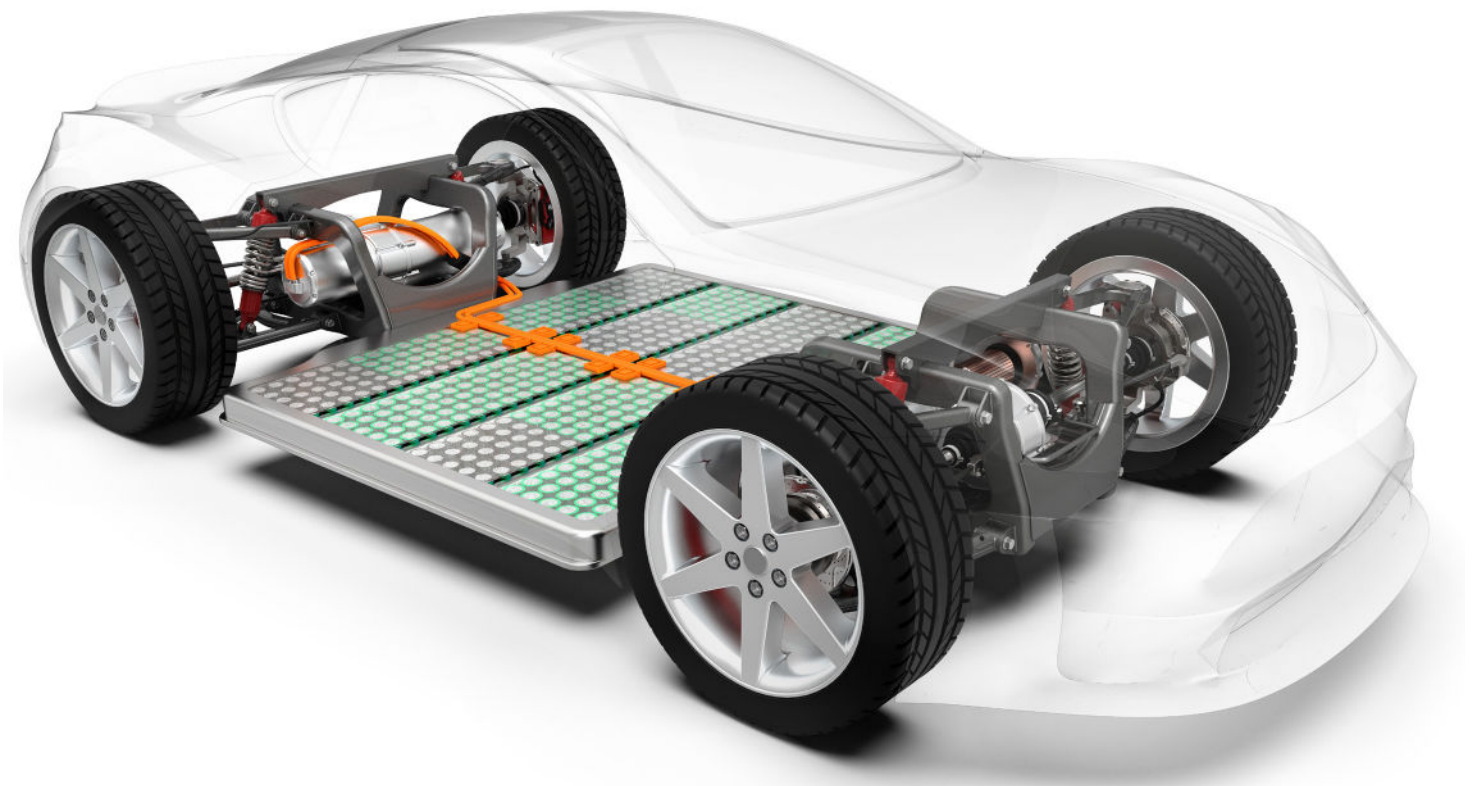




Adhesives Research®

Solutions for Electric Vehicle Battery Applications



Adhesive solutions that drive innovation

www.adhesivesresearch.com

Solutions for Electric Vehicle Battery Applications

As a global technology leader, Adhesives Research (AR) provides connectivity, thermal management, and moisture barrier protection to critical electronics segments, including Electric Vehicle (EV) Battery production. AR's portfolio of pressure sensitive adhesives is designed for a broad range of applications throughout the cell, module, and pack, including electrode and conductive bonding, encapsulation, device wrapping, shock absorbency, and process aids. Our chemists and engineers are passionate about developing novel products that enable our customers to overcome challenging applications in meeting the demands of an ever-evolving EV Battery market.

