Ice resurfacer

PRODUCT GUIDE



www.engo-ice.com







Resurfacing with Engo Innovation and user-safety is our priority

Engo has been developing and building ice resurfacing machines for 40 years. Since then we constantly improved and maximized the performance and ease of use of our machines.

Already in 1990, we reacted to the environmental changes offering emission-free electric machines. Besides innovation we also focus on user safety. In 1998 and 2002 Engo invented and patented two revolutionary maintenance systems which help to reduce the work effort as well as the risk of injuries.

All of our machine types can be equipped with numerous innovative, helpful features, making it a unique, individualized piece.

Certifications

All Engo products conform to the **CE marking**. CE (= Conformité Européenne) is a special certification that indicates conformity with health, safety, and environmental protection standards for products sold within the European Economic Area.

The Engo company is also **ISO certified.** To meet the ISO 9001:2015 standards, we evaluated all of our processes using detailed metrics, and we implemented a quality management system according to international standards.







ICE RESURFACER DASHER BOARDS

40 years of experience

Strong for the ice age

Engo is the reliable partner and supplier of high-quality ice arena equipment with 40 years of experience.

We develop and produce various models of electric ice resurfacers, and innovative, flexible dasher boards. The product range also covers a comprehensive range of arena accessories. Engo's products set standards in terms of usersafety, innovative technology, and particularly in user-friendly operating systems. Ice arenas worldwide, and international ice sports championships, right up to the Olympic Games put their trust in the quality of Engo products.









This graphic shows the most significant product characteristics exemplary for all product models of Engo ice resurfacers.



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- Robust, durable, and completely hot-dipped galvanized steel frame / chassis.
- 2 Solid axle units with integrated pendulum and power steering cylinder in the front axle.
- Hydraulic oil-immersed brakes with mechanical negative break on the rear axle.
- Durable **conditioner**, hot-dip galvanized, and powder-coated. Availalable with different blade sizes from 1.700 up to 2.500 mm.
- 5 **Blade** made from high-grade, tempered steel with an average service life of 45-60 hours. Maximum cutting depth of 25 mm.
- 6 Hydraulic side brush and optional ice edger that cut and sweep precisely along the dasher board.

Water tank made of PE-HD 500 (= high-density polyethylene) or stainless steel. Choice of different capacity sizes ranging from 500 L up to 2,000 L.

An integrated **electrical proportional control valve** that closes automatically when the maximum amount of water is reached.

Snow tank made of hot-painted steel with a capacity between 2.2 m³ and 5 m³. The bottom of the tank is covered by a PE-HD sheet to facilitate the snow discharge.

Inspection window allows the operator to observe the filling level inside the snow tank while driving the resurfacer. A spotlight integrated into the tank supports this process.

12 6

Powerful, electric and maintenance-free

A/C motors (Alternating Current Technology)

High capacity battery pack of a voltage of 80V, and a capacity of 360 Ah up to 1.320 Ah. Easily accessible for maintenance from outside by lifting the snow tank.

- Ergonomically sprung driver's seat with arm rest and safety belt, adjustable both horizontally and vertically, for a comfortable driving experience.
- Color touch screen display of different sizes from 4.3-inch up to 10.4-inch; to monitor and adjust the most important functions.
- Hydraulic levers or joystick to operate the most important work steps during the ice resurfacing process.
- **Foot pedals** for brake, and step-less speed control up to max 13 km/h.



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Drive system

Zero emissions for clean ice and air

Most Engo ice resurfacers are based on electric, four-wheel drive with power steering.

- Sustainable and low in consumption
- 0% emissions combined with 100% driving pleasure
- No toxic gases
- High performance: 1.940 Nm
- Clean air for maximum safety in enclosed arenas
- Saves money and energy



Equipment highlights

Each Engo ice resurfacer model includes a number of standard equipment features, and offers a range of functional, innovative options.

1 Fast blade change system

Invented and patented by Engo

Designed to change the blade in a quick, safe and easy way:

- Based on a mechanical lever mechanism
- No need to remove any screws
- It requires 2 minutes and only one person
- No need to touch the blade directly
- Proven for over 20 years and constantly improved
- Increases safety and reduces the risk of hand or finger injuries

The standard equipment includes all tools required for this operation.





2 Auger washout system

Invented and patented by Engo

This auger wash system makes the washing process as safe and convenient as possible:

- The operator can start the process simply by pulling a lever located on the conditioner
- The system flushes out snow and ice from the augers
- The operator does not need to open any of the bodywork covers, or lift the snow tank

3 Ice Boost

Snow breaker for augers



The **Ice Boost** for augers can be activated through a button in the driver's cockpit.

