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## INDUSTRY SINCE 1970

# The Baby Diaper Market

Independent Brands  
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Hygiene Market

Hygiene Machinery

Ultrasonics Report

# Hygiene Machinery Update

*A survey of what equipment suppliers are innovating in the personal care segment*

BY KAREN MCINTYRE, EDITOR

## GDM

Equipment specialist GDM has leveraged its 30-year experience to develop a new proposition: Business Made Easy. Thanks to a holistic approach, the company can respond to customers' requests from pre-sales advice to enhanced customer services, being by their side through the entire value chain and positioning itself not only as machinery suppliers but also as consulting partners. The key challenge is applying this strategy across diversified regional markets, both in terms of manufacturers' and final consumers' requests.

"On one side we have high penetration markets, which are more mature and require high speed technology as well as innovative products, and low penetration markets, typical of emerging economies, that aim to high volumes and diversification in order to acquire market shares," says Maurizio Cantoni, GDM, head of sales & marketing. "On the other side, differences in consumers' behavior are to be found even in the same region. A deep knowledge of the markets, the ability to segment and the capability to adapt are key for whoever wants to thrive in this market."

No matter the market, innovation is undeniably the keyword

for the future of the disposable hygiene market. Customers need the entire supply chain to find new solutions for global pressing problems, one of them being sustainability.

The challenge for equipment suppliers is to design machines that can run alternative and greener raw materials (e.g. treeless fluff, plant-based nonwovens, bio-based SAP, etc), to deliver products with a lower environmental footprint. But green is not enough: waste reduction is another pivotal goal in future market developments. For this reason, GDM has developed a specific program called Option Zero, which allows manufacturers to consume fewer raw materials, reduce defects and waste and even use less glue in the process. This makes the final product more sustainable, while granting more financial sustainability to the manufacturer.

Additionally, the market is requiring affordable premiumization: customers look for premium features but are unwilling to pay more for them. This means that manufacturers are asked to find new ways to deliver premium products at lower prices. And technologies must cater to this need. For instance, GDM has designed the in-line laminated waistband solution—an equipment able to add in-line premium features to the product, such as elastic and pocket waistband, that can also be assembled on existing machines. This kit can thus reduce system complexity and produce premium products while keeping costs down.

In terms of processing requests, keeping OEE high, speeding up machine startups and delivering qualitative product volumes in shorter times are frequent requests from manufacturers. "So yes, speed and efficiency are still crucial in the hygiene machinery market. For this reason, GDM is investing in R&D activities to continuously improve its machinery and better respond to the needs of its customers," Cantoni adds. "As to digitization, it is impossible to ignore the latest trends: Industry 4.0, the Internet of Things, and Artificial Intelligence are boosting the development of new solutions even for hygiene machinery manufacturers. Providing a complete digital ecosystem along with industrial advanced technology opens new possibilities in terms of consul-



tancy and customer care, leading to the full automation of plants. Together with Coesia, GDM has developed an entire digital ecosystem made of three digital “mates”—OptiMate, PefroMate and HyperMate.

Sustainability is a global trend that is finally influencing manufacturers worldwide. If energy-saving stands basically for efficiency, new materials runnability translates into a request for higher machine flexibility. With this in mind, GDM has set up an in-house test rig where, often in partnership with raw materials suppliers, has been running a wide variety of innovative raw materials. Of course, such materials often have unprecedented features that push its engineering team to disrupt and rethink traditional processes. And this is as challenging as it is rewarding. But also, these tests allow it on the one hand to assess how flexible its machines can be and, on the other hand, to keep performance at its best. Which leads to huge improvements.

Lately GDM efforts have focused more strongly on machine modularity. This property is key to face the challenges of sustainability and premiumization, enabling manufacturers to cater to customers’ needs while creating value for their business on different levels.

Modularity, in fact, allows the switch from standard to premium features on board the same machine. This means maximizing

machine uptime, keeping performance and quality production at their best and reducing time-to-market, which positively impacts on the return on investment.

In addition, modularity facilitates the production of a broader range of products: leveraging the same machines, it is possible to diversify the product portfolio, better responding to market requests and thus acquiring new market shares. And this, along with machine flexibility, translates into more value generated for the customer as well as a more competitive market edge.

[www.gdm-spa.com](http://www.gdm-spa.com)

### **Angelini Technologies - Fameccanica**

The landscape of the hygiene machinery market remains dynamic, presenting both challenges and opportunities, particularly when viewed from the perspective of machinery suppliers. The market continues to be dynamic and two primary factors drive the competition: the emergence of new markets in developing countries, where demand for high-quality machinery is on the rise, and the strategic focus of developed nations on the incontinence segment and related services.

