GEA LIQUID NITROGEN FREEZER

Rapid and optimal freezing

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THE PRODUCT.

The freezing of liquid products is normally done with the purpose of easy storage and handling. Liquid nitrogen freezing is optimal when liquids are to be freeze dried. A special benefit of GEA's Liquid Nitrogen Freezer is the extremely fast freezing, which secures optimal freezing and optimal conditions for successive freeze drying of bacteria cultures.

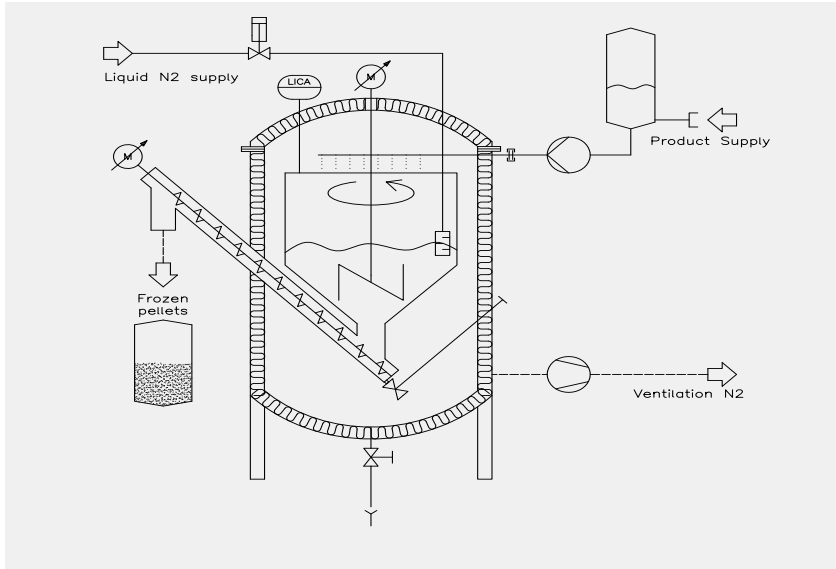
Further, liquid nitrogen freezing forms droplets and the frozen product is therefore dust free and free flowing. Consequently, there is almost no product loss. This makes liquid nitrogen freezing the perfect solution for freezing of rather expensive products. The size of the spherical droplets formed during the freezing is very uniform and mainly dependent on the viscosity of the liquid being frozen.

The properties of the Liquid Nitrogen Freezer
Compared with other freezing methods using blast freezers and drum freezers, the liquid nitrogen freezer is very compact. There are almost no moving parts and the system requires thus almost no maintenance and is very easy to clean. The equipment is provided with CIP but can also be disassembled and sanitized.

Applications
- Bacteria
- Lactoferrin
- Colostrum
- Health extracts
- Yeast
- Enzymes
- Proteins

Liquid Nitrogen Freezer

Liquid Nitrogen Freezer
Process diagram



THE PRODUCT.

Technical description

The Liquid Nitrogen Freezer consists of the following main components:

- Liquid feed arrangement for feeding of the liquid cultures to the pelletizer tank in droplet form through two feed tubes. The droplets are then frozen within a few seconds.
- Pelletizer tank with conical outlet for freezing of the pellets in liquid nitrogen at -196°C.
- Motorized agitator ensuring that the liquid nitrogen is in constant motion to prevent agglomeration of the pellets and gas insulation around the pellets.
- Liquid nitrogen supply valve for supply nitrogen to the pelletizer tank.
- Liquid nitrogen level control for adjusting the liquid nitrogen level in the pelletizer tank.
- Screw conveyor for removing the frozen pellets from the pelletizer tank.
- Due to the difference in density of the pellets and the liquid nitrogen the frozen pellets will sink to the bottom of the freezing tank and be picked up by the screw conveyor. The pellets fall from the screw conveyor into an insulated container which can be moved to a cold room.
- Ventilation system to secure that a slight negative pressure is maintained in the freezing tank to prevent nitrogen gas from escaping to the surroundings.
- The feed and discharge arrangements can be dismantled and separated for cleaning and sterilizing.
- The Pelletizer can be offered with CIP system for insertion at the feed pumps and external CIP of the Auger.

The design is modular with three different sizes for different capacities from about 100 l/h up to 500 l/h:
(The typical pellet size is between 2 and 3mm)

Model	Capacity	Size	Nitrogen consumption
LNF-100	100 kg/h	Ø500	300 kg/h
LNF-220	220 kg/h	Ø640	550 kg/h
LNF-500	500 kg/h	Ø850	1300 kg/h

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