

Trends, Challenges, and Solutions in the Food and Beverage Packaging Landscape

Label and Packaging Materials

July 2023



Agenda

- About Avery Dennison
- Our 2030 Sustainability Goals
- Top Consumer and Industry Trends
- Label Solutions for Glass and PET Containers
- Functional Packaging for Food and Beverages

About Avery Dennison



Who we are

Avery Dennison is a global materials manufacturer of branding and information labeling solutions and functional materials for consumer goods, apparel, food, logistics, industrial and healthcare industries.

Fortune 500 rank
412

Sales in 2022
\$9.0 billion

Employees
36,000

Operations in
50 countries



Our Businesses at a Glance

Materials Group

\$6.5 bil.⁽¹⁾

(former LGM and IHM)

Pressure-sensitive materials

- Label materials (LPM)
- Graphic and reflective materials
- Functional materials (e.g., tapes⁽²⁾)



Solutions Group

\$2.5 bil.⁽¹⁾

(former RBIS)

- RFID solutions
- Branded tag and embellishment solutions
- Data management and identification solutions
- Pricing and productivity solutions



(1) FY 2022 Net Sales

(2) Previously part of IHM

Former segment names: Label and Graphic Materials (LGM), Industrial and Healthcare Materials (IHM) and Retail Branding and Information Solutions (RBIS)

Avery Dennison's Role in the Value Chain

Value chain



Basic label construction

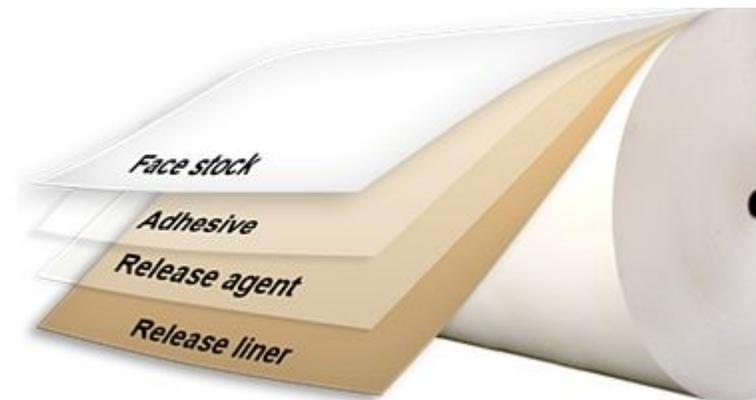
Top Coat

Face stock: Paper, Film or Foil

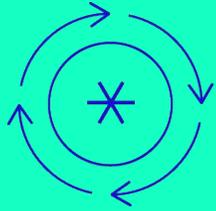
Adhesive: Emulsion, Hot Melt or Solvent

Release Coating Silicone

Release Liner: Paper or Film



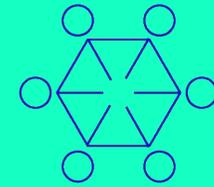
2030 Sustainability Goals



Deliver innovations that advance the circular economy



Reduce our environmental impact in operations and supply chain



Make a positive social impact by enhancing the livelihood of our people and communities

Our 2030 sustainability goals were developed based on careful analysis of what is most important for our business and stakeholders, and they include the areas where we can make the greatest difference. We are working toward a deforestation-free future and measuring against Scope 3 standards for GHG emissions, with an ambition of net zero by 2050.

To learn more, visit esg.averydennison.com



Target Net Zero

A new era in
carbon footprint
measurement.

What is Carbon Trust?

- The Carbon Trust is a global climate consultancy driven by the mission to accelerate the move to a decarbonised future
- Offers a unique opportunity for us to provide primary data from our operations to truly measure the impact our current and future product
- In compliance with PAS 2050, GHG protocol and ISO standards for LCA, this eliminates any potential concerns on greenwashing or sharing misinformation

Carbon Trust Sample Report:

Product

Original:

BW0146

Face PE85 NTC Trans

Adhesive S692N

Liner BG40Wh Imp FSC

Redesigned:

BW7016

Face Flex+ Clear NTC

Adhesive S692N

Liner BG33Wh Imp FSC

Carbon



0.67 kgCO₂E/sqm

Savings: **54%**

0.31 kgCO₂E/sqm

Is equivalent to:
90,506 miles / 144,810 km driven by an average passenger vehicle.

Water



3.05 l/sqm

Savings: **20%**

2.44 l/sqm

Is equivalent to:
65,232 minutes shower with an average flow



AD

Circular

Liner and Matrix Recycling Program

What is AD Circular?

- AD Circular is a recycling program launched by Avery Dennison to build a circular packaging economy by helping converters and brands to recycle matrix and liner waste with ease.
- It offers an accessible, economical solution to label waste recycling at a similar or lower cost compared to other waste disposal methods.
- We have partnerships with reputable recyclers across ASEAN so you can get on board right away!

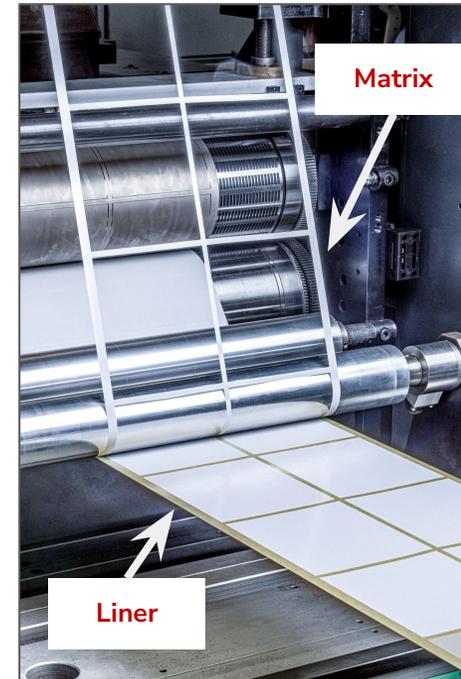
Sign up for AD Circular today! Simply scan the code below and enter your information and we will guide you through.



