

The world of MAJA Ice Machines

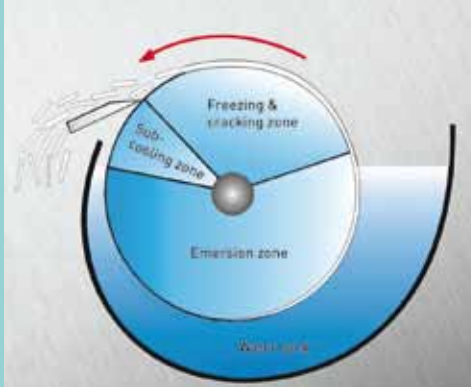
FLAKE ICE

NUGGET ICE



MAJA[®]

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 50 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...



All about sanitary
MAJA Flake Ice

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 evaporator 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 evaporator tank in plastic material (insulation and no corrosion).
- Round-shaped, cleaning-friendly evaporator tank; if necessary it is even replaceable.
- Evaporator tank free of built-in parts without angles and edges, 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 & gaz), for example: water supply with back-flow protection, special drinking water hoses for protection from biofilm.



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, delimiting 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.



With
removable
water tank

Evaporator tank removal at the side for the small machine types up to 500 kg.

Evaporator tank removal at the top for all machine types from 800 kg upwards.



Compact and space saving:
The smallest MAJA Flake Ice
Machines **SAH 85 L / SAH 170 L**
with integrated condensing unit
and mobile ice storage system
EV 50.
Ice output 85 and 170 kg / 24 h.



Video evaporation
tank removal at
SAH 85/170

Flake ice machines with integrated condensing unit and ice storage system

SAH



SAH 85 / SAH 170 with EV 50

Equipment & features

- Cleaning-friendly machine design according to the HY-GEN sanitation principle with removable water tank.
- Frame and housing in stainless steel.
- Condensing unit in air-cooled execution (L).
- 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.
- With integrated heat exchanger for optimum energy efficiency.
- Refrigerant stop valve and refrigerant pump-down when the machine stops.
- 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.



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 Timer with timer function (see page 16): free programmable production and cleaning cycles.
- External UV-disinfection system in the water supply.
- External water pre-heater for water/ambient temperatures between +2°C and +5°C.



Technical details

Type	Ice output *) kg / 24 h	Water consumption m ³ /24 h	Electrical connection 1AC/50Hz/230V/PE kW	Width mm	Depth mm	Height mm	Ice storage kg	Weight kg
SAH 85 L	85	0,085	0,58	705	700	1380	approx. 50	155
SAH 170 L	170	0,170	0,99	705	700	1380	approx. 50	175

Refrigerant R404A

*) Water temperature +16°C, ambient temperature +20°C; higher temperatures may lead to reduced ice output.

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

- Cleaning-friendly machine design according to the principle of HY-GEN sanitation with removable evaporation tank.
- Condensing unit in air-cooled execution (L). Water-cooled execution (W) on demand.
- Refrigerant R404A.
- Frame and housing in stainless steel.
- Reliable SPS control unit.
- Easy operation by a big variety of control panels with or without program function (see page 16).
- With integrated heat exchanger for optimum energy efficiency.
- Refrigerant stop valve and refrigerant pump-down when the machine stops.



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	Water consumption m ³ /24 h	Electrical connection 1AC/50Hz/230V/PE kW	Width mm	Depth mm	Height mm	Weight kg
SAH 250 L	250	0,25	1,26	776	581	996	145

Type	Ice output *) kg / 24 h	Water consumption m ³ /24 h	Electrical connection 3AC/50Hz/400V/PE kW	Width mm	Depth mm	Height mm	Weight kg
SAH 500 L	500	0,50	2,29	776	581	996	180

*) Water temperature +16°C, ambient temperature +20°C; higher temperatures may lead to reduced ice output.
 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



The whole range
 of MAJA Flake Ice
 Machines



SAH 800 - 3000

Flake ice machines with integrated condensing unit

SAH

Equipment & features

- Cleaning-friendly machine design according to the principle of HY-GEN sanitation with removable evaporation tank.
- Condensing unit in air-cooled execution (L).
- Standard refrigerant R404A.
- Frame and housing in stainless steel.
- Reliable SPS control unit.
- Easy operation by a big variety of control panels with or without program function (see page 16).
- With integrated heat exchanger for optimum energy efficiency.
- Refrigerant stop valve and refrigerant pump-down when the machine stops.

Options

- Refrigerant R407F for SAH 800 L - SAH 3000 L:
 Compared to R404A, this refrigerant has a reduced global warming potential (GWP) of about 50 %.
- 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 IN-OUT of about 5 K ($t_{\min} -8^{\circ}\text{C}$).

