

Icephobic coatings at UQAC: one of the ten most important discoveries of 2008!

Researchers at the Université du Québec à Chicoutimi (UQAC) have made a major breakthrough in developing icephobic nanostructured thin layered coatings which prevent ice adhesion and accumulation on protected surfaces. This is an important discovery which could revolutionize the design of strategic equipment and infrastructure in coldclimate regions by using this type of coating.

In fact, disproportionate atmospheric ice adhesion and accumulation on exposed equipment and structures is the source of disastrous technological repercussions and major economic losses. One just has to think of overhead power lines, transportation, wind turbines, bridges, and many other types of equipment and structures, the proper function of which is disrupted by atmospheric icing. The major ice storm of 1998 in Eastern Canada, an episode which is engraved in the collective memory of our society, is a striking example of the devastating effects of icing.

On the heels of many years of research in the field of atmospheric icing, Professor Masoud Farzaneh, holder of the CIGELE Industrial Chair and INGIVRE Canada Research Chair on Atmospheric Icing Engineering, and his team have been pursuing superhydrophobicity research, which is at the foundation of the recent development of icephobic coatings.

The approach consists in creating a nanostructured morphology on surfaces to be protected, using various methods. The surfaces are subsequently passivated using surfacelayered, lowenergy nanofims. Under these conditions, the chemical and electrostatic bonding forces between the ice and the protected surface are minimized or even neutralized.

The icephobicity of the protected surfaces was characterized by submitting numerous samples to ice accretion tests in the CIGELE refrigerated wind tunnel. Comparative tests showed that there was substantially no ice accumulation on the protected surfaces, compared with unprotected surfaces on which several millimetres of ice had accreted with strong adhesion.

Professor Farzaneh's team are proud of their achievement and are working diligently at characterizing the developed coatings in terms of stability, durability and aging in view of their practical applications.

Professor Farzaneh and his team of researchers made the Québec Science magazine selection for one of the 10 most important discoveries of 2008.

Légende photo :Professor Masoud Farzaneh and the CIGELE researchers who developed a new material destined to become a shield against icing.

