

ATTACHED TO YOUR WORLD

Lead the charge!

SMART ADHESIVE AND SEALANT TECHNOLOGIES FOR BATTERY SYSTEMS



Adhesive solutions by **ARKEMA**

Bostik smart solutions for battery systems

CONTENTS

Charles descent and a site
Sharing your priorities
Solutions for every battery application
Wide-ranging technologies to support customer needs
Acting and innovating for people and the planet
We are sustainability enablers
Why partner with us?
Choosing the right solution

A GLOBAL LEADER IN SMART ADHESIVES

For more than a century, we have developed innovative sealing and bonding solutions that touch and improve people's daily lives. Customers worldwide use our bonding systems in countless applications, across diverse fields, from industrial manufacturing, assembly and transportation, to daily mobility and e-mobility applications.

BOSTIK, AN ARKEMA COMPANY

We're committed to innovation and continually invest in technological advances in our drive to develop ever more capable and adaptable 'smart' adhesives. This commitment is supported by our parent company, Arkema, a globally renowned manufacturer of specialty chemicals and advanced materials.

BOSTIK AND ARKEMA SOLUTIONS FOR ELECTRIC VEHICLE BATTERY SYSTEMS

The electrification of powertrains is at the core of the transition towards a sustainable future of mobility - with batteries being the key technology. Arkema and Bostik are at the forefront of this technological and industrial transformation, being present all along the battery value chain - providing a unique range of solutions both inside and outside of the battery cell.



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Sharing your priorities

The successful take-up of electric vehicles relies on automotive and battery manufacturers addressing a wide range of challenges to meet the performance and competitiveness of today's and tomorrow's batteries. These include **improved safety**, **longer service life**, **greater range**, **fast charging**, **reliable performance**, **sustainable solutions**, and **reduction of costs**.

> With our wide range of innovative adhesive and sealant technologies for all key applications within battery systems, Bostik is committed to helping our customers increase safety, sustainability, reliability and efficiency.



SAFETY

Safety is paramount in electric vehicle design. Our adhesives help customers to meet stringent industry safety standards that increase driver and passenger safety, while also aiding safer battery manufacturing processes.

- Increased fire protection and crash resistance for enhanced driver and passenger safety
- 'Label free' & low VOC adhesives for increased user comfort and safety during manufacturing process



SUSTAINABILITY

From suppliers to customers, our demanding sustainability objectives generate a positive impact on the current key environmental challenges.

- Recycling and repair/Design for disassembly
- Preservation of resources
- Reduced overall carbon footprint







RELIABILTY

Major engineering challenges for battery systems include service life, thermal management and durability. With our adhesives, we contribute to improved vehicle reliability and increased long-term battery performance.

- Longer service life
- Improved thermal management
- Resistance to temperature, outside environment and extreme conditions
- Improved overall battery performance







Price, range and faster charging are key considerations for end-consumers. Our adhesives help to increase overall electric vehicle efficiency while also being efficient to process.

- Ideal for automated processes/Ease of use in high volume assembly
- Cost efficient
- Improved charging times and range
- Enables lightweight design





Wide-ranging technologies to support customer needs

Discover more about the features and benefits of Bostik's adhesive and sealant technologies, and how they address key applications in the battery system, from cell to module assembly through to battery pack assembly, and its integration into a vehicle's chassis.

BOSTIK

BUTYL

SEALING & GASKETING SOLUTIONS

SILYL MODIFIED POLYMER (SMP)

- High process efficiency in fully automated conditions and scalable for high volume
- Primerless on most substrates
- Excellent final sealing performance and air tightness
- Excellent elasticity
- Fire retardant

HOT MELT ADHESIVES

HOT MELT PRESSURE SENSITIVE ADHESIVES (HMPSA)

- Excellent sprayability due to low viscosity
- Perfect for high-speed automated application
- Excellent processability and highly cost efficient
- Instant adhesion (no curing time)
- Good bonding performance
- Resistance to vibration

HOT MELT POLYAMIDES (HMPA)

low pull-off force

humid conditions

automated conditions

Ideally suited for low pressure moulding

• Easy to service and repair, thanks to

Instant air-tight seal between substrates,

with excellent final sealing performance

Good ageing resistance in warm and

• High process efficiency in fully

- Excellent processability (single low pressure injection step and short cycle times) to address high volume demands
- High resistance to harsh environments (e.g. high/low temperatures, non-polar fluids etc.)

