

ALU Star in Concrete:

SOLKAV also construct aluminium floors in concrete. The aluminium is anodised and put into concrete of the same quality as for steel piping systems. Due to the similar metal characteristics of Aluminium and steel the cold conductivity is the same; but the system is easier to install and therefore significantly cheaper.



Professional Ice:

Round speed skating tracks:

The system is also usable for Ice tracks with its rounding. The full aluminium Ice floor provides perfect Ice ready for all sport standards. You may use it indoor or outdoor; even in areas with high wind and/ or high temperature handicaps.



Ice Halls with NHL Ice quality:

The ALU Star system is due to cold conductivity of the full aluminium concept the only mobile system producing a homogenous Ice quality which is sufficient for Top class Ice Hockey.



Other options for Ice Floors:

Solkav manufacture various other Ice Floors

EPDM Floors: White EPDM Ice Floors: The EPDM technology is flexible to adapt to any Ice Rink design. The white upper surface reflects the sun and make the Ice production process easy.

SPORT SOLAR Floors: Solkav produce Ice Rinks since many years integrating the EPDM piping system into a Tartan floor to use the Floor in winter as an Ice Rink; and in summer as a sport surface. On top you may use the system im summer also as SOLARSYSTEM.



So you can expect a triple Use of your investment.

Distributor



SOLKAV GmbH • www.solkav.eu

SOLKAV - ALU STAR

Skating on professional Ice with minimum electrical requirement



SOLKAV

Experience & the Key



In 1983 SOLKAV installed the **first mobile Ice Rink in the world** in Retz, Austria. The Ice Rink was made of an EPDM Ice Floor. This system is still the industrial standard in mobile Ice Rinks.



Meanwhile Solkav developed additionally, using all its long-term experience a **modular aluminium Ice Floor system** which provides a continuous ALU piping without any connecting pieces of other low cold conductive materials (rubber, plastic, other). That grants **a minimum electrical consumption and a perfect homogenous Ice Rink** at the same time. The single Floor pieces are easy to stick together.



Tichelmann Piping (3 Pipe-system) is standard for perfect and homogenous Ice quality in the whole Ice Rink. The collecting pipes are supplied in DA 100 or DA 160. Therefore the maximum length of Ice fields is up to 100 meters length.



Modular System inclusive Rink Fence elements: The Rink Fence is an Add On module, easy to install and to integrate into the Ice field.



You get a complete Ice field

Set up >> Fill with water >> Leave >> Next day >> Ice

The ICE Quality specifications of the PCT nominated World Patent of Solkav are:

Sustaining Ice under difficult conditions:

Due to the ALU Star qualities SOLKAV can grant to sustain Ice under the following conditions:

Outside Temperatur	25°C	20°C	15°C	8°C
Wind speed	< 2 m/s < 7,6 km/h	< 6 m/s < 21,6 km/h	< 10 m/s < 36 km/h	< 25 m/s < 90 km/h
Solar radiation	< 1.000 Watt / m ²			

You can use ALU Star systems under outside area conditions also in sun belt areas like the Mediterranean Sea or the south of the US Mexico and so on. Of course under the assumption of a use of SOLKAV cooling technology or SOLKAV authorized cooling systems. All weather conditions have to last more than 3 hours to be dangerous to existing Ice.

Scope of Delivery:

Delivery scope of a complete Ice Floor, ready to assemble is:

Full continuous aluminium Ice Floor consisting of the following elements according to the defined Ice Rink size of xxx m² Ice Rink:

- consisting of three types of field elements:
 - ALU Fields of 1 x 5 m (with 20 Alu pipes per running meter)
 - 1 m long Headers with 3 pipe-system (DA 100 up to Ice Rink size of 1.200 m² or DA 160 (Ice Rinks size > 1.201 m²);
 - 1m long return pieces
- Fast assembler couplings to connect the 1m Header tubes
- 2 return pipes and Camlock connection valves for the Chiller piping
- Protection caps for the single collecting pipes
- Aluminium profiles 70 x 40 x 2 mm of 15,25 m length and a piece of 1 m length for pipe passing to keep the whole Ice field dense.
- White plastic foil and adhesive tape (for single use)
- Walk-able ALU cover on the collecting pipes
- Installation Tool Kit
- Do it yourself Repair Kit

ALU STAR Advantages

Minimum Electrical Consumption

Ice Field Comparison in electrical consumption and installed Cold capacity needed

Arsenal Research Austria (authorized test agency of Austria with European accreditation) compared all Ice Field systems used in the market were tested. The test conditions for the simulation on base of Infinite Elements standard were:

Outside temperature:	5 °C	Condensation temperature	28 °C
Ice Field temperature:	- 5 °C	Wind:	2,6 m/s on the Ice surface
Sun:	irrelevant because of reflexion	Ice Field length:	30 m
Liquid used	Ethylenglycol mix (40%)	Liquid flow:	80 L / m ^s
Ice Thickness:	60 mm	Ice Fields covered by concrete or sand:	50 mm

The electrical consumption of an Ice Rink and the installed cooling power depends on three factors:

- 1. Evaporation temperature:**
The evaporation temperature depends on the piping material and its cold conductivity. Each 1°C on the level of approx. - 10°C increase or decrease means for screw, piston or scroll compressors **4,25%** increase or decrease of electrical consumption per °C
- 2. Ice Field surface constancy (Watt / m^s)**
The Ice Field need to have on the upper surface a constant Ice quality. The material used and infill material (in case of Infloor piping systems) influence the Watt / m^s needed
- 3. Hydraulic power because of pressure loss**
The piping geometry influence the hydraulic power and therefore the electrical consumption of the circulation pumps. We assume in the model the use of CRM pumps with 50% efficiency.

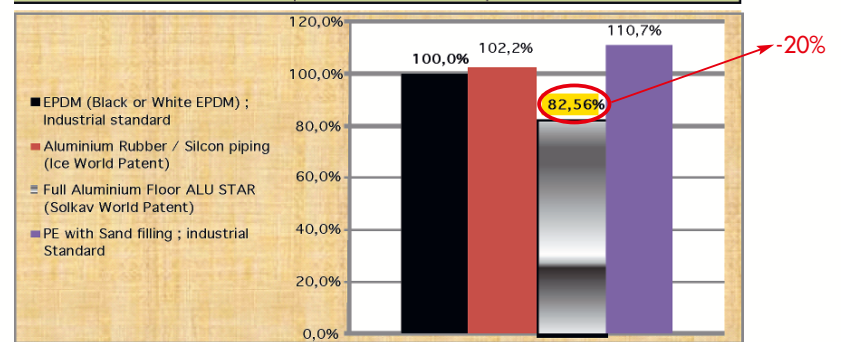
We define EPDM put on an existing underground as Reference base being 100%:

The simulation brought the following results:

Mobile Systems:

	T _{in}	? T _{in/K}	W/m ^s	? p/kPa	W/m ^s circ.
EPDM (Black or White EPDM)	-12,10 °C	0,00 °C	223	71	5,00
Aluminium Rubber / Silicon piping	-12,15 °C	-0,05 °C	236	9,7	2,50
Full Aluminium Floor	-10,63 °C	1,47 °C	218	2,9	2,17
PE with Sand filling	-14,53 °C	-2,43 °C	214	2,1	2,08

Ice Field Comparison in electrical consumption



Executive Conclusion:

SOLKAV ALU Star reduces the electrical consumption and the cooling power installed by approx. **- 18%** against EPDM (industrial standard) approx. **-20%** against Aluminium systems with Silicon/EPDM connection pipes and is the **best option by far** for minimum electrical consumption and withstanding Ice against Sun and Wind.