

Contributing to enhanced performance and safety in lithium-ion batteries HARDLEN® sustainable adhesive



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The appearance of diverse electronic devices and the accelerated development of electric vehicles (EVs) are spurring ever greater demand for lithium-ion batteries (LiBs). The electrolytes in LiBs must be tightly sealed to prevent internal leaks. As the batteries themselves become hot, however, high heat resistance is also required for sealing materials and adhesives. Impurities must be thoroughly removed, as their presence in the materials used in LiBs can result in degradation of battery performance and in fires. The HARDLEN® adhesion promoter for polyolefin handled by TOYOBO MC Corporation is an adhesive that features excellent adhesion to polypropylene (PP) resin. With its heat resistance enhanced through the application of maleic anhydride modification technology, it has been adopted as an adhesive for LiB sealing materials. The company achieved supply to customers from an early stage of the growing demand for LiBs thanks to its one-of-a-kind technologies and manufacturing processes for removal of impurities, and boasts a high market share even now.

These technologies originate in the company's textile dyeing technologies. About 50 years ago, the resin known as PP faced a challenge in that while it was light and convenient, it did not dissolve in organic solvents and was thus difficult to process and dye. Toyo Kasei Kogyo Co., Ltd.* developed a technology to chlorinate PP, dissolve it in solvent, and dye it. The company also introduced maleic anhydride modification technology that enables precise modification of the chlorinated PP, for free control over its physical properties. HARDLEN® which is able to freely bond PP to other polymers, has won strong approval in the marketplace and has grown its market share primarily in automotive coating applications. As a further application, the company developed the above-mentioned adhesive for LiB sealing materials and has been boosting production since 2017.

LiBs are indispensable not only for EVs but also for renewable energy storage batteries, robots, IoT devices, and more. The stable supply of HARDLEN® which aids battery performance and safety, will contribute to the evolution and advancement of electronic devices.



New HARDLEN® manufacturing facility at the Takasago Plant

*Merged into TOYOBO CO., LTD. in 2010