

TMW35

MICROWAVE TEMPERING TUNNEL

The TMW35 allows deep frozen foods to be tempered or defrosted (butter) quickly. It is adapted for products like meat, poultry, fish, fruits, vegetables, cheese, butter, etc...

The distinctive feature of the TMW 35 tunnel is the use of the microwave technology to achieve the best tempering homogeneity while maintaining a good microwave efficiency.



The very low floor space, the length under microwaves (residence time) and the crossed coupling of microwaves above and below the blocks, are a few examples of the solutions used to conciliate capacity, flexibility, efficiency and homogeneity.

KEY BENEFITS

- **Profitable:** save money by avoiding drip losses
- **Fast:** very short time of treatment, between 5 to 15 minutes
- **User friendly:** easy loading / unloading, colour touch screen HMI
- **Homogeneous:** excellent temperature homogeneity thanks to multiple microwave inlets
- **Reliable:** no need for regular maintenance, except daily cleaning
- **Hygienic:** no bacteriological growth, complies with all hygiene regulations and standards
- **Flexible:** can be used for tempering packed (cardboard, plastic film ...) or unpacked food
- **Compact:** small floor footprint
- **Connected:** USB and ethernet connection for remote control



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TEMPERING CAPACITIES

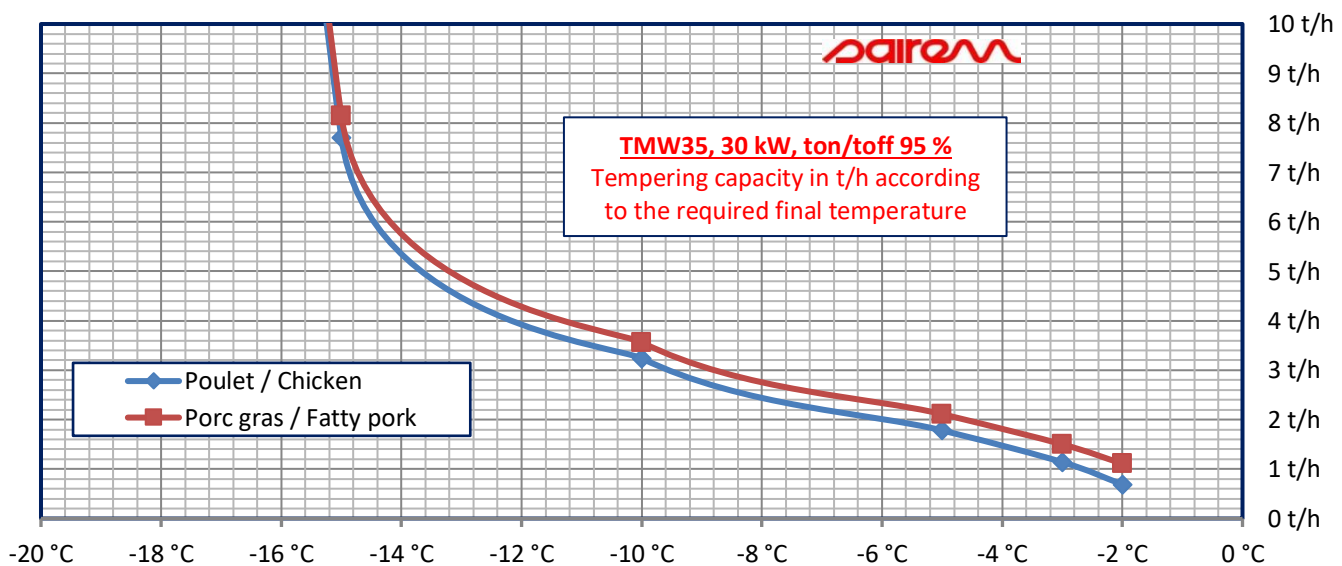
The TMW35 offers a tempering capacity between 1 t/h and 1.5 t/h from -20 °C to a final temperature of -4 °C / -2 °C in 95% of the block, which is the optimum temperature for processing: dicing, grinding, cutting, slicing... The capacity is calculated to temper frozen blocks with standard dimensions 600 mm x 400 mm x 200 mm and a weight of about 20 / 25 kg. If fatty products are to be processed, fat ought to be very homogeneously distributed in the block, otherwise the limit temperature for homogeneity is -4 °C.

