

Flake ice and nugget ice

The world of MAJA Ice Machines

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- A close-up photograph of a MAJA ice machine's discharge chute. The chute is a polished, metallic, curved channel. A large volume of clear, irregularly shaped ice flakes is falling from the bottom of the chute into a dark-colored collection bin. The background is a plain, light-colored wall.
- Cooling and production of foodstuff
 - Ideal solution for many uses
 - Proven solution for over 60 years
 - Developed and produced in Germany

MAJA flake ice for the food industry



HY-GEN protected

- Hygienic ice production
- Fast and simple cleaning
- Manually and / or fully automatically



Efficient refrigeration

- Ice temperature approx. -7°C
- Quick product cooling
- Slow melting
- Long freshness



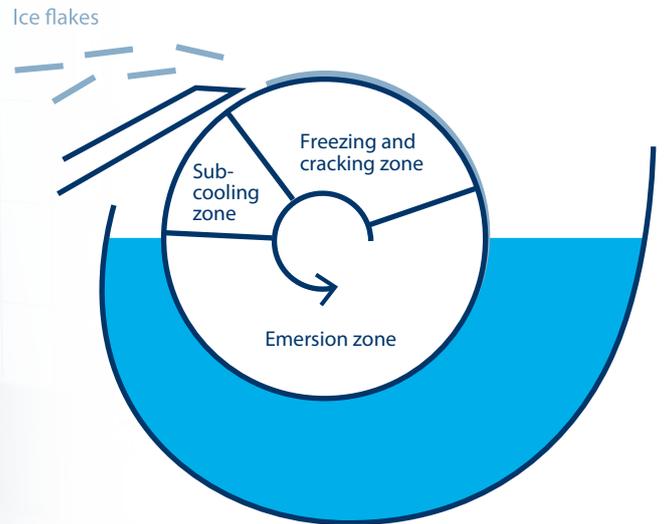
Dry-frozen flake ice

- Dry surface
- Virtually no water from melting
- Easy storage
- Easy handling
- Attractive appearance



Light weight

- (density 0,42 kg / dm³)**
- Up to 30% lighter than other types of ice
 - Thus less ice requirements for display filling
 - Savings on transportation costs



Simple, but ingenious for over 60 years

A deep-frozen metal cylinder, rotating in a water reservoir, guarantees constant ice quality. With each rotation, water freezes on the evaporation drum and then flakes off, leaving the machine as dry-frozen ice. This system of ice production was developed by MAJA and has proven its reliability for more than six decades. It is efficient, cost-saving and does not require special maintenance.

Versatile use in the food and also in the non-food sector:

- Mincer process for emulsified / boiled sausage production
- Dough production for baking and pastry products
- Refrigeration of fish and seafood
- Filling of fresh food displays in supermarkets
- Decorative refrigeration of buffets (in hotels, restaurants, event catering...)
- Cryotherapy in human and veterinary medicine
- Health spas & leisure swimming baths
- Artificial snow tracks for sports and leisure



Thin ice flakes (1-2 mm)

- Very good product covering
- Big surface, thus good heat exchange



Good mixing behavior

- Little mechanical resistance
- No damage to the product and to the tools, such as mincer blades and dough hooks



Reduced production costs

- High efficiency
- Economy of resources
- 100% of the water becomes ice



High reliability - low maintenance

- Reduced operating and maintenance costs
- No additional efforts for water treatment, such as softening, filtration etc.

The HY-GEN sanitation principle by MAJA

Ideal conditions for efficient cleaning, manually or fully automatically.

HY-GEN Flake Ice Machines from MAJA are designed to allow the production of flake ice under excellent sanitary conditions. The core piece is the water tank in plastic material, which can easily be removed for cleaning.

The MAJA Label „HY-GEN Protected“ stands for:

- Evaporator can be opened without the use of tools for cleaning purposes and is accessible from all sides.
- Easily removable hygiene water tank in plastic material (insulation and no corrosion).
- Round-shaped, cleaning-friendly water tank; if necessary it is even replaceable.
- Water tank free of built-in parts without angles, edges and screws, for easy and efficient cleaning.
- Automatic water pipe rinsing when the machine was out of operation for more than 24 hours.
- Special hygiene advantages in conformity with the current German drinking water regulations issued by the DVGW (German association for water & gas), for example: water supply with back-flow protection



With removable water tank

*Water tank removal at the side
for all types of SAH 85 to SAH 500
as well as for RVH 250*



*Water tank removal at the top
for all types of SAH 800 - 3000
and RVH 400 - 12000*



Options MAJA-SCS

MAJA Flake Ice Machines can also be cleaned fully automatically. Thanks to the patented evaporator self-cleaning system MAJA-SCS, the ice producing unit can be regularly cleaned without investing additional working time or labour.

The cleaning cycle is started manually by ON/OFF push-buttons or fully automatically by programmable control panel (option). A mixture of water and special cleaning agent flows around all machine parts that contact water, thus cleaning, deliming and reduction of germs in one and the same operation.

MAJA-SCS is not only a guarantee for ideal sanitation conditions for the production of flake ice: The efficient routine cleaning process helps to maintain the value of your MAJA Flake Ice Machine.

SAH 85/170

Eco-friendly flake ice production



SAH 85/170 EcoPro



SAH 85/170 L R449A



Stackable ice storage bins EV 50 on wheeled base



Water tank removal for cleaning purposes

EcoPro: Pioneering sustainability in flake ice production

The MAJA SAH 85 and SAH 170 are available in two versions. While the standard models run efficiently on the refrigerant R449A, the EcoPro versions take a leap forward in sustainable refrigeration by utilizing the natural refrigerant propane R290 (GWP 3).

Propane R290 distinguishes itself by having almost zero impact on the greenhouse effect, making it an eco-friendly alternative to commonly used fluorinated refrigerants. By opting for an EcoPro model, you're not just selecting a high-quality ice machine, you're aligning your operations with more sustainable practices, making a tangible difference for a greener future.

Machine structure

- Cleaning-friendly machine design according to the HY-GEN sanitation principle with removable water tank
- Ice output 85 and 170 kg/24 h
- Frame and housing in stainless steel
- With mobile ice storage system EV 50 for storage and transport of approximately 50 kg of flake ice:
 - Inner and outer surface in robust polypropylene
 - Foamed PU insulation for ideal storage conditions
 - Cleaning-friendly surfaces
 - Drainage plate to separate melting water from the ice
 - Easy emptying by water drain with outlet valve
 - Wheeled base in stainless steel for easy mobility
 - Solid and stackable thus space-saving

Operation

- Easy operation by ON/OFF pushbuttons
- With function and error code indication, start/stop function of optional self-cleaning system
- Reliable SPS control unit

Hygiene options

- **Patented fully automatic self-cleaning system:** MAJA-SCS for time savings and optimum sanitation safety by automating the cleaning process; standard for SAH 170 EcoPro and optional equipment for SAH 85 EcoPro
- **External UV disinfection system** in the water supply
- **Ozone disinfection system** in the water supply

Options

- **Additional ice storage bins EV 50:** For more flexibility by alternating use and increased storage capacity
- **Cover for EV 50:** For hygienic transportation and storage
- **Control Panel ON/OFF for remote operation:** With wall holdfast and cable 5 m
- **Control Panel Timer with timer function:** Freely programmable ice production and cleaning cycles
- **External water pre-heater:** For low water / ambient temperatures between +2°C and +5°C



TECHNICAL DETAILS

MAJA SAH EcoPro R290

| Type | Ice output *) kg/24 h (1 h) | Fresh water consumption m ³ /24 h | Electrical connection 1AC/50Hz/230V/PE kW | Width mm | Depth mm | Height mm | Ice storage kg | Refrigerant charge kg | GWP **) | CO ₂ e t | Weight kg |
|----------------|--------------------------------|--|--|-------------|-------------|--------------|----------------------|-----------------------------|------------|------------------------|--------------|
| SAH 85 EcoPro | 85 (3,5) | 0,085 | 0,53 | 705 | 700 | 1380 | ca. 50 | 0,09 | 3 | <0,01 | 156 |
| SAH 170 EcoPro | 170 (7,0) | 0,170 | 0,78 | 705 | 700 | 1380 | ca. 50 | 0,12 | 3 | <0,01 | 167 |

TECHNICAL DETAILS

MAJA SAH L R449A

| Type | Ice output *) kg/24 h (1 h) | Fresh water consumption m ³ /24 h | Electrical connection 1AC/50Hz/230V/PE kW | Width mm | Depth mm | Height mm | Ice storage kg | Refrigerant charge kg | GWP **) | CO ₂ e t | Weight kg |
|-----------------|--------------------------------|--|--|-------------|-------------|--------------|----------------------|-----------------------------|------------|------------------------|--------------|
| SAH 85 L R449A | 85 (3,5) | 0,085 | 0,58 | 705 | 700 | 1380 | ca. 50 | 0,7 | 1397 | 1,0 | 160 |
| SAH 170 L R449A | 170 (7,0) | 0,170 | 0,99 | 705 | 700 | 1380 | ca. 50 | 1,0 | 1397 | 1,4 | 172 |

*) The indicated ice output is an approximate value (depending on installation conditions).
Water temperature +16°C, ambient temperatures +20°C.

