

Comparing a Bucceri Snowfall Modular System to a Techno-Alpin Container Snow Factory Machine and similar technologies.

What is a Techno-Alpin Snow Factory?

The Techno-Alpin Snow Factory machine is currently the most popular plus temperature snow making systems system used by ski resorts in Europe.

The Techno-Alpin Snow Factory is a type of snowmaking system that is designed to produce snow in temperatures that would otherwise be too warm for traditional snowmaking methods. It uses ice making machines to create snow by cooling water to make ice flakes in a containerized snowmaking plant that makes the same quantity of ice daily in all temperatures.

It is questionable if you can call the product produced “snow” being more like “crushed ice”. This snow can be used to supplement natural snowfall or to provide a base layer of snow for ski slopes, cross-country tracks, and other winter sports areas.

The Snow Factory can operate in temperatures up to around 15°C (59°F), making it a valuable tool for ski resorts that are in warmer climates or are experiencing milder winters due to climate change. It can also be used to provide snow for events and competitions that require a specific amount of snow on the ground.

The Techno-Alpin Snow Factory is just one of several snowmaking technologies available on the market, but it has gained popularity in recent years due to its ability to produce snow in a wider range of temperatures and conditions than traditional snowmaking methods.





The Patented Buccheri Snowfall technology is new and patented.

A Modular 50-ton Buccheri Snowfall system consists of 10 individual Buccheri Snowfall Units and grouped together or operated separately can produce 125 cubic meters of snow per day when the temperature is 5 degrees Celsius or above **and up to 2000 cubic metres of snow per day in sub-freezing temperatures.**

The Buccheri machines can make snow in any temperature up to 30 degrees Celsius and at 5 degrees Celsius requires an energy cost of 40 kW/hr per cubic meter of snow produced.

Its snow multiplication technology allows for higher production rates in temperatures below 5 degrees Celsius.

The snow multiplication rate can increase the capacity to over 2000 cubic metres of snow daily in sub freezing temperatures.

Another big advantage of this system is that it is more mobile than competing systems, which could make it more suitable for certain applications or locations where mobility is important.



To compare the Bucci Modular 50-ton snowmaking system to the Techno-Alpin Snow factory 50-ton machine, we had to consider several factors, including their capacity, energy consumption, and other features.

In terms of capacity, both the Bucci and Techno-Alpin machines have a capacity of 50 tons per day in plus temperatures above 5 degrees Celsius.

However, the Bucci machine's unique snow multiplication technology allows for higher production rates when temperatures and conditions are below this temperature, as will be seen in results from recent testing that follow.

In terms of energy consumption, the Bucci machine requires 40kW/hr. per cubic meter of snow produced at a temperature of 5 degrees Celsius, while the Techno-Alpin Snow factory 50 requires approximately 65kW/hr. per cubic meter of snow produced, according to the manufacturer's specifications.

The Techno-Alpin Snow factory 50 is that it is a fully automated, self-contained containerized system that operates normally in a static location to produce snow continuously, even in relatively warm temperatures.

On the other hand, the Bucci Modular 50-ton snowmaking system is designed to be more mobile and flexible, with a modular design that allows it to be operated in one location or be easily transported and used in a variety of locations.

Its snow multiplication technology allows for much greater production rates in temperatures below 5 degrees Celsius.



A Bucci Snowfall Hybrid machine being operated next to a Snow Factory at Mt Buller Ski Resort Australia.

Why is a comparison important?

It is important because climate change is causing a need for snow making machines that can produce snow at higher temperatures.

Traditional snow making machines are becoming less effective due to a decrease in the number of hours available for operation, and warmer temperatures are becoming more common.

When choosing snow making equipment, the most important consideration should be the ability to produce high quantities of snow in temperatures ranging from +5 to -2 degrees Celsius.

Ski resorts often prioritize making man-made snow during the early season and during periods of warm or dry weather when natural snowfall is insufficient.

This is especially important in regions where natural snowfall is unreliable, as it allows resorts to open on schedule and provide a consistent skiing experience for their guests.

In addition, ski resorts may use snow making to supplement natural snowfall during warm or dry weather periods, in order to extend their skiing season and provide better skiing conditions for their guests.

Assessment Criteria for evaluation:

When comparing two snow making systems, there are several key factors to consider. Here are some suggestions on how to best compare the two systems:

Snow quality: Consider the quality of snow produced by each system, including its consistency, density, and ability to hold up under different weather conditions. You may want to observe the snow being produced by each system and test it out on the slopes.

