

Golden Bay Refrigeration & Air Conditioning

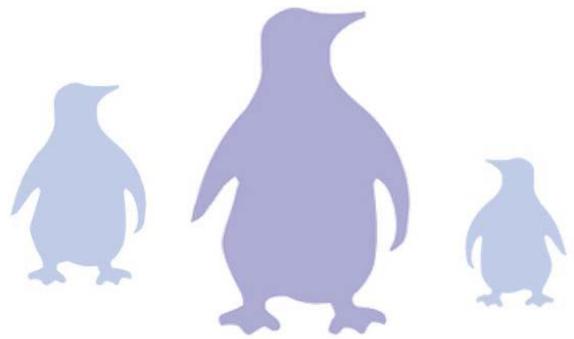
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Milk Pre-Cooling Problems!!

Our secret is out

Packo Ice Builders - Milk into Vat @ 3°C - 4°C

50 year old technology re-vamped for today's milk cooling problems

HOW THEY WORK:

With a stainless steel double skinned water tank with 50mm high density foam, with copper piping set up in rows to produce up to 75/80mm diameter of ice on each pipe. Packo Model 120 = 1.3 tons of ice storage and 3300 litre of 0°C ice water. As milking starts, ice water is drawn from the tank and fed to a plate heat exchanger,

as water is being drawn off, an air pump starts and produces bubbles (like in a Spa pool) which causes slow melting of ice, producing more 0°C ice water.



The air pump also stops layering of return water from plate heat exchange, with milk entering the storage vat at 3°C the vat refrigeration will not run until such a time as milk temperature reaches 6°C. With a vat wrap on the vat this could be several hours before main vat unit starts.

Ice builder refrigeration units are sized to re-build ice at different rates of time depending on kw's required.

From 4 – 8 hrs depending on unit size – e.g.

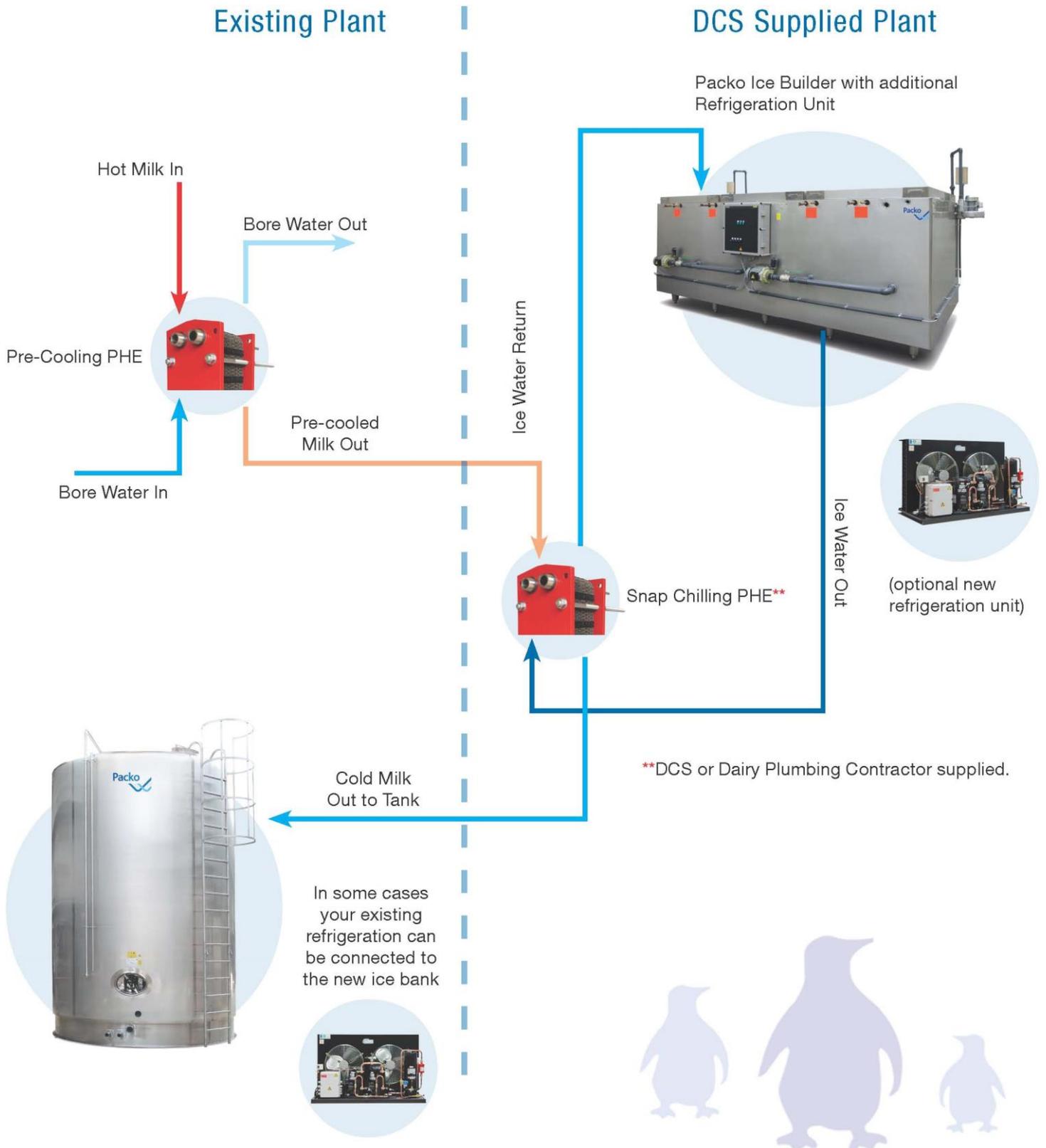
Small
8hrs

Medium
6hrs

Large
4hrs

These times have been calculated on complete depletion of ice reserves, with ice water left in tank at 5°C
 Depending on ice builder size selected, in most cases there has been enough ice thermal storage in the tank to do both morning and afternoon milkings and only rebuilding the ice at night on night rate power.

Standard Solution for existing Vertical DX Milk Tanks (with Pre-Cooler)



In the past years there have been several systems in place on dairy units with different results. One has been water chillers with large storage tanks up to 25-30000 litre. These tanks have been kept at approx. 9°C water temperature.

When milking starts the return water from the plate heat exchange returns to the top of this storage tank and starts to warm up the whole 25 / 30000litre of water, as the temperature comes up to approx. 10 – 11°C the water chiller unit starts to bring this temperature back down to 9°C. With large volumes of water like this the refrigeration unit will operate for a long period of time to bring it back to temperature resulting in quite a large power consumption. If the storage vessel is too small, even with Glycol mixture the refrigeration unit will have a large power consumption.

e.g. 25000 litre storage tank

Temperature rise from 9 – 15°C = 6°C Pull down time
with 10HP unit on R134A approx. 1°C per 1 ½ hrs = 6 x
1.5H =9hrs Two milkings – 18hr run time

Hence we have found that there is no substitute for large thermal storage capacity as in ice.

[There is also the availability to purchase these Ice-banks through your Farmlands account or on your Farmlands cards.](#)

Should you require any more information. Please do not hesitate to contact:

Golden Bay Refrigeration
Dairy Cooling Specialists



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