**) The refrigerant R449 A (GWP 1397) belongs to the fluorinated greenhouse gases. For more climate-friendly ice production, choose the SAH EcoPro to run on propane R290 (GWP 3).
Connections: Water supply 3/4" external thread, drain water 2 x 3/4" hose clip

SAH Compact

MAJA Flake Ice Machines Compact with integrated condensing unit Ice output 250 and 500 kg/24 h



SAH 250



SAH 500



Examples of installation
SAH 250/500 on subframe for
ice cart EVA 80

Machine structure:

- Cleaning-friendly machine design according to the principle of HY-GEN sanitation with removable water tank.
- Frame and housing in stainless steel

Refrigeration

- Condensing unit in air-cooled execution (L)
- Refrigerant R449A**)
- Integrated heat exchanger for optimum energy efficiency
- Refrigerant stop valve and refrigerant pump-down when the machine stops

Operation

- Easy operation by ON/OFF pushbuttons.
Control panels with or without program function see page 18
- Reliable SPS control unit

MAJA Flake Ice Machines Compact with integrated condensing unit Ice output 800, 1.500 and 3.000 kg/24 h



SAH 800



SAH 3000

Machine structure:

- Cleaning-friendly machine design according to the principle of HY-GEN sanitation with removable water tank.
- Frame and housing in stainless steel

Refrigeration

- Standard condensing unit in air-cooled execution (L)
Watercooled condensing unit (W) on demand
- Refrigerant R449A***)
- Integrated heat exchanger for optimum energy efficiency
- Refrigerant stop valve and refrigerant pump-down when the machine stops

Operation

- Easy operation by ON/OFF pushbuttons.
Control panels with or without program function see page 18
- Reliable SPS control unit

Options

- **Condensing unit in water-cooled execution (W):**
For a temperature difference IN-OUT of about 10 - 20 K
- **Condensing unit cooling by heat exchange circuit (WS):**
For a temperature difference of heat transfer medium or water IN-OUT of about 5 K ($t_{\min} - 8^{\circ}\text{C}$)



TECHNICAL DETAILS

MAJA SAH 250/500 L

| Type | Ice output *) kg / 24 h (1 h) | Fresh water consumption m ³ /24 h | Electrical connection 1AC/50Hz/230V/PE kW **) | Width mm | Depth mm | Height mm | Refrigerant charge kg | GWP **) | CO ₂ e t | Weight kg |
|-----------------|----------------------------------|--|--|-------------|-------------|--------------|-----------------------------|------------|------------------------|--------------|
| SAH 250 L R449A | 250 (10) | 0,25 | 1,26 | 776 | 581 | 996 | 1,6 | 1397 | 2,2 | 140 |
| Type | Ice output *) kg / 24 h (1 h) | Fresh water consumption m ³ /24 h | Electrical connection 3AC/50Hz/400V/PE kW **) | Width mm | Depth mm | Height mm | Refrigerant charge kg | GWP **) | CO ₂ e t | Weight kg |
| SAH 500 L R449A | 500 (20) | 0,50 | 2,05 | 776 | 581 | 996 | 2,1 | 1397 | 2,9 | 165 |

Installation with minimum wall distance at the left and rear side of the machine.
Connections: Water supply 3/4" external thread, drain water 3/4" hose clip

TECHNICAL DETAILS

MAJA SAH 800/1500/3000 L

| Type | Ice output *) kg / 24 h (1 h) | Water consumption (fresh water) m ³ /24 h | Electrical connection 3AC/50Hz/400V/N/ PE kW **) | Width mm | Depth mm | Height mm | Refrigerant charge kg | GWP **) | CO ₂ e t | Weight kg |
|------------------|----------------------------------|---|---|-------------|-------------|--------------|-----------------------------|--------------|------------------------|--------------|
| SAH 800 L R449A | 800 (33) | 0,80 | 2,52 | 1170 | 760 | 1150 | 4,2 | 1397 (R449A) | 4,9 | 310 |
| SAH 1500 L R449A | 1.500 (62) | 1,50 | 4,37 | 1430 | 780 | 1230 | 5,2 | 1397 (R449A) | 7,3 | 400 |
| SAH 3000 L R449A | 3.000 (125) | 3,00 | 7,76 | 1700 | 980 | 1420 | 10,0 | 1397 (R449A) | 14,0 | 575 |

*) The indicated ice output is an approximate value (depending on installation conditions).
Water temperature +16°C, ambient temperatures +20°C.

**) Special voltage on demand.

***) The refrigerant R449 A (GWP 1397) belongs to the fluorinated greenhouse gases.

Connections: Water supply 3/4" external thread, drain water 2 x 3/4" hose clip

RVH-L and RVH-LT Split

MAJA Flake Ice Machines Split with separate condensing unit Ice output 250 – 12.000 kg/24



RVH 1500 L



RVH-L



RVH-LT

Examples of refrigeration units (condensing units):



L1000



L1500 - L3000



LT2500 - LT3000



L6000/LT6000

Machine structure:

- Cleaning-friendly machine design according to the principle of HY-GEN sanitation with removable water tank
- Separate condensing unit in weather protection housing in galvanized steel. Silent, solid and service-friendly solution with good access for maintenance
- Machine types RVH 9000 and RVH 12000 L/LT: consist of two separately operated rotating evaporator units.
Advantages: individual control of ice output according to varying needs and high operational safety

Refrigeration

- The ice producing unit is made for operation with the fluorinated greenhouse gas R449A (GWP 1397) and is supplied without refrigerant filling.
- The refrigerant charge and the resulting CO₂ equivalent (CO₂e) of the ice machine must be determined during its start-up.
- Air-cooled condensing unit:
 - Temperature range version L: approx. -15°C until +38°C
 - Temperature range version LT: approx. -15°C until +42°C
 - With heat exchanger for optimum energy efficiency.
 - Electronic condenser fan speed regulator for automatic adaptation to variable ambient temperatures.

Operation

- For remote operation; see page 18 for a big variety of control panels with or without program function

Options

- **Winter mode:**
For ambient temperatures -15°C until -40°C.
- **Water-cooled execution of (separate) condensing unit:**
Version W for a temperature difference t_{IN} / t_{OUT} approx. 10 - 20 K.
- **Refrigeration of (separate) condensing unit by heat transfer medium or water:**
Version WS for a temperature difference t_{IN} / t_{OUT} of approx. 5 K ($t_{min} -8°C$)
- **Special coating of condenser fans:**
For installation in aggressive (salt-laden) sea air.

TECHNICAL DETAILS Temperature range version L: approx. -15°C until +38°C**MAJA RVH-L**

| Type | Ice output *) kg / 24 h (1 h) | Fresh water consumption m ³ /24 h | Electrical connection RVH kW 3AC/50Hz/400V/ N/PE **) | Width mm | Depth mm | Height mm | Weight kg | Condensing unit "L" dimensions WxDxH mm Electrical connection kW Weight approx. kg |
|-------------|----------------------------------|--|--|-------------|-------------|--------------|--------------|---|
| RVH 250 L | 250 (10) | 0,25 | 0,28 | 1045 | 512 | 525 | 90 | 866x462x581 1,15 65 |
| RVH 400 L | 400 (16) | 0,40 | 0,28 | 1185 | 512 | 525 | 115 | 1032x462x751 1,71 90 |
| RVH 800 L | 800 (33) | 0,80 | 0,28 | 1345 | 512 | 525 | 140 | 1352x732x891 2,25/2,55 167 |
| RVH 1000 L | 1.000 (41) | 1,00 | 0,28 | 1545 | 512 | 525 | 165 | 1352x732x891 2,96 168 |
| RVH 1500 L | 1.500 (62) | 1,50 | 0,28 | 1695 | 512 | 525 | 175 | 1352x732x1201 4,09 262 |
| RVH 2000 L | 2.000 (83) | 2,00 | 0,28 | 1695 | 512 | 525 | 175 | 1700x946x1536 6,65 330 |
| RVH 2500 L | 2.500 (104) | 2,50 | 0,28 | 1695 | 512 | 525 | 175 | 1700x946x1536 7,33 344 |
| RVH 3000 L | 3.000 (125) | 3,00 | 0,34 | 1730 | 675 | 525 | 215 | 1700x946x1536 7,33 344 |
| RVH 6000 L | 6.000 (250) | 6,00 | 0,52 | 1860 | 1450 | 586 | 425 | 2200x1300x1810 14,64 1000 |
| RVH 9000 L | 9.000 (375) | 9,00 | 0,52 0,34 | 1863 | 1456 | 1572 | 740 | 2200x1300x1810 14,64 1000 1700x 946x1536 7,33 344 |
| RVH 12000 L | 12.000 (500) | 12,00 | 0,52 0,52 | 1863 | 1456 | 1572 | 955 | 2200x1300x1810 14,64 1000 2200x1300x1810 14,64 1000 |

