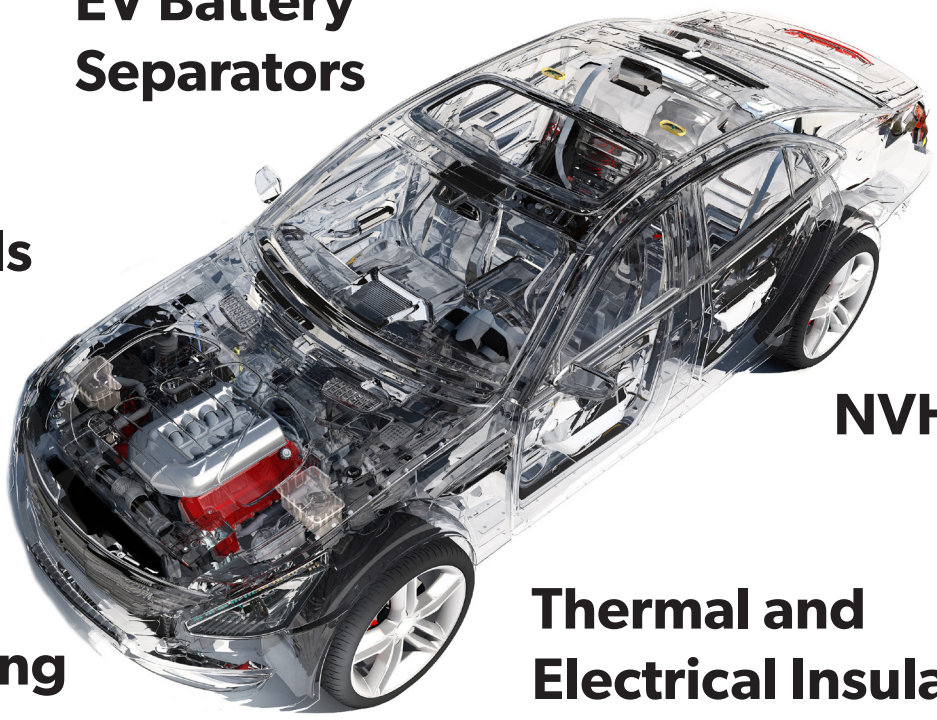
WHITLAM GROUP

Pressure-Sensitive Adhesive Automotive Bonding Applications

Whitlam manufactures parts that are used to assemble various sub-assemblies.

Whether the application is to reduce Buzz, Squeak, and Rattle (BSR), to eliminate Noise, Vibration, and Harshness (NVH), or to achieve light weighting goals to improve fuel economy we can provide an engineered solution.

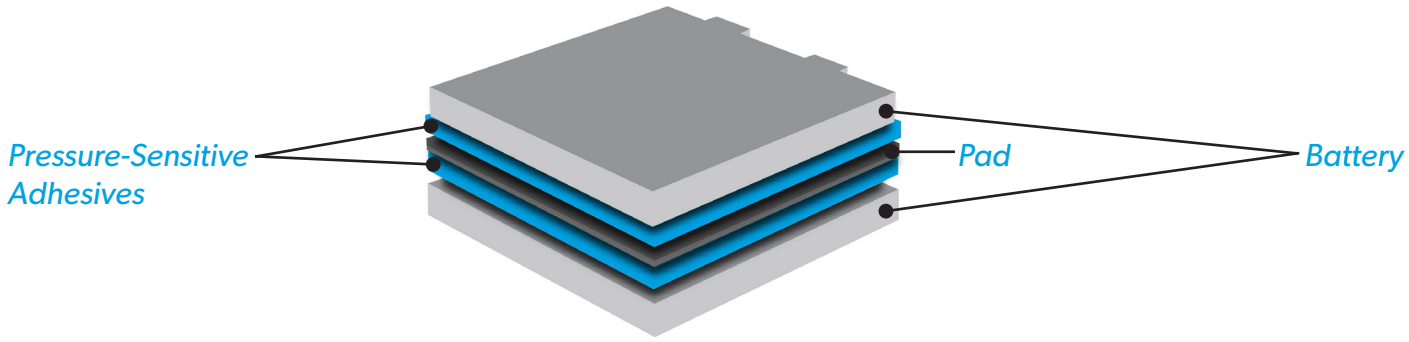
Our team at Whitlam Group specializes in design, and custom converting to create a product to meet your needs. This could include solving a problem, providing efficiency gains, or reducing costs. Our state-of-the-art equipment allows Whitlam to accommodate some of the tightest tolerances in the industry, down to +/- 0.1mm (material dependent).
Our Servo-Motion control systems allow for island placement, and the ability to laminate many materials with great precision.



