

Blast and Fluid Bed Freezer – FT36

The Armfield Blast and Fluid Bed Freezer combines these two important industrial processes into one scaled-down freezer cabinet.

Applications

- ▶ Detailed study of batch blast freezing process
- ▶ Study of fluid bed freezing
- ▶ Effect of air velocity
- ▶ Effect of air temperature
- ▶ Simulation of the production scale process



Blast freezing



Freezer Chamber



Description

The blast freezer and fluid bed sections are contained inside an insulated cabinet along with the fan and evaporator. Access doors to both sections are fitted with observation windows and an electrically heated surround to prevent the doors from freezing in the closed position. Inside the cabinet, a fan with adjustable impeller transports air from the interior of the cabinet into the freezer ducting and through the evaporator tube bank where it transfers heat to the refrigerant.

The air, now reduced in temperature, passes through the tray section, which can be observed through a removable Perspex panel. It then changes direction and passes vertically up through the fluid bed section, back into the cabinet space where it is again circulated by the fan.

The blast freezer section contains five trays on to which the food samples to be frozen are placed. There is a facility for thermocouple sensor leads to pass into the ducting and through the cabinet wall so that freezing temperatures and rates can be monitored externally. There is a facility for a suitable anemometer to be inserted into the ducting to allow the air speed to be measured.

The compressor supplying the refrigerant to the evaporator is located externally on the same framework as the cabinet, as in the control system.

Air flow rate is varied by external control of a damper system and required air temperature is set externally using a microprocessor-based controller.

A floor-standing, insulated freezer cabinet incorporating both blast and fluid bed freezer capabilities. Observation/access doors for both sections having heated perimeters to prevent freezing in closed position. Blast freezer section having five removable stainless steel trays and a polycarbonate observation/loading section.

A 1.1kW axial flow fan blows air from the cabinet interior through an evaporator tube bank where the air is chilled. Refrigerant (R502) is circulated to the evaporator by an externally mounted 4kW compressor which is water cooled. The chilled air is guided via an aluminium duct to the blast freezer section at velocities up to 10 m/s. This velocity can be varied by external adjustment of a 'damper' system in the ducting. After the blast freezer section, the ducting turns vertically upward and terminates with a 0.23m x 0.23m fluid bed section with adjustable surround. The chilled air then flows into the cabinet space to be recirculated by the fan. Cabinet temperature is controlled by an external microprocessor controller down to a minimum of -35°C.

Requirements

Scale



- ▶ Electricity supply: Three phase (see ordering codes)
- ▶ Water: The water supply must have a line pressure of not less than 3.0 bar and a flow capacity of more than 25 l/min @ 3 bar at 20°C.

Overall dimensions

Length	3.30m
Width	1.80m
Height	1.70m
Packed and crated shipping specifications	
Volume	10.0m ³
Weight	1,225Kg

Technical specifications

Max air velocity	10 m/s
Minimum cabinet temp	-35°C
Blast freezer section	
Number of trays	5
Cross-section of duct	0.3m x 0.3m
Fluid bed section	
Area of fluid bed	0.05m ²
Fluid bed surround height	Adjustable to 100mm
Evaporator fan	1.1kW
Compressor (water cooled)	4.0kW

Optional Accessories

- ▶ Stainless Steel option (Enamelled as standard).



Ordering codes

- ▶ FT36-C: 415V / 3ph / 50Hz
- ▶ FT36-D: 208V / 3ph / 60Hz
- ▶ FT36-E: 380V / 3ph / 50Hz
- ▶ FT36-F: 220V / 3ph / 60Hz

Knowledge base

- > 28 years expertise in research & development technology
- > 50 years providing engaging engineering teaching equipment

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