The tempering capacity is variable and depends on the final required temperature and on the product (meat, fish, vegetables, fruits, butter, etc). Figures below show these variations.

The data in the charts are calculated for the TMW 35 operating at 30 kW power, with t_{on}/t_{off} ¹ optimum at 95 %, for blocks with regular size and weight 25 kg (600 mm x 400 mm x 200 mm) and for a starting temperature around -20 °C/-18 °C.

The maximum microwave power which can be used in processing is limited by the products and not the tunnel. Recipes power vs. time must be chosen according to the compromise between capacity and homogeneity of heating.

TEMPERING CAPACITY VS. DESIRED FINAL TEMPERATURE



Example: Chicken \approx 1.8 t/h from -18 °C to -5 °C or \approx 1.15 t/h from -18 °C to -3 °C.

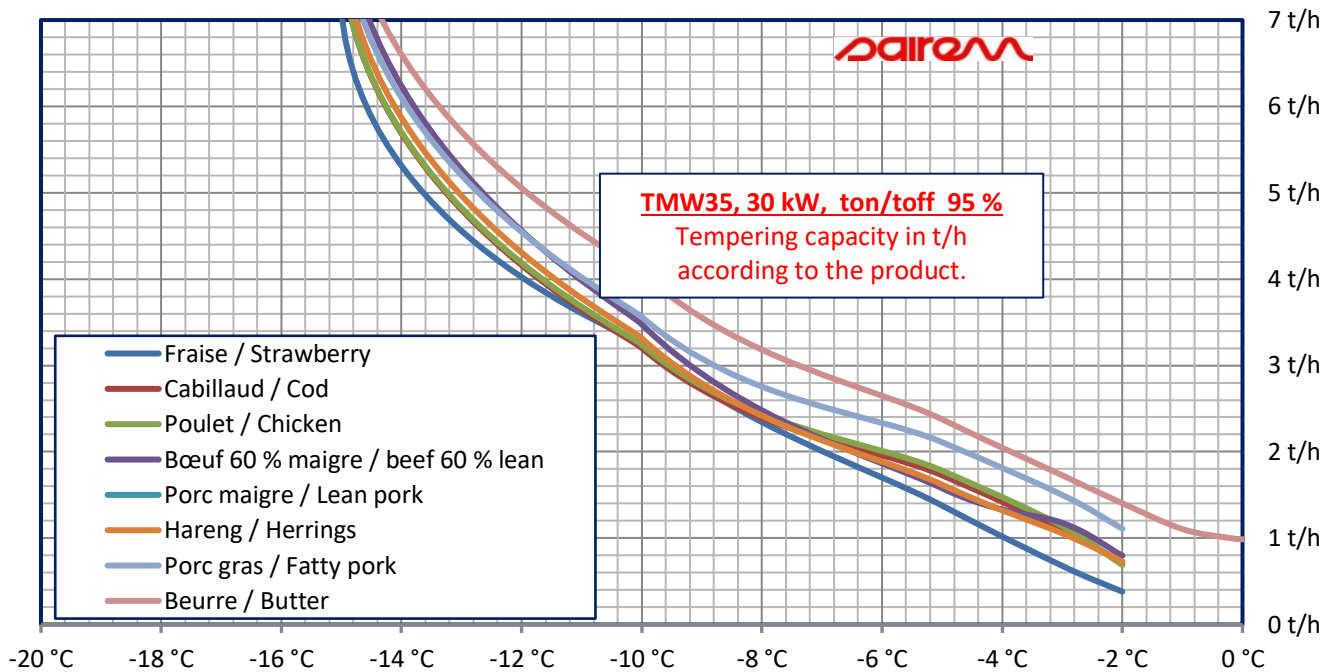
Example: Fatty pork \approx 2.1 t/h from -18 °C to -5 °C or \approx 1.5 t/h from -18 °C to -3 °C.

