Particleboard Manufacturing from Pre-Compacted Wood Particles

Electra Papadopoulou1 • Sotiris Kouontouras1 • Costas Statopoulos1 • Gunnar Kalén2 • Sylvia H. Larsson2

1 CHIMAR HELLAS SA Sofouli 88, 55131, Kalamaria, Thessaloniki, Greece
2 Swedish University of Agricultural Sciences, Department of Forest Biomaterials and Technology, SE-90183 Umeå, Sweden

BACKGROUND

An important aspect of the final price of particleboards is the cost of raw materials, which depends to a large extent on transportation costs. In order to reduce this cost, a solution would be to transfer wood in a compressed form, like for example pellets.

In the framework of the EU project MOBILE FLIP, wood material from Scots pine (Pinus sylvestris) and Norway spruce (Picea abies) in the form of chips, pellets and milled pellets was tested for its suitability to produce particleboards.

Pre-trials were made where wood pellets were used as feedstock for particleboard manufacturing. However, pellets did not loose their original shape and the particleboard quality was very low (Figures 1 and 2).

Materials and methods

A mixture of spruce and pine wood chips was hammer milled (4, 6 and 8 mm screen size). Pellets were made from all three assortments. Pellets from the three assortments were cutting milled (6 mm screen size).

The materials were dried and blended with a typical Urea-Formaldehyde resin and formed into mats with dimensions of 35x35cm.

RESULTS

It was found that pellets is not a suitable feedstock for particleboard manufacturing. On the contrary, raw material before pelletizing (C) as well as milled pellets (MP) are good feedstock in particleboards manufacturing no matter of the particle size. When comparing the two types, non-pelleted material gives overall better results.

CONCLUSIONS

Making particle boards from pre-compacted biomass is an interesting idea, to improve the raw material supply chain for the particle board industry. However, we need to make more tests with other materials. Pellet making for particle board feedstock do not have to strive for making "top quality" pellets, but the focus should be on bulk density increment. Hence, there is more to explore regarding pellet quality requirements for this particular market.

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 637020 –MOBILE FLIP.