



clearintent

More ways to use less.

Our Clearintent™ Portfolio contains hundreds of products that help our customers and their end users reduce materials consumption; shrink their environmental footprint; and support safety, fairness and human rights.



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Building value through sustainability

A more sustainable future may require taking a fresh look at how we use plastics; the ClearIntent™ Portfolio can help

Avery Dennison is committed to helping converters and brand owners deliver products that are more sustainable —products that use less raw material and greater amounts of recycled material, that produce less waste, and that enable recycling.

Our ClearIntent™ Portfolio makes it easier than ever to choose label and packaging solutions that align with these criteria. This constantly expanding portfolio is available as a growing movement encourages companies and consumers to re-think how the earth's resources are used.

A workhorse material ... but with a great cost

Global plastic use has grown substantially since World War II, when shortages of natural materials prompted manufacturers to develop synthetic alternatives. Today, it's a workhorse raw material. In 2015, 448 million tons of plastic were produced for the consumer, industrial, transportation, building and construction, and packaging industries.

This reliance comes with a cost, however, and there's a realization that our current approach to plastic is not sustainable. According to the Ellen MacArthur Foundation, if nothing about our consumption changes, new plastics will require 20 percent of petroleum production within the next 35 years. This is up from 6 percent in 2014.

And, more than 80 percent of that plastic ends up in landfills, incinerators or sensitive environments. In fact, 8 million tons of plastic waste enters the ocean each year, according to the United Nations. By 2050, according to a calculation by the Ellen MacArthur Foundation, there will be more plastic in the oceans than fish, by weight!



Meanwhile, one of the world's most reliable sources for plastic waste handling and recycling has said "stop." In January 2018, the government of China—a nation that has imported about 45 percent of the world's plastics for recycling since 1992, according to United Nations Comtrade data—put into effect a policy known as the "National Sword." This bans the importation of PET and other plastic bottles and containers, along with mixed paper. That waste, which includes plastics generated by Europe and North America, now seems even more likely to end up in landfills or oceans.

Governments are starting to respond

There are reasons for optimism, though, as many countries have started to put strategies and legislation in place to tackle the problem.

The European Union is discussing a strategy to discourage use of single-use plastics—possibly taxing their use—and invest in research and development of modern, recyclable products. In the United Kingdom, the government has pledged to eliminate single-use packaging by 2025. India has made a pledge to do so by 2022. In fact, more than 60 countries have introduced bans and fees aimed at eliminating plastic waste.

Additionally, major U.S. brands such as Unilever, Procter and Gamble, and Coca Cola have pledged to employ more recycled, re-used, or compostable materials in the next decade. A wide

range of British companies have signed on to the UK Plastic Pact, making a similar pledge for recyclability and reduction.

A new way of thinking about the economy

Transcending all these efforts is, perhaps, a different way of thinking about the economy. It's a shift from the current linear model where products, including plastics, are manufactured from raw materials, used once, then discarded into landfills; to a circular model where products are designed and manufactured in a way that optimize them for reuse or recycling.

This approach could even benefit the economy. The Ellen MacArthur Foundation states, for instance, that the shift to a circular economy could result in a net economic gain in Europe alone of 1.8 trillion Euros (\$2.0 trillion USD) by 2030, compared to the linear approach.

The conditions for this shift thus may be ripe. "As the call for a new economic model based on systems-thinking grows louder," states the Ellen MacArthur Foundation, "an unprecedented favorable alignment of technological and social factors today can enable the transition to a circular economy."

We want to be part of the solution

The Label and Packaging industry has a tremendous opportunity to play a role in this shift, simply because we



play such a big role in the current state of affairs. We're plugged into a very broad, global, value chain that uses significant amounts of plastic. According to a feature story in the June 2018 National Geographic, plastic packaging accounts for nearly 40 percent of all plastic manufactured with a life cycle of less than 6 months.

We at Avery Dennison recognize the opportunity to be part of the solution. So we're developing and offering solutions that have sustainable improvements. These are products that use less material, eliminate unnecessary material, and maintain the levels of performance for which our products are known. They help enable a circular economy, providing recyclable solutions that have less impact on the local communities that handle sourcing.



