

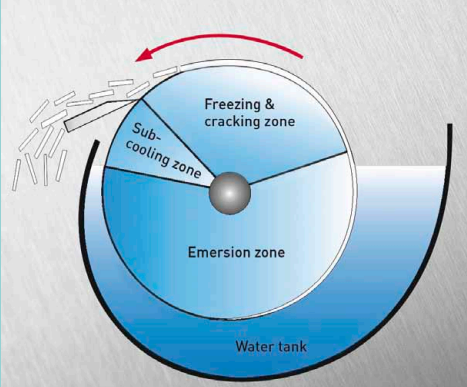
The world of MAJA Ice Machines

FLAKE ICE

NUGGET ICE



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.



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.



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

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



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.

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.



RVH 12000

Technical details

Type	Ice output *) kg / 24 h (1 h)	Fresh water consumption m ³ /24 h	Refrigeration capacity required kW	Electrical connection 3AC/50Hz/400V/PE kW	Width mm	Depth mm	Height mm	Weight kg 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:

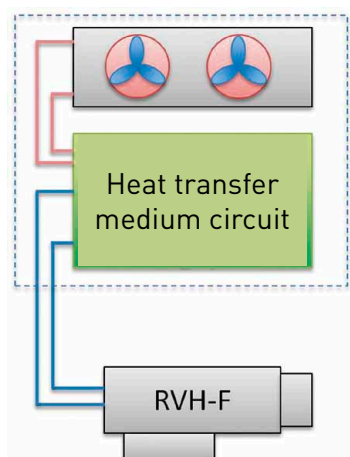
- No influence on the destruction of the ozone layer and the greenhouse effect.
Ozone depletion potential ODP = 0
Global warming potential GWP = 0

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) m ³ /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 $+16^{\circ}\text{C}$, ambient temperatures $+20^{\circ}\text{C}$; 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

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

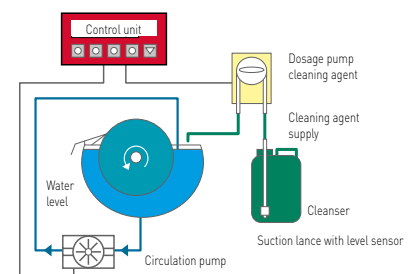


Protective cover for Control Panel Touch

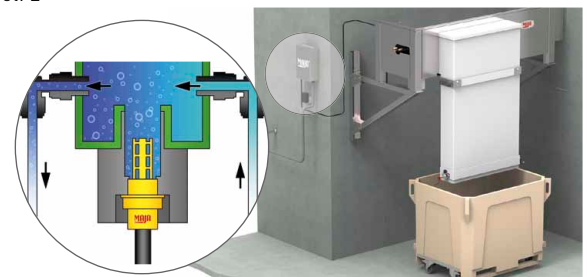
Sanitation options

- 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

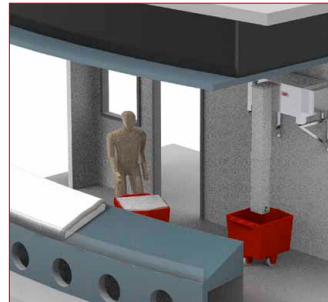
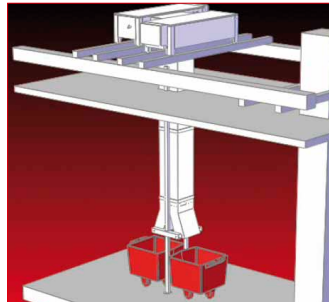


Pict. 2



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).

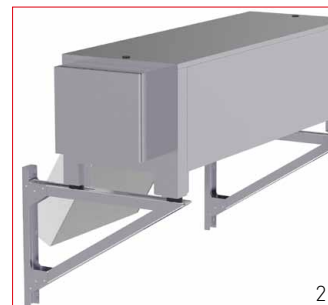
■ Ice chutes:

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.



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



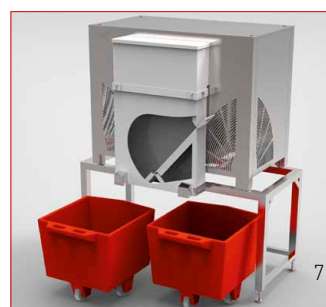
RVH on universal subframe for two ice transport carts EVA 75



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 EVA

MAJA
PART OF **marel**

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 approx. 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

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 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. m ³ (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.