The world of MAJA Ice Machines

FLAKE ICE

NUGGET ICE

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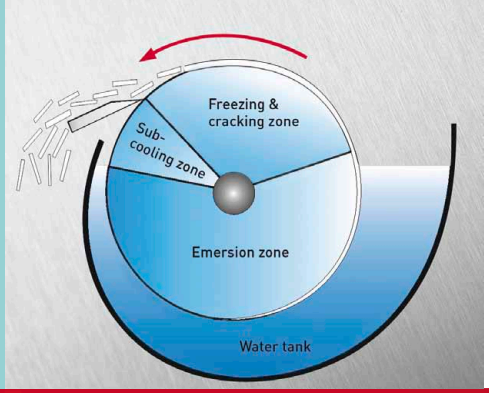
A deep-frozen metal cylinder, rotating in a water reservoir, guarantees constant ice quality. With each rotation, water freezes on the evaporation drum and then flakes off, leaving the machine as dry-frozen ice. This system of ice production was developed by MAJA and has proven its reliability for more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



Flake Ice Technology by MAJA:

Simple, but ingenious - for over 60 years!

MAJA Flake Ice for versatile use:

Applications
- Mincer process for 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

Efficient refrigeration - ice temperature approx. -7°C
- Quick product cooling
- 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 and reduced costs for transportation.

Thin ice flakes (1-2 mm)
- Very good product covering
- Big surface, thus good heat exchange
- Little mechanical resistance, thus good mixing behaviour, no damage to the product and to the tools, such as mincer blades, dough hooks...

Reduced production costs
- High efficiency
- 100% of the water becomes ice, therefore no waste of water

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

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 HY-GEN sanitation principle by MAJA:

Ideal conditions for efficient cleaning, by hand and also fully automatically!

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, special drinking water hoses for protection from biofilm.

With removable water tank

Water tank removal at the side for all types of SAH 85 - 500 and RVH 250

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

Option 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.

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Compact and space saving:
The smallest MAJA Flake Ice Machines **SAH 85 L and SAH 170 L** with integrated condensing unit and mobile ice storage system.
Ice output 85 and 170 kg / 24 h.

Flake ice machines with integrated condensing unit and ice storage system

SAH

SAH 85 / SAH 170 L with EV 50

Equipment & features

Machine structure:

- Cleaning-friendly machine design according to the HY-GEN sanitation principle with removable water tank.
- 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.

Refrigeration:

- Condensing unit in air-cooled execution (L)
- Refrigerant R449A **)
- With 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 (see page 16):
  With function and error code indication, start/stop function of optional self-cleaning system.
- Reliable SPS control unit.

Removal of the water tank for cleaning purposes

Stackable ice storage bins EV 50 on wheeled base

85/170 L

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 L, optional equipment for SAH 85 L
- **Additional ice storage systems 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 (see page 16)
- **Control Panel Timer with timer function** (see page 16):
  Freely programmable ice production and cleaning cycles
- **External UV-disinfection system** in the water supply
- **External water pre-heater:**
  For low water / ambient temperatures between +2°C and +5°C

Technical details

Type	Ice output *) kg / 24 h (1 h)	Water consumption (fresh water) m³/24 h	Electrical connection 1AC/50Hz/230V/PE kW	Width mm	Depth mm	Height mm	Ice storage kg	Refrigerant charge kg	GWP R449A **)	CO2e t	Weight approx. kg
SAH 85 L R449A	85 (3,5)	0,085	0,58	705	700	1380	approx. 50	0,7	1397	1,0	155
SAH 170 L R449A	170 (7,0)	0,170	0,99	705	700	1380	approx. 50	1,0	1397	1,4	175

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

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

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

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MAJA Flake Ice Machines
SAH 250 L and SAH 500 L:
Compact machine structure,
including condensing unit.
Ice output 250 and 500 kg / 24 h

SAH 250 / 500

Flake ice machines with integrated condensing unit

SAH

Equipment & features

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); water-cooled execution (W) on demand.
- With integrated heat exchanger for optimum energy efficiency.
- Refrigerant stop valve and refrigerant pump-down when the machine stops.
- Refrigerant R449A **)

Operation:

- Easy operation by ON/OFF pushbuttons. Control panels with or without program function see page 16.
- Reliable SPS control unit.

Examples of installation SAH 250 / 500:
On subframe for ice cart EVA 75 or on silo EN1

Technical details

Type	Ice output *) kg / 24 h (1 h)	Water consumption (fresh water) m³/24 h	Electrical connection 1AC/50Hz/230V/PE kW	Width mm	Depth mm	Height mm	Refrigerant charge kg	GWP R449A **)	CO2e t	Weight kg
SAH 250 L R449A	250 (10)	0,25	1,26	776	581	996	1,6	1397	2,2	145

Type	Ice output *) kg / 24 h (1 h)	Water consumption (fresh water) m³/24 h	Electrical connection 3AC/50Hz/400V/PE kW	Width mm	Depth mm	Height mm	Refrigerant charge kg	GWP R449A **)	CO2e t	Weight kg
SAH 500 L R449A	500 (20)	0,50	2,05	776	581	996	2,1	1397 (R449A)	2,9	180

Special voltage on demand.

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

**) R449A belongs to the fluorinated greenhouse gases.

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

Installation with minimum wall distance at the left and rear side of the machine.

