

# NONWOVENS INDUSTRY SINCE 1970

## Sustainability in **HYGIENE PRODUCTS**

Sustainability Starts with  
Upstream Production

Heartland Polymers Make  
Monumental Investment

Natural Hygiene Market  
Keeps Growing

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# Sustainability Starts with Upstream Production

Design and technology choices paired with local feedstock will help Heartland generate less greenhouse gas than average global PP facilities

It's no secret sustainability has moved up the list when it comes to raw material sourcing, along with the standard requisites, quality, efficiency, cost, and processability. While downstream activities are vital to bringing sustainability to life in tangible ways through products and partnerships, there is considerable value to be discussed in the actions being taken upstream to reduce our footprint.

As only the second polypropylene production (PP) to come online in the last decade—and the first single-site propane dehydrogenation (PDH) and PP plant in North America – the Heartland Polymers team determined sustainability would be built into the plant design and production approach long before ground was broken. According to an independent study conducted by Heartland's parent company, Inter Pipeline, those design and technology choices paired with local feedstock will help Heartland generate less greenhouse gas than average global PP facilities.

"We had the rare opportunity to be one of the only PP operations designed and built at the onset of this modern era of sustainable consciousness—sustainability wasn't an add-on for Heartland, it was a building block," says Yonas Kebede, Heartland's director of sales and marketing. "From the beginning, the intention was to pull out all the stops in the creation of a modern facility that would produce high quality product with a reduced footprint. We're committed to continual improvement in this area, and that means we will quantify and communicate our impacts after we've been in full operations for at least a year."

Due to its integrated nature, Heartland's facility fuels power production in the cogeneration unit (CUB) with production by-products from the PDH Unit, such as ethane and hydrogen. These by-products make up approximately 32 per cent of the operation's total fuel usage, reducing the total carbon footprint by approximately 130,000 tonnes annually.

"Additionally, the design choice to utilize air cooling instead of water cooling in the operation has a significant impact on the amount of water used at Heartland," explains Kebede. As a result, Heartland is projected to use 80% less make-up water than water cooled operations.

## The Power of Cogeneration (CUB)

An on-site central utility block (CUB) cogeneration unit recovers residual heat from the operation of its gas turbines and utilizes it to produce steam for use by the propane dehydrogenation and polypropylene units to support process equipment energy requirements. The residual heat recovery process is used instead of traditional power and emissions-intensive fossil fuels, such as coal.

Kebede explains that the integration of the cogeneration plant within the broader petrochemical complex plays a significant role in reducing Heartland's overall GHG emissions. As well, because natural gas is the feedstock for the CUB, it produces cleaner, lower emitting electricity to support facility operations.

"Production technology is another area where our industry is making leaps and bounds, both in terms of overall efficiency and reduced impacts," he says. "Our team conducted a considerable

amount of research before finally selecting Oleflex™ PDH technology and Grace UNIPOL® technology for PP.”

While the Oleflex™ PDH technology is relatively on par with average emissions estimates from other PDH operations, the hydrogen used to fuel the integrated cogeneration unit and process heaters is a by-product of the dehydrogenation process to create the propylene. This further reduces GHG emissions and removes the need for imported grid electricity to fuel the process (grid-based power can be higher emitting than power generated from the integrated cogeneration unit).

Similarly, the Grace UNIPOL® technology utilized in the PP plant leverages the benefits of the onsite, integrated cogeneration unit by removing the need for imported electricity and associated indirect emissions.

### Contributing Back to the Grid

Heartland’s central utility block uploads approximately ~50 megawatts to the provincial public grid annually. This power, produced with natural gas as a feedstock, provides low emissions power to the public grid in the region. Combustion of natural gas emits about half as much carbon dioxide as coal and 30 per cent less than oil, as well as far fewer pollutants, per unit of energy delivered.<sup>1</sup>

### Solvent Free

Kebede says another major benefit for downstream customers is the fact the PP technology employed is also solvent free,<sup>2</sup> which is a safer and more environmentally friendly production process.

### Direct Propane Supply

Heartland’s production facility is located in Alberta, which has

the highest domestic production of natural gas liquids (NGL), especially propane in North America. Approximately one-third of the facility’s propane supply is produced by parent company Inter Pipeline’s (IPL’s) Offgas Business. Offgas is supplied via pipeline from the oilsands upgraders located in North Alberta and sent to IPL’s offgas business where it processed into various NGLs, such as propane. The offgas business also extracts the heat value from those NGLs into natural gas, a cleaner burning fuel and sends it back to the upgraders. The propane from the offgas business used in Heartland’s PDH Plant has the additional environmental benefit of positively impacting the oilsands upgrading operations through the reduction of greenhouse gas emissions by over 300 ktCO<sub>2</sub>e/yr., otherwise they would have to use a heavier and more emission intensive stream as a fuel or flare it.

### Diversifying End Use, Creating Lower Emissions

Taking more than 22,000 barrels of Canadian propane feedstock per day and turning it into polypropylene pellets removes the potential for the carbon in propane to be available as a combustion fuel source. This production process, which captures the carbon feedstock into a solid form of a pellet, can be used to produce recyclable products and represents the equivalent to removing roughly 217,000 passenger vehicles from roads each year.

### Sustainable Water Use

Another area where Heartland’s deliberate decisions are paying dividends is in the reduction of freshwater usage, explains Kebede. The facility’s sustainable use of water is a step change compared to most other facilities, he says, because of the conscious decision to not use a cooling tower fed by water, which significantly reduces the environmental footprint.

“Our PDH plant’s A-Frame Condenser Technology reduces fresh-water make-up requirements by a factor of 19 times,” he explains, “which is a reduction of almost 1.5 million cubic metres of make-up water per year.

While Heartland Polymers supports research aimed at reducing plastic waste, and considers novel partnerships for downstream activities, Kebede says the company will also continue to invest in practices that reduce environmental impacts at the source.

“We believe that plastics belong in the economy, not the environment. Every decision throughout the supply and value chain impacts the next. The first consideration in a circular economy is the sourcing and production of the raw materials,” Kebede says. “We’re committed to proving better is possible, and that starts with our approach to production.” ■

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# Polypropylene made in Canada, ready for the world.

Heartland operates out of a major industrial hub in Alberta, Canada. Being located in one of the top propane producing regions in the world is a real asset. Having abundant local supply of feedstock and access to polymer-grade propylene helps us serve customers, wherever they are, more reliably.





# Plastics Research in Action: Finding New Uses for Post-Consumer Recyclables

Research initiative focuses on reducing plastic waste and increasing the use of PCR materials

**B**uilding a facility with reduced emissions and environmental impacts was just the start for new entrant Heartland Polymers. Before its North American-first single-site propane dehydrogenation (PDH)/polypropylene (PP) facility was producing pellets, Heartland had made a significant investment in applied research to reduce plastic waste and find new uses for post-consumer recycled materials.

“Heartland is committed to delivering actionable solutions that position our industry for responsible growth, and that means actively participating in finding those solutions,” explains Yonas Kebede, Heartland director of sales and marketing. “As a producer, it’s important for us to lead by example and promote the benefits of a circular economy.”

In November 2019, Heartland’s parent company, Inter Pipeline, announced a \$10 million, 10-year partnership with the Northern Alberta Institute of Technology (NAIT) titled Plastics Research in Action (PRIA). The goal of PRIA is to draw on NAIT’s applied research expertise in process engineering, process automation, and environmental sustainability to explore plastic waste reduction opportunities.

