Tape
- 90038: Bus Bar Conductive Foil Tape
- 90039: Insulation/Dielectric

ARclad®

- 90031: Single-faced film
- 90033: Double-faced film
- 90034: Double-faced foam

ARclad®

- 90031: Single-faced foil
- 90033: Single-faced foil

ARclad®

- 90036: Arclad Bus Bar Tapes
- 90037: Transfer adhesive
### the ingredients

#### Bus Bar Tapes
<table>
<thead>
<tr>
<th>Product</th>
<th>Construction</th>
<th>Adhesive</th>
<th>Liner</th>
<th>Description</th>
</tr>
</thead>
</table>

#### Electrical Interconnect Tape
<table>
<thead>
<tr>
<th>Product</th>
<th>Construction</th>
<th>Adhesive</th>
<th>Liner</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARclad® 9032</td>
<td>Transfer adhesive</td>
<td>Electrically-conductive acrylic</td>
<td>2 mil polyester film</td>
<td>A 1 mil electrically conductive adhesive featuring high Z-axis conductivity and limited X-Y conductivity.</td>
</tr>
</tbody>
</table>

#### Junction Box and Frame Assembly Tapes
<table>
<thead>
<tr>
<th>Product</th>
<th>Construction</th>
<th>Adhesive</th>
<th>Liner</th>
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</table>

#### Insulation and Coverlay Tapes
<table>
<thead>
<tr>
<th>Product</th>
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<th>Adhesive</th>
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<th>Description</th>
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#### Cell Positioning Tape
<table>
<thead>
<tr>
<th>Product</th>
<th>Construction</th>
<th>Adhesive</th>
<th>Liner</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARclad® 92486</td>
<td>Single-faced film</td>
<td>High-performance, low-outgassing acrylic</td>
<td>2 mil polyester film</td>
<td>A 2 mil polyester film coated with a low-outgassing acrylic adhesive. Secures cell in place during lamination processes and is also compatible with encapsulants.</td>
</tr>
</tbody>
</table>

#### Barrier Adhesive Tape
<table>
<thead>
<tr>
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<th>Adhesive</th>
<th>Liner</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARclad® 92734</td>
<td>Transfer adhesive</td>
<td>High-barrier elastomer</td>
<td>2 mil polyester film</td>
<td>A 2 mil coating of a high-barrier elastomer that offers excellent adhesion to many common barrier films such as FEP and Tedlar.</td>
</tr>
</tbody>
</table>

Adhesives Research offers UL-rated products and we work directly with customers to obtain the proper certifications for their products as necessary.

### PSA s e n h a n c e  p e r f o r m a n c e & e f f i c i e n c y

- Bond instantly to low surface energy surfaces
- Resist corrosion with electronically clean formulations
- Conform to flexible constructions
- Demonstrate reliable and stable conductivity
- Deliver uniform adhesive thickness
- Facilitate in-line process/roll-to-roll manufacturing
- Demonstrate UV and environmental stability
Electronically Clean, Low Outgassing Tapes

Electronically clean adhesives are acrylic, thermally conductive adhesives available from Adhesives Research offer significant advantages over mechanical bonding & assembly. Easy-to-apply and clean to process, these adhesives require no cure time and are solvent-free. They offer consistent application thickness, allow for thermal expansion and contraction, and are ideal for bonding irregular or dissimilar surfaces.

ARclean ® electronically clean adhesives are acrylic, thermally conductive adhesives available from Adhesives Research offer significant advantages over mechanical bonding & assembly. Easy-to-apply and clean to process, these adhesives require no cure time and are solvent-free. They offer consistent application thickness, allow for thermal expansion and contraction, and are ideal for bonding irregular or dissimilar surfaces.

The ARclear ® line of defect-free optically clear tapes is an independent developer and manufacturer of pressure-sensitive adhesives, tapes, specialty films, coatings, and laminates. ARclad®, ARclear® and ARclean® are registered trademarks of Adhesives Research, Inc. They are environmentally durable to resist corrosion and environmental aging. Pass leak tests when used as seals and offer excellent adhesion to a variety of substrates. They are acid-free, organotin-free, have low extractable ions, and are ideal for bonding thermally conductive materials for delivering highly-reliable conductivity in thin film photovoltaic modules.

Flexible Encapsulation and Barrier Systems

Flexible encapsulation and barrier systems are used to bond or seal sensitive components in harsh environments. ARadhesive technologies form strong, flexible bonds while providing moisture and oxygen barrier properties required for dependable encapsulation. The adhesive can be provided in a transfer adhesive format, or coated onto a tin-plated copper foil backing as an alternative bus bar in a transfer adhesive format, or coated onto a metal substrate. The adhesive can be provided as a PSA foam, double-coated PSA foil, or as a double-coated PSA film. ARadhesive technologies form strong, flexible bonds while providing moisture and oxygen barrier properties required for dependable encapsulation.

Mechanical Bonding & Assembly

Mechanical bonding & assembly is used to bond or fasten parts together using screws, bolts, rivets, or adhesives. ARfasteners, liquid adhesives or epoxies for general assembly. Easy-to-apply and clean to process, these adhesives require no cure time and are solvent-free. They offer consistent application thickness, allow for thermal expansion and contraction, and are ideal for bonding irregular or dissimilar surfaces.

ARclean ® electronically clean adhesives are acrylic, thermally conductive adhesives available from Adhesives Research offer significant advantages over mechanical bonding & assembly. Easy-to-apply and clean to process, these adhesives require no cure time and are solvent-free. They offer consistent application thickness, allow for thermal expansion and contraction, and are ideal for bonding irregular or dissimilar surfaces.