MAJA Flake Ice Machines
SAH 800 / 1500 / 3000:
Compact machine structure,
including condensing unit.
Ice output 800 - 3000 kg / 24 h

SAH 800 - SAH 1500 - SAH 3000

Flake ice machines with integrated condensing unit

SAH

Equipment & features

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:

- Different versions of condensing units are available:
  - standard air-cooled execution (L)
  - water-cooled execution (W) on demand
- With integrated heat exchanger for optimum energy efficiency.
- Refrigerant stop valve and refrigerant pump-down when the machine stops.
- Refrigerant R449A **)

Easy operation:

- By control panel ON/OFF for remote operation; see page 16 for a big variety of control panels with or without program function.
- 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°C).

Technical details

Type	Ice output *) kg / 24 h (1 h)	Water consumption (fresh water) m³/24 h	Electrical connection 3AC/50Hz/400V/N/PE kW	Width mm	Depth mm	Height mm	Refrigerant charge kg	GWP R449A **)	CO2e t	Weight kg
SAH 800 L R449A	800 (33)	0,80	2,52	1170	760	1150	4,2	1397	4,9	280
SAH 1500 L R449A	1500 (62)	1,50	4,37	1430	780	1230	5,2	1397	7,3	355
SAH 3000 L R449A	3000 (125)	3,00	7,76	1700	980	1420	10,0	1397	14,0	600

Special voltage on demand.

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

**) R449A belongs to the fluorinated greenhouse gases.

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

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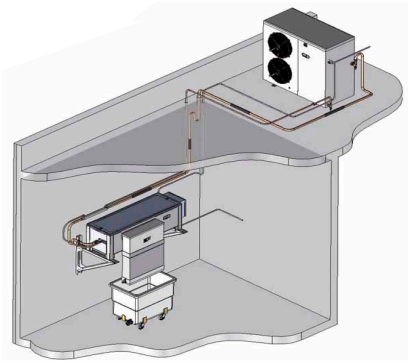
Flake ice machines **RVH-L** and **RVH-LT**: split version for separate installation of ice producing unit (rotating evaporator) and condensing unit, designed to provide individual solutions.
Ice output 250 - 12000 kg / 24 h

RVH 1500 L



Flake ice machines with separate condensing unit

Equipment & features

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.
- 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 gases R449A (GWP 1397) or R404A (GWP 3922) 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 R449A (+45°C with R404A).
- With heat exchanger for optimum energy efficiency.
- Electronic condenser fan speed regulator for automatic adaptation to variable ambient temperatures.

Easy operation:

- By control panel ON/OFF for remote operation; see page 16 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.

Examples of condensing units:

L1000

L1500 - L3000

LT2500 - LT3000

L6000 / LT6000

Flake ice machines with separate condensing unit
R449A / R404A up to approx. +38°C
RVH-L

Technical details

Type	Ice output *) kg / 24 h (1 h)	Fresh water consumption m³/24h	Electrical connection RVH 3AC/50Hz/400V/N/PE kW	Width mm	Depth mm	Height mm	Weight approx. kg	Condensing unit "L" dimensions WxDxH mm Electrical connection kW R449A / R404A Weight approx. kg
RVH 250 L	250 (10)	0,25	0,28	1045	512	525	80	802x462x581 | 1,15 / 1,28 | 65
RVH 400 L	400 (16)	0,40	0,28	1185	512	525	85	1032x462x751 | 1,71 / 1,91 | 90
RVH 800 L	800 (33)	0,80	0,28	1345	512	525	125	1352x732x891 | 2,25 / 2,55 | 167
RVH 1000 L	1000 (41)	1,00	0,28	1545	512	525	145	1352x732x891 | 2,96 / 3,31 | 168
RVH 1500 L	1500 (62)	1,50	0,28	1695	512	525	160	1352x732x1201 | 4,09 / 4,69 | 262
RVH 2000 L	2000 (83)	2,00	0,28	1695	512	525	160	1700x946x1536 | 6,65 / 7,43 | 330
RVH 2500 L	2500 (104)	2,50	0,28	1695	512	525	160	1700x946x1536 | 7,33 / 8,25 | 344
RVH 3000 L	3000 (125)	3,00	0,34	1730	675	525	220	1700x946x1536 | 7,33 / 8,25 | 344
RVH 6000 L	6000 (250)	6,00	0,52	1860	1450	586	320	2200x1300x1810 | 14,64 / 16,73 | 1000
RVH 9000 L	9000 (375)	9,00	0,52 0,34	1863	1456	1572	600	2200x1300x1810 | 14,64 / 16,73 | 1000 1700x 946x1536 | 7,33 / 8,25 | 344
RVH 12000 L	12000 (500)	12,00	0,52 0,52	1863	1456	1572	700	2200x1300x1810 | 14,64 / 16,73 | 1000 2200x1300x1810 | 14,64 / 16,73 | 1000

Flake ice machines with separate condensing unit
R449A up to approx. +42°C
R404A up to approx. +45°C
RVH-LT

