

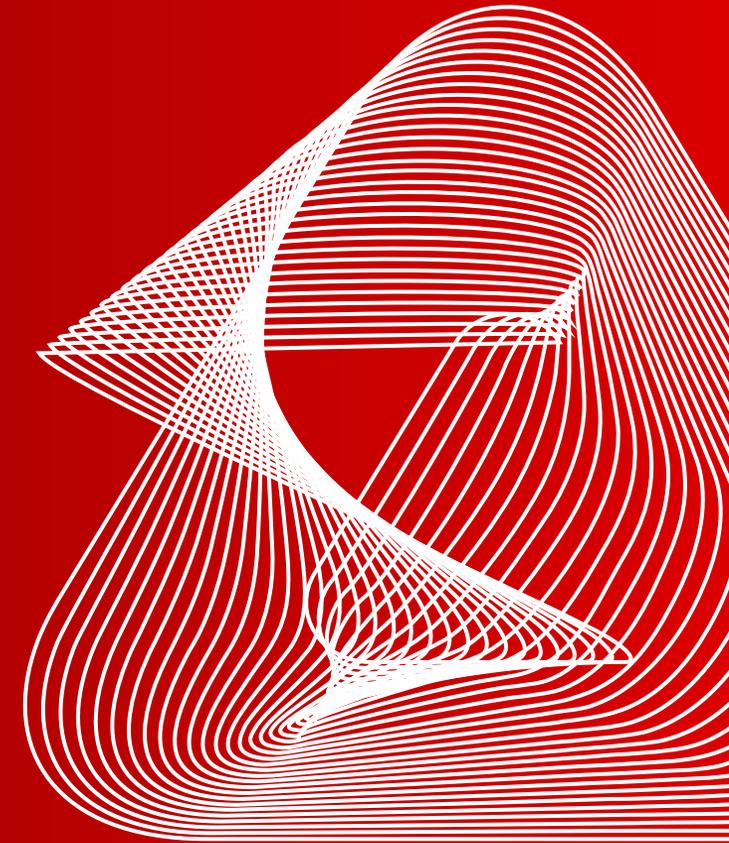


LabelTalk

by Avery Dennison - ASEAN

Automotive Labeling Solution

2022



Welcome to the Webinar

Starts at 10:30 AM



Please wait



Speaker for Today



Silvia Loren Tan

Product Manager, Durables

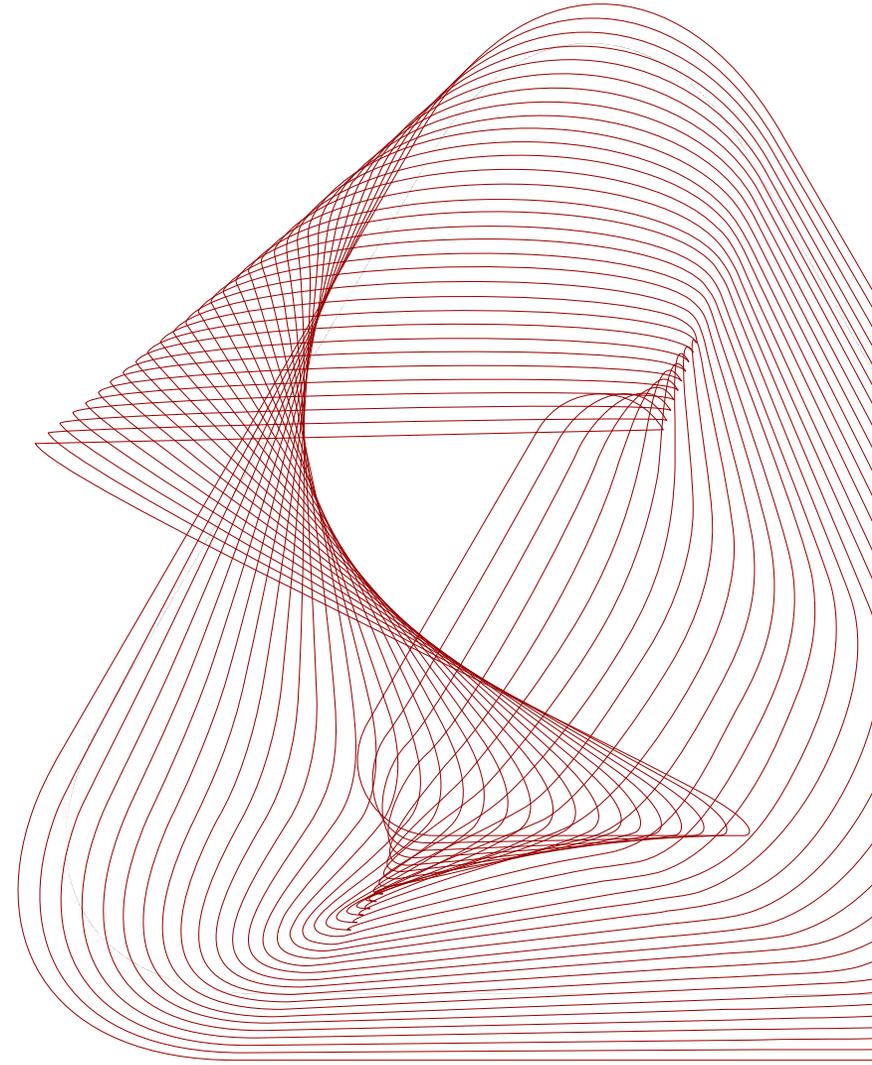
9+ years in PSA Industry. Diversified experience in both Technical and Product management

Agenda

- Market Dynamic and Trend
- Automotive and EV Application
- Auto Specialized Adhesive
- Auto Specialized Portfolio
- Auto General Portfolio
- AD Services



Market Dynamic and Trends



Automotive Market Trends

- **Electrification**
Expansion of Electric Vehicles (EV) which brings the new insight to labeling needs around high voltages, acoustic, and electromechanical requirements.
- **Lightweighting**
Regulatory pressure on reduction of CO2 emission drives advancement of plastics, adhesives, films that reduce overall carbon footprints.
- **Autonomous Driving**
Driven by the goals to reduce road fatalities and improve traffic flows through automation and connectivity.
- **COVID-19 Impact on Automotive Industry**
The pandemic is reshaping the supply chain and customer behaviour.