Matrix
Recycling



Liner
Recycling



Top Consumer and Industry Trends



Top 3 trends shaping F&B packaging



Sustainable Packaging



Changing preferences of the Asian consumer



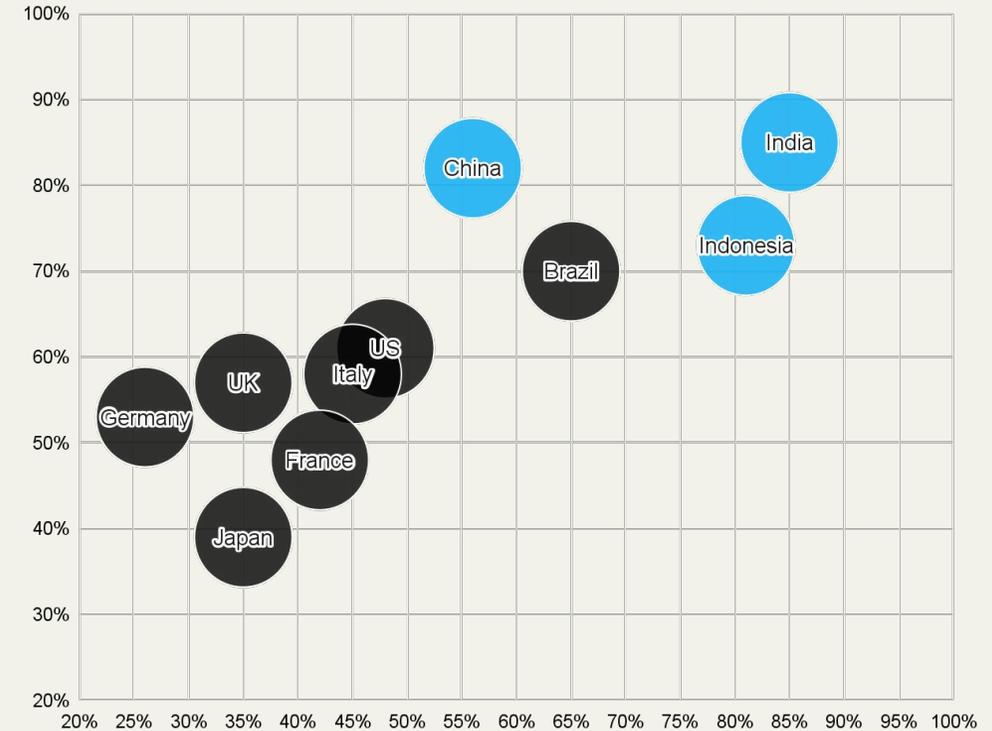
Digital Transformation

01 Consumer awareness on sustainable packaging

- Strong rise in sustainability concerns with the younger generations in Asia (*McKinsey Packaging Survey (2021)*)
- Willingness to pay for sustainable food packaging is higher in China, India and Indonesia v.s. other EU countries
- Brands under scrutiny on their approach to sustainable packaging
- Places importance on perceived sustainability of brands

To what extent would you be willing to pay more for sustainable packaging in packaged food?

Answers range from "a little" to "a lot more"



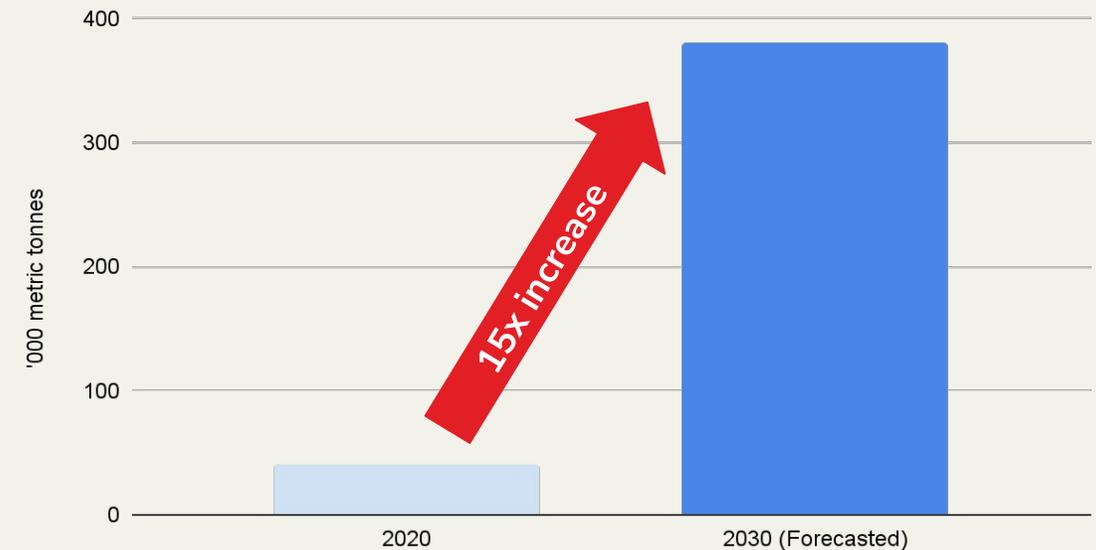
How do you currently perceive the importance of packaging sustainability compared to the times before Covid-19?