Technical details

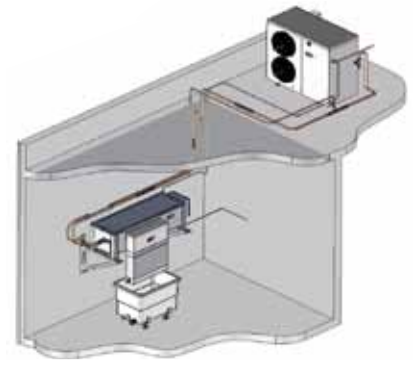
Type	Ice output *) kg / 24 h	Water consumption m ³ /24 h	Electrical connection 3AC/50Hz/400V/PE kW	Width mm	Depth mm	Height mm	Weight kg
SAH 800 L	800	0,80	2,8 (R407F 2,4)	1170	760	1150	280
SAH 1500 L	1500	1,50	5,0 (R407F 4,4)	1430	780	1230	355
SAH 3000 L	3000	3,00	8,7 (R407F 7,85)	1700	980	1420	600

*) Water temperature +16°C, ambient temperature +20°C; higher temperatures may lead to reduced ice output.
 Water supply 3/4" external thread, drain water 1" hose clip.

Flake ice machines **RVH-L** and **RVH-LT**: split version with separate 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

- Cleaning-friendly machine design according to the principle of HY-GEN sanitation with removable evaporation tank.
- Separate condensing unit in weather protection housing in galvanized steel. Silent, solid and service-friendly solution with good access for maintenance.
- Condensing units with standard refrigerant R404A:
 - L = air-cooled execution for ambient temperatures from -15°C up to approx. +32°C
 - LT = air-cooled execution for ambient temperatures from -15°C up to approx. +45°C
- Easy operation by a big variety of control panels with or without program function (see page 16).
- RVH 9000 and RVH 12000 L/LT consist of two separately operated rotating evaporator units.
Advantages: high operation safety and individual control of ice output according to varying needs.
- Electronic condenser fan speed regulator for automatic adaptation to variable ambient temperatures
- With suction line heat exchanger for optimized working conditions concerning ice capacity and ice quality.

Options

- Winter mode for ambient temperatures between -15°C and approx. -40°C.
- Refrigerant R407F for RVH 800 LT - RVH 12000 LT: Compared to R404A, this refrigerant has a reduced global warming potential (GWP) of about 50 %. Suitable for ambient temperatures from -15°C up to approx. +38°C. The standard technical details are similar to the standard R404A LT-versions. Details on demand.
- Separate condensing unit in water-cooled execution (W): Mounted on subframe without housing. Refrigeration by water t_{IN} up to max. +30°C. Temperature difference t_{IN} / t_{OUT} approx. 10 - 20 K.
- Separate condensing unit, refrigeration by heat transfer medium (WS): Mounted on subframe without housing. Refrigeration by heat transfer medium t_{IN} up to min. -8°C. For a temperature difference t_{IN} / t_{OUT} of approx. 5 K.

Examples of condensing units:



L1000



L1500 - L3000



LT2500 - LT3000



L6000 / LT6000

Flake ice machines with separate condensing unit R404A / R407A up to approx. +32°C

RVH-L

Technical details

Type	Ice output *) kg / 24 h	Water consumption m ³ /24h	Electrical connection 3AC/50Hz/400V/PE kW	Width mm	Depth mm	Height mm	Weight kg	Condensing unit dimensions WxDxH mm Electrical connection kW Weight kg
RVH 250 L	250	0,25		Details on demand				
RVH 400 L	400	0,40	0,28	1185	512	525	85	1032x462x751 1,91 90
RVH 800 L	800	0,80	0,28	1345	512	525	125	1352x732x891 2,54 167
RVH 1000 L	1000	1,00	0,28	1545	512	525	145	1352x732x891 3,25 168
RVH 1500 L	1500	1,50	0,28	1695	512	525	160	1352x732x1201 4,58 262
RVH 2000 L	2000	2,00	0,28	1695	512	525	160	1700x946x1536 7,68 330
RVH 2500 L	2500	2,50	0,28	1695	512	525	160	1700x946x1536 8,84 344
RVH 3000 L	3000	3,00	0,34	1730	675	525	220	1700x946x1536 8,84 344
RVH 6000 L	6000	6,00	0,52	1860	1450	586	320	2200x1300x1810 17,74 1000
RVH 9000 L	9000	9,00	0,52 0,34	1863	1456	1572	600	2200x1300x1810 17,74 1000 1700x 946x1536 8,84 344
RVH 12000 L	12000	12,00	0,52 0,52	1863	1456	1572	700	2200x1300x1810 17,74 1000 2200x1300x1810 17,74 1000

Flake ice machines with separate condensing unit R404A up to approx. +45°C R407F up to approx. +38°C