Electrification

Market Highlight

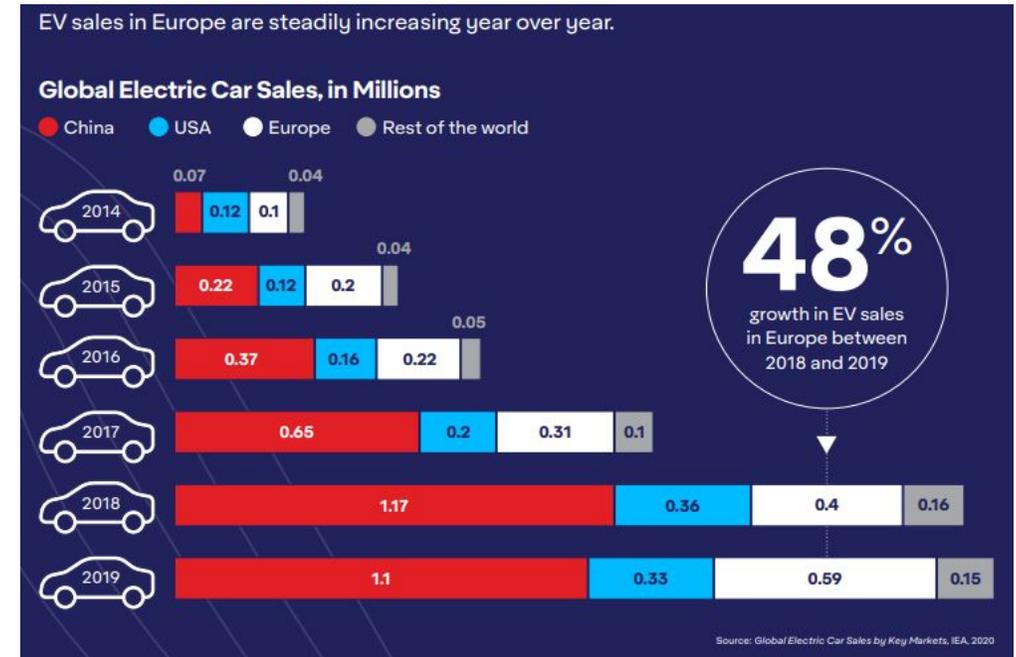
- **Rapid expansion** of EV Sales/ Demand in main regions like EU, US, and China
- EV makers are debuting **new car models** to boost the recent sluggish sales
- The growth in EV demand drives **more localization** of the supply chain (tiers/OEM)

Consideration Factors

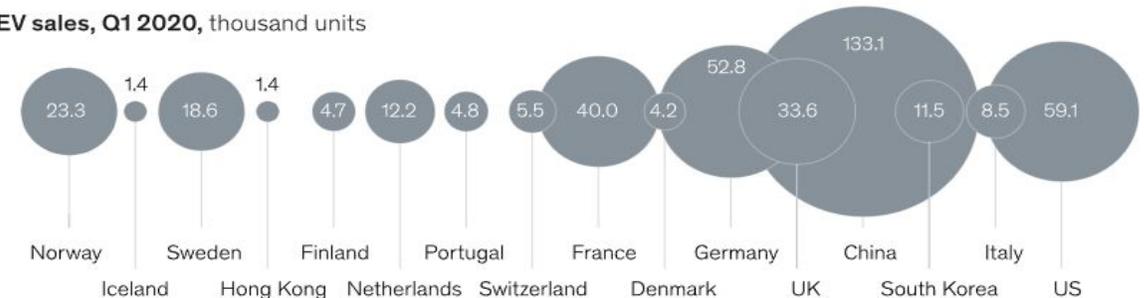
- Change of assembly elements & parts
 - EV prod: Fewer component with more unique needs
- Safety aspect of EV battery and other electrical component
- Acoustic design improvement
- The needs for more sensors and electromechanical devices

Technology Limitation

- Charging station and infrastructure
- Fire risk of EV batteries
- Safety consideration in autonomous driving
- Countries regulations



EV sales, Q1 2020, thousand units

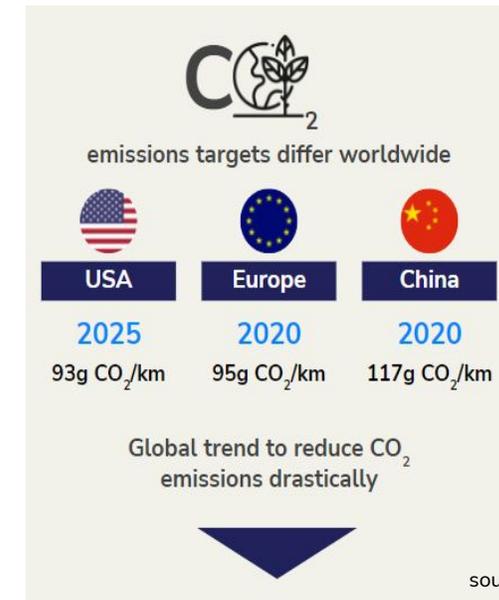


Source: Ev-volume.com; Light Vehicle Sales Forecast, May 2020, IHS Markit

source: [McKinsey & Company](#)

Lightweighting

- **Country regulations** to reduce Carbon Footprint pushes the need to reduce material component
 - Willingness for brand owner to pay more for lighter weight material
- Electrification enhance the need for lightweight materials
 - Achievable through **material mix** and replacement of steel to High-strength steel, Aluminum or Carbon Fiber
 - **PSA to replace metal clips** in sealing
- Lightweight materials requires new approach to bonding component
 - More challenging **low surface energy**
 - **Textured/rougher** surface
 - **Contamination** from release agent during plastic moulding



Automotive's shift towards lightweight will result in significant changes in the base materials industry



source: [McKinsey & Company: Lightweight, heavy impact](#)
Classification: Avery Dennison - Public