- It accelerates the RPM (Revolution per minute) of the augers to remove disruptive ice or snow
- It can be activated on ice during the resurfacing process
- It prevents the augers from blocking

4 Battery charger

The microprocessor-controlled battery charger "Selectiva" by Fronius (80V/400V) is part of the standard equipment. It measures the voltage automatically before the beginning of the loading process to ensure the optimum performance curve. It also allows to see the history of the charging curves.







Equipment highlights



5 Full Auto System Start

STANDARD for IceWolf PRO, IceTiger and IceLion

The Full Auto System Start facilitates the operation of the machine for drivers, saving time and minimizing complexity. It allows the driver to concentrate on the driving lane, and the operation of the ice edger and side brush.

The system automatically starts the operating steps in a pre-defined order:

- Lowering the conditioner and wiping cloth
- Activating the augers and the water discharge
- Bringing the blade into the desired position
- Switching on the entire lighting system
- · Activating optional equipment, such as the ice washing or the Solid Ice system

6 TWS STANDARD for IceWolf PRO

(Tank Wash System)

saving money and time.

The TWS is a quick, and very efficient way of washing out the snow tank using a pipe that is installed in the tank's interior.

7 Ice edger OPTIONAL

The ice edger is mounted next to the board brush, between the two axles. Together they cut, sweep and plane the ice surface along the dasher board in one turn -



8 Solid Ice OPTIONAL

Welcome to the new age of ice making

The high-end, state-of-the-art water spraying system distributes the water on the ice using nozzles, instead of the traditional wiping cloth.

HOW IT WORKS:

The advanced spraying system sprays pressurized water onto the ice. Up to 44 nozzles convert water into fine droplets. This smooth, consistent water application freezes quickly.

ADVANTAGES:

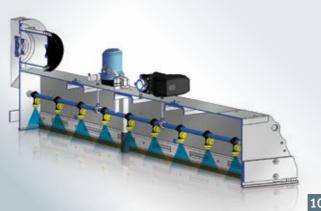
- Consistent water application
- Time-saving: The sprayed water freezes quickly in contact with the ice
- Energy cost-saving, because less energy for the refrigeration system is needed
- Reduces the development of dangerous ruts
- Reduces overlapping ice layers
- Athletes will notice the extra smooth and clear ice surface
- Better visibility of sponsor advertisements





Equipment highlights









9 LLS OPTIONAL

(Laser Levelling System)

The **LLS** provides an even, consistent ice surface by adjusting the cutting depth automatically. The driver defines the ideal reference point on the ice surface.

The transmitter sends a laser signal to the receiver which is based on the machine. The system automatically adjusts the blade position based on the difference between the reference point and the variable ice conditions.

10 IWS OPTIONAL

(High-Pressure Ice Washing System)

With the IWS the scores on the ice are cleaned precisely, and traces of snow abrasion are removed. Water used for washing is applied on the ice surface using a pressure pump, and through a spray bar with nozzles. Any dirty water absorbed is filtered and pumped into the snow tank.

11 WWS OPTIONAL

(Wheel Wash System)

The **WWS** is used to automatically clean the tires. It is particularly useful before the machine goes onto the ice, especially if it has been on any asphalt surfaces. The water used for washing is sprayed onto the tire through a pipe. The system removes any dirt particles and uses only a small amount of water.