Module and Pack Applications:

Conductive Bonding:

Highly conductive tapes to solve interconnection challenges, available as foil-backed tapes, transfer tapes and heat seals

Thermal Interface Material Bonding:

Adhesives specially designed to facilitate bonding of thermal interface materials to enable heat transfer between components in the module/pack

Process Aids:

Ultra-clean release liners and protective films to withstand the extreme coating and baking conditions for electronics production with no chemical contamination

Vibration, Noise, and Corrosion Management:

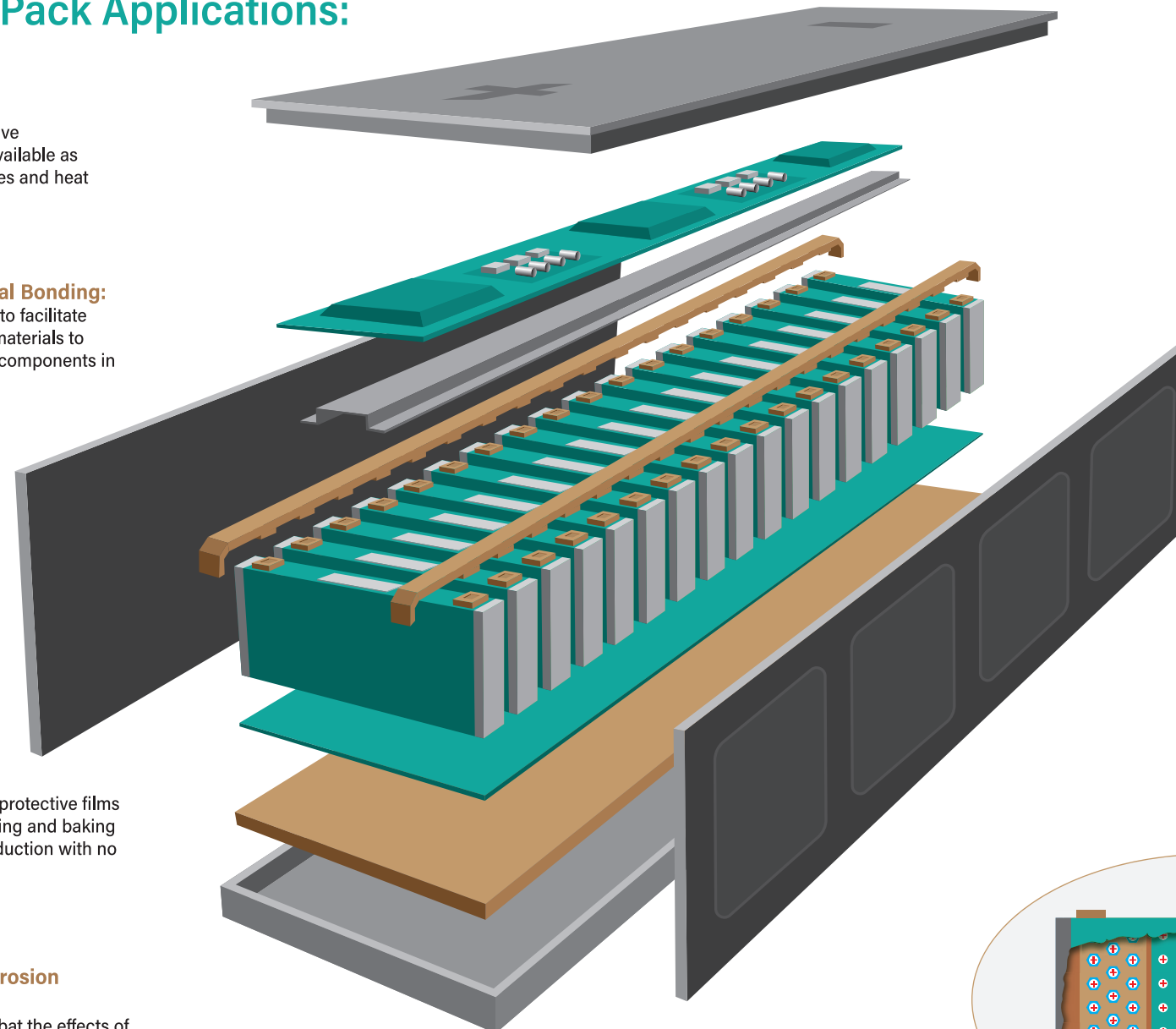
Dampening adhesives to combat the effects of nuisance factors such as harmonics/clattering and decay