RVH-LT

Technical details

Type	Ice output *) kg / 24 h	Water consumption m ³ /24h	Electrical connection 3AC/50Hz/400V/PE kW	Width mm	Depth mm	Height mm	Weight kg	Condensing unit dimensions WxDxH mm Electrical connection kW Weight kg
RVH 250 LT	250	0,25		Details on demand				
RVH 400 LT	400	0,40	0,28	1185	512	525	85	1032x462x751 2,39 90
RVH 800 LT **)	800	0,80	0,28	1345	512	525	125	1352x732x891 3,06 170
RVH 1000 LT **)	1000	1,00	0,28	1545	512	525	145	1352x732x1201 4,58 262
RVH 1500 LT **)	1500	1,50	0,28	1695	512	525	160	1352x732x1201 6,56 262
RVH 2000 LT **)	2000	2,00	0,28	1695	512	525	160	1700x946x1536 8,84 344
RVH 2500 LT **)	2500	2,50	0,28	1695	512	525	160	1900x882x1561 10,40 480
RVH 3000 LT **)	3000	3,00	0,34	1730	675	525	220	1900x882x1561 10,40 480
RVH 6000 LT **)	6000	6,00	0,52	1860	1450	586	320	2800x1300x2275 24,96 1200
RVH 9000 LT **)	9000	9,00	0,52 0,34	1863	1456	1572	600	2800x1300x2275 24,96 1200 1900x 882x1561 10,40 480
RVH 12000 LT **)	12000	12,00	0,52 0,52	1863	1456	1572	700	2800x1300x2275 24,96 1200 2800x1300x2275 24,96 1200

Standard refrigerant R404A. Supplied without refrigerant filling. Special voltage on demand.

*) Water temperature +16°C, ambient temperature +20°C; higher temperatures may lead to reduced ice output.

**) RVH 800 LT and bigger also in version R407F.

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

Suction line heat exchanger enclosed separately.

MAJA®

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



RVH 1500

RVH 12000

Flake ice machines without condensing unit

RVH

Equipment & features

- For connection to (separate) external refrigeration units or multicompressor refrigeration systems.
- Cleaning-friendly machine design according to the principle of HY-GEN sanitation with removable evaporation tank.
- Easy operation by a big variety of control panels with or without program function (see page 16).
- RVH 9000 and RVH 12000 consist of two separately operated rotating evaporator units.
Advantages: high operation safety and individual control of ice output according to varying needs.



RVH 12000

Technical details

Type	Ice output *) kg / 24 h	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 approx.
RVH 250	250	0,25	Details auf Anfrage					
RVH 400	400	0,40	t ₀ -20,5°C, 2,2	0,28	1185	512	525	85
RVH 800	800	0,80	t ₀ -21,5°C, 4,0	0,28	1345	512	525	125
RVH 1000	1000	1,00	t ₀ -18,5°C, 5,6	0,28	1545	512	525	145
RVH 1500	1500	1,50	t ₀ -18,5°C, 8,4	0,28	1695	512	525	160
RVH 2000	2000	2,00	t ₀ -21,5°C, 11,5	0,28	1695	512	525	160
RVH 2500	2500	2,50	t ₀ -21,5°C, 13,5	0,28	1695	512	525	160
RVH 3000	3000	3,00	t ₀ -21,0°C, 16,2	0,34	1730	675	525	220
RVH 6000	6000	6,00	t ₀ -22,0°C, 33,0	0,52	1860	1450	586	320
RVH 9000	9000	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	12,00	t ₀ -22,0°C, 33,0 t ₀ -22,0°C, 33,0	0,52 0,52	1863	1456	1572	700

Standard refrigerant R404A, others on demand. Supplied without refrigerant filling. Special voltage on demand.

*) Water temperature +16°C, ambient temperature +20°C; higher temperatures may lead to reduced ice output.

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

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

For ecological ice production:
Flake ice machines **RVH-F** without
condensing unit, for connection to a
heat transfer medium circuit.
Ice output 2.000 - 8.000 kg / 24 h



Flake ice machines for connection to a heat transfer medium circuit

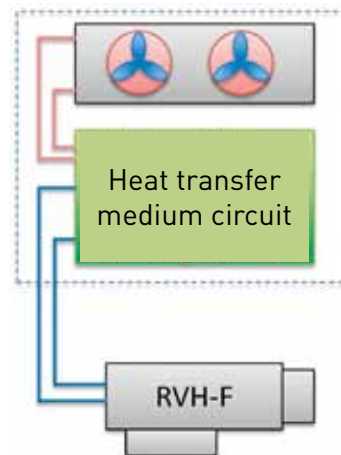
RVH-F

Equipment & features

- For connection to an existing external heat transfer medium circuit (by fluid, e.g. water-glycol mixture).
- Ecological 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
- Cleaning-friendly machine design according to the principle of HY-GEN sanitation with removable evaporation tank.
- Easy operation by a big variety of control panels with or without program function (see page 16).

Installation conditions

- Temperature of heat transfer fluid:
 $t_{IN} -25^{\circ}C$
 $t_{OUT} -22^{\circ}C$



Technical details

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

*) Water temperature +16°C, ambient temperature +20°C; higher temperatures may lead to reduced ice output.