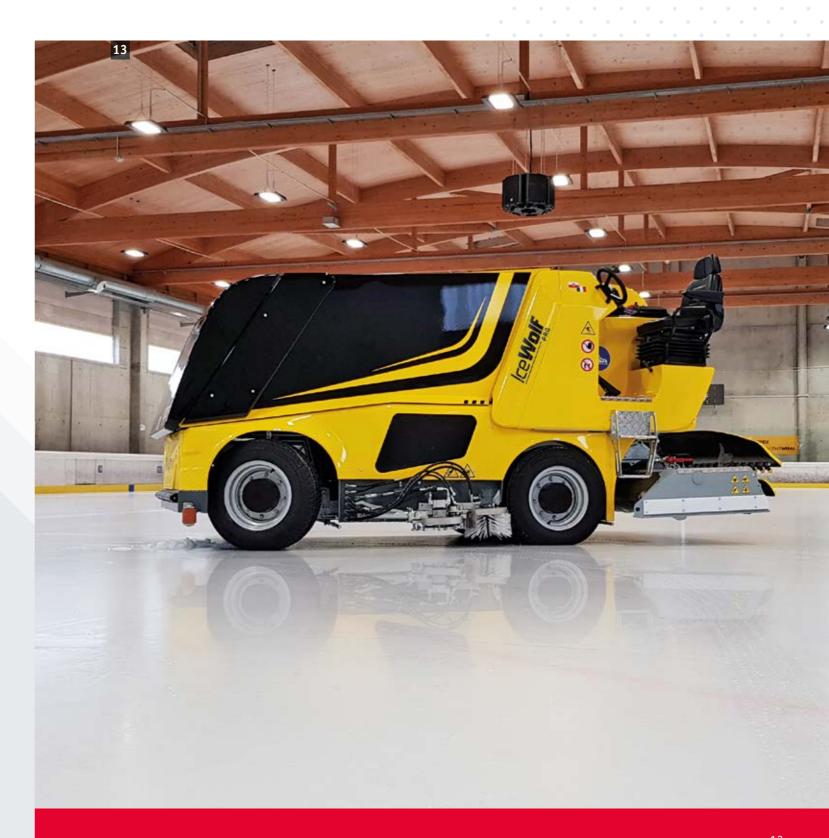
12 Driver's cabin OPTIONAL

The fully enclosed driver's cabin consists of colored vitrification, a door and a window. The cabin offers a heating system, as well as a swiper function on the front, right side and back window.

Product customization OPTIONAL



Through product customization, Engo ice resurfacers can be adapted according to preferences for color and special technical equipment, to suit individual customer's requests





1.400 mm



3.500 mm



4.000 mm



4.000 mm



engo IceDingo

- Application: Ice field boarders
- Blade width: 360 mm
- Operation: Electric

engo IcePuma

- Application: Ice fields up to 1.200 m²
- Blade width: 1.700 mm
- **Operation:** Electric or Diesel

engo IceWolf SMART | CLASSIC | PRO EDITION

- Application: Ice fields up to 1.800 m²
- Blade width: 2.000 mm (Optional 2.150 or 2.300 mm)
- Operation: Electric

engo IceTiger

- Application: Ice fields up to 3.000 m²
- Blade width: 2.300 mm (Optional 2.500 mm)
- Operation: Electric

engo IceLion

- Application: Ice fields up to 7.000 m²
- Blade width: 2.500 mm
- Operation: Electric







Electric ice resurfacer

Small and precise

The small, electrically-operated and very handy ice edger is ideally suited for precision work at the edges of the ice field along the dasher board.



What makes it special

- Electric drive: Emission-free, eco-friendly and cost-saving
- Low noise
- Adjustable in height and inclination
- Powerful electric motor (24 V 2.0 KW)
- Wheels for easy transportation on unfrosted surfaces
- Special battery charger for 220 V / 24 V

Engo IceDingo
1.400 x 470 x 1.200
max 360 mm
24 V / 90 Ah
1 DC motor
Electric



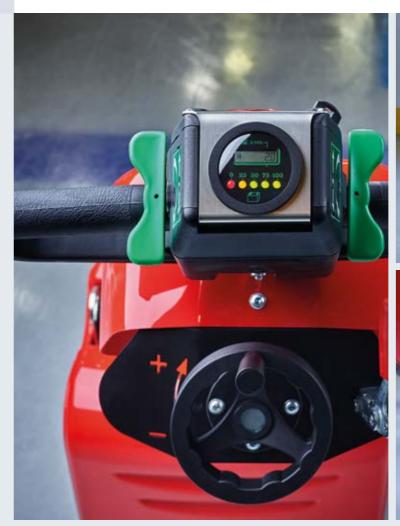
With high technology to the highest ice quality

Highest quality, innovation and technology from the development to production.

At Engo we understand that in ice resurfacing, technology is one of the key factors which can determinate success. For this reason, we offer our clients our experience by combining technical and manufacturing expertise.

Our wide range of machines and special equipment combines maximum precision and high performance.

We do not only want to be a supplier, but also a reliable partner. That is why we offer a complete service from the project to the after-sales assistance.







lce**Puma**

Electric ice resurfacer

Small and economical

The small machine with unique performances for ice fields up to 1,200 m².



Uncomplicated and flexible

The IcePuma is easy to steer, because of its tight turning radius. The operation of the machine is intuitive and uncomplicated. It is ideal for smaller ice fields within shopping malls.