TECHNICAL DETAILS Temperature range version LT: approx. -15°C until +42°C**MAJA RVH-LT**

| Type | Ice output *) kg / 24 h (1 h) | Fresh water consumption m ³ /24 h | Electrical connection RVH kW 3AC/50Hz/400V/ N/PE **) | Width mm | Depth mm | Height mm | Weight kg | Condensing unit "LT" dimensions WxDxH mm Electrical connection kW Weight approx. kg |
|--------------|----------------------------------|--|--|-------------|-------------|--------------|--------------|--|
| RVH 250 LT | 250 (10) | 0,25 | 0,28 | 1045 | 512 | 525 | 90 | 866x462x581 1,15 68 |
| RVH 400 LT | 400 (16) | 0,40 | 0,28 | 1185 | 512 | 525 | 115 | 1032x462x751 2,14 90 |
| RVH 800 LT | 800 (33) | 0,80 | 0,28 | 1345 | 512 | 525 | 140 | 1352x732x891 2,75 170 |
| RVH 1000 LT | 1.000 (41) | 1,00 | 0,28 | 1545 | 512 | 525 | 165 | 1352x732x1201 4,09 262 |
| RVH 1500 LT | 1.500 (62) | 1,50 | 0,28 | 1695 | 512 | 525 | 175 | 1352x732x1201 5,78 262 |
| RVH 2000 LT | 2.000 (83) | 2,00 | 0,28 | 1695 | 512 | 525 | 175 | 1700x946x1536 7,33 344 |
| RVH 2500 LT | 2.500 (104) | 2,50 | 0,28 | 1695 | 512 | 525 | 175 | 1900x882x1561 8,89 480 |
| RVH 3000 LT | 3.000 (125) | 3,00 | 0,34 | 1730 | 675 | 525 | 215 | 1900x882x1561 8,89 480 |
| RVH 6000 LT | 6.000 (250) | 6,00 | 0,52 | 1860 | 1450 | 586 | 425 | 2800x1300x2275 21,73 1200 |
| RVH 9000 LT | 9.000 (375) | 9,00 | 0,52 0,34 | 1863 | 1456 | 1572 | 740 | 2800x1300x2275 21,73 1200 1900x 882x1561 8,89 480 |
| RVH 12000 LT | 12.000 (500) | 12,00 | 0,52 0,52 | 1863 | 1456 | 1572 | 955 | 2800x1300x2275 21,73 1200 2800x1300x2275 21,73 1200 |

*) The indicated ice output is an approximate value (depending on installation conditions).

Water temperature +16°C, ambient temperatures +20°C.

**) Special voltage on demand.

***) The refrigerant R449 A (GWP 1397) belongs to the fluorinated greenhouse gases.

Connections:

Water supply 3/4" external thread, drain water 3/4" hose clip

RVH Modular

MAJA Flake Ice Machines Modular
without condensing unit, for connection to an external
condensing unit or refrigeration system
Ice output 250 – 12.000 kg/24 h



RVH 400



RVH 1000



RVH 1500 - 3000



RVH 6000



RVH 9000 - 12000

Machine structure

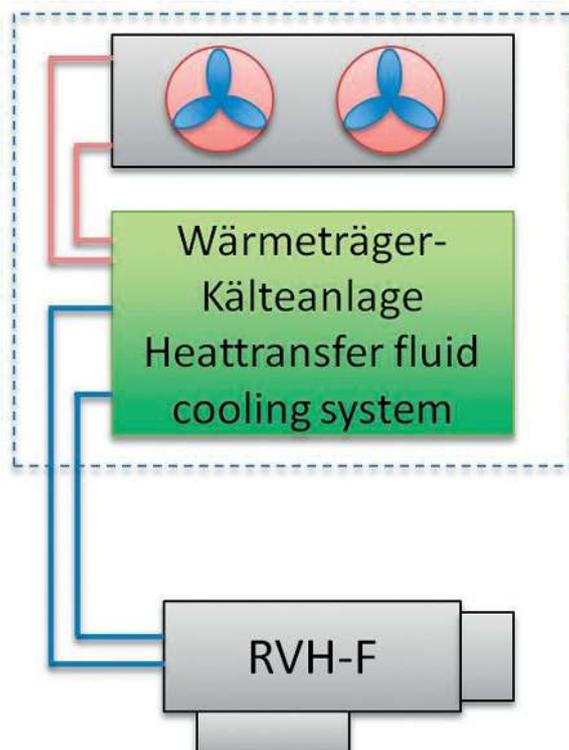
- Cleaning-friendly machine design according to the principle of HY-GEN sanitation with removable water tank.
- For connection to (separate) external refrigeration units or multicompressor refrigeration systems.
- Machine types RVH 9000 and RVH 12000 L/LT: consist of two separately operated rotating evaporator units. Advantages: individual control of ice output according to varying needs and high operational safety.

Refrigeration

- For operation with the fluorinated greenhouse gas R449A (GWP 1397). Other refrigerants on demand.

Operation

- For remote operation; see page 18 for a big variety of control panels with or without program function



Machine structure

- Cleaning-friendly machine design according to the principle of HY-GEN sanitation with removable water tank.
- For connection to an existing external heat transfer medium circuit (by fluid, e.g. water-glycol mixture). An ecological and future-proof alternative to the traditional refrigerants.

Eco-friendly flake ice production

- No influence on the destruction of the ozone layer and the greenhouse effect.
 Ozone depletion potential ODP = 0
 Global warming potential GWP = 0

Easy operation

- By control panel ON/OFF for remote operation; see page 18 for a big variety of control panels with or without program function

Installation conditions for a MAJA RVH-F

- Temperature of heat transfer fluid:
 t_{IN} approx. -25°C
 t_{OUT} approx. -22°C

TECHNICAL DETAILS**MAJA RVH**

| Type | Ice output *) kg/24 h (1 h) | Fresh water consumption m ³ /24 h | Refrigeration capacity required kW | Electrical connection 3AC/50Hz/400V/PE kW **) | Width mm | Depth mm | Height mm | Weight kg |
|-----------|--------------------------------|--|--|--|-------------|-------------|--------------|--------------|
| RVH 250 | 250 (10) | 0,25 | t _o -20,0°C, 1,8 | 0,28 | 1045 | 512 | 525 | 90 |
| RVH 400 | 400 (16) | 0,40 | t _o -20,5°C, 2,2 | 0,28 | 1185 | 512 | 525 | 115 |
| RVH 800 | 800 (33) | 0,80 | t _o -21,5°C, 4,0 | 0,28 | 1345 | 512 | 525 | 140 |
| RVH 1000 | 1.000 (41) | 1,00 | t _o -18,5°C, 5,6 | 0,28 | 1545 | 512 | 525 | 165 |
| RVH 1500 | 1.500 (62) | 1,50 | t _o -18,5°C, 8,4 | 0,28 | 1695 | 512 | 525 | 175 |
| RVH 2000 | 2.000 (83) | 2,00 | t _o -21,5°C, 11,5 | 0,28 | 1695 | 512 | 525 | 175 |
| RVH 2500 | 2.500 (104) | 2,50 | t _o -21,5°C, 13,5 | 0,28 | 1695 | 512 | 525 | 175 |
| RVH 3000 | 3.000 (125) | 3,00 | t _o -21,0°C, 16,2 | 0,34 | 1730 | 675 | 525 | 215 |
| RVH 6000 | 6.000 (250) | 6,00 | t _o -22,0°C, 33,0 | 0,52 | 1860 | 1450 | 586 | 425 |
| RVH 9000 | 9.000 (375) | 9,00 | t _o -22,0°C, 33,0 t _o -21,0°C, 16,2 | 0,52 0,34 | 1863 | 1456 | 1572 | 740 |
| RVH 12000 | 12.000 (500) | 12,00 | t _o -22,0°C, 33,0 t _o -22,0°C, 33,0 | 0,52 0,52 | 1863 | 1456 | 1572 | 955 |

*) The indicated ice output is an approximate value (depending on installation conditions).

Water temperature +16°C, ambient temperatures +20°C.

**) Special voltage on demand.

For optimum operation in terms of ice output and quality, the use of a suction gas heat exchanger is required.