Wire Management:

Adhesives and tapes for securing, handling and wrapping harnesses/cables within the battery pack

General Bonding:

Versatile bonding options throughout the module and pack (including low VOC, low surface energy and high surface energy substrates)



Cell Applications:

Edge Sealing and Moisture Barrier Protection:

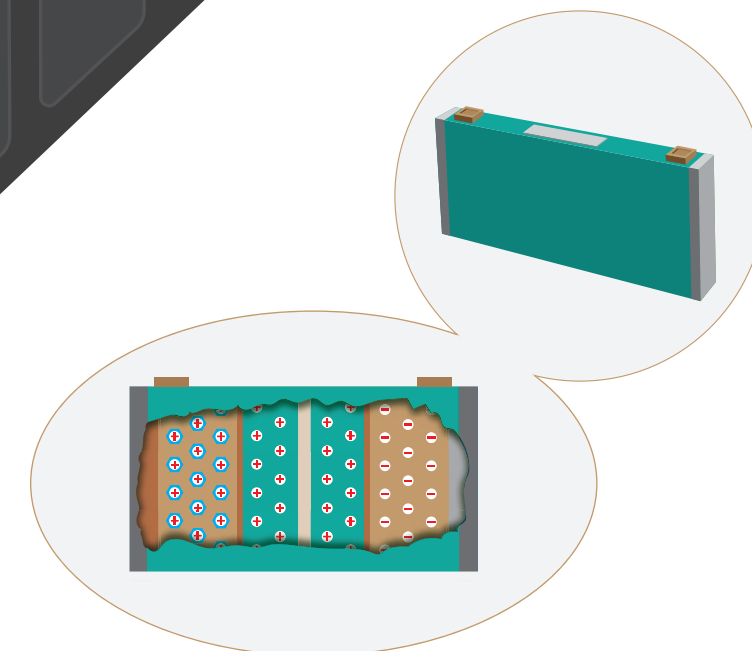
Specialty hydrophobic adhesives, with superior thermoxidative and UV stability, to protect the most sensitive battery components

Device Wrapping:

Electrically insulating options to protect and isolate battery cells and components

Shock Absorbent Pads:

Low surface energy and foam bonding adhesives for high-performance shock-absorbing applications



Thermal Runaway Protection:

Bonding solutions to incorporate barrier and isolating materials in the battery

Electrode Bonding:

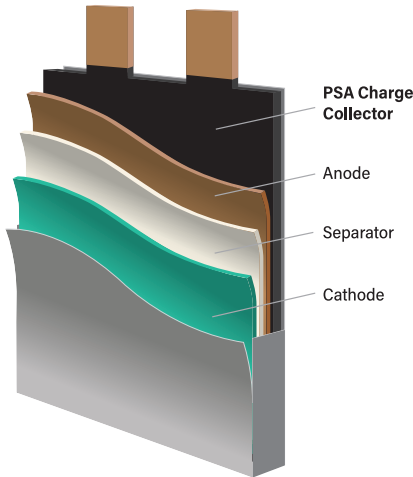
Ultra-thin adhesives for direct electrode bonding with cell tabs to enable increased energy density

Technology Highlights

Electrode Bonding

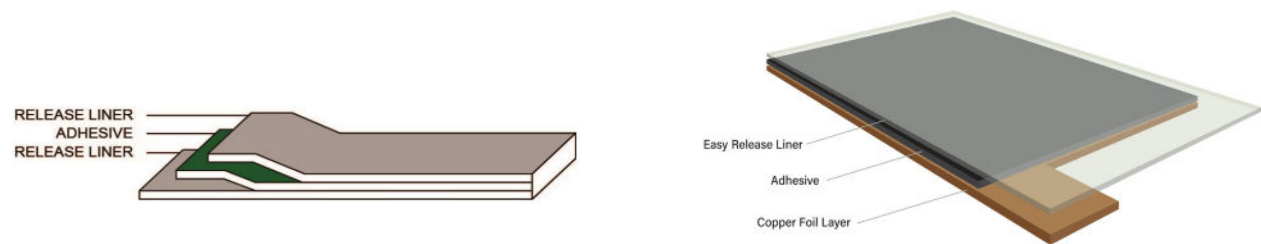
Key features:

- ✓ Non-reactive adhesive chemistry for direct electrode contact.
- ✓ Ultra-thin tape enhances energy density
- ✓ Efficient cell assembly compared to conventional electrodes.



