

Reff Project Targeting the Realization of a Recycling-Based Society

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Issues Facing Society and Background of Recycling Technology Developments

In Japan, most used disposable diapers are incinerated, which impacts the environment due to the emission of CO₂ during this process. Further, as disposable diapers contain high moisture content, they are difficult to burn, which requires more energy for incineration and additional costs to maintain and build new incinerators. The production of new disposable diapers also requires many natural resources, including wood.

To remain the preferred brand by customers and to continue to grow, it is important that Unicharm establishes a sustainable system in which the life cycle of our disposable diapers does not burden the natural environment, and that we instill the sustainable value of this system in our customers. Based on our belief that new technologies were needed to achieve this goal, in 2015 we launched a project to recycle used disposable diapers.

Circular Recycling of Used Disposable Diapers

After launching this project in 2015, in fiscal 2016 we began demonstration trials in Shibushi City, Kagoshima Prefecture, to recycle used disposable diapers at So Recycle Center, which handles the recycling of waste in Shibushi City. Subsequently, in fiscal 2018, Osaki Town located in So County, Kagoshima Prefecture, joined the demonstration trials. In June 2022, nursing care facilities in Kagoshima Prefecture began using disposable diapers incorporating recycled materials as part of their absorbent materials, realizing the horizontal recycling of used disposable diapers. Based on this world-first*¹ horizontal recycling technology for disposable diapers, the Recycle for the Future (Reff) Project was born, as we aim to create a future in which hygiene products are not discarded after use.



Unicharm's recycling system cleans and separates collected disposable diapers and applies our proprietary ozone treatment to sterilize and recycle the extracted pulp, making it equivalent to unused raw materials in terms of hygiene, safety, and use.

We learned that 100 used adult disposable diapers recycled over a one-year period could reduce waste equivalent to 21 garbage trucks (two tons) and save the equivalent of 60 trees in forest resources*².

After trials were completed in June 2022, we began selling *Lifree Reff Side Leak Prevention Tape-on* and *Lifree Reff All Night Dry & Secured Pad Ultra* to hospitals and nursing care facilities. In April 2024, we also launched *Deo-Toilet Deodorant and Antibacterial Sheet Reff* and *MamyPoko Pants Reff*.

*¹ Horizontal recycling of used disposable diapers to new disposable diapers using ozone treatment technology (based on Unicharm research, December 2020)

*² Based on Unicharm research, March 2024



Lifree Reff All Night Dry & Secured Pad Ultra



Lifree Reff Side Leak Prevention Tape-on



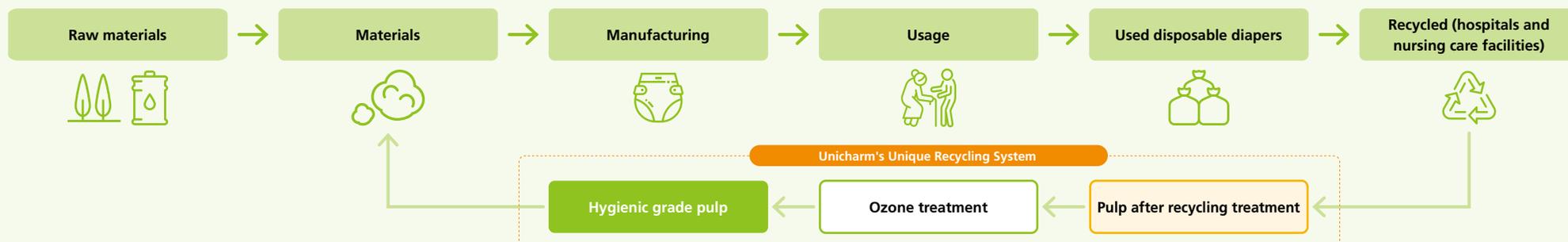
Deo-Toilet Deodorant and Antibacterial Sheet Reff



MamyPoko Pants Reff

► Recycling of used disposable diapers

Disposable diaper recycling model



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Disseminating Information and Consumer Understanding and Cooperation

Consumer understanding and cooperation with regard to sorting and collection is an essential aspect of our efforts to promote the recycling of used disposable diapers. Since June 2022, we have continued to disseminate information through the Unicharm social media account “Notes for reflecting on the future of disposable diapers.” In April 2024, we launched the ReFF brand website “Together we create a future cycle.”

In addition, in April 2023, Shibushi City began collecting used disposable diapers at five day-care facilities through the Hands-Free Commute* program, and in March 2024, disposable diaper collection boxes were also installed. In Osaki Town, we are working to promote the understanding and spread of sorted collection through the distribution of disposable diaper collection bags made with plastic separated in the recycling process (since December 2022) and workshops for making post-cards using recycled pulp (since July 2023).



Disposable diaper collection box



Disposable diaper collection bag



Workshop activities

* Flat-rate service providing disposable baby diapers and baby wipes to childcare facilities

P.074 Hands-Free Commute: A Subscription-Based Model for Disposable Diapers

web Notes for reflecting on the future of Unicharm's disposable diapers (in Japanese only)

https://note.com/unicharm_reff

web ReFF brand website “Together we create a future cycle.”

<https://www.unicharm.co.jp/en/csr-eco/reff.html>

Promotion Structure

ReFF is promoted by a cross-organizational team led by the chief ReFF officer (CRO) and comprising members in charge of marketing, technical development, and public relations. In collaboration with the Ministry of the Environment, we work with various municipalities and organizations, including Shibushi City and Osaki Town in Kagoshima Prefecture, as well as So Recycle Center LLC.

Future Developments and Further Value Creation

Currently, our recycling system is in operation in two municipalities, Shibushi City and Osaki Town. Our goal is to develop a recycling model that can be deployed not only in Japan but also overseas and implement it at over 10 municipalities by 2030.

To create a sustainable society, it is also important to create a society in which recycling disposable diapers after use is the norm, where customers choose recycled products because of their sustainable value. Unicharm began using business cards made from recycled pulp in January 2024. Going forward, we will continue to work toward the realization of a recycling-oriented society through the expansion of ReFF product categories and sales channels.



Received Award of Excellence at 50th Global Environment Award

Unicharm received the Award of Excellence at the 50th Global Environment Award (sponsored by the National Institute for Environmental Studies and Nikkan Kogyo Shimbun, with support from the Ministry of the Environment) in recognition of our efforts to provide products with the same level of convenience as disposable products, while cooperating with several municipalities and organizations to address the social issues of waste and resource recycling, and contributing to sustainability while remaining an economically viable business.



Received Award of Excellence at 6th EcoPro Awards

The EcoPro Awards (organized by the Sustainable Management Promotion Organization) recognize products, services, technologies, solutions, and business models that solidly incorporate environmental considerations and are highly regarded by businesses, consumers, and investors in the Japanese market, with the aim of promoting further development and dissemination. Unicharm received the Award of Excellence at the 6th EcoPro Awards in recognition of our contributions to resource recycling through our used disposable diaper horizontal recycling initiative involving years of technological development and the establishment of a demonstration model.



Unicharm is proactively promoting the formation of a rule system, including standardization, to realize a recycling-oriented society.

In March 2024, the Ministry of Economy, Trade and Industry (METI) established a Japanese Industrial Standard (JIS) specifying quality and testing methods for recycled pulp used in urine-absorbing products. This standard, which objectively assures the quality and safety of recycled pulp, is expected to promote the recycling of disposable diapers using various methods and promote the use of recycled pulp.