Entering the fourth year of the project, PRIA has positive advances to share in the form of practical solutions that are keeping plastics out of landfills and in the economy. Kebede says the Heartland team is very encouraged by the results so far.

## Key project updates from PRIA this year include:

- **Asphalt: A new path to the future**  
Paving roads in Alberta with hard to recycle post-consumer plastics is at the heart of The Asphalt Project. The applied

research created new paved roads at Alexander First Nation, on the Heartland Petrochemical site, and in the partnering counties in the summer of 2022. Across the test locations, this project will redirect around 3.74 tons of plastic waste—equivalent to 716,000 plastic bags or 415,000 plastic bottles.

- **Establishing a research protocol for microplastics in water**

This project is identifying, quantifying, and monitoring microplastics in the North Saskatchewan River in the Edmonton Metropolitan Region. The project is garnering international attention, when the research team was invited to share the NAIT-designed research protocol at the American Society for Testing and Materials (ASTM) conference in Seattle in April 2022. The team is also working on its first peer-reviewed publication, further raising the profile and credibility of PRIA’s applied research.

- **PP-Blended Flooring**

The third project is focused on the development of polypropylene flooring from recycled materials. The research team is working with a flooring manufacturer to develop and commercialize sustainably produced luxury flooring, validating the ability to introduce factory and consumer regrind and recycled content into their product – a critical step towards a zero-waste factory and circular economy.

“It’s amazing to see these innovations applied in real life, in products that are used every day, and to think we’re only scratching the surface of what’s possible,” Kebede says. ■

# Trends in the Baby Diaper Market

As they deal with varying challenges, diaper makers continue to prioritize innovation and sustainability

By Tara Olivo, Associate Editor



Raw material shortages, supply chain disruptions and inflation have tested manufacturers and brands in the baby diaper market over the last few years. Adding to these challenges, birth rates in the U.S. have steadily declined during the last decade and a half. Despite these concerns, innovation is alive in the baby diaper category and new brands have continued to launch.

“The pandemic has served as a double-edged sword for the diaper industry,” says Sonali Jagadev, research analyst - Beauty & Fashion, Euromonitor. “On one hand, greater price sensitivity has weakened the spending power of the consumer. On the other hand, increased health and eco-awareness has popularized value added product features with clean origin, natural, plant-based and organic products. Now, some questions have arisen: how do you reach the point where value and quality can meet, and how do you get this balance in the post-pandemic world?”

Although the U.S. is a mature market, Euromonitor is still expecting to see modest growth for baby diapers over the next five years, with disposable pants driving this growth. Most of the growth seen today is not volume driven; it is price driven because of inflation, Jagadev adds.

Dyper CEO Sergio Radovic says the supply chain has proven to be one of the most pressing challenges for young brands. “Between the pandemic, the raw material availability and fluctuating prices it creates a constant flux. Brands such as Dyper that rely on specialized plant-based materials and unique raw materials are often particularly disadvantaged and have to exhibit high resilience to assure interrupted supply to consumers. These and other challenges also present unique opportunities to innovate, something that comes naturally to young brands rooted in challenging the status quo.”

Pricie Hanna, managing partner, Price Hanna Consultants, notes that all competitors have been forced to raise diaper prices to pass through material and supply chain price increases. “To date, it appears that retailers and consumers alike have understood this and generally accepted the higher prices in the U.S. However, household budget pressures are increasingly motivating consumers to start to

try lower priced diapers,” she explains. “The inflation pressures and consumer concerns are more intense in Europe due to more severe energy and food inflation hikes.”

In the U.S., diaper leaders have reported that private label share gains have happened but seem moderate, Hanna says, while in Europe, where the private label shares have historically been higher than the U.S., private label share growth has been slightly higher this year.

Recently, Jagadev has seen strong competition from private labels in the U.S. “Gone are the days when private labels were just considered as a cheaper alternative to the leading brand. Today, private label is not about cheaper—they are just as innovative as premium brands. Private label brands are continually evolving, and in recent years retailers have re-made their own brands by integrating popular product features such as plant-based ingredients, biodegradable, sustainably sourced, soft for baby’s skin, along with eye catching packaging and targeted marketing language. It’s further clouding the line between national brands and private label.”

First Quality, a manufacturer of both branded and private label absorbent hygiene products, expects to continue to see a lot of growth for private label in the year ahead, according to Sima Delacruz, chief commercial officer at First Quality. “In the current economy, more consumers are reconsidering private label options,” she says. “This is an opportunity for retailers to invest in their own diaper brands and take a holistic approach to building consumer loyalty. Doing so means understanding consumers’ lifestyles and preferences and delivering personalized products and experiences that meet those needs.”

But today, competition is no longer just between the top multinational brands like Pampers and Huggies and private label. Over the last decade, the proliferation of new brands in the disposable baby diaper market has continued to alter the category. By partnering with contract manufacturers, building omni-channel strategies and utilizing social media, smaller independent brands like Honest, Hello Bello and Dyper have been able to make a minor dent in the market.

Ontex, an international supplier of personal care products, is capitalizing on the growth of private label and independent brands with its new facility that opened last summer in Stokesdale, NC. The plant currently manufactures baby diapers for retailers and lifestyle brands and will ultimately expand its production and workforce to manufacture products for other product categories. The Stokesdale facility complements Ontex's plant in Tijuana, Mexico, in supplying the growing partner brand market in North America.

In fact, the company's strategy is to be the number one partner for partner brands—retailers, online lifestyle brands and healthcare facilities, according to the company.

Ontex already has a significant position in the European partner brand business. While its position is smaller in North America, Ontex sees this region as a strategic growth platform and is making structural investments in the region to support the group.

In July, Ontex's Mexican business activities, excluding its Tijuana site, was sold to Softys S.A. as it concentrates on its partner brands and healthcare business. In recent years, the Tijuana site has become a contract manufacturing hub for Ontex's partner brands business.

"We have grown double-digit in North America and expect to maintain that momentum in the future," says a company spokesperson. "The agreement with Softys to divest our business in Mexico and Central America to them, does not include the Tijuana factory, which remains in Ontex's scope to supply the North American operations, in combination with the Stokesdale plant."

According to Euromonitor, the top two players—P&G and Kimberly Clark—capture most of the baby diaper marketshare, around 75-76%, while private labels make up 16-18% of the market. "Others," which used to account for 1-2% of the market five years back now holds 3-4% of the market share, according to the market researcher's preliminary numbers for 2022. "Others" includes brands like Hello Bello, Dyper, Kudos, First Quality, Bambo Nature and Rascal + Friends, etc.

"While these brands are considered 'Other,' they have gained share from private labels and the leading national brands," Jagadev observes.

Hanna adds that the smaller independent brands have loyal followers who primarily buy online as well as a few major brick and mortar retailers. While these independent brands tend to be premium priced diapers, most of their consumers have high to middle incomes and can afford the higher prices, although current economic trends may slow their growth rates, she comments.

While these independent brands have not yet made a significant impact on market share in the category, they have influenced the way both large and small companies design and market their products.

"Smaller independent brands like Honest and Hello Bello have long since established the benchmark in design and innovation for the rest of the players," says Natalia Richer, diaper and absorbent hygiene products consultant, Diaper Testing International. "When Honest launched in 2012, [it] was first-of-its kind in focusing on

a premium market, elevated sustainability claims and social-media-worthy patterns and customization. As Honest and a few other brands paved the road in the new premium space, they enjoyed free reign for a few years as it wasn't until 2019 when P&G responded to this new demand with their own premium diaper line Pampers Pure."

