

5<sup>th</sup> World Congress on

# Materials Science & Engineering

June 13-15, 2016 Alicante, Spain

## The potential of ceramic particles in coatings with improved scratch and wear resistance

**Caterina Lesaint Rusu<sup>1</sup>, Malin Brodin<sup>2</sup>, Hilde Lea Lein<sup>1</sup>, Mari-Ann Einarsrud<sup>1</sup> and Gary Chinga-Carrasco<sup>2</sup>**<sup>1</sup>Norwegian University of Science and Technology, Norway<sup>2</sup>Paper and Fibre Research Institute, Norway

This work aims at improving the resistance of coatings to scratch, impact, wear and chemicals by changing the composition of the composite layer. The latter is currently comprised of a melamine-impregnated layer and ceramic particles. Finding the optimum composition for highest possible scratch resistance is one of the main activities of this study. An important part has been the functionalization of the ceramic particles for securing an optimal adhesion between the particles and the resin matrix. Since mechanical performance of a composite material strongly depends on the properties of the filler-matrix interface and, in particular, on the level of adhesion between the matrix and the reinforcing filler, coupling agents have been added to promote interfacial adhesion and improve the properties of the composites. In addition, the position of the particles in the coating layer has been varied. Coatings have been manufactured and tested. It was expected that an optimal particle distribution and adhesion will increase the scratch resistance of the structure. The analyses have shown that the chemical wear of the coating was better with small ceramic particles and high amount of hardener. Additionally, the impact resistance was significantly improved with small particles and high amount of hardener. The correct thickness and curing state of the coating, considering the best parameters for the different layers in the structure, is assessed.

### Biography

Caterina Lesaint Rusu has completed her Master degree in Chemical Engineering from the Norwegian University of Science and Technology in 2012. She has started working as a PhD candidate in March 2014 at the same University, under the supervision of Associate Professor Hilde Lea Lein. Her work aims at the improvement of floor laminates and is conducted within the 'Elephant floor' project.

[caterina.l.rusu@ntnu.no](mailto:caterina.l.rusu@ntnu.no)

### Notes: