

CP Amerio Manual Contact Plate Freezers

Highest efficiency in Heat Extraction

During the freezing cycle, the top and bottom of each food package is in intimate contact with the freezing surface of the contact plate. Since the refrigerant flows through passageways in the flat metal freezer plates, the surface temperature in contact with the package is very near that of the refrigerant temperature. Further, the refrigerant flow is engineered to provide uniform surface temperatures over the entire plate area, assuring ideal freezing performance.

Big cost savings in energy use, refrigeration performance and cold room facilities.

While the customer may specify a choice of ammonia or halocarbon refrigerant, the combined principles of non-consumable recirculated refrigeration and direct heat absorption through intimate contact with the product surface provide unsurpassed overall freezing economy.

Such factors as ambient; product temperature; the desired core hardness; the number of freezer stations which determine load capacity; local energy costs; availability and costs of cryogenic media used in consumable media freezing systems etc., all affect a true cost comparative analysis. However, long experience in providing contact plate freezers for a wide range of bulk and pre-packaged products has provided some guideline data. In general, Amerio contact plate freezing costs represent about 1/7th the cost of consumable freezing media systems and about 33% the cost of utilizing blast freezing which requires substantial hardening room facilities and utilization of labor. CP engineers will be glad to

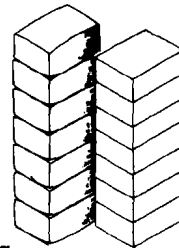
provide a meaningful cost analysis once specific plant operating and product packaging parameters are made available.

Rapid freezing rate assures high product quality.

Fast contact plate freezing helps maintain the desired product characteristics such as texture, flavor, etc. Much smaller size ice crystals are formed within red meats, poultry and delicate seafood tissues, for example, than is possible with systems designed to freeze product at slower rates. Food cell damage is virtually non-existent. Nutrient fluids and the flavor and aroma elements, essential to retaining product identity after thawing, are largely preserved. And, the rapid freezing rate of Amerio Plate Freezers avoids the risk of product discoloration, further enhancing continued product acceptance at the consumer level.

Optimum flat package shape minimizes costly packaging requirements.

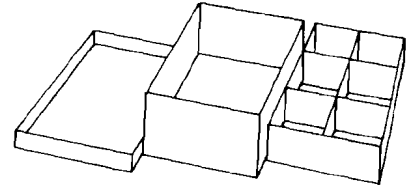
In a fully loaded station comprising a single layer of packaged product, the top and bottom package surfaces are in direct contact with the flat plate surfaces and all package sides are in intimate contact with adjacent packages throughout the freezing cycle. The end result is a uniformly smooth, flat sided package that stacks well, can be readily shrink-wrapped for pallet-load handling, consumes minimal storage area and provides excellent appearance at the retail display.



Further, the engineered arrest in package side movement permits the use of lower cost, nominal thickness packaging materials with no sacrifice in the appearance of final frozen product. These reductions in packaging material thickness and/or the elimination of secondary protective wrappings often enhance overall freezing performance.

Innovative freezing techniques add versatility.

While the majority of Amerio Contact Plate Freezers are used for freezing product contained in rectangular shape cartons, more and more units are being used for freezing non-cartoned bulk and proportioned product to gain the economies of contact plate freezing.



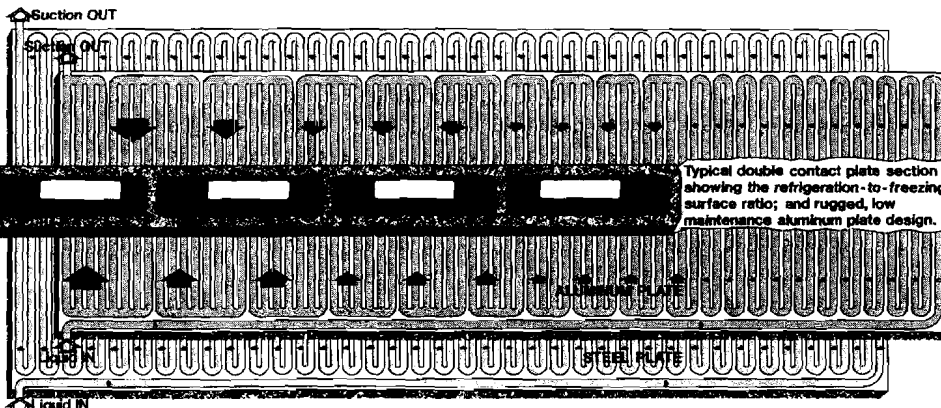
In some variations, trays are used to hold single layers of product such as shrimp or vegetables for subsequent bulk bagging. Other processors use deep drawn trays fitted with dividers for freezing blocks of fish fillets, ground meats, etc. for distribution to secondary product processors.