Reduce.
ClearIntent products use less material to help conserve limited natural resources.



Use recycled content.
ClearIntent products incorporate materials that have already been used.



Enable recycling.
ClearIntent products enable recycling of plastic packaging.



Source responsibly.
The ClearIntent portfolio includes hundreds of facestocks made with paper certified by the Forest Stewardship Council or film and paper facestocks made from renewable resources.

The ClearIntent Portfolio of products

Such solutions are easier than ever to identify through our ClearIntent Portfolio.

It's a growing selection of competitively-priced products that aims to help converters and brand owners reduce materials consumption or shrink their environmental footprint while supporting safety, fairness and human rights.

It features label adhesives that enables the recycling of plastic bottles, papers certified by the Forest Stewardship Council®, and apparel labels made from renewable resources that are manufactured in factories that meet the industry's standards for worker safety and health, and more.

Quantifiable sustainability

The sustainability impact of many of these products is quantifiably measured through our Greenprint™ program. An objective, analytical and transparent approach, the Greenprint program compares each sustainable product offering to its standard counterpart across factors such as raw material and energy use, greenhouse gas emissions, and waste. It gives customers the assurance and confidence that their material choices are, indeed, more sustainable than the product to which it is compared.

To earn its place in our ClearIntent Portfolio, a product must demonstrably reduce environmental impact by meeting one of more of these criteria:

The bottom line is that using the ClearIntent Portfolio makes it easier to improve the environmental impact of packaging without sacrificing performance; and in many cases, without paying more. And, its focus on reduce-reuse-recycle helps our entire value chain align with the concepts of the circular economy.

This issue of AD Connect includes a full listing of the ClearIntent Portfolio, along with feature stories on many of the newest additions. It also discusses an important consumer trend related to sustainable packaging and explores a new effort to help converters and brand owners recycle liner and matrix waste.

Additional information about our ClearIntent Portfolio is available at label.averydennison.com/sustainability, or through your Avery Dennison sales representative. **AD**



Think Sustainability ... Think Performance ... ThinkThin

New portfolio includes sustainability-focused solutions for thermal printing

Our 2025 Sustainability goals are helping us shape change across our industry. In response, the Avery Dennison team is driven to bring innovative products to the marketplace that can help converters and brand owners operate with a lower overall environmental footprint.

One of the team's areas of focus includes taking a fresh look at many of our existing products. Applying materials science expertise, the team finds opportunities to reengineer those products to use a lower volume of raw materials while providing comparable levels of performance. In other words, the products do more with less.



The ThinkThin™ portfolio

One of the many results of that work is the ThinkThin portfolio of products. It's built on a foundation of innovative, thinner facestocks and liners that provide greater sustainability—as measured against our Greenprint™ methodology—and comparable performance to the standard, thicker versions. ThinkThin also meets our “Reduction of Materials” standard within our broader (and ever-growing) ClearIntent™ Portfolio of sustainability focused solutions.

New thermal transfer products prove “less is more”

The portfolio includes a variety of new products for thermal transfer and direct thermal printing.

— TTC Eco Construction

TTC Eco™ is a top-coated thermal transfer label construction with a 2.1 mil paper facestock, and 1.5 mil liner.

These thinner components allow a 20,000 foot roll of TTC Eco to have the same outer diameter and weight as a 15,000 foot roll of the standard TTC product. This translates to serious benefits for converters. The additional length per roll enables converters to run longer quantities of material with less changeover. Customers will also save significantly on shipping costs, including freight and boxes.

There are end-user benefits as well. The TTC Eco construction allows 33 percent more labels per roll, compared to our standard product.* This can reduce the amount of time and effort spent on changeovers: An 8-inch OD roll of TTC Eco can produce 750 feet of labels, instead of 500 feet of the standard product. So users need to change the label roll only twice, instead of three times, per ribbon roll.

The Avery Dennison Greenprint™ profile for TTC Eco is impressive. Compared to the standard, coated, thermal transfer construction (product number 53870), TTC Eco requires 16 percent less fossil material, 24 percent less biobased material, 21 percent less water, and 24 percent less energy to produce. Its production produces 27 percent less greenhouse emissions, and the product results in 26 percent less solid waste.