In this context, Angelini Technologies - Fameccanica is growing and maintaining its leading position by adopting a multifaceted approach. The company’s ability to cater to both emerging

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and mature markets through distinct product strategies has been a key differentiator. Moreover, Angelini Technologies - Fameccanica's unwavering commitment to innovation, encompassing advancements in both technologies and services, has played a pivotal role in sustaining its competitive edge. Notably, the company has embraced a robust digital journey strategy, further enhancing its ability to meet evolving market demands and maintain its leadership in the hygiene machinery sector.

Sustainability and innovation at Angelini Technologies - Fameccanica are two sides of the same coin, as demonstrated by its dedicated efforts towards achieving the LIFE ALL-IN revolution—a transformative initiative aimed at delivering a more sustainable product to our customers. This innovation involves the implementation of new, in-line processes that significantly enhance the environmental footprint of its products.

The primary challenge it encountered in realizing the LIFE ALL-IN concept was ensuring the seamless integration of these new processes into its production line.

One of the main challenges it faced was the need to effectively process a diverse range of raw materials while maintaining optimal production speed. Striking the right balance was crucial to prevent any adverse impact on the final product design. Its objective was to not only meet sustainability goals but also to deliver tangible benefits to its customers in terms of cost-effectiveness and operational efficiency.

Overcoming these challenges required a meticulous approach to research, development and implementation. By addressing the complexities associated with processing diverse raw materials while upholding production speed and product quality, it has successfully achieved the LIFE ALL-IN revolution. This groundbreaking initiative stands as a testament to its unwavering commitment to sustainability and its ability to overcome challenges in pursuit of innovative and environmentally responsible solutions.

Angelini Technologies - Fameccanica has also achieved over 1000 current patent rights worldwide, embodying more than 230 unique inventions, and in 2022 has been ranked among the Top 200 Sustainable Companies in Italy in the Sustainability Award 2023.

The LIFE ALL-IN technology represents a paradigm shift in the production process of absorbent hygiene products (AHPs), offering several key advantages that contribute to creating a more sustainable product. These include in-line material creation, CO2 emissions reduction, cost reduction and industry restructuring and environmental friendly practices.

In essence, LIFE ALL-IN technology not only enhances operational efficiency and cost-effectiveness but also positions companies at the forefront of sustainability in the AHPs and nonwoven industry. This innovative solution exemplifies how advancements in technology can catalyze positive transformations, fostering economic and environmental benefits concurrently.

Beyond sustainability, a key demand is flexibility, wherein customers seek machinery that can accommodate diverse prod-

uct structures within the same system. The ability to implement smart and rapid size changes without negatively impacting the Overall Equipment Effectiveness (OEE) of the machine is critical. This flexibility empowers our customers to produce varying product configurations efficiently, enabling them to meet market demands and maximize production volumes.

In response to these demands, Angelini Technologies - Fameccanica is continuously engaged in developing new products and technologies. By staying at the forefront of innovation, it aims to provide solutions that not only align with sustainability goals but also address the broader needs of its customers. Its commitment to flexibility is reflected in its ongoing efforts to introduce cutting-edge products and technologies that set new standards in the hygiene machinery industry.

[www.fameccanica.com](http://www.fameccanica.com)

### Anqing Heng Chang Machinery Co., Ltd

As a leading enterprise in the industry, Anqing Heng Chang Machinery Co., Ltd (HCH) continues to focus on research and development, allowing it to launch some new technologies, such as unmanned feeding technology, high-speed ultrasonic application, etc., mainly for multinational customers who have a higher demand for equipment speed and product upgrade.

One of the booming trends in the industry continues to be the growth of pants-style hygiene products for baby, feminine care and adult incontinence applications. On the other hand, the demand for processing more environmentally friendly raw materials hasn't been as strong from the company's point of view.

Describing the disposable hygiene market overall, HCH believes overall demand will keep growing, considering the low market penetration of some categories in developing countries.

[www.aqhch.com.cn/en/](http://www.aqhch.com.cn/en/)

### Andritz Diatec

Andritz Diatec designs, manufactures and supplies turnkey converting machines to produce a comprehensive range of absorbent hygiene products. As the market for these products becomes more demanding and dynamic, the company has designed its converting machines to offer high flexibility in terms of diversified product structure and the possibility to process a wide range of different materials while keeping price/performance ratio at the highest level.

In addition, the current market situation drives big producers to concentrate on optimization of internal efficiency (upgrades, machine downtime, product quality, machine relocations) rather than making new capacity investments. Fast growing companies in the retail market focus on solution providers, fast processing OEMs and cost-effective technologies.

