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ADHESIVE FOR CHIPBOARD AND ITS SYNTHESIS

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ABSTRACT

Due to their high reactivity, chemical versatility, and economic competitiveness, formaldehyde-based polycondensation adhesives are used in large quantities—up to 20 million metric tons in 2010—worldwide, primarily in the woodworking industry. Since the 1970s, formaldehyde emissions from its products have come under pressure and have steadily declined. The debate that began with the latest European CLP (classification, labeling and packaging) regulation, which came into force in 2016, has intensified again, classifying formaldehyde as a carcinogenic category 1B compound. Given the potential and even stronger future restrictions on the use of formaldehyde, it is necessary to develop and implement suitable alternatives to replace formaldehyde-based adhesive systems such as urea formaldehyde in the woodworking industry. This review represents a critical evaluation of formaldehyde-free adhesive systems for the production of particleboard wood composites proposed in the literature so far. The adhesive systems analyzed here include both synthetic and renewable adhesives.

Keywords. Chipboard glue, glue synthesis, formaldehyde, new methods.

Chipboard as a product dates back to the early 20th century and was used to recycle low grade lumber and wood waste during World War II when good quality lumber was in short supply. Chipboard is made by cutting wood into particles smaller than 2 mm of any size. They are then made into a panel and glued together traditionally using UF or PF adhesive resins. Other resins, such as isocyanates, can and have been used, and due to indoor air quality issues, research into the use of non-formaldehyde resins is ongoing. Most particle boards are made using a sandwich system in which the core of the board is made up of large particles and the outer layers are made up of smaller particles to improve the surface. The board production technology was developed using sawdust, rolling waste and recycled wood. Other non-wood lignocellulosic materials have also been used to make particle board, such as bagasse.

ANALYSIS AND METHODOLOGY OF THE LITERATURE

Thus, the production of particle boards involves stripping the bark of the wood, which is then split into small chips or pieces using a "crusher" and further reduced in size. This secondary reduction is carried out by several different methods such as forging (grinding and grinding) or knife systems (cutting and shearing). Disc refiners can also be used to produce very fine particles for surface cleaning by abrasion. The particles are then dried before resin is sprayed (different amounts of resin can be used for the core, eg 6-12%, and the surface layers, eg 4-8%), and crumbs (coarse in the center and fine at the edges). surface) are formed. The mat is then pressed at high temperature (eg 200° C.) in a continuous or sequential process. Finally, the slabs are cut and cut to size and finished by sanding or adding any coating or varnish or high pressure (HPL) or low pressure (LPL) paper laminate impregnated with melamine.

RESULTS

Due to its recycled nature, particle board has the same properties in all sizes. The resin system used has a great influence on the properties of the board, moisture resistant resins with a high resin content are used for high quality panels. The strength of the board is usually lower than that of plywood, with an MMF value of 16-22 MPa compared to 35-45 MPa for plywood. Chipboard also tends to have low water resistance, but this can be changed with moisture resistant resins and additives (giving the panel a green color in cross section).

OUTPUT

Chipboard is usually coated or laminated to enhance its aesthetic qualities and is easily treated with flame retardants (which usually have a reddish cut) or chemical preservatives. Chipboard is one of the most common wood based products used in flat furniture, interior cabinetry and work surfaces (HPL coated). It is also used for wall and floor panels.

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