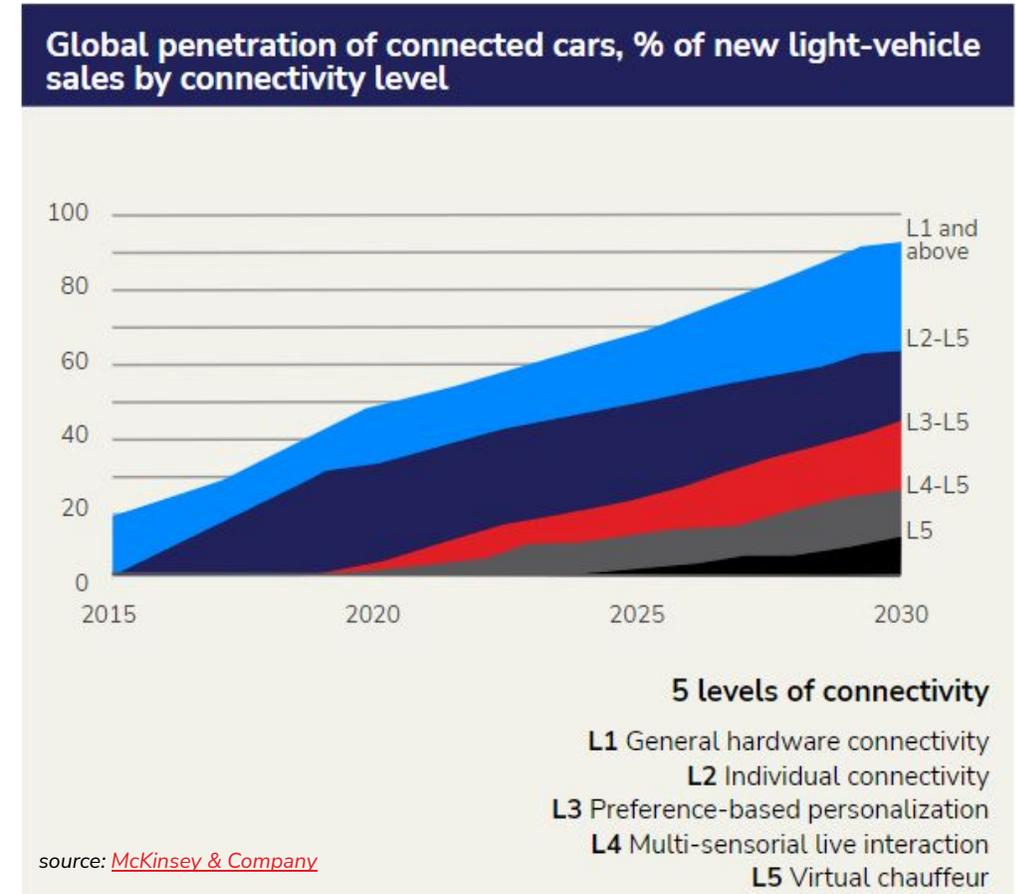
Autonomous Driving

Market Highlight

- Driven by the goal of resolving traffic congestion and road fatalities
- By 2030, 45% of global new car sales could be at level 3 or above connectivity
- 40% of today's driver willing to change their vehicle brand to experience greater connectivity

Consideration Factors

- Safety and convenient features (Sensors, In-car entertainment, etc..)
- Traceability challenge of component **supply chain** and ensure of **no counterfeiting**
 - RFID and NFC technology plays important role
- Fulfilling customer request car features can be very challenging



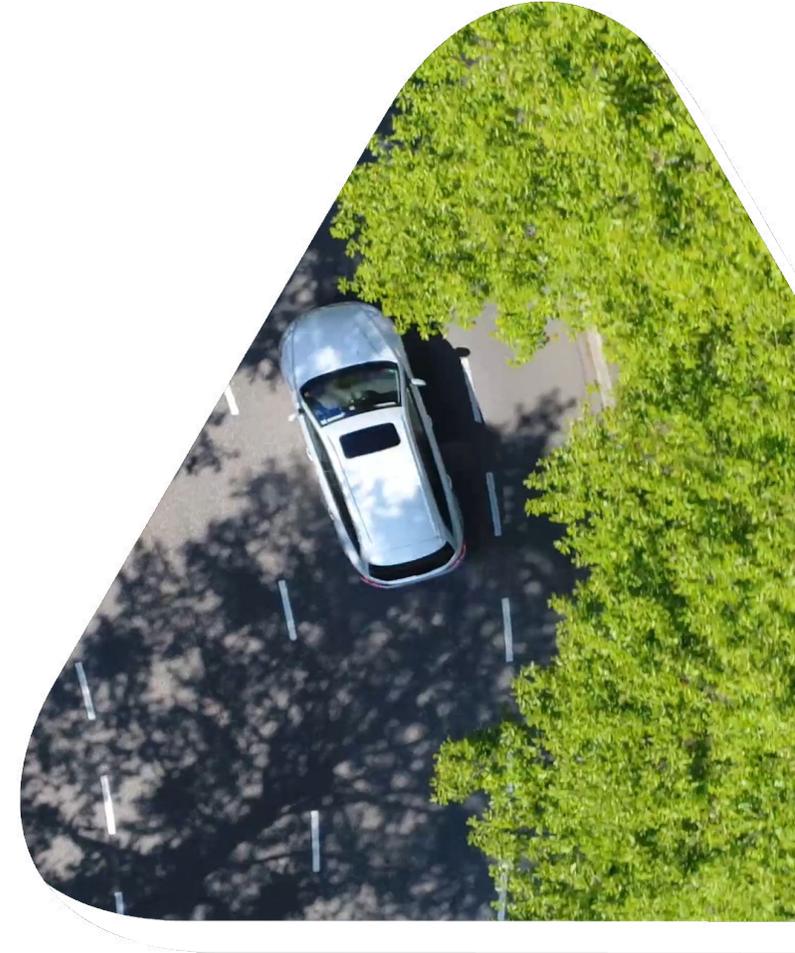
COVID-19 Impact on Automotive Industry

- Some regions automotive industry has fallen 20-30% in year 2020 due to Covid-19 impact
- As opposed to other regions, EV penetration in EU increased by 7.5% from high purchase incentive to dampen COVID impact.
- Despite the challenge, we see some opportunities in:
 - Higher interest in **dual sourcing** of material
 - Production movement from global to **local supply chain**
- Changes in consumer behaviour:
 - Preference to own private car for security and protection reasons due to the pandemic
 - Car-sharing (Uber, Grab, hail-taxi) is not preferred to due to chance of contamination



