

The Safe Way to Blast Chill, Freeze and Thaw

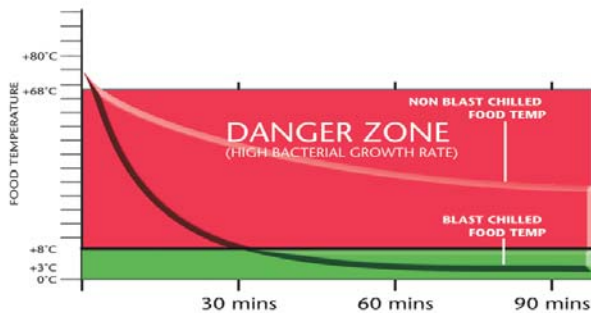


FOSTER
REFRIGERATOR
Blue Paper

Why Blast Chill?

Blast Chilling & Freezing: The only way to ensure food safety and quality

Current food legislation requires that all food must be cooled as quickly as possible. This means that whenever food is chilled or frozen, it must be in the "Danger Zone" between +8°C and +68°C, where bacteria multiply fastest, for as little time as possible. Under ideal conditions, bacteria split into two every 20 minutes. So from 1 bacteria to 69 million in 12 hours!



To minimise the time spent in the Danger Zone, a specially designed Blast Chiller or Freezer is required - standard refrigeration equipment just isn't capable of extracting heat fast enough

Why putting warm food in a refrigerator just won't suffice:

Food quality is reduced by damage to texture & consistency. Bacteria have time to multiply before a safe temperature is achieved. The refrigerators' temperature is raised, bringing other food into the "Danger Zone"

What is Blast Chilling?

Department of Health Guidelines state that to safely Blast Chill food its temperature must be reduced from +70°C to +3°C or below within 90 minutes. Many Blast Chillers, including the Foster range now exceed this requirement and can safely blast chill from a starting temperature of +90°C

What is Blast Freezing?

Current European guidelines recommend that food be reduced from a temperature of +70°C to -18°C in no more than 240 minutes

The Facts

For too long the catering industry has not chilled food properly, simply leaving it out to cool in the kitchen, or placing it in a general purpose refrigerator which is too slow. These are highly dangerous practices, especially in summer, and could very easily lead to food poisoning

- Food poisoning is on the increase and can be fatal
- According to the Food Standards Agency, an estimated 5.5 million people a year are affected by food poisoning, the vast majority as a result of eating in a restaurant, café, takeaway or fast food outlet

The Law & how it affects you

The Food Safety Act 1990 makes it an offence to "render food injurious to health" or to sell food that does not comply with safety requirements

The Guidelines for Cook-Chill and Cook-Freeze Catering Systems, 1989 state that "food should be chilled to between 0°C and +3°C within a period of 90 minutes. A specially designed rapid chilling apparatus is required if rapid reduction of temperature is to be achieved"

To ensure that you meet the above obligations, food must be blast chilled. The prosecution only has to prove "beyond reasonable doubt" that a person has not met food safety requirements. The 1990 Act includes severe penalties – a large fine or up to two years' imprisonment

Ignorance is unacceptable and is not a satisfactory defence, nor is it good business sense either!

Due Diligence is the only defence: "It shall be a defence for the person charged to prove that he/she took all reasonable precautions and exercised all due diligence to avoid the commission of the offence"

The Future

Traditionally blast chilling was only a necessity for large institutional kitchens using Cook-Chill operations. Now, it is essential in hotels and restaurants where their banqueting system uses cook-chill, and many kitchens and catering facilities are insisting on having Blast Chill facilities to maintain the quality of their cooked product, maximise food hygiene and reduce wastage

The European Commission is planning to implement a new European Directive on Food Safety in the next few years, which will include legislation on safe food chilling. The Directive will require that ALL catering facilities use blast Chilling equipment to cool down cooked food

How do Blast Chillers & Freezers work?

