

Matal s.a., 44840 Les Sorinières, France

# Cooling Concrete with the Ice Tower Concept

Matal is a professional company for ice making, who have made a lot of development especially in the flake ice sector production, storage and distribution. In the concrete sector, the quantity of ice produced and the quantity of ice stored is increasing more and more to meet the requirements of the concrete production plants.

Especially for the UAE market where the constructions are coming bigger and bigger, the industrial have been obliged to go on another concept that the traditional rake system.

## The “first in first out” system

The ice storage is characterised by the possibility the customer have to empty it quickly and easily. The rake system extraction is a horizontal rake moving on the upper side of a horizontal ice storage. The ice production is installed on the upper side and the ice produced is falling down on the lower part of the storage (Fig. 1).

In the traditional rake system, the first ice that is produced will be the last ice that will be extracted. This is facilitating the icing of the storage principally due to the weight of the ice and that process is more and more important the moment the storage of the ice is long.

As a contrary to an ice tower, the storage is vertical, so the first ice that will be pro-

duced is the first ice that will be extracted. In that case, flake ice is staying within a shorter period in the silo. Icing due to the mass of ice in the upper side is not anymore a major problem.

Several constraints can be noticed for a rake system. The major constraint is the icing danger that is blocking fully the concrete production. Of course because of the important quantities of mechanical or moveable parts installed in a rake system, mechanical dysfunction can also occur

Having a big volume on storage for a rake system is not a good solution because the stored time is limited and the ice had to be used fully time to time. The obligation of emptying that volume every three days to

avoid icing is real and is giving headaches to plant managers. In certain cases the production of concrete might need to stop during that process.

In fact, and to avoid main problems, that kind of storage is never used at 100% of the real capacity and it is advisable that the real useful capacity is about 20% less that the announced quantities.

## The Ice Tower Concept – the adapted Solution to big quantities

The real first in first out concept means that the first ice that is produced is the first one that will be sent out. This parameter is most important because it means that it will have a serious impact on the time storage, quality of the ice and way of using the material.

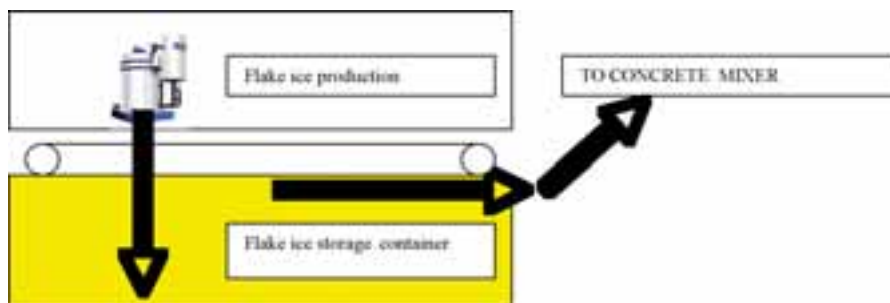


Fig. 1a: Traditional rake system for ice extraction

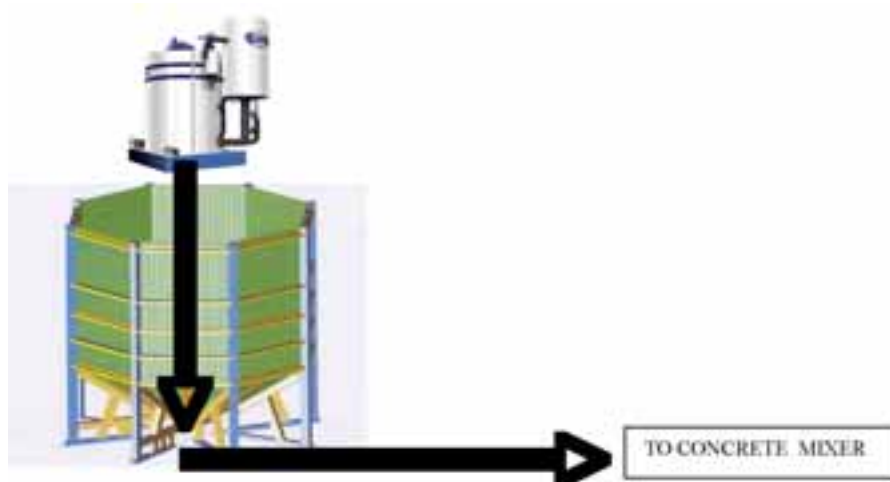


Fig. 2: Vertical storage system



Fig. 1b

Plant managers have to take care of another problem actually. More and more ready mix plants are mixing 24hours a day, so production and storage combination have to be very well designed and adapted to each other.

In that case the best is to use a first in first out system to avoid that the storage keep old ice during production time. With the ice tower concept, the concrete manufacturer is only maintaining fresh ice in storage at the end of the day and for extracting old ice he is never obliged to stop the concrete production.

The vertical arrangement of the tower is giving other advantages as the fact that less



Fig. 3: Ice Tower Concept

square meters are used and as also the fact that the production and storage quantity announced can be more easily verified.

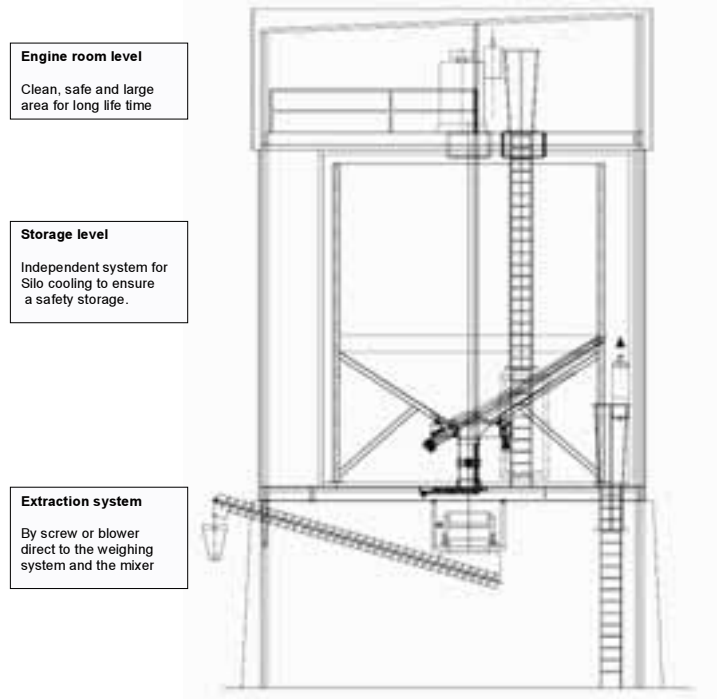
This particular element is also participating to an easy way of concrete production handling for the plant manager. The moment one can manage the available ice quantity, one can have a better expectation of the concrete production.

In term of maintenance, the fact that the machinery is installed in the upper side is allowing an easy maintenance. The available space is more important than in a container. A longer life time for the material can be expected.

This large space availability had permitted customers to install on a first step 50 tons production on the engine room and to add another 50 tons production facility two year later. This is not possible with a container installation and the effective cost of the plant at the final stage is at the advantage of the vertical arrangement. The Chain extraction system used with the ice tower concept is a very simple and reliable system. It allows fast and big quantities of flake ice extraction. The maintenance required is much lower than with a rake extractor.



Fig. 4: Chain extraction system used with the ice tower concept



For smaller needs of ice production, rake systems still might be preferably for concrete plants. For production capacities up to 75 tons, Matal recommends their rake system. For production capacities of 90 tons and more, the ice tower concept seems to be the best solution.

FURTHER INFORMATION



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