- Electric drive: Emission-free, eco-friendly and cost-saving
- Strong, maintenance-free A/C motors and high capacity battery
- Patented fast blade change and auger washout system
- Ergonomic driver's platform with hydraulic levers and 4.3-inch color display with touch screen
- Ice boost snow breaker for augers while driving

	Technical data	Engo IcePuma
	Dimensions (Length x Wide x Height)	3.500 x 1.830 x 1.990 mm
	Height with snow tank up	2.800 mm
	Ground clearance	200 mm
	Wheelbase	1.650 mm
	Weight (Standard equipment)	3.160 kg
	Turning radius	3.700 mm
	Max. speed	13 km/h
	Blade width	1.700 mm
	Water tank volume	500 L
	Snow tank volume	2,2 m³ (Compressed 2,8 m³)
	Battery	80 V 360 Ah
	Augers engine	Hydraulic
	Motor	2 asynchronous motors
	Drive system	Electric or Diesel, all-wheel drive with power steering
4	Pump pressure	160 bar
	Tires	185 x R14" studded tires
	Wheel rims	6,0 x 14"



Ice Wolf

Electric ice resurfacer

Power for quality

User-friendly, efficient ice resurfacer for standard ice fields up to 1.800 m².

One machine, many choices

The IceWolf is available in three different editions, characterized by their different levels of operation comfort, scale of equipment and level of electricity: SMART, CLASSIC, PRO











What makes it special

- Electric drive: Emission-free, eco-friendly and cost-saving
- Strong, maintenance-free A/C motors and high capacity battery
- Different water tank capacities available
- Different blade-sizes available
- Patented fast blade change and auger washout system
- Ergonomic driver's platform with hydraulic levers or joystick and display with touch screen
- Ice boost snow breaker for augers
- "Solid Ice": High-end, state-of-the-art water spraying system as optional equipment
- Ice-, wheel- and snow tank washing system as optional equipment
- Integrated ice edger as optional equipment for the IceWolf Classic & Pro
- Fully automatic system start for work functions for the IceWolf Pro

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Technical data	Engo IceWolf / SMART, CLASSIC, PRO
Dimensions (Length x Wide x Height)	4.000 x 2.150 mm (Optional 2.300 or 2.420) x 2.100 mm
Height with snow tank up	2.900 mm
Height with driver's cabin	2.550 mm
Ground clearance	250 mm
Wheelbase	1.975 mm
Weight (Depending on the equipment)	4.900 – 5.300 kg
Turning radius	4.000 / 3.650 mm
Max. Speed	13 km/h
Blade width	2.000 mm (Optional 2.150 or 2.300 mm)
Water tank volume	1.000 L (Optional 1.100 or 1.200 L)
Snow tank volume	3,0 m³ (Compressed 3,6 m³)
Battery	80V 805 Ah (Optional 875 Ah or 880 Tensor)
Augers engine	Hydraulic (Ice Wolf Smart) & Electric (Ice Wolf Classic & Pro)
Motor	4-6 asynchronous motors
Drive system	Electric all-wheel drive with power steering
Pump pressure	160 bar
Tires	225 x R16" studded tires
Wheel rims	8,0 x 16"





lce**Tiger**

Electric ice resurfacer

Speed for quality

The ideal resurfacer to create a perfect ice surface in a few minutes for sporting events such as high-speed ice skating. It is ideal for ice fields up to 3,000 m².

High-tech for driving comfort

The IceTiger is an electrical high-tech ice resurfacing machine which covers every possible requirement. The driver cockpit is designed ergonomically with an easily reachable proportional joystick and 10.4-inch high-resolution color touch screen.





4.000 mm







What makes it special

engo.

- Electric drive: Emission-free, eco-friendly and cost-saving
- Strong, maintenance-free A/C motors and high capacity battery
- Different water tank capacities available
- Different blade-sizes available
- Patented fast blade change and auger washout system
- Ergonomic driver's platform with joystick and 10.4-inch color touch screen display
- Integrated ice edger as optional
- Fully automatic system start for work functions
- Ice boost snow breaker for augers while driving
- "Solid Ice": High-end, state-of-the-art water spraying system as optional equipment
- Snow tank washing system
- High pressure, efficient ice washing and wheel washing system as optional equipment
- Optional water and snow tank connection for more volume

Technical data	Engo IceTiger
Dimensions (Length x Wide x Height)	4.000 x 2.420 (Optional 2.660 mm) x 2.300 mm
Height with snow tank up	2.970 mm
Height with driver's cabin	2.700 mm
Ground clearance	195 mm
Wheelbase	2.000 mm
Weight (Depending on the equipment)	5.500 – 5.900 kg
Turning radius	4.500 / 4.350 mm
Max. speed	13 km/h
Blade width	2.300 mm (Optional 2.500 mm)
Water tank volume	1.100 L (Optional 1.200 or 1.300 L)
Snow tank volume	3,6 m³ (Compressed 4,2 m³)
Battery	80V 805Ah (Optional 875 Ah or 880 Tensor)
Augers engine	Electric
Motor	5 asynchronous motors
Drive system	Electric all-wheel drive with power steering
Pump pressure	160 bar
Tires	245/75 x R17,5" studded tires
Wheel rims	6,5 x 17,5 "

Ice resurfacer



lceLion

Electric ice resurfacer

Think big

This machine is the ideal partner for ice fields with a surface of maximum 7,000 m².

