

# Peace of milk



SMART MILK COOLING



# Smart Milk Cooling

## EXPERTS IN MILK COOLING

### Experts in cooling and milk

Packo Cooling has been designing and producing milk cooling tanks in Belgium, Ireland and China since the 1960's. We also produce batch and continuous pasteurisers for processing milk on the farm and we provide solutions for cooling in the food and general processing industry. In many countries the name Packo is a synonymous with (milk) cooling.

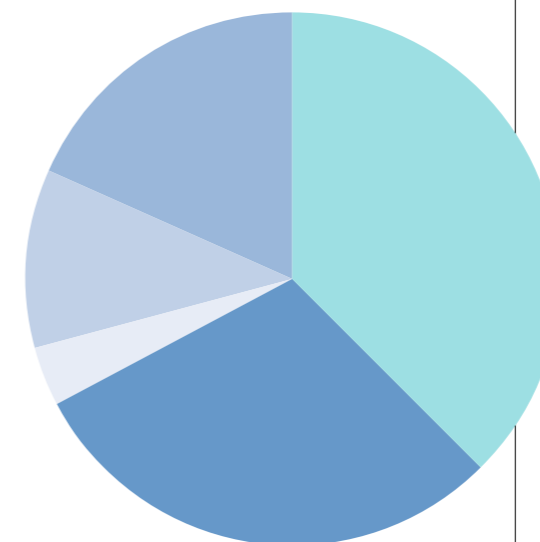
### Member of the Verder Group

Packo Inox and its business units form part of the Verder Group. This international group employs 1500 people and is represented by its own sales and production companies in more than 20 countries.

### Cross-pollination assured

Packo Cooling is one of the five business units at Packo Inox:

- Cooling – experts in cooling milk and other fluids
- Pumps – the main specialist when it comes to stainless steel pumps
- Electropolish – professionals in the treatment of stainless steel surfaces
- Industry – solutions for hygiene-sensitive production processes in food and pharmaceuticals
- Milking machine components – all sorts of stainless steel components for milking systems



Business unit turnover

- Cooling
- Pumps
- Electropolish
- Industry
- Milking machine components



# All over the world

## ENTER THE PERFECTLY CHILLED WORLD

### Customised solutions

Packo Cooling delivers customised systems. Each of our solutions is aimed at the specific needs of our customers:








- From family-run dairy farms to mega-farms
- For milk collection centres

### Always near at hand

Packo Cooling wherever you are. We are one of the largest producers of milk cooling systems in the world, operating in more than 80 different countries. More than 100 Packo Pilots around the globe are ready to give you personalised advice. They are responsible for the sales, installation and maintenance of all our solutions. In other words, Packo remains vigilant no matter where you are located.



**All types of animals.** Packo Cooling has cooling solutions for all milk producing animals including:

- |   |   |
|---|---|
|  Cows    |  Horses    |
|  Goats   |  Camels    |
|  Sheep   |  Buffalo's |
|  Donkeys |   |

### Your income is protected

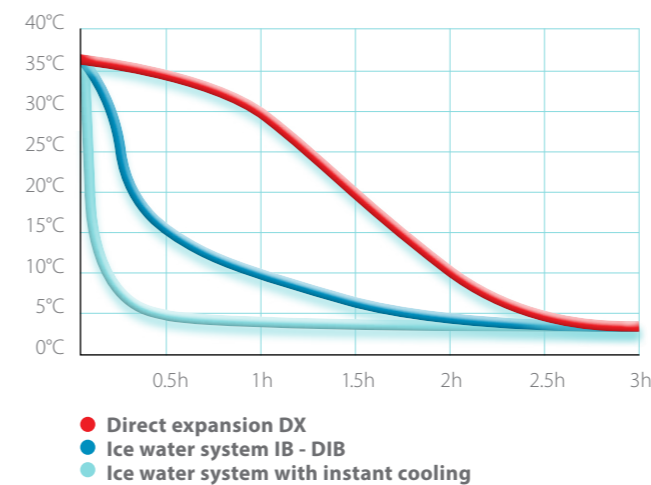
All our solutions have been designed with maximum attention paid to hygiene. You can rest assured: you will pass every quality inspection with flying colours. The sophisticated design and the in-built technology provide you with vital operational security.