Technical details

Type	Ice output *) kg / 24 h (1 h)	Fresh water consumption m³/24h	Electrical connection RVH 3AC/50Hz/400V/N/PE kW	Width mm	Depth mm	Height mm	Weight approx. kg	Condensing unit "LT" dimensions WxDxH mm Electrical connection kW R449A/R404A Weight approx. kg
RVH 250 LT	250 (10)	0,25	0,28	1045	512	525	80	866x462x581| 1,15 / 1,28 | 68
RVH 400 LT	400 (16)	0,40	0,28	1185	512	525	85	1032x462x751 | 2,14 / 2,39 | 90
RVH 800 LT	800 (33)	0,80	0,28	1345	512	525	125	1352x732x891 | 2,75 / 3,11 | 170
RVH 1000 LT	1000 (41)	1,00	0,28	1545	512	525	145	1352x732x1201 | 4,09 / 4,69 | 262
RVH 1500 LT	1500 (62)	1,50	0,28	1695	512	525	160	1352x732x1201 | 5,78 / 6,45 | 262
RVH 2000 LT	2000 (83)	2,00	0,28	1695	512	525	160	1700x946x1536 | 7,33 / 8,25 | 344
RVH 2500 LT	2500 (104)	2,50	0,28	1695	512	525	160	1900x882x1561 | 8,89 / 10,11 | 480
RVH 3000 LT	3000 (125)	3,00	0,34	1730	675	525	220	1900x882x1561 | 8,89 / 10,11 | 480
RVH 6000 LT	6000 (250)	6,00	0,52	1860	1450	586	320	2800x1300x2275 | 21,73 / 25,26 | 1200
RVH 9000 LT	9000 (375)	9,00	0,52 0,34	1863	1456	1572	600	2800x1300x2275 | 21,73 / 25,26 | 1200 1900x 882x1561 | 8,89 / 10,11 | 480
RVH 12000 LT	12000 (500)	12,00	0,52 0,52	1863	1456	1572	700	2800x1300x2275 | 21,73 / 25,26 | 1200 2800x1300x2275 | 21,73 / 25,26 | 1200

Special voltage on demand.

Suction line heat exchanger enclosed separately.

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

**) R449A / R404A belong to the fluorinated greenhouse gases. Supplied without refrigerant filling.

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

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Flake ice producing unit (rotating evaporator) **RVH** without condensing unit, for connection to an external condensing unit or refrigeration system. Compact, space-saving structure.
Ice output 250 - 12000 kg / 24 h


RVH 400


RVH 1000


RVH 1500 - 3000


RVH 6000


RVH 9000 - 12000

Flake ice machines without condensing unit

RVH

Equipment & features

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: consist of two separately operated rotating evaporator units. Advantages: individual control of ice output according to varying needs and high operational safety.


RVH 12000

Refrigeration:

- For operation with the fluorinated greenhouse gases R449A (GWP 1397) or R404A (GWP 3922). Other refrigerants on demand.

Easy operation:

- By control panel ON/OFF for remote operation; see p. 16 for more control panels with or without program function.

Technical details

Type	Ice output *) kg / 24 h (1 h)	Fresh water consumption m³/24 h	Refrigeration capacity required kW	Electrical connection 3AC/50Hz/400V/PE kW	Width mm	Depth mm	Height mm	Weight kg approx.
RVH 250	250 (10)	0,25	t_0 -20,0°C, 1,8	0,28	1045	512	525	80
RVH 400	400 (16)	0,40	t_0 -20,5°C, 2,2	0,28	1185	512	525	85
RVH 800	800 (33)	0,80	t_0 -21,5°C, 4,0	0,28	1345	512	525	125
RVH 1000	1000 (41)	1,00	t_0 -18,5°C, 5,6	0,28	1545	512	525	145
RVH 1500	1500 (62)	1,50	t_0 -18,5°C, 8,4	0,28	1695	512	525	160
RVH 2000	2000 (83)	2,00	t_0 -21,5°C, 11,5	0,28	1695	512	525	160
RVH 2500	2500 (104)	2,50	t_0 -21,5°C, 13,5	0,28	1695	512	525	160
RVH 3000	3000 (125)	3,00	t_0 -21,0°C, 16,2	0,34	1730	675	525	220
RVH 6000	6000 (250)	6,00	t_0 -22,0°C, 33,0	0,52	1860	1450	586	320
RVH 9000	9000 (375)	9,00	t_0 -22,0°C, 33,0 t_0 -21,0°C, 16,2	0,52 0,34	1863	1456	1572	600
RVH 12000	12000 (500)	12,00	t_0 -22,0°C, 33,0 t_0 -22,0°C, 33,0	0,52 0,52	1863	1456	1572	700

Special voltage on demand.

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

Supplied without refrigerant filling.

For optimized working conditions concerning ice capacity and ice quality a suction line heat exchanger is necessary.

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

Flake ice machines (rotating heat exchangers) **RVH-F** without condensing unit, for connection to a heat transfer medium circuit. For ecological and sustainable ice production projects.
Ice output 2.000 - 8.000 kg / 24 h

Flake ice machines for connection to a heat transfer medium circuit

RVH-F

Equipment & features

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:

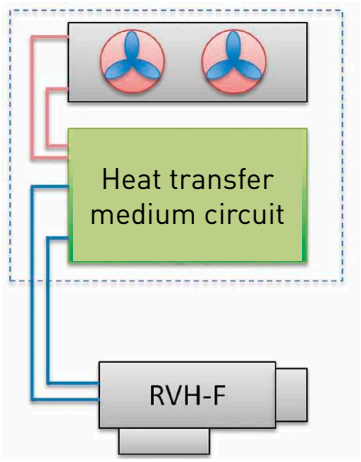
- No influence on the destruction of the ozone layer and the greenhouse effect.
  Ozone depletion potential ODP = 0
  Global warming potential GWP = 0

Easy operation:

- By control panel ON/OFF for remote operation; see page 16 for a big variety of control panels with or without program function.

