In order to respond to social challenges, potential problems, and changes in the market environment that have become apparent, the Advanced Technology Division and the New Business Creation Division have classified the target markets into the following three categories: "existing market," "new market," and "next-generation market," and are devoting resources to research & development and commercialization for each category. When it is difficult to find solutions on our own, we actively promote open innovation through alliances with venture companies, universities, research institutes, and other organizations, both in Japan and overseas. We incorporate the concept of "Creating Shared Value (CSV)," deepen communication with our stakeholders, and work on development that can realize the creation of shared value between the Toyal Group and society. We also aim to lead the world with new ideas, being based on aluminum, but not limited to it.

C S R Key Challenge

## Innovation to Shape the Future

## Contributing to society by developing products that help protect the environment

Hayashi: Helping to solve social challenges such as environmental conservation is the most important theme of the Advanced Technology Division. The R & D theme I am working on is the development of new products aimed at reducing CFPs and VOCs during the automobile manufacturing process. Our approach to environmental conservation is quite broad, and requires research and development that is closely attuned to social trends and the wishes of our customers. To this end, we place importance on sharing information with sales and other divisions.

Kino: The Intellectual Property Team is in charge of managing the protection and utilization of intellectual property rights, such as patents, and contributes to society by assisting in the conclusion of technology agreements with other companies and organizations. This is necessary when developing and marketing products that lead to sustainability, for example, by reducing CO<sub>2</sub> emissions. In recent years, I

Foil C Ri

Advanced Technology Divisio R & D Supporting Unit Intellectual Property Team Miho Kino Powder & Paste Headquarters R & D Unit Research Team Yuya Hayashi

have had the impression that there has been an

increase in the number of patents for paper-

based packaging materials with the aim of

research is one way for us to grasp social

& D and sales members to support product

development.

trends, we share these research results with R

Hisataka: My mission is to solve social issues.

In the compound business that I am in charge

products for agriculture, thereby contributing to

reducing the environmental impact and healthy

compound business, including biodegradability,

proposing environmentally friendly products that

recycling, and biomass. We are committed to

solve social issues and meet customer nee

living. As Mr. Havashi mentioned, there are a

diverse range of approaches to reducing

environmental impact, even just in the

of, we add various functionality to resins to

develop resins that are easy to recycle and biodegradable, as well as pest repellent

moving away from plastics. Since patent

**Dissolvable aluminum foil / TOKELUMI®** 

TOKELUMI® was developed based on the concept of "environmentally friendly aluminum foil." It can be dissolved in aqueous solutions with a low environmental impact, such as salt and acetic acid, and we are currently exploring applications that take advantage of this characteristic. The photos on the right show the result of immersing aluminum foil in a mixed solution of salt and acetic acid at 40°C. While there is no change in the generic aluminum foil, TOKELUMI® can be seen vigorously bubbling and dissolving 60 minutes after immersion.

## Recycling Technology / W Cycle

Aluminum and resin laminated foils used for packaging and other applications are difficult to peel off, and much of it is disposed of as combustible trash. We see this situation as a challenge and are working to develop a peeling technology that will make recycling possible. We have already succeeded in separating them at the laboratory level. We will continue our research to further improve the technology while resolving issues one by one with the aim of practical application.

## Near-infrared reflective black metallic pigment

Near-infrared reflective black metallic pigments are black metallic pigments that reflect near-infrared rays by not using carbon black, a fine carbon particle found in dark paints. All materials generate heat by absorbing solar energy, but carbon black absorbs the entire spectrum of light, which reduces the efficiency of air conditioning and makes it inapplicable for autonomous driving technology that uses infrared light.

Near-infrared reflective black metallic pigments are expected to contribute to solving these problems because they do not use carbon black, and they are also expected to contribute to solving social problems such as improving the environment and automobile safety.

Foil Headquarters Adv bil Converting Sales Unit West Japan Team In Riku Hisataka





TOKELUMI®

General aluminum foil



Aluminum and resin laminated foil

Resin



pigment Retains metallic design and characteristics