Connection: Water supply 3/4" external thread, drain water 1" hose clip

TECHNICAL DETAILS**MAJA RVH-F**

| Type | Ice output *) kg/24 h (1 h) | Fresh water consumption m ³ /24 h | Refrigeration capacity required kW **) | Electrical connection 3AC/50Hz/400V/PE kW **) | Width mm | Depth mm | Height mm | Weight kg |
|------------|--------------------------------|--|--|--|-------------|-------------|--------------|--------------|
| RVH 260 F | 260 (11) | 0,26 | 1,5 | 0,28 | 1185 | 512 | 525 | 85 |
| RVH 530 F | 530 (22) | 0,53 | 2,7 | 0,28 | 1345 | 512 | 525 | 125 |
| RVH 660 F | 660 (27) | 0,66 | 3,8 | 0,28 | 1545 | 512 | 525 | 145 |
| RVH 1000 F | 1.000 (41) | 1,00 | 5,5 | 0,28 | 1695 | 512 | 525 | 160 |
| RVH 2000 F | 2.000 (83) | 2,00 | 11,0 | 0,34 | 1730 | 675 | 525 | 220 |
| RVH 4000 F | 4.000 (166) | 4,00 | 22,0 | 0,52 | 1860 | 1450 | 586 | 320 |
| RVH 6000 F | 6.000 (250) | 6,00 | 11,0 + 22,0 | 0,34 + 0,52 | 1863 | 1456 | 1572 | 600 |
| RVH 8000 F | 8.000 (333) | 8,00 | 22,0 + 22,0 | 0,52 + 0,52 | 1863 | 1456 | 1572 | 700 |

Special voltage on demand. Without refrigerant charge.

*) The indicated ice output is an approximate value (depending on installation conditions).

Water temperature +16°C, ambient temperatures +20°C.

**) t_{in} approx. -25°C, t_{out} approx. -22°C

***) Special voltage on demand.

Connection: Water supply 3/4" external thread, drain water 1" hose clip

Modular

MAJA Flake Ice Machines Modular without condensing unit for direct operation with an ammonia / R717 multicompressor refrigeration unit Ice output 7.000 and 14.000 kg/24 h

Equipment & features

Optimum energy efficiency - increased power density

- Compared to traditional refrigerants, e.g. R449A, the direct ammonia operation brings more power density, thus increased ice output with the same machine scale.
- Electronic evaporation pressure regulation for optimum evaporation efficiency.
- The RVH 12000 NH3 consists of two separately operated rotating evaporator units. Advantages: individual control of ice output according to varying needs and high operational safety.



RVH 12000 NH3

Eco-friendly flake ice production

- Excellent ecological impact by the use of the natural refrigerant R717 (ammonia / NH₃)
- R717 consists of the elements nitrogen and hydrogen, gases which are natural parts of the earth atmosphere.
- No influence on the destruction of the ozone layer, no influence on the greenhouse effect:
Ozone depletion potential ODP = 0
Global warming potential GWP = 0

High safety standard

- Integrated safety system with gas detector and automatic cutoff and blockage in case of leakage

Easy operation by Control Panel Touch with touch display

- Individual placing of the control unit
- With timer function for freely programmable production and cleaning cycles (with option MAJA-SCS self-cleaning system), for having the right quantity of fresh MAJA Flake Ice at your disposal exactly in time (see page 18).

Installation conditions

- Existing R717 multicompressor refrigeration unit working in pump operation, that means the refrigerant becomes liquid and circulates.
- Ammonia temperature approx. -30°C
- Pump pressure 2 – 4 bar

MAJA Flake Ice Machines Modular without condensing unit for direct carbon dioxide operation with a R744 / carbon dioxide multicompressor refrigeration unit Ice output 500 and 15.200 kg/24 h

Option

- Hybride solution RVH-CO2 HYBRID:
Ideal for customers who are interested in investing already now in a RVH-CO2 and to operate it with an existing R449A circuit as an interim solution until final refit of the whole refrigeration system.
- until final refit of the whole refrigeration system



RVH 3000 CO2

Optimum energy efficiency - increased power density:

- Compared to traditional refrigerants, e.g. R449A, the direct carbon dioxide operation brings more power density, thus increased ice output of up to 30 % compared with the same machine scale.
- Electronic expansion valve for optimum evaporation efficiency.

Eco-friendly flake ice production

- Excellent ecological impact by the natural refrigerant R744 (carbon dioxide / CO₂) for flake ice production.
- ODP = 0, GWP = 1
- R744 consists of the elements carbon and oxygen, which are natural parts of the atmosphere.

Easy operation by Control Panel Touch

- With timer function for freely programmable production and cleaning cycles (with option MAJA-SCS)

Installation conditions

- Subcritical R744 circuit $HP_{max} = 90$ bar; $LP_{max} = 28$ bar; other conditions on demand.
- Evaporation pressure regulator to adapt the evaporation to $t_0 =$ approx. -25°C
- Stop valve liquid line and suction line
- Pressure relief valve with interchangeable valve for maintenance
- If necessary, R744 gas detector (depending on the local situation at the place of installation).



TECHNICAL DETAILS

MAJA RVH-NH3

| Type | Ice output *) kg/24 h (1 h) | Fresh water consumption m ³ /24 h | Refrigeration capacity required kW | Electrical connection 3AC/50Hz/400V/PE kW **) | Width mm | Depth mm | Height mm | Weight kg |
|---------------|--------------------------------|--|--|--|-------------|-------------|--------------|--------------|
| RVH 6000 NH3 | 7.000 (291) | 7,0 | t ₀ -30,0°C, 42 | 0,96 | 1860 | 1450 | 586 | 540 |
| RVH 12000 NH3 | 14.000 (583) | 14,0 | t ₀ -30,0°C, 84 | 2 x 0,96 | 1863 | 1456 | 1572 | 1085 |

TECHNICAL DETAILS

MAJA RVH-CO2

| Type | Ice output *) kg/24 h (1 h) | Fresh water consumption m ³ /24 h | Refrigeration capacity required kW | Electrical connection 3AC/50Hz/400V/PE kW **) | Width mm | Depth mm | Height mm | Weight kg |
|---------------|--------------------------------|--|---|--|-------------|-------------|--------------|--------------|
| RVH 400 CO2 | 500 (21) | 0,5 | t ₀ -25,0°C, 2,8 kW | 0,28 | 1185 | 512 | 525 | 120 |
| RVH 800 CO2 | 1.000 (41) | 1,00 | t ₀ -25,0°C, 5,5 kW | 0,28 | 1345 | 512 | 525 | 140 |
| RVH 1000 CO2 | 1.300 (54) | 1,30 | t ₀ -25,0°C, 7,3 kW | 0,28 | 1545 | 512 | 525 | 155 |
| RVH 1500 CO2 | 1.900 (79) | 1,90 | t ₀ -25,0°C, 10,7 kW | 0,28 | 1695 | 512 | 525 | 170 |
| RVH 2000 CO2 | 2.500 (104) | 2,50 | t ₀ -25,0°C, 14,4 kW | 0,34 | 1695 | 512 | 525 | 180 |
| RVH 2500 CO2 | 3.000 (125) | 3,00 | t ₀ -25,0°C, 16,2 kW | 0,34 | 1695 | 512 | 525 | 180 |
| RVH 3000 CO2 | 3.800 (158) | 3,80 | t ₀ -25,0°C, 20,5 kW | 0,34 | 1730 | 675 | 525 | 220 |
| RVH 6000 CO2 | 7.600 (317) | 7,6 | t ₀ -25,0°C, 41,0 kW | 0,52 | 1860 | 1450 | 586 | 505 |
| RVH 9000 CO2 | 11.400 (475) | 11,4 | t ₀ -25,0°C 41,0 kW + 20,5 kW | 0,34 + 0,52 | 1863 | 1456 | 1572 | 755 |
| RVH 12000 CO2 | 15.200 (634) | 15,2 | t ₀ -25,0°C 41,0 kW + 41,0 kW | 0,52 + 0,52 | 1863 | 1456 | 1572 | 965 |

*) The indicated ice output is an approximate value (depending on installation conditions).
Water temperature +16°C, ambient temperatures +20°C

**) Special voltage on demand.

Connections:

Water supply 3/4" external thread, drain water 1" hose clip

Overview about the complete range

A big choice of machine types allows individual solutions for special customer requirements.

| FLAKE ICE MACHINES | Ice output kg/24h | Condensing unit | | |
|--|--|--------------------|-----------------------|----------------------------|
| | | Compact machine | Split installation | Without condensing unit |
| SAH 85 L - SAH 3000 L | 85 - 3.000 | • | | |
| SAH 250 W - SAH 3000 W | 250 - 3.000 | • | | |
| SAH 500 WS - SAH 3000 WS | 500 - 3.000 | • | | |
| RVH 250 L - RVH 12000 L | -15°C to approx. +38°C 250 - 12.000 | | • | |
| RVH 250 LT - RVH 12000 LT | -15°C to approx. +42°C 250 - 12.000 | | • | |
| RVH 800 W - RVH 12000 W | -15°C to approx. +38°C 800 - 12.000 | | • | |
| RVH 800 WS - RVH 12000 WS | -15°C to approx. +38°C 800 - 12.000 | | • | |
| RVH 250 - RVH 12000 | 250 - 12.000 | | | • |
| RVH 250 N - RVH 12000 N (without control unit) | 250 - 12.000 | | | • |
| RVH 260 F - RVH 8000 F | 260 - 8.000 | | | • |
| RVH 6000 NH3 - RVH 12000 NH3 | 7.000 + 14.000 | | | • |
| RVH 400 CO2 - RVH 12000 CO2 | 500 - 15.200 | | | • |
| RVE 702 S - RVE 3102 S ship version (integral water tank) | 750 - 2.900 | | | • |