Automotive

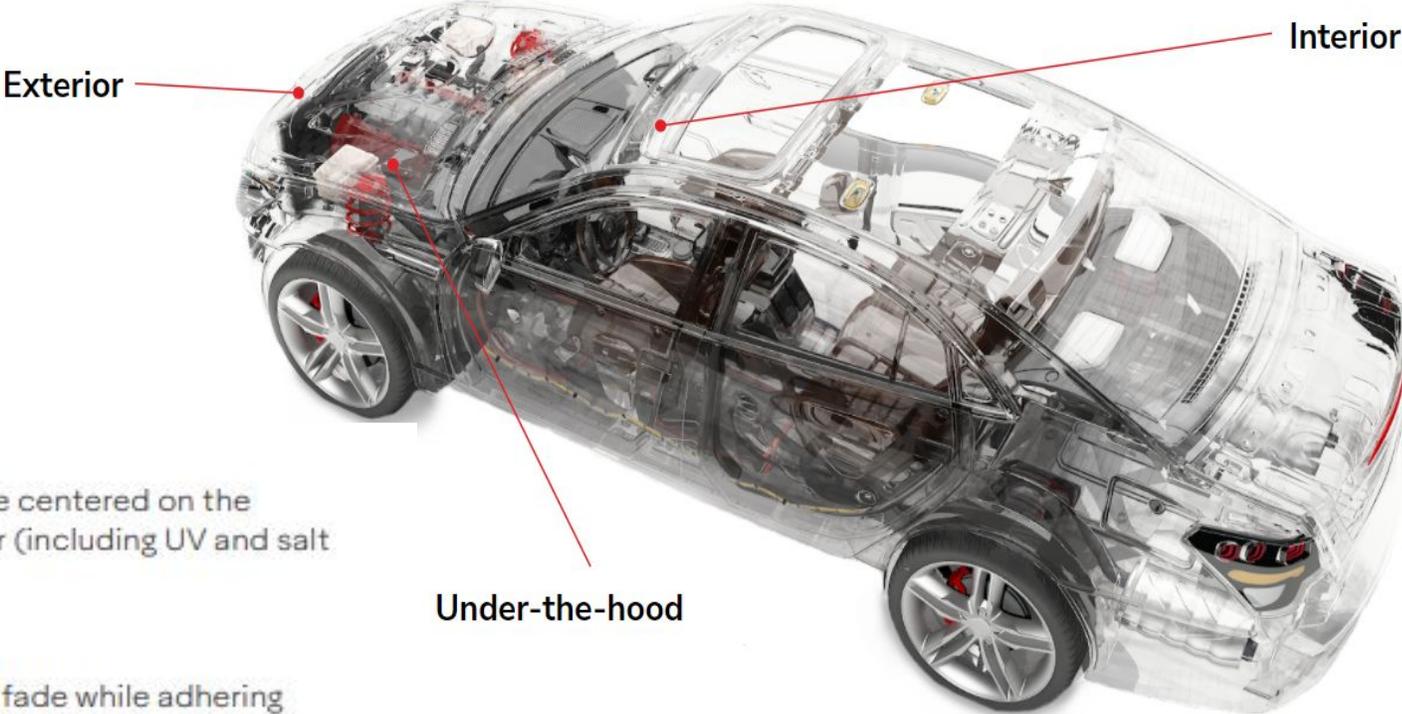
- Avery Dennison Solution



Avery Dennison Solution Offering



Solution Segmentation



Exterior **More than meets the eye**
Our labeling solutions for automotive exteriors are centered on the importance of long-term protection from weather (including UV and salt exposure), abrasion and tampering.

Interior **What's inside matters**
Our performance materials for interiors will resist fade while adhering readily to low surface energy plastics, and can be enhanced with smart security features to combat tampering.

Under the Hood **In the heat of the action**
Our materials for under hood applications perform as required from very low (-40C) to very high (+150C) temperature ranges, and adhere to oily and textured surfaces while resisting moisture, steam cleaning and harsh engine chemicals.

EXTERIOR Application



Component identification

- Bumper identification
- On metal RFID tag



Decorative films

- Limited editions
- Change of colour/texture



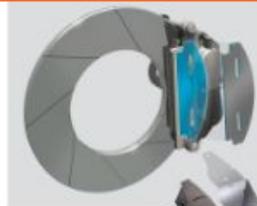
PPF for car body protection

- Highly transparent & durable
- Stone-chip resistant
- Self healing



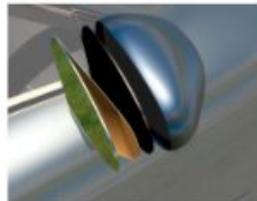
RHA adhesive technology

- LSE
- High texture
- Contaminated surfaces



Powertrain solutions:

- Brake shims
- Heat Shields
- NVH treatment



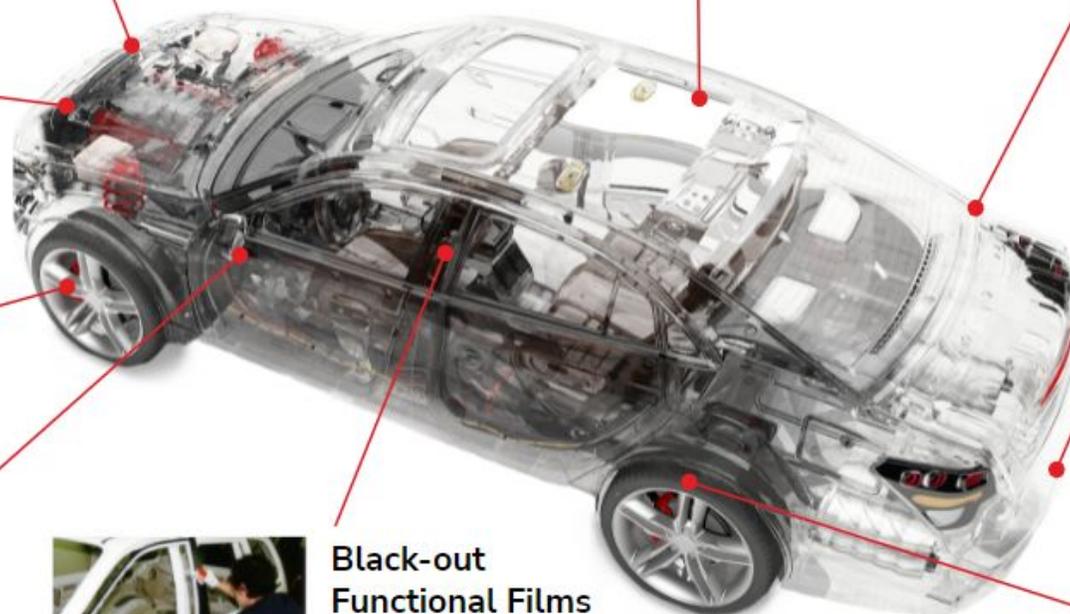
Exterior Attachment:

- Badges & Emblems
- Body Side Moldings
- Mirror bonding



Black-out Functional Films

- Pillar protection
- Change in texture and finish
- Lighter weight



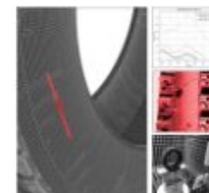
Production and quality monitoring

- High temperature labels
- Moisture sensors



Specialized Automotive solutions

- Tire identification
- Cable flag RFID enabled



INTERIOR Application



Heat-seal adhesive for technical textiles:

- Carpet labels
- Seat belt labels
- Sun visor labels



Interior Attachment:

- Foam trim
- Non-woven Insulation
- Seat and Steering wheel heating



Safety solutions:

