Formax Blender FB-300

Flow Ice – Ice Slurry – Liquid Ice

Formax introduces a new generation of Flow Ice generators based on the blender technology. With a new and improved design of a high capacity ice blender we are releasing a machine that can generate up to 10 tons pr hour of flow ice.

What is new? The production of the ice and brine mixture from the crunched ice is controlled by scientific calculation made in specially designed real time software that is installed in the control module. By this the monitoring of the process and dosing of the components (3 phases) that go into the mixture is very precise. This gives even quality of the output and full control of the process.

System description

What makes the blending technology special is the big amounts of liquid ice (ice slurry) that can be generated in a short time and the ice blend can easily be stored in buffer tanks or applied directly. The viscosity (fluidity) of the product is such that it can easily be pumped in normal water piping at temperatures as low as –10°C.

The method is based on taking a dose of conventional ice (flake -, cube -, tube - ice, etc.) put it into a blender (mixer with rotating knives) and dose a certain amount of brine (salt water) and mix it into a homogenous mixture of liquid ice. By controlling the salinity and the amount of water mixed, it is possible to decide the temperature of the final ice blend.

The main components in the system are a Ice machine, the Formax Blender and a Brine mixing tank (when not using sea water directly). A typical system set-up is shown in following sketch.

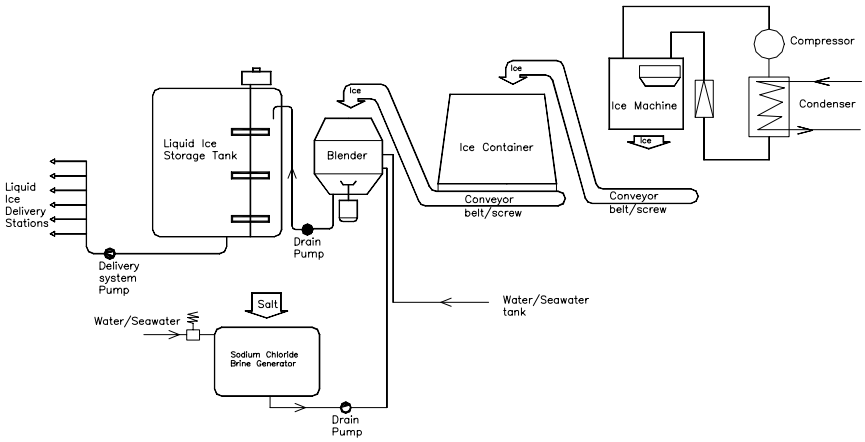

Figure 1: Liquid ice system (option)

Application of the liquid ice

The liquid ice is used in all fields of fish processing, meat processing and other

food applications. We mention some fields of applications in the following list:

- Chilling and storage of fish in wet fish trawlers and long liners
- Chilling and storage of shrimp
- Chilling and storage of fresh salmon during harvesting and transportation.
- Chilling of fresh fillets before IQF freezing or final packing.
- Chilling raw material in pelagic purseiners. By adding Liquid ice to

the RSW tanks of purseiners, the initial heat shock when the live catch enters the hold can be absorbed by pumping liquid ice into the storage tanks. The melting of the ice will chill down the fish quickly and the RSW system then only needs to maintain the 0°C level of the water.

Benefits of using the liquid ice

The main benefits of using the liquid ice are:

- The fluidity of the ice makes a very efficient contact between the ice and the product, making the cooling very efficient. This results in faster chilling than with conventional ice.
- The soft texture of the ice and the fact that the product is floating in the ice means less mechanical impact on the product and no risk of bruises
- The fast chilling of the raw material reduces water losses (drip) of the product and in some cases it will even imply water absorption. The end result is higher yield.

…….. and additional benefits provided by using the Formax system are:

- Salinity and water content can be controlled very precisely allowing full control of the ice water ratio (from 0% - 60% ice) and control of ice temperature.
- The system is very compact and simple in operation. The system can easily be installed onboard fishing vessels and in places with space or access problems.
- The unit is mechanically very robust and there are few moving parts, which makes it operationally safe and easy to maintain.