Installation conditions

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



Technical details

Type	Ice output*) kg/24h (1 h)	Water consumption (fresh water) m³/24h	Refrigeration capacity required kW **)	Electrical connection 3AC/50Hz/400V/PE kW	Width mm	Depth mm	Height mm	Weight approx. kg
RVH 2000 F	2000 (83)	2,0	11,0	0,34	1730	675	525	220
RVH 4000 F	4000 (166)	4,0	22,0	0,52	1860	1450	586	320
RVH 6000 F	6000 (250)	6,0	11,0 + 22,0	0,34 + 0,52	1863	1456	1572	600
RVH 8000 F	8000 (333)	8,0	22,0 + 22,0	0,52 + 0,52	1863	1456	1572	700

Special voltage on demand.

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

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

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

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Flake ice producing unit (rotating evaporator) **RVH-NH3** without condensing unit, for direct operation with an ammonia / R717 multicompressor refrigeration unit.
For ecological and sustainable ice production projects.
Ice output 7000 and 14000 kg / 24 h

RVH 12000 NH3

Flake ice machine for direct ammonia operation NH_3 (R717)

RVH-NH3

Equipment & features

Optimum energy efficiency - increased power density:
- Compared to traditional refrigerants, e.g. R404A, 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.

Eco-friendly flake ice production:
- Excellent ecological impact by the use of the natural refrigerant R717 (ammonia / NH_3).
- 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 (control unit 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 16).

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

Technical details

Type	Ice output *) kg/24h (1 h)	Water consumption (fresh water) m³/24h	Refrigeration capacity required	Electrical connection 3AC/50Hz/400V/PE kW	Width mm	Depth mm	Height mm	Weight approx. kg
RVH 6000 NH3	7000 (291)	7,0	t_0 -30,0°C, 42 kW	0,96	1860	1450	586	330
RVH 12000 NH3	14000 (583)	14,0	t_0 -30,0°C, 84 kW	2 x 0,96	1863	1456	1572	720

Special voltage on demand.

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

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

Flake ice producing unit (rotating evaporator) **RVH-CO2** without condensing unit, for direct carbon dioxide operation with a R744 multicompressor refrigeration unit. For ecological and sustainable ice production projects.
Ice output 500 - 15200 kg / 24 h

RVH 1500 CO2

CO2 ECO FRIENDLY

Flake ice machine for direct carbon dioxide operation CO_2 (R744)

RVH-CO2

Equipment & features

Optimum energy efficiency - increased power density:
- Compared to traditional refrigerants, e.g. R404A, 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 / CO_2) 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 temperature 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).

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 or R404A circuit as an interim solution until final refit of the whole refrigeration system.

Technical details

Type	Ice output *) kg/24h (1 h)	Water consumption (fresh water) m³/24h	Refrigeration capacity required	Electrical connectioin 3AC/50Hz/400V/PE kW	Width mm	Depth mm	Height mm	Weight approx. kg
RVH 400 CO2	500 (21)	0,5	t_0 -25,0°C, 2,8 kW	0,28	1185	512	525	85
RVH 800 CO2	1000 (41)	1,0	t_0 -25,0°C, 5,5 kW	0,28	1345	512	525	125
RVH 1000 CO2	1300 (54)	1,3	t_0 -25,0°C, 7,3 kW	0,28	1545	512	525	145
RVH 1500 CO2	1900 (79)	1,9	t_0 -25,0°C, 10,7 kW	0,28	1695	512	525	160
RVH 2000 CO2	2500 (104)	2,5	t_0 -25,0°C, 14,4 kW	0,28	1695	512	525	160
RVH 2500 CO2	3000 (125)	3,0	t_0 -25,0°C, 16,2 kW	0,28	1695	512	525	160
RVH 3000 CO2	3800 (158)	3,8	t_0 -25,0°C, 20,5 kW	0,34	1730	675	525	220
RVH 6000 CO2	7600 (317)	7,6	t_0 -25,0°C, 41,0 kW	0,52	1860	1450	586	320
RVH 9000 CO2	11400 (475)	11,4	t_0 -25,0°C 41,0 kW + 20,5 kW	0,52 + 0,34	1863	1456	1572	600
RVH 12000 CO	15200 (634)	15,2	t_0 -25,0°C 41,0 kW + 41,0 kW	0,52 + 0,52	1863	1456	1572	700

Special voltage on demand.