Electrode Bonding

	ARcare® 93802	ARcare® 94141	ARcare® 94274
Description	High-performance	Ultra-thin, high-peel	Ultra-thin, high shear
Adhesive Thickness	25 µm	5 µm	5 µm
Peel Adhesion, Stainless Steel	23 oz/in	31 oz/in	12 oz/in
Loop Tack, Stainless Steel	16 oz/in	5 oz/in	18 oz/in
Static Shear, 70°C	9 min	16 min	>5,000 min



Transfer Tape

- Allows for easy die cutting and handling.
- Designed/manufactured in the USA.
- Slit sizes and length options.

Converted Parts

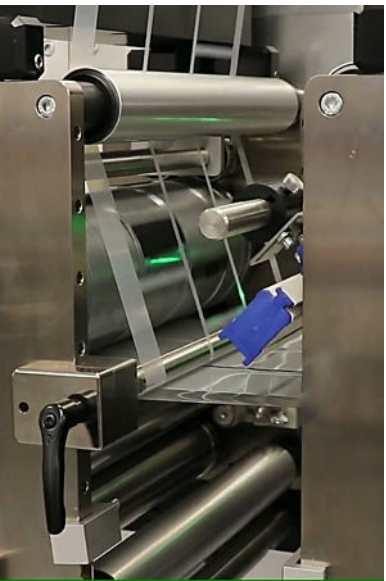
- Ready to assemble complete with foil tab.
- Available in individual parts or roll-to-roll.
- Customizable options.

Technology Highlights

Ultra-Clean Process Aids

Key Release Liner features:

- ✓ Clean release and practically no silicone transfer.
- ✓ PET substrates can withstand coating and baking/curing conditions.
- ✓ Available with tailorable release levels.

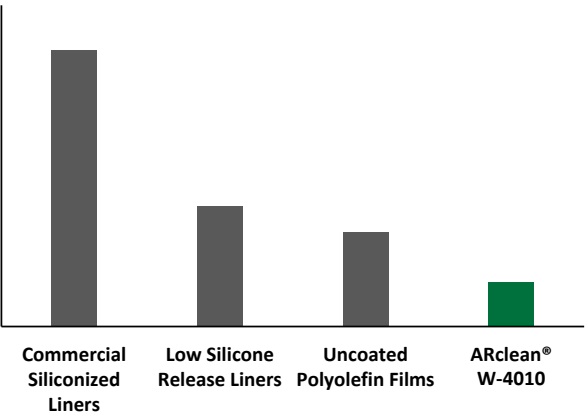


Ultra Clean Process Aids

Release Liner	Extractable Silicone	Substrate
ARclean® W- 4010	5 ng/cm² both release and back side	2 mil (51 µm) PET
ARclean® W- 4013	5 ng/cm² both release and back side	2 mil (51 µm) PET
ARclean® W- 5030	4 ng/cm² release side and 3 ng/cm² back side	2 mil (51 µm) PET

AR's Ultra-Clean Release Liners provide unmatched cleanliness for sensitive electronics applications. Available with smooth release profiles at tailored release levels, these process aid films are ideal for coating and curing of sensitive electrolyte films, functional coatings, and more.

Ultra Clean Process Aids



Adhesive Guide

ELECTRODE BONDING

Product	Description	Construction	Adhesive type/ thickness	Peel Adhesion, Stainless Steel	Loop Tack, Stainless Steel	Static Shear, 70°C
ARflow® 93802	High-performance	TT	Rubber/25 µm	23 oz/in	16 oz/in	9 min
ARflow® 94141	Ultra-thin, high-peel	TT	Rubber/5 µm	31 oz/in	5 oz/in	16 min
ARflow® 94274	Ultra-thin, high-shear	TT	Rubber/5 µm	12 oz/in	18 oz/in	>5,000 min