Although the volumes of the small boutique brands such as Dyper and Coterie are but a small fraction of the market, Richer says they are highly aspirational brands and the rest of the industry including raw material suppliers, converters and product developers look to them in defining the next step in innovation powered by heightened sensitivity to new consumer needs.

### Diaper Developments

In recent years, innovation in the baby diaper market has concentrated on skin comfort, leak protection and innovative core designs as well as the push for more sustainable ingredients. Interest in diaper pants is also growing, according to diaper industry experts.

From Richer's point of view, the largest opportunities in mature markets can be defined as: opportunity for increased sustainability, elevated diapering experience and better fitting materials for ease of use and leakage protection. "Until a true solution for responsible disposal and recovery of diapers exists, sustainability claims are limited to marginal improvements in supply chain such as plastic sourced from renewable materials, increased plant-based components across diaper layers, and other improvements such as green conversion energy," she says.

When it comes to "elevating the diapering experience," she means improving the visuals and haptics of the products and refining the shopping and unboxing experience.

Diaper Testing International has also seen an increase in elastic components used in diaper design, as well as an increase in sales for pants versus traditional diapers. "In mature markets there is still an opportunity to steer consumers towards diaper pants, cannibalizing traditional diaper sales," she adds.

Despite only being a small part of total diaper market sales, disposable pants are gaining acceptance, and will account for nearly 70% of the overall category in absolute value in the coming five years, according to Jagadev of Euromonitor.

"The pants format, despite its higher price, is gaining traction and most of the opportunities lie here as parents opt for earlier potty training and seek products better at preventing bedwetting," she says. "In the U.S. manufacturers of disposable pants have increased innovation to reinforce comfort with a fun and aesthetic twist."

Also, she adds, consumers in the U.S. are slowly shifting towards exclusively associating pants with training, something that they use very briefly just during the potty training period to instead see that this is a product that can properly support their baby's needs much earlier than the potty training.

An example of this is the enhanced version of Huggies Pull-Ups that launched in 2021. After receiving parent feedback and conducting





First Quality recently launched Earth + Eden Sensitive diapers.

extensive market research, the upgraded Pull-Ups are intended to make potty training fun, fast and easy with new Disney music-themed graphics that fade when wet to help teach kids to stay dry. Additionally, with the updated musical fading graphics, Pull-Ups feature a short story on the pack that parents can read to their child to help motivate them and make potty training fun.

In addition to more interest and activity in baby diaper pant designs, Hanna says most of the key trends influencing design are related to efforts to make diapers more sustainable and/or free from substances that consumers have been told to avoid.

First Quality has recently responded to this trend. In July the company launched Earth + Eden Sensitive diapers with a renewed focus on eco-conscious design made safe and luxurious.

“Over the last decade, sustainability and ingredient transparency have become more important to consumers,” says Delafraz. “They want diapers that are not only better for baby but also the environment. They’re also increasingly selective about what they don’t want to have in a diaper, hence why Earth + Eden Sensitive diapers are free from lotions, natural-rubber latex, fragrance and elemental chlorine bleaching, and use only non-toxic, water-based inks.”

Earth + Eden Sensitive diapers’ super-absorbent core is made with plant-based materials, and it only uses fluff that is certified by the Sustainable Forestry Initiative. The diapers have a cotton enhanced layer that is exceptionally soft for ultimate comfort. They also feature an enhanced waistband for a better fit and less mess. The breathable outer cover and hypoallergenic inner liner work together to keep babies dry, while Comfort-Cuffs around the legs help prevent red marks and irritation. Earth + Eden Sensitive diapers are also accredited by the Skin Health Alliance, certifying that they have been independently tested for skin safety, efficacy and quality.

“Our company motto is ‘Make Things Better,’ and it’s truly what drives us,” says Delafraz. “In launching Earth + Eden, we aimed to create a wellness brand to help empower people who want to live clean, healthy lifestyles without sacrificing product performance. Building on what people already loved about Earth + Eden Sensitive diapers, we are now delivering even more of the eco-conscious and skin-safe qualities that parents are seeking in

a luxuriously soft diaper that offers excellent protection.”

Currently, the outside packaging of Earth + Eden diapers is 100% recyclable cardboard and the plastic inserts are made from 20% post-consumer recycled materials. First Quality has a goal to achieve 100% plastic-free packaging soon. To achieve this, it is developing a durable, recyclable paper insert to replace the plastic insert, and it has already trialed this solution in limited quantities, according to Delafraz. First Quality is planning to launch the new solution sometime this year.

Meanwhile, Babyganics is also answering the call for “less is more” when it comes to baby diaper ingredients. In August the company launched Triple Dry Diapers, the brand’s most absorbent diaper. The diapers feature vibrant and quirky designs that include cheerful shapes, colors, patterns and supportive messages for parents to brighten their day (or night).

The new diapers—which come in newborn through size six—are two times faster at absorbing wetness. The Triple Dry Diaper protection comes from the U-shaped channel which quickly whisks wetness away from baby’s bottom, an absorbent core which locks moisture away and a breathable layer that circulates air to skin.



Babyganics’ new Triple Dry Diaper features a U-shaped channel that quickly whisks wetness away.

The diapers feature a blend of plant-derived and traditional materials that provide a soft cloth-like feel inside and out. The brand has also included a touch of NeoNourish Seed Oil Seed Oil (a dedicated diaper blend of tomato, sunflower, cranberry, black cumin and raspberry seed oils) on the topsheet with baby’s skin in mind. Strong tabs and stretchy wings for a secured fit and an ultra-thin flexible core mean babies are comfortable when on the move. The diapers were designed with TCF (Totally Chlorine-Free) fluff pulp, are non-allergenic, dermatologist-tested, and made without latex, petroleum-based lotions or fragrances.

### Market Expansion

While most of the smaller independent baby diaper brands kicked off online through direct-to-consumer channels, more of them have successfully turned to omni-channel strategies for

wider consumer reach and have been increasingly expanding into larger retail stores—both in brick and mortar and online.

In fact, both The Honest Company and Dyper launched into one of the world’s largest retailers this year—Walmart.

Honest’s diapers, wipes and other body care products debuted on Walmart.com in July and later became available in the corporation’s brick and mortar stores in the fall. The widespread distribution at Walmart will allow Honest to expand its accessibility to existing and new consumers, providing a convenient shopping experience with additional ways to shop Honest products online and in-store.

Meanwhile, Dyper announced in September that its plant-based baby diapers and wipes were available in most Walmart U.S. stores and online at Walmart.com.

“As a father of three, making responsible diapering accessible and convenient to all families has been on my mind from the day I started this business,” says Radovic. “Collaborating with Walmart is a major milestone in our quest to provide a viable alternative to conventional diapers and wipes that don’t sacrifice performance or functionality at an everyday low price.”

Walmart’s scale allows these high-performing diapers and wipes to be offered at their most competitive prices ever, according to Dyper.

During the first half of last year, the company expanded into Thrive Market, an online marketplace, as well as select Whole Foods Market retail locations, marking the first time Dyper products were available in brick and mortar retail stores.