THERMELT

 Sustainable solution (reduced waste, bio-based, solvent-free and recyclable)

STRUCTURAL ADHESIVES

2-COMPONENT POLYURETHANE (2K PU)

PLIOGRIP[™]

- High design flexibility and versatility through multi-substrate bonding
- Excellent adhesion of dissimilar substrates (e.g. aluminium to composites) for lightweight design
- High bonding strength combined with high elongation at break
- High process efficiency in fully automated conditions
- Low isocyanate

UV CYANOACRYLATE (UV CYANO)

- Dual cure (light and surface/contact curing)
- Very short curing time after exposure to light (UV and visible light), allowing for rapid bonding and excellent processability
- Instant bonding capability ensures curing of non-transparent surfaces via contact
- No post-curing required
- Low odour, low blooming

THERMAL MANAGEMENT 🛛 📥 Polytec PT

THERMALLY CONDUCTIVE GAP FILLERS 1K Non Reactive

- · Silicone free material
- · Removable for recycling and repair
- · Excellent ratio of performance and density
- Reduced process complexity and investment costs for 1K compared to 2K

THERMALLY CONDUCTIVE ADHESIVES 2K PU

- · Thermally conductive
- No CRM labelling
- Mechanical properties with flexibility
- Good adhesion on various substrate
- Easy & facst processing

METHYL METHACRYLATE (MMA)

SAF&FIT

- High bonding strength in dynamic conditions
- Minimal surface preparation required and suitable for multi-substrate bonding
- Excellent ageing and chemical resistance (e.g. glycol)
- Good temperature resistance
- Well suited for automated assembly processes thanks to a good compromise between open and fixture time
- Not CMR (carcinogenic, mutagenic, or toxic for reproduction) classified

HYBRID CYANOACRYLATES (2K CYANO)



- Quick to achieve high structural strength
- Fast fixture time for excellent processability
- Instant bonding in combination with long open time and gap filling capabilities
- Excellent adhesion to multiple substrates including aluminium

THERMALLY CONDUCTIVE GAP FILLERS 2K SMP

- Various thermal conductivities
- Fully Automated process
- Product type: legacy, injectable, high temperature
- Applications range from module/pack up to power electronics

THERMALLY CONDUCTIVE ADHESIVES 2K Epoxy

- Low density, high flowing rate, non-abrasive, nonsilicone
- Automated process (bead applied by robot), application time: <1 min
- High bonding strength
- High thermal resistance up to 200°C validated
- Vertical application possible

See **Page 14** for full range of solutions

Acting and innovating for people and the planet

We are sustainability enablers

ARKEMA'S GLOBAL COMMITMENT TO SUSTAINABILITY



Delivering sustainable solutions driven by innovation

Developing solutions to replace existing materials based on crude oil, with bio-based and fully recyclable materials:

 Arkema obtained SuCCESS™ certification, the world's first sustainable castor code



Managing our activities as a responsible manufacturer

Acting for people's health & safety and for the environment:

• Aim to reduce GHG emissions by 38% (vs 2015) and VOC emissions by 68% (vs 2012) by 2030



Cultivating an open dialogue and close relations with our various stakeholders

Communicating in a transparent and accountable manner with customers, suppliers and partners:

• Ranked in 2021 Dow Jones Sustainability Indices (DJSI) among the chemical sector leaders: #3 in DJSI World, #2 in DJSI Europe

DRIVING SAFETY AND SUSTAINABILITY IN E-MOBILITY



Improving safety

- Committed to developing label-free solutions with low VOC, and without hazardous substances, for increased safety during manufacturing processes
- · Increasing driver and passenger safety, with fireand crash-resistant solutions