DEVICE WRAPPING

Product	Description	Construction	Backing color/type/ thickness	Adhesive type/ thickness	Release Liner type/ thickness	Peel Adhesion to Stainless Steel (ozf/in (N/25 mm))
ARcare® 93948	Resistant to high-temp bubbling & bond failure; Acid-free	SCT	Black/PET/51 µm	Acrylic/25 µm	PET/51 µm	50 (13.9)
ARcare® 92073	Clean, low VOCs, heat resistant; Acid-free	SCT	Black/PET/76 µm	Acrylic/38 µm	PET/51 µm	78 (21.7)
ARcare® 93945	Clean adhesive; Highly flexible polyurethane backing	SCT	Clear/PU/51 µm	Acrylic/73 µm	PET/51 µm	74 (20.1)
ARcare® 93469	Low tack for temporary/ in-process device wrapping applications; Heat stabilized PET backing	SCT	Clear/ PET/ 51 µm	Acrylic/18 µm	PET/51 µm	3 (0.8)
ARcare® 7759	Clean adhesive; Clear PET backing	SCT	Clear/ PET/ 51 µm	Acrylic/30 µm	PET/51 µm	50 (13.9)

SHOCK ABSORBENT PADS

Product	Description	Construction	1st Release Liner (Type/ Thickness)	1st Adhesive (Type/ Thickness)	Carrier (Color/ Type/ Thickness)	2nd Adhesive (Type/ Thickness)	2nd Release Liner (Type/ Thickness)	Peel Adhesion to Stainless Steel (ozf/in [N/25 mm])
ARclad® 8626-78 (Grey Foam)	Acrylic adhesive designed for a water-tight bond; Resistant to temperature extremes, humidity, & vibrations	DCFT	Blue/ PP/102 µm	Acrylic/58 µm	Grey or Black/ closed-cell PE foam/1/32" (794 µm)	Acrylic/58 µm	Blue PP/76 µm	100 (27.8)
ARclad® 8726-78 (Black Foam)								
ARclad® 72000 Series	Rubber-based adhesive formulated for superior anchorage to foam & shock-absorbing materials; High peel adhesion & shear performance	See ARclad® 72000 Series table for construction details						163 (45.3)
ARclad® 73000 Series	Acrylic formulated for superior anchorage to foam & shock-absorbing materials; High peel adhesion & shear performance on low surface energy substrates	See ARclad® 73000 Series table for construction details						122 (33.9)

Adhesive Guide

GENERAL BONDING

Product	Description	Construction	1st Release Liner (Type/ Thickness)	1st Adhesive (Type/ Thickness)	Carrier (Color/ Type/ Thickness)	2nd Adhesive (Type/ Thickness)	2nd Release Liner (Type/ Thickness)	Peel Adhesion to Stainless Steel (ozf/in [N/25 mm])
ARclad® 7418	Aggressive acrylic adhesive with superior adhesion to various surfaces	TT	White/ Poly-coated paper/160 µm (double-faced)	Acrylic/64 µm				50 (13.9)
ARclad® 8645-78	Temperature-resistant foam tape offering excellent shear and peel performance on diverse surfaces	DCFT	Blue/ PP/76 µm (double-faced)	Acrylic/58 µm	Grey/closed-cell PE foam/ 42 mil (1067 µm)	Acrylic/58 µm		85 (23.6)
ARclad® 8314-10	Resistant to temperature and humidity; Offers strong adhesion to low surface energy materials and is ideal for rough surfaces and gap filling	DCFT	White/ SCK paper/81 µm (double-faced)	Acrylic/84 µm	Clear PET/ 25 µm	Acrylic/84 µm		90 (25.0)
ARclad® 71000 series	Acrylic designed for enhanced bonding to high surface energy materials	See ARclad® 71000 Series table for construction details						89 (24.7)
ARclad® 73000 series	Acrylic designed for enhanced bonding to low surface energy materials	See ARclad® 73000 Series table for construction details						122 (33.9)
ARclad® 74000 series	Clean acrylic with low outgassing and low VOCs	See ARclad® 74000 Series table for construction details						48 (13.3)

THERMAL RUNAWAY PROTECTION

Product	Description	Construction	1st Release Liner (Type/Thickness)	1st Adhesive (Type/Thickness)	Carrier (Color/Type/ Thickness)	2nd Adhesive (Type/Thickness)
ARclad® 73000 series	Acrylic designed for enhanced bonding to low surface energy materials	See ARclad® 73000 Series table for construction details				