They operate in a similar fashion to combi or convection ovens with powerful fans creating a fast even air flow, except the air is, of course, very cold instead of hot. Using a high-powered refrigeration system, cold air is blasted laterally over the product at high speed, extracting heat at an optimum rate, whilst maintaining food quality. Once the food is out of the Danger Zone and the chill or freeze cycle is complete, the equipment switches into "Hold mode" to keep the food at the required temperature (+3°C if chilled, -18°C if frozen)

But I don't need a Blast Chiller...

If you serve hot meals, then you will almost certainly benefit from using a Blast Chiller or Freezer. The Foster range offers a capacity to suit all volumes, from the small independent restaurant to a large-scale Cook-Chill operation. Blast Chillers not only ensure food of the highest quality, but also make it easy for caterers to comply with Food Safety and Temperature Control legislation, keeping your customers and the Environmental Health Officer happy

Benefits of Blast Chillers & Freezers

Quality

Damaging bacteria is rendered dormant, minimising food spoilage

Colour, texture, flavour, structure and nutritional value is locked in

Delicate food surfaces such as pasta and fruit are protected, as rapid chilling stops an "ice skin" forming which otherwise dehydrates and damages the products' appearance

Blast freezing also helps to keep food looking good. The slower food freezes, the larger the ice crystals formed; and large ice crystals can damage food, dry it out, and break down the physical structure leaving you with an unrecognisable product

Air chill/freeze temperatures are fully adjustable, depending on the food to be chilled, to ensure your end product is of the best quality

Reduced Food Wastage

Kitchens with blast chillers and freezers throw away less food. Food left over, from a hot servery for example, can quickly and safely be chilled for later use, with complete confidence in its quality and safety. Once prepared and chilled, only the correct numbers need be reheated, as legislation states that chilled food can be safely kept below +3°C for up to 5 days after production

Blast chillers can even be used to chill wine, cans or other drinks, buffet dishes, salads and serving dishes

Kitchen Efficiency

Blast Chilling allows you to manage your kitchen better. Advance food preparation lets you prepare larger batches when it suits you, and then chill or freeze some for later use. This makes for fewer (larger) batches, more efficient use of ovens, more predictable working hours and optimum use of your chef's schedule, and gives you time to improve on presentation and attend to customers. Blast chilling can increase your potential profits by increasing production capacity, and reducing food wastage. It can even help you to increase your menu options

Gastronorm flexibility - The Foster range is compatible with all your kitchen equipment as it takes all standard Gastronorm 1/1 containers, and trolley-loading models are compatible with all standard combi-trolleys

Food surface protection

The appearance and surface texture of food is safe with Foster. Delicate food, such as rice, pasta, fish or fruit, is blast chilled without affecting product appearance through surface dehydration

This food surface protection is achieved using Foster's Circulair™ air circulation system. The airflow is "sucked through" rather than blown onto food, and flows in a horizontal direction. This means that cold air flows over - rather than directly at - the food surface. In addition the speed of the airflow is automatically controlled and adjusted during both the blast chill and the hold phases. This prevents an 'ice skin' from forming on the product and also stops 'wind chill' damage and dehydration to the food surface - thereby maintaining the visual appeal and the taste of the product.



Gone are the days of complicated Blast Chillers. The Foster Blast Chiller Range has been designed to be as simple to use as a domestic washing machine. No complicated display or mass of switches: a simple menu-driven dial enables even a new operator to work the unit in seconds. Just rotate the dial to the programme you require, and press to start. It couldn't be easier!



The new Foster range of Blast Chillers also have the following benefits:

- Now capable of blast chilling from +90°C if required
- Automatic Hold function
- Automatic Defrost & "Smart Defrost" functions ensure maximum performance and minimum energy usage
- Info Update Screen shows all you need to know
- HACCP software option in 3 formats for data retrieval and management
- Foster Circulair™ air circulation system ensures uniform chilling whilst protecting the food surface
- Coated coil - stops corrosion and prolongs refrigeration system life
- Durable door designed with magnetic gasket