Preserving resources

- Developing solutions to extend battery lifespan, reduce waste and enable repair and recycling allowing for eco-design and circularity
- Driven by our 70-year legacy in sustainable materials, we're exploring alternative raw materials to preserve resources





Reducing environmental impact

- Electric vehicles significantly contribute to the reduction of GHG emissions, and we're committed to providing solutions for battery systems across the value chain
- Committed to the reduction of GHG emissions and energy consumption of our own business activities
- Serving regions with localised support, to reduce carbon footprint of logistics



Drawing on our deep expertise in the battery and automotive markets, we are able to offer OEMs and tier suppliers market-leading solutions that solve modern day e-mobility challenges.

EVERYWHERE IN THE BATTERY

We uniquely offer high-performance material solutions for both inside and outside of the battery cell, and are present all along the value chain.



INNOVATION

We're a renowned development partner, with global R&D teams. We innovate with our customers by leveraging our group's strong research and science portfolio on specialty materials.



MARKET-LEADING PORTFOLIOS

We offer a wide range of adhesive and sealant technologies to address major challenges in battery systems.

ARKEMA



LEGACY

We have long-term partnerships with cell and car manufacturers, bringing more than 25 years' experience in the battery market, and over 40 years in the automotive market.



APPLICATION & PROCESS EXPERTISE

We have a global network of expert teams with application and process know-how. We bring dedicated technical support and customised solutions to our customers.

With a 70-year legacy in sustainable materials, sustainability is at the core of our group's strategy. We continuously invest in R&D on sustainable initiatives with our customers.

Discover more about how our cutting-edge battery solutions are enabling the design and development of next-generation vehicles, here: **battery.arkema.com**

GLOBAL COVERAGE

Our global manufacturing capabilities mean we're able to serve customers from within their own regions.



DEDICATED TO BATTERIES

We're continually expanding our technology portfolio of battery solutions through acquisitions, and developing new partnerships in e-mobility.

Choosing the right solution

Use the table below to identify the right solution for your application needs.