Meanwhile, Parasol, which first launched its line of premium baby diapers in 2016, recently debuted in buybuy Baby stores. This came as a positive surprise to its CEO and co-founder Jessica Hung. “I have always been impressed with buybuy Baby’s loyal support of woman-owned, entrepreneurial businesses, many founded by mothers like myself determined to create a better way for our children. That buybuy Baby—the industry’s most discerning product expert — has chosen to share Parasol diapers, diaper pants and baby wipes with their loyal customers is not only tremendous validation of the

excellence of our products, but importantly, it’s recognition of our shared dedication to continually improving family life and babies’ happiness and well-being,” she says.

Parasol has also garnered international interest and is set to launch in Taiwan next month.

Parasol diapers’ unique RashShield design is the result of its co-founder’s relentless pursuit to create the first and only rash-free diaper.

Conceived with love in California, Parasol sources worldwide to bring the softest, most absorbent, sustainable materials and the latest innovative engineering to babies and their families.

Hung says there has been a high demand from Parasol subscribers to expand sizing past size 5, so this year the company plans to add size 6 for both pants and diapers. The company also plans to continue upgrading its materials to be even more luxurious, comfortable and soft. “We never rest on our success. We will continue seeking the latest technology and highest quality innovative materials,” she says.

The small player has been resilient over the last few years. From supply chain to logistics issues, to the current inflation situation, Hung is relieved to have survived the challenges during the Covid pandemic. “We’re still here, and we are committed to ensuring our products give parents the peace of mind that they are doing the best possible for their babies,” she says.

### New Life After Use

Creating more sustainable end of life solutions has been a key focus of the diaper industry, and in recent years many companies have created some practical solutions as an alternative to landfilling.

Ontex Group NV continues to provide recyclable diapers to support Woosh, a Belgian startup that aims to make diaper recycling a reality in Ontex’ home country of Belgium. Ontex helped launch the startup and continues to support the company with products and expertise as it grows.

Woosh now delivers recyclable, disposable diapers and collects used diapers from more than 200 day care centers in Belgium, which together care for more than 5200 children and plans to expand the service to more than 1000 day care centers by 2024. Together with waste companies Woosh aims to set up the first diaper recycling facility in Belgium.

Although Ontex does not have the ambition to invest in recycling plants, it will actively support partnerships with other companies and governments, according to an Ontex spokesperson.

Ontex has also participated in a program to test industrial scale composting of diaper pads with circular economy company Les Alchimistes in France since 2021. The trial has provided Ontex with useful insights into consumer preferences and behavior that it can use to further explore composting options supported by governments such as the French Ministry for Ecological Change, the spokesperson says.

In Australia, Huggies maker Kimberly-Clark announced a new diaper recycling trial that could be Australia’s answer to the 1.5 billion disposable diapers that end up in landfill each year.

The Nappy Loop has been underway in South Australia since July and uses anaerobic digestion to turn the organic materials in used Huggies nappies into nutrient-rich compost, as well as bioenergy that is captured and used to power the recycling process.

The Nappy Loop team is being led by Kimberly-Clark Australia, along with Australia’s national science agency, CSIRO, one of South Australia’s largest composters, Peats Soils and Garden Supplies, Solo Resource Recovery, and early learning and care



Honest’s launch in Walmart last year will expand its accessibility to existing and new consumers.



Kimberly-Clark's The Nappy Loop diaper recycling trial has been underway since July. Image: Rob Brown. Courtesy: Kimberly-Clark ANZ.

provider G8 Education. Together, the team has collected and recycled almost two tons of used Huggies diapers, proving that anaerobic digestion is a viable option for the recycling process.

“Families and day care centers across the country rely on the convenience and performance of disposable nappies and while we work to innovate and create more sustainable products, recycling is one solution for disposable nappy waste,” says Kimberly-Clark ANZ managing director Belinda Driscoll. “Identifying a

recycling solution that works hasn't been easy due to the availability of technology and collection systems. Today is a very proud day for us, announcing that we have trialed right here in Australia, and it represents a big step in Kimberly-Clark ANZ's sustainability strategy.”

The Nappy Loop trial has adopted a B2B model, with Solo collecting used Huggies nappies from G8 Education's Welly Road Early Learning Centre in Mount Barker and delivering them to the Peats composting facility for processing. Utilizing anaerobic digestion, the organic material in the used nappies is transformed into nutrient-rich compost while the plastic components are separated and evaluated for future recycled products. In addition, the anaerobic digestion process creates bioenergy which is captured and used to power the Peats composting facility.

After five months of recycling used nappies, The Nappy Loop team is now exploring the opportunity to scale the program in South Australia and nationally. This includes partnering with APR Plastics to test the recycling of the recovered plastic from the nappies using pyrolysis, with the aim of having results available in early 2023.

Meanwhile, in Japan, Daio Paper and Livedo Corporation are collaborating to develop recycling technology that will repurpose pulp and other materials to make new diapers. Through technology developed by Total Care Systems, the pulp, plastics and the superabsorbent polymers are separated from used diapers. Daio has been working with Total Care, a Japanese recycling specialist, since 2005 but earlier methods used the plastic and SAP waste to make fuel and the pulp to make building materials. Daio Paper and Livedo Corporation are refining the process to reuse the materials specifically for diapers.

To promote the recycling of used disposable diapers, the companies are cooperating with local governments, hospitals and welfare facilities, for collection. Additionally, the company is developing a commercialization plan with a view to the

construction of a new recycling processing plant.

Daio Paper plans to produce fluff pulp used for absorbent articles such as disposable diapers at its Mishima Mill in Shikoku Chuo City, Japan, starting in July 2023, and will produce pulp recycled from used disposable diapers in-house. By blending it with fluff pulp, the company will promote horizontal recycling into absorbent products such as disposable diapers instead of raw materials for building materials.

Through this research, Daio and Livedo plan to recycle 6000 tons of used disposable diapers annually and reduce CO2 emissions by approximately 1940 tons annually.

Dyper, meanwhile, is transitioning its Redyper program from a composting solution to using biochar technology.

With Dyper's Biochar technology, the company is entering the biochar economy by turning soiled diapers into biochar. Biochar is a carbon-rich product created through a heating process called pyrolysis, which allows for waste to be transformed into a reusable commodity that can improve soil, assist in air and water purification, and be an additive to paints and inks for improved pigment.

“Dyper is constantly looking to expand and innovate in the product, packaging and responsible disposal space,” says Radovic. “When it comes to responsible disposal and driving meaningful reduction of landfill waste, we had originally started our journey by introducing our Redyper program utilizing composting, fully aware of the inherent difficulties of doing it at scale. However, given the urgency of the issue at hand and in the absence of a more-scalable, breakthrough technology solution, we wanted to get things started while initiating a broad-based research program with the objective to identify the next generation of diaper disposal technology at the same time.”

To date, Dyper's landfill avoidance program Redyper has diverted more than 11.5 million pounds of waste from landfills, turning used diapers and wipes into nutrient-rich topsoil that is used in large-scale landscaping, roadside plantation, and growing sod. With the new Biochar innovation, the company will bring modular disposal technology to complement and eventually replace composting closer to the consumers, reducing processing and transfer times. “When in place, we will be able to reduce landfill waste and lessen overall global greenhouse gas emissions by transforming something as environmentally hazardous as a used diaper into something that can ultimately have a carbon-neutral footprint on the planet, without the use of offsets,” says Radovic.

