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ICE ADHESION MEASUREMENT: IMPACT OF EXPERIMENTAL METHOD

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In the last decade of years a lot of novel surface coatings to avoid or reduce ice adhesion were introduced, any of them based on well known mechanisms, like for instance water repellency due to surface roughness and any of them based on interesting effects, like a mixture of different surface energies as for instance fluoro-silicone block copolymers. Different laboratories adopted these mechanisms to different material systems and so already a lot functionalised surface coatings are provided in the field.

Unfortunately, up to now there is no standardized method to determine a defined anti-icing property [1]. Many adhesion tests are available, with varying load levels, varying loading rates, different adherent ice types, different cooling rates, undefined surrounding moisture levels and further divergent influencing test parameters. Last but not least all captured ice adhesion strengths need to be adjusted in terms of their applied measurement principle to rank presented coating systems. On the way to a standardized testing method still many efforts have to be made to get a clear understanding of all physical and chemical influencing factors affecting the adhesion of ice on technical surfaces [2, 3].

In this paper a method is introduced and discussed, which allows to measure ice adhesion strength of frozen bulk ice. In the light of the various experimental methods described in the literature, was favored the principle of the so called horizontal shear test. In this presentation, advantages and disadvantages of this horizontal test method will be figured out. Especially the influence of testing temperature and quasi-liquid layer as the interface between surface coating and ice will be implemented, as well as the necessity of strong statistical data collection and statistically validation will be discussed.

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