



# PERMANENT ICE RINKS FROM THE XPERTS



ICE SPORTS ARENA DESIGN  
ICE RINK TECHNOLOGY  
REFRIGERATION ENGINEERING



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## PROFESSIONAL ICE RINKS BY AST ... Complete solutions in variable design

AST is a worldwide operating group of companies with several subsidiaries and associated companies and a success story of more than 30 years in professional and leisure sports. The core ideology of these companies focuses primarily on the quality and continuous development of their businesses and their products. Knowing the market's demands and requirements is the basic prerequisite for sustained success in this niche market - but fulfilling them day after day with great perseverance and passion is the real credo to which AST is committed with its range of products and services to its customers.

### TECHNOLOGY FOLLOWS DEMAND

Which ice rink technology we ultimately recommend to our customers and which product best suits its future application depends on many and completely different factors. For this reason, we offer our customers an extensive range of differentiated ice rink solutions. In the eyes of our customers, these product variants, together with the high advisory competence of our employees, represent an added value that is worldwide appreciated and uncompromisingly to their advantage.

Whether it is a mobile, semi-mobile or stationary ice rink in year-round operation, or whether a multi-functionality has to be guaranteed at the location, our customers can be sure that thanks to our many years of experience, we have become very well acquainted with the requirements of the market and our ice rinks have therefore been optimised to meet these very different needs.

The AST ice rink products described here are based on a sophisticated and, above all, reliable system technology. Moreover, our ice rinks are not standard products: each individual ice rink project has its own unique character.

The ISO certification of our business processes also plays a key role in the quality of our products and is to the benefit of our customers.



AST Skate- and/or IceBox (mobile ice rinks based on EPDM)



AST Classic (semi-mobile ice rinks with shaft-assembly)

## THE AST ICE RINK MANUFACTORY

All components of an AST ice rink - no matter what type are developed, designed, manufactured and subsequently pre-assembled at our production site in Höfen (Austria) into ready-to-assemble units by AST engineers for optimized ice rink operation.

AST also selects and integrates the optimum chiller/refrigerant technology and the appropriate ice resurfacing machines.

In this way, we create the conditions for the most efficient and time-optimised installation of our fitters on the construction sites.

## SCOPE OF SERVICES

The complete package of a professional AST ice rink includes besides the classic „ice rink hardware“ a number of additional components and services:

- personal and competent on-site consultation
- Definition of on-site requirements (connections)
- Project Management (ONE contact person)
- Visualization of the ice rink project
- Refrigeration technology optimized for the size of the ice rink
- Connecting piping (ice rink/chiller)
- Ice rink technology (EPDM/IcePhalt/Concrete)
- Dasher boards (professionals/amateurs/leisure time)
- Ice-Resurfacing machine (as required)
- Accessories (hockey goals, net protection, etc.)
- Transport of the whole ice rink equipment
- Installation by trained AST assembling teams
- Commissioning of the ice rink system
- Briefing of the ice rink operator, ice master
- Remote maintenance setup (optional)

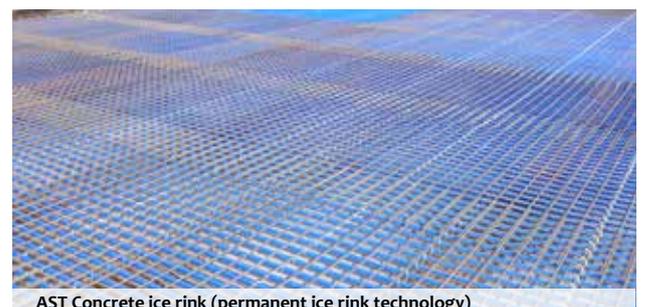


**„It was imperative for us to have an ice rink system that performed reliably and met the strict requirements of the International Ice Hockey Federation. With AST as supplying partner we were able to satisfy every expectation. Thus, we strongly recommend AST’s services, as they are a professional, reliable and precise company. “**

Enver Hansen (CEO IIHF 2018 Denmark)



AST IcePhalt (permanent ice rink technology - multifunctional)



AST Concrete ice rink (permanent ice rink technology)

## EPDM ICE RINKS

### The efficient Ice Mat System

#### AST Ice Mats

The AST EPDM mats are rolled out side by side to one surface. An environmentally friendly antifreeze/water mixture is cooled down by a refrigerating machine and pumped through the ice mats.

We use this very reliable technology not only for mobile and partially mobile ice rinks, but above all also for ice hall renovation projects where an aging concrete slab has to be renewed. This alternative is not only much more cost-efficient in its implementation, it can also be realized in shortest time.



