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## **Biodegradability of GLUDAN Dispersion Adhesives**

We hereby declare that GLUDAN PVAc , PVAc/E and Polyacrylate dispersion adhesives are water based adhesives formulated with polyvinyl acetate homopolymer, and polyvinyl acetate/ethylene and polyacrylate ester copolymer dispersions, respectively.

The polymers in the dispersions are only slowly biodegradable but they do not disturb or harm the biological processes in waste water cleaning plants. The polymers will typically end up as small harmless particles in the sediment.

The adhesives may furthermore contain additives such as plasticizers, wetting agents, lubricants etc. that are typically organic compounds which much more easily will degrade as a result of the biological processes in the waste water purification plants.

Some of the GLUDAN dispersion adhesives contain mineral fillers such as limestone and china clay. These fillers that originate from the nature cannot degrade biologically since they already have been brought to a stable end condition by mother nature.

All Gludan dispersion adhesives contain very small amounts of biocide. This is to prevent that micro organisms such as bacteria and fungi attack the adhesives and start a putrefaction process resulting in bad odour and discolouration eventually making the adhesive useless.

The biocide will not harm the biological processes in the waste water treatment plants being present at only ppm level. The biocides used by GLUDAN are easily biodegraded and thus will not accumulate in the plants.

To further elucidate the harmlessness of the GLUDAN dispersion adhesives in connection with waste water cleaning, environment and health it should be pointed out that no GLUDAN products are classified as harmful to health or environment.

GLUDAN does not apply raw materials that are classified as toxic or CMR (carcinogenic, mutagenic, reprotoxic) class 1 or 2.

GLUDAN raw materials do not include organic solvents, phthalates, alkyl phenol derivatives, gene modified materials or substances based on heavy metals such as lead, mercury, cadmium, copper or chromium(VI).

Finally, it should be emphasized that almost all raw materials used by GLUDAN comply with either the US or the German regulations covering substances permitted for use in adhesives for food packaging materials.

### **Gludan GmbH**

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