EV Battery Bonding

The use of pressure-sensitive tapes to bond pouch and/or prismatic cells together in EV Battery pack assemblies offer key benefits:

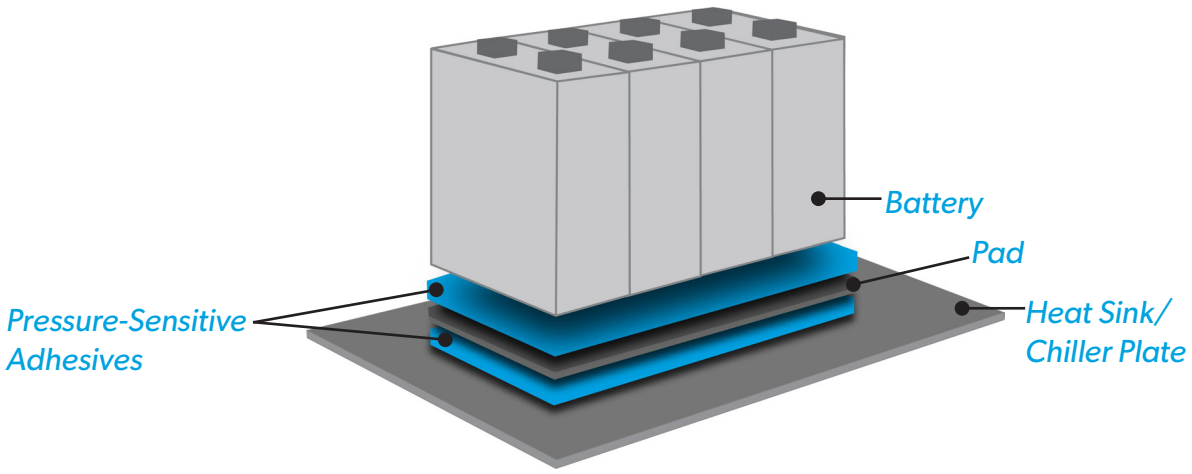
- Pressure-sensitive adhesives require no cure time, with immediate strength — they can act as an assembly aid and a bonding solution, unlike liquid applied products.
- There is no need for mixing nozzles or pot life concerns, as pressure-sensitive adhesives feature single-component functionality.
- Flame retardant and dielectric tapes are available when there are flame or electrical requirements.



Thermal & Electrical Insulation

EV and battery manufacturers have strict requirements against thermal runaway events and rely on mica, ceramic fibers and other materials for protecting cells and passengers.

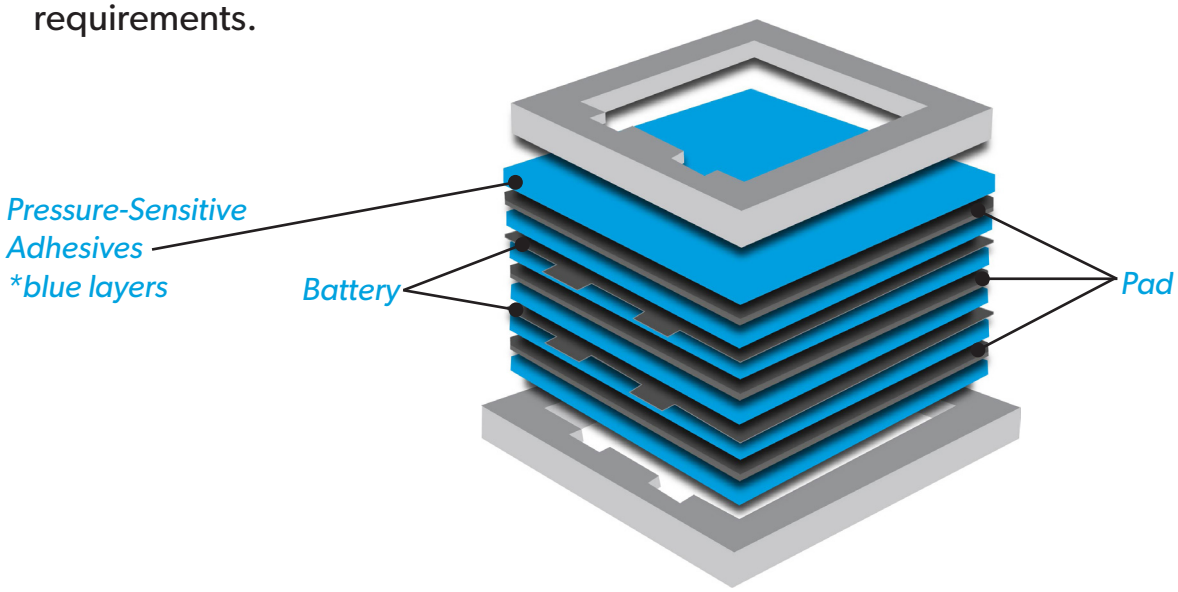
- Flame retardant adhesives that enable composites and materials to meet UL® 94 V-0 and other flame requirements.
- Single- and double-coated filmic tapes for fiber encapsulation and dielectric strength.
- Easy release liners for preventing cohesive failure of delicate fibrous based materials.