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

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

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MAJA Flake Ice Machines:

Overview about the complete range

FLAKE ICE MACHINES	Ice output kg/24h	Condensing unit		
		Compact machine	Split installation	Without condensing unit
SAH 85 L - SAH 3000 L	85 - 3000	●		
SAH 250 W - SAH 3000 W	250 - 3000	●		
SAH 500 WS - SAH 3000 WS	500 - 3000	●		
RVH 250 L - RVH 12000 L -15°C to approx. +38°C	250 - 12000		●	
RVH 250 LT - RVH 12000 LT -15°C to approx. +42°C (+45°C)			●	
RVH 800 W - RVH 12000 W -15°C to approx. +38°C	800 - 12000		●	
RVH 800 WS - RVH 12000 WS -15°C to approx. +38°C			●	
RVH 250 - RVH 12000	250 - 12000			●
RVH 250 N - RVH 12000 N (without control unit)	250 - 12000			●
RVH 2000 F - RVH 8000 F	2000 - 8000			●
RVH 6000 NH3 - RVH 12000 NH3	7000 + 14000			●
RVH 400 CO2 - RVH 12000 CO2	500 - 15200			●
RVE 702 S - RVE 3102 S ship version (integral water tank)	750 - 2900			●

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)
- **Ice producing units without condensing unit for connection to an existing multicompressor refrigeration system** (RVH, RVH-N, RVH-NH3, RVH-CO2, RVH-F).
- **Ice producing units 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 for R449A and from approx. -15°C to + 45°C for R404A.
- **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°C).

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

Refrigeration of condensing unit			Refrigerant				Heat transfer fluid
Air	Water	Heat transfer medium	R404A	R449A	R744 (CO_2)	R717 (NH_3)	Fluid
●				●			
	●			●			
		●		●			
●			●	●			
●			●	●			
	●		●	●			
		●	●	●			
			●	●			
			●	●			
							●
						●	
					●		
			●	●			

Refrigerants

- Standard refrigerants for MAJA Flake Ice Machines: **R449A (GWP 1397)** and **R404A (GWP 3922).** 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 refrigerans without ecological impact:

  R717 / NH_3 (ODP = 0, GWP = 0)
  R744 / CO_2 (ODP = 0, GWP = 1)

- **Alternative refrigerant solution:**

  Heat transfer fluid (ODP = 0, GWP = 0)

NH_3 ECO FRIENDLY

CO_2 ECO FRIENDLY

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MAJA Flake Ice Machines:
Individual configuration for meeting with any requirements.

Different types of control units

Type	ON/OFF pushbuttons illuminated, 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 cable
SAH 85 / 170 / 250 / 500	Standard	Optional	Optional	---	---
SAh 800 - 3000	---	---	---	Standard	Optional
RVH-L / RVH-LT / RVH-W / RVH-WS	---	---	---	Standard	Optional
RVH / RVH-F	---	---	---	Standard	Optional
RVH-CO2 / RVH-NH3	---	---	---	---	Standard

ON/OFF buttons


Control Panel ON/OFF


Control Panel Timer


Control Panel Standard

Control Panel Touch (touch display)

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

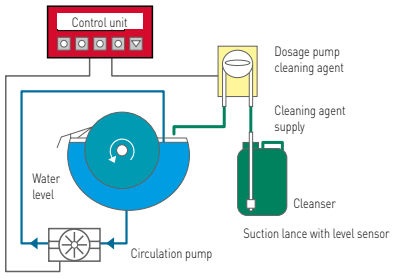
Optionally available:
- Protective cover for touch display
- Length of cable 5, 10 and 18 m


Protective cover for Control Panel Touch

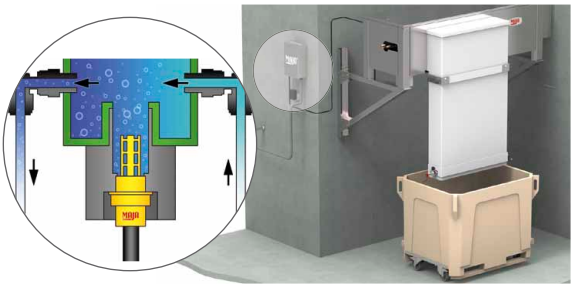
Sanitation options

- **Evaporator self-cleaning system MAJA-SCS** (pict. 2)**:** 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 3).
- **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.
- **External UV-disinfection system in the water supply:** For hygienization of the supply water

Pict. 1

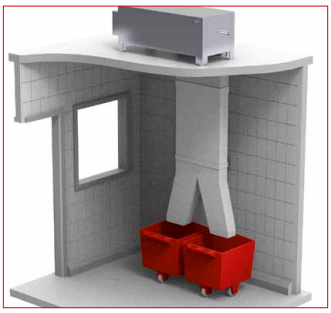
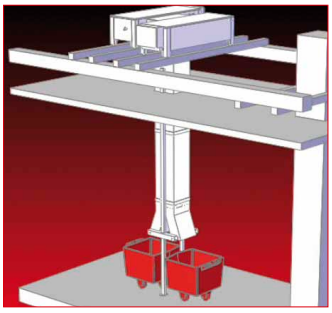
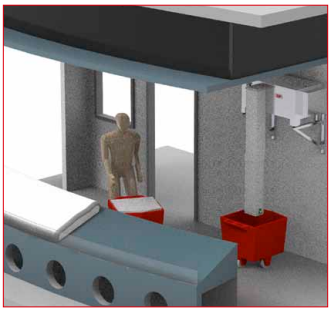
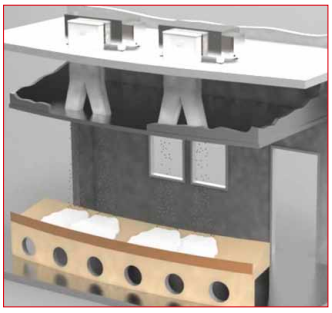


Pict. 2



A big variety of installation options allow tailor-made solutions.