Machine types

- Compact machines with integrated condensing unit (SAH), for ambient temperatures from approx. +10°C to +38°C
- Split version for separate installation of condensing unit and ice producing unit (RVH-L, RVH-LT, RVH-W, RVH-WS)
- Modular flake ice machines without condensing unit for connection to an existing multicompressor refrigeration system (RVH, RVH-N, RVH-NH3, RVH-CO2, RVH-F)
- Flake ice machines with integral water tank for installation on fishing vessels without condensing unit for seagoing use onboard of fishing vessels (RVE-2S)

Refrigeration of condensing unit

- L = refrigeration by air for standard ambient temperatures from approx. -15°C to +38°C
- LT = refrigeration by air for ambient temperatures from approx. -15°C to +42°C
- W = refrigeration by water for a temperature difference of IN / OUT of approx. 10 - 20 K
- WS = refrigeration by heat transfer medium or water for a temperature difference IN / OUT of fluid / water of about 5 K ($t_{\min} - 8^{\circ}\text{C}$).

| Refrigeration of condensing unit | | | | | | | Heat transfer fluid |
|----------------------------------|-------|----------------------|-------|-------------------------|-------------------------|----------------|---------------------|
| Air | Water | Heat transfer medium | R449A | R744 (CO ₂) | R717 (NH ₃) | R290 (Propane) | Fluid |
| • | | | • | | | • | |
| | • | | • | | | | |
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Refrigerants

- Standard refrigerants for MAJA Flake Ice Machines: R449A (GWP 1397). They belong to the fluorinated greenhouse gases.
- Use of other refrigerants on demand.
- Already since 2008, MAJA can also supply ice machine ranges for operation with natural refrigerants without ecological impact:
 - R717 / NH3 (ODP = 0, GWP = 0)
 - R744 / CO2 (ODP = 0, GWP = 1)
 - R290 / Propan (ODP = 0, GWP = 3)
- Alternative refrigerant solution: Heat transfer fluid (ODP = 0, GWP = 0)



Accessories and options

Individual configuration for meeting with any requirements

Control Panel Touch

- Well-arranged presentation of the control and display elements
- Easy operation, input directly on the display
- Programming of automatic start and stop times
- Programming of automatic cleaning cycles (only with option MAJA-SCS self-cleaning system)
- Fast and easy change of language
- Display of additional information
- Residue water outlet (manual)
- Automatic restart of the machine after electricity / water cutoff
- Visualization of state of sanitation
- Checkup after manual cleaning
- "All components correctly placed?"
- Error code indication on the display in clear text
- Sanitation report
- Display error memory
- Degree of protection IP 65

Optionally available:

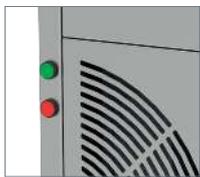
- Protective cover for touch display (pict. 3)
- Length of cable 5, 10 and 18 m
Length of cable 5, 10 and 18 m

Sanitation options

- **Evaporator self-cleaning system MAJA-SCS (pict. 1):**
For sanitation safety at the push of a button; fully automatic cleaning, descaling and reduction of germs of all machine parts that contact water (see page 4)
- **Ozone disinfection (pict. 2):**
Highly reactive oxygen is added to the supply water by the MAJA Ozone Module, reducing germs and microorganisms on all material which is reached by the ozonized water (pipes, water tank, chutes, storage bins...). Easy integration of the MAJA Ozone Module into the water inlet by connecting two water hoses and a permanent 230V power supply.
- **External UV-disinfection system in the water supply:**
For hygienization of the supply water

DIFFERENT TYPES OF CONTROL UNITS

| Type | ON/OFF illuminated pushbuttons, integrated into machine frame | Control Panel ON/OFF with wall support and 5 m cable for remote operation | Control Panel Timer with timer function | Control Panel Standard | Control Panel Touch 5 m Kabel |
|---------------------------|---|---|---|------------------------|-------------------------------|
| SAH 85/170/250/500 | Standard | Option | Option | – | – |
| SAH 800 - 3000 | – | – | – | Standard | Option |
| RVH-L/RVH-LT/RVH-W/RVH-WS | – | – | – | Standard | Option |
| RVH/RVH-F | – | – | – | Standard | Option |
| RVH-CO2/RVH-NH3 | – | – | – | – | Standard |



ON/OFF buttons



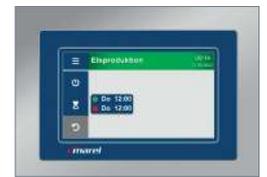
Control Panel ON/OFF



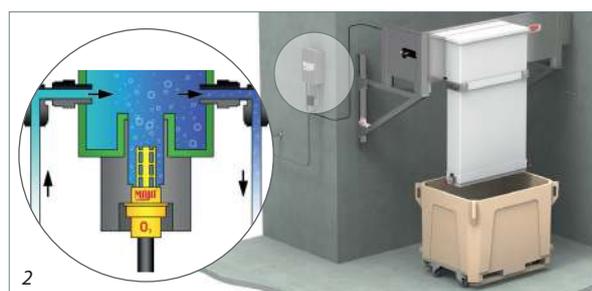
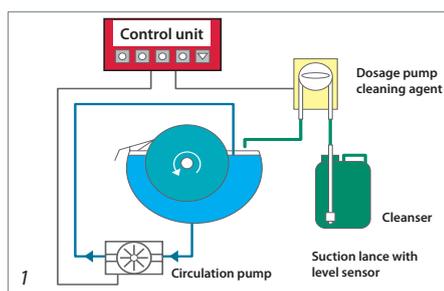
Control Panel Timer



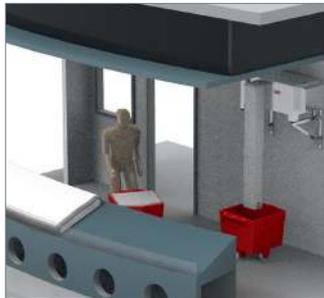
Control Panel Standard



Control Panel Touch



A big variety of installation options



Tailor-made solutions

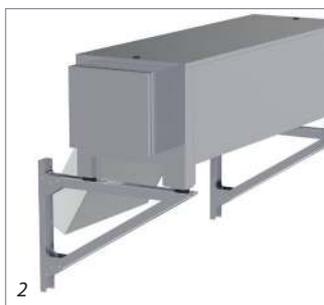
Examples of installation

- **Consoles:**
Special consoles (picture 1 + 2) allow the wall fixation of the SAH compact ice machines up to 500 kg, of the RVH ice producing units up to 3000 kg as well as of the condensing units L/LT 800 - 3000. They can be combined with different chute systems so that the ice falls directly into storage bins, ice transport carts or directly into a supermarket ice display (picture 5).
- **Subframes:**
To allow the individual installation of the ice machines, different types of subframes are available suitable for the use of one or two ice transport carts (picture 3 + 4).
- **Ice chutes:**
Modular chute systems allow a lot of different installation options for MAJA Ice Machines, starting from a simple chute extension, until an automatic Y-chute system with two ice extraction points (picture 6), which can also be supplied with manual blocker allowing to choose the cart to be filled (picture 7).

Further accessories: wall holding devices for chutes, photoelectric barriers, reflection light sensors for ice level control in the reservoir, etc.

1. RVH on wall console with vertical chute
2. RVH on wall console with inclined chute
3. SAH 250/500 on subframe UG 250/500 for cart EVP 310
4. RVH on universal subframe for two ice transport carts EVA 80

5. Chutes for direct filling of supermarket displays with flake ice
6. RVH on wall console with Y chute for two ice outlets EVP 310
7. Extension chute with manual blocker and 2 ice transport carts EVA 80



Ice transport and storage

Ideal conditions for long-lasting freshness

Ice carts for transport and storage

Different mobile ice collection systems allow the convenient transport and the temporary storage of MAJA Flake Ice.

The cart types EV 50, EVA 80, EVP 310 / 460 and EVF 201 are equipped with thermal insulation for an optimum conservation of the MAJA Flake Ice during a certain period of time.

The cart types EVL (without insulation) are offered for short distance ice transportation.

For all types of ice carts special covers are available (option) for protecting the ice from contamination during transport and storage.