Source: [Sustainability in packaging: Consumer views in emerging Asia](#)

02 Global brands have sustainability goals and commitments

- Global brands in ASEAN are taking the lead to develop sustainable products by 2025/2030
- Major themes in sustainable packaging:
 - Reducing virgin plastic through lightweighting or **increasing r-content**
 - **Recyclable**, Compostable, Reusable, Biodegradable
 - **Improving the recycling infrastructure** and technology

Forecasted Food Grade rPET demand in ASEAN 2020-2030

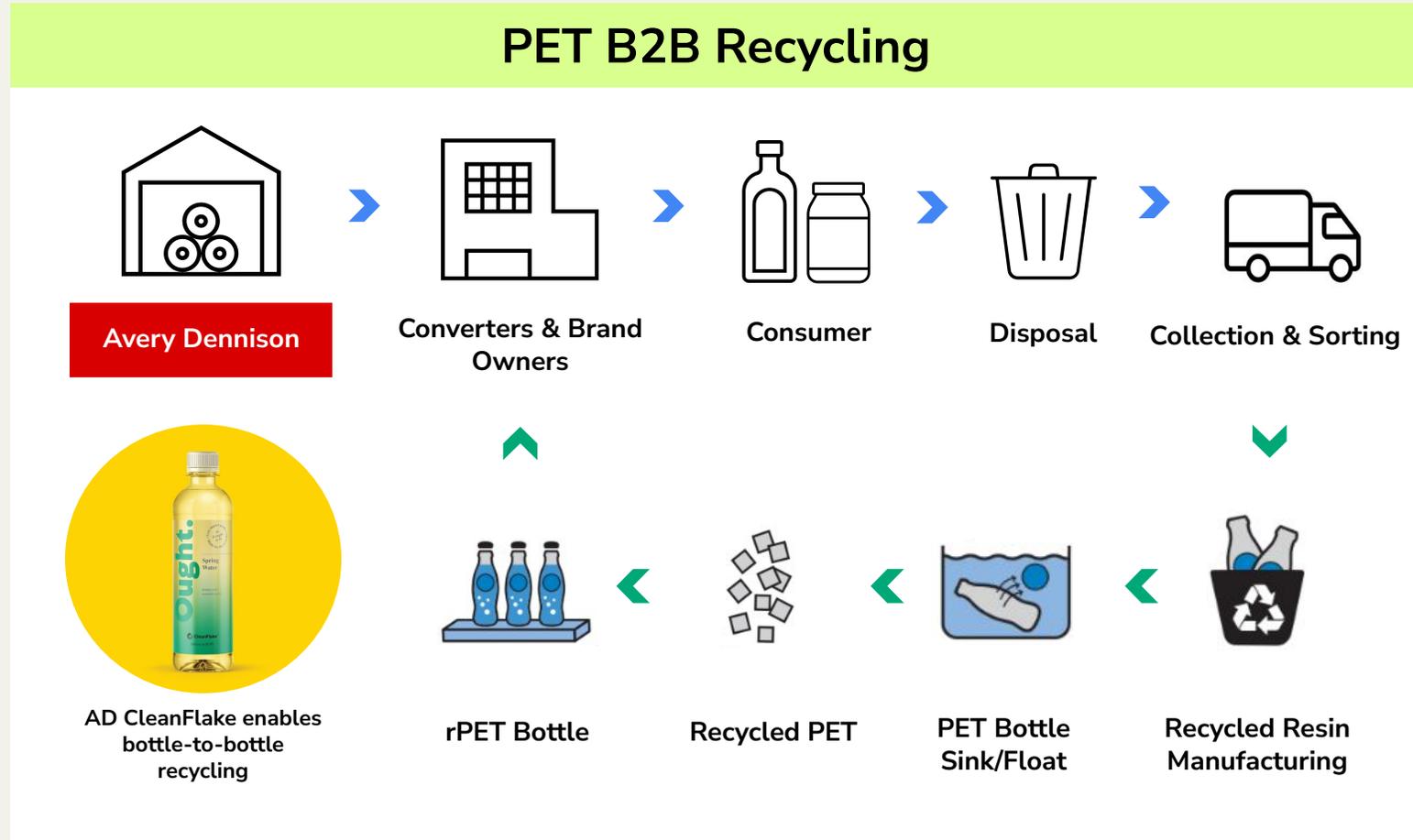


Source: [Recycled PET in SE Asian and Indian F&B Packaging](#)