Examples of installation

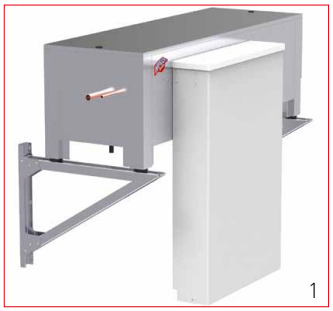
Installation accessories

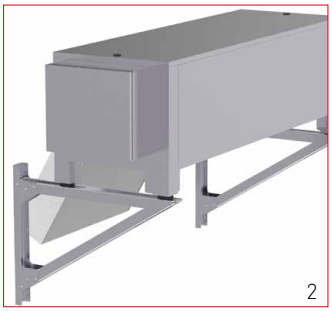
- **Consoles:**
  Special consoles (picture 1 + 2) allow the wall fixation of the SAH compact ice machines up to 500 kg, of the RVH ice producing units up to 3000 kg as well as of the condensing units L/LT 800 - 3000. They can be combined with different chute systems so that the ice falls directly into 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 chose 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

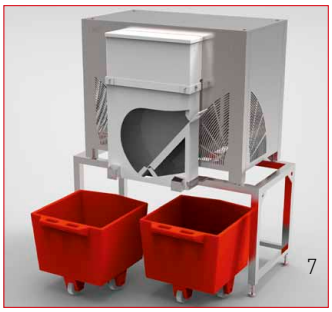

2
RVH on wall console with inclined chute


3
SAH 250/500 on subframe UG 250/500 for cart EVA 75


4
RVH on universal subframe for two ice transport carts EVA 75


5
Chutes for direct filling of supermarket displays with flake ice


6
RVH on wall console with Y chute for two ice outlets


7
Extension chute with manual blocker and ice transport carts EVA

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Ice handling and transport

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 75, 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.

Stackable ice bins
EV 50 on wheeled base

Ice transport cart EVA 75 for
about 75 kg of MAJA Flake Ice

Ice storage cart EVP 310 / 460
for aprox. 130 / 190 kg of flake ice

Useful equipment:
Ice shovels (white or blue)
made from food safe plastics

EVL 250 / 440, the basic solution
for the transport of about 105 / 185
kg of MAJA Flake Ice

EVF 201 carts for ITS silos
Option: set with 6 ice buckets,
each for about 11 kg of flake ice.

Carts for ice transport & storage

Type	Maximum ice capacity 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 75	75	680	800 (with handle)	680	20,5	Subframes + ITS-K silos, instead of standard mincer carts
EVP 310	130	747	945	762	42	Subframes
EVP 460	190	1030	1236	628	67	Subframes
EVF 201	90	649	1055 (with handle)	712 (889 with handle)	25,5	ITS silos
EVL 250	105	624	884	753	25	Subframes
EVL 440	185	780	1100	841	36	Subframes

Ice storage

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 MAJA's automatic ice silo systems at page 20.

SAH 250/500 on silo EN 1

Silo ITS 1350-60 including 2 ice carts EVF 201

Silo ITS 1350-60 K for the use of 2 standard mincer carts

Silo EN1

Type	Max. 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	Max. silo storage capacity approx. kg	Max. 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	1220 - 1486	1905	217	1
ITS 1350-60	612	792	1524	1016	1220 - 1486	1905	378	2
ITS 2250-60	955	1135	1524	1016	1220 - 1486	2464	412	2
ITS 3250-90	1474	1744	2286	1016	1220 - 1486	2464	642	3

ITS silos for standard mincer carts

Type	Max. storage capacity approx. kg	Width mm	Depth mm	Depth with door mm	Height mm	Weight kg	Number of mincer carts (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	1220 - 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

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

Flake ice storage systems with automatic dispension: highly economical and sanitary.

AS

Equipment & features

- The ice produced by the MAJA flake ice machine installed on the silo cover, falls into the silo for intermediate storage. At the push of a button, the required ice quantity is automatically extracted by means of solid spiral conveyors.
- **Improved sanitary conditions:**
  No manual ice handling, no contact with external tools!
- The silo frame, internal and external housings as well as the spiral conveyors are made from stainless steel.
- Different optional accessories are available for offering for each special application the optimum solution, allowing economical process optimization.
- With interface for installing a floor balance.

Automatic flake ice silos type AS

Type	Storage capacity approx. m³ (kg)	Number of spiral conveyors	Width mm	Depth mm	Height mm	Silo weight (unloaded) kg	Max. silo cover load kg	Electrical connection kW 3AC/50Hz/N/PE/400V
AS 21	2,1 (800)	2	1451	3811	2473	1500	1000	2,0
AS 30	3,0 (1200)	2	1451	3811	2973	1500	1000	2,0
AS 45	4,5 (1800)	2	1451	3811	3723	1750	1000	2,0
AS 50	5,0 (2000)	3	1642	4342	3229	2350	1500	3,8
AS 63	6,3 (2600)	3	1642	4342	3729	2500	1500	3,8
AS 72	7,2 (3000)	3	1796	4824	3282	2950	1500	3,8
AS 77	7,7 (3200)	3	1642	4342	4229	2700	1500	3,8
AS 92	9,2 (3800)	3	1796	4824	3782	3150	1500	3,8
AS 112	11,2 (4600)	3	1796	4824	4282	3300	1500	3,8

Examples for options & accessories

- Digital ice level indication (approx. 1 % precision)
- Further options on demand.