— Thinner liners and linerless technology

The ThinkThin™ portfolio will also include a selection of thinner liner options for direct thermal (DT) printing, including a 1.7 mil SCK and a 1.2 mil PET. These options deliver point-of-use performance that's comparable to standard, thicker liners. Again, these thinner, lighter products require less fuel to ship, resulting in lower emissions and lower freight costs. And, they produce less waste for landfills. These products have been put through customer trials with satisfactory results.

Taking the “thinner” approach to its extreme is our DT Linerless technology. Through the application of a thin coating of release material to the paper or film facestock, the need for a liner is removed altogether. The absence of a liner has—as might be expected—a significant impact on the product's sustainability, both upstream and downstream from the point of use. For more about DT Linerless, see the Innovation feature in this issue of AD Connect.

Try ThinkThin for yourself

Transparency is crucial, particularly when making claims about a product's sustainability. To that end, we're pleased to share Greenprint information about any of the products in our ThinkThin and ClearIntent portfolios.

We also invite converters to trial these products on their own presses, so they can be fully confident before putting them into production. Your Avery Dennison sales representative can help you get the information or product samples you need to get started. **AD**

*Based on internal testing and converter feedback

Recycling Plastic Packaging

CleanFlake™ Adhesive Technology

Avery Dennison CleanFlake™ Portfolio of labeling solutions significantly improves the rPET yield in the recycling process while maintaining the shelf appeal that pressure-sensitive labels are known for. Pressure-sensitive labels typically limit PET recyclability into food-grade rPET due to adhesive contamination. However, CleanFlake™ technology cleanly separates in reaction to the caustic bath, leaving no adhesive residue on the PET flake.

Avery Dennison has expanded its CleanFlake™ portfolio to include clear and white Global MDO and BOPP films as well as paper facestocks. It passes the highest form of testing available from the Association of Plastic Recyclers for films that conform with the PET recycling process. **AD**

To learn more about this or any of our other sustainable solutions, get in touch with our sustainability team:



Sarah Sanzo
Compliance and Sustainability Manager



Michael Bearer
Recycling Program Lead



Matt Wilkinson
APR Technical Committee Lead

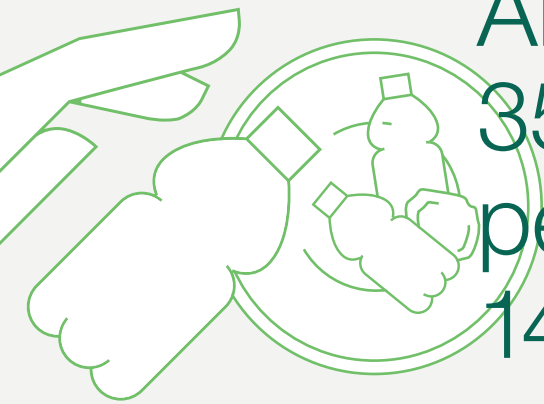


Mitch Rackovan
APR Technical Committee Lead



Tim Bohlke
Brand Owner Relationship Manager

93% of all plastic packaging is for the food, beverage and HPC segments



Americans throw away 35 billion plastic bottles per year, leaving only 14.6% to be recycled

25% of all plastic received by recyclers ends up in landfills



91% of plastic in the US is not recycled

Application Consultants

Get to know the team providing customers with real-time technical support via phone, email or web chat

This is the next piece in the series looking at our **ADvantage** technical teams. In this issue, we'll meet our Application Consultants.

High quality recommendations tailored to the customer

Avery Dennison Application Consultants (AC) provide pre-order technical support to customers via phone, email or web chat. Leveraging both deep product knowledge and customer-specific data, they make timely recommendations on the best product(s) to test for an application, and that are tailored to the customer's existing inventory and capabilities. The team also provides technical training through offerings such as our PS101 and Technical Symposiums.

Real-time support from a real person

Based out of the Avery Dennison LGM headquarters in Mentor, Ohio, our 10 ACs plays a critical role in our technical service strategy—a real-time, easy-to-reach source of reliable information and guidance.

