

**Development of hard, bendable UV curable resin
having excellent substrate adhesions**

**-Applicable for protection of electronic components and
functional film applications-**

Sanyo Chemical Industries, Ltd. has announced that we get ready for a sample supply of "NEOJET FL", a UV curable resin that is "hard," "bendable," and has "excellent adhesion to substrates.

We are also ready for further customization to meet user needs and will continue to contribute to technological innovation in the ever-evolving display and electronic materials fields.

In general, polymer materials such as UV curable resins tend to become brittle for hard resins and lose strength for soft resins. However, in recent years, there has been a growing demand for UV curable resins that are not only hard and strong but also do not crack when deformed, such as in flexible electronic materials, foldable smart phones, and decorative films for automobile interiors. UV curable resins with good elongation are required. In addition, the development of the display and electronic materials fields and the evolution of applications have led to diversification and sophistication of needs, such as special shapes of adherends, diversification of base materials, and high-precision patterns, which require optimal solutions for UV curable resins as well. This has created a need for optimal solutions for UV curable resins.

"NEOJET FL" was designed and developed to solve these problems by combining our interface control, synthesis, and compounding technologies. It is a hard, strong, and elongated (tough) acrylate-based UV-curable resin that exhibits 75% elongation, approximately 18 times that of our conventional product. The thin film coated and cured on polyimide film exhibits high flexibility and adhesiveness, with no peeling or cracking even after bending 100,000 times at a tip curvature radius of 0.5 mm in a bending test.

"NEOJET FL" has excellent adhesion not only to polyimide film but also to various base materials such as glass and metal. "NEOJET FL" is hard, strong, deforms without cracking, and has excellent base material adhesion, making it suitable as a protective material for electronic components and circuits used in the increasingly flexible electronic materials. "NEOJET FL" is suitable as a protective material for electronic components and circuits used in the increasingly flexible electronic materials.

It also has low viscosity and high discharge stability, making it applicable to inkjet^{*1} applications, which are attracting attention as a next-generation electronics manufacturing technology. Furthermore, it has excellent moldability and is so flexible and transparent that it does not crack even after repeated bending, making it applicable to optical film applications.

In addition to "NEOJET FL," we also offer "NEOJET PAD," a high adhesion grade with high adhesion to olefin base materials, which generally have poor adhesion and are prone to peeling, and "NEOJET GMAD," which has high adhesion to metals and glass, to meet diverse needs. We provide solutions to meet a variety of needs.

[Future plans]

As the development of wearable and flexible devices and the IoT, in which all devices are connected to the Internet, advances, it is expected that application to specially shaped adherends, the mounting of a vast array of components (cameras, sensors, etc.), and complex combinations of components and devices will become necessary in the future. As a solution to these advanced needs, we aim to commercialize the "NEOJET" series and develop products tailored to various needs.



Origami cranes made with sheet cured material using "NEOJET FL"

| Properties | | "NEOJET FL" |
|----------------------------------|-------------------------------|-----------------------|
| Product Properties | Solid concentration (%) | 100 (without solvent) |
| | Viscosity (mPa·s) | 17 |
| Physical properties after curing | Pencil hardness | HB |
| | Growth (%) | 75 |
| | Tg(° C) | 77 |
| | Total light transmittance (%) | 90 |
| | Haze (%) | 0.6 |
| | refractive index | 1.53 |

Viscosity : Type E viscometer / 25° C, Curing conditions : LED385, 2000 mJ/cm² , 1000 mW/cm² ,
Film thickness after curing 10 μ m

Pencil hardness : on PET film, film thickness 100 μ m, 750 g load (in accordance with KIS K5400)

Elongation : Measured by autograph in accordance with JIS K6251. (Dumbbell No.3 type)

Tg : Measured with Reogel E4000 by making strips 5mm wide and 1mm thick

<Reference>

※1 Inkjet technology is a technology that selectively applies UV curable resin on a substrate to create a desired pattern.

① Less loss of materials such as resins and process chemicals, and reduced environmental impact.

② Easy digital control of coating thickness and pattern

③ High degree of freedom, such as deposition on minute areas and tertiary shapes

④ High-speed, high-precision, non-contact patterning for large areas

With features such as these, it is attracting attention as a next-generation electronics manufacturing technology.

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 texture 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 ore safe and environmentally friendlier offerings, improving lives and societies across the world. We aim to contribute to realize a sustainable society through our corporate activities.

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