¹ Microwave utilization within 1 hour including loading/unloading. the optimum is 95 %.

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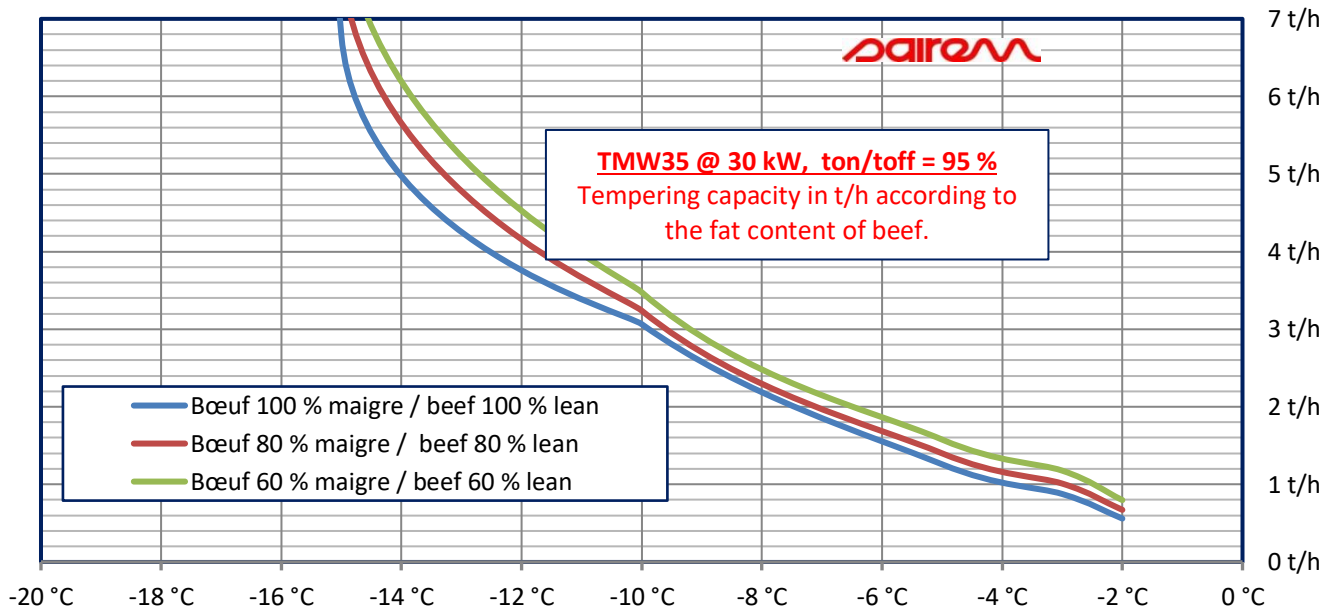
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TEMPERING CAPACITY VS. PRODUCT TYPE



Examples: butter (1.8 t/h at -3°C) or beef 60 % lean (1.15 t/h at -3°C) for the same final temperature.

TEMPERING CAPACITY VS. FAT CONTENT



Example: capacity \approx 1.2 t/h for beef 60 % lean, or \approx 0.85 t/h for beef 100 % lean from -18 °C to -3 °C

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Capacity is highly variable if final temperature is -7°C or -3°C , or if meat is lean beef or fat pork. Such variations are linked to physical laws such as for example, latent heat of fusion. Capacity varies according to the processed product (lean beef, pork...), its fat content and the final required temperature.

