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Microbial Analysis on Starch Based Glue Fermentation of Corrugation Packaging Plant: A Critical Study

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Abstract: *These days, packaging is essential to preserving the quality of goods because it protects them from environmental, chemical, and physical hazards. Despite the widespread usage of polymer - based packaging materials, paper - based packaging goods have recently gained popularity due to their affordability and environmental friendliness. Currently, food products and e - commerce businesses are packaged using paper and paper - based board materials. The majority of paper and paper board packaging is structurally dependent on adhesives used in the packaging industry, both in the conversion process and on the packing line. The selection of adhesives can have a substantial impact on the productivity and efficiency of manufacturing lines. The types of adhesives used in the paper industry include 100% solids adhesives such as hot melts and heat - sealing glue, water - based adhesives both synthetic and bio - polymer based (starch, cellulose, protein, and itaconic acid), and solvent - based adhesives (polyurethane and acrylic - based). Water - based heat - expandable glue with cushion - like and thermally insulating qualities has been available more recently for use in protective wrap and packaging. Here, we want to provide a summary of the adhesives research trend in the paper packaging sector. The overview provides a summary of the various adhesives used in the paper packaging sector.*

Keywords: Paper, Packaging, Bio - Based, Adhesive, Expandable, Starch Based Glue Fermentation, Microbial Fermentation, Corrugation Materials

Proposed case study and interest of research by -
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1. Introduction

Packaging & Corrugation

Packaging wraps and protects commodities once they are manufactured, maintains their integrity throughout handling, transit, warehousing, and distribution, and ensures their wholesomeness while usage.

Physical protection is also provided by the packaging, which includes improving shock shielding, internal product safeguarding, and decreasing shock damage caused by snagging, friction, vibration, and impact. This protection can range from preventing product damage to creating barriers to moisture, oxygen, carbon dioxide, and other gases. Packaging can function as a light barrier, preventing the colour of a product from fading. In addition to providing non - resistant protection, many packages now actively contribute to the quality of a product by assisting in the maintenance of the optimal conditions around the product.

Because of the properties of polymers, plastic packaging is suitable for preserving items throughout transportation and delivery to clients. Despite its benefits, plastic is derived from a petroleum resource, whereas paper and pulps are derived from trees. Furthermore, plastic can be recycled and reused, but it is currently difficult to achieve high levels of post - consumer recycled content in plastics due to post - consumer waste contamination. Plastics used in flexible packaging, like many other major plastics applications, have come under intense scrutiny in recent years as sustainability concerns have grown and spread globally. Papers have traditionally been utilized in flexible packaging for a variety of purposes, including confectionery, pet food, and dry food. Paper is significantly more biodegradable than plastic and can be readily recycled. Furthermore, paper - based flexible packaging is frequently laminated with plastic/aluminium or coated with resin, making it non - recyclable. Many businesses are transitioning to paper packaging instead of plastic packaging to become more sustainable, especially with the new plastic tax set to take effect in 2022. However, converting to paper has its own set of environmental difficulties. Pulp and paper industries, which are now growing, are one of the important sectors in every country throughout the world, contributing not only to gross domestic product but also, shockingly, to environmental pollution and health concerns. In India, over 700 pulp and paper mills produce approximately 7.0 million tons of paper and paper board. Every tonne of pulp generates 1.25 tons of waste black liquor solids. Because of their eco - friendliness, paper and paper - based board materials were among the first and most widely used packaging types for e - commerce and food goods such as drinks, dry powders, confectionery, and bakery products. Adhesive methods were required for such expanding and sustainable paper industry. In this section, we examined the adhesives research trend in the expanding paper industry.