Trend #1: Sustainable Packaging

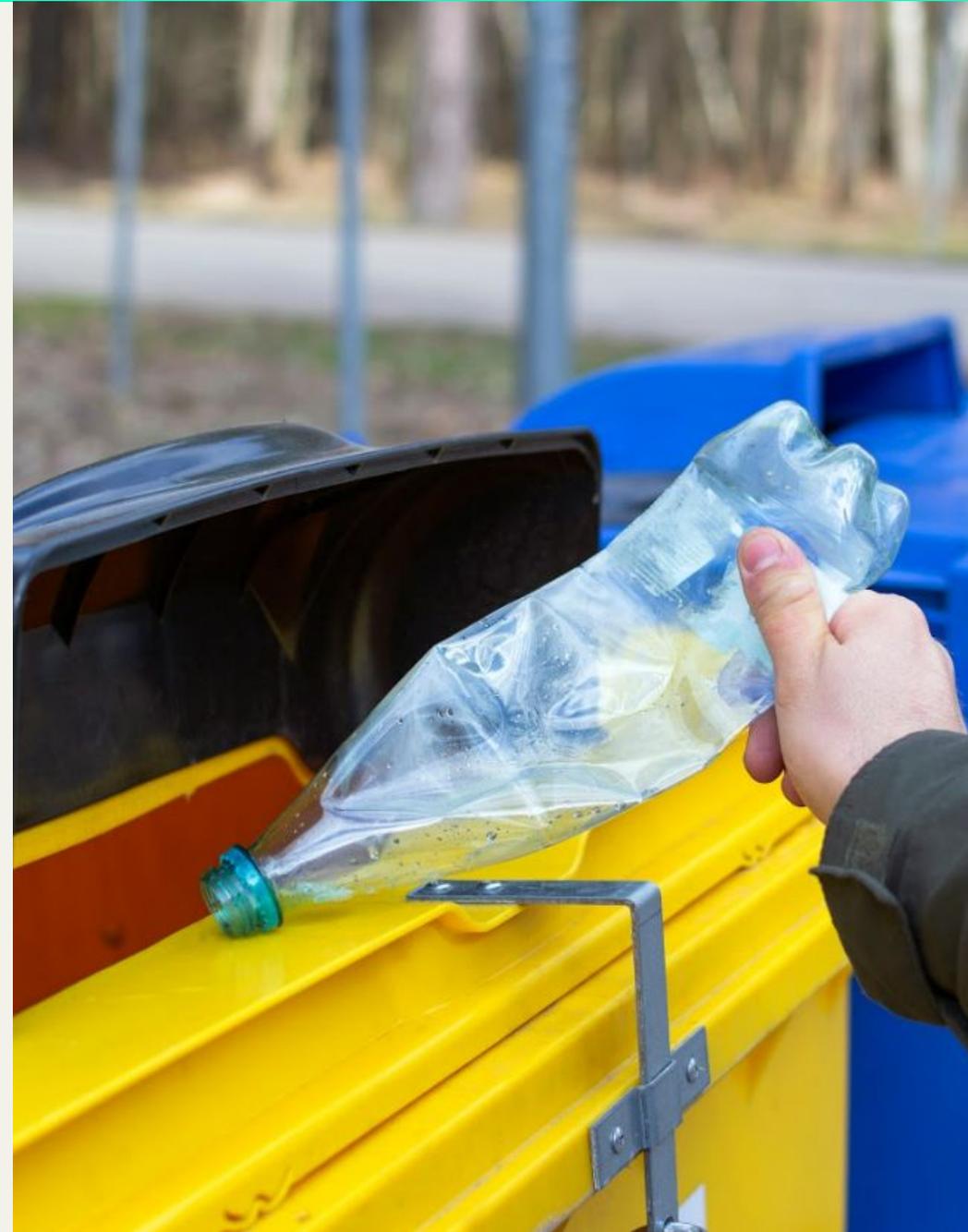
Demand for rPET drives advancement in Bottle-to-Bottle (B2B) recycling

Company	Global rPET targets	ASEAN rPET initiatives
	50% rPET (2030)	<p>Philippines Set up bottle-to-bottle recycling plant with Indorama Ventures</p> <p>Indonesia Setting up bottle-to-bottle recycling plant with Dynapack</p>
	50% rPET (2025)	<p>Indonesia Setting up B2B recycling plant with Veolia with 100% rPET</p>
	50% rPET (2030)	<p>Thailand Started to use bottles made from 100 percent rPET</p>
	50% rPET (2025)	<p>Malaysia First in Malaysia to use high-quality rPET for its RTD products</p>



03 Emerging environmental regulations driving developments in the recycling infrastructure

- Regulations will be the **key driver for local brands to adopt sustainable solutions** in their packaging
- Emergence of **EPR regulations in countries like Vietnam and the Philippines** — Brands are to take responsibility of the end-of-life management of their products packaging
- Regulations prompting the use of **rPET in F&B packaging** will drive demand for high quality rPET and the need for bottle-to-bottle recycling
- Need for brand owners to consider the environmental impacts of their product/ packaging at the design stage to comply with regulations and avoid paying additional EPR fees



EPR: Extended Producer Responsibility

What is it?

- An environmental policy tool that places the **responsibility on brand owners/producers** to take charge of their products' entire lifecycle from product design to disposal, including packaging
- Typically in the form of **taxation/EPR fees**
- Fees collected can be used to fund the country's waste management and infrastructure (collection, sortation, recycling)
- Paired with incentives to promote sustainable product design (e.g. Design for Recyclability, min. R-content)

What does it mean to you?