			SEALING & GASKETING			STRUCTURAL							HOT MELT, CONVERTED		FUNCTIONAL					
PART	APPLICATION	SMP	Butyl	UV gasket	Elastosol	Acrylic (MMA)	2K PU	Epoxy	Anaerobic	UV AGRYLIC 2K Cvano	UV Cyano	HMPSA	Thermoplastic powder	Web & Film	Eletrically Conductive Adhesive	Thermal gap fillers	TECHNOLOGIES	PRODUCT *	KEY PROPERTIES	
BATTERY CELL ASSEMBLY	Bonding Cylindrical & Prismatic cells																Acrylic	SAF Ultimate 10; SAF 30-15, Ultimate 25	Excellent environmental resistance/ plated steel)	
						•	•	•									2K PU	Pliogrip 3540 -10, GPU 6130E**, GPU 6120E**	Excellent impact resistance / Fast cu	
																	UV Acrylic	DC 7508	Choc and vibration resistance	
																	Ероху	TC 406, TC 476, VP 2040	Curing at room temperature;thermal i	
	Bonding of pouch cells											•					HMPSA	TLH 2211 ELO; TEP 4411 ;THGRIP 2315-02	Good adhesion, quick setting, limited	
	Bonding of compression pads or thermal barriers											•					HMPSA	THERMORESOL TEP 70	High cohesion / Good thermal stabilit	
BATTERY PACK ASSEMBLY	Cover Sealing / Gasketing: non-serviceable																SMP	ISR 70-03*, ISR 70-05 AP*, ISR 70-03 FR*	Good elasticity, reasonable setting sp	
		•				•											Acrylic	SAF 400 15	Fast curing time / Permanent resilien	
	Cover Sealling / Gasketing: serviceable		•														Butyl	BEV 10H; Butyl Strips 1185	Good wetting properties / very good s	
	Structural bonding (e.g. battery housing, cooling plate)																2K PU	XPU18018 AM/BM, GPU 6130E**, GPU 6120E**	Good adhesion / Reasonable setting t	
																	2К Ероху	Pliogrip 5761B	Specific adhesion to bare metal and co	
																	Acrylic	SAF Ultimate 5; SAF 60 10; SAF 30 5, Ultimate 15 AP	Quick setting, high strength, reasonab	
																	2K SMP	GCR 6101**	Scalable for high volume production /	
					•	•	•	•	•	•							Anaerobic	TA- WL	Not CLP Classified / 100% connection	
																	2K Cyano	Structural; MP 515	High bonding strength / Excellent adhe	
																	UV acrylic	LC 177	Low shrinkage and non-cracking prop adhesion	
																	Elastosol	Elastosol M98	Adheres to a wide range of metal subs and pre treatment processes	
	Pack to chassis		•														Butyl	BEV 10H; Butyl Strips 1185	Very good tackiness / Good overall pe	
	Lamination for EMI shielding																PA Powder	EAA 1600	Ethylene Acrylic Acide, pre-applied po process can be used for lamination d	
													•	•			Web & Film	PE120, SPA110	No adhesive application system requir aluminium sheet, requires heated pro	
ELECTRONIC COMPONENTS	Encapsulation / LPM												•				НМРА	Thermelt [™] 865A & 865B	Good flexibility at cold temperatures	
	Conformal coating							•	•		•						UV Cyano	Light lock	Long open time without activation / L	
	Potting								•								Thermal Conductive Epoxy	TC 417-2	Excellent chemical and moisture res glass, metal, ceramic, FR 4 and most	
																	Ехроху	EP 601; EP 630	Low viscosity / Multi-substrates adhe	
	Sealing / gasketing of BMC			•													UV gasket	AU060R, AUV-8460	Flexible and durable / Resistant to te	
THERMAL MANAGEMENT	Gap fillers (GFs)																1K Thermal paste	VP2106-408; TP230; TP300	High thermal conductivity > 2,3 w/Mk	
		•														•	2K SMP	GF 180; GF230; GF300; GF300LV; .VP2112-120	Easy to dispense / good thermal cond	
	Thermally conductive																2K PU	XPU TCA 202	Thermal conductivity 1,5w/m.k) / No C	
	adhesives (TCAs)						•	•									Ероху	TC 432; TC 406; TC 476; VP 2027-28-7	Highly thermally conductive / exceller	
															•		Ероху	EC101, EC244, PU1000	Highly electrically conductive / excelle	

*Product names are diferent for AMAS region: ISR 70-03A; ISR 70-08A; ISR 70-03A FR. ** Product available only for specific region : APAC

CONTACT US

For more information on our smart solutions for battery systems, contact Bostik today: emea.industrial@bostik.com

fast curing / Adhesion on a wide range of substrates (e.g. Al and Ni

re response at room temperature

- management ; easy handling
- heat load to cells as swirl applied
- ty / Suitable for difficult substrates (PP, PE)
- ed when applied as Dual-SMP, good adhesion performance
- ce even after aging / Minimal surface preparation
- ealing against moisture / corrosion protective / easy to remove
- ime / Elastic behaviour
- omposites / Excellent impact absorption / Superior chemical resistance
- ole elasticity, limitations on PET film
- Isocyanate free solutions /Strong and durable sealing
- no loosening / Vibration resistant
- sion to many different substrates / Temperature and humidity resistance perties / High chemical and temperature resistance / Multi-substrate
- strates / Excellent chemical resistance / High resistance during cleaning
- erformance / Suitable for thin profiles
- owder to aluminium sheet offline, hot process required, SMC forming lirectly
- red, can be deposited as separate layer during assembling of SMC and occess
- / Good wettability / Flammability UL94 V0 Class
- Low odor, low blooming / Multi-substrate adhesion
- sistance / Cure at room temperature / Multi-substrate adhesion e.g. t plastics
- esion e.g. silicon, glass, metal
- mperature / Humidity resistance
- : / Easy to dispense / no curing / easy to remove
- ductivity / Silicone-free
- CMR labelling / Elongation of 10%
- nt adhesion to ferrous and non ferrous metals and most plastics
- ent adhesion to ferrous and non ferrous metals and most plastics

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