Liquid and light viscosity products such as creamed vegetables and liquid egg are first sealed in sanitary pouches, placed in compartmented trays, and after freezing, overwrapped in lightweight cartons to achieve an inexpensive and effective package at retail display.

In contact plate freezing round containers, lid "pop-off" is eliminated because of the positive pressure exerted by the flat contact plate surfaces. Often a lower-cost round container/lid package can be used to gain further cost efficiencies.

The latest in Aluminum Plate Design

Refrigerated media is efficiently circulated through the use of progressive parallel streaming. This provides maximum saturated (wetted) refrigerated surface while maintaining the desired low pressure drop. This maximum utilization of heat exchange surface provides uniform fast freezing over the entire surface of the plate.



Hydraulic Pump Unit

1½ HP for 1-3 Freezers. 2 HP for 1-6 Freezers.

Control Lever

Four-way valve regulates hydraulic fluid to lifting cylinder.

Hydraulic Cylinder

lifts and closes freezing plates

Top Pressure Plate

evenly distributes hydraulic pressure over full plate surface.

Connecting Linkage

Sequentially separates plates during opening cycle to set station dimension.

Corner Headers

provide even distribution of refrigerant

Refrigerant Hoses

Rubber for Ammonia; Bronze for Halocarbon. Carry refrigerant between corner headers and individual plates.

Trays

Optional for non-cartoned packages or bulk product.

Freezer Contact Plates

engineered with high efficiency circulation mode for uniform heat extraction over entire surface area.

Insulated Doors are equipped with heavy duty hinges and frost breaker type locks. Full set at front and rear for choice of loading or unloading.

Built rugged

Heavy duty mechanical linkage powered by a central hydraulic cylinder is controlled by a lever. Full length side bar spacers installed between all plates assures accurate spacing of plates to accommodate established size packaged product.

Plate design is performance-proven in hundreds of installations to provide optimum strength over years of continuous service.

Simple to Operate

Trays of product to be frozen are loaded in each station from either front or back while plates are in open position. When loading of all stations is complete, plates are hydraulically lowered into position, imposing 5 PSI (0.35 kg/cm²) positive surface contact on product packages.

Versatile.

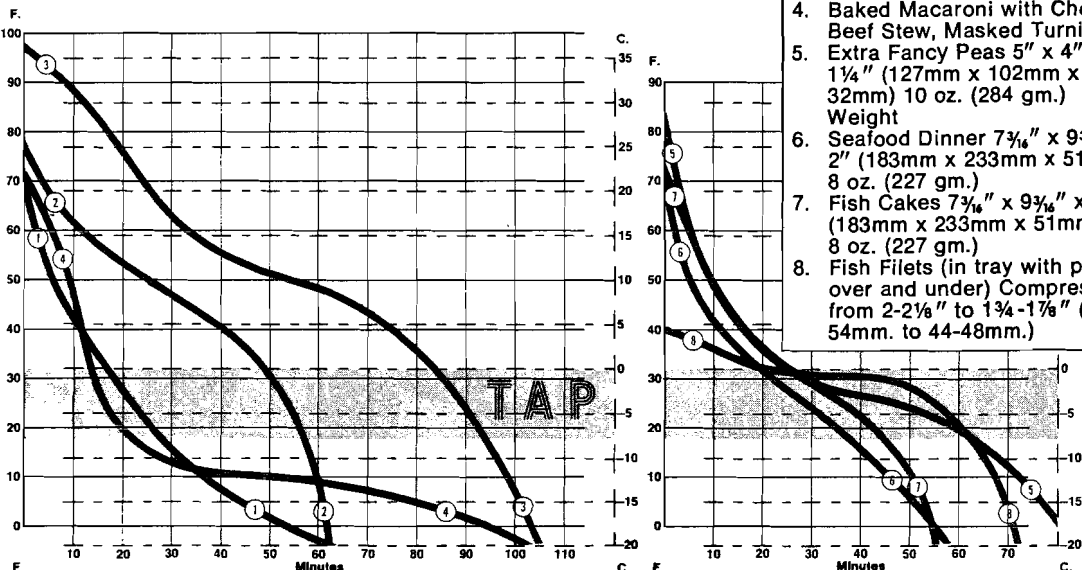
Because all Amerio Freezers are built to customer requirements, every unit can be fitted to handle one or several product sizes determined by the positioning of the end spacers. Nominal package size changes often entails a simple substitution of end spacers and minor control adjustments.