Redyper currently composts diaper waste to create beneficial topsoil. According to Dyper, Biochar will reduce the processing time from several months to minutes. Another benefit to the transition is that an efficient Biochar reactor needs less space and electricity than a traditional composting facility. Additionally, Biochar reactors have the capacity to process two tons of diapers per day; that's approximately 7,200 diapers every 10 hours, or 12 diapers a minute. Further, converting Dyper diapers and wipes to biochar yields an 80% reduction in mass. For example, 100 pounds of dry diapers yields approximately 20 pounds of biochar.

Debating in 2023, Biochar reactors will be in select markets. ■



# Custom Solutions for Nonwovens Manufacturing

Heartland prides itself on offering its customers the tools they need to succeed

By Julio Muzquiz, *Senior Technical Service Specialist, Heartland Polymers*

At Heartland Polymers, we're excited about the growth and evolution we're seeing in nonwovens as manufacturers keep pushing the boundaries to create products that are lighter, stronger, more durable, and more flexible.

Our sales and technical support team takes great pride in providing customers with the tools they need to keep pushing those boundaries. And for us, it always starts with developing a boots-on-the-ground understanding of our customer's unique needs, their end requirements, the equipment and technology they have in place. This is not a one-size-fits-all industry.

## Low VOC, Faster and Cleaner Processing

Consistency and reliability are paramount for nonwovens customers. We're seeing our manufacturing partners across industrial and hygiene markets benefit from our fiber grade homopolymer (H5235G). This product delivers low VOC, faster and cleaner processing, along with enhanced down gauging capabilities.

Quality assurance is the number one goal, which is why Heartland has conducted trials at the Non-Wovens Institute – the world's first accredited academic program for the interdisciplinary field of engineered fabrics—to test and verify product quality. Recent trials found the product runs exceptionally clean, which translates to less equipment maintenance as well as the potential for improved processability. I'm hearing the same thing from customers as they're processing, and as a technical specialist, that makes me happy.

Heartland's homopolymer varieties provide excellent uniformity over a broad range of melt flows, high strength-

to-weight ratio, and exceptional toughness and versatility, bringing new meaning to the phrase 'all purpose'. More rigid and resistant to high temperatures, our homopolymers are particularly suitable for high-heat applications or steam sterilization applications, offering durability and flexibility across a diverse range of applications in injection molding, film, fiber, sheet extrusion and thermoforming.

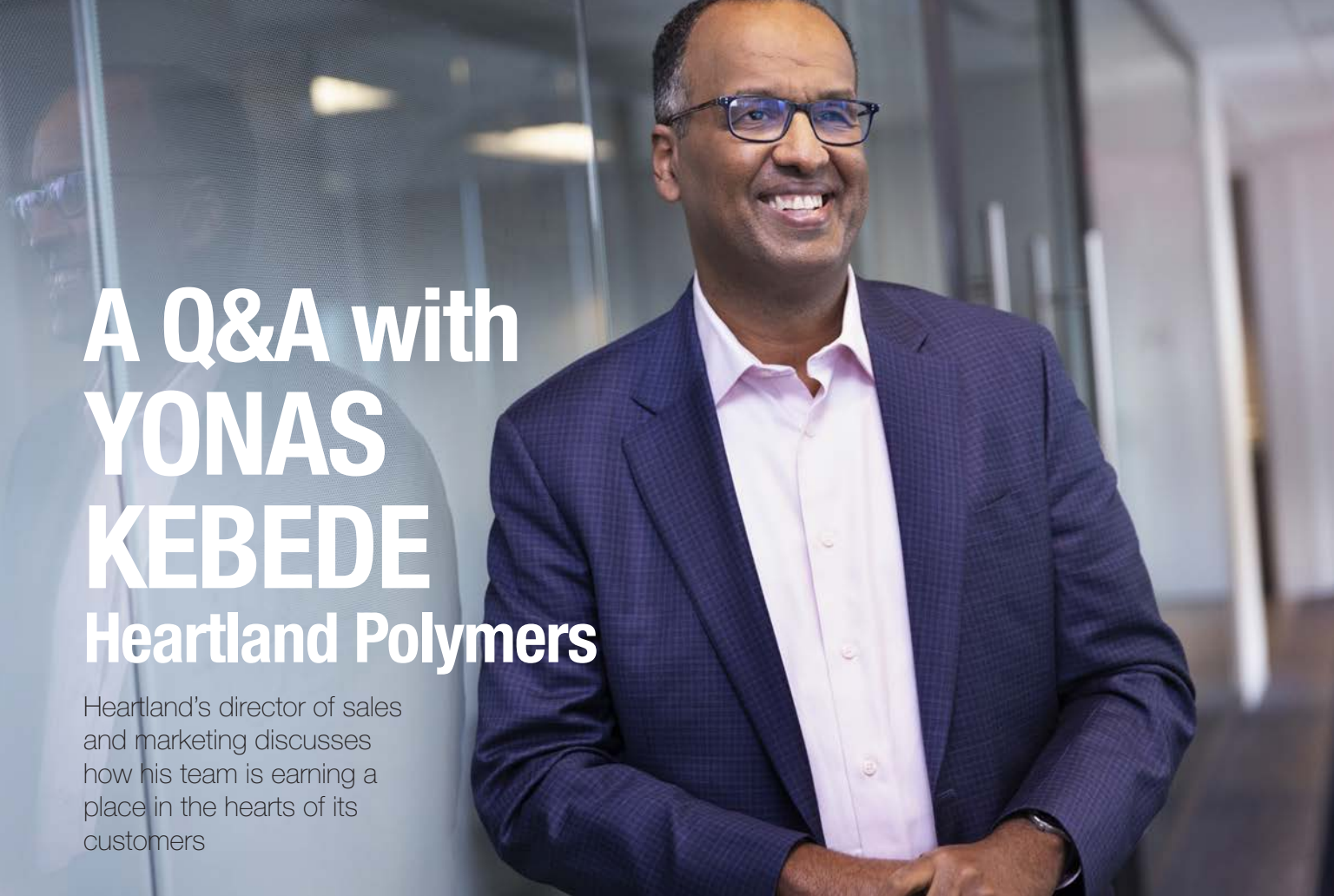
## Quality Assurance

Our state-of-the-art quality control lab was designed and optimized to ensure that every aspect of production meets and exceeds the high standards of our supply chain partners and our polypropylene customers. We also happen to have some of the industry's most experienced lab experts leveraging leading technologies and best practices to provide the competitive edge our partner's demand.

Some of the quality characteristics our customers are reporting include: excellent balance of processability and physical properties; a tailored balance of stiffness to impact properties; exceptional heat and chemicals resistance; and Phthalate free.

It's important for our team to build relationships with our clients and learn from each other as we design and create the products their business needs to stay ahead of the curve. At Heartland, we see an exciting future in non-wovens, where technology and bright minds are empowered to shape the future.

*Julio brings unparalleled technical expertise to Heartland Polymers, backed by more than 25 years of providing polyolefins technical support for HDPE, LLDPE, PP resins. ■*



# A Q&A with YONAS KEBEDE Heartland Polymers

Heartland's director of sales and marketing discusses how his team is earning a place in the hearts of its customers

**Y**onas Kebede, Heartland's director of sales and marketing, sat down to answer questions about North America's first single-site propane dehydrogenation (PDH)/polypropylene (PP) plant—and how Heartland plans to earn a place in the hearts of its customers.

**Q: It's been a busy year for Heartland. What are some of the highlights?**

**Yonas:** It's been a monumental year to say the least. Our PDH unit came on-line, and on spec. That's been an exciting experience, but not without some learning along the way. Running the plant as an integrated facility and reaching maximum rates for a sustainable time period was a big milestone. We'll continue to learn and optimize as we go. For me, it was amazing to see us producing and loading 18 railcars per day.

**Q: As a new entrant, you have a lot of eyes on you. What's the response been so far?**

**Yonas:** We're very grateful for the encouraging response. The personal notes and calls from the industry mean a lot. Folks are happy to see another source come into the marketplace, and there's a lot of interest in our location outside of the Gulf. It's been amazing to see several of our customers come online with significant monthly purchases, and our sales and customer success teams continue to work closely with manufacturers to understand where and how Heartland might be a fit for them. It was also exciting to sponsor the World Petrochemical Conference

in March and to have good face to face meetings with our clients.

**Q. What were some of the challenges this year?**

**Yonas:** As with everyone in the industry, we've been adjusting to some of the market volatility we see, for example the disparity between domestic and export prices we saw in Q1. Lower domestic demand in Asia has also created a surplus in South America, where we're working hard to establish strong ties. Our team is highly experienced in domestic and global markets, and that's been invaluable as we fine-tune and react to the realities of the industry. In terms of our facility, an asset of this magnitude requires an incredible amount of teamwork and a steady focus on the long term. We learn from the setbacks and get better as a result.

**Q. What are you most excited about for the rest of 2023?**

**Yonas:** The theme for the second half of the year is about us living our philosophy of continual improvement. We said from the start that we believe better is possible, and that starts with us. We have an open feedback loop with our customers so we can be transparent, and that means keeping one another informed along the journey. For example, I've been talking about how we can service our customers with inventory on hand and from our PGP cavern when our PDH plant requires a turn around, and our PP Storage In Transit (SIT) locations that are able to service the customer with a quicker turnaround time of order. And of course, we will continue to get qualified with our customers and to meet as many of our industry friends as we can along the way. ■

# Polypropylene made in Canada, ready for the world.

Alberta, Canada, is a long way from areas where extreme weather events can disrupt production. But we're not isolated. We're connected to a vast rail network, strategically located storage facilities, and international ports. Our GPS-equipped railcars enable customers to track shipments along the way.



The Honey Pot Company uses organic cotton in its period care and bladder care products.

# Natural Hygiene Products Market Keeps Growing

Brands continue to launch new baby diapers, period care and light incontinence products using plant-based ingredients

By Tara Olivo, Associate Editor



The use of plant-based fibers and bio-based ingredients in disposable absorbent hygiene products continues to expand as consumer preferences for natural ingredients and overall environmental awareness grows, while at the same time global anti-plastics legislation aims to limit the use of petroleum-based plastics.

“The natural hygiene market is certainly growing with much untapped opportunities as technology and supply chain evolve and consumer awareness improves,” says Liying Qian, head of Tissue and Hygiene, Euromonitor International.

Consumer expectation, business promotion and regulatory push are among the pillars driving this trend, she adds. “How these three pillars play out in the natural movement within the hygiene industry vary by market. For example, in the U.S., the brand push has played a bigger role relative to Europe, where policies targeting plastics reduction like the European Green Deal has been a more fundamental accelerator.”

The magnitude and outlook of this trend is also underpinned by investment happening on the upstream of supply chain, she says, referring to nonwoven materials such as Glatfelter’s GlatPure portfolio, absorbent hygiene components that are made with 100% plant-based and renewable fibers, and Suominen’s Biolace Natura, a developmental product utilizing hemp mixed with cellulosic fibers.

According to Marilyn Austin, CEO and co-founder of Hempres, a brand of hemp-based period care products, two-thirds of consumers prefer and are willing to pay more for sustainable products and the period category is included in this trend. “The period care category has seen significant growth, largely due to increased consumer awareness regarding the ingredients used in traditional period care products, as well as growing concerns about menstrual health, hormone health, and the environment,” she says.

Qian says the segment’s expansion is manifested in products featuring plant-based or bio-based ingredients or components,

more prominently within feminine care and baby care. “Though the natural segment is also gaining attraction in adult incontinence, the magnitude is slightly weaker by measure of available product SKUs with ‘natural’ or other plant-based attributes, due in part to challenges in overcoming certain technical and cost barriers to meet both performance-based properties, which take the priority, and natural expectation.”

In some instances, companies that offer plant-based period products have expanded to include plant-based light incontinence products. One such brand is The Honey Pot Company, which first launched nearly a decade ago with a line of washes and wipes, but soon after debuted menstrual care products like herbal and non-herbal pads, heavy flow pads, tampons and menstrual cups. Around two years ago, the company entered the incontinence category.

“Our humans were asking for pads that assisted in those ‘dribble moments,’ so we made six incontinence pad options with our beloved herbal essential oil blend and non-herbal options for humans who simply want protection,” says Beatrice Dixon, co-founder and CEO at The Honey Pot Company. “When we innovate at Honey Pot, we are always thinking about how we can reach more humans in a meaningful way and having safe and better-for-you incontinence pads was what they were asking for. We were so glad to deliver on this and be able to provide odor and leak protection for the humans that need it.”

The Honey Pot Company’s pads are made with a 100% cotton cover topsheet, and its tampons are made with organically grown cotton.

“We’re in the vagina business thus anything that touches the vulva and vagina has to be designed to cater to its needs,” says Dixon. “The responsibility means that we put our ingredients through rigorous analysis and construct that which is best for humans. That’s why organic cotton is an absolute non-negotiable but also why we’ve invested a tremendous amount of resources in our clinical testing.”

The Honey Pot’s portfolio is clinically tested, hypoallergenic,

dermatologist-tested and gynecologist-approved.

And, like other smaller lifestyle brands in menstrual care, The Honey Pot Company's emphasis on overall wellness is key to its brand. It also plays in other product categories like washes, wipes, suppositories, vulva cream, lubricants, anti-itch products and more.

"We're the all-in-one destination for humans to build out their vaginal wellness rituals," Dixon says. "Also, we like to say we're in the empowerment business. We have built a brand on education, and we want to empower our humans on their personal wellness journey - to learn about themselves, to claim their own wellness, to be comfortable in their skin, despite the stigmatization we have all been conditioned to feel around our sexual, physical and mental health. Our products build upon that approach."

Dixon says the plant-based hygiene market continues to grow as people become more informed about the products they use in terms of sustainability and total wellness. "It's also becoming the norm," she says. "It would be virtually impossible to enter this space without creating products that are made with vetted ingredients that deliver on efficacy and safety. The emphasis on self-care, health and wellness are also still very much so at the forefront of buying decisions. Humans want to buy products that are made with trusted ingredients and a brand that they see themselves reflected in to improve both their wellness routines and general needs."



Here We Flo incorporates both bamboo and organic cotton in its products.

Here We Flo is another brand offering plant-based period and bladder care products. Founded by Susan C. Allen and Tara Chandra, Here We Flo uses both bamboo and organic cotton in its line up.

The idea for the business started in December 2013, when Allen and Chandra chatted in the university bathroom between classes. "We often talked about how we wanted to start a socially impactful business," recalls Chandra. "I had studied economics at Columbia and Susan, who loved well-designed, eye-catching branding, was working for OSF—a major philanthropic organization. This combined with my observation that 'I can't find

organic tampons anywhere in London,' was the 'aha' moment behind our decision to start FLO."