AS silo with pneumatic ice dispension

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 AS-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.

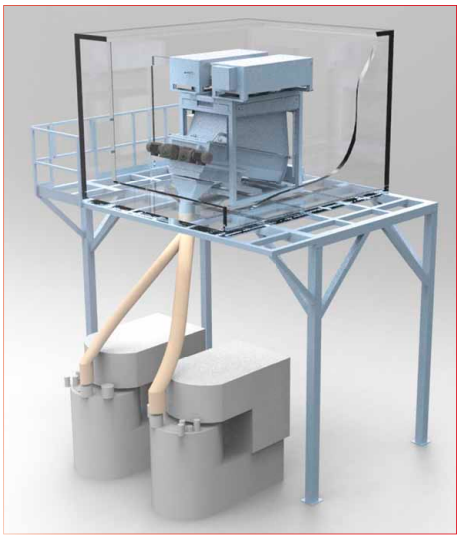
- **Reduced manual labor:**
  No longer manual shovelling of tons of flake ice! Simplified work for the staff, better working conditions.
- **Time savings:**
  No internal transportation of the flake ice from the place of production to the display.
- **Improved sanitation:**
  Less contact of the staff with the ice. Silo and spiral conveyor made in solid stainless steel.

Portion control ice batches:
Precise weight for reliable processes.

VS

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 dispension directly into the process (e.g. baking industry).



Example of installation:
Ice dosage system VS5 with 2 RVH 3000

Equipment & characteristics

- 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.
- 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 super-ordinated recipe control system.
- Reliable process and traceability
- Time savings by automatic dosage

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Flake ice machines (rotating evaporators) **RVE-2S** without condensing unit, for connection to an existing refrigeration system for seagoing use onboard of fishing vessels.
With built-in water tank.
Ice output 750 - 2.900 kg / 24 h

Flake ice machines for fishing vessels:

Made for seagoing use in the fishing industry.

Equipment & features

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 R404A **) refrigeration system
- With maintenance-friendly electro-mechanical controls
- Compact machine size

Special seagoing machine execution:

- 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

Type	Ice output *) kg/24h (1 h)	Water consumption m³/24h	Refrigeration capacity required	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 kW	0,47	1210	884	640	180
RVE 702 S seawater	750 (31)	0,75	t_0 -33,0°C, 4,8 kW	0,35	1210	884	640	180
RVE 1702 S fresh water	2000 (83)	2,00	t_0 -20,0°C, 12,0 kW	0,47	1410	884	640	205
RVE 1702 S seawater	1700 (70)	1,70	t_0 -33,0°C, 9,5 kW	0,35	1410	884	640	205
RVE 3102 S fresh water	2900 (120)	2,90	t_0 -21,0°C, 16,2 kW	0,47	1580	884	640	215
RVE 3102 S seawater	2200 (91)	2,20	t_0 -33,0°C, 13,0 kW	0,47	1580	884	640	215

Special voltage on demand.

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

**) R404A: fluorinated greenhouse gas GWP 3922; supplied without refrigerant charge.

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

MAJA PART OF marel

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.

MAJA Nugget Ice for the food business:
Long freshness, attractive appearance and easy handling!

Versatile applications for MAJA Nugget Ice:

- **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.

Special characteristics of MAJA Nugget Ice:

- **Ice temperature**
  Approx. -0,5°C, thus ideal cooling for versatile application fields of MAJA Nugget Ice.
- **Characteristics**
  Density approx. 0,5 kg / dm³, shiny, unregularly 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.

MAJA Nugget Ice Machines types NAS / NAC:
Different machine ranges with or without self-cleaning system as well as useful accessories are available to meet with individual customer requirements.
Ice output 175 - 1420 kg / 24 h

NAS / NAC 175

NAS / NAC 300

NAS / NAC 970

MAJA Nugget Ice Machines:
For every requirement the best solution.

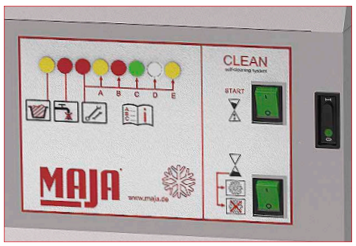
NAS
NAC

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 (see options page 26).



Operating unit with LED-display

MAJA Nugget Ice Machines NAS-L / NAC-L

NEW self-cleaning system

Machine structure:
- Compact machine, ready for plug & play

Refrigeration:
- Integrated condensing unit, air-cooled execution (L)
- Refrigerant of NAS / NAC 175 L / 300 L / 530 L: propane R290 (GWP 3)
  Refrigerant of NAS / NAC 970 L: R452A (GWP 2141 **)

R290 ECO FRIENDLY

Technical details

Type	Ice output *) kg / 24 h (1 h)	Water consumption (fresh water) m³/24 h	Electrical connection 1AC/50Hz/230V/N/PE kW	Width mm	Depth mm	Height mm	Refrigerant charge kg	Refrigerant GWP **)	CO2e t	Weight kg approx.
NAS / NAC 175 L	175 (7)	0,175	0.80	560	640	622	0,095	R290 / 3	< 0,1	65
NAS / NAC 300 L	300 (12)	0,30	1,15	620	640	755	0,120	R290 / 3	< 0,1	81
NAS / NAC 530 L	530 (22)	0,53	1,90	620	640	755	0,145	R290 / 3	< 0,1	93