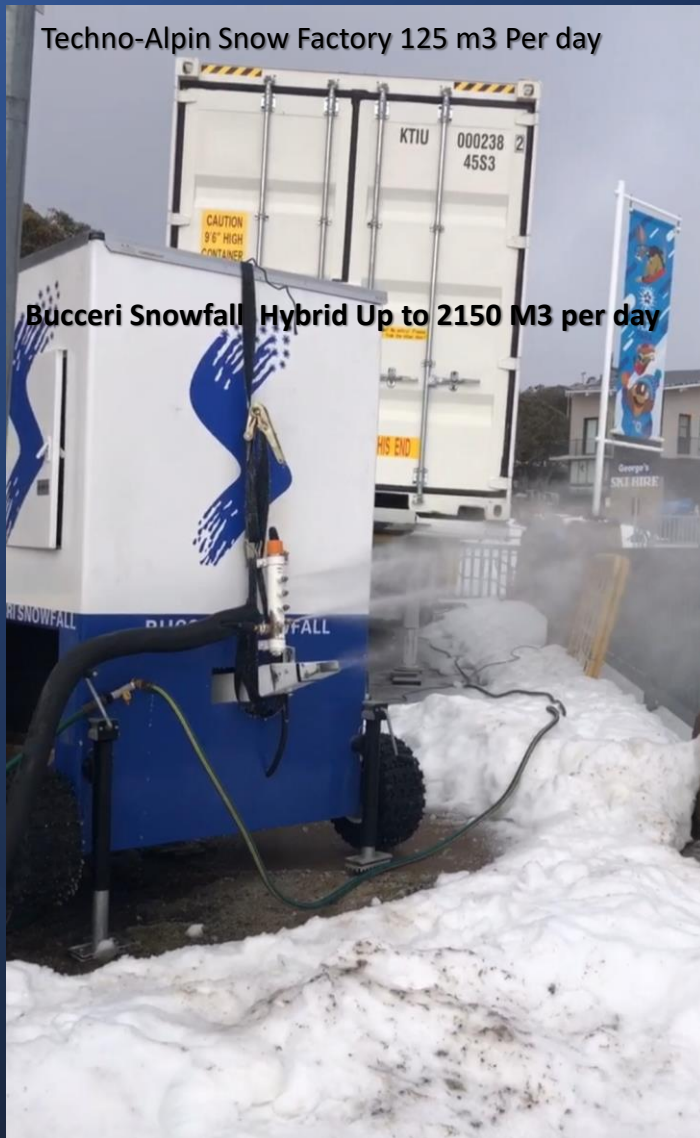
Snow production capacity: Compare the snow production capacity of each system, including how much snow it can produce in each amount of time, and how quickly it can cover a given area of the ski resort.

Energy efficiency: Compare the energy efficiency of each system, including the amount of energy required to produce a given amount of snow, as well as any energy-saving features or technologies that may be included in the system.

Ease of use and maintenance: Consider the ease of use and maintenance of each system, including the training required to operate the system, the level of maintenance and upkeep required, and the availability of spare parts and technical support.

Cost: Compare the cost of each system, including the upfront cost of purchasing and installing the system, as well as any ongoing costs such as energy and water usage, maintenance, and repairs.

By considering these factors, you can compare the two snow making systems and determine which one is best suited for your specific needs and requirements.





BETWEEN THE THREES!

WHERE THE BUCCERI SNOWFALL HYBRID THRIVES!

As a general guideline, in regions with milder climates and shorter winter seasons, the number of hours with temperatures between -3 and +3 degrees Celsius will be higher, especially during the transition periods between winter and spring or fall and winter.

In these areas, ski resorts will rely more heavily on snowmaking to supplement natural snowfall and maintain skiing conditions.

The number of hours each year that the temperature would be between -3 degrees Celsius and +3 degrees Celsius at a ski resort will depend on the specific location and climate of the resort.

These temperature conditions commonly occur for long periods before the lower temperatures required for conventional snow making arrive.

These temperature conditions are also common for long periods during the day even when the colder temperatures occur normally for short periods at night or early morning.

Comparison of Snow Production Capacity at 0 degrees Celsius

Additional information about the testing of the Bucceri Snowfall system at the Soldier Hollow Nordic Ski Centre, a location that has hosted the Winter Olympics.

According to the results of the testing, at 0 degrees Celsius with a Bucceri small nozzle in use, the system will produce 15 cubic meters of snow per hour or 360 cubic meters of snow per day with a power usage of 200 kW per hour.

This is 235 cubic metres per day more than the Techno-Alpin Snow factory system.

This equates to an energy usage of 13 kWh per cubic meter, which is 1/5 of the cost of the previously stated value of 65 kWh per cubic meter for the Snow factory system and is due to the patented multiplication process of the Bucceri Snowfall System.

