

Developed New Defoamer for Aqueous Pressure Sensitive Adhesive with Excellent Antifoaming and Anti-cratering Properties

Contribute to the improvement of adhesive tape productivity resulting in responding to the vigorous demand for packaging materials

San Nopco Limited (HQ: Kyoto, Japan, President: Hiroyuki Tsuruta), a wholly owned subsidiary of Sanyo Chemical Industries, Ltd., (HQ: Kyoto, Japan, President: Takao Ando) has developed a defoamer (anti-foaming agent); NOPTAM 3590, which exhibits a superior defoaming property in the coating process of aqueous adhesives within the manufacturing process of pressure sensitive adhesive (PSA) tape such as OPP * tape. NOPTAM 3590 is excellent in defoaming property, and also it suppresses cratering during application and drying of adhesives. It is suitable for high-speed coating of adhesive because it hardly foams, and contributes to the improvement of adhesive tape productivity.

【Background of the development】

Growing demand for Internet shopping has led to an expanding demand for packaging materials such as cardboard and adhesive tape. Amid a growing interest in SDGs (Sustainable Development Goals) and environmental concerns on a global scale, there has been an increasing demand for environmental measures such as volatile organic substance (VOC) reduction in the adhesive tape manufacturing process as well. In countries such as China where regulations are strict, the adhesive for PSA tapes has considerably changed to aqueous type.

OPP adhesive tape is mainly used as packaging tape overseas. OPP tape is a transparent tape manufactured by coating adhesive on backing plastic film. When coating, excessive adhesive is scraped away by the scraper, then collected and reused (see the scheme of the process). If the foams generates during coating or recycling in adhesive tape manufacturing process, it cause difficulties in process control or equipment operation such as overflow of the tank as well as troubles such as coating defect. Therefore, defoamer is usually used to eliminate such troubles.

As polymerization of acrylic monomers takes place in water a surfactant is used, meaning that resistance to humidity and water is inferior.

Aqueous based PSA contains surfactant to dissolve and disperse the poorly soluble adhesive compounds into water. However this surfactant causes unwanted foaming. And if trying to raise the coating speed to improve the productivity, accompanying measures such as lowering viscosity and raising speed of the cycle are necessary. But they tend to worsen foaming side effect. Therefore, strong defoamer is desired, but such defoamer can have a problem that cause cratering of the adhesive during application and drying of adhesives.

San Nopco Limited has been developing various defoamers and leading the industry since our establishment in 1966 by leveraging our abundant field experiences and surfactant technologies. Based on such accumulated expertise, we optimized the effective component of the defoamer. And we succeeded to develop the new defoamer

with excellent antifoaming and anti-cratering properties; NOPTAM 3590, which is suitable for the aqueous adhesive coating process in PSA manufacturing

【Features of the technology】

<Problems of conventional defoamer>

Usually defoamer is used for aqueous adhesive, because surfactant as one of the inevitable components of the adhesive also has adverse feature to promote foaming side effect. When defoamer contacts the foam, it intrudes the foam membranes and replaces the stabilizing surface by surfactants. In consequence the foam is destroyed. But the defoamer with excellent defoaming property is usually difficult to dissolve in aqueous components and the dispersion particle size is large. So the adhesive resin around the defoamer is locally receded and small circular uncoated defects (cratering) may occur. The cratering not only makes the appearance worse, but it also decreases the strength of the adhesion due to the partial absence of the adhesive. Therefore, the new defoamer to satisfy both of excellent defoaming and anti-cratering property was required.

<About NOPTAM 3590>

The newly developed NOPTAM 3590 is optimized for various factors such as surface tension, solubility to foam, size of dispersed particles, viscosity, etc. in order to maximize the defoaming property without cratering. Actually when using NOPTAM 3590 for PSA, it has no cratering and no problem with the appearance and strength. In addition, it can contribute to improve productivity because it hardly foams even if the coating speed is increased several times before. Accordingly, NOPTAM 3590 has been gained popularity.

【Feature Plan】

From the viewpoint of reducing environmental impact, the demand for aqueous adhesives is expected to grow more and more. In addition, NOPTAM 3590, which is excellent in defoaming property, and also it suppresses cratering, can be expected to be effective for the paint industry where aesthetics are important and development of the aqueous products is progressing. San Nopco Limited will provide detailed supports globally to the various problems with prompt and proper solutions. And we will contribute to respond quickly to the changes in the times and customer needs, and reduce the environmental load by putting priority on “Environment and Energy”.

<Reference>

●Appearance of PSA



Cratering
(Conventional)



No cratering
(NOPTAM 3590)

*Coated onto oriented polypropylene film with 50μm wet film thickness and dried

●Aqueous adhesive coating process in PSA tape manufacturing process