- Airbag labels
- Occupant sensors
- Hands-Off Detection



Rubber Hybridized Acrylic (RHA) adhesive technology

- Low Surface Energy
- High texture



Wire Harness

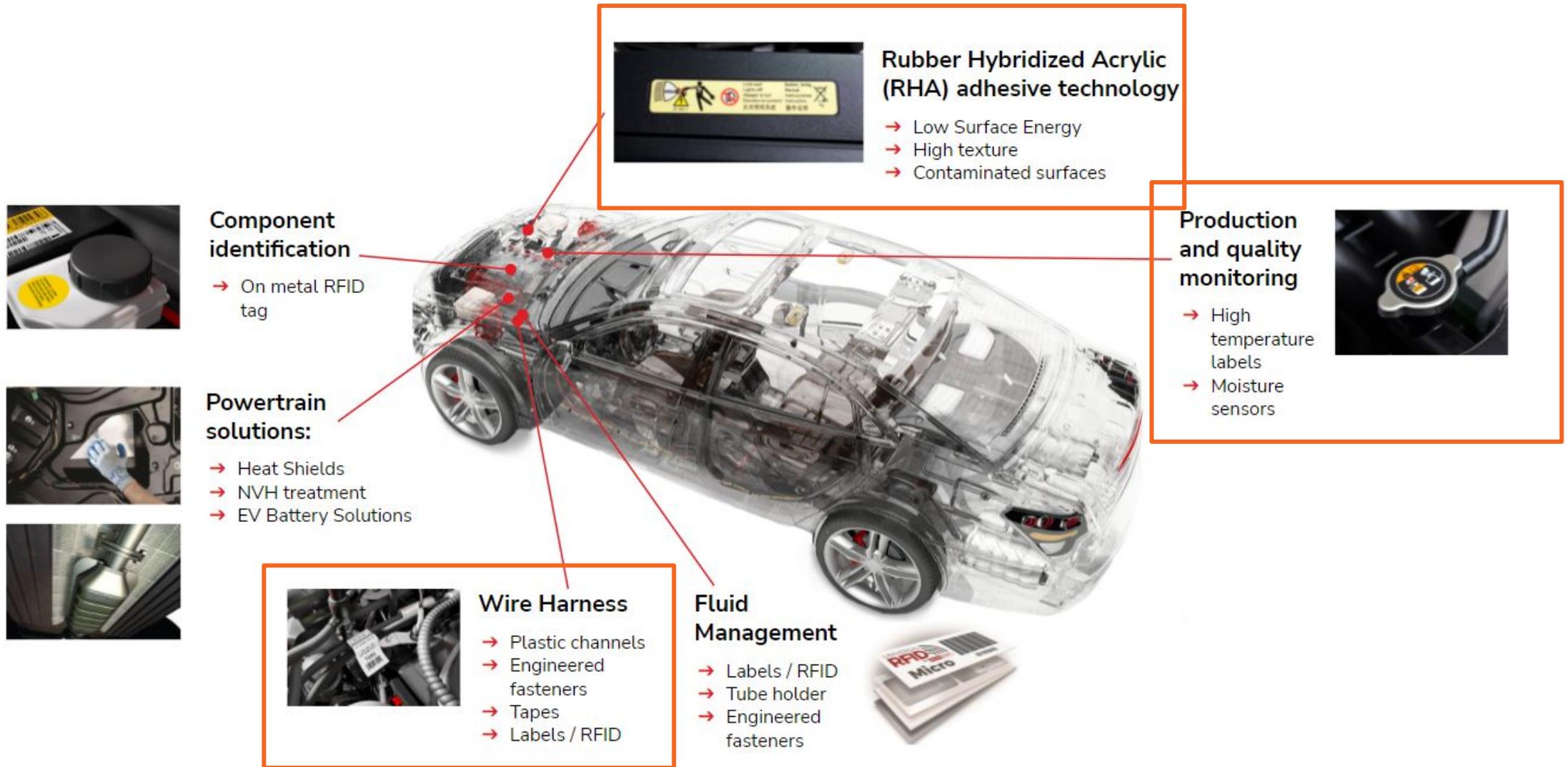
- Plastic channels
- Engineered fasteners
- Tapes
- Labels / RFID



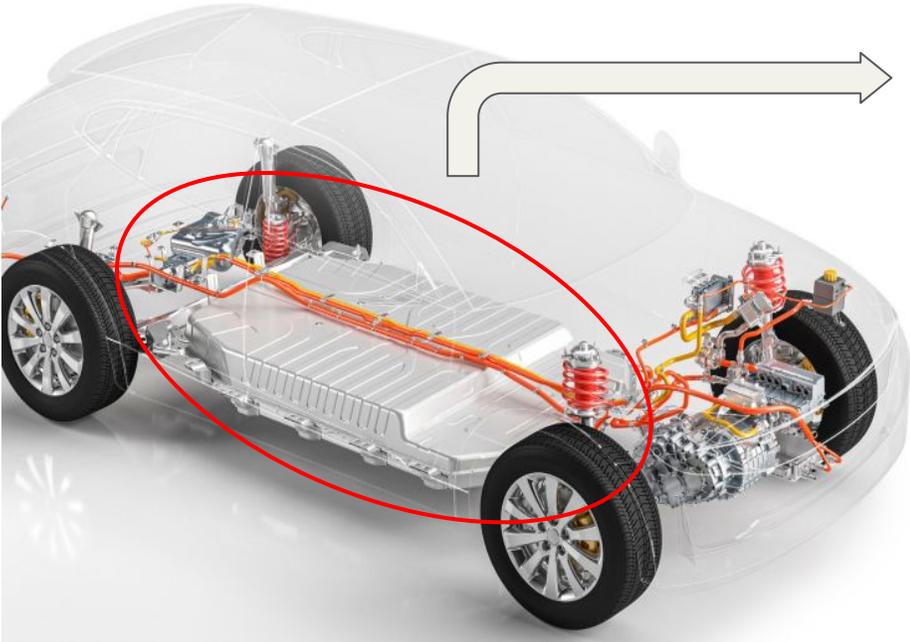
Production and quality monitoring

- Moisture sensors
- Component identification
- Production control

UNDER THE HOOD Application



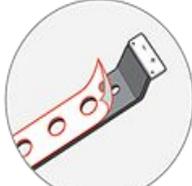
ELECTRIC VEHICLES (EV) Application



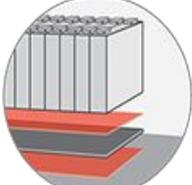
Thermal Runaway Protection



Flexible Busbars



Thermal Interface Materials



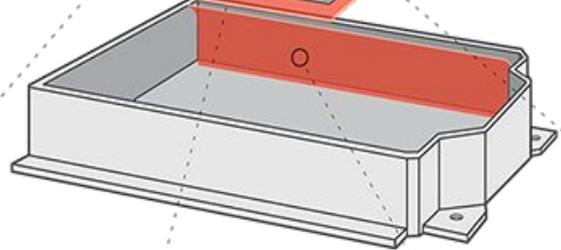
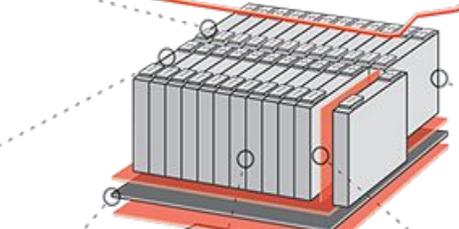
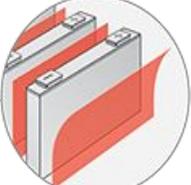
Pack Seal and Gasketing