It's important to note that these results were obtained under specific testing conditions, and the performance of the system may vary depending on the location, weather conditions, and other factors.



Comparison of Snow Production Capacity at -2 degrees Celsius

According to the results of the testing, at -2 degrees Celsius with a medium nozzle, the system can produce 6 times its nominal capacity, which equates to 750 cubic meters of snow per day with an energy cost of 200 kW per hour.

This is 625 cubic metres per day more than the Techno-Alpin Snow factory system.

This equates to an energy usage of 6.8 kWh per cubic meter of snow produced, which is around 1/10 of the cost of the previously stated value of 65 kWh per cubic meter for the Snow factory system and is due to the patented multiplication process of the Bucceri Snowfall System.

It's important to note that these results were obtained under specific testing conditions, and the performance of the system may vary depending on the location, weather conditions, and other factors.

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Comparison of Snow Production Capacity at -7 degrees Celsius

According to the results of the testing, at -7 degrees Celsius with a medium nozzle, the system can produce 17 times its nominal capacity, which equates to 2160 cubic meters of snow per day with an energy cost of 200 kW per hour.

This is 2035 cubic metres per day more than the Techno-Alpin Snow factory system.

This equates to an energy usage of 4 kWh per cubic meter of snow produced, which is around 1/16 of the cost of the previously stated value of 65 kWh per cubic meter for the Snow factory system and is due to the patented multiplication process of the Bucciari Snowfall System.

It's important to note that these results were obtained under specific testing conditions, and the performance of the system may vary depending on the location, weather conditions, and other factors.



THE CONCLUSION



The Bucceri Snowfall system can produce more snow under a range of operating conditions and nozzle combinations than any plus temperature snow making system in the world today.

Up to 20 times the capacity in sub-freezing temperature conditions.

The ability to create and distribute ice nuclei at high pressure to mix with water particles and facilitate freezing at low temperatures is a unique and important feature of the Patented Bucceri Snowfall Hybrid system.

The maximum capacity of a 50-ton Bucceri machine can be further increased beyond 2000 cubic metre per day by utilizing advanced multiplication with snow production rates far exceeding those achieved in the recent test results.

The Bucceri Snowfall system in terms of snow production costs at low temperature compares favorably to conventional snow making systems like fan gun systems .

The test results from the Lech tests in 2009 found that it was appropriate to begin snowmaking at temperatures of -5.5 degrees Celsius and below, and that the average energy cost for snowmaking was 4.3 kilowatt-hours per cubic meter of snow produced.

The test results at Utah showed similar production costs to those of some fan gubs highlighted in the Lech report.



**BUCCERI SNOWFALL
SNOW QUALITY - EXCELLENT
FINE PARTICLE SIZE**



**TECHNO-ALPIN SNOW FACTORY SNOW C
-MORE LIKE CRUSHED ICE**

COST BUCCERI Vs TECHNO-ALPIN SNOW FACTORY



A Basic 50 Ton Bucceri Snowfall Hybrid
Modular System similar price to a 50 Ton
Techno-Alpin Snow Factory machine!



SERVICEABILITY

The 2023 Utah tests were done at the Utah operation of Ice Castles* located at Soldier Hollow, Midway Utah.

In 2023, Ice Castles trialed different plus temperature snow making machines with the intention of a future purchase.

The operations manager is familiar with the her plus temperature machines on the market and the company rented a Snow Magic machine this past winter. The Snow Magic machine is similar in operation to a Techno-Alpin Snow Factory,

The Bucceri Snowfall Module was tested for a 4-week period between 17 January and February 14, 2023.

The operations manager was quoted as saying that “ **This was the best plus temperature snow making machine that he had ever seen and was impressed at how easy the Bucceri Snowfall is to maintain and service.**”

Ice Castles is a company that creates large, interactive structures made entirely out of ice. The company was founded in Utah in 2009 by Brent Christensen, who initially built an ice cave in his yard as a winter activity for his children.

Since then, Ice Castles has grown into a company that creates elaborate ice castles in several locations throughout the United States, including Colorado, Minnesota, New Hampshire, and Wisconsin. The ice castles typically feature tunnels, caves, slides, fountains, and other interactive elements, and are built using thousands of individual icicles that are sprayed with water and allowed to freeze into place.

Ice Castles structures are typically open to the public during the winter months, and visitors can explore the castles and participate in various activities, such as ice slides, ice-carving demonstrations, and fire performances. The ice castles are also used as a backdrop for photography and other events.

Ice Castles has received widespread media attention for its unique and innovative approach to winter entertainment, and the company has been featured in numerous television shows, movies, and news programs.