Kometos Oy provides thawing systems for efficient and controlled defrosting of any deep-frozen food products. Thawing equipment is perfectly suited e.g. for defrosting of meat, fish and poultry products.

# FINNCOLD THAWING SYSTEMS

Kometos Oy has delivered thawing rooms, cabinets and modules to its customers for more than 30 years. Thawing systems are installed on customer´s premises as complete and are designed and manufactured to ensure a high quality, energy efficient result with minimum losses.

## BENEFITS OF FINNCOLD THAWING SYSTEMS

### 1. WIDE RANGE OF APPLICATIONS

The Finncold thawing technology is perfectly suited for controlled defrosting of deep-frozen food products.

### 2. HIGH-QUALITY THAWING PROCESS

The PLC-controlled Finncold thawing technology utilises heat, controlled air flows, cryotechnology and humidity. The end result is a high quality product with minimum losses.

### 3. FAST AND CONTROLLED THAWING PROCESS

The thawing programme developed by Kometos ensures a fast and controlled thawing process. The thawing process is controlled by temperature sensors.

### 4. TESTED THAWING METHOD

Only high quality components, tested in accordance with our plant's quality system, are used in the Finncold thawing method.

### 5. HYGIENIC THAWING PROCESS

Only indoor air is used in the Finncold thawing process. Furthermore, thawing rooms and thawing containers are manufactured of moisture resistant and easily cleaned ST elements approved for foodstuffs, which allows guaranteeing hygiene during the defrosting process.

### 6. STORAGE MODE

Following the completion of the thawing process the Finncold thawing system automatically switches into the storage mode, keeping food products at the desired temperature. Moreover, thanks to the timed thawing programme the thawing process can be activated at a desired time.

### 7. VERSATILITY

Finncold units may be set up as thawing room solutions or as thawing containers outside the production facility. It is also possible to set up a thawing equipment solution in the customer's existing premises. Furthermore, a thawing room solution can be provided as a drive-through version.

## FUNCTION OF THAWING SYSTEMS

**FINNCOLD FROZEN PRODUCTS THAWING SYSTEMS** operate along a PLC controlled thawing process, where temperature, air flow and humidity are controlled using temperature- (product surface-, internal temperature- and room temperature-) as well as humidity sensors. Air flow is controlled by a variable frequency drive EC-fans.

The thawing system is also supplied with cooling equipment making it possible to use the chamber for storage (max. 48 hours) when the product´s target temperature has been achieved. Storage temperature = process target temperature until the system is stopped.

The cooling equipment enables scheduled thawing (max. 48 hours). Products can be placed in the cabinet on beforehand while also setting the start time of the thawing process. In this instance the cabinet operates as a cold storage (max -6 °C) until the thawing process starts according to the set schedule.



## FINNCOLD THAWING CABINET MTM-1

Product number **1101011001**

| TECHNICAL INFORMATION | |
|---|---|
| Size | 1825 x 1725 x 3100 |
| Capacity | 1 trolley or 500 – 660 kg / process |
| Area of activity | -20 °C...+2 °C, Products in trolley on the shelf |
| Defrosting time | Varies by product/by packaging, indicative times:<br>-20 °C... -2 °C 10 - 12 h<br>-20 °C...+2 °C 16 - 24 h |
| Weight of cabinet | Total weight appr. 650 kg. |
| Cooling | Hermetic refrigeration compressor 3,1 kW |
| Heating | Electric resistor heating |
| Air circulation | Air circulation with EC-fan |
| PLC control | Control PLC KOMETOS |
| **INTERFACE DATA** | |
| Electrical connection | 3 x 400 V 32 A |
| Water connection | R ½", min. 4 bar |
| Compressed air supply | R ½", 2,8 bar |

## FINNCOLD THAWING CABINET MTM-2

Product number **1101011002**

| TECHNICAL INFORMATION | |
|---|---|
| Size | 2720 x 2500 (2200) x 3000 |
| Capacity | 2 trolleys/pallets or 1000 – 1200 kg / process |
| Area of activity | -20 °C...+2 °C, Products in trolleys on the shelf. |
| Defrosting time | Varies by product/by packaging, indicative times:<br>-20 °C...-2 °C 10 - 12 h<br>-20 °C...+2 °C 16 - 24 h |
| Weight of cabinet | Total weight appr. 850 kg. |
| Cooling | Hermetic refrigeration compressor 3,1 kW |
| Heating | Electric resistor heating |
| Air circulation | Air circulation with EC-fan |
| PLC control | Control PLC KOMETOS |
| **INTERFACE DATA** | |
| Electrical connection | 3 x 400 V 63 A |
| Water connection | R ½", min. 4 bar |
| Compressed air supply | R ½", 2,8 bar |


