

Not a fan, not a lance ...

“... a Bächler!”

Almost all snow machine manufacturers now offer a wide range of energy-intensive, electric fan machines and compact, water/air snow lances using compressed air. Not so at Bächler Top Track: the Swiss firm has consistently focussed on its NESSy and SnoTek technologies, seeking to differentiate its products from standard solutions by means of a deliberate, results-oriented approach.

Looking back, the very first snow-making system from Bächler Top Track, VANESSA launched in 2000, set the course that the Swiss company with head office in Emmenbrücke near Lucerne has continued to follow to this day. “We were already genuine pioneers back then with regards to variability,” explains Mario Koch, who runs the company alongside his father Bruno Koch and Claus Dangel. “We presented a modular snow head in cooperation with our Swiss nozzle partner. We were able to adapt the nozzle mounting and positioning precisely to the local conditions, depending on snow quality and the start of snowmaking.”

Understanding the snow

Bächler Top Track has been optimising its technologies since 2004, working closely with scientists from the University of Applied Sciences and Arts Northwestern Switzerland (FHNW) and the Institute for Snow

and Avalanche Research in Davos (SLF). “It’s all pure physics, and if you’re getting nature to work for you, you have to understand how it works”, says Mario Koch, commenting on the collaboration with fluid and thermo engineers and snow experts, who concentrated on the details of the “hot” phases in the snowmaking process – ice nuclei forming and solidification. They studied where and when the so-called ice nuclei from the compressed air/water nucleator nozzles have to come into contact with the droplets from the water nozzles. When drop shape and size, time and position are optimal for this “inoculation” – based on the findings – high-quality machine-made snow forms during the solidification phase in the approx. 10-second flight.

According to Bächler, the focus was not just on temperature-critical issues relating to how snowmaking could start earlier or achieve multi-stage full power quickly. Factors relating to equipment and, thus, of

economic significance, were also taken into account using theoretical modelling, wind tunnel tests and 1:1 field tests. This included process air with reduced air volumes and water atomization via spray nozzles without compressed air, in which flow rate was optimised for high snow volume across all temperature ranges.

From theory to practice

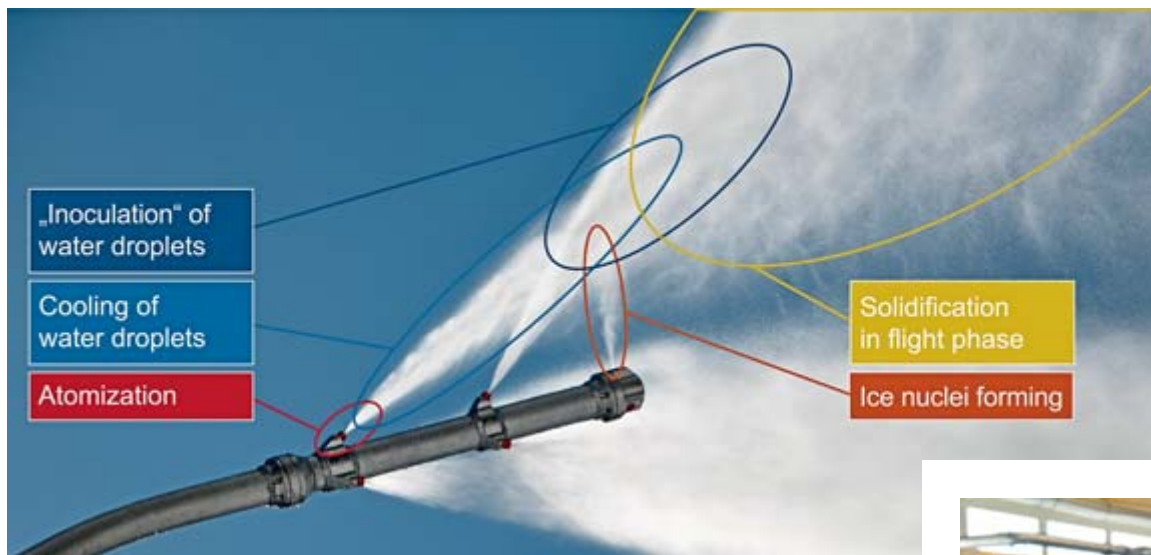
The scientific findings were implemented for the first time in the multi-award winning NESSy technology (“New Energy-efficient Snowmaking System), which Bächler Top Track launched as an alternative to conventional snow lances and energy-intensive fan machines in 2008. According to the manufacturer, the elongated one and multi-stage NESSy snow heads at that time required up to 80 % less compressed air and were much quieter than the water/air solutions offered by the competition. Regarding snowmaking at marginal temperatures,