THERMAL INTERFACE MATERIAL BONDING

Product	Description	Construction	1st Release Liner (Type/Thickness)	1st Adhesive (Type/ Thickness)	Carrier (Color/Type/ Thickness)	2nd Adhesive (Type/ Thickness)
ARclad® 71000 series	Acrylic designed for enhanced bonding to high surface energy materials	See ARclad® 71000 Series table for construction details				
ARclad® 72000 Series	Rubber-based adhesive formulated for superior anchorage to foam & shock-absorbing materials; High peel adhesion & shear performance	See ARclad® 72000 Series table for construction details				
ARclad® 73000 series	Acrylic designed for enhanced bonding to low surface energy materials	See ARclad® 73000 Series table for construction details				

Adhesive Guide

CONDUCTIVE BONDING

Product	Description	Construction	1st Release Liner (Type/ Thickness)	1st Adhesive (Type/ Thickness)	Carrier (Color/Type/ Thickness)	2nd Adhesive (Type/ Thickness)	2nd Release Liner (Type/ Thickness)	Peel Adhesion to Stainless Steel (ozf/in [N/25 mm])	Volume Resistance	Surface Resistance
ARcare® 93758	Performance conductive acrylic; Resistant to creep, temperature, and humidity; Tin-coated backing for oxidation and corrosion resistance	SCT	Clear/ PET/51 µm	Highly conductive acrylic/25 µm	Roll-annealed tin-coated copper foil/ 36 µm			35 (9.7)	<2 mΩ	<0.5 Ω
ARcare® 92570	Die-cuttable construction with superior EMI shielding and grounding capabilities	SCT	Clear/ PET/51 µm	Highly conductive acrylic/33 µm	Copper foil/ 18 µm			62 (17.2)	<2 mΩ	<118 mΩ
ARclad® 93853	Heat-seal adhesive for shielding and electrical bonding; Resistant to temperature and humidity	SCT		Conductive curable heat seal/33 µm	Roll-annealed tin-coated copper foil/ 36 µm			40 (11.1)	<50 mΩ	<118 mΩ
ARclad® 9032-70	Transfer tape adhesive with superior z-axis conductivity due to its unique filler package	TT	Clear/ PET/51 µm	Conductive acrylic/25 µm			White PET/51 µm	30 (8.3)	<10 mΩ	>10 kΩ
ARclad® 8001-77	Double-coated adhesive offering conformability to rough surfaces	DCT	White/ Poly-coated paper/160 µm	Conductive Acrylic/51 µm	Highly conductive nonwoven/ 20 µm	Conductive Acrylic/51 µm	Poly-coated paper/160 µm	45 (12.5)	<0.5 Ω	<4 Ω

VIBRATION, NOISE AND CORROSION MANAGEMENT

Product	Description	Construction	1st Release Liner (Type/ Thickness)	1st Adhesive (Type/ Thickness)	Carrier (Color/ Type/ Thickness)	2nd Adhesive (Type/ Thickness)	2nd Release Liner (Type/ Thickness)	Peel Adhesion to Stainless Steel (ozf/in [N/25 mm])
ARclad® 8626-78 (Grey Foam)	Acrylic adhesive designed for a water-tight bond; Resistant to temperature extremes, humidity, & vibrations	DCFT	Blue/ PP/102 µm	Acrylic/58 µm	Grey or Block/ closed-cell PE foam/1/32" (794 µm)	Acrylic/58 µm	Blue PP/76 µm	100 (27.8)
ARclad® 8726-78 (Black Foam)								
ARclad® 72000 Series	Rubber-based adhesive for superior bonding to foam & shock-absorbing materials; Water-tight seal with high peel & shear performance	See ARclad® 72000 Series table for construction details						163 (45.3)
ARclad® 74000 series	Clean acrylic with low outgassing and low VOCs	See ARclad® 74000 Series table for construction details						48 (13.3)

WIRE MANAGEMENT

Product	Description	Construction	Carrier (Color/Type/ Thickness)	Adhesive (Type/ Thickness)	2nd Release Liner (Type/ Thickness)	Peel Adhesion to Stainless Steel (ozf/in [N/25 mm])
ARclad® 74000 series	Clean acrylic with low outgassing and low VOCs	See ARclad® 74000 Series table for construction details				48 (13.3)