THAWING -20°C>-2°C IN 8 HOURS

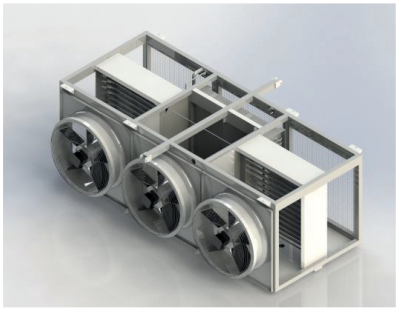
# FINNCOLD THAWING MODULE MTC-15

Product number **1101013015**

| TECHNICAL INFORMATION | |
|---|---|
| Size | 8890 x 2800 x 3300 |
| Capacity | 9 – 15 euro pallets or 5400 – 9000 kg / process |
| Area of activity | -20 °C (-18 °C) ...+2 °C,<br>Products in E2 boxes or trolleys<br>-20 °C(-18 °C) ... -2 °C,<br>Products in E2 Boxes, trolleys or carton packages + spacers between layers<br>Optimal thawing process is achieved when the product´s start temperature is -20 °C (-18 °C) in case of both the scheduled process and the so called direct thawing process. |
| Defrosting time | Varies by product/by packaging, indicative times:<br>-20 °C...- 2 °C 8 - 12 h<br>-20 °C...+ 2 °C 12 - 18 h |
| Structure | A technology space integrated into the outdoor defrosting system with a control panel, cooling equipment and water and compressed air connections for moistening. |
| Frame | Self-supporting metal subframe, 8 pcs support legs. |
| Weight | Total weight appr. 4 500 kg |
| **POWER UNIT TECHNOLOGY** | |
| Cooling | Hermetic refrigeration compressor, refrigerant R449, cooling capacity of 7,2 kW (-8 °C/+32 °C). If the temperature of the surrounding environment exceeds +32 °C, the efficiency of the cooling compressor drops thus the thawing process is prolonged. |
| Heating | Electric resistor heating, power 60 kW |
| Air circulation | Air circulation with EC -fans (3 pcs) |
| Air flow quide | Rising and lowering with a spindle motors |
| PLC control | Control plc KOMETOS. The operating panel is located outside the container next to the door. Thawing equipment can be connected to the client's Ethernet data network through which Kometos has the opportunity for a secure service connection. IP addresses from a client. Ethernet connection enables to get thawing data from PLC. |
| **INTERFACE DATA** | |
| Electrical connection | 3 x 400 V 125 A |
| Water connection | R ½", 4 bar |
| Compressed air supply | R ½", 2,8 bar |
| Drain connection | Ø 75 mm |


# FINNCOLD THAWING SYSTEM

| TECHNICAL INFORMATION | |
|---|---|
| Area of activity | -20 °C (-18 °C) .. +2 °C, E2 boxes / trolleys<br>-20 °C(-18 °C) ... -2 °C, E2 boxes / trolleys / carton packages + spacers between layers<br>Optimal thawing process is achieved when the product´s start temperature is<br>-20 °C (-18 °C) in case of both the scheduled process and the so called direct thawing process. |
| Defrosting time | Varies by product / by packaging, indicative times:<br>-20 °C...- 2 °C 8 - 12 h<br>-20 °C...+ 2 °C 12 - 18 h |
| **POWER UNIT** | |
| Cooling | Hermetic refrigeration compressor, refrigerant R449, cooling capacity of 4,7 kW or 7,2 kW (-10 °C/+32 °C). If the temperature of the surrounding environment exceeds +32 °C, the efficiency of the cooling compressor drops thus the thawing process is prolonged. |
| Heating | Electric resistor heating, power 45 kW or 60 kW. |
| Air circulation: | Air circulation with EC –fans (3 pcs). |
| Air flow guide | Rising and lowering with a spindle motors. |
| Control system | LC- control: The control logic Omron / Kometos.<br>The thawing system will be connected to client´s Ethernet-data network, through which Kometos has the opportunity for a secure service connection. IP addresses from a client.<br>Ethernet connection enables to get thawing data from PLC. |