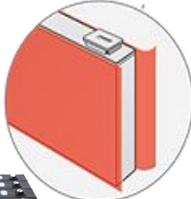
Compression Pads



Cell to Cell Bonding



Cell Wrapping



Electrical Insulation



Blue Wrapping Label

Automotive - Airbags

- This product was designed to also be **resistant to rust inhibitor sprays** used on some parts.
- The construction features **flame retardant** component added with relatively high silicone/solvent adhesive coat weight property.
- During converting **security cuts** are added to the product to allow for easy deployment of the airbag when triggered.



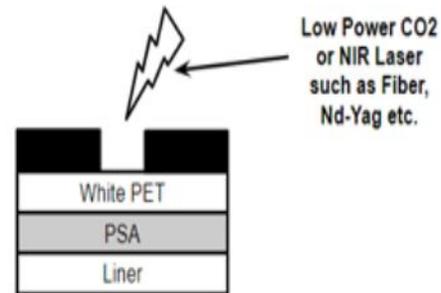
Automotive - Sunvisor

- Warning and Identification label **on textile (woven/non-woven)** which requires to label to **adhere permanently** for safety reason.
- Avery Dennison **heat-activated adhesive** technology allows labels to form **structural permanent bond** upon introduction of the heat.
- Meeting automotive requirements such as **flame retardancy, chemical & UV resistance, TTR print** made with excellent top coat system prior to label heating.
- Product availability
 - BV498 - Transfer PET White PT/S8073/BG40WH
 - BY943 - PET25 MAT WH OPQ/S8075/PET23



Automotive - PET Black Film Laser Etch

- A **permanent label marking** solutions used mainly for automotive VIN (Vehicle Identification); General industry/electronic asset ID (medical device, fire extinguisher, white goods, etc..)
- AD **specialized durables hard coating** resisting 200 taber test cycle; protecting black top coat under for laser marking to take place.
- Material is **tested and validated by key OEMs:**
 - Coherent, CAB, FOBA, Cartes
- Product availability
 - BY086 - PET50 Black Laser Etch/S8029/ BG45WH FSC
 - Mix & Match with other automotive adhesive depending on area application



Automotive Specialized - Adhesive

Application Surface

Metal - AL170	Paint & Plastic - S8029	Rough & Low SE Plastic - S8049	Textiles & PVC - S8072/3/4	Siliconized Fabric - S8092	UV Warm Melt
<ul style="list-style-type: none">- Pure solvent Acrylic- Outstanding resistant to wide range of chemical and temperature- High shear- First choice in harsh environment	<ul style="list-style-type: none">- Resinated solvent Acrylic- Balanced adhesion across wide range of substrates- Good chemical, humidity and water resistance	<ul style="list-style-type: none">- Rubber Hybridized Acrylic (RHA) Adhesive- AD patented adhesive for rough, oily and other difficult substrates- RHA Technology having excellent ultimate adhesion of rubber, with good conversion and chemical resistance of acrylic	<ul style="list-style-type: none">- Two stage Heat Activated adhesive- Ultra removable when applied, with heat (160°C) presence, it becomes irreversible permanent bond	<ul style="list-style-type: none">- Silicone Adhesive- Outstanding resistance to wide range of chemical and Temperature- Application on siliconized/silicone contaminated surfaces such as airbags label	<ul style="list-style-type: none">- Acrylic based hotmelt- Environmental Friendly adhesive exhibit Solvent based performance- Excellent heat resistance and performance on LSE substrates

Automotive Specialized - Adhesive

Condition/PET Face	S8001	S8015	S8025	S8029	S8049
Low surface energy substrates*	⊕	⊕	⊕	⊕	●
Textured Surfaces**	⊕	⊕	⊕	⊕	●
Water resistance, 4 Hr Immersion	⊕	●	●	●	●
Chemical resistance***, 4 Hr Immersion	⊕	●	⊕	⊕	⊕
Outdoor exposure, ASTM G155	⊕	⊕	⊕	⊕	⊕
Low temperature, up to -40C, HSE/LSE	● / ●	● / ⊕	● / ●	● / ●	● / ●
High temperature, up to 180C/Under hood	●	●	●	⊕	⊕
Small diameter (1", PET Rod)/Wire harness	⊕	⊕	●	●	●
Oily substrate	⊕	⊕	⊕	⊕	●
Humidity	●	●	●	●	●
FMVSS 302****	●	●	●	●	●
Interior cabin	●	●	●	●	●

*LSE: e.g. PP, HDPE, LDPE

** Textured Surfaces: e.g. Powder Coated Paints, Textured Plastics

*** Chemicals: e.g. IPA, Oil, Gas Splash, Diesel, Detergent, Brake Fluid

**** Rating may be affected by face material

Innovative hybrid adhesive S8049/S8029

These materials are highly resistant to heat and harsh chemicals and convert/die-cut very easily. S8049 is ideal for engine compartment labels due to its exceptional adhesion performance on textured, somewhat oily and low surface energy substrates. When heavy texturing is not present, S8029 is a lower coat weight option offering consistent converting.

Under hood and Exterior adhesives S8015/S8025

These adhesives provide good performance on a broad variety of low surface energy substrates, along with excellent shear and cohesive strength. They offer good performance in both high and low temperatures over extended periods of time. They are also excellent candidates for wire or harness wrap applications.

Interior adhesive S8001

Designed for environments with lower heat and humidity along with less demanding chemical resistance, this adhesive is most commonly used in the cabin. It offers relatively strong low surface energy adhesion and good performance around small diameter wiring and tubing.

Silicone Adhesive S8092

Silicone coated or otherwise contaminated substrates are found in many automotive parts such as airbags or molded parts. This is an innovative adhesive that provides initial tack and final peel adhesion for superior performance, making it ideal for technical textiles.

