



Water Proofing Agent (Alkyl Ketene Dimer (AKD) Emulsion)

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Product Category	<ul style="list-style-type: none"> Alkyl Ketene Dimer (AKD) Emulsion
Application	<ul style="list-style-type: none"> Used in paper manufacturing Used in molded pulp application
Key Function(s)	<ul style="list-style-type: none"> Improve wet strength of paper quality Enhance physical properties of paper Minimize chance of paper deterioration under moist conditions

Paper is a material that is very sensitive to moisture, especially the types of paper which are used in printing and packaging. The standard humidity for best preservation of paper is about 50%. However, with the humid tropical monsoon climate and high humidity all year in ASEAN countries, this has a significant impact on the production and preservation of all types of paper. Paper produced in an environment with high humidity will easily become wet, loose, moldy, and faded.

Stellar Unity has collaborated with a large Paper Chemicals factory from China to provide long term supply and reliable quality of Alkyl Ketene Dimer (AKD) emulsion. It is emulsion prepared from AKD (Alkyl ketene dimer) resins with water and surface modification agents.

Alkyl Ketene Dimers (AKD) are chemical compounds primarily used in the paper industry as sizing agents to improve the water resistance and surface properties of paper. They are typically produced by the dimerization of long-chain fatty acids, such as stearic acid, which results in a compound with two ketene groups attached to the alkyl chains.

Key Points about AKD (Alkyl Ketene Dimers):

- Chemical Structure:** AKD has a dimeric structure, meaning they consist of two long-chain fatty acid molecules linked by a ketene group (C=O).
- Function:** In the paper industry, AKD emulsion is used as sizing agent. It enhances the water resistance of paper by forming hydrophobic bonds within the paper fibers. This helps to make the paper more resistant to moisture, reducing the tendency to absorb water.
- Applications:**
 - Paper sizing:** The most common use of AKD is in paper manufacturing, where it is added to the paper pulp. This gives the paper better printability and resistance to water or ink smudging.
 - Surface treatment:** AKD is also used in other industries for surface treatment of materials to provide water-repellent or partially some oil-repellent properties.



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4. **Formulation:** AKD from Stellar Unity is typically sold in emulsion form, which can be easily incorporated into the papermaking process.
5. **Environmental Considerations:** AKD is generally considered safe and effective in their intended applications. However, the environmental impact of their production and use can vary depending on factors such as the source of raw materials and disposal practices. The biodegradability and safety profiles of AKD products are usually evaluated to ensure minimal environmental harm.
6. **Reaction with Paper:** AKD reacts with the hydroxyl groups present in cellulose fibers to form covalent bonds, which gives the paper its water resistance.

Therefore, AKD emulsion is an essential paper chemical or a prominent paper additive in the paper industry, enhancing the durability and quality of paper products by improving water resistance.

AKD emulsion can be used in the process of neutral paper making in factories directly. Paper can not only be endowed with predominant capability of water resistance, and soak capability of acid alkaline liquor, but also with the ability of brim soaking resistance. By using it, paper mills can improve physical properties of paper, it has been widely used in producing various kind of paper, such as art base paper, electrostatic autographic transfer paper, double colloid paper, non-carbon paper, archival paper, photo base paper, yew base paper, stamp base paper, napkin, etc.

When AKD is applied as surface sizing agents, it will ensure hydrophobic performance in various paper, packaging, and board grades, and in addition provide improved printing characteristics and increased convertibility, such as glueability and friction.

As surface sizing reduces the amount of internal sizing needed it helps reduce wet end complexity and improves machine runnability. Stellar Unity can provide AKD emulsion which is compatible with different surface application techniques such as film, pond, and spray sizing technologies, and can be applied at the size press together with a starch solution.

- Applicable to various paper and board grades
- Ensure good hydrophobicity, convertibility, and printability
- Effective over a wide pH range
- Fully cured on-machine
- Compatible with other size press additives
- Maintain good ratio between sizing performance and cost

As mentioned over again, Stellar Unity has collaborated with a large Chinese manufacturer for Paper Chemicals. Therefore, it can manage the supply and minimize unnecessary cost to the paper mill. The quality system of our Cationic Rosin Sizing is controlled through a large scale manufacturing process to balance between performance in use and cost in operation for paper mills.



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