ACs can, for instance, provide extra confirmation to a customer who already knows which product they want to test. They can consult on substrate adhesion, product compliance information, environmental conditions, durability, product cost comparison, or provide other information to help the customer choose the best product to test for an application.

“We understand how important it is to be able to contact a ‘real person’ for support at the moment it’s needed,” says Brandi Davis, Senior Technical Services Manager. “So, we track our response time carefully to help the team learn and improve. For instance, we know we respond to 99.6 percent of incoming customer emails within two-and-a-half hours, and resolve the customer’s issue more than 73 percent of the time through that first response.”

Getting it right the first time

That first-response—getting it right the first time—is key. Doing so requires a special combination of experience, teamwork and knowledge.



Integrity

We are driven by doing the right thing. Always.

- We do what we say.
- We put ethics above all else.
- We are honest and transparent in all we do.

Courage

We are brave in the face of adversity and the unknown.

- We think big and set ambitious goals.
- We stand and speak up for what is right.
- We acknowledge and recognize the contributions of others.

External Focus

We get out to get better.

- We are motivated by our customers' success.
- We explore the external environment to stretch our perspective and inform our thinking.

Diversity

We gain strength from diverse ideas and teams.

- We require different viewpoints and debate.
- We create an inclusive and respectful environment for people of all backgrounds and orientations.

The team boasts an average Avery Dennison tenure of over 15 years, and each AC has a core area of expertise that he or she shares with the others. Each team member also receives ongoing training to be knowledgeable in all product lines and applications.

Additionally, the team partners with peer technical groups such as our Regional Technical Managers (profiled in the previous AD Connect), and works closely with our Marketing and Sales teams to stay on top of market and product trends.

High-talent, high motivation

“This is a collection of highly talented and motivated individuals,” says Brandi. “Collectively, they offer

diverse and complementary skill sets, a passion for customer advocacy, and an insatiable curiosity for how things work. Most importantly, they have a work ethic that just won’t quit.”

Continues Brandi: “Customers consistently and frequently tell us that this team is one of the key reasons they contact Avery Dennison first with new opportunities. Their commitment to service excellence and dedication to our customers is inspirational. They are the best pre-order tech support team, in the industry—period!” **AD**

To reach an Application Consultant:



Call

1-800-944-8511, choose option 2.