# ICE WATER COOLING

SMART MILK COOLING

## COOLING FOR A RAPIDLY CHANGING WORLD

Ice water cooling technology has been in existence since the 1960's. Thanks to the rapidly changing trends in the dairy sector, ice water cooling is becoming the preferred method. Ice water cooling is the ultimate solution because traditional cooling technologies tend to fall short. Don't forget the increasing need for rapid cooling for both large and small, as well as sharply varying volumes of milk.



The responsiveness and efficiency of our ice water cooling systems guarantee extremely rapid cooling without the risk of freezing.

### New challenges for milk cooling

The advent of **mega farms** is one of these trends. Milking is carried out around the clock on these huge farms. This means that milk is delivered continuously, and there is a constant flow of large volumes of milk that must be cooled down rapidly.

Of course there are also situations where milk is conveyed at low or varying rates of flow. This includes farms using **milking robots**, **milk collection centres** and the **cyclic milk production** of goats and sheep, or grouped calving.

### Rapidly ice cold, but never frozen

Such trends have made **ice water cooling the new standard**. It is important that the milk is always cooled, regardless of the quantity. This can't be done with traditional technologies, because the cooling only starts once a specific volume has been reached. Ice water cooling cools down any volume of milk very rapidly to the critical temperature. Additional example: cooling occurs at positive temperatures so that there is never the risk of freezing.

### Ice water + alternative energy is the cheapest way of cooling your milk.

Ice water cooling permits self generated energy (for example solar panels and wind turbines) to be deployed and stored effectively. This means that you can produce ice water either free or at very low costs. A win-win situation.

## ICE WATER COOLING RAPIDLY ICE COLD, BUT NEVER FROZEN

The Paco milk cooling tanks, with or without integrated ice builders, are the result of years of experience with cooling fluids in the dairy and food industries. The ice builder produces a stock of ice, so that large volumes of ice water at 0.5°C is created and your valuable milk is rapidly cooled, without the risk of freezing.

### General features

- Large ice reserves act as a buffer for one or two milkings.
- Efficient transfer of cold energy.
- Optimal cleanability.



**Rotojet® – unique, efficient tank cleaning.**  
This unique, patented cleaning system together with the Paco iControl provides perfect and reliable cleaning of the complete milk cooling tank. The Rotojet® has been designed in accordance with the strict hygiene stipulations in EHEDG (European Hygienic Engineering & Design Group). Thanks to this technology the tank is cleaned in compliance with the latest hygiene standards, therefore guaranteeing the quality of the milk at all times.

Agitator with innovative Rotojet® cleaning.

iControl tank control with integrated Oculus tank guard.

The CFC-free polyurethane provides perfect insulation, without any thermal bridges.

Integrated ice builder under the milk tank.

Self-cleaning tank outlet.



**Open milk cooling tanks** with integrated ice builder, from 600 to 2,300 litres.



**Closed milk cooling tanks** with either separate or integrated ice builder, horizontal models from 1,600 to 36,000 litres, vertical models from 12,000 to 50,000 litres.



**Ice builder** for producing ice water with a power buffer between 8 and 370 kWh.

- Large reserves of cold-energy when milking starts – buffer for 1 to 2 milkings.
- Smart cooling – Production of ice water at cheaper rates thanks to alternative electricity generation (e.g. solar and wind energy) on the farm.



**Falling film chiller** for producing ice water with a power supply between 80 and 240 kW.

- Continuous production of ice water at 0.5°C
- Ideal for mega farms with continuous milking, where large volumes of milk must be cooled rapidly while retaining high quality.
- Instant cooling of the milk.

## DIRECT EXPANSION FOR THOSE WHO PREFER THE TRADITIONAL METHODS

Packo Cooling also has milk cooling tanks with direct expansion for traditional dairy farms, which are made from stainless steel and modified to suit the milking system and the number of milkings.

### General features

- The laser-welded, multi-injection evaporator guarantees rapid, efficient and problem-free cooling of the milk.
- The refrigerant uses the entire surface of the evaporator in order to ensure the best heat exchange.
- The cooling capacity is adapted to the milking regime: traditional milking, robotic milking, seasonal fluctuations, etc.
- When combined with the Eco-cool® cooling unit, the milk cooling process is extra economical.