Typical Time/Temperature Freezing Rates for:

1. Bread Dough 2 in. 51mm Thick 20 oz. (567 gm.) Weight
2. Beef Steaks 4¼" x 4¼" x 1¼" Thick (108mm x 108mm x 32mm) 8 oz. (227 gm.) Weight.
3. Cubed Beef Steaks (2) 5½" x 8" x 2¾" Thick (137mm x 203mm x 60mm) 8 oz. (227 gm.) Weight.
4. Baked Macaroni with Cheese
5. Beef Stew, Masked Turnips Extra Fancy Peas 5" x 4" x 1¼" (127mm x 102mm x 32mm) 10 oz. (284 gm.) Weight
6. Seafood Dinner 7¾" x 9¾" x 2" (183mm x 233mm x 51mm) 8 oz. (227 gm.)
7. Fish Cakes 7¾" x 9¾" x 2" (183mm x 233mm x 51mm) 8 oz. (227 gm.)
8. Fish Filets (in tray with paper over and under) Compressed from 2-2½" to 1¾-1½" (51-54mm. to 44-48mm.)

TAP . . . the critical zone

The formation of ice crystals, which takes place between 32° and 18° F (0 to -8°C) during freezing plays a crucial role in safeguarding product characteristics. As a rule, the quicker this *Thermal Arrest Period* is traversed, the better. Charted at the right are typical freezing curves for specific products frozen in an Amerio Contact Plate Freezer. While many factors can affect the rate of freezing of your products, a fairly conclusive analysis can be made by testing your product and packaging in our extensive pilot plant facilities.



Time/Temperature Freezing Performance

Listed in the chart below are products, their weight/volume, package thickness, infeed temperature, retention time and refrigeration factor. Using these figures as a guideline, the processor can approximately determine the process parameters for his product.

Considerations that affect chart use:

- Prepared foods may vary in refrigeration loads due to use of different raw materials.
- Tonnages shown in the chart are reference point figures. Actual refrigeration factors should be calculated for each condition.
- Higher temperatures at the suction side of the refrigeration will generally require an increase in product retention time.
- The discharge of product at core temperatures higher than shown and allowed to equalize may materially decrease required retention time.
- Retention time is affected by product composition, packaging technique, package type and other variables.

Product Group	Product	Weight or Volume	Freezing Thickness		Entering Temperature		Retention Time (In Minutes)	Refrigeration Factor
			Inches	Cm.	F.	C.		
Vegetables	In Sauce	10 oz.	15/16	2.38	70	21	45-55	1.5-2.0 TR/100 lb. 100-133 kcal/kg
	Fresh Packed in Cheese or Butter Sauce	10 oz.	1½-1¾	3.8			85-110	
		40-48 oz.	2-½	5.35			140-180	
Baked Goods	Donuts-Glazed and Filled	½ Doz.	1-¾	3.5	70	21	35-45	.83 TR/100 lb. 55 kcal/kg
	Rolls - "Heat and Serve"	1 Doz.	1-½	3.8	80	26.5	35-45	.86 TR/100 lb.
	Fruit Pies	10 oz.	1-¾	3.5	70	21	40-65	57 kcal/kg
	Pumpkin Pie	12 oz.	1-¾	3.5			90-110	
Prepared Foods	Pot Pies	8 oz.	1-¾/16	3.97	70	21	90-110	.86 TR/100 lb.
	Meat Loaf Dinner	11 oz.	1-½/8	2.86	90	32	70-80	57 kcal/kg
Meat Products	Hamburger Patties	45 oz.	2-½	5.35	40	4.5	55-60	1.2 TR/100 lb.
	Hamburger Patties	190 oz.	5	12.7			220-260	80 kcal/kg
	Sausage, Pork Link	16 oz.	1-¾	3.5			60-80	.75 TR/100 lb. 50 kcal/kg
Fish	Whiting 5 lb. Block	60 oz.	2-½	6.35	40	4.5	150-170	1.25 TR/100 lb. 83 kcal/kg
Dairy Products	Ice Cream	½ Gal.	3-½	8.9	22	-5.5	90-100	360 BTU/Gal.
	Ice Cream	½ Gal.	5	12.7			140-160	23 kcal/liter

All temperatures and retention times are based on 0°F (-18°C) core hardness at discharge and -45°F (-43°C) plate temperature.