# FINNCOLD THAWING ROOMS MTS-6 - 15 x 2

| | MTS-6 | MTS-9 | MTS-12 | MTS-15 | MTS-15 x 2 |
|---|---|---|---|---|---|
| Product number | 1101012006 | 1101012009 | 1101012012 | 1101012015 | 1101012030 |
| Size L x W x H | 4460 x 2800 x 3100 | 5940 x 2800 x 3100 | 6675 x 2800 x 3100 | 8145 x 2800 x 3100 | 8145 x 5600 x 3100 |
| Capacity, pallets (800 x 1200) | 3 - 6 pallets | 6 - 9 pallets | 6 - 12 pallets | 9 - 15 pallets | 2 x 9 - 15 pallets |
| Capacity, 600 kg / pallet | 1800 - 3600 kg | 3600 - 5400 kg | 3600 - 7200 kg | 5400 - 9000 kg | 2 x 5400 - 9000 kg |
| Cooling capacity (kW) | 4,7 | 4,7 | 7,2 | 7,2 | 7,2 |
| Heating capacity (kW) | 45 | 45 | 60 | 60 | 60 |
| INTERFACE DATA | | | | | |
| Electrical connection 400 V / 50 Hz | 100 A | 100 A | 125 A | 3 x 400V 125 A | 3 x 400V 125 A |
| Water connection | R1/2", 4 bar | R1/2", 4 bar | R1/2", 4 bar | R1/2", 4 bar | R1/2", 4 bar |
| Compressed air supply | R1/2", 2,8 bar | R1/2", 2,8 bar | R1/2", 2,8 bar | R1/2", 2,8 bar | R1/2", 2,8 bar |
| Option | | | | | |
| Freezing | -6 °C | -6 °C | -6 °C | -6 °C | -6 °C |
| Capacity | 3000 kg | 3000 kg | 3000 kg | 3000 kg | 3000 kg / module |


# FINNCOLD
# THAWING ROOM MTS-24

Product number **1101012024**

| TECHNICAL INFORMATION | |
|---|---|
| Size | 7650 x 4600 x 3100 |
| Capacity | 24 euro pallets or 14 400 kg / process |
| Range | -20 °C (-18 °C) ... +2 °C,<br>Products in E2-boxes or trolleys. If the products are in boxes, thawing spacers must be inserted between the layers.<br>Optimal thawing process is achieved when the product´s start temperature is -20 °C (-18 °C)<br>for both the scheduled process and the so called direct thawing process. |
| Defrosting time | Varies by product/by packaging, indicative times:<br>-20 °C...- 2 °C 8 - 12 h<br>-20 °C...+ 2 °C 12 - 18 h |
| Cooling | Cooling by means of a cooling agent. A coolant available in the system of the plant, such as NH3, glycol, Freezium or similar. The solution is pumped to the heat exchanger delivered by Kometos. Cooling capacity requirement: 25 kW. Max. temperature of the solution: -15 °C. |
| Delivery limit | The client shall supply and connect a pipeline from their own cooling system to the valves delivered by Kometos. Kometos shall deliver the required valves, heat exchangers, pumps and pipelines from the heat exchanger to the room. |
| Heating | Heating by means of a heating agent. A heated solution available in the system of the plant, such as glycol, Freezium or similar. Heating capacity need: 90 kW. Minimum temperature of the solution: +40 °C. |
| Delivery limit | The client shall supply and connect a pipeline from their own cooling/heating system to the valves delivered by Kometos. The client shall provide for a possible supplementary filling of system. Liquid circulating steamer is glycol. |
| Air circulation | Air circulation with EC-fans |
| Intermediate level/ Air guide | Electromechanical spindle motors for lifting and lowering the intermediate level. |
| PLC control | Control PLC KOMETOS. The operating panel is located outside the room next to the door.<br>Thawing equipment can be connected to the client's Ethernet data network through which Kometos has the opportunity for a secure service connection. |
| **INTERFACE DATA** | |
| Electrical connection | 3 x 400 V 63 A/room |
| Water connection | R ½", 4 bar |
| Compressed air supply | R ½", 2,8 bar |


# FUNCTION OF TUNNEL FREEZER SYSTEMS

The module has been built with sandwich panels (ST elements) developed and approved for the food industry. Rapid freezing is produced by the process of efficient cooling with a unique air circulation system, built into the module. Tunnel freezer can also be used as normal frozen storage (max. -30 °C).

## FINNCOLD TUNNEL FREEZER FF-2500

Product number **1104002500**

| TEKNISET TIEDOT | |
|---|---|
| Size | 5600 x 2900 x 3500 |
| Capacity | 6 Euro pallets or 2 500 kg / process |
| Area of activity | +5 °C ...-20 °C,<br>Freezing on pallets/gratings, block size 600 x 400 x 150 mm |
| Freezing time | Varies by product and by packaging<br>Indicative times are: +5 °C...- 20 °C, 18 - 22 h |
| Frame | Self-supported, specially designed welded metal frame with 6 pc supporting legs. |
| Weight | Total weight appr. 4500 kg |
| Connection data | - Electrical connection: 3 x 400 V/100A.<br>- Drain connection, for condensation water. |
| Cooling | Hermetic refrigeration compressor together with condenser and evaporator, refrigerant R449, cooling capacity of 23 kW (-35 °C/+32 °C). A cooling evaporator coil electric defrost. |
| Air circulation | Circulation air with propeller fans. |
| Intermediate level/air control | Solid intermediate level |
| Control | Thermostat-controlled freezing process. Operating switches built into the loading door jamb. |

