News Release

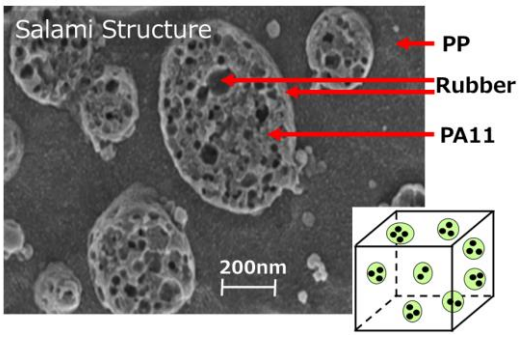
High Impact Polymer Resin Jointly Developed by Toyota Boshoku and Toyota Central R&D Labs., Inc. Wins "2019 R&D 100 Award"

Aichi (JAPAN) -December 19, 2019- A **High Impact Polymer Resin** jointly developed by Toyota Boshoku Corporation and Toyota Central R&D Labs., Inc. has been named a winner of the 2019 R&D 100 Awards* sponsored by R&D World Magazine.

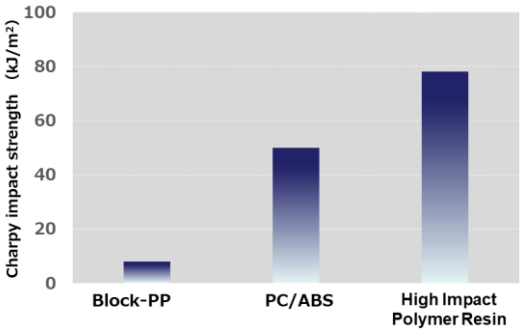
While companies recently have been concentrating greater efforts on meeting their SDGs and ESG criteria, Toyota Boshoku took an early lead in driving to promote environmental-friendly manufacturing. Focusing on the plant material Kenaf, the company has been producing components using Kenaf since 2000, consistently addressing all aspects, from plant cultivation to product development. We have advanced development of materials utilizing plant-derived materials with the aims of reducing CO_2 emissions and making more effective use of resources. In 2013, Toyota Boshoku jointly developed the **High Impact Polymer Resin** with Toyota Central R&D Labs., Inc.

[About the Award]

The **High Impact Polymer Resin** that won this award is a resin material featuring the world's highest levels of impact resistance. Combining polyamide 11 (PA11), a 100% inedible plant-derived resin, and the petroleum-derived resin polypropylene (PP), the material is formed into a "salami structure" [Fig. 1] by controlling dispersion of the resins at the nanometer level, resulting in a plastic with approximately ten times the impact strength of PP [Fig. 2].



[Fig. 1] Nanostructure of High Impact Polymer Resin



[Fig. 2] Impact resistance of High Impact Polymer Resin

In commercializing door trim products made with this **High Impact Polymer Resin**, we have discovered the optimal formulation that achieves both cost savings and performance. Approximately 20% weight reduction was accomplished for the new door trim base material. The development was adopted for use in the TOYOTA CROWN in 2018 [Fig. 3]. The 2019 R&D 100 Award indicates the tremendous praise we have received for commercializing this advanced research material, which is excellent in scientific terms as well.

[Fig. 3] TOYOTA CROWN door trim

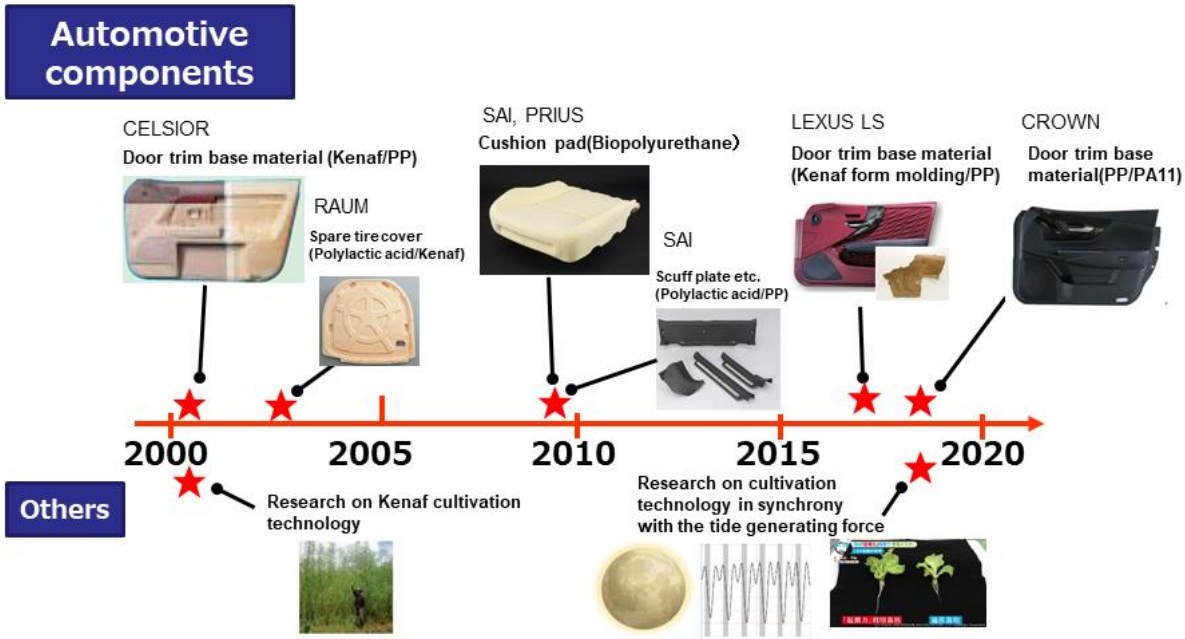
Toyota Boshoku aims to be an *Interior Space Creator* that provides safe, environmentally considerate, and comfortable cabin spaces for our customers around the world. Going forward, Toyota Boshoku and Toyota Central R&D Labs. will continue to develop sustainable materials that are friendly to the earth and to human.

*Sponsored by the U.S. magazine R&D World, the R&D 100 Awards is a traditional and prestigious award program honoring the 100 best products and technologies that research institutions and companies worldwide have developed and put into practical use in the past year.

Award ceremony (December 5, 2019 in San Francisco, USA)

[Reference]

1) Transitions in Toyota Boshoku's Environmental Technology Development



2) Patents and Documents Related to High Impact Polymer Resin

Patent applications for material development
• Patent applications: 20

Patent applications and awards related to commercialization of door trim products
• Patent applications: 7
• Award history:
-Technical Development Award, 69th JSAE Awards
-2019 Chubu Science and Technology Center Honorable Mention Award, Chubu Science and Technology Center