Capacities

The system capacities can range up to 215 tons/day of liquid ice out put. The capacity depends on the liquid ice quality(homogeneity), which is adjustable. The following table shows the capacity as a function of liquid ice quality.

Quality	**Capacity**
Low	240 tons/24hrs
Medium	150 tons/24hrs
High	100 tons/24hrs

Table 1: Liquid Ice Capacity

The FB-300 blender look and dimensions

The look of the FB-300 blender is shown in the following sketch. The dimensions are specified in the caption text of the sketch.

Figure 2: Formax Blender FB-300; Material: Stainless Steel; Height: 1770 mm; Width: 1060 mm; Depth: 1320 mm; Weight: 340 kg

Delivery systems and liquid ice storage systems

Due to the nature of the liquid ice it is very easy to pump and deliver to any position by a pipe and a water pump. Formax has developed a storage and delivery system that makes it possible to order a specific amount of ice to a delivery point. The liquid ice is stored in a tank and kept homogeneous by an agitator. The system can have any number of delivery points and is controlled by a PLC in a terminal box. The deliveries can be pre-programmed doses or continues on/off regulated flow.

The following figure shows a typical delivery system setup.

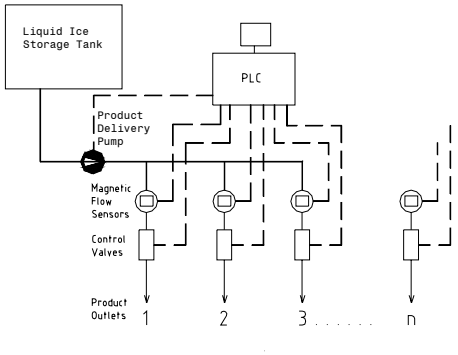

Figure 3: Delivery system DS1

The DS1 delivery system is a parallel delivery system with flow sensor and control valve (controlled by PLC computer) on every station. The pump runs if any order is not fully delivered.

Each batch volume size is independently adjusted on the PLC control panel and automatically delivered at referring delivery station as soon as signal is given. The delivery signal is either given manually (button pressed by person) or automatically according to timer settings (periodical delivery) or status at the station (ex. a batch could be ordered when a box on a conveyor belt enters button).

The delivery stations can get as many as requested. The illustration shows 3 stations.

This is the most complete delivery system provided by Formax.

Application: High delivery system capacity and accurate batch size.

Note: Formax also provide other types of delivery systems according to customers requests.

Brine mixing

A fully saturated brine solution is mixed in a tank and dosed to the blender by a pump. The control unit of the blender regulates the size of the brine dose

The Formax Blender is an economic system

The compact and efficient design of the Formax 300 blender means less cost pr generated ton of liquid ice, less investment and less space required for the installation.

Design and hygiene

The Formax FB-300 blender is designed to the highest standards of the European Community, EN1672-2:1997 for food processing machinery and can be used for all food processing applications. The equipment is made in Stainless steel and other food grade materials. High concern is taken in hygiene and easy access to all parts of the machine, which makes it easy to clean and maintain.

All electronic components are sealed in water tight chasing and the machine can be cleaned with water and all food grade reagents.

The control panel is simple and easy to operate. The user can select from a number of pre-programmed features. The control unit can be accessed from external computer by a PC net connection.

Technical Specification

The Formax FB-300 blender:

Capacity:.....10 tons/hour 20/80 mix

Power consumption:.....7.5 kW (max)

Energi pr. kg liquid ice:.....2.880 kJ/kg (0.8 kWh/ton)

Voltage: .....380 V / 440 V 50/60 Hz

Volume:.....400 Litres

Weight: .....400 kg

Material - steel.....ANSI 316 L

FB-300 Liquid Ice Blender