- Brands need to consider the environmental impact of their products from the design stage
- Brands that proactively implement sustainable practices through EPR may benefit from a positive reputation and increased customer loyalty

Summary of EPR Frameworks in ASEAN

Countries	EPR Framework	Status
 Philippines	The EPR Act of 2022 came into effect in Aug 2022 , mandating the recovery of plastic packaging waste (target 20% by 2023)	5
 Vietnam	Effective in Jan 2022 , EPR sets up the recycling obligation and targets of packaging wastes, depending on type, or contribute to the Vietnam Environmental Protection Fund (VEPF).	5
 Indonesia	Legal framework in place (<i>Waste Management Law of 2008</i>) but mechanisms are yet to be in place. No recycling targets have been set at this point.	4
 Singapore	EPR framework for managing packaging waste is still being studied. Mandatory Packaging Reporting & Beverage Container Return Scheme will lay the foundations for the introduction of EPR in 2025.	3
 Malaysia	Currently no EPR schemes in place, but implemented policies on plastic waste. Plastics Sustainability Roadmap 2021-2030: Targets 25% of all post-consumer plastic packaging to be recycled by 2025, and 100% to be recyclable by 2030.	3
 Thailand	Thailand's Roadmap on Plastic Waste Management Phase 2: plan on the enactment of EPR law on packaging in 2027. EPR is still on a voluntary basis.	2

Stages of EPR Framework

LEVEL 5	EPR Framework currently in place
LEVEL 4	EPR framework is approved by government, but not implemented.
LEVEL 3	EPR framework is drafted. Yet to be approved by government.
LEVEL 2	EPR framework is being drafted and country is considering EPR laws.
LEVEL 1	Not considering any EPR laws

What is Design for Recyclability?

- Incorporating environmental considerations into product design to facilitate recycling at the end of their life cycle
- It involves conscious design choices that optimize recyclability, minimizing waste and environmental impact

Packaging Substrates	 PET	 Glass	 HDPE	 PP
Key End-Use Segments	Edible Oils, Bottled Water, RTD Tea/Coffee	Sweet Spread, RTDs Spirits, Energy Drink	Dairy Milk	Egg, Fruit Punnet
Recommended label material based on DFR	Low density label with washable adhesive	Labels that cleanly separate from the bottle	Label with the same material composition as the bottle (mono-material)	Label with the same material composition as the bottle (mono-material)
Compatible Avery Dennison solutions	CleanFlake™ + Low density PP & rPP	Wash off / glass recycling solutions	Monomaterial: Films & Adhesive	Monomaterial: Films & Adhesive



01 Increasing focus on health and wellness

- **Macro drivers:** Urbanization and growing middle class
- Increasing consciousness about the nutritional content of their food (sugar content, health-oriented)
- Governments ensuring nutritional information of F&B products are readily available (e.g. VN mandates nutritional labelling, SG Nutrigrade)
- Heightened sensitivity to food safety with over **40%** of Asian consumers likely to trace their food sources (*source: PwC Survey 2020*)



Singapore Nutri-grade system bans advertisement of beverage with high sugar content

What does it mean for your business?

- **Labels with larger billboard needed to fit more information** (e.g. multi-layer labels)
- **Clean label design:** Transparent labels allowing consumer to see the product inside
- Use of **QR codes/ NFC** technologies enable food traceability and consumer engagement



02 Demand for convenience and functionality

- Settling into new schedules to pre-pandemic time
- Rising demand for easy-to-prepare chilled and ready meals due to busier lifestyles and inflation pressure

What does it mean for your business?

- **Reclosure packaging with barrier properties:** Easy resealability and preservation of food
- Need for low temp labels for chilled and frozen food



Digitalization of packaging

- E-commerce acceleration: New business model that supports omnichannel sales
- Engage with consumers and to engender trust



What does it mean for your business?

- Digitalisation for operational efficiency and supply chain transparency
- Connected packaging technologies such as QR codes and NFC create greater product transparency and deliver interactive experiences
- New business model (e.g. refill and reuse): Track the no. of times the packaging gets reused, understand insights about consumer behaviour

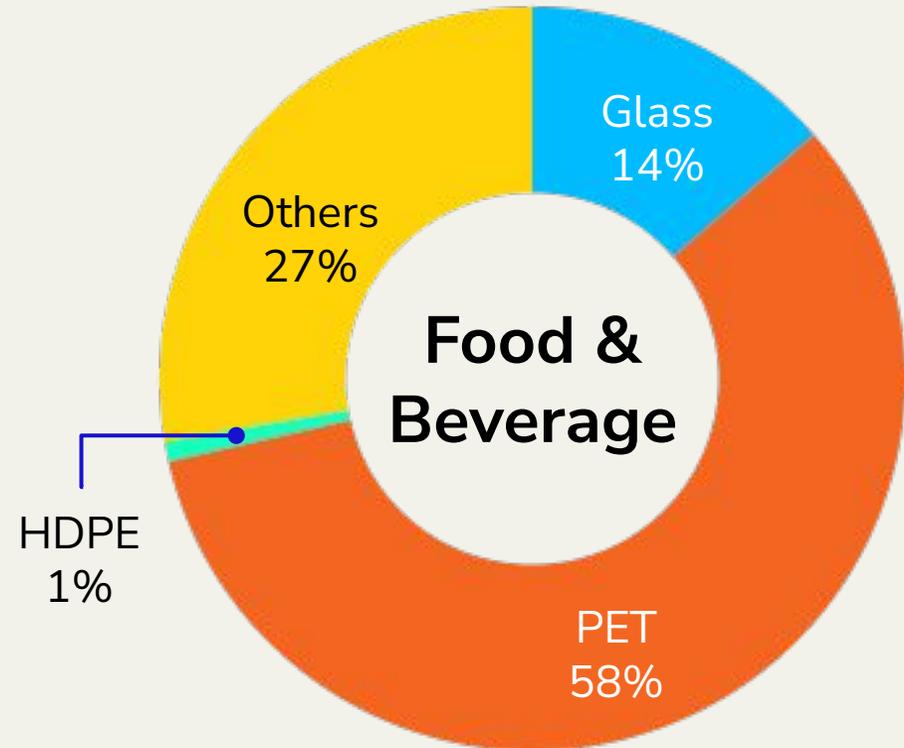
Label Solutions for Glass and PET Containers



PET and glass — the most preferred materials in F&B packaging

Compared to other packaging materials, PET and glass offer:

- Easier recyclability
- PET lightweighting and cost-effectiveness
- Health and safety
- Enhanced aesthetics



Labels play an important role in making PET and glass packaging successful. Avery Dennison provides label solutions that improve their operational efficiency, shelf appeal, and sustainability.



