

## **Mitsubishi Chemical and Nippon Paper Industries Develop Sustainable Packaging Material Made of Compostable and Biodegradable Polymer and Paper-Based Barrier Material**

Mitsubishi Chemical Corporation

Mitsubishi Chemical Corporation (MCC; Head office: Chiyoda-ku, Tokyo; President: Masayuki Waga) announced today the joint development of a sustainable packaging material in collaboration with Nippon Paper Industries Co., Ltd. (NPI; Head office: Chiyoda-ku, Tokyo; President: Toru Nozawa). The packaging uses MCC's compostable and biodegradable polymer, BioPBS™, and NPI's paper-based barrier material, SHIELDPLUS®, both of which are biodegradable and manufactured from renewable raw materials.

BioPBS is a plant-derived, compostable and biodegradable polymer developed and patented by MCC and manufactured by PTT MCC Biochem Company Limited, a 50-50 joint venture between MCC and PTT Global Chemical Public Company Limited. This is an environmentally friendly polymer, which can decompose into water and carbon dioxide by living microorganisms in the environment. It offers outstanding performance compared with other biodegradable polymers in terms of low-temperature heat sealing properties, heat resistance, and flexibility, among other features.

SHIELDPLUS is an environment-friendly material that makes use of paper manufacturing and coating technologies developed by NPI over many years. It is made from paper, which is renewable, sustainable, and biodegradable, with barrier properties that block oxygen and maintain a fresh flavor. The barrier function enables the quality of the contents (especially food) to be preserved with minimal odor transfer. Because it is paper-based, SHIELDPLUS is also distinguished by a typical paper-like texture, which differs from barrier films.

Given the need to combat the issue of plastic waste, there is increasing demand for compostable and biodegradable polymers or paper products that can replace conventional plastic in items such as confectionary packaging and straws. This packaging material developed by MCC and NPI performs extremely well at preserving the content's quality through the heat-sealing properties of BioPBS and the barrier properties of SHIELDPLUS, while at the same time being a biodegradable, sustainable product made using renewable raw materials. The two companies will make this material widely available for use in packaging items such as confectionaries and coffee beans.

As MCC moves toward fulfilling the Mitsubishi Chemical Holdings Group's vision of "Realizing KAITEKI,\*" it continues to accelerate research and development and expand applications for compostable, biodegradable and plant-derived products, such as BioPBS, to help enable the circular economy and achieve the UN Sustainable Development Goals.

\*KAITEKI is an original concept devised by the Mitsubishi Chemical Holdings Group and denotes "the sustainable well-being of people, society and our planet Earth."

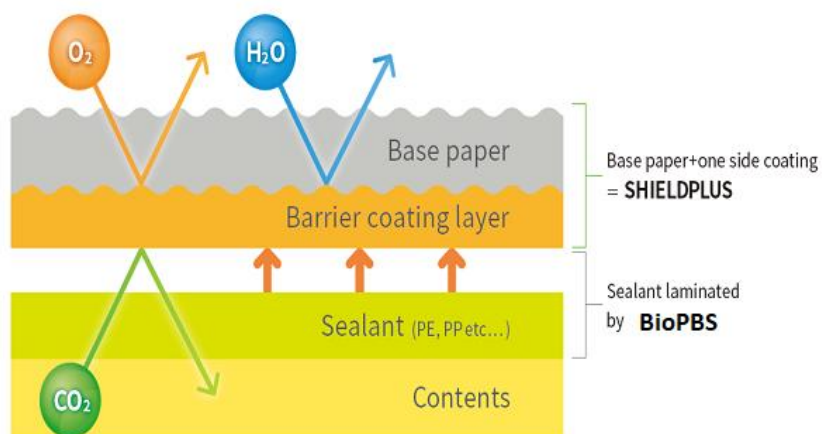
## Packaging Samples



[Left] Flat-bottom and square-bottom bags; manufacturing partner, Kyodoshiko Co., Ltd.

[Right] Pouches sealed on three sides; featured as a reference exhibit at the EcoPro 2019 exhibition

## Material Composition



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