All the above charts are calculated for a TMW35 operating under following conditions:

- Power of microwave generator at 30 kW
- $T_{\text{on}}/T_{\text{off}}$ at 95 %
- Blocks or products with regular mass and shape
- Blocks or products regularly placed on the belt
- Starting temperature between -20°C and -18°C homogeneous in all the blocks or products

EXAMPLES OF BLOCKS PROCESSED WITH THE TMW35



Beef
25% fat, 25 kg
1500 kg/h from -18°C to $-4^{\circ}\text{C}/-2^{\circ}\text{C}$



Pork shoulder
10 to 15 % fat, 25 kg
1000 kg/h from -18°C to $-3^{\circ}\text{C}/-1^{\circ}\text{C}$



Chicken breasts
15 kg
950 kg/h from -18°C to $-4^{\circ}\text{C}/-2^{\circ}\text{C}$



Strawberries
10 kg bags
950 kg/h from -18°C to $-3^{\circ}\text{C}/-1^{\circ}\text{C}$



Rhubarb
10 kg bags
950 kg/h from -18°C to $-3^{\circ}\text{C}/-1^{\circ}\text{C}$



Broccolis
20 kg bags
900 kg/h from -18°C to $-3^{\circ}\text{C}/-1^{\circ}\text{C}$

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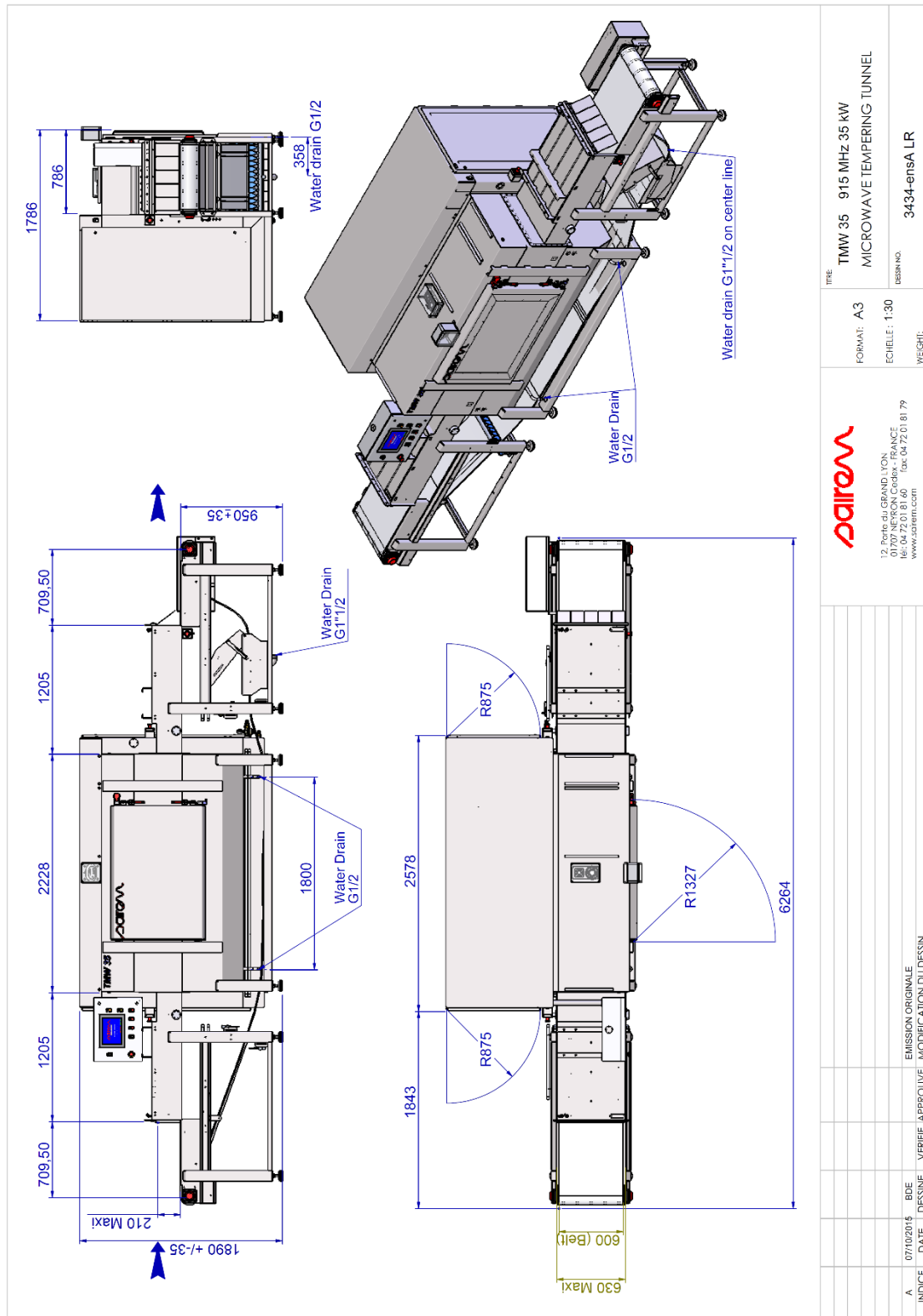
KEY SPECIFICATIONS