The EPDM pipes can be covered with various sports surfaces during permanent installation. This protects the pipes and allows the surface to be used without ice. AST supplies solutions with artificial grass, tartan or a fixed quartz coating.



#### Advantages

The narrow tube layout of the AST ice mats enables an energy-transferring surface of 2 m<sup>2</sup> per m<sup>2</sup> of ice surface. This results in a uniform cold field and a homogeneous ice surface.

Due to the low overall construction of the AST ice rink, less water is required = energy saving. And by an optimal dimensioning of the chiller we keep the connection values low.

The AST ice rinks are configured according to the Tichelmann system. This guarantees optimum flow through

all ice mats and uniform cooling of the entire ice surface. Due to their flexibility, the ice mats adapt perfectly to their substructure. Thus, „Adventure ice paths with gradients, inclines and curves can be uncompromisingly integrated.



## Applications

This ice rink solution, which has been tried and tested for decades and is permanently optimised, is primarily used for all ice rinks that are operated during the winter months at designated locations. During the ice-free period, the ice or SkateWay boxes with their pre-installed ice mats can be stored in a space-saving way (as they can be stacked).

For permanent installations, a wide range of solutions can be offered for collector pipe installation: installed on the floor, in an on-ground or underground channel, on a wall or on the dasher board.

The AST EPDM ice rinks are also very popular for multi-functional sports facilities. In such cases, the AST EPDM classic ice rink is removed during ice rink operation, rolled up again during the summer months and stowed in a shaft provided for this purpose.

### AST IceBox

The AST IceBox consists of a stable, hot-dip galvanised steel construction with an aluminium cladding. The PE collector pipes are already integrated in the ice boxes. The collector pipes consist of flow and return pipes. The ice mats are permanently connected to them. For transport, the rolled up ice mats are stored on the ice boxes. Removable transport brackets allow easy stacking of the ice boxes for transport and storage.

The standard AST ice boxes at a glance:

Width	2,5m
Mat length	20m (ice surface/Icebox 50m <sup>2</sup> )
	30m (ice surface/Icebox 75m <sup>2</sup> )
	40m (ice surface/Icebox 100m <sup>2</sup> )

### AST SkateWay®

The AST SkateWay® system is a further development of the AST IceBox technology. The SkateWay® ice mats are clipped onto the so-called connection panels. This connection technology enables us to achieve the required flexibility in terms of width, length and shape of the ice rink. The width of the connection panels is selectable (0.5m / 1.0m or 2.5m) - the mat lengths of the AST SkateWays are also selectable (10 / 20 or 30m).



AST IceBox [Dimensions: 2500 x 1000 x 1145mm (L/B/H)]



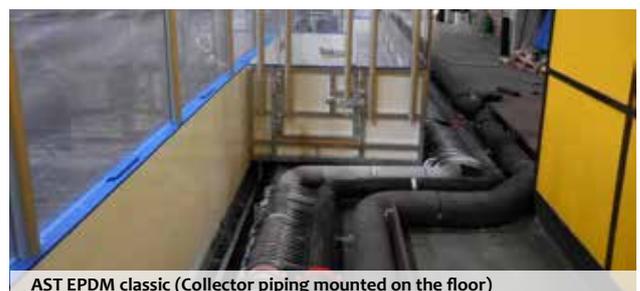
AST SkateBox [Dimensions: 2500 x 960 x 430mm (L/B/H)]



AST SkateWay ice mats [Dimensions: 2210 x 770 x 800mm (L/B/H)]



AST EPDM classic (Collector piping inside a channel)



AST EPDM classic (Collector piping mounted on the floor)



# ICEPHALT® ICE RINKS

## The patented AST Multi-functional ice rink

### Innovation in perfection

After the successful pioneering work in the segment of mobile EPDM ice rinks, made possible by the development of the ice and skate box, the AST IcePhalt® ice rink represents another highly innovative product on the ice rink market. This patented system solution is designed for permanent indoor and outdoor ice rinks.

