

Wind power

Icing wind tunnel

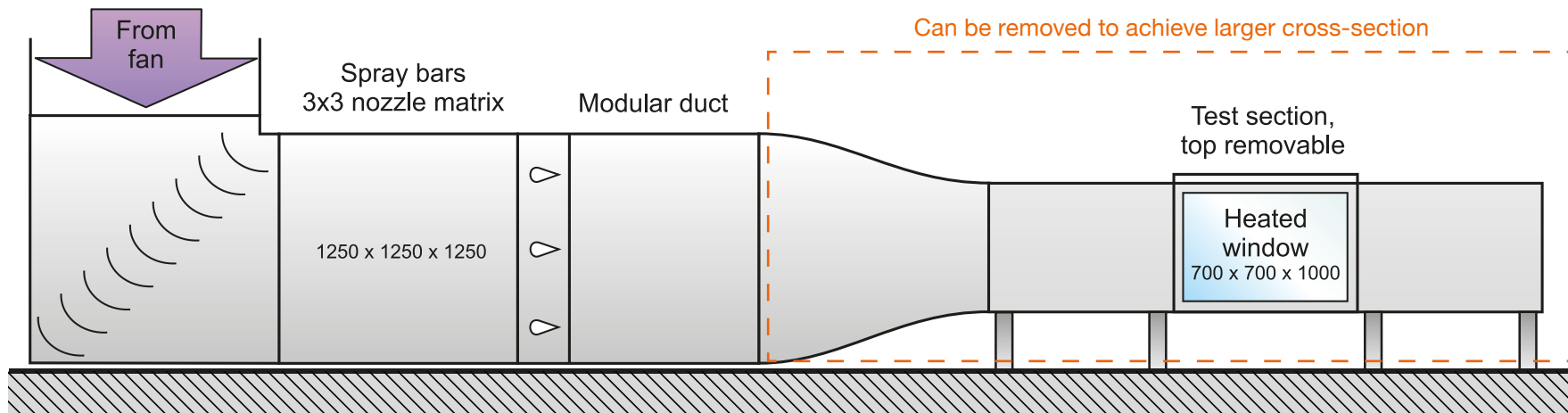
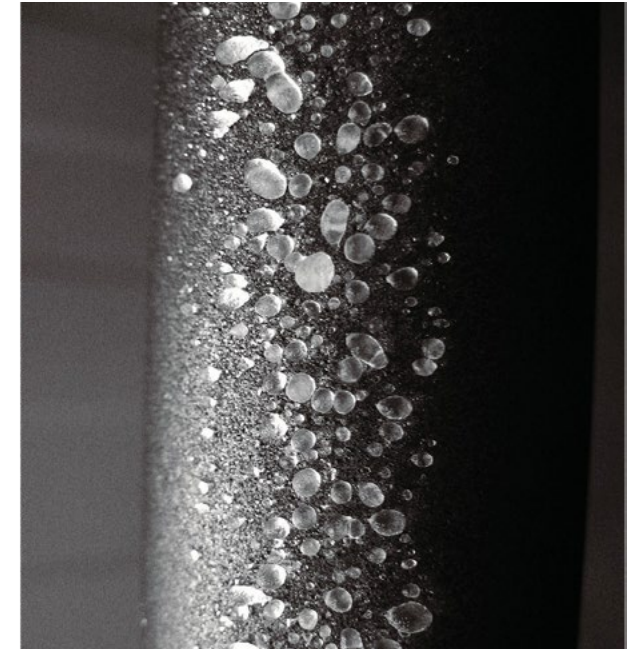
beyond the obvious

Icing wind tunnel

VTT icing wind tunnel serves testing and verification of products and concepts. Wide variety of validated operating conditions including in-cloud icing and freezing rain can be selected according to customer needs. The tunnel is located inside a temperature-controlled room which allows easy handling of test specimen. The combination of low running costs and high competence of personnel make this facility a unique possibility for trying out new ideas, functionality of prototypes, design optimisation, and verification of products in controlled environment.

Examples of tests

- Drones and drone components
- Aerodynamic profiles
- Coatings
- Anti- & De-icing systems
- Ice detectors
- Wind sensors
- Air intake screens and droplet separators



Property	Range in the facility	VTT's Reference conditions	
		In-cloud icing, stationary components	In-cloud icing, wind turbine rotor blades
Temperature [°C]	-25...+30	-5	-5
Wind speed [m/s] 1	0...50	7	40
Water content, LWC [g/m ³]	0,1...1,0	0,2	0,2
Droplet size, MVD [μm] 2	12...30	16...17	16...17
Turbulence intensity, TI [%] longitudinal component		1,3	0,6
Rain intensity [mm/h]	1...6	MIL-STD-810G	

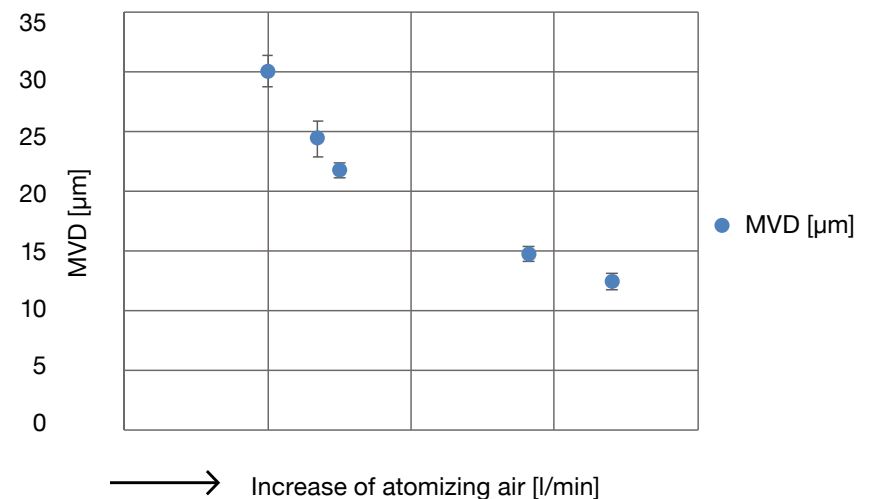
Droplet size (MVD) has been validated 05-08/2018 by Finnish Meteorological Institute (FMI), University of Oulu and Technical University of Denmark (DTU). Operational conditions in the icing wind tunnel are calibrated with the method which is described in the ISO 12494 international standard "Atmospheric icing of structures".

- 1) Wind speed up to 20 m/s can be achieved continuously. Wind speed between 20 – 50 m/s can be achieved for shorter periods and has to be assessed case by case.
- 2) Icing wind tunnel can be operated in typical or severe icing conditions and droplet size level can be tuned according to customer requirements.

Anemometer in test



Validated droplet size regime in the icing wind tunnel test section



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