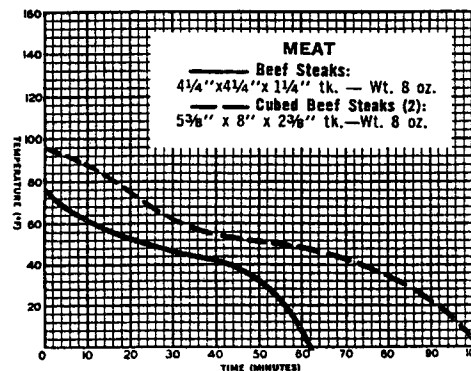
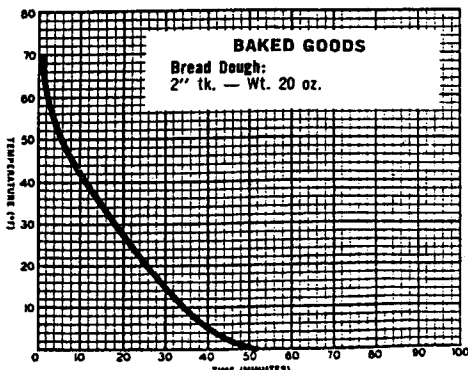
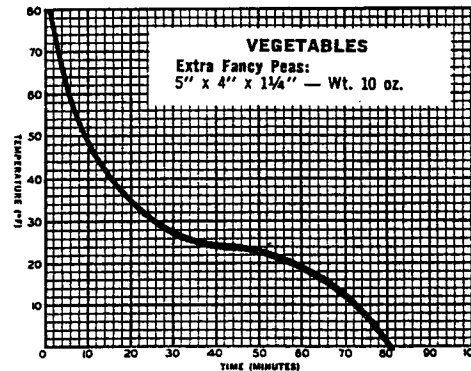
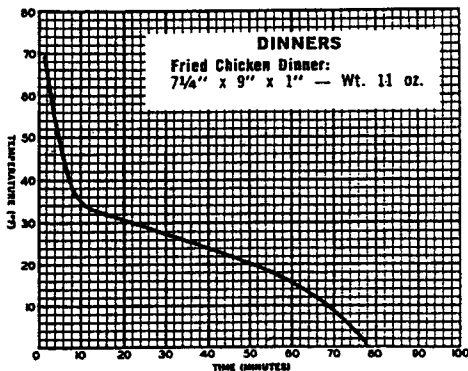
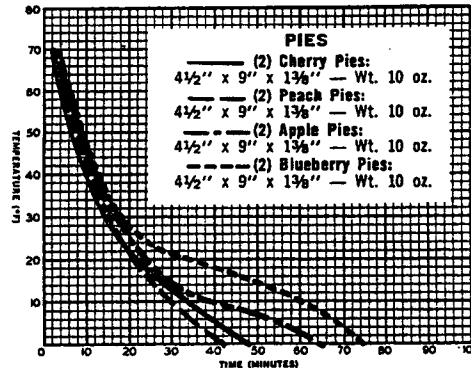
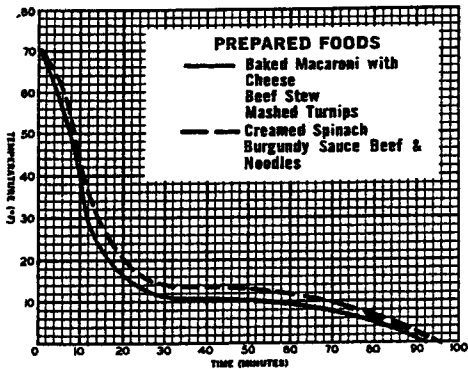
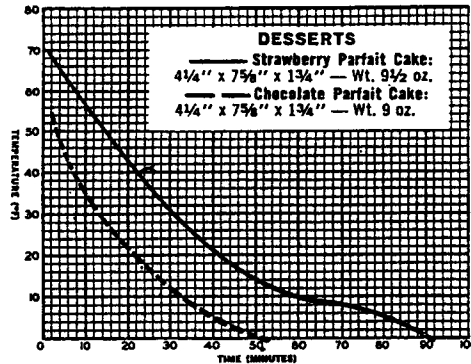
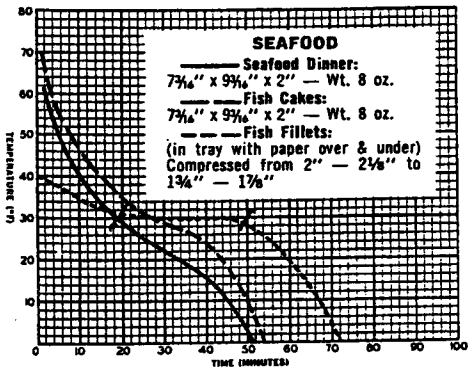
TR = Tons of Refrigeration



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