



Your Food - Our Focus

Foodservice Equipment
Crafted For Lasting Value

Retherm Oven Background

Retherm

Reheating food that has been previously cooked to a safe temperature and safely cooled to a frozen or refrigerated "slacked" state 41°F or less. All food that is being reheated from this state must reach an internal temperature of 165°F for 15 seconds within 2 hours or must be thrown out. In general, cooking times of 90 min or less are preferred to allow for a safe amount of flexible cooking time and preparation.

Retherm ovens are typically found in large institutions such as school, hospitals, and prisons. Retherm ovens allow food preparation to occur off site, catering to centralized kitchens with satellite operation that have a minimum of other expensive cooking equipment, as well as associated kitchen ventilation systems.

In many respects, retherm ovens are similar in design to low temperature convection ovens. A retherm oven however, has about four times the wattage and double the air movement to increase energy transfer efficiency.

Retherm Efficiency

The transfer of energy from a heated cabinet to a thermal mass (food) in a fast and controlled rate. Testing determines how effective Retherming energy transfers to a thermal mass (food). By testing an empty cabinet and a loaded cabinet, we can compare the energy transfer in kW to the thermal mass (food).

Retherm-energy efficiency is a measure of how much of the energy that an appliance consumes is actually delivered to the food product during the rethermalization process.

$$\text{REE (Retherm-Energy-Efficiency)} = \frac{\text{EF (Energy to Food)}}{\text{EA (Energy to Appliance)}}$$

The larger the thermal mass, the more energy (kW), is needed to transfer to the mass. In the same regards, the more energy (kW) the faster the thermal mass can absorb the energy and reach desired temperatures.



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Convection Efficiency

A convection oven (also known as a fan-assisted oven or simply a fan oven) is an oven that has fans to circulate air around food

With the use of convection forced air (fan) in the cabinet, Retherm times are increased by +25% (test show 20 – 30% dependent upon product types). Air circulation and flow are paramount when retherming bulk loads of thermal mass (food) to insure air is not being restricted around the mass. Increasing the mass or load requires more air circulation for dynamic temperature transference. The absence of air movement will thus increase the time and power required to retherm the product to safe temperature. ***It should be noted, that the TRANSFER of energy is as much a factor in retherm times, as the AMOUNT of energy (wattage/kW) introduced.***

Radiant Efficiency

Testing in a radiant (no fan) environment has proven that the low convective airflow inhibited the oven's ability to heat the product in the center of the cabinet. Retherming times can be compensated by either higher wattage (energy) and/or with increased temperature in the cook compartment. It is recognized that natural convection air circulation is present however the natural thermal air movement from the hot cabinet and cold thermal mass transfer is minimized.

The energy savings and inefficiency of not utilizing a forced air system is far out weighted by the increased energy required in time and/or temperatures to properly retherm product within safe HACCP guidelines. As noted in the above section, the efficiency of the *transfer* of energy is as important as the *amount* of energy introduced.

FACTORS AFFECTING OVEN TEMPERATURE AND COOK TIME WHEN RETHERMING:

- State of Food - Slacked Vs Frozen: Slacked Food is recommended and will cut down cook time
- Product Density: The denser the product or meal package material, the longer the cook time.
- Oven Load: Space between product creates better air movement, shorter cook times.



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Retherm Comparison Cabinets

LCH-18		RH-18		RH-18-HO	
208v	220v-240v	208v	220v-240v	208v	220v-240v
Watts: 3370	Watts: 4405	Watts: 9,745	Watts: 12,895	Watts: 11,170	Watts: 14,720
Single Phase		Single Phase		Three Phase	
Number of blowers: 1		Number of blowers:2		Number of blowers:2	
Gentle air movement for slow cooking.		Large air movement for high volume heating and finishing.			
					

FOOD WARMING EQUIPMENT COMPANY, INC.

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