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

Water supply: 3/4" external thread; drain water: 1" hose clip.

Special voltage on demand.

For ecological ice production:
Flake ice producing unit (rotating evaporator) **RVH-NH3** without condensing unit, for direct operation with an ammonia / R717 multicompressor refrigeration unit.
Ice output 7.000 and 14.000 kg / 24 h



RVH 12000 NH3



Flake ice machine for direct ammonia operation NH₃ (R717)

RVH-NH3

Equipment & features

Optimum energy efficiency - increased power density:

- Compared to other usual refrigerants, the direct ammonia operation brings more power density, thus increased ice capacity with the same machine scale.

Easy operation by Control Panel Touch:

- Individual placing of the control unit with touch display, with cable 5 m, touch display with timer function for free programmable production and cleaning cycles: For having the right quantity of fresh MAJA Flake Ice at your disposal exactly in time.
- Electronic evaporation pressure regulation for optimum evaporation efficiency.

Eco-friendly flake ice production:

- Excellent ecological impact by the use of the natural refrigerant R717.
- 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 and 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.
- Cleaning-friendly machine design according to the principle of HY-GEN sanitation with removable evaporation tank.

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	Water consumption m ³ /24h	Refrigeration capacity required	Electrical connection 3AC/50Hz/400V/PE kW	Width mm	Depth mm	Height mm	Weight kg
RVH 6000 NH3	7000	7,0	t ₀ -30,0°C, 42 kW	0,96	1863	1456	586	330
RVH 12000 NH3	14000	14,0	t ₀ -30,0°C, 84 kW	1,92	1863	1456	1572	720

*) Water temperature +16°C, ambient temperature +20°C; higher temperatures may lead to reduced ice output.

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

Special voltage on demand.

For ecological ice production:
Flake ice producing unit (rotating evaporator) **RVH-CO2** without condensing unit, for direct carbon dioxide operation with a R744 multicompressor refrigeration unit.
Ice output 500 - 3.800 kg / 24 h



RVH 1500 CO2



Flake ice machine for direct carbon dioxide operation CO₂ (R744)

RVH-CO2

Equipment & features

Optimum energy efficiency - increased power density:

- Compared to R404A, the direct carbon dioxide operation brings more power density, thus increase of ice capacity 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 use of the natural refrigerant R744 (carbon dioxide / CO₂) for flake ice production.
- R744 consists of the elements carbon and oxygen, which are natural parts of the atmosphere.
- 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

Easy operation by Control Panel Touch (control unit with touch display):

- Timer function for free programmable production and cleaning cycles: For having the right quantity of fresh MAJA Flake Ice at your disposal exactly in time.

Installation conditions

- Subcritical R744 / CO₂ circuit
HP_{max} = 90 bar, LP_{max} = 28 bar
Other pressure conditions on demand.
- Evaporation pressure regulator to adapt the evaporation temperature of the RVH-CO2 to t₀ = 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

Type	Ice output *) kg/24h	Water consumption m ³ /24h	Refrigeration capacity required	Electrical connection 3AC/50Hz/400V/PE kW	Width mm	Depth mm	Height mm	Weight kg
RVH 400 CO2	500	0,5	t ₀ -25,0°C, 2,8 kW	0,28	1185	512	525	85
RVH 800 CO2	1000	1,00	t ₀ -25,0°C, 5,5 kW	0,28	1345	512	525	125
RVH 1000 CO2	1300	1,30	t ₀ -25,0°C, 7,3 kW	0,28	1545	512	525	145
RVH 1500 CO2	1900	1,90	t ₀ -25,0°C, 10,7 kW	0,28	1695	512	525	160
RVH 2000 CO2	2500	2,50	t ₀ -25,0°C, 14,4 kW	0,28	1695	512	525	160
RVH 2500 CO2	3000	3,00	t ₀ -25,0°C, 16,2 kW	0,28	1695	512	525	160
RVH 3000 CO2	3800	3,80	t ₀ -25,0°C, 20,5 kW	0,34	1735	675	525	220

*) Water temperature +16°C, ambient temperature +20°C; higher temperatures may lead to reduced ice output.
Water supply 3/4" external thread; drain water 1" hose clip.
Special voltage on demand.