Type	Ice output *) kg / 24 h (1 h)	Water consumption (fresh water) m³/24 h	Electrical connection 3AC/50Hz/400V/N/PE kW	Width mm	Depth mm	Height mm	Refrigerant charge kg	Refrigerant GWP **)	CO2e t	Weight kg approx.
NAS / NAC 970 L	970 (40)	0,97	3,60	850	640	915	1,200	R452A / 2141	2,5	149

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

**) R452A belongs to the fluorinated greenhouse gases.

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

MAJA Nugget Ice Machines NAS / NAC

Machine structure:

- Without condensing unit, for connection to an external refrigeration unit or a multicompressor circuit

Refrigeration:

- For refrigerants R449A (GWP 1397), R452A (GWP 2141), R404A (GWP 3922) (fluorinated greenhouse gases)

Technical details

Type	Ice output *) kg / 24 h (1 h)	Water consumption (fresh water) m³/24 h	Electrical connection 1AC/50Hz/230V/N/PE kW	Refrigeration capacity required kW	Width mm	Depth mm	Height mm	Weight kg approx.
NAS / NAC 300	300 (12)	0,30	0,3	1,25 t_0= -18°C (+/-1K)	620	640	755	64
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)	Water consumption (fresh water) m³/24 h	Electrical connection 3AC/50Hz/400V/N/PE kW	Refrigeration capacity required kW	Width mm	Depth mm	Height mm	Weight kg approx.
NAS / NAC 970	970 (40)	0,97	0,6	3,5 t_0= -18°C (+/-1K)	850	640	915	122

MAJA Nugget Ice Machines NAS-CO2 / NAC-CO2

Machine structure:

- Without condensing unit, for direct operation with a R744 / CO_2 refrigeration unit HP_{max} = 90 / 52 bar, LP_{max} = 60 bar.
- Compared to other traditional refrigerants (e.g. R404A) the carbon dioxide operation brings more power density.

Eco-friendly flake ice production:

- Excellent ecological impact by the use of the natural refrigerant R744 (carbon dioxide / CO_2) for flake ice production.
- R744 consists of the elements carbon and oxygen, which are natural parts of the atmosphere. It has almost no influence on the destruction of the ozone layer and on the global warming effect:

  Ozone depletion potential ODP = 0
  Global warming potential GWP = 1

Technical details

Type	Ice output *) kg / 24 h (1 h)	Water consumption (fresh water) m³/24 h	Electrical connection 1AC/50Hz/230V/N/PE kW	Refrigeration capacity required kW	Width mm	Depth mm	Height mm	Weight kg approx.
NAS / NAC 440 CO2	440 (18)	0,44	0,3	1,8 t_0 = -18°C (+/-1K)	620	640	755	64
NAS / NAC 780 CO2	780 (32)	0,78	0,4	2,7 t_0 = -18°C (+/-1K)	620	640	755	87

Type	Ice output *) kg / 24 h (1 h)	Water consumption (fresh water) m³/24 h	Electrical connection 3AC/50Hz/400V/N/PE kW	Refrigeration capacity required kW	Width mm	Depth mm	Height mm	Weight kg approx.
NAS / NAC 1420 CO2	1420 (59)	1,42	0,6	5,1 t_0 = -18°C (+/-1K)	850	640	915	122

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

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

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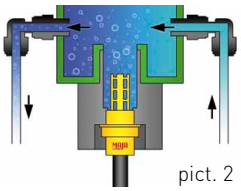
Sanitation accessories for end-to-end hygienic ice production


pict. 1

- **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.


pict. 2

- **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.


pict. 3

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.


pict. 4

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
Subframe for EV 50	---	NAS / NAC 970 - 1420 CO2	887	688	669	26
Subframe for EVA 75	---	NAS / NAC 175 - 530	814	814	734	27
Subframe for EVA 75	---	NAS / NAC 970 - 1420 CO2	887	725	734	28
Mobile ice storage bin EV 50	50	subframe	615	650	661	20
Mobile ice storage bin EVA 75	75	subframe	680	800	680	20
Mobile ice storage bin EVP 310	130	Subframe	747	945	762	42
Mobile ice storage bin EVP 460	460	Subframe	1030	1236	628	67
Silo ES 150	150	NAS / NAC 175 - 530	762	801 - 1065	1016	66
Silo ES 300	300	NAS / NAC 530 - 1420 CO2	1220	801 - 1065	1270	94

*) Dimensions of subframes and silos without ice machine


EV 50


EVA 75


EVP


ES 150


ES 300

MAJA Nugget Ice Machines:

The product range at a glance

MAJA NUGGET ICE MACHINES	Ice output kg/24h	Cleaning system MAJA-SCS	Condensing unit		Refrigerant			
			Compact machine with integrated condensing unit	Without condensing unit	R404A GWP 3922 --- R449A GWP 1397	R452A GWP 2141	R290 GWP 3	R744 GWP 1
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	●		●	●	●		
NAS 440 CO2	440			●				●
NAC 440 CO2	440	●		●				●
NAS 780 CO2	780			●				●
NAC 780 CO2	780	●		●				●
NAS 1420 CO2	1420			●				●
NAC 1420 CO2	1420	●		●				●

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