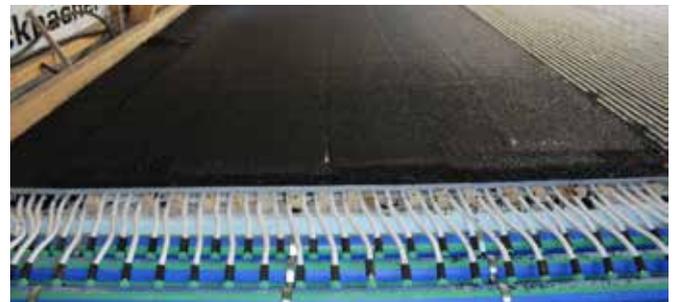
The cooling pipes are embedded in an asphalt base layer and then covered with a special asphalt. In this way, the elastic properties of the asphalt can be exploited and the formation of cracks prevented, even at high temperature differences. The AST IcePhalt® ice rink is based on a very clever and uncomplicated construction process, which significantly shortens the construction time and thus reduces costs.



## Advantages

- ◆ uncomplicated substructure construction
- ◆ a flexible shaping of the ice rink becomes possible
- ◆ the individual special asphalt layers are installed in a time efficient manner
- ◆ the robust and resistant asphalt area allows double usage (an ice rink in winter / a sports and event area in summer)
- ◆ suitable for the application of various sports surfaces
- ◆ a solar use of the asphalt surface becomes possible (for outdoor installations)

In case of dual use of the system, we recommend the construction of a foundation to which the board system is bolted during ice rink operation. If the IcePhalt® ice rink is used as a permanently cooled ice rink, we recommend the installation of an underfloor heating system.



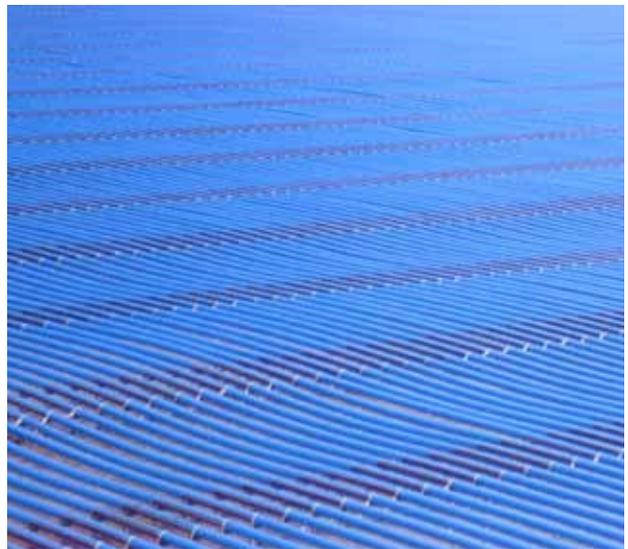
## CONCRETE ICE RINKS

### The traditional & proven permanent ice rink

#### Cemented durability

As the market leader in ice rink technology, AST also offers tailor-made solutions for concrete slabs. AST builds on the many years of experience gained from numerous ice rink projects and manufactures concrete cold plates for all types of ice sports. Depending on its application and the environmental conditions, each system is individually adapted to the customer's needs.

Our specialist fitters install the cold piping and prepare the construction for concrete casting. The concrete required for this is sourced from a supplier close to the project site. In order to ensure that all specifications and recommendations are taken into account, the pouring of the concrete is always monitored by a site manager appointed by us. Through this procedure we ensure the high AST quality standards of your concrete ice slab.



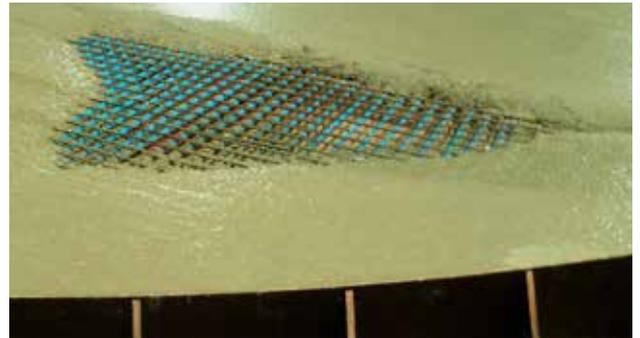
## CONSTRUCTION METHOD

- ◆ Foundation
- ◆ Permafrost heating
- ◆ Substructure
- ◆ Isolation
- ◆ Armouring
- ◆ Cooling pipes made of:
  - PE pipes
  - Alu-composite pipes
  - Steel
  - Copper
- ◆ Quality-concrete casting

## Advantages

- ◆ suitable for NH<sub>3</sub> or CO<sub>2</sub> direct evaporator operation
- ◆ but also recommended for brine operation
- ◆ Overall construction consisting of environmentally friendly and proven building materials
- ◆ the cooling plate has a high load capacity
- ◆ the overall engineering of all ice rink components (refrigeration piping, cooling technology, dasher boards, etc.) is supervised by AST ice rink experts
- ◆ Cost certainty in implementation

We also use our experience from numerous ice rink projects to implement these concreted cold plates for ice rinks of all types of ice sports. In cooperation with local construction companies this ice rink technology will be realized worldwide.