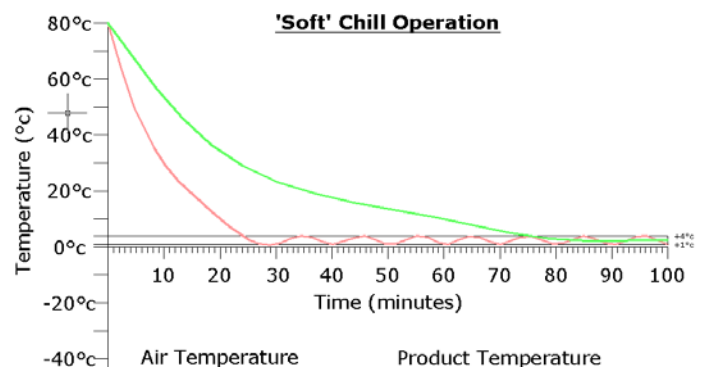
Soft Chill, Hard Chill, Hard Chill Max and Shock Freeze: What do they mean?

These are the 4 main programmes that you will need to use your Blast Chiller or Freezer for

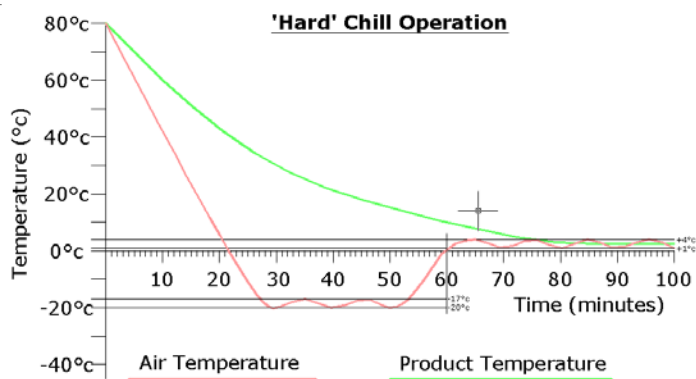
Soft Chill- For the safe chilling of delicate products. The Soft Chill cycle is ideal for the rapid but gentle chilling of any dish. This cycle brings the temperature of the food down whilst retaining a positive air temperature. This prevents large ice crystals forming which can damage the structure of delicate foods such as gateaux and patisserie items, and high water content items such as vegetables, rice and pasta. Using this programme thereby maintains the texture, consistency and appearance of these foods, with no dehydration or cell damage

Hard Chill- For general purpose chilling. The Hard Chill cycle is ideal for chilling "standard products" such as cooked meat, pies, lasagne, individually portioned meals etc. The new Foster range keeps the air temperature at around -15°C for the first 70% of the cycle, to reduce temperature quickly.

Air temperature is then increased for the last 30% of the cycle to stop surface damage and to ensure quality



Theoretical Performance at Soft Chill Air Temp: (maintained above 0°C for protection of delicate products)



Theoretical Performance at Hard Chill Lower Air Temp. (for more efficient cooling)

Hard Chill Max- for high density and high fat content product. This specialised programme is designed to rapidly chill products with high densities or high fat contents, such as meat joints, stews and sous vide

Shock Freeze- the safe way to freeze food. Products to be frozen can be shock frozen to -18°C within 240 minutes. This ensures quality and food safety with no damage to appearance, structure, or taste

Thawing

Having made sure your food is blast frozen properly and quickly, it is vital that the defrosting is equally controlled in a cabinet that is designed for the job. Dangers occur when food products are allowed to thaw in ambient surroundings. For example, if a product is left out overnight or for several hours in a warm kitchen to defrost, the surface of the product is likely to rise to +20°C or more, which accelerates the growth of bacteria

To defrost food, the air around needs to be relatively warmer than the food itself so that heat can be transferred from air to food to melt the ice. If it is too warm it will cause high surface temperatures before the core of the product is defrosted. If it is too cool, there will not be a sufficient temperature difference to transfer heat quickly enough to the food and it may take a long time to defrost the product. A quick steady thaw with continuously introduced heat is the reason why a thawing cabinet gives such excellent results