Compression Pad

Individual prismatic and pouch cells in EV Battery packs need protection from impact and movement. Pouch cells can also swell during charging and discharging. To help prevent damage, EV Battery manufacturers are placing foams backed with pressure-sensitive tape between each cell. The use of pressure-sensitive tapes for cell cushioning offers some key benefits:

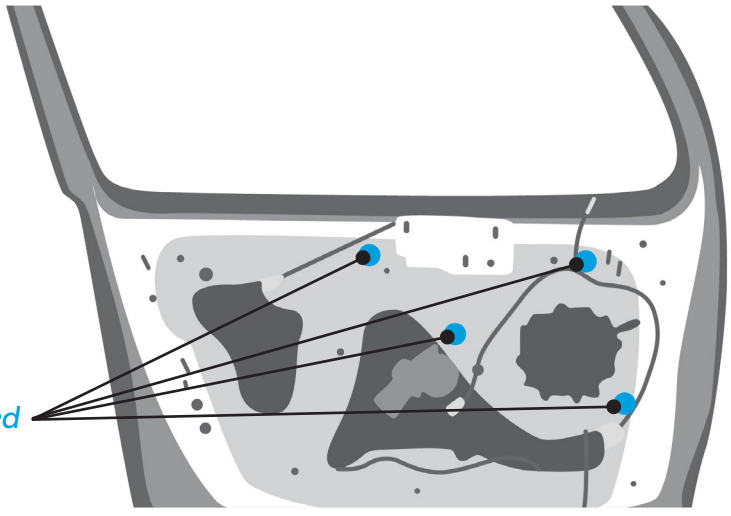
- Pressure-sensitive tapes require no cure time, with immediate strength — they can act as an assembly aid and a bonding solution, unlike liquid applied products.
- Full coverage adhesion between the metalized polyester pouch cell and cushion foam when pressure-sensitive tapes are used.
- Flame retardant and dielectric tapes are available when there are flame or electrical requirements.



Hole Sealing

Whitlam's hole covering products offer weight reduction of up to 85% in comparison to typical rubber and plastic hole plugs. There are a variety of alternatives to rubber or plastic plugs to fit any application.

- Thinner materials with pressure sensitive adhesive
- Air-tight closing to seal off holes from water and dust
- Characteristics include excellent acoustic-damping performance

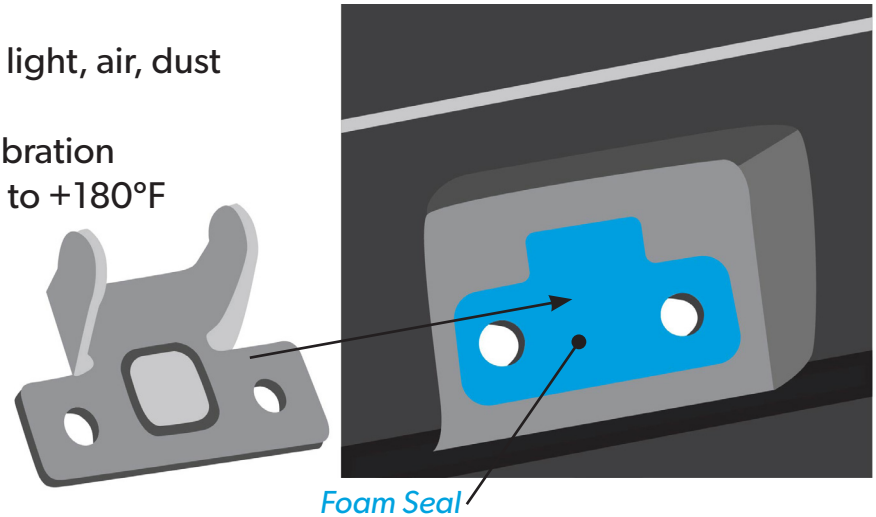


Foam Seals

Custom engineered Foam & Foam Tapes to provide an economical solution to your most demanding sealing requirements. These closed-cell PVC foams can be manufactured with or without adhesive.

