

FrostBoss®

Findings from a Computational Fluid Dynamics (CFD) study and report by Sequence Computational Engineering Ltd.

Computational Fluid Dynamics Study

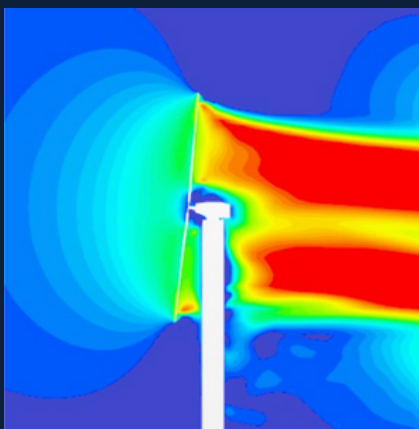
SUMMARY

This independent Computational Fluid Dynamics (CFD) study by Sequence Computational Engineering Ltd highlights the airflow velocity generated by three different frost fans. CFD modelling was completed on three frost fan geometries; the FrostBoss® C49 (4-blade) and their leading competitor 3-blade and 2-blade frost fans at the respective operating speeds.

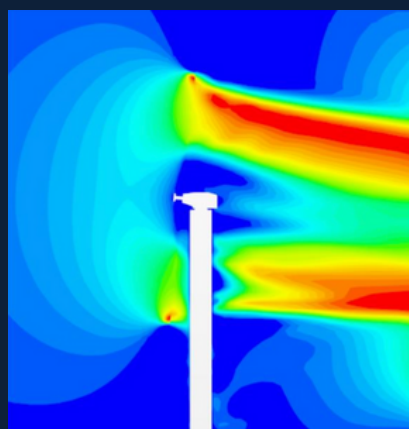
The findings of the study reveal that the FrostBoss® C49 fan generates similar, but much more uniform airflow, giving greater penetration capability into the katabatic drift. Whilst operating at a 440rpm lower engine speed than competitor fans, the FrostBoss® C49 fan ensures the most balanced distribution throughout the blade span.

Computational Fluid Dynamics (CFD) diagram showing the longitudinal wind speed comparison between a FrostBoss C49 (4-blade) and a conventional 2-blade fan.

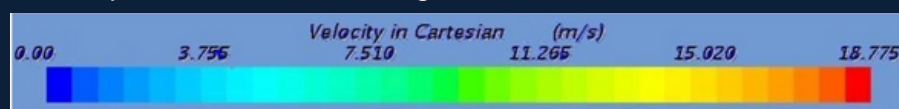
Frost Boss C49 (4-blade) fan
turning at 418 rpm



Conventional 2-blade fan
turning at 550 rpm



Wind speed scale in the longitudinal direction of the fan blast

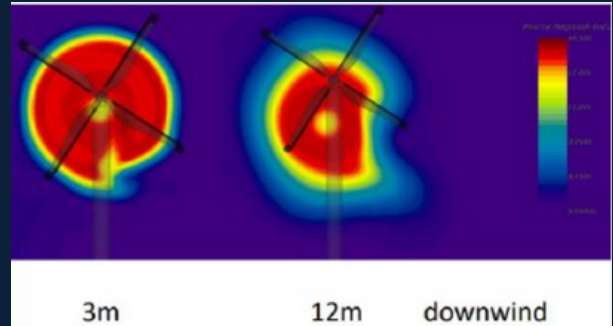
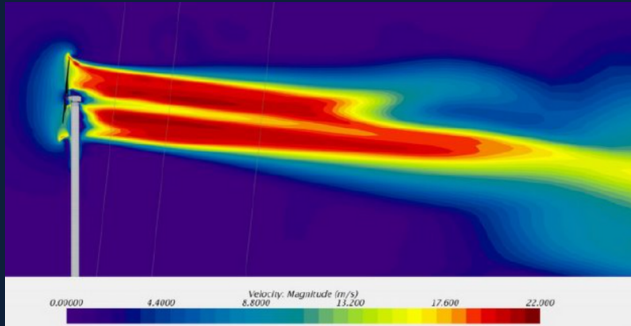