Adhesive Guide

EDGE SEALING & MOISTURE BARRIER PROTECTION

Product	Description	Construction	1st Release Liner (Type/Thickness)	Adhesive (Type/ Thickness)	2nd Release Liner (Type/Thickness)	Peel Adhesion to Stainless Steel (ozf/in [N/25 mm])	Moisture permeability (g-mil/m2-day)
ARclear® 44005 (formally ARcare® 93453)	Moisture barrier adhesive with strong adhesion to various substrates; Chemically inert with excellent thermo-oxidative and UV stability	TT	Clear/ PET/51 µm	Rubber/13 µm	Clear PET/51 µm	45 (12.5)	2.2
ARclear® 44010 (formally ARcare® 92734)	Moisture barrier adhesive with strong adhesion to various substrates; Chemically inert with excellent thermo-oxidative and UV stability	TT	Clear/ PET/51 µm	Rubber/25 µm	Clear PET/51 µm	45 (12.5)	2.2
ARclear® 44110 (formally ARcare® 93378)	Moisture barrier adhesive with strong adhesion to various substrates; Chemically inert with excellent thermo-oxidative and UV stability	TT	Clear/ PET/51 µm	Rubber/25 µm	Clear PET/127 µm	50 (13.9)	2.2
ARclad® 72000 Series	Rubber-based adhesive for superior bonding to foam & shock-absorbing materials; Water-tight seal with high peel & shear performance	See ARclad® 72000 Series table for construction details				163 (45.3)	
ARclad® 73000 series	Acrylic adhesive designed for water-tight bonding to low surface energy materials	See ARclad® 73000 Series table for construction details				122 (33.9)	

PROCESS AIDS

Product	Description	Construction	Carrier (Color/Type/ Thickness)	Adhesive (Type/ Thickness)	Release Force (g/2in)
ARclean® 4010	Ultra-clean liner with ultra-low extractables; Ideal for sensitive electrical components and cast materials like ceramics and colloids	SCT/Liner	Clear/PET/51 µm		10
ARclean® 4013		SCT/Liner	Clear/PET/76 µm		10
ARclean® 4026		SCT/Liner	Clear/PET/51 µm		10
ARclean® 5030		SCT/Liner	Clear/PET/51 µm		54
ARclad® 79027	Low-tack acrylic suitable for temporary protection or as a process aid for casting	SCT	Clear/PET/51 µm	Acrylic/18 µm	17
ARclad® 79029		SCT	Clear/PET/51 µm	Acrylic/23 µm	113

Adhesive Guide

ARclad® 71000 Series

Product	Construction	1st Release Liner (Type/Thickness)	1st Adhesive (Type/Thickness)	Carrier (Color/Type/Thickness)	2nd Adhesive (Type/Thickness)
ARclad® 71020	TT	Brown, Poly-coated Kraft Paper / 109 µm	Acrylic / 51 µm	-	-
ARclad® 71035	TT	Brown, Poly-coated Kraft Paper / 109 µm	Acrylic / 89 µm	-	-
ARclad® 71150	DCT	Brown, Poly-coated Kraft Paper / 109 µm	Acrylic / 51 µm	Clear PET / 25 µm	Acrylic / 51 µm
ARclad® 71180	DCT	Brown, Poly-coated Kraft Paper / 109 µm	Acrylic / 89 µm	Clear PET / 25 µm	Acrylic / 89 µm

ARclad® 72000 Series

Product	Construction	1st Release Liner (Type/Thickness)	1st Adhesive (Type/Thickness)	Carrier (Color/Type/Thickness)	2nd Adhesive (Type/Thickness)
ARclad® 72020	TT	Brown, Poly-coated Kraft Paper / 109 µm	Rubber / 51µm	-	-
ARclad® 72035	TT	Brown, Poly-coated Kraft Paper / 109 µm	Rubber / 89 µm	-	-
ARclad® 72150	DCT	Brown, Poly-coated Kraft Paper / 109 µm	Rubber / 51µm	Clear PET / 25 µm	Rubber / 51µm
ARclad® 72255	DCT	Brown, Poly-coated Kraft Paper / 109 µm	Rubber / 51µm	Tissue / 38 µm	Rubber / 51µm
ARclad® 72340	DCT	Brown, Poly-coated Kraft Paper / 109 µm	Rubber / 51µm	DC Scrim	Rubber / 51µm