MAJA[®]

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 800 WS - SAH 3000 WS	800 - 3000	●		
SAH 800 L R407F - SAH 3000 L R407F		●		
SAH 800 W R407F - SAH 3000 W R407F		●		
SAH 800 WS R407F - SAH 3000 WS R407F		●		
RVH 250 L - RVH 12000 L -15°C to approx. +32°C		250 - 12000		●
RVH 250 LT - RVH 12000 LT -15°C to approx. +45°C			●	
RVH 800 LT R407F - RVH 12000 LT R407F -15°C to appr. +38°C	800 - 12000		●	
RVH 800 W - RVH 12000 W			●	
RVH 800 W R407F - RVH 12000 W R407F			●	
RVH 800 WS - RVH 12000 WS			●	
RVH 800 WS R407F - RVH 12000 WS R407F			●	
RVH 250 - RVH 12000	250 - 12000			●
RVH 2000 F - RVH 8000 F	2000 - 8000			●
RVH 250 N - RVH 12000 N (without control unit)	250 - 12000			●
RVH 6000 NH3 - RVH 12000 NH3	7000 + 14000			●
RVH 400 CO2 - RVH 3000 CO2	500 - 3800			●
RVE 702 S - RVE 3102 S ship version	750 - 2900			●

Machine types

- Compact machines with integrated condensing unit (SAH), for ambient temperatures of +10°C to approx. +38°C
- Split version for separate installation of condensing unit and ice producing unit RVH (RVH-L, RVH-LT, RVH-W, RVH-WS)
- Ice producing unit without condensing unit for connection to an existing multicompressor refrigeration system (RVH, RVH-NH3, RVH-CO2, RVH-F).

Refrigeration of condensing unit

- L = refrigeration by air for standard ambient temperatures of approx. -15°C to +32°C
- LT = refrigeration by air for ambient temperatures of approx. -15°C to +45°C for R404A and of approx. -15°C to +38°C for R407F.
- W = refrigeration by water for a temperature difference of IN and OUT of about 10 - 20 K
- WS = refrigeration by heat transfer medium or water for a temperature difference IN / OUT of fluid / water of about 5 K ($t_{\min} - 8^\circ\text{C}$).

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	R407F	R744 (CO ₂)	R717 (NH ₃)	Fluid
•			•				
	•		•				
		•	•				
•				•			
	•			•			
		•		•			
•			•				
•			•				
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		•	•				
		•		•			
			•				
							•
			•				
						•	
					•		
			•				

Heat transfer fluid

■ Standard refrigerant for MAJA Flake Ice Machines: **R404A**. Already since 2008, MAJA can also supply alternative refrigerant solutions with less ecological impact:

■ Natural refrigerants :

R717 / NH₃ (ODP = 0, GWP = 0)
 R744 / CO₂ (ODP = 0, GWP = 1)

■ Alternative refrigerants:

R407F (ODP = 0, GWP = 1825)

Besides that, some machine types can be supplied for operation with other refrigerant options, such as **R507, R407A, R410...**

■ One more refrigerant solution:

Heat transfer fluid:
Water-glycol mixture
 (ODP = 0, GWP = 0)



MAJA Flake Ice Machines: Individual configuration for meeting with any special 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
SAH 85 / 170	Standard	Optional	Optional	---	---
SAH 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	---	---	---	---	Standard
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
- Manual 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
- Display error memory
- Degree of protection IP 65

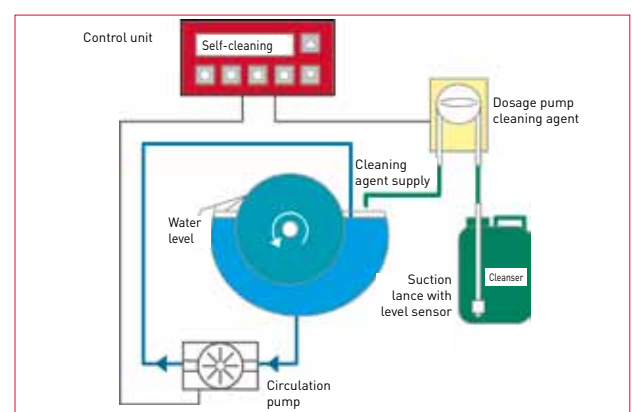
Optionally available:

- Protective cover for touch display
- Length of cable standard 5 m
Options 10 or 18 m



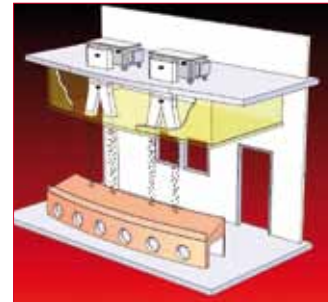
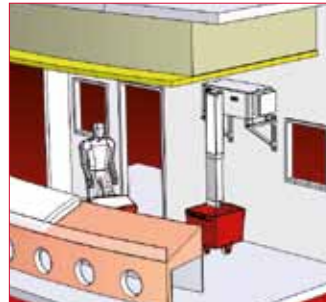
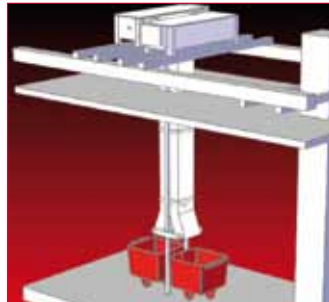
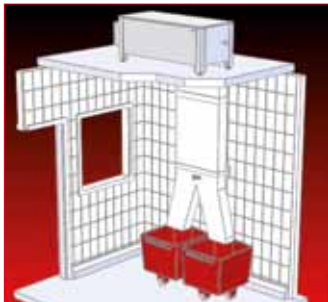
Sanitation options

- Patented evaporator self-cleaning system MAJA-SCS** (see page 3):
For sanitation safety at the push of a button; fully automatic cleaning, deliming and reduction of germs of all machine parts that contact water.
- External UV-disinfection system in the water supply:**
For making sure that only hygienically perfect water is used for flake ice production.