CARTS FOR ICE TRANSPORT & STORAGE

| Type | Maximum ice capacity approx. kg | Width mm | Depth mm | Height mm | Weight kg | Suitable for |
|---------|---------------------------------|----------|--------------------|-----------------------|-------------------------|---|
| EV 50 | 50 | 615 | 650 | 661 | 20 (incl. wheeled base) | SAH 85/170 |
| EVA 80 | 80 | 681 | 824 (with handle) | 703 | 22 | Subframes + ITS-K silos, instead of standard mincer carts |
| EVF 201 | 90 | 649 | 1055 (with handle) | 712 (889 with handle) | 25,5 | ITS silos |
| EVP 310 | 130 | 747 | 945 | 762 | 42 | Subframes |
| EVP 460 | 180 | 1030 | 1236 | 628 | 67 | Subframes |
| EVL 250 | 105 | 1030 | 884 | 753 | 25 | Subframes |
| EVL 440 | 185 | 780 | 1100 | 841 | 36 | Subframes |



1. Stackable ice bins EV 50 on wheeled base
2. Ice transport cart EVA 80 for about 80 kg of flake ice
3. Ice storage cart EVP 310 / 460 for approx. 130 / 190 kg of flake ice
4. EVL 250 / 440, the basic solution for the transport of about 105 / 185 kg of flake ice
5. EVF 201 carts for ITS silos; option: set with 6 ice buckets, each for about 11 kg of flake ice

Silo solutions

Optimal storage and simple ice removal

Storage bins and silo systems:

If MAJA Flake Ice has to be produced on stock, the quality of the ice and its durability depend significantly on the storage conditions. The MAJA silo bins are equipped with thermal insulation to minimize the melting process.

The silo surfaces are easy to clean. Drain valves allow the evacuation of melting and cleaning water for sanitary ice storage conditions. Besides that, the silo ranges EN and ITS simplify the ice handling.

The silo EN1 and all ITS-silos are equipped with a comfortable door to take out the ice by hand. Besides that, the ITS-silos have a silo bottom scuttle. When unlocking, the ice falls automatically into the ice storage carts below the silo.

For fully automatic ice extraction and dosage of portion control ice batches, learn more about our automatic ice silo systems at page 21/22.

SILO EN1

| Type | Maximum storage capacity approx. kg (l) | Width mm | Depth mm | Depth with door mm | Height mm | Weight kg |
|------|---|----------|----------|--------------------|-----------|-----------|
| EN 1 | 185 (430) | 762 | 788 | 991 - 1258 | 1093 | 94 |

ITS SILOS WITH ICE STORAGE CART/S EVF

| Type | Maximum silo storage capacity approx. kg | Maximum storage capacity including EVF 201 cart/s kg | Width mm | Depth mm | Depth with door mm | Height mm | Weight (without cart/s) kg | Number of ice cart/s included in delivery |
|-------------|--|--|----------|----------|--------------------|-----------|----------------------------|---|
| ITS 500-31 | 227 | 317 | 788 | 1016 | – | 1524 | 186 | 1 |
| ITS 700-31 | 318 | 408 | 788 | 1016 | 1212 - 1486 | 1905 | 217 | 1 |
| ITS 1350-60 | 612 | 792 | 1524 | 1016 | 1212 - 1486 | 1905 | 378 | 2 |
| ITS 2250-60 | 955 | 1135 | 1524 | 1016 | 1212 - 1486 | 2464 | 412 | 2 |
| ITS 3250-90 | 1474 | 1744 | 2286 | 1016 | 1212 - 1486 | 2464 | 642 | 3 |

ITS SILOS FOR STANDARD MINCER CARTS

| Type | Maximum silo storage capacity kg | Width mm | Depth mm | Depth with door mm | Height mm | Weight kg | Number of ice cart/s (not included in delivery) |
|---------------|----------------------------------|----------|----------|--------------------|-----------|-----------|---|
| ITS 500-31 K | 227 | 863 | 1016 | – | 1587 | 210 | 1 |
| ITS 700-31 K | 318 | 863 | 1016 | 1220 - 1486 | 1949 | 270 | 1 |
| ITS 1350-60 K | 612 | 1673 | 1016 | 1218 - 1486 | 1949 | 425 | 2 |
| ITS 2250-60 K | 955 | 1673 | 1016 | 1220 - 1486 | 2626 | 471 | 2 |
| ITS 3250-90 K | 1474 | 2483 | 1016 | 1220 - 1486 | 2626 | 692 | 3 |



1. SAH 250/500 on silo EN 1
2. Silo ITS 1350-60 including 2 ice carts EVF 201
3. Silo ITS 2250-60 K for the use of 2 standard mincer carts



Flake ice storage systems with automatic distribution

Wherever big quantities of flake ice must be handled, the use of automatic silo systems is recommended. The time-consuming and labor-intensive manual shoveling of tons of flake ice is no longer necessary thanks to fully automatic extraction and weighing solutions.



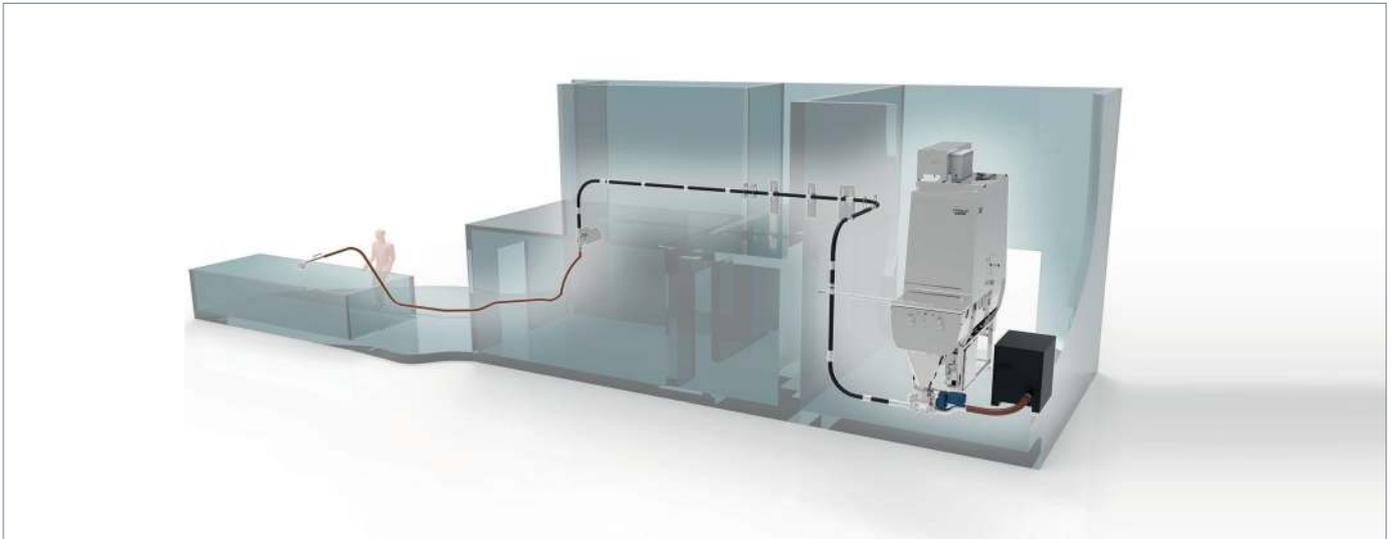
Highly economical and sanitary

IXT Silo with automatic distribution:

- Filling of carts without manual labor**
 The flake ice produced by the MAJA Flake Ice Machine is temporarily stored in the IXT Silo and, as required, discharged into ice transport carts. Manual shoveling is no longer necessary, which saves time and effort and provides greater hygiene.
- Hygienic and robust design:**
 The IXT Silo is made with a stainless-steel frame, housings, and auger conveyors to ensure maximum hygiene. Internal and external angled surfaces provide an easy-to-clean design and thorough melt water emptying.
- Equipment and options:**
 Different optional accessories are available for offering for each special application the optimum solution, allowing economical process optimization. They also have an integrated interface for the use of a Marel floor scale for ice storage trolleys with weighing platform mounted on or embedded in the floor. Further options on demand.

IXT WITH AUTOMATIC DISTRIBUTION

| Type | Storage capacity approx. | Number of auger conveyors | Width mm | Length mm | Height mm | Silo weight (unloaded) kg | Electrical connection kW |
|----------|--------------------------|---------------------------|----------|-----------|-----------|---------------------------|--------------------------|
| IXT 1000 | 1000 kg | 2 | 1265 | 3510 | 3015 | 1900 kg | 2,0 kW |
| IXT 1500 | 1500 kg | 2 | 1265 | 3510 | 3775 | 2100 kg | 2,0 kW |
| IXT 2100 | 2100 kg | 2 | 1265 | 4050 | 3810 | 2400 kg | 2,0 kW |
| IXT 2700 | 2700 kg | 2 | 1265 | 4050 | 4300 | 2550 kg | 2,0 kW |
| IXT 4000 | 4000 kg | 3 | 1775 | 4050 | 4300 | 3350 kg | 2,75 kW |



Portion control ice batches for reliable processes

IXT Silo with pneumatic ice dispensation

- **Filling your flake ice display has never been more comfortable**

One or several MAJA Flake Ice Machines are installed on top of a stainless steel IXT Silo, in which the flake ice is stored until its extraction. A spiral conveyor in the silo delivers the ice to a dosage system. Thanks to pneumatics, the display is filled with flake ice by means of a dosing tube - fast, easy and comfortable.