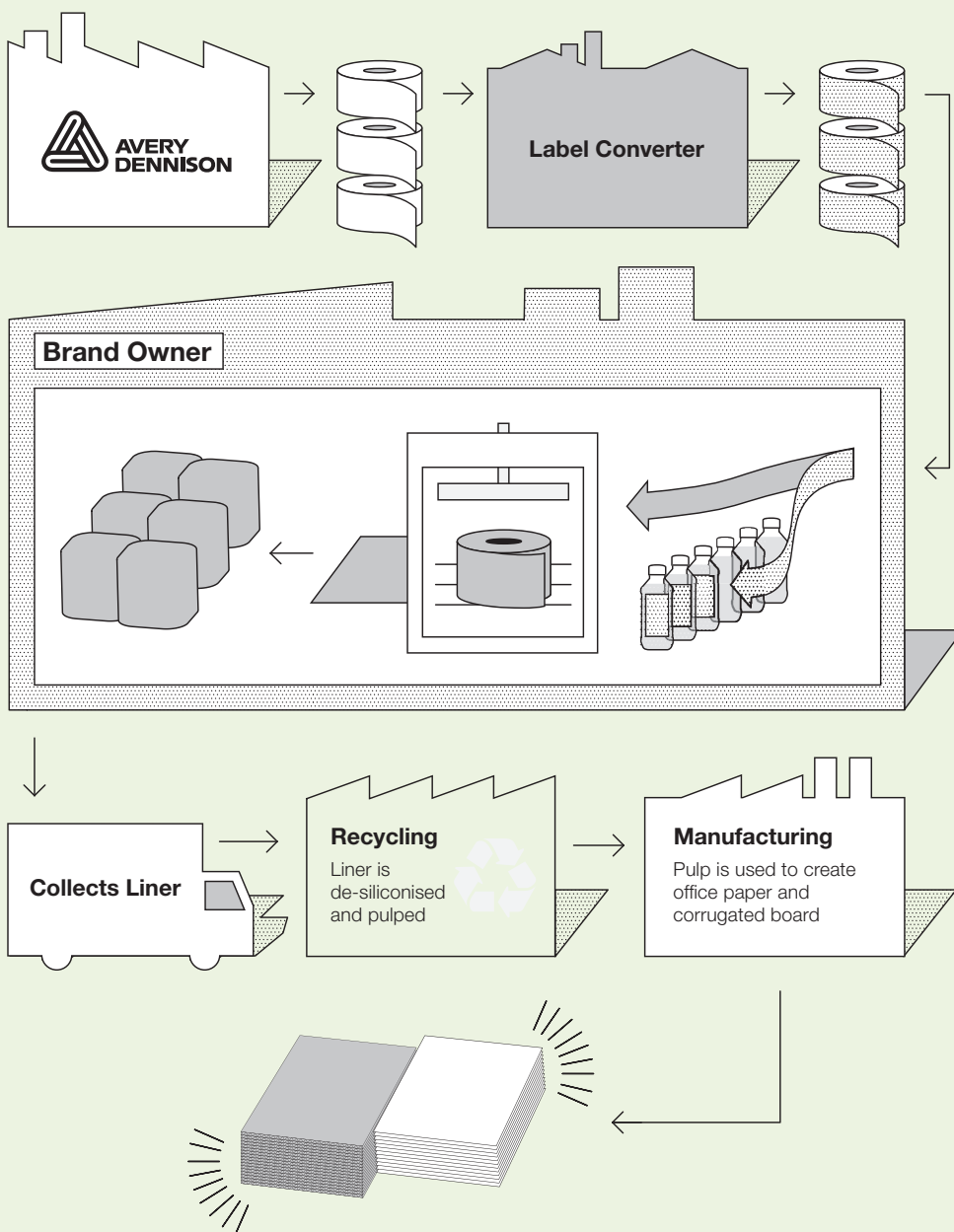


Web Chat

Click on the “Live Chat” link on product pages at label.averydennison.com

Finding a solution for label waste

How we're helping the industry tackle the challenge of liner and matrix waste



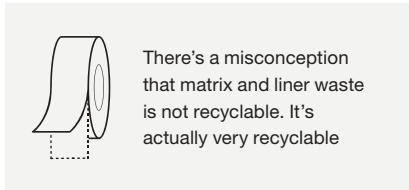
Avery Dennison has launched our Global Matrix and Liner Waste Recycling program. This exciting effort is designed to help both converters and brand owners reduce their label waste disposal costs, meet regulatory requirements, and achieve landfill reduction targets. From a branding standpoint, it may help companies build their reputation for environmental responsibility.

Connecting customers with matrix and liner waste recyclers

The program centers on helping connect label converters and brand owners with recyclers through an interactive, global recycling map available on our website. The map shows the location and contact information for companies with recycling capabilities for paper, film and PET liner and matrix materials.

These include recyclers that are equipped to process the waste into raw materials for new products, or transform it into fuel pellets (more about that below). The easy-to-use map is supplemented with a printable list of recyclers and their contact information, broken down by global region. Both resources are updated regularly, to help ensure customers have current information at their fingertips.

To help converters be aware of all their recycling options, Avery Dennison is also working closely with TLMI by joining the Environmental committee. The organization recently announced its own PET release liner recycling program. Working together, we believe we can accelerate the rate at which matrix and liner waste recycling is adopted.



There's a misconception that matrix and liner waste is not recyclable. It's actually very recyclable

Liner waste is a significant issue

The Global Matrix and Liner Waste Recycling program addresses a key sustainability issue in our industry: What to do with the significant volume of liner and matrix waste we're producing.

That volume is, indeed, significant. According to a 2017 study by Alexander Watson Associates (AWA), industry in the U.S. produces: 273 kilotons of paper-based liner waste. 68 percent of it is landfilled.

31 kilotons of film-based liner waste. 71 percent of it is landfilled. 46 kilotons of paper-based matrix waste. 38 percent is landfilled. 6 kilotons of film-based matrix waste. 45 percent is landfilled.

Breaking down the challenge

Such numbers may seem overwhelming. But as we look deeper at the liner and matrix waste challenge at an industry level, some specific issues emerge.