Specialty Adhesives Removable and Void

Certain automotive label applications require highly specialized materials. These can include labels that are applied during the manufacturing or assembly process, but are removed downstream with clean removal. In addition, tampering and authentication concerns are growing, leading to increased requirements for security features. We offer several void options, and can customize this capability based on specific conditions.

Automotive Specialized - Portfolio

Metal - AL170

AA642	Transfer PET White Top AL170-BG42WH
AA145	Transfer PET Matt White AL170-BG42WH 100
AA645	Transfer PET Matt Chrome Top AL170-BG42WH
AA146	Transfer PET Matt Silver AL170-BG42WH
BS912	Transfer PET Platinum TC19 AL170-BG45WH FSC

Paint & Plastic - S8029

BN947	Transfer PET White Top S8029-BG42WH
BN949	Transfer PET Matt White S8029-BG42WH
BH781	Transfer PET Matt Chrome Top S8029-BG42WH
BN950	Transfer PET Matt Silver S8029-BG42WH
BS913	Transfer PET Platinum TC19 S8029-BG45WH FSC

Siliconized Fabric - S8092

AS191	Transfer PET36 Top White S8092-PET75
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Rough & Low SE Plastic - S8049

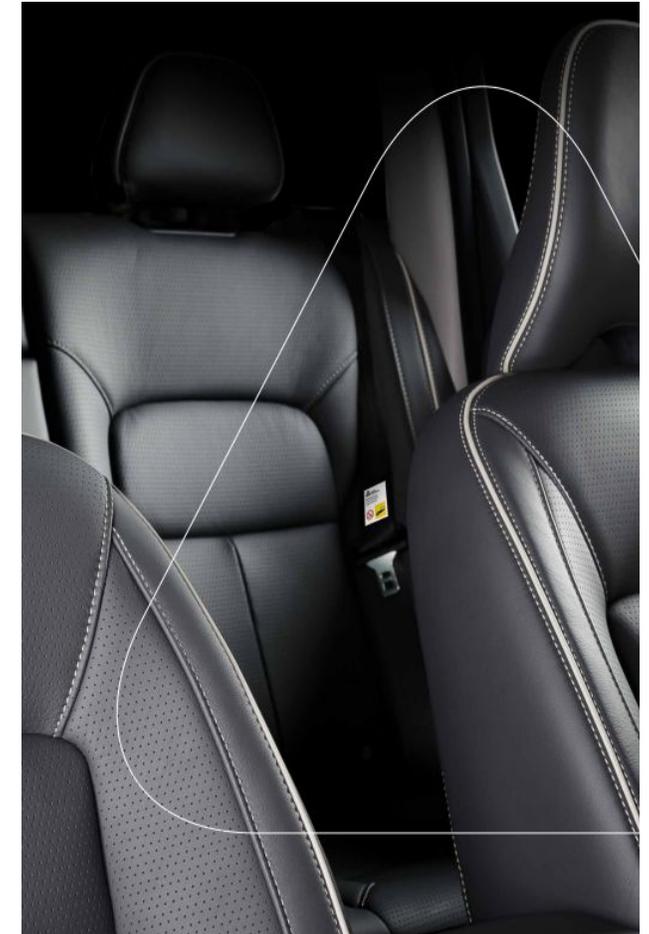
AJ059	Transfer PET White Top S8049-BG42WH BSS
AL854	Transfer PET Matt White S8049-BG42WH BSS
AL852	Transfer PET Matt Chrome Top S8049-BG42WH BSS
AJ060	Transfer PET Matt Silver S8049-BG42WH BSS

Textiles & PVC - S8072/3/4

BF049	PVC CAST White S8072-BG45WH
BT959	Transfer PET125 White PT S8073-BG40WH
BU102	PET16 Matt Silver S8074 PET30

Laser Etch

BY086	PET50 Black Laser Etch-S8029-BG45WH FSC
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Automotive General - Portfolio

Base Film Portfolio

Product Code	Product Description	UL Certified?	Adhesive Type	Example of Application
MZ0102	2M WH PET TC/S333/BG50Wh	UL-969	Emulsion Acrylic	Work-in-Progress, VIP label
MZ0104	2M MAT CH PET TC/S333/BG50WH	UL-969	Emulsion Acrylic	
MZ0097	2M MAT WH PET TC/S333/BG50WH	UL-969	Emulsion Acrylic	
MZ0362	50mic Matte White PET TC / DS017HT / BG50# White ni	No	Solvent Acrylic	
MZ0380	50mic Matte White PET TC / DS015 / BG50# White ni	No	Solvent Acrylic	
40443	2M WH PET TC/S730/SCK#50	UL-969	Solvent Acrylic	
MZS1028	90mic White Gloss PVC/DS129U/BG50 White ni	No	Solvent Acrylic	Wet Cell Battery
MZ0459	Synthetic Paper 3 TC/AS3015/BG50Whi ni	No	Solvent Acrylic	
BWS707	63 Micron FasClear 250/ S8040/BG50# Wh	UL-969	Solvent Acrylic	Cable Label
BWS708	63mic Primax 250/ S8040/BG50#WH	UL-969	Solvent Acrylic	
SD8310	PP TopNG WH/TS79N/BG50 double silicone	No	Hotmelt	Tire POP label
SY5003N	Barrier Foil 25um WH PET/TS79N/P140	No	Hotmelt	

Overlamination Portfolio

Product Code	Product Description	UL Certified?
MZ0111	1M CL PET TC/S8020/PET30	UL-969
MZ0111N	1M CL PET TC/S8020/BG40WH	UL-969
79325	1M CL UV PET/S3000/1M PET	UL-969
77843	1M Matte Clear Polysetr/S8020/40#BG	UL-969
75849	3mil Velvet Lexan/S730/1.5mil PET	UL-969
MZ0082G	CLPET16TCY/S8020D/23PET	No



Automotive - Electric Vehicles (EV)

Innovation in EV Batteries Is Accompanied by Innovation in Automotive Materials

New powertrains require new qualification considerations around labels and adhesives.



Durability

More demanding applications show a need for materials with higher dielectric strength and ESD (electrostatic dissipative) features. Labeling materials must be flame retardant, chemical resistant, and hold up under high voltage.



Adhesion

EV manufacturing needs lightweight materials to compensate for the weight of battery packs, requiring better performing adhesives that bond to low surface energy plastics that are often contaminated by moulding agents.



Functionality

EVs bring a higher number of components of sensors and electromechanical devices dependent on the battery management systems. RFID enabled labels show new possibilities around identification and connectivity.

Avery Dennison is Your Label Partner for EV Production



Full Range of EV Solutions

A broad materials portfolio for battery labeling, thermal conductive, high-shear adhesives, insulating, shielding and sealing, as well as RFID enablement.