- **Reduced manual labor**

Manual handling and transportation of ice from the IXT Silo to point-of-use is eliminated due to the dosing hose.

- **Time savings**

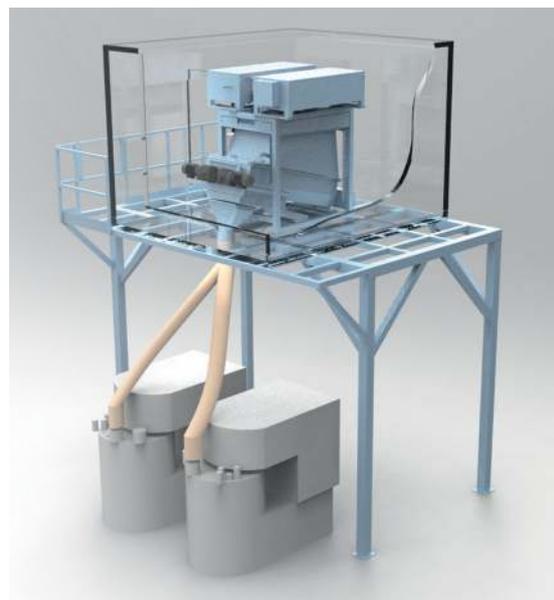
No internal transportation of the flake ice from the place of production to the display.

- **Improved sanitation**

Less contact of the staff with the ice. Silo and spiral conveyor made in solid stainless steel.

VS silo with automatic ice weighing system

- **Intelligent ice management for excellent sanitary conditions and increased efficiency:** The MAJA Ice Weighing Systems of the VS range allow the hygienic storage and dosage of precise flake ice batches. Processors gain more benefit by automating the complete ice application, starting from the flake ice production until the ice dispensation directly into the process (e.g. baking industry).
- **Storage capacity:** approx. 300 kg of MAJA Flake Ice, ambient temperature max. +15°C
Ice dosage by two solid stainless steel spiral conveyors
Individual adjustment of batch volume and batch quantity, depending on the installed ice machine's capacity.
- **Weighing process:** Short batch weighing process, e.g.:
approx. 25 sec. for 10 kg
approx. 40 sec. for 20 kg
- **Weight accuracy:** +/- 250 g (depending on ambient conditions), thus precise temperature adjustment (e.g. for dough production)
- **Touch display:** for manual input of the desired batch weight
- **Option:** full process automation by connection to a superordinated recipe control system



Example of installation: Ice dosage system VS07 with 2 RVH 3000

RVE-02 flake ice machines for fishing vessels

Flake ice machines (rotating evaporators) without condensing unit, for connection to the on-board compound system, for seagoing use in the fishing industry
Ice output 750 - 2.900 kg/24 h

Special flake ice machine range for operation on fishing vessels:

- Made for the trouble-free flake ice production under special conditions at sea, where the quality of the catch depends on the continuous availability of ice and refrigeration.
- Suitable for fresh water or seawater freezing
- For connection to an existing R449A **) refrigeration system
- With maintenance-friendly electro-mechanical controls
- Compact machine size

Special seagoing features:

- Built-in water tank (non removable), with slap-over protection for trouble-free ice production even in rough sea.
- Increased protection from corrosion for operation in salt-laden ambiance, e.g. non-corroding evaporator, housing in stainless steel 1.4571 (AISI 316Ti; formerly V4A)

Accessories & options

- Water tank heating for protection from freezing damages caused by ambient temperatures below +6°C or water temperatures below +8°C
- ON/OFF remote control unit with 5 m cable

| TECHNICAL DETAILS | | | | | | | | MAJA RVE-02 | |
|------------------------|-------------------------------|--|---|---|-------------|-------------|--------------|--------------|--|
| Type | Ice output *) kg/24h (1 h) | Water consumption m ³ /24 h | Refrigeration c apacity required kW | Electrical connection 3AC/50Hz/400V/PE kW ***) | Width mm | Depth mm | Height mm | Weight kg | |
| RVE 702 S Fresh water | 1100 (45) | 1,10 | t ₀ -20,0°C, 6,7 | 0,47 | 1210 | 884 | 640 | 180 | |
| RVE 702 S Salt water | 750 (31) | 0,75 | t ₀ -33,0°C, 4,8 | 0,35 | 1210 | 884 | 640 | 180 | |
| RVE 1702 S Fresh water | 2000 (83) | 2,00 | t ₀ -20,0°C, 12,0 | 0,47 | 1410 | 884 | 640 | 220 | |
| RVE 1702 S Salt water | 1700 (70) | 1,70 | t ₀ -33,0°C, 9,5 | 0,35 | 1410 | 884 | 640 | 220 | |
| RVE 3102 S Fresh water | 2900 (120) | 2,90 | t ₀ -21,0°C, 16,2 | 0,47 | 1580 | 884 | 640 | 250 | |
| RVE 3102 S Salt water | 2200 (91) | 2,20 | t ₀ -33,0°C, 13,0 | 0,47 | 1580 | 884 | 640 | 250 | |

*) The indicated ice output is an approximate value (depending on installation conditions).

Water temperature +16°C, ambient temperatures +20°C

**) R449A: fluorinated greenhouse gas GWP 3922; supplied without refrigerant charge.

***) Special voltage on demand.

Connections: Water supply 3/4" external thread, drain water 1" hose clip





MAJA Nugget Ice for the food business

Versatile applications

Food trade / retail

Refrigeration and presentation of fish and fresh food in supermarket displays.

Catering, hotels, restaurants, roadhouses, petrol stations, events...

Refrigeration of foodstuff and drinks, eyecatcher for the appetizing presentation of different food.

Bars & clubs

Refrigeration and mixing of drinks and cocktails.

Baking business

Dough production of baking and pastry products.

Fish business

Refrigeration of fish and seafood during transport and sales.

Vegetables

Refrigeration of vegetables after the harvest, during transportation, in the distribution and retail.



Long freshness, attractive appearance and easy handling!

Ice is important for the refrigeration, the presentation and the production of foodstuff. If you prefer either the fine, mat-white flake ice or the shiny, granular nugget ice - at MAJA it's up to you which ice will suit you best for your individual requirements!

Production of MAJA Nugget Ice:

An evaporator screw rotates in an evaporation drum, which is filled with water and refrigerated from outside. The water freezes on the inner drum surface to small ice particles, which are scraped off by the rotating evaporator screw and conveyed upwards. The ice passes through an extrusion die and gets like that its characteristic nugget shape.



Ice temperature approx. $-0,5^{\circ}\text{C}$
ideal cooling for versatile application fields of MAJA Nugget Ice.



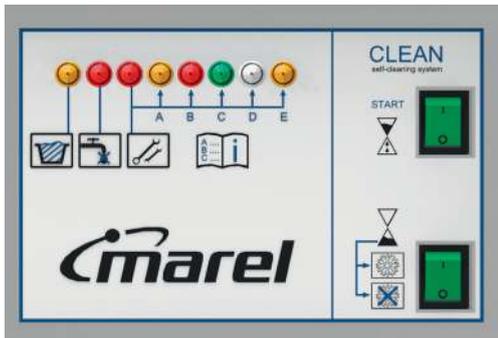
Characteristics
Density approx. $0,5 \text{ kg} / \text{dm}^3$, shiny, irregularly shaped nuggets, granular structure. That's why MAJA Nugget Ice has a very appetizing appearance.



Storage properties
MAJA Nugget Ice can be stocked in insulated storage bins. It can be stored in a cold-room at low temperatures above 0°C for several days, remaining loose and easy to dose.

Compact NAS / NAC

Different machine ranges with or without self-cleaning system. Ice output 175 - 970 kg / 24 h



Control unit with LED display

Equipment & features of MAJA Nugget Ice Machines

Solid execution

- Front / side panels, top cover and ice chute made from stainless steel

Easy operation

- ON/OFF pushbuttons
- LED-display for indication of operation modes

Sanitary nugget ice production

- All NAC types are equipped with MAJA-SCS, the self-cleaning system for ideal sanitation conditions

Refrigeration:

- MAJA Nugget Ice Machines fit into different refrigeration concepts and are available as plug-in compact machine or as a modular ice machine.