Face Material

PP40

- Clear film facestock, thinnest material in the industry, less carbon footprint — Facestock + adhesive combination is engineered to work on high speed labelling
- Carries more labels per roll — higher efficiency throughout the value chain
- Offered with Avery Dennison's industry-leading top coat for quality and durability (better abrasion resistance)
- High clarity and wet out performance for the “no label look”
- Launched with S7210 adhesive for PET and glass substrates at the best price to value
- Ideal application for bottled water, sauces and condiments

Carbon footprint comparison

Products	Carbon Emission	Savings per 1,000,000 SQM
PP40	0.40 kgCO ₂ E/sqm	-9%
PP50	0.43 kgCO ₂ E/sqm	Equivalent to 14,640 km driven by an average passenger vehicle





Face Material

rPP

- White film facestock, contains 30% recycled PIW
- High gloss and and opacity for a premium look
- Equivalent converting and labelling performance to conventional PP
- Offered with Avery Dennison's industry-leading top coat for quality and durability (better abrasion resistance)
- Cost neutral compared with virgin grade face material — a first in the ASEAN industry
- Launched with S7210 adhesive for PET and glass substrates at the best price to value
- Suitable for general applications, eg., cooking oil, sauces, condiments



Carbon footprint comparison

Products	Carbon Emission	Savings per 1,000,000 SQM
rPP	0.43 kgCO ₂ E/sqm	-9%
PPNg	0.48 kgCO ₂ E/sqm	Equivalent to 17,148 km driven by an average passenger vehicle



Face Material

MC Elite FSC

- Semi gloss prime paper facestock, made using 14% less materials — the lightest in the industry (70 GSM)
- FSC certified
- Carries more labels per roll — higher efficiency throughout the value chain
- This 70gsm facestock is ideal for overlaminates, lighter in paper gsm without compromise in the label dispensing performance vs 80gsm paper
- Ideal application for PET/Glass containers, e.g., cooking oil, sauces, condiments

Carbon footprint comparison

Products	Carbon Emission	Savings per 1,000,000 SQM
MC Elite FSC	0.50 kgCO ₂ E/sqm	-7%
MC Primecoat GP FSC	0.53 kgCO ₂ E/sqm	Equivalent to 14,055 km driven by an average passenger vehicle



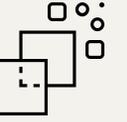


Adhesive

Emulsion S7210

- Specially engineered for strong, long-lasting adhesion on glass and PET substrates
- A clear adhesive that enables the 'no label look' with a clear film face and PET liner material
- Enables short-term repositionability — saves labels and bottles from being discarded
- Low adhesive ooze — higher performance on converting and labelling, less maintenance, more uptime, overall cost reduction
- Best price to Value — can be paired with PP40 Clear and rPP White
- Complies with FDA standards for non-direct-food contact





