

## Boosting Abrasion Resistance of Coatings using an aqueous suspension of Nano SiO<sub>2</sub>

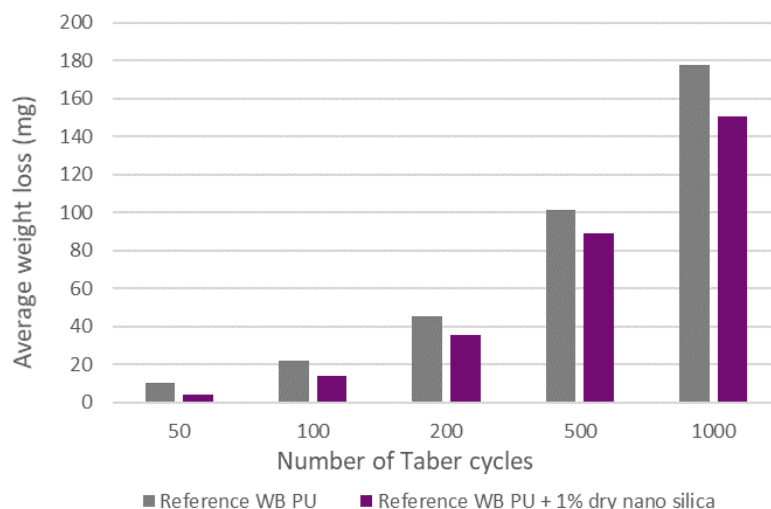
Within the European FP7 project SHYMAN (Sustainable Hydrothermal Manufacturing of Nanomaterials), Promethean has developed a broad range of aqueous nano-suspensions. VLCI has worked, among others, on a silica nano-suspension, and confirmed its easiness to formulate and ability to increase abrasion resistance of coatings.

### About nano-silica

In coatings, nano-silica is known for improving the abrasion resistance of coatings. It can also be used to increase the dirt- and water repellence of coatings. Based on Hansen Solubility Parameters, the Promethean's nano-silica was stabilized with a matching dispersant, which makes it now easy to formulate.

### What are the benefits related to coatings?

From VLCI's research, abrasion resistance improvements have been confirmed in a water-based polyurethane system (water-based OH-functional polyacrylic dispersion + aliphatic (HDI) polyisocyanate). The study below shows the average weight loss (in mg) after 50, 100, 200, 500 and 1000 cycles of Taber abraser (CS 17 wheels), for the reference PU system against the same system containing 1% dry nano-silica. After 1000 cycles, the abrasion resistance was improved by 15%.



### What are the targeted product developments?

The targeted applications are water-based topcoats, from high to low PVC levels, where abrasion resistance improvements are required to meet product specifications. VLCI can help you implementing it in your formulation to achieve the desired properties.