At the time, Chandra says the market was dominated by corporate brands that weren't transparent about their ingredients and the effects they were having on bodies and the planet. "Here We Flo is on a mission to challenge shame and disrupt the period, bladder and sexual wellness markets with products that use organic and vegan materials, including tampons, pads and condoms," she says. "In addition, we want to make people feel crazy confident about life's messiest moments, discussing menstruation, bladder leaks and sex in a humorous, accessible, and empowering way. Our hope is that our products make you laugh, make you think and then make you feel brave enough to start a conversation about your own experiences."

Here We Flo's products are divided into three categories. FLO period care: pads, tampons and liners; glo sensitive bladder care: bamboo pads and liners with a charcoal chip to naturally neutralize odors; and XO! sexual wellness: condoms and lube. "We pride ourselves on all our products being vegan, organic and biodegradable," Chandra says.

According to Allen, bamboo and organic cotton are highly absorbent and help to avoid leaks. "They are also soft and comfortable against the skin, reducing irritation and discomfort," she says. "Additionally, bamboo and organic cotton are naturally antibacterial and hypoallergenic, making them a healthy and sustainable choice for these types of products."

Currently, Here We Flo's products are available at retailers in the U.S. and U.K. Soon, the company will expand its range with longer liners and individual packs of tampons to give consumers more options.

Meanwhile, hemp is the fiber of choice for period care newcomer Hempress which offers a lineup of organic, biodegradable and regenerative hemp-based period care products. This includes day pads, night pads and liners. The company also offers cosmetic pads, swabs and a medical-grade silicone menstrual cup.

"What sets Hempress apart is our commitment to addressing the existing gaps in the period care market, particularly in terms of sustainability and transparency," says Austin. "In the current market, many products claim to be sustainable but fall short in delivering genuinely eco-friendly and transparent solutions. While some may feature an organic fiber topsheet, the remainder of their composition often consists of synthetic materials. Additionally, several products make misleading claims of biodegradability."

Hempress, on the other hand, offers products that are entirely crafted from organic hemp and cotton fibers, complemented by a biodegradable and plant-based PLA backsheet. "We maintain full control over our supply chain and possess proprietary product specifications, ensuring that we have comprehensive knowledge of our products, which we readily share with our customers," she explains.

Additionally, Hempress manufactures its products in the European Union, adhering to the highest health and



environmental standards. “This stands in contrast to the majority of period care products in the market, which are often produced in China, where concerns regarding supply chain transparency and regulatory compliance arise,” she says.

According to Austin, not only does hemp possess the advantages of organic cotton, but it also surpasses it in terms of sustainability, absorbency, durability and versatility. “Hemp products demonstrate superior liquid absorption and retention compared to other organic cotton alternatives available in the market,” she says. “The durability of hemp proves especially advantageous in personal care items like cosmetic pads and swabs, as it helps maintain product integrity without unraveling, a common issue with cotton products.”

U.K.-based Planera has taken a different route to sustainability. The company has developed a flushable sanitary pad made of cellulose. The pads, now branded as Fluus (Fluus is a portmanteau of “flush us”), uses Flushtec, a completely new technology, developed and owned by Planera, with a patent pending. “As part of our mission to hold brands accountable and give consumers an easy option to be more sustainable, we are at the early stages of conversations with manufacturers who are interested in licensing our technology, so watch this space,” says Dr. Olivia Ahn, CEO, Fluus by Planera.

Fluus uses a unique blend of biodegradable polymers including wood pulp, absorbent powder and water-soluble film that work with the star polymer—CMC (carboxymethyl cellulose) which quickly absorbs blood and keeps it locked away while remaining 100% biodegradable. The company chose cellulose as the fiber because it is more widely available than other natural fibers such as cotton or hemp. Also, the tree sap-based adhesive is unique to Fluus as it contains no acrylics. “Fluus is the only disposable period pad on the market that does not use hot melt adhesive and therefore does not create microplastics,” Dr. Ahn says.

Although groups like the Responsible Flushing Alliance in the U.S. list sanitary pads and tampons as products that consumers should not flush, Dr. Ahn says the Fluus team is on a journey to educate people on the brand’s unique and revolutionary Flushtec technology and its flushability certification. To give its consumers confidence, Fluus pads are certified flushable by the Water Research Centre (WRC), having passed the testing protocol (WIS 04-02-06), which guarantees that the pads will never block up sewer systems.

“The disposal journey of a standard period product can be complicated, but we know what happens to our pads once they are flushed,” she says. “After it travels through the drainage system, the disintegrated pad arrives at the water treatment center, having broken down into cellulose plant fibers half the size of an eyelash. It can safely pass through the screens where it is used as biogas and fertilizer, creating a circular product lifecycle.”

Dr. Ahn says the pad disappears and leaves no permanent waste. “It’s the only period product that breaks down in the toilet, similar to loo roll. With the power of the toilet flush, Fluus pads break down into plant fibers and biodegradable materials, which

means no permanent waste is left behind, as opposed to the microplastics and chemicals left by other period products.”

Fluus pads are also completely biodegradable, including the wrapper and peel papers. “The problem with putting your used pad in the trash is that we lose control over where it ends up,” she says. “In the U.K., 56% end up in landfill and we can’t guarantee the correct environment for it to safely biodegrade.”



August period care products recently expanded into over 400 Target stores in the U.S.

Fluus pads are currently available to purchase directly from the brand’s website, [www.werefluus.com](http://www.werefluus.com). The company is also actively looking to expand its distribution channels over the coming year to make flushable period care available for more consumers.

Meanwhile, period care brand August, a gender-inclusive and sustainable period care brand that first launched direct-to-consumer in June 2021, is in expansion mode. Earlier this year the company launched into Target stores nationwide. The brand’s first entry into physical retail stores include its line of period-positive tampons, liners and pads in over 400 Target stores across the U.S.

All August tampons, pads, and liners are sustainably made with 100% organic cotton materials, are hypoallergenic, fragrance-free and free of harmful chemicals. Prioritizing transparency, August openly shares information about its supply chain on the website and discusses its practices with its community through its traceability page and FAQ page. In addition to being a certified 1% for the Planet company, August is also a Climate Neutral Certified company — the only tampon brand to have the certification.

Nadya Okamoto, one of the co-founders of August, had worked for years in the period advocacy space as a nonprofit leader and a consultant, as well as an author. “I kept feeling frustrations on

roadblocks on how to change culture and influence the industry and felt that many of them could be solved if I had the opportunity to build a socially conscious and period positive brand that really centered transparency and sustainability. And that is what August is!" Okamoto says. "We are a gender inclusive period care brand that prides itself on leading with transparency, and an interest in changing the culture around periods. It's ridiculous how much period stigma still exists today even in 2023, and I think August really exists to be able to shatter that period stigma and bring a bigger tone of celebration and dignity into conversations around periods."

Next, the brand is gearing up to launch some new initiatives around fighting the tampon tax (an unfair sales tax placed on period care items considering them non-essential goods). "Since our launch, we've covered the tampon tax whenever possible for DTC orders, and we think we found a way to pay customers back for the tampon tax they pay (in the 20 states it still exists) when they buy August in stores," says Okamoto.

Milan, Italy-based Corman, the manufacturer of Organyc feminine care products, has long been in the plant-based period product category. The company introduced the first range of 100% cotton feminine care pads in the early 1990s. In addition to organic cotton feminine care pads, the brand offers organic cotton tampons, facial wipes, nursing pads and bladder leakage pads.