"Innovation is where you can create tangible benefits for customers," says Ettore Paolini, general manager, Andritz Diatec. "From this perspective, there is always pressure to innovate. We are constantly proposing new solutions that come from different sides of the same group with technological synergies."

Innovations address sustainability and efficiency. Topics such as circularity, raw material savings, waste reduction and recycling, energy saving and digital solutions drives the company's customers developments. A high demand lies in an efficient production with a minimum use of resources (raw material, energy, water, etc.), while having still highest product quality.

Also driving research and development is flexibility which is even more important than speed. "Since process and product requirements are very dynamic, converting lines need to be easily upgraded with new features or changing components," Paolini says. "This allows for a shorter time to market for new feature to be launched. The lines are also designed to be user-friendly and have excellent accessibility for maintenance work."

Moreover, digitalization remains a megatrend. The company offers a broad and constantly growing range of innovative products and services in the industrial digitalization sector under the brand name Metris. One focus area is the Metris all-in-one digitalization platform, which provides full support for industrial plants throughout their entire life cycle. It combines a complete set of functionalities for preventive maintenance, simulation and optimization using the latest artificial intelligence methods, plus cyber security, and condition monitoring with smart sensors in an integrated approach.

Being part of a strong group, like Andritz, and covering a large proportion of the nonwovens value chain, present several benefits in developing new, innovative products and to create connections within the industry. The company's expertise in the treatment of raw materials and market knowledge of possible end uses bring unique added value for the nonwovens industry.

One concept for a bio-based diaper, which was developed in close cooperation with key players in the hygiene industry, made of 90% bio-based materials and with 100% bio-based spunlace nonwovens, perfectly demonstrates that personal care and environmental protection can go hand in hand. At the same time, this diaper concept will give rise to further development opportunities in the production of increasingly environmentally friendly, sustainable, bio-compostable materials made of spunlace nonwovens. Andritz is working with its technologies on the entire value chain, from fiber to nonwoven to converting, from its customers to the end user.

[www.andritz.com](http://www.andritz.com)

### W+D

With a view to global market potential and growth rates, the hygiene market continues to be highly interesting. The final product, like the diaper or feminine care item is seeing some changes,, which will increase the need for new, sustainable and innovative machinery and products in the future: "While the market power of retailers in previous decades resulted in price fights, low margins for finished products, and manufacturers even exiting the business, there seems to be a turning point," the company says. "Thanks to sustainability awareness,

ingredient awareness, innovative start-ups and direct B2C supply channels like e-commerce, it has become possible again to launch good products at reasonable prices. Such products bring fresh wind into the market. They create new production volumes and will need new manufacturing solutions. To summarize: Yes, after years of doubts we can confirm today that the hygiene machinery market indeed remains competitive and promising."

In 2018, W+D strategically acquired German machine and retrofit expert Bicma allowing it to today offering a wider hygiene-machine portfolio than ever before. Three strong brands—W+D, Bicma and PCMC—with up to 60+ years of experience in hygiene machinery manufacturing are meanwhile under the roof of U.S.-based, privately held Barry Wehmiller its new Barry Wehmiller Converting Solutions brand BWCS. The company's global network of 250+ service technicians, a large customer base with 1000+ installed machines worldwide, and their joint expertise in personal care, tissue converting and wipes technology solutions, provide a strong background for fostering W+D's position as one of the top leaders in the hygiene market.

W+D is currently undertaking several ongoing initiatives to reduce energy consumption and CO2 footprint of the machines. These will bring diaper manufacturing to a completely new level of sustainability. In addition, W+D is focusing on reducing or replacing single-wrap plastic for menstrual care and ultrathin light-inco products. Creative concepts like inline-manufactured envelopes for premium or dispenser products replace single-wrap plastic by paper, while other solutions even reduce the use of any single-wrap material by up to 85%.

Within hygiene, light incontinence continues to see high growth, particularly male incontinence has a high potential because penetration is still low. Based on decades of experience and a leading position in machinery for this market, W+D has created a combo-machine series. These lines can produce top-quality bladder-pads for female, unisex and male users on one same line. Customers save factory space and investment by entering into each of these growing market segments with just one production line. In addition, W+D offers a dedicated line specialized in the production of V-shaped male incontinence protector-pads. Multiple sizes from smallest "men pantyliner" up to double-core pads with foam side-elastic are feasible. Optionally, the folded sides can be fixed by a bridge-tape, especially if run without single-wrap.

"The hygiene machinery market remains competitive, but its character has changed," executives say. "Most of the top machine suppliers are meanwhile part of large international company groups. Such mergers typically contribute to the companies' growth thanks to expertise and synergies from business segments outside of the nonwovens market. Having a strong mother company in the background is an essential advantage in coping with the various challenges of the future such as raw material availability, supply chain stability, innovation, global

service, sustainable manufacturing concepts, ecological and social conscience, financial security.”

