Ice adhesion testing started at Sirris

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Icing poses many challenges and risks into our daily activities or to the operations of machinery. At Sirris we have been running activities to improve our knowledge on atmospheric icing events and to find icing mitigation. This work is part of the COOCK Fighting Icing and NewSkin projects.

One task was to develop an ice-adhesion test setup and a methodology to test multiple samples at the same time under the same conditions, using the nozzle array which is installed in our large climatic facility. After the initial design and the prototyping stages, a new ice-adhesion test setup is finally up and running, and the results are very promising.

This system in Figure (1) is based on a horizontal pusher, which consists of a block to push the ice on the flat samples, a motor to drive the block with high precision and a loadcell to measure the load acting on that block. A short video on the way the ice is pushed from a sample can be seen here.

Accept marketing-cookies to watch this video. For FireFox users, disable the ‘Enhanced tracking protection’ of your browser to view this video.

Initial test results on bare aluminum samples are already in the range of other horizontal push testers used for the same purpose. Currently, the tests are performed to reduce the scatter as much as possible and to improve the repeatability of the results.

The test is fairly unique, as all other adhesion strength pusher tests make use of icing samples which are shaped in moulds, often on very small ice samples. With our setup we can test a variety of test samples on larger samples under different ice conditions and icing types with a better simulation of conditions in the field.

Ice testing experiments are quite complex, with numerous parameters effecting the results.

In the coming weeks, a procedure for benchmark testing of several anti-ice coatings and surfaces will be finalised.

If you have questions about this test setup of the projects, please do not hesitate to contact us. You can also read more about the results of this Coock project in our reports here.

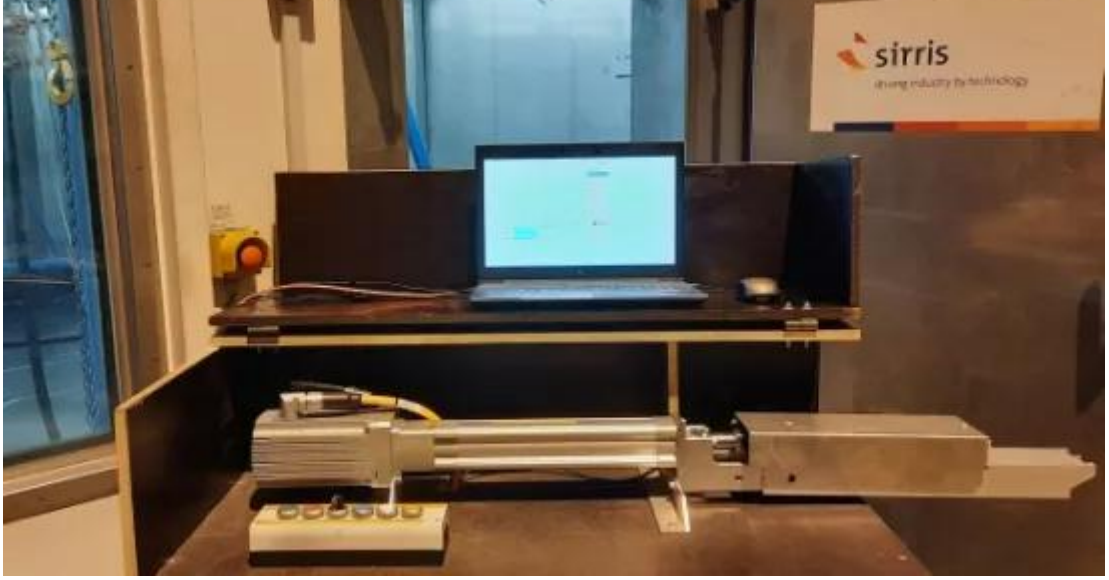


Figure (1) Horizontal ice adhesion tester developed by Sirris



Figure (2) Initial ice adhesion test results (average values) of bare aluminum compared to the results in the literature

Authors