With snow production of up to 120 m³ per hour, the Bächler double-headed lance SnoTek MEDUSA sets standards in economical snowmaking.



The energy-efficient Bächler technology allows for an environmentally responsible first installation or economical retrofit of existing snowmaking infrastructures in all altitudes.



It's all pure physics: the positioning of the functional nozzles and working zones guarantees the efficiency of the characteristically elongated NESSy snow head.

the slender NESSy also performed on a par with heavy fan machines, which have an energy requirement up to 15 times higher.

NESSy only fell behind the fans in terms of wind susceptibility and throwing distance, which Bächler modified during the next stage of development in any case. Once again with the support of the Swiss university experts, the company combined the powerful and far-reaching V-jet principle with the efficient NESSy nucleators: The Bächler SnoTek premiered in 2011 and sprang to the top of the familiar performance categories with the introduction of the double-headed SnoTek MEDUSA, which as the "first bladeless fan" has flow rates up to 900 l/min and controlled throwing distances up to 35 metres.

The head makes the difference

Thanks to continuous development of patents and the modular orientation of product development, NESSy and SnoTek consolidated their unique technological position over the years according to Bächler. This claim is most evident with the multi-head variants MEDUSA and TRIDUSA. "Today we achieve 2 to 3 times the snow vol-

ume with the multi-head designs compared to the competition and with a comparable volume of air. This allows existing water/air infrastructures to be 'packed' with additional Bächler or upgraded locally with our multi-head solutions with an hourly production volume of up to 120 m³ of snow without costly investment", calculates Mario Koch.

The multi-head Bächler match the fan machines with corresponding snow volumes and clearly outperform them at marginal temperatures, which also applies to other supposedly low-pressure forces according to Mario Koch: "Our NESSy and SnoTek produce snow reliably from -1.5 °C FK, which means they're also suitable as a standard solution for valley locations. With its powerful throw, SnoTek is an economical alternative for wind-exposed areas or a practical solution for tight trails or tracks in the 'Track' version".

The Bächler range currently includes nine different models with various equipment levels, including the NESSy ZeroE, a powerful, multi-stage solution without a compressed air supply and e-connection, as well as the compact indoor Bächler LiMES



As COO Mario Koch is responsible for Bächler's production in Emmenbrücke near Lucerne.

for efficient and economical snowmaking in ski domes. "These models show how we are continuously developing our own technology and consistently implementing our physical findings relating to snowmaking", declares Mario Koch. Bächler claims the solidification phase has been optimised for LiMES so that the ambient air within the ski dome barely increases in temperature even during extended periods of snowmaking.

A class of its own?

"Fan, lance or Bächler?: this almost 'categorical' distinction is now the norm on our customer projects, as the necessary technical requirements for first installations, conversions or retrofits are too different". Bächler Top Track will also be discussing this with international visitors at the forthcoming INTERALPIN (Hall B.O – Stand: B036): is a new category needed within standard snowmaking technologies? tb

Reduced to the essentials, the Bächler LiMES was launched in 2018 as a compact and economically efficient solution for indoor snowmaking.

Photos: Bächler Top Track

