World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:11, No:06, 2017

Modification of Polyurethane Adhesive for OSB/EPS Panel Production

Authors : Stepan Hysek, Premysl Sedivka, Petra Gajdacova

Abstract : Currently, structural composite materials contain cellulose-based particles (wood chips, fibers) bonded with synthetic adhesives containing formaldehyde (urea-formaldehyde, melamine-formaldehyde adhesives and others). Formaldehyde is classified as a volatile substance with provable carcinogenic effects on live organisms, and an emphasis has been put on continual reduction of its content in products. One potential solution could be the development of an agglomerated material which does not contain adhesives releasing formaldehyde. A potential alternative to formaldehyde-based adhesives could be polyurethane adhesives containing no formaldehyde. Such adhesives have been increasingly used in applications where a few years ago formaldehyde-based adhesives were the only option. Advantages of polyurethane adhesive in comparison with others in the industry include the high elasticity of the joint, which is able to resist dynamic stress, and resistance to increased humidity and climatic effects. These properties predict polyurethane adhesives to be used in OSB/EPS panel production. The objective of this paper is to develop an adhesive for bonding of sandwich panels made of material based on wood and other materials, e.g. SIP) and optimization of input components in order to obtain an adhesive with required properties suitable for bonding of the given materials without involvement of formaldehyde. It was found that polyurethane recyclate as a filler is suitable modification of polyurethane adhesive and results have clearly revealed that modified adhesive can be used for OSB/EPS panel production.

Keywords : adhesive, polyurethane, recyclate, SIP
Conference Title : ICMSME 2017 : International Conference on Material Science and Material Engineering
Conference Location : Venice, Italy
Conference Dates : June 21-22, 2017