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).

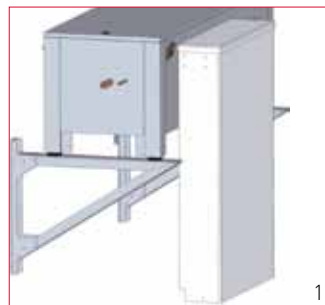
■ Subframes:

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).

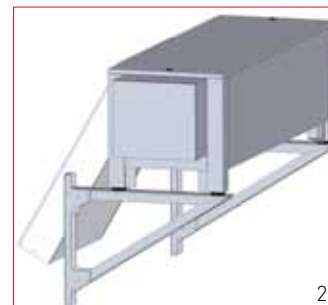
■ Ice chutes:

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 (image 7).

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



RVH on wall console with vertical chute



RVH on wall console with inclined chute



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



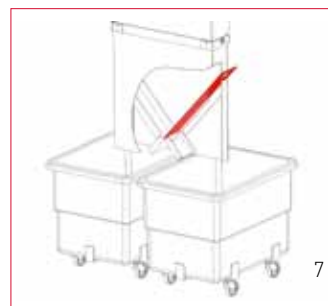
RVH on universal subframe for two ice transport carts EV 50



Chutes for direct filling of supermarket displays with flake ice



RVH on wall console with Y chute for two ice outlets



Extension chute with manual blocker and ice transport carts EVL

MAJA[®]

Ice handling and storage

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 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 are not insulated and made 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



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	660	19 (incl. wheeled base)	SAH 85/170
EVA 75	75	680	800 (with handle)	680	21	Subframes + ITS-K silos, instead of standard mincer carts
EVF 201	90	649	1055 (with handle)	712 (889 with handle)	26	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 carts can be positioned under the ice storage silo for filling automatically with flake ice by unlocking the silo bottom scuttle. The flake ice can also be taken out of the silo by hand through a comfortable flap.

For automatic ice extraction and dosage of portion control ice batches, learn more about MAJA's automatic ice silo systems at page 20.

Silo EN1

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



SAH 250/500 on silo EN 1



Silo ITS 1350-60 for 2 ice carts EVF 201

ITS silos with ice storage cart/s EVF

Type	Max. silo storage capacity kg	Max. storage capacity EVF cart/s included (201 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	421	2
ITS 3250-90	1474	1744	2286	1016	1220 - 1486	2464	642	3

ITS silos for standard mincer carts

Type	Max. storage capacity 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

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 dispensation: 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 the means of 2 or 3 spiral conveyors, depending on the silo type.
- **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.
- Interface for floor balance.



Automatic flake ice silos type AS

Type	Storage capacity approx. m ³ (kg)	Number of spiral conveyors	Width mm	Depth mm	Height mm	Silo weight (unloaded) kg	Allowed floor load per foot kg	Max. silo cover load kg	Electrical connection kW 3AC/50Hz/400V
AS 21	2,1 (800)	2	1451	3811	2473	1400	700	1000	2,0
AS 30	3,0 (1200)	2	1451	3811	2973	1500	900	1000	2,0
AS 45	4,5 (1800)	2	1451	3811	3723	1750	1200	1000	2,0
AS 50	5,0 (2000)	3	1642	4342	3229	2350	1400	1500	3,8
AS 63	6,3 (2600)	3	1642	4342	3729	2500	1600	1500	3,8
AS 72	7,2 (3000)	3	1796	4824	3282	2950	1900	1500	3,8
AS 77	7,7 (3200)	3	1642	4342	4229	2700	1900	1500	3,8
AS 92	9,2 (3800)	3	1796	4824	3782	3150	2200	1500	3,8
AS 112	11,2 (4600)	3	1796	4824	4282	3300	2500	1500	3,8

Examples for options & accessories

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

AS 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 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.

Advantages:

- **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 dosage:
Precise weight for reliable processes.