Power meets agility

The IceLion offers all the necessary features to conquer also big ice fields. At the same time drivers can enjoy the good reactivity and manoeuvrability of the machine.





2.660 mm











- Electric drive: Emission-free, eco-friendly and cost saving
- Strong, maintenance-free A/C motors and high capacity battery
- Patented fast blade change and auger washout system
- Ergonomic driver's platform with hydraulic levers and 10.4-inch color touch screen display
- Integrated ice edger as optional equipment
- Fully automatic system start
- Ice boost snow breaker for augers while driving
- "Solid Ice": High-end, state-of-the-art water spraying system as optional
- Wheel and snow tank washing system as optional equipment
- High pressure, efficient ice washing system as optional equipment
- Optional water and snow tank connection for more volume

Technical data	Engo IceLion
Dimensions (Length x Wide x Height)	4.600 x 2.660 x 2.300 mm
Height with snow tank up	3.400 mm
Height with driver's cabin	2.800 mm
Ground clearance	250 mm
Wheelbase	2.170 mm
Weight (Depending on the equipment)	6.000 – 6.800 kg
Turning radius	5.000 / 4.850 mm
Max. speed	13 km/h
Blade width	2.500 mm
Water tank volume	2.000 L
Snow tank volume	5 m³
Battery	80V 1.000 Ah (Optional 1.240 Ah or 1.040 / 1.320 Tensor)
Augers engine	Electric
Motor	6 asynchronous motors
Drive system	Electric all-wheel drive with power steering
Pump pressure	160 bar
Tires	245/75 x R17,5" studded tires
Wheel rims	6,5 x 17,5"





ce arena equipment	Tobling		IceWolf	SMART	IceWolf	CLASSIC	IceWolf	PRO	IceTiger		IceLion
Type of equipment ST = STANDARD / OP = OPTIONAL	ST	OP	ST	OP	ST	OP	ST	0P	ST	OP	ST OP
Acoustic signal when reversing, operating snow tank and when augers are backwards in motion							•				•
Adjustable, cloth covered driver's seat with sprung suspension and armrest											•
Manually adjusted water flow											•
Automatic, speed dependent water management				•		•					
LED daytime lights				•							
LED snow tank headlights											
Sensor for water temperature											
LED work lights for brush and ice edger				•		•					•
Powder-coated conditioner made of rust-free stainless steel		•				•		•			
Galvanized, powder-coated conditioner 1.700 mm											
Galvanized, powder-coated conditioner 2.000 mm											
Galvanized, powder-coated conditioner 2.150 mm											
Galvanized, powder-coated conditioner 2.300 mm											
Galvanized, powder-coated conditioner 2.500 mm											
TWS - Snow Tank Washing System											
IWS High-Pressure Ice Washing System											
IWS Ice Washing System											
WWS High-Pressure Tire Washing System											
Hydraulic ice edger											
Laser leveling system											
Solid Ice water spraying system				•							
Water tank made of stainless steel											
Parking sensors											
Front and rear-view camera											
Integrated laser beam as driving assistance											
LED turning indicator front and rear, stroboscope headlights and brake lights											
Underbody lighting (red, green and blue)											
Water and snow tank connection											
Water fountain - only in combination with tank connection											
Electrical battery water filling system											
Adjustable, artificial leather driver's seat with sprung suspension and armrest											
Heated driver's seat											
Heated driver's cabin with colored glazing, DAB+radio, and stereo sound system											
Driver's canopy		•									
Ice thickness measurement with indication on the display unit - COMING SOON											
Toolbox with high-quality tools											
Studded spare tire with rim or chrome-plated rims											

For information on the full equipment-range please visit www.engo-ice.com or write to: info@engo-ice.com

Engo Ltd

Via Forch 9 39040 Varna (BZ) Italy

T +39 0472 057590 info@engo-ice.com

www.engo-ice.com



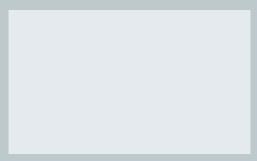


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TECHNO LPIN°

This brochure has been prepared only as a general guide for the customer. Some equipment described or shown may be optional at additional cost. Specifications are subject to change. For current product information, please contact the Engo Company.

Engo Dealer



Certification





Member





