

Puu-28.3011: Wood-based Composites and Engineered Wood Products

Examination date: 10th March 2010

Total Marks 50

1. Explain briefly the following terms: **(5 marks)**
 - i. Three-layer board
 - ii. Pre-pressing
 - iii. Vertical density profile
 - iv. Furnish
 - v. Springback

2. Briefly describe the main production steps in the manufacture of either particleboard or MDF **(7 marks)**

3. Answer all of the following: **(9 marks)**
 - i. How can the moisture resistance of particleboard be improved?
 - ii. In OSB manufacturing, why are the logs soaked before stranding?
 - iii. What is the purpose of pre-pressing in particleboard and MDF manufacture?

4. Answer all of the following: **(9 marks)**
 - i. Why is it important to control the furnish moisture content of in the manufacture of wood-based composites like particleboard and MDF?
 - ii. How and why does wood density affect the mechanical properties of particleboard?
 - iii. How and why does the size of the resin droplet affect the properties of particleboard?

5. Answer one of the following: **(10 marks)**
 - i. Briefly describe the process for making fibre for MDF and explain how and why the process conditions (pressure and temperature) influence energy consumption and the properties of fibre produced. Also describe "blow-line blending" and explain why good distribution of resin on the fibre is achieved.
 - ii. During the hot pressing of particleboard, mat thickness, counter pressure, core vapour pressure, surface temperature and core temperature vary. Explain, with the aid of a diagram, how and why these vary during hot pressing and how this affects the development of the board's properties.

6. Write an essay (1-2 pages) on one of the following topics: **(10 marks)**
 - i. Manufacture and applications of LVL
 - ii. Future raw materials for particleboard and MDF
 - iii. Adding value to wood-based composites
 - iv. Manufacture and applications of OSB