Recently, Corman has taken a step further in its quest for sustainability when it announced last month the development of the first-ever biodegradable and compostable plastic tampon applicator, soon to be launched by the Organyc brand. Corman teamed up with Slovenia-based Tosama on the innovation.

After 10 years of patient and methodical research, Tosama's and Corman's research and development teams developed a technology that uses the waste products of wheat, corn and sugar cane, to transform it into a moldable biomass plastic. This new bioplastic can be injection molded at high speeds to create a plastic tampon applicator that is not only great for the planet but great for women too.

"Tosama is one of the world's leading manufacturers of tampons. And while creating 100% certified organic cotton tampons was achieved many years ago, achieving the same level of sustainability with a plastic applicator presented a challenge," says Mojca Šimnic Šolinc, director of Tosama. "In business it's ideal to move fast, but when creating something totally new and so important to the earth, applying patience and partnership is the key. We're proud of the fact that Tosama and Corman research and development teams are the first to find a breakthrough and commercialize this important idea."

Corman's Organyc brand will be the first to offer the new biodegradable and compostable plastic applicator tampon. The product was formally introduced in Amsterdam, at the PLMA trade show on May 23 and will launch globally in the third quarter of this year.

Chiara Poggio, Europe and Middle East marketing manager for Corman and the Organyc brand, comments, "Plastic applicator tampons are preferred by women around the world because of

the ease of insertion. Easier insertion also leads to easier accuracy of tampon placement, which helps stop leaks. But plastic is not great for the planet. Corman's Organyc brand of period care promises women they can Expect Respect, respect for their bodies and the earth on which we all live. The opportunity to offer women this first no-compromise plastic applicator tampon, truly meets the Organyc brand's promise to them."

## Diaper Developments

When it comes to sustainability, innovations in the baby diaper category have been well documented over the last decade. The Honest Company can be credited with putting diaper sustainability and ingredient transparency on the map when the brand's diapers first launched in 2012. Since then, many diaper brands big and small have followed suit by detailing the raw materials of diaper components as well as innovating with different plant-based materials like sugarcane and bamboo. Each year, the number of baby diapers positioned as natural and plant-based continues to expand.

Kudos, a diaper brand that launched in 2021 and features 100% breathable cotton touching baby's skin, recently received a boost when its founder Amrita Saigal appeared on the television show Shark Tank in January. Saigal secured \$250,000 in funding in exchange for a 10% stake in the company from host Mark Cuban and guest host Gwyneth Paltrow, the actress and founder of lifestyle brand Goop. The duo agreed to invest in the diaper brand after hearing Saigal's background as an MIT-trained engineer, a Harvard Business School graduate and a part of Procter & Gamble's research team as well as the story behind developing the award-winning diaper brand.

"We were blown away by the positive response we received after Shark Tank and are so grateful for the support we've been shown by the parents who have been with Kudos from the start, and those who have discovered us through the show," says Saigal. "Not only did we more than double our business in one weekend, but we also welcomed a whole new set of consumers dedicated to the same mission that we have of promoting a toxin-free and plastic-free future for the next generation."

Because of the experience, Kudos also saw a lot of inbound interest from the Shark Tank audience for applying its Kudos technology to products for adult incontinence. "We are looking forward to entering into that market in the future," Saigal says.

Kudos uses a 100% cotton topsheet, meaning that the baby's bottom touches only cotton, not polypropylene, which is found in most other diapers. Cotton is the number one pediatrician-recommended material to combat and prevent skin conditions like diaper rashes and eczema. Other diaper features include a double layer of absorbent material to protect against leaks, extreme softness and thinness.

"In our research before launching Kudos, what really stood out to us was how much parents care (as they should!) about the materials touching baby's skin," Saigal explains. "And when it comes to what's touching baby's skin, no material is better

than cotton. There's a reason that the doctor recommends cotton underwear for adults, just like there's a reason that all the best baby clothes are made from 100% cotton."

Cotton is naturally soft, breathable and hypoallergenic. It is also naturally very absorbent. "This aspect of cotton can be a double-edged sword," Saigal says. "On the one hand cotton soaks up moisture fast, but on the other hand you need to figure out how to get that moisture out of the cotton and into the core of the diaper. That's where our patent-pending and award winning DoubleDry tech comes in."

Kudos' DoubleDry technology features two layers of absorption and thousands of funnels built in to funnel moisture away from baby's bum and into the core of the diaper so that baby's skin can stay dry.

Kudos' ultimate goal is to become the No. 1 eco-friendly consumer absorbents company in the world, Saigal says. "Diapers are just the start."

The company recently launched baby wipes made with Veocel Lyocell fibers, and next it will be turning its attention to training pants (applying its DoubleDry technology) and adult diapers in the future.

Another new diaper brand touting natural materials is Freestyle, which developed a baby diaper engineered with a proprietary 100% tree-free BambooTek core, unlike most other diapers that feature tree-based fluff pulp.

The company's founders, Mike Constantiner and Russ Wallace, teamed up after they were both trying to figure out what they wanted to do next professionally. Wallace previously worked at another diaper brand. "We started talking about different opportunities as parents in the baby care and parenting space, and talking about brands," Constantiner recalls. "Russ had a relationship with a supplier from his previous company, which we picked up a conversation with, and there was an opportunity to develop a very unique product."

According to Constantiner, every other diaper on the market uses tree pulp in the core, which, depending on the diaper, is roughly 30% to 35% of the material in the product. "We've seen reports that upwards of one billion trees could be cut down a year to support the global diaper market, and we thought that it was a really interesting opportunity to instead of using tree pulp to work with bamboo from an organic farm."

After exploring the opportunity, Constantiner and Wallace entered into an R&D process with the supplier, and after developing what they thought was a really good diaper product, built a brand that focuses on the youthfulness and creativity that goes into parenting. "That was really the impetus of Freestyle," he says. "We felt like there was an opportunity to create a diaper that checks all the boxes. Most importantly it performs well. It also has some unique innovation on the sustainability side that it isn't just greenwashing—there is material impact while not affecting performance—and we're able to offer it at a price point that's acceptable to most families."

On the technology side, Wallace says the bamboo-based core



Freestyle developed a baby diaper engineered with a proprietary 100% tree-free BambooTek core, unlike most other diapers that feature tree-based fluff pulp.

is a drier pulp. "The job of the fluff pulp in the diaper is to spread the moisture around so that the moisture can reach the super absorbent polymer which does the heavy lifting," he says. "In our case, it turns out that using bamboo instead of wood pulp has a material and performance impact."

Freestyle had its baby diapers lab tested at SGS in preparation for conversations with some big box retailers and, according to the company, it outperformed in absorption capacity and moisture retention compared to some of the biggest brands in the natural diaper space.

And, even as a number of new baby diaper brands continue to crop up, Freestyle's founders are optimistic that their brand will stand out.

"I think consumers are always interested in a better value package and I think that's going to be especially true over the next 12-24 months if everybody's prediction becomes true with the recession, so if something happens, I think people will be appreciative of a different presentation on shelf," Wallace says. "Our strategy all along has been to have a meaningful retail presence. We show up very differently on shelves, we talk about parenting very differently, and we present a very different value grid where there's a unique sustainability claim that I think is meaningful, a unique performance claim that does outperform what has been traditionally presented to the consumer as the best diaper, and we can offer all of that at a price point that is below all those offerings." ■