Foster Controlled Thaw cabinets operate at approximately +10°C and circulate air at accelerated speed over frozen food. This is done by means of alternate gentle heat (provided by heaters) and refrigeration via special air ducting and fans. This speeds up the thawing process so that large quantities of similar food can be thawed at the same time keeping food temperatures within safe limits while defrosting

The Basic Do's & Don'ts of Blast Chilling & Freezing

Different foods give up their heat at different rates and therefore there are certain factors that need to be considered when determining chill or freeze time, and which programme should be used. A 10kg meat joint will not have the same chilling requirements as 10kg of patisserie product

- Density, water content, and fat content all affect the time required to achieve temperature
- Delicacy of the foods' structure and surface must be taken into account when selecting the programme required
- Weight loadings and the thickness of product should not be exceeded. Foster recommends a maximum loading of 3.75kg per Gastronorm 1/1 container

- Large joints of meat will not chill within the standard guidelines. In this situation, guidelines recommend that joints are either portioned before chilling, or chilled as quickly as is possible
- Product that is hotter than the recommended starting temperature will obviously take longer to chill
- It is recommended that foods are not covered or lidded, as this will extend the time required. Use of deep containers will also extend the chilling time
- It is essential that good airflow passes over the product to facilitate even and consistent chilling. Foil should not be used to cover food if possible
- Always check the food product before and after with a hand held temperature probe and record it
- Do not overfill containers (recommended depth is 25mm) and keep food evenly spread
- Allow food to rest after cooking-especially meat to ensure the quality and texture of the end product. Guidelines recommend that food is rested and cooled for 30 minutes before blast chilling
- Do not overload the Blast Chiller as this will mean the required temperature will not be achieved in time
- Always clean and sanitise the fitted core probe before use
- Decant hot liquids into manageable size Gastronorm containers
- Pre-Chilling the unit is recommended to improve the cooling time
- If in doubt, use the probe to ensure safe temperatures are achieved

Guide Blast Chilling & Freezing Times*

Food Type	Includes	Blast Chill Programme required	Time required to Blast Chill (minutes)	Time required to Shock Freeze (minutes)
Meat	Beef, pork, beef, lamb, poultry & mince	Hard	40-90	60-240
Fish	Fried, poached or baked- haddock, plaice, salmon, cod filets etc & shellfish	Soft	30-90	60-240
Prepared dishes	Stews & casseroles, lasagne, risotto, sheperds pie	Hard	50-90	90-240
Vegetables & Pulses	Steamed or roasted veg, rice and potatoes etc	Soft	30-90	60-240
Fruit	Stewed and cooked fruits	Soft	60-90	60-240
Bakery	Cakes	Hard	30-90	70-240
Bakery	Pastries	Hard	60-90	50-240
Desserts	Fruit based desserts & egg based flans	Soft	30-90	70-240
Desserts	Sponge puddings and dense desserts such as cheesecake	Hard	30-90	70-240

* All times listed should be used as a guide only, and will depend on type, size and quantity

Government Publications:

The Food Safety Act 1990

The Food Safety (General Food Hygiene) Regulations 1995

The Food safety (Temperature Control) Regulations 1995

The above titles are available from: The Stationery Office, PO Box 29, Norwich, NR3 1GN. Tel: 0870 6005522

Guidelines for Cook-Chill and Cook-Freeze Catering Systems, 1989. London.

Available from: The Department of Health. Tel: Tel: 0207 210 4850

Other Foster Blue papers include:

The ECA Scheme

Hydrocarbons in Refrigeration - What caterers need to know

The Climate Change Levy

Fire Ratings & Coldroom Panels

Food Temperature Laws

Inspection by Environmental Health Officers

Food Safety and E. Coli

HACCP- Hazard Analysis Critical Control Points

Handling and Serving Ice

CFC's, Refrigeration and the Caterer

Safe Food Storage

Plan for a Catering Crisis

For copies of our other Blue Papers, visit www.fosterrefrigerator.co.uk/food_safety or call 0500 691122



Oldmedow Road, King's Lynn Norfolk PE30 4JU

Tel: (01553) 691122 Fax: (01553) 691447

Visit us on our website:

<http://www.fosterrefrigerator.co.uk>