Quality of Air Mix Generated by 4 vs 3 vs 2 Blade Frost Fans

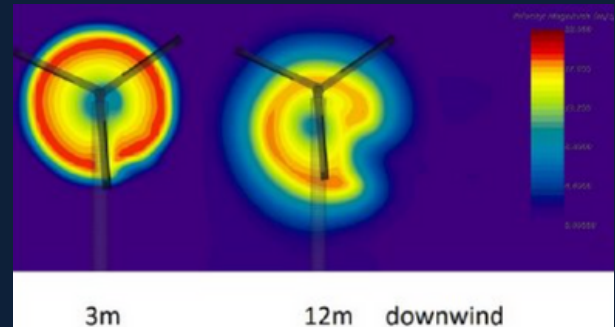
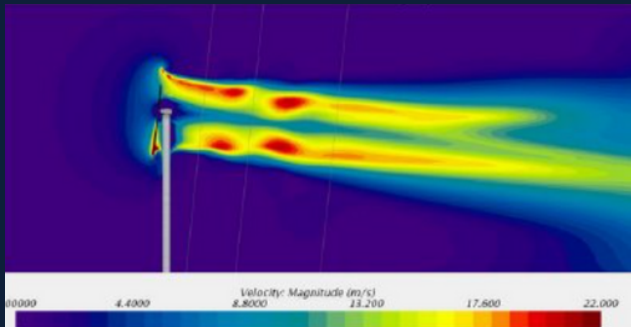
Horizontal Velocity Profile

Cross section of the flow field

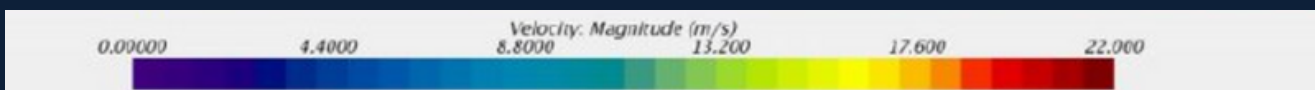
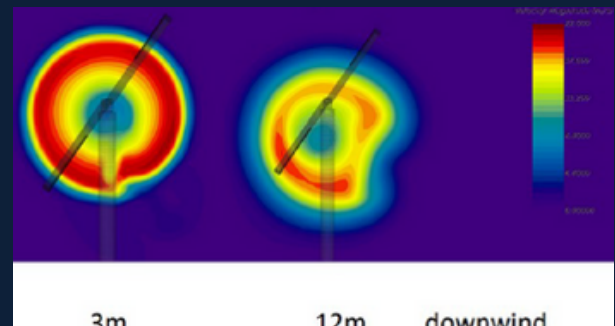
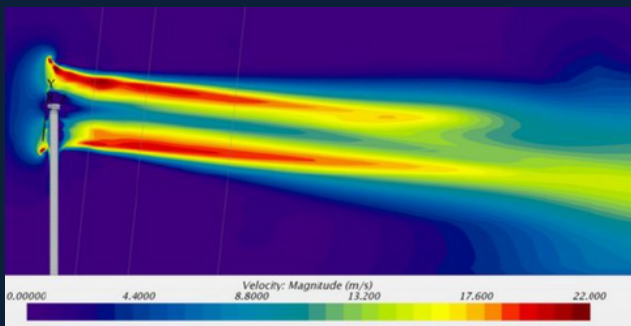
FrostBoss® C49 fan at 1760 rpm



Competitor Lineal shaped 3 blade at 2200 rpm



Competitor Lineal shaped 2 blade at 2200 rpm





Findings

The Horizontal Velocity Profile Maps reveal that the FrostBoss® C49 Frost Fan produces similar, but much more uniform airflow, giving greater penetration capability into the katabatic drift, while running at an engine speed 440rpm lower than competitor models.

The Cross-Section Flow Field diagram showcases how the advanced design of FrostBoss® composite blades ensures even airflow distribution and maximum coverage. Each section of the C49 blade is meticulously engineered with the ideal aerodynamic pitch from root to tip, creating consistent wind speed across the entire blade. This reduces turbulent mixing at the centre, forming a uniform airflow tube where all energy is focused on wind speed rather than turbulence, delivering superior efficiency and performance.

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DISCLAIMER: Data sources includes manufacturer's published data, independent acoustic reports and CFD modelling conducted by Matrix Applied Computing Ltd and reported by Sequence Computational Engineering Ltd.

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