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Sanyo Chemical Industries, Ltd.

Sanyo Chemical Developed Resin Additive to Improve Chemical Resistance of ABS resin

Sanyo Chemical Industries, Ltd. has announced that we developed a resin additive “FUNCTIVE” that can improve chemical resistance of ABS (acrylonitrile, butadiene, styrene) resins by adding a small amount. Since ABS resins are used in a wide range of application, we will contribute to the further expansion of their applications by imparting chemical resistance to them.

[Background of the development]

Sanyo Chemical has resin modifiers such as "PELESTAT" and "PELECTRON" that are Inherently Dissipative Polymers to form conductive paths in the polymeric matrix to prevent the static buildup of resins, and "UMEX" as compatibilizers in polyolefin compounds and as dispersion promoters for inorganic fillers for polyolefin. Sanyo Chemical, with its core surface control technology, polymer design & synthetic technology and its accumulated expertise of resin modifiers, has developed a resin additive to improve chemical resistance of ABS resins.

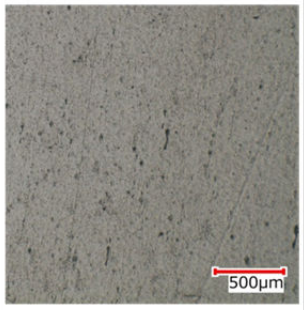
When ABS resin comes into contact with chemicals such as organic solvents, its appearance deteriorates and generates cracks. "FUNCTIVE" can improve the chemical resistance of ABS resin by adding a small amount to ABS resin (Fig. 1, Table 1). In addition, since “FUNCTIVE” provides great performance with a small addition amount of 2 to 5% by weight, it has almost no effect on the mechanical properties of the resin.

"FUNCTIVE" can improve chemical resistance not only for general-purpose grade ABS resin, but also for high-performance grade ABS resin such as flame-retardant ABS, glass fiber / carbon fiber reinforced ABS, and PC / ABS, which is a composite resin of polycarbonate (PC) and ABS.

By improving the chemical resistance of these ABS resins, we believe that we can contribute to expanding the applications of ABS resins by increasing kinds of applicable materials, printing, painting and adhesion, etc.

Sanyo Chemical

＜Appearance after 5 minutes of dropping xylene＞

Before chemical resistance test	After chemical resistance test		
Chemicals	ABS resin	ABS / FUNCTIVE Y-200 (100 / 2 wt/wt)	ABS / FUNCTIVE Y-200 (100 / 5 wt/wt)
			

＜Evaluation chemical resistance by 1/4 elliptical method＞

Chemical Substances	ABS resin	Adding amount of FUNCTIVE Y-200 to ABS resin	
		2phr	5phr
Xylene	0.57	0.62	0.70
Heptane	0.63	0.71	0.78
Isopropyl alcohol	0.60	0.63	0.70

* In the 1/4 elliptical method, the injection-molded test piece is fixed to the elliptical surface rig to generate the strain and the chemical is applied on it, left for 2 hours in the condition at 23 °C, 50 RH%, and the critical strain value ε is calculated at which cracking occurs. If the critical strain value is less than 0.7, cracks may occur due to contact with chemicals, and if it is 0.7 or more, it is judged to have chemical resistance. (*)
* Varies depending on the type of ABS resin, molding method, and shape of the molded product.

<Expected application examples by improving chemical resistance>

①Automobile exterior parts

Door handles, side mirror housings, spoilers, radiator grills, etc.

Prevents cracks due to solvents in the paint. This leads to give more choices of paints and improve yield.

②Automobile interior parts

Console box, door trim, instrument panel, etc.

Prevents cracks and deteriorates surface of ABS resin caused by the sunscreen and alcohol for disinfection which are used by the user

③ Home appliances

Bodies of washing machines, refrigerators, display frames for TVs, personal computers, and game machines, etc.

Prevents cracks due to contact of detergent and alcohol for disinfection.

④Housing equipment

Expanded application to resin parts that come into contact with detergents, such as bathrooms, wash basins, and kitchens.

【Future plans】

With the urgent need for global warming countermeasures, the automobile industry and other industries are working to improve fuel efficiency by reducing the weight of greenhouse gases, and the demand of ABS resin and other high-performance resins is expected to increase. In addition due to the digital revolution and the full-scale operation of the 5th generation mobile communication system (5G), the market for ABS resin, which is also used for the frame of digital devices, is expected to expand further. We will continue to meet the diversifying needs of resin modification through various solutions.

About Sanyo Chemical

Sanyo Chemical, established in 1949 in Kyoto, Japan, is a global manufacturer and seller of performance chemicals. Beginning as a manufacture of soap and textile agents, we have since diversified our product portfolio to meet the needs of the market. Today, we feature over 3,000 different types of products and have established an international presence. Our portfolio of chemicals spans a variety of industries and types, from automotive components to daily-use electronics, as well as cosmetics and medical equipment, all with the aim of creating more safe and environmentally friendlier offerings, improving lives and societies across the world.

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