MAJA NAS-L/NAC-L:

- Integrated refrigeration unit, air-cooled version (L)
- Refrigerant for NAS/NAC 175/300/530: Propane R290 (GWP 3)
- Refrigerant for NAS/NAC 970: R452A (GWP 2141 **)

MAJA NAS/NAC:

- Without refrigeration unit, for connection to an external refrigeration unit or an existing on-site refrigeration system
- For refrigerants R449A (GWP 1397), R452A (GWP 2141)



NAS/NAC 175



NAS/NAC 300/530



NAS/NAC 970



TECHNICAL DETAILS

MAJA NAS-L/NAC-L

| Type | Ice output *) kg/24 h (1 h) | Fresh water consumption m ³ /24 h | Electrical connection 1AC/50Hz/230V/PE kW | Width mm | Depth mm | Height mm | Refrigerant charge kg | Refrigerant/ GWP | CO2e t | Weight kg |
|---------------|--------------------------------|--|--|-------------|-------------|--------------|-----------------------------|-------------------------|-----------|--------------|
| NAS/NAC 175 L | 175 (7) | 0,175 | 0,80 | 560 | 640 | 622 | 0,095 | R290/3 | < 0,1 | 65/70 |
| NAS/NAC 300 L | 300 (12) | 0,30 | 1,15 | 620 | 640 | 755 | 0,120 | R290/3 | < 0,1 | 80/83 |
| NAS/NAC 530 L | 530 (22) | 0,53 | 1,90 | 620 | 640 | 755 | 0,145 | R290/3 | < 0,1 | 92/95 |
| Type | Ice output *) kg/24 h (1 h) | Fresh water consumption m ³ /24 h | Electrical connection 3AC/50Hz/400V/PE kW | Width mm | Depth mm | Height mm | Refrigerant charge kg | Refrigerant/ GWP **) | CO2e t | Weight kg |
| NAS/NAC 970 L | 970 (40) | 0,97 | 3,60 | 850 | 640 | 915 | 1,200 | R452A/2141 | 2,5 | 150/153 |

*) The indicated ice output is an approximate value (depending on installation conditions).
Water temperature +10°C, ambient temperatures +10°C. Detailed information on demand.

***) R452A belongs to the fluorinated greenhouse gases.

Connections: Water supply 3/4" external thread, drain water 3/4" hose clip

TECHNICAL DETAILS

MAJA NAS/NAC

| Type | Ice output *) kg/24 h (1 h) | Fresh water consumption m ³ /24 h | Electrical connection 1AC/50Hz/230V/PE kW | Refrigeration capacity required kW | Width mm | Depth mm | Height mm | Weight kg |
|-------------|--------------------------------|--|--|--|-------------|-------------|--------------|---------------------|
| NAS/NAC 300 | 300 (12) | 0,30 | 0,3 | 1,25 t ₀ = -18°C (+/-1K) | 620 | 640 | 755 | 62 |
| NAS/NAC 530 | 530 (22) | 0,53 | 0,4 | 1,85 t ₀ = -18°C (+/-1K) | 620 | 640 | 755 | 87 |
| Type | Ice output *) kg/24 h (1 h) | Fresh water consumption m ³ /24 h | Electrical connection 3AC/50Hz/400V/PE kW | Refrigeration capacity required kW | Width mm | Depth mm | Height mm | Weight kg ca. |
| NAS/NAC 970 | 970 (40) | 0,97 | 0,6 | 3,5 t ₀ = -18°C (+/-1K) | 850 | 640 | 915 | 122 |

Sanitation options and installation accessories

- **Water filter system (pict. 1)**

To protect the machine from sediment and limescale deposit for better sanitation. Suitable systems are available from MAJA. They filter out floating particles and reduce the risk of limescale deposit, which has positive effects on the machine's life cycle and state of hygiene.

- **Self-cleaning system MAJA-SCS**

All MAJA Nugget Ice Machines of the NAC series are equipped with the self-cleaning system MAJA-SCS. It allows routine cleaning and deliming - only at the push of a button. All machine parts that contact water are cleaned and delimed thoroughly without demanding precious labour time. Automatic cleaning with MAJA-SCS is not only a guarantee for ideal sanitation conditions for the production of ice: The efficient routine cleaning process helps to maintain the value of your MAJA Nugget Ice Machine.

- **Ozone disinfection (pict. 2)**

Highly reactive oxygen is added to the supply water by the MAJA Ozone Module, reducing germs and micro-organisms on all material which is reached by the ozonized water (pipes, water tank, chutes, storage bins...) Easy integration of the MAJA Ozone Module into the water inlet by connecting two water hoses and a permanent 230V power supply.

Installation accessories

- **Chute systems**

For individual adaption to the local situation

- **Installation on wall consoles (pict. 3) or subframes**

e.g. for the use of ice storage and transport carts EV 50

- **Installation on ice storage silo type ES (pict. 4)**

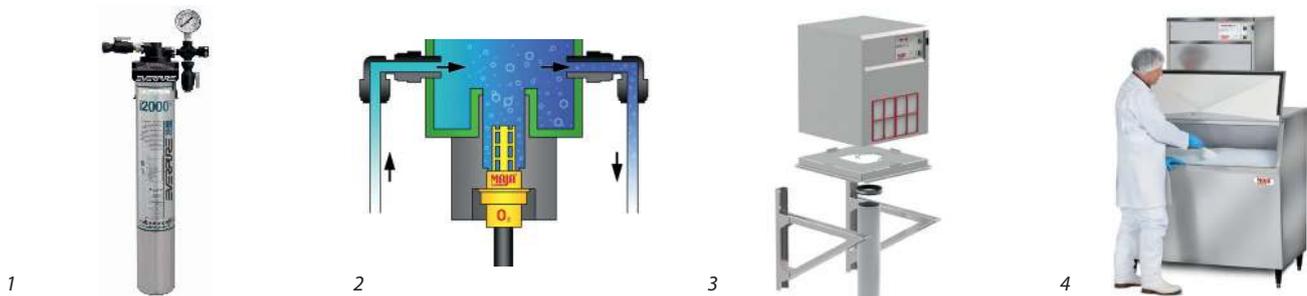
If MAJA Nugget Ice has to be produced on stock, the quality of the ice and its durability depend significantly on the appropriate storage conditions. The nugget ice silos type ES are equipped with thermal insulation to minimize the melting process. The surface is easy to clean. Drain valves allow the evacuation of melting and cleaning water for sanitary ice storage conditions. The nugget ice can be taken out of the silo through a comfortable flap.

TECHNICAL DETAILS

| Type | Capacity kg | Suitable for | Width mm | Depth mm | Height mm | Weight kg |
|--------------------------------|-------------|-------------------|----------|------------|-----------|-----------|
| Subframe for EV 50 *) | - | NAS/NAC 175 - 530 | 787 | 680 | 669 | 25 |
| | | NAS/NAC 970 | 887 | 688 | | 26 |
| Subframe for EVA 80 *) | - | NAS/NAC 175 - 530 | 845 | 725 | 734 | 27 |
| | | NAS/NAC 970 | 887 | 725 | 734 | 28 |
| Mobile ice storage bin EV 50 | 50 | Subframe | 615 | 650 | 661 | 20 |
| Mobile ice storage bin EVA 80 | 80 | Subframe | 681 | 824 | 703 | 22 |
| Mobile ice storage bin EVP 310 | 130 | Subframe | 747 | 945 | 762 | 42 |
| Mobile ice storage bin EVP 460 | 180 | | 1030 | 1236 | 628 | 67 |
| Silo ES 150 *) | 150 | NAS/NAC 175 - 300 | 762 | 801 - 1065 | 1016 | 66 |
| Silo ES 300 *) | 300 | NAS/NAC 530 - 970 | 1220 | | 1270 | 94 |

*) Dimensions of subframes / silos without ice machine

Sanitation accessories for end-to-end hygienic ice production:



The product range at a glance

| NUGGET ICE MACHINES | Ice output kg/24h | Cleaning system MAJA-SCS | Condensing unit | | Refrigerant | | |
|---------------------|----------------------|-----------------------------|-----------------|-------------------------|-------------------|-------------------|---------------|
| | | | Compact machine | Without condensing unit | R449A GWP 1397 | R452A GWP 2141 | R290 GWP 3 |
| NAS 175 L | 175 | | • | | | | • |
| NAC 175 L | 175 | • | • | | | | • |
| NAS 300 L | 300 | | • | | | | • |
| NAC 300 L | 300 | • | • | | | | • |
| NAS 530 L | 530 | | • | | | | • |
| NAC 530 L | 530 | • | • | | | | • |
| NAS 970 L | 970 | | • | | | • | |
| NAC 970 L | 970 | • | • | | | • | |
| NAS 300 | 300 | | | • | • | • | |
| NAC 300 | 300 | • | | • | • | • | |
| NAS 530 | 530 | | | • | • | • | |
| NAC 530 | 530 | • | | • | • | • | |
| NAS 970 | 970 | | | • | • | • | |
| NAC 970 | 970 | • | | • | • | • | |

Ice storage and transport solutions



EV 50



EVA 80



EVP 310



EVP 460



ES 150



ES 300

TRANSFORMING FOOD PROCESSING