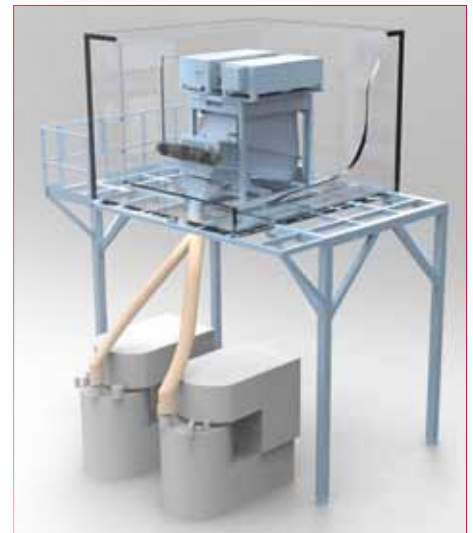
VS5

Intelligent ice management for excellent sanitary conditions and more efficiency:

The MAJA Ice Weighing System VS5 allows the hygienic storage and dosage of flake ice batches. Especially industrial baking companies gain more benefit by automating the complete process, starting from the flake ice production until the precise dosage of ice batches directly into the kneading machine.

Equipment & characteristics

- Storage capacity approx. 200 kg of MAJA Flake Ice, ambient temperature of 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), for a precise adjustment of the dough temperature and constant dough quality.
- 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.



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

MAJA[®]

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!

Nugget ice from MAJA:

Thanks to its special characteristics, this type of ice is very interesting for the food business!



Versatile applications for MAJA Nugget Ice:

- **Food trade / retail**
Refrigeration and presentation of fish and fresh food in supermarkets.
- **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 crop, during transportation, in the distribution and retail.

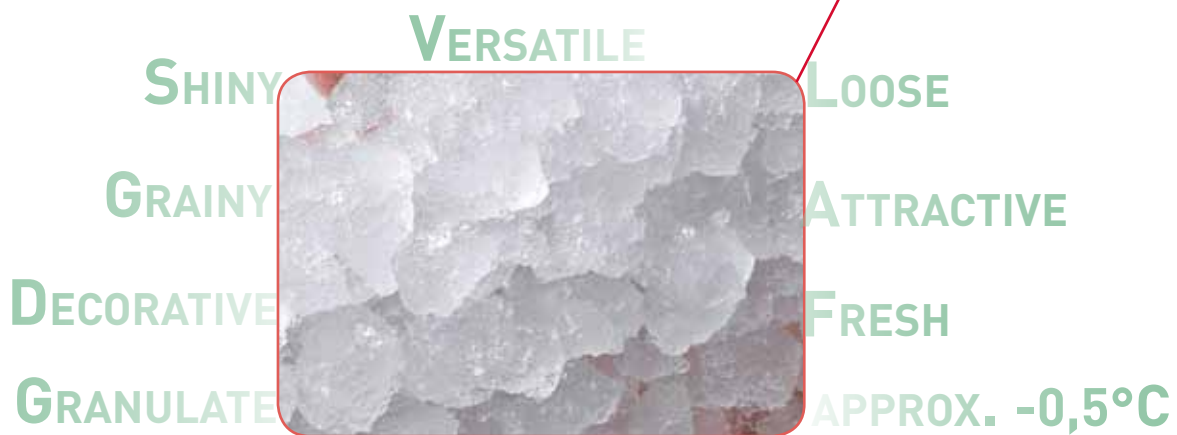


An evaporator screw rotates in an evaporation drum, which is filled with water and refrigerated from outside. The water freezes on the inner drum surface to small ice particles, which are scraped off by the rotating evaporator screw and conveyed upwards. The ice passes through an extrusion die and gets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

MAJA Nugget Ice offers a lot of advantages:
Long freshness, attractive appearance and easy handling!

Special characteristics of MAJA Nugget Ice:

- **Ice temperature**
Approx. $-0,5^{\circ}\text{C}$, thus ideal cooling for versatile application fields of MAJA Nugget Ice.
- **Characteristics**
Density approx. $0,5 \text{ kg} / \text{dm}^3$, 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
THE OTHER KIND OF ICE!

MAJA[®]

MAJA Nugget Ice Machines:

It is up to you to make your choice between three different machine ranges: compact version for plug & play, without condensing unit for R404A or for direct R744 operation. Ice output 300 - 1420 kg / 24 h



NA 300/530



NA 970

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

NA

MAJA Nugget Ice Machines NA-L

- Compact nugget ice machine, ready for plug & play, with integrated condensing unit, air-cooled execution (L).
Water-cooled execution (W) on demand.

Technical details

Type	Ice output *) kg / 24 h	Water consumption m ³ /24 h	Electrical connection 1AC/50Hz/230V/N/PE kW	Width mm	Depth mm	Height mm	Weight kg approx.
NA 300 L	300	0,30	1,15	750	561	698	105
NA 530 L	530	0,53	1,90	750	561	698	112

Type	Ice output *) kg / 24 h	Water consumption m ³ /24 h	Electrical connection 3AC/50Hz/400V/N/PE kW	Width mm	Depth mm	Height mm	Weight kg approx.
NA 970 L	970	0,97	3,6	900	626	874	168

MAJA Nugget Ice Machines NA

- Nugget ice machine without condensing unit, for connection to an external refrigeration unit or a multicompressor circuit.