- Closed cell structures seal out light, air, dust and moisture
- Cushions against shock and vibration
- Service temperatures of -20°F to +180°F

**Hinge would be applied on top of Foam Seal application*



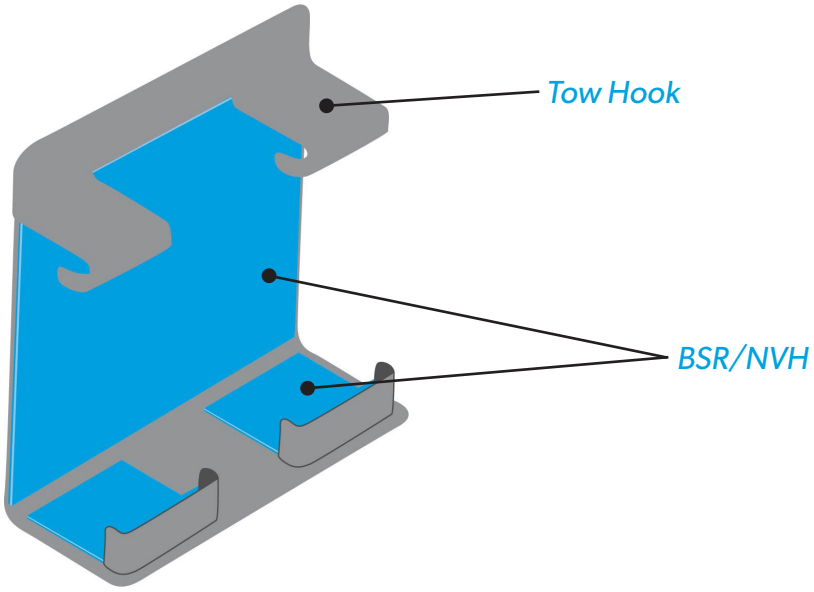
BSR/NVH

By combining pressure sensitive adhesives and using a variety of sound damping materials you are able to quiet noise and reduce vibration in many areas for automotive applications.

Double sided tapes for every application. A portfolio of products pre-tested to major OEM specifications. Low-VOC options.

- Reduce structure-borne noise in metal and composite panels and support structures
- Optimized acrylic converts vibrational energy to negligible heat that readily dissipates
- Reduce vibrational fatigue to decrease wear and tear on parts and lower the risk of part loosening and displacement
- Attach materials when low VOC is required
- Attach polyurethane, polyethylene or crushed EPDM gasket to seal air, water, and dust out

** BSR/NVH have various applications with a wide range of solutions within a vehicle to prevent buzzing, squeaking, rattling, and to cancel out noise and vibration.*



Adhesive Selection

Adhesive	Construction	Facestock/ Carrier	Liner(s)	Adhesive Characteristics: Flame Retardancy	Dielectric	Easy Release	LSE Bonding	XLSE Bonding	Gap Filling	Shear Strength	Temperature Resistance	Chemical Resistance
General Automotive Acrylic	Transfer Tape	-	2mil Clear PET/ 80# SCK			••	••			•	•	•
	Double Coated	0.5mil PET	60# SCK		••		••			•	•	•
	Single Coated	0.5mil PET	3mil Clear PET		••		••			•	•	•
	Single Coated	2.5mil PE	60# SCK		••		••			•	•	•
High Performance Acrylic	Transfer Tape	-	80# SCK							•••	••	••
	Double Coated	0.5mil PET	60# SCK		••					•••	••	••
Flame Retardant Acrylic	Transfer Tape	-	80# SCK	••			•			•	•	•
	Transfer Tape	-	2mil Clear PET/ 80# SCK	••		••	•			•	•	•
	Double Coated	1mil PET	60# SCK	••	••	••	•			•	•	•
	Double Coated	1mil PET	60# SCK	••	••	••	•			•	•	•
	Single Coated	1mil PET	80# SCK	••	••	••	•			•	•	•
	Single Coated	1mil PET	80# SCK	••	••	••	•			•	•	•
Flame Retardant Silicone	Double Coated	1mil PET	80# SCK	••	••	••	••	••		•	••	•
Flame Retardant Differential	Transfer Tape	-	2.5mil White PET/ 2mil Clear PET	•••			•••	••		••	•••	••
	Double Coated	1mil PI	2mil Clear PET/ 2.5mil White PET	•••	••		•••	••		••	•••	••
	Single Coated	1mil PI	2.5mil White PET	•••	••		•••	••		••	•••	••
Acrylic Foam Bond	Double Coated	Acrylic Foam	5mil RED PE				•		••	•••	•	•
	Double Coated	Acrylic Foam	5mil RED PE				•		••	•••	•	•

• = good ••= better •••= best

Memberships and Affiliations

GFA Gasket Fabricators Association · fta Member · Michigan Minority Supplier Development Council · MMA Michigan Manufacturers Association · 3M Select Converter Select · TLMI · AIAG Automotive Industry Action Group · AASA

Certifications

UL · ISO 14001:2015 Certification Intertek · IATF 16949:2016 Certification Intertek · CSA

About Whitlam Group

Whitlam Group is a leader of engineered label solutions and functional parts, solving complex label challenges for the world's largest corporations. Serving the automotive, industrial and consumer goods market for over sixty years, as a strategic partner. We understand the needs and processes of our customers and we proactively help them to achieve their objectives.

Learn more at www.whitlam.com

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