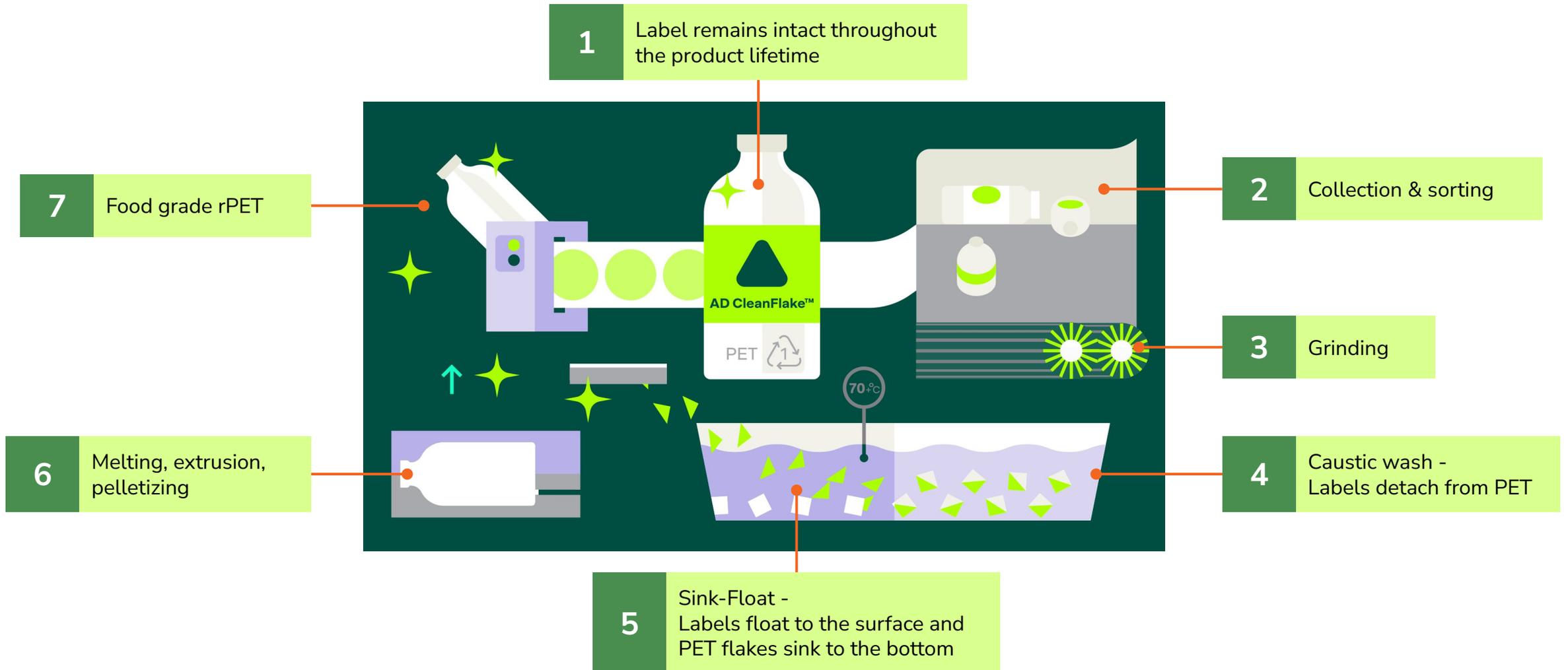
Adhesive

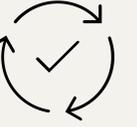
CleanFlake™

- Enables food-grade bottle-to-bottle recycling through a clean removal of the label during PET recycling without compromise of performance and adhesion
- Specially engineered for strong, long-lasting adhesion on PET substrates
- Retains the aesthetics of a standard film label
- Can be paired with PP40 Clear and rPP White
- Accredited by the APR (Association of Plastic Recyclers) for its contribution to the recyclability of PET and HDPE, and a recipient of numerous awards
- Recognized by local recyclers for enabling recycling



How CleanFlake™ Works





Adhesive

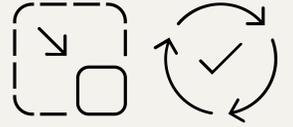
Hotmelt S2025N

- Contains 30% bio-based materials
- Low adhesive ooze — higher performance on converting and labelling, less maintenance, more uptime.
- Most effective cost — can be paired with MC Elite paper 70gsm
- Specially engineered for strong, long-lasting adhesion on glass and PET substrates
- Complies with FDA standards for non-direct-food contact



Liner

rPET23



- Contains 30% PCW recycled PET
- Ideal for high-speed converting and dispensing at (500 to 800 bottles per minute)
- Suitable for high clarity to achieve the “no label look”
- Thinner liner enabling less changeover and wastage, more space for transportation and storage and increase labelling efficiency

Carbon footprint comparison

Products	Carbon Emission	Savings per 1,000,000 SQM
rPET23	0.38 kgCO ₂ E/sqm	-12%
Virgin PET23	0.44 kgCO ₂ E/sqm	Equivalent to 20,719 km driven by an average passenger vehicle





Liner

BG33

- A thinner liner that can be paired with rPP
- Uses less raw materials and carries more labels per roll
- Enables less changeover and wastage, more space for transportation and storage and increases labelling efficiency
- No investment on new die tool

Carbon footprint comparison

Products	Carbon Emission	Savings per 1,000,000 SQM
BG33	0.46 kgCO ₂ E/sqm	-6%
BG40	0.49 kgCO ₂ E/sqm	Equivalent to 11,356 km driven by an average passenger vehicle





Facestock

AD XeroLinr DT

- Reduces the use of materials by 30% compared to label with liner
- 60% more labels per roll translating to fewer roll changes and more printer up time
- Lower supply chain costs: 40% less weight and fewer rolls to ship or store
- Saves liner disposal cost
- Variable length label capability

Applications

- ✓ Quick service restaurant
- ✓ eCommerce and logistics
- ✓ Retail supermarkets



Carbon footprint comparison

Products	Carbon Emission	Savings per 1,000,000 SQM
DT Linerless	0.13 kgCO ₂ E/sqm	-76%
Linered DT	0.53 kgCO ₂ E/sqm	Equivalent to 158,492 km driven by an average passenger vehicle

Labels that Support Functional Packaging for Food



Functionality

Chilled & Frozen Food



C2075F

Moisture-resistant and stronger initial tack, better price-to-value

- A perfect match for **chilled and freezer** applications
- Excellent initial tack, affinity to low energy substrates — perfect for **dry and moist** applications like vacuum pack products where the surface can become moist
- Available with **recycled content face PIW** for added sustainability advantage

Applications

- ✓ Raw and processed meat, poultry, fruit, vegetables, and dairy products
- ✓ Labels applied to regular and irregular shared filmic surfaces
- ✓ HFFS or VFFS packaging

Product code	Face	Adhesive	Liner
SY7220	rPP White TC	C2075F	BG40Wh Imp FSC
SY7221	rPP Synthetic Paper	C2075F	BG40Wh Imp FSC

Functionality

PVDC-free OXYB (Oxygen Barrier) Reclosure Label



PVDC-free

Enables recycling of food packaging — a step towards Circular Economy

- Offer easy opening with repeated resealability
- Deliver transparency that is required in “see-through” food packaging
- Extended product shelf life (very low oxygen transmission rate (OTR) of 8 cc/m²/24 hours)
- Free of PVDC which is considered a contaminant for the recycling stream

Applications

- ✓ Fresh herbs
- ✓ Biscuits
- ✓ Fresh meats and cold cuts
- ✓ Cheese
- ✓ Prepared fruit
- ✓ Savory snacks
- ✓ Confectionery
- ✓ Packaged produce

Product code	Face	Adhesive	Liner
BR584	PP50 TOP CLEAR OXYB PF	R5052	BG40WH FSC
BY631	PE80 CLEAR OXYB PF	R5052	BG40WH FSC

Direct Food Contact Labeling



S2800

A permanent, adhesive exhibiting high adhesion on fresh meat in both ambient and heavily chilled conditions.