Technical details

Type	Ice output *) kg / 24 h	Water consumption m ³ /24 h	Electrical connection 1AC/50Hz/230V/N/PE kW	Width mm	Depth mm	Height mm	Weight kg approx.
NA 300	300	0,30	0,3	750	561	698	78
NA 530	530	0,53	0,4	750	561	698	82

Type	Ice output *) kg / 24 h	Water consumption m ³ /24 h	Electrical connection 3AC/50Hz/400V/N/PE kW	Width mm	Depth mm	Height mm	Weight kg approx.
NA 970	970	0,97	0,6	900	625	874	121

Standard refrigerant for NA-L / NA-W / NA: R404A

*) Water temperature +10°C, ambient temperature +10°C. Higher temperatures may lead to reduced ice output. Detailed information on demand.

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

MAJA Nugget Ice Machines NA-CO2

- Nugget ice machines without condensing unit for direct carbon dioxide operation with a R744 / CO₂ refrigeration unit.
- Compared to other usual refrigerants (e.g. R404A) the carbon dioxide operation brings more power density.

- 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



Eco-friendly flake ice production:

- Excellent ecological impact by the use of the natural refrigerant R744 (carbon dioxide / CO₂) for flake ice production.

Technical details

Type	Ice output *) kg / 24 h	Water consumption m ³ /24 h	Electrical connection 1AC/50Hz/230V/N/PE kW	Refrigeration capacity required kW	Width mm	Depth mm	Height mm	Weight kg approx.
NA 440 CO2	440	0,44	0,3	1,8 t ₀ = -18°C (+/-1K)	750	561	756	78
NA 780 CO2	780	0,78	0,4	2,7 t ₀ = -18°C (+/-1K)	750	561	756	82

Type	Ice output *) kg / 24 h	Water consumption m ³ /24 h	Electrical connection 3AC/50Hz/400V/N/PE kW	Refrigeration capacity required kW	Width mm	Depth mm	Height mm	Weight kg approx.
NA 1420 CO2	1420	1,42	0,6	5,1 t ₀ = -18°C (+/-1K)	900	626	946	121

*) Water temperature +10°C, ambient temperature +10°C. Higher temperatures may lead to reduced ice output. Detailed information on demand.
Water supply 3/4" external thread, drain water 3/4" hose clip

Equipment & features of MAJA Nugget Ice Machines

- **Solid execution:**
Front / side panels, ground plate, top cover and ice chute made from stainless steel.

- **Easy operation:**
ON/OFF pushbuttons
LED-display for indication of operation modes (pict. 1).



Pict. 1

- **Optional accessory water filter system (pict. 2):**
MAJA recommends using a water filter system to protect the machine from sediment and limescale deposit for better sanitation.
Suitable systems are available from MAJA. They filter out suspended particles and reduce the risk of limescale deposit, which has positive effects on the machine's life cycle and state of hygiene.



Pict. 2

Installation accessories

■ Consoles:

Special consoles (pict. 1) allow the wall fixation of the NA-machines. They can be combined with a chute system so that the ice falls directly into storage bins or ice transport carts.

■ Subframes:

MAJA Nugget Ice Machines can be installed on a special subframe suitable for the use of ice transport carts type EV 50 (pict. 2) or EVA 75.

■ 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 and EVA 75 are equipped with thermal insulation for an optimum conservation of the MAJA Nugget Ice during a certain period of time. Special covers are available (option) for protecting the ice from contamination during transport and storage.

■ Ice storage:

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. 3).



Pict. 1



Pict. 2: NA 300 / 530 on subframe for ice storage cart EV 50



NA 300 / 500 on silo ES 150



NA 530 on silo ES 300



Pict. 3: NA 970 on ice storage silo ES 300

MAJA Nugget Ice Machines:

The product range at a glance

MAJA NUGGET ICE MACHINES	Ice output kg/24h	Condensing unit		Refrigeration of condensing unit		Refrigerant	
		Compact machine with integrated condensing unit	Without condensing unit	By air	By water	R404A	R744
NA 300 L	300	●		●		●	
NA 530 L	530	●		●		●	
NA 970 L	970	●		●		●	
NA 300 W	300	●			●	●	
NA 530 W	530	●			●	●	
NA 970 W	970	●			●	●	
NA 300	300		●			●	
NA 530	530		●			●	
NA 970	970		●			●	
NA 440 CO2	440		●				●
NA 780 CO2	780		●				●
NA 1420 CO2	1420		●				●

Condensing units

- L = air-cooled condensing unit
- W = water-cooled condensing unit (on demand)

Refrigerants

- Standard refrigerant for MAJA Nugget Ice Machines:
R404A
- Alternatively, the eco-friendly **CO2-range** is available.
(ODP = 0, GWP = 1).

MAJA ICE MACHINES

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MAJA Ice Machines 10 / 2015 EN
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