# REFRIGERATION ENGINEERING

## Cooling supply - individually & optimized

### Coolness with measure and goal

The different ice rink sizes, their intended use, but also the geographical conditions of our ice rink projects require on the one hand a very high degree of refrigeration know-how and on the other hand a correspondingly diverse product and solution flexibility.

The refrigeration machine concept is selected considering cost- and energy effectiveness, suitable operation concept and last but not least we endeavour to make use of environmentally friendly refrigerants with lowest possible GWP (global warming potential).

Our refrigeration system solutions are divided into three main categories so that we can offer our customers refrigeration technology that is optimal for their needs and conserves resources:

- ◆ Air-cooled chillers in compact-design
- ◆ Air-cooled chillers in split-design
- ◆ Liquid-cooled chillers

For the production of the cooling energy required for the ice rink, AST relies on both proven systems and the latest technology to meet the requirements of the European standard EN378 and the F-Gas Regulation for the protection of our environment.

When cooling, large amounts of heat are generated as „waste“ - this waste heat will be used if possible. AST plans heat recovery on a project-by-project basis with a ... where possible and reasonable.



## AST DASHER BOARD TECHNOLOGY

### Ice Hockey / Inline Hockey / Barriers for Leisure ice rinks

#### Variety of solutions through and through

The range of the ice sports disciplines and the resulting specific requirements to the board suppliers are meanwhile very diverse and ultimately also the reason why the AST product and service spectrum is based on variety, rule conformity and quality.

Regardless of whether it's a impact absorbing ice hockey board, an inline hockey board or a mobile ice field perimeter of a temporary ice landscape, AST offers the right product for every need and integrates into the complete rink design.

For more details and additional information on this AST product segment, we provide our customers with a specially developed catalogue.

Here is an overview of our board products:

#### PROFESSIONAL ICE HOCKEY



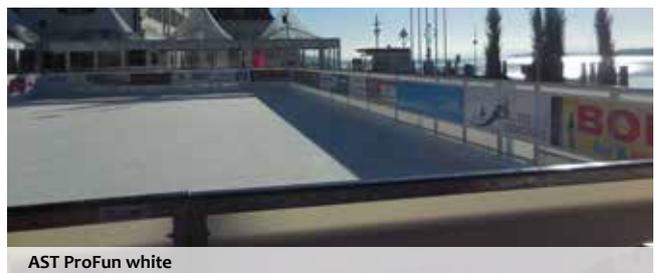
AST ProSport Dynamic & AST ProSport Customized

#### INLINE HOCKEY



AST ProSport Inline

#### FREIZEIT EISBAHNEN



AST ProFun white



AST ProFun clear



AST ProFun Alpine



AST ProFun Alpine flexible

## ICE RESURFACING

### Distribution of the traditional brands WM ice technics & Zamboni

#### Wellness for the ice

The quality of an ice rink - rather the condition of its surface - is decisively influenced by the ice resurfacing machine used to process it. On the one hand, as an ice rink operator you reduce the risk of injury on the ice with a professionally treated ice rink - on the other hand you influence the ice strength and thus the energy requirement of your ice rink with a permanent and correctly carried out ice maintenance.

We are familiar with the market requirements and therefore also know that we have to provide our customers with a suitable range of functionality and additional performance features to offer a product range of ice resurfacing machine covering all usage requirements related to the ice rink operation. In order to be able to reliably fulfil these requirements, you can rely on the serious advice of our sales specialists as well as on the advice and support of a specially established and highly qualified AST service team ... 365 days a year.

AST distributes, trains operators and services ice resurfacing machines of the traditional brands WM ice technics and for the Austrian market the model range of Zamboni. The ice resurfacing machines of these premium manufacturers are characterized by their high reliability, ease of maintenance and excellent ice resurfacing properties.

From WM you can choose between five models, whereby standardized planing widths from 1400 to 2300 mm are possible. In addition, different motorizations are available: Petrol, gas, diesel or electric.

For the Austrian market we offer you the complete model range of the manufacturer Zamboni, as already explained above. AST plans and supplies the needed infrastructure to ensure that all utilities for operation and maintenance needed for efficient operation have been considered.



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