PREVENTING FROZEN WOODCHIPS ADHESION IN TRAILER

Logistic companies face troubles in winter due to the woodchips freezing and adhering in trailers, making the unloading dangerous and incomplete which reduce the volume of carried goods leading to the increase number of trucks per delivery.

Solutions like spraying fuel oil, hydrophobic paint, lining or durable coating, have been used around the cold regions of the world with various results. Based on research, a common problem for logistics companies during winter is the adhesion of the woodchips to the walls and floor of storage and transport trailers. Trailer inner coating is an easy and durable solution.

A series of tests are planned at Novia University of Applied Sciences in collaboration with the Tampere University to test different combinations of solution to prevent this problem.

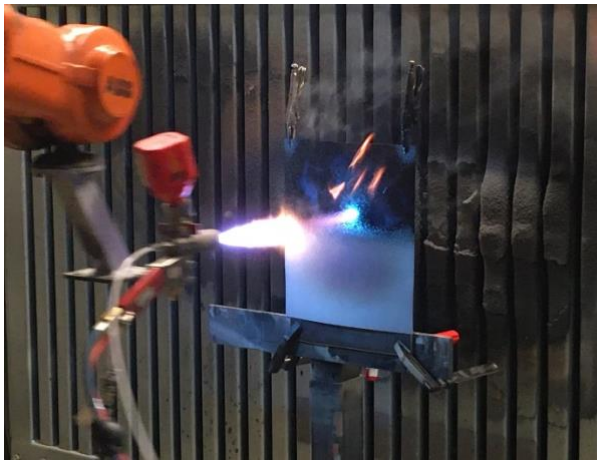
TEST BOXES

To test the different solutions, 4 boxes were made, 3 out of steel (2 to be thermally sprayed with polyethylene FS-PE and FS-SLIPS) and 1 of polyethylene lining material.

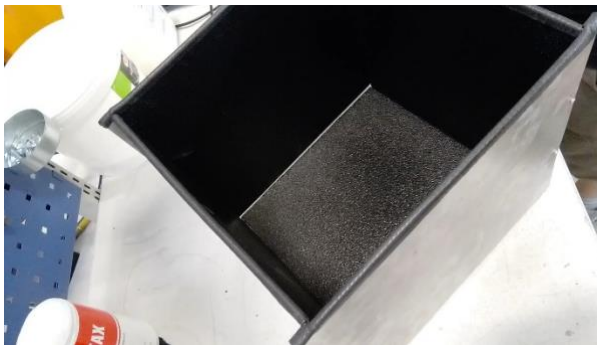
Picture 1. Test boxes, 1) PE 2) Steel

COATING

The coating was realized at Tampere University under the supervision of Heli Koivuluoto and her team. A flame spray polyethylene surface was coated. The procedure consists of pretreatment of the steel plate by grit blasting, heating the plate to 90-100°C, then coating with LD-PE through a nozzle with carrier gases of oxygen, acetylene and air. Once the coating is done, there is a post-heating about 160°C with flame (no additional air).



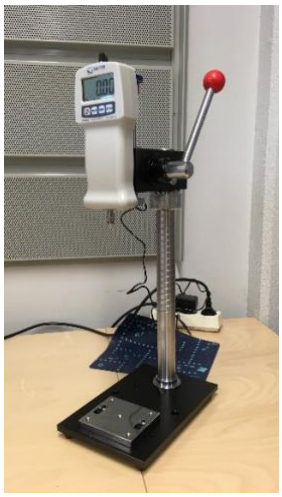
Picture 2. Coating in progress at Tampere coating lab



Picture 3. Coated box with FS-PE

TESTS

After coating, the boxes will be filled with moist woodchips and stored at -10°C and 70% humidity for a period varying between 12 to 24 hours. After this, shear tests will be done on the boxes. The box design allows the bottom to slide away, to measure the ice adhesion of woodchips by a Sauter force gauge mounted on a stand.



Picture 4. Shear test installation

The different coatings will be compared to define the best choice to reduce woodchips adhesion and therefore reduce trouble in the logistic companies. This small scall design gives a good view on what we try to reach on the full scale, namely low ice adhesion. With good and reliable information, companies will know which path to take to reach low ice adhesion and avoid unloading troubles.

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