First is the misconception that these materials are not recyclable. Actually, liners and matrix waste—whether paper or film, and whether siliconized or not—can be recycled in most cases.

One of the more intriguing uses for these recycled materials is in the production of fuel pellets. According to Tedd Vancamp of Convergen Energy, one of the recyclers in our program, "Matrix waste pellets can be cost competitive with coal and natural gas for the amount of energy produced, while the adhesive component—which can help the pellet stick together—is often a welcome part of the pellet production process."

A second issue is that converters who do have a desire to recycle often lack the strategy and process for getting it done. Such a strategy should begin with an understanding of the type and amount of waste being produced and its associated disposal costs, matched to an understanding of the recycling options and their costs. When

companies think more strategically about recycling, they can better evaluate the options and develop the goals and processes needed to execute.

Finally, there's a the lack of infrastructure to make recycling a viable option for converters and brand owners who've done that strategic thinking. The recyclers are out there. But shipping waste materials to a specialized recycling plant that may be several states away is often not cost effective for many converters.

Taking a strategic approach

The fact is, there's no one-size-fits all solution to the challenge of label waste. What works for a converter supporting major brands at a regional or national level may be very different from what's needed by a smaller converter with a more local footprint.

In either case, however, there are options. Our Global Matrix and Liner Waste Recycling Program can help.

We encourage brand owners and converters to take a strategic approach when exploring their label waste recycling options. It may not be an easy path, but the outcomes can be rewarding. Your Avery Dennison representative can provide guidance to get you started.

To learn more about how we're working to tackle the label waste challenge, and view our interactive recycler map, visit label.averydennison.com/sustainability. **AD**

Introducing Direct Thermal Linerless Technology



How Direct Thermal Linerless works, and how it helps

Direct Thermal Linerless technology is available in self-wound rolls. It's designed for both linerless enabled hand apply and auto apply printers, and offers excellent thermal sensitivity and consistent release.

The key to the technology is the application of a thin release coating on the facestock. This coating prevents the adhesive from sticking to the layer underneath it, eliminating the need for a liner and matrix.

According to Avery Dennison Greenprint™ methodology, when compared to our standard product, Direct Thermal Linerless technology can make a significant impact on sustainability.

- 32 percent reduction of water use
- 32 percent reduction of greenhouse gas emissions
- 30 percent reduction in use of biobased materials
- 31 percent reduction in energy use
- 36 percent reduction in waste

More than waste reduction

The sustainability impact of using Direct Thermal linerless can be significant and the advantages don't end there.

As the technology uses less material, the self-wound rolls are 35 percent thinner than standard products, and offer up to 60 percent more labels per roll. This can translate to a range of productivity benefits, including fewer roll changes and more printer uptime. Labor is reduced, as there is no liner waste to eliminate. Safety increases with the disappearance of that "slick" liner waste on the shop floor. Because each roll of Direct Thermal linerless yields more labels, there's less to ship. This helps converters manage their shipping costs.

Use of linerless labels is growing

While linerless label materials still make up a small portion of the market both in the US and worldwide, use of the technology is indeed growing. According to the AWA 2017 Linerless Report and Avery Dennison's own research, the industry can expect a 5.1 percent global CAGR between 2016 and 2021 for linerless, and a

1.6 percent CAGR in the US across the same time period.

Leading applications include postal and shipping labels, warehouse, weigh scale, and mobile printers. But regardless of where and how they're used, linerless technology offers a benefit of significantly less waste. Release liners and matrix account for more than half of the label waste created during label application. That's a lot of material providing virtually no value from the point of application onward.

Solutions for greater sustainability

Direct Thermal Linerless is an important addition to our ClearIntent™ Portfolio of products, which can help converters and brand owners realize greater sustainability in their own products and processes.

For more information about Direct Thermal Linerless and other sustainable conversion solutions, contact your Avery Dennison representative, or visit label.averydennison.com/sustainability. **AD**

Introduced at Labelexpo 2018, Avery Dennison Direct Thermal Linerless technology offers a combination of sustainability, productivity and convenience. It's engineered to help converters and end users get more done with less, while minimizing their environmental impact.