Reference	TMW35
Construction	<ul style="list-style-type: none"> • Cavity: 304 L stainless steel, chain conveyor belt in polyethylene, microwave door with $\frac{1}{4} \lambda$ choke, microwave inlet above and below, automatic loading and unloading. • Microwave generator: cabinet is IP55 and equipped with a single 35 kW magnetron, electronic system and boards without any adjustment to make maintenance easier, high reliability.
Tempering capacity	<ul style="list-style-type: none"> • Depends on final temperature, product, fat content
Conveyor belt	<ul style="list-style-type: none"> • Flat top Intralox principle, width 600 mm, operating height 950 mm • Adjustable belt speed. Left to right or right to Left configurations
Max. size of blocks	<ul style="list-style-type: none"> • 600 x 400 x 200 mm, 30 kg maximum per block • Optional maximum height 250 mm
Microwave frequency	<ul style="list-style-type: none"> • 915 MHz. Other frequencies available according to regulation of each country
Microwave power	<ul style="list-style-type: none"> • 35 kW maximum, adjustable from 10 kW to 35 kW
HMI Human Machine Interface	<ul style="list-style-type: none"> • 12" touch screen, multi-lingual, control of microwave power and belt speed, 50 programmable recipes, tunnel status, faults status, etc... Microwave start, emergency stop, etc.
Specific safety	<ul style="list-style-type: none"> • Microwave leak detector • Smoke sensor: detects a fire, stops microwaves, inject water via nozzles
Voltage & consumption	<ul style="list-style-type: none"> • 400 V, 3-phase + earth (no neutral), 50/60 Hz, 50 kVA at full power
Cooling water	<ul style="list-style-type: none"> • Min. 30 L/min with differential pressure min. 3.5 bar, inlet water temperature 18 °C to 22 °C, power to dissipate 12 kW; ES 1.5" gas female • Optional: air/water chiller or water/water chiller
Belt washing (option)	<ul style="list-style-type: none"> • System for belt washing and drying located near the tunnel output
Cleaning	<ul style="list-style-type: none"> • Water jet inside the tunnel • Evacuation under the tunnel
EC standards	<ul style="list-style-type: none"> • 2006/42/CE, BT 2006/95/CE, CEM 2004/108/CE, EN 55011, CEI60519-6 :2011
Dimensions (W x H x D)	<ul style="list-style-type: none"> • 6284 x 1890 x 1786 mm
Weight	<ul style="list-style-type: none"> • 1900 kg

TMW35 MICROWAVE TEMPERING TUNNEL

MAIN DIMENSIONS

CONVEYOR BELT LEFT TO RIGHT



TMW35 MICROWAVE TEMPERING TUNNEL

CONVEYOR BELT RIGHT TO LEFT