Hygiene machines remain in production for decades, so it is vital to keep them up to date concerning technology and product features. Retrofitting such lines requires specific knowledge and excellent project management. Both is a key expertise of W+D, being specialists in any type of retrofit including new drive systems, additional product features or sizes, or even the integration of major new production processes.

For own machines, proprietary solutions like W+D's telescoping quick-change drumformer or the all-in-one S2S size-modules allow extremely fast size changes. Size-change time on adult-diaper machines can be reduced to only two hours, while market standard is a shift or more.

[www.w-d.de](http://www.w-d.de)

## **PACKAGING COMPANIES**

### **Optima**

The new Optima HSC cartoner takes speed combined with format flexibility to a new level in the packaging industry. Its agility greatly exceeds previous solutions on the packaging machine market.

Sustainable packaging materials are in greater demand than ever before. Optima supports companies meeting this challenge by providing flexible packaging systems such as the new horizontal high-speed cartoner Optima HSC. “The new horizontal high-speed cartoner Optima HSC paves the way for our motto ‘Delivering new flexibility in packaging.’ As a company, we can only achieve honest packaging based on the principle of a holistic view of the circular economy with innovative technologies. At Optima, we have understood and embraced this,” explains Oliver Rebstock, managing director of Optima non-wovens GmbH.

The new horizontal high-speed cartoner Optima HSC opens up new possibilities in terms of packaging flexibility for the paper hygiene industry. What makes this machine special is that the horizontal cartoner enables agility far exceeding the solutions currently available on the market. The system features a packaging process that sets new standards for speed and format flexibility in the paper hygiene industry. The Optima HSC can also be flexibly connected to bag packaging machines. With this combination, it is possible to use a wide variety of packaging materials in one system, including cardboard, paper, biodegradable and PE bags.

Employees in production are increasingly becoming “connected workers.” Optima applications support machine operators during their daily work. They are provided with digital assistance systems that support them in handling the machine. This includes for example the Optima format change assist, which provides step-by-step instructions for changeovers made between different pack sizes. A remote connection for Optima Service and much more are also included in the service portfolio. The process optimizations help reduce waste,

increase efficiency thanks to fewer interruptions and improve system availability, which in turn has a positive effect on conserving resources in production.

[www.optima-packaging.com](http://www.optima-packaging.com)

### **TMC**

The success of any diaper production line hinges on the efficiency and precision of its packaging processes. IMA TMC is in such realm a perfect technological partner for packaging machinery dedicated to the diaper market. Renowned for its cutting-edge technology and unwavering commitment to innovation, IMA TMC stands at the forefront, offering a comprehensive range of machinery designed to elevate diaper packaging to unprecedented levels of speed, accuracy and reliability.

At the heart of IMA TMC's offerings lies a range of machines crafted for the unique demands of the baby and adult diaper industry. The D-NAMIC, automatic stacker and bagger in pre-formed bags, is a cornerstone of their product lineup. This robust machine efficiently handles the stacking of diapers (up to 1200 pads/minute) with unparalleled precision, while the integrated bagging mechanism ensures a flawless packaging process, up to 75 bags/minute. Designed with an acute understanding of the industry's demands, the D-NAMIC not only enhances production speed but also guarantees a consistent and aesthetically pleasing final product.

Downstream the primary packaging machinery is its bundler, a perfect completion to diaper packaging lines. D-BUND, IMA TMC's bundling machine, streamlines the final packaging stage of the diapers. This equipment is able to cover a great range of formats thanks to its flexibility and accommodates a huge number of bundle configurations. Thanks to its innovative design, D-BUND ensures that each bundle is compact, secure, and ready for distribution.

What sets IMA TMC apart is not just the caliber of its individual machines but the comprehensive solution they provide to manufacturers. The company can support the manufacturing process up to palletization, thanks to its innovative solutions dedicated to the end-of-line. On this matter, the patented gripping head Nest is able to handle products with a lift from below, leaving them undamaged. By seamlessly integrating the stacker & bagger, the bundler, and the palletizer, IMA TMC offers a harmonious packaging process. This approach not only optimizes production efficiency but also minimizes downtime and operational hiccups, translating to significant cost savings for manufacturers.

As the diaper industry continues to evolve and demand for quality and efficiency rises, IMA TMC remains at the forefront, consistently pushing the boundaries of what is possible in diaper packaging. With a commitment to excellence, technological prowess, and a deep understanding of market dynamics, IMA TMC is not just a supplier; rather a strategic partner for diaper manufacturers looking to stay ahead in a competitive landscape.

[www.ima.it](http://www.ima.it) ■