## FINNCOLD TUNNEL FREEZER FF-5000

Product number **1104005000**

| TEKNISET TIEDOT | |
|---|---|
| Size | 9725 x 3200 x 3500 |
| Capacity | 12 Euro pallets or 5 000 kg / process |
| Area of activity | +5 °C ...-20 °C,<br>Freezing on pallets/gratings, block size 600 x 400 x 150 mm |
| Freezing time | Varies by product and by packaging<br>Indicative times are +5 °C...- 20 °C, 18 - 22 h |
| Frame | Self-supported, specially designed welded metal frame with 8 pc supporting legs. |
| Weight | Total weight appr. 5 500 kg. |
| Connection data | - Electrical connection: 3 x 400 V/160 A.<br>- Drain connection, for condensation water. |
| Cooling | Hermetic refrigeration compressor together with condenser and evaporator, refrigerant R449, cooling capacity of 2 x 23 kW(-35°C/+32° C). A cooling evaporator coil electric defrost. |
| Air circulation | Circulation air with propeller fans. |
| Intermediate level/air control | Solid intermediate level. |
| Control | Thermostat-controlled freezing process. Operating switches built into the loading door jamb. |


# FUNCTION OF TUNNEL FREEZER SYSTEMS

The module has been built with sandwich panels (ST elements) developed and approved for the food industry. Rapid freezing is produced by the process of efficient cooling with a unique air circulation system, built into the module. Tunnel freezer can also be used as normal frozen storage (max. -30 °C).

## FINNCOLD TUNNEL FREEZER FF-10000

Product number **1104010000**

| TECHNICAL INFORMATION | |
|---|---|
| Size | 13400 x 3500 x 3500 |
| Capacity | 20 Euro pallets or 10 000 kg / process |
| Area of activity | +5 °C ...-20 °C,<br>Freezing on pallets/gratings, block size 600 x 400 x 150 mm |
| Freezing time | varies by product and by packaging<br>Indicative times are: +5 °C...- 20 °C, 18 - 22 h |
| Frame | Self-supported, specially designed welded metal frame with 8 pc supporting legs. |
| Weight | Total weight appr. 7000 kg |
| Connection data | - Electrical connection: 3 x 400 V/260A.<br>- Drain connection, for condensation water. |
| Cooling | Hermetic refrigeration compressor together with condenser and evaporator, refrigerant R449, cooling capacity of 4 x 23 kW (-35 °C/+32 °C).<br>A cooling evaporator coil electric defrost. |
| Air circulation | Circulation air with propeller fans. |
| Intermediate level/air control | Solid intermediate level |
| Control | Thermostat controlled freezing process.<br>Operating switches built into the loading door jamb. |

## FINNCOLD FROZEN STORAGE FV-40000

Product number **1104040000**

| TECHNICAL INFORMATION | |
|---|---|
| Size | 13400 x 6400 x 3500 |
| Capacity | 2 x 36 Euro pallets or 2 x 20 000 kg / process |
| Area of activity | -20 °C, FiLo |
| Frame | Self-supported, specially designed welded metal frame with 16 pc supporting legs. |
| Weight | Total weight appr. 14 000 kg. |
| Connection data | - Electrical connection: 3 x 400 V/36 A.<br>- Drain connection, for condensation water. |
| Cooling | Hermetic refrigeration compressor together with condenser and evaporator, refrigerant R449, cooling capacity of 13 kW (-35 °C/+32 °C).<br>A cooling evaporator coil electric defrost. |
| Air circulation | With propeller fans. |
| Control | Thermostat-controlled freezing process.<br>Operating switches built into the loading door jamb. |

# FINNCOLD
# REFRIGERATION CABINET SF

Product number **1103000600**

FINNCOLD stiffening cabinet is intended for the stiffening of food products placed in special product carts.

Stiffening contributes to lower loss while the hygiene and storage life of products to be sliced increases.

The Finncold PLC-based control system controls both the stiffening process by means of room and products sensors, and the thawing of equipment. The controlled freezing process utilizes variable direction air flow that is guided through special air deflectors evenly around the cabinet.

Programming allows product freezing to -2° C…-3° C as required.


| TECHNICAL INFORMATION | |
|---|---|
| Size | 2100 x 1500 x 3250 (loading height max. 2000 mm) |
| Capacity | 1 trolley place or 600 kg / process<br>+4 °C...-2 °C degrees; the surface temperature of the product in about 45 minutes |
| Weight | Total weight about 900 kg |
| Freezing | Ammonia solution -35 °C from client's solution line, cooling capacity 30 kW. |
| Air circulation | EC fans (2 pieces) |
| Intermediate level/air control | Fixed, integrated into the cabinet, made of stainless steel |
| Control | KOMETOS PLC control, control panel integrated in the cabinet structure. |
| **INTERFACE DATA** | |
| Electrical connection | 3 x 400 V, 16 A |

KOMETOS
Results by know-how

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