Expert Support

Personal on-site or hotline support on quality, standards, and re-qualifications thanks to our global experience with OEM & Tier specifications.



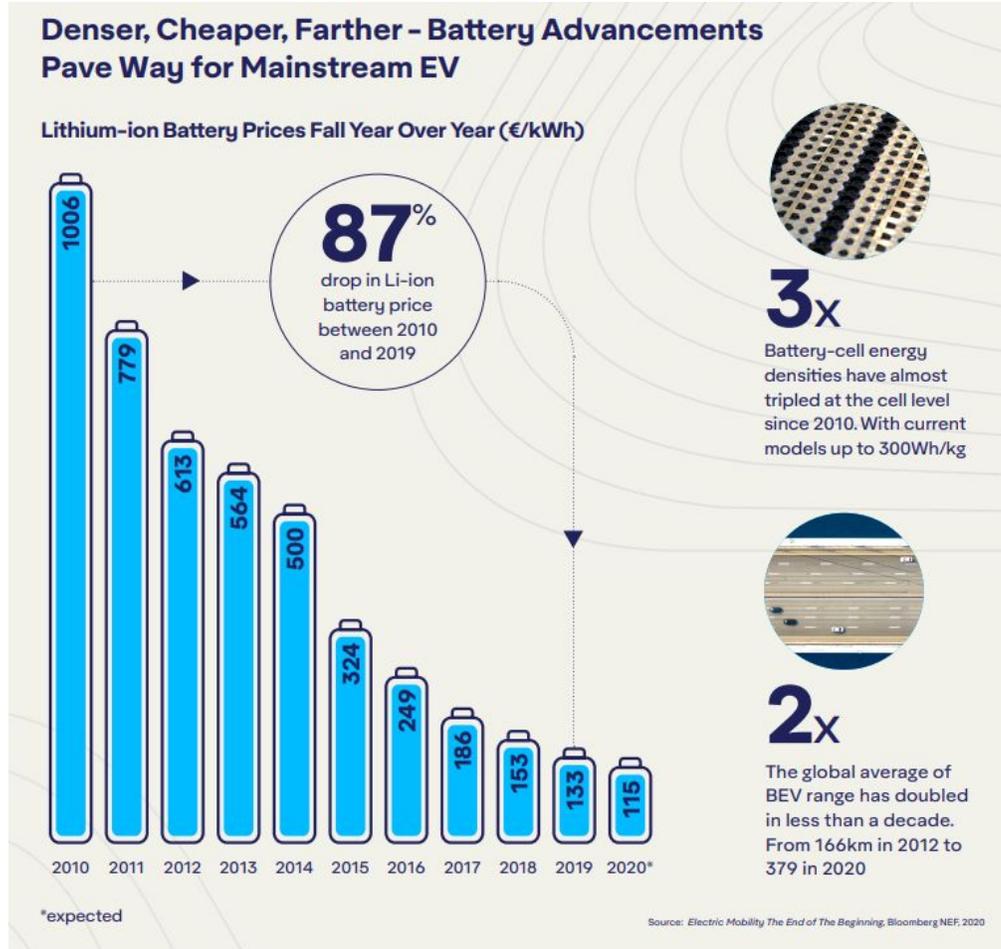
Automotive Qualified Adhesives

Most diverse selection of in-house developed and manufactured adhesives, fulfilling industrial regulations and specifications. Highest quality standards and continuous investment in R&D.



Reliable Supply

Multiple European production plants ensure a consistent supply flow, and offer flexibility around short lead times and small MOQs.



Automotive - Electric Vehicles (EV) Portfolio

Avery Dennison offers wide range of adhesive and film options to accommodate varying requirements

Adhesive Categories				
General Automotive Acrylic	High Performance Acrylic (HPA™)	Flame Tough™ Acrylic	Flame Tough™ Silicone	AFB™
Designed for general automotive requirements with good initial tack and low surface energy bonding coupled with good temperature resistance.	Designed for the highest performance needs such as temperature resistance and shear strength.	Similar in performance to the General Automotive Acrylic with flame retardant properties.	Offers the highest flame retardancy and temperature resistance in the portfolio with the ability to bond to silicone-based materials.	Acrylic foam tapes designed for gap filling and bonding rigid components to each other.



Carrier/Facstock Categories		
Polyester	Flame Tough™ Polyester	Flame Tough™ Polyimide
Polyester film with -7 kV/mil dielectric strength.	Proprietary polyester film with -7 kV/mil dielectric strength and flame retardant properties.	Polyimide film with -7 kV/mil dielectric strength and excellent flame retardant properties and temperature resistance.



Reducing flammability

Acrylic- and silicone-based adhesives with Flame Tough™ flame-retardant properties that allow composites and materials to meet UL® 94 V-0 and other flame requirements.



Boosting dielectric strength

Single- and double-coated tapes that incorporate dielectric films. Our materials and adhesives are tested for breakdown voltage and dielectric strength requirements using GB/T 1408.1-2016 and ASTM D3755 test methods.



Protecting pack materials

Single- and double-coated tapes providing dimensional stability and material encapsulation, along with easy release liners that can help protect delicate fibrous materials during assembly.



Service and Solution

- For more than **85 years** we have been developing new adhesive and its technology, with **>400 Adhesive Scientist** Avery Dennison Worldwide
- We work closely with **Automotive OEM** to offer right solutions based on Brand owner specification
- **Excellent Compliance** team to address on regulations
 - IATF16949, UL, CSA, IMDS, ISO, FMVSS-302
- **Full R&D lab** services across the Globe
 - Mentor, USA ISO 17025 certified
 - Oegstgeest, Europe
 - Neal Research Center, China
 - ADIKC, India
- Top coating and voidable film capability by AD-Hanita

										
Interior	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Exterior	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Under the hood	✓		✓	✓	✓	✓	✓	✓	✓	✓
Security	✓		✓	✓	✓		✓			✓
Temporary			✓	✓			✓			
High Abrasion			✓	✓			✓			
Others		✓		✓	✓		✓		✓	



Automotive Fogging Test



Automotive Abrasion Test



Hot Water/High Pressure



Accelerated Weathering



Flammability



Salt Spray/Corrosion Testing



Avery Dennison Accredited Test Scope

Our laboratory in Mentor, Ohio, was audited in June 2017 and received ISO 17025 accreditation, which has been renewed through 2023. This accreditation allows us to provide both materials and testing services, which are free to our customers and eliminate the need for additional testing.

In addition, the Mentor Innovation Center is ISO 9001:2015 accredited.

Thank you



**AVERY
DENNISON**

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