ARclad® 73000 Series

Product	Construction	1st Release Liner (Type/Thickness)	1st Adhesive (Type/Thickness)	Carrier (Color/Type/Thickness)	2nd Adhesive (Type/Thickness)
ARclad® 73020	TT	Brown, Poly-coated Kraft Paper / 109 µm	Acrylic / 51 µm	-	-
ARclad® 73035	TT	Brown, Poly-coated Kraft Paper / 109 µm	Acrylic / 89 µm	-	-
ARclad® 73150	DCT	Brown, Poly-coated Kraft Paper / 109 µm	Acrylic / 51 µm	Clear PET / 25 µm	Acrylic / 51 µm
ARclad® 73180	DCT	Brown, Poly-coated Kraft Paper / 109 µm	Acrylic / 89 µm	Clear PET / 25 µm	Acrylic / 89 µm

ARclad® 74000 Series

Product	Construction	1st Release Liner (Type/Thickness)	1st Adhesive (Type/Thickness)	Carrier (Color/Type/Thickness)	2nd Adhesive (Type/Thickness)
ARclad® 74018	TT	Brown, Poly-coated Kraft Paper / 109 µm	Low VOC Acrylic / 46 µm	-	-
ARclad® 74030	TT	Brown, Poly-coated Kraft Paper / 109 µm	Low VOC Acrylic / 76 µm	-	-
ARclad® 74146	DCT	Brown, Poly-coated Kraft Paper / 109 µm	Low VOC Acrylic / 46 µm	Clear PET / 25 µm	Low VOC Acrylic / 46 µm
ARclad® 74251	DCT	Brown, Poly-coated Kraft Paper / 109 µm	Low VOC Acrylic / 46 µm	Tissue / 38 µm	Low VOC Acrylic / 46 µm
ARclad® 74336	DCT	Brown, Poly-coated Kraft Paper / 109 µm	Low VOC Acrylic / 46 µm	DC Scrim	Low VOC Acrylic / 46 µm

Types of Tape Construction

Transfer Tape (TT)

Unsupported adhesive is coated directly onto a release liner, allowing transfer films to be the most flexible and conformable of all bonding systems.

- ✓ Vibration damping
- ✓ Bonds with consistently thin line
- ✓ High strength bonding to a variety of industrial substrates
- ✓ Conforms well to irregular surfaces



Single-Coated Tape (SCT)

Single-coated tapes consist of a backing that is coated on one side with an adhesive. Single-coated tapes are available either in selfwound rolls or with a release liner for ease of application.

- ✓ Ideal for over-lamination
- ✓ Protecting
- ✓ Energy management



Double- Coated Tape (DCT)

Double-coated tapes have a carrier that is coated on both sides with an adhesive, eliminating heat and solvent cure cycles. The instant bonding capabilities of double-coated tapes make them very conducive to automation and high-speed processing.

- ✓ Offers ease of handling
- ✓ Bonding rigid materials to irregular surfaces
- ✓ Compensates for thermal expansion
- ✓ Reduces sound, shock, and vibration
- ✓ Allows use of two different adhesives per application



Heat-activated Film Tape

Heat-activated film tapes require heat and pressure to achieve final bonding to any surface.

- ✓ Ideal for plasticized materials
- ✓ High ultimate bonding strength
- ✓ Conforms to irregular or textured surfaces



High-performance Thin Foam Tape

High-performance thin foam tape is designed for mounting smart devices and other components in various electronics applications.

- ✓ Fill narrow gaps
- ✓ Excellent impact resistance
- ✓ Distribute stress uniformly over the bonded area





Adhesives Research®

About Adhesives Research:

Adhesives Research is a permanently independent developer and manufacturer of adhesives and coatings for various markets.

We utilize our material knowledge, polymer synthesis/formulation expertise, and versatile manufacturing capabilities to supply key components to the industry. We offer robust products and technologies and can also rapidly customize to meet the specific needs of an application.

Headquartered in Glen Rock, PA. Adhesives Research has also sales and manufacturing facilities in Ireland and sales offices in China and Singapore.

To learn more information about how Adhesives Research can help solve tape and materials engineering challenges, contact us today.



Scan me for more details

2023, Adhesives Research, Inc.

(October 2023)

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