- Good adhesion at room and cold temperature
- Approved for direct food contact onto moist and fatty foods
- Complies with European food regulation 1935/2004/EC

Applications

- ✓ Direct dry food
- ✓ Cheese and dairy
- ✓ Meat and animal products
- ✓ Chilled food



Z3000

A removable hot melt adhesive designed for adhesion to fresh fruits and vegetables with **edible skin**

- A high initial tack label designed for all fruits and vegetables, including fruits with textured surfaces e.g. kiwi, avocado
- Complies with FDA 175.105 and FDA175.125B

Applications

- ✓ Fresh fruits
- ✓ Vegetables

PEHD Tamper Evident Label



PEHD ultra destructible film by delamination with a print receptive surface

- Ideal for food security applications that require high tamper evident features
- Good initial tack and adhesion to wide range of substrates
- Gives a rapid 'tamper evident' bond on most substrate, creating an ideal security feature

Applications

- ✓ Food seal label
- ✓ Food delivery

Product code	Face	Adhesive	Liner
SY7179	PE HD TAMPER EVIDENT	S700N	BG40Wh Imp FSC

Dissolvable Solution



Trends in Food Rotation

- Food containers are constantly being reused and relabeled
- The need for labels that do not leave residue behind that bacteria can cling to, reducing the risk of contamination

Features

- Labels **dissolve and wash away with normal tap water** and slight agitation, leave no adhesive or fiber residue on containers
- Simplifies washing and relabeling processes, improving operational efficiency
- Sustainability - Enables reuse of containers

Applications

- ✓ Inventory labels
- ✓ Food rotation
- ✓ Container date code labels
- ✓ Packaging labels
- ✓ Reusable containers

Product code	Face	Adhesive	Liner
15666	Dissolvable Paper FSC	S2600	40#SCK
B4446	DT Dissolvable	S2600	40#SCK

Biodegradable & Compostable



S9500

Adhesive for combination with facestock that can be reintroduced into nature

- Carries the “OK Compost” certificate according to EN13432 regulations for industrial composting
- Available with a whole range of paper and biodegradable film facestocks
- Direct food contact approval for dry, non-fatty foods
- Helps meet growing demand for sustainable solutions for difficult-to-recycle packaging

Applications

- ✓ Packaging solution that need
- ✓ to be both biodegradable and compostable
- ✓ Direct labeling on dry food (fruits and vegetables)
- ✓ Beverages, especially on biodegradable bottles (e.g. PLA)



Labels that Support Functional Packaging for Beverages



Wash-Off for Returnable Glass Bottles



S6000

Designed to enable recycling and reuse of glass bottles with **clear-on-clear label looks**

- Easy label removal, no adhesive residue on bottle or in washer
- Not affected by moist environment
- Adhesive does not contaminate the washing water
- Recommended condition: 2% caustic, 75 - 80°C, duration 5-7mins

WO1900

Designed for returnable glass bottles, paired with **wet strength paper** facestock

- Easy label removal, no adhesive residue on bottle or in washer
- Not dissolving with condensation or in ice-bucket
- Recommended condition: 2% caustic, 75 - 80°C, duration 5-7mins - **Tested successfully in Kronos washer**

Applications

- ✓ Beer
- ✓ Spirit
- ✓ Wine

Cold Temperature Adhesive



C7501

- Adhesive for low temperature and moist environment
- Developed to provide good **room temperature** performance and excellent **cold temperature** performance
- Very good **ice bucket** and cold performance
- Wide service temperature range
- Low ooze, excellent wide web converting
- Suited for **milk bottles and jugs**, and works well in **wet or dry** environments, or in cold and room temperatures

Applications

- ✓ Beverages and juices
- ✓ Sparkling wines
- ✓ PE milk bottles
- ✓ PET bottles
- ✓ Glass bottles

The adhesive can only adhere to certain levels of surface water. If the surface becomes too wet, the label will slide and fail to adhere to the container.

Freshly Moulded Containers and Hot-filling



S477A.MB

Designed for **freshly moulded and hot-filling containers** with added sustainability values with biomass adhesive

- S477A acrylic emulsion adhesive is high initial tack to hold tight even on low surface-energy materials like HDPE
- Suited for in-line right after containers are freshly moulded — Reduces downtime to wait at least 24 hrs before labeling
- Suited for hot filling beverage. Reduce downtime — Faster filling process
- **Biomass emulsion acrylic adhesive** - APEO-free, min 30% renewable-based adhesive

Applications

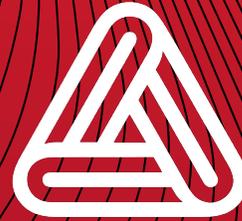
- ✓ Milk bottles
- ✓ Hot-filling beverages and juices
- ✓ Freshly blow-moulded for household, cleaners, detergent, personal hygiene products

Q

&

A

Thank you



**AVERY
DENNISON**