*Insulated alcove makes easy access from the dairy to the tank controls, the outlet and the manhole cover.*



*The iControl controls with integrated Eco-wash rapid cleaning and Oculus tank guard.*

*The CFC-free polyurethane provides perfect insulation, without any thermal bridges.*

*Floor and/or wall evaporator modified to match the milking system and number of milkings.*

*Manhole with hygienic sampling valve.*

*Bottom filling with linked valves.*



**Open milk cooling tanks,**  
from 300 to 3,400 litres.



**Horizontally closed milk cooling tanks,**  
from 1,050 to 36,000 litres.



**Vertical milk cooling tanks for outdoors,**  
from 12,000 to 50,000 litres.

## BUFFER TANK

### MAXIMUM OPTIMISATION OF ROBOTIC MILKING

It is important with robotic milking to minimise disruption in order to optimise total daily milkings through the robot. In order to do this, the buffer tank will guarantee continuity of milking during cleaning of the milk cooling tank. The Packo Cooling buffer tanks are available between 250 and 1,000 litres.

When combined with the traditional milk cooling tank with direct expansion, the milk can also be pumped as cooled (to 4°C) into the buffer tank with the Packo Eco tube and an ice builder. This means that the quality of the milk is safeguarded while the milk cooling tank is being cleaned.



## SOFT START COOLING

### NO RISK OF FREEZING FOR ROBOTIC MILKING AND GROUP CALVING



For robotic milking, group calving and seasonal productions, all Packo milk cooling tanks with direct expansion are fitted with Soft Start Cooling®. Soft Start Cooling® guarantees top quality cooling and prevents the milk from freezing. The patented technology from Packo provides safe milk cooling and works independent of the milking robot, although taking account of the volume of milk present in the tank.

The capacity of the cooling unit is harmonized with the robotic milking.

All of this means that after collecting the milk and cleaning the tank, the cooling is discreetly restarted when the next lot of milk is received.

CONTROL TECHNOLOGY

# iCONTROL

SMART MILK COOLING

INFORMATIVE  
INTELLIGENT  
INTERACTIVE



More and more technological features are being deployed to help simplify the lives of farm managers and dairy farmers.

They are partly taking over the control, so that more is left for other activities.

iControl stands for intelligent software, recording information and clear and simple interaction between the dairy farmer, the milk cooling tank and the milking system. iControl records all the parameters and logbook data.

#### Control via Web and App

Packo Cooling keeps a close eye on the latest technologies. With the online applications you can follow the progress of your milk cooling tanks remotely.

#### Interested?

Contact the Packo Pilots in your region.





## CONTROL TECHNOLOGY

# iCONTROL – THE CENTRAL BRAIN OF YOUR MILK COOLING TANK

All activities can be integrated. In addition to the standard functions of cooling, cleaning and stirring, there are also extra functions built in, including two milk temperature sensors, smart ice building according to requirements in the ice bank tanks, individual regulation of the water volume per cleaning step, automatic changes to the cleaning times with respect to the type and volume of the tank and the volume of cleaning water selected.

### Milk quality protection

- Cool safe – Permanent monitoring of important parameters such as the temperature of the milk and cleaning water, duration of cooling, cleaning and the stirring function, resulting in the best quality monitoring.
- Visual and audible alarms on iControl or via text message (optional) give quick warnings for taking rapid action.
- Check cooling extra protection checks whether the cooling is turned on during milking. This ensures that the milk is always cooled.



Four main menus contain all the functions.

The robust, high resolution 7" touch screen guarantees simplicity of operation.

Screen with continuously active display of your tank status.



### Oculus tank guard

The Oculus tank monitor is integrated into the iControl. The tank guard checks for optimum operation of the iControl by monitoring the cooling and cleaning cycles and also the stirring detection. All the data is logged and can be consulted via user-friendly tables and graphs.



### Pacap volume indicator

The Pacap volume indicator is also integrated into the iControl. Pacap displays the number of litres of milk in the milk cooling tank. The volume can be read off in tables or on graphs.

### Controlled cleaning

The unique Packo cleaning system prevents the deposit of hazardous vapours after cleaning the tank. Therefore the milk is never contaminated by the remains of cleaning agents.

### Data exchange

Each milk cooling tank has a unique ID, installed on an SD card resulting in fast and easy data exchange.

### Online interventions

If the iControl on your tank is connected to the internet, your installation engineer can inspect the operation of your milk cooling tank online. In the event of any problems arising, he can remotely work out whether on-site intervention is necessary. This results in receiving help in the most efficient manner and avoiding unnecessary costs.



# ECOLOGICAL SOLUTIONS

## THE PACKOLOGICAL CHOICE

A growing, future-oriented dairy farm always has increasing energy demands. Energy bills can therefore very quickly increase. But not with the Packo Cooling solutions. Packo offers a unique and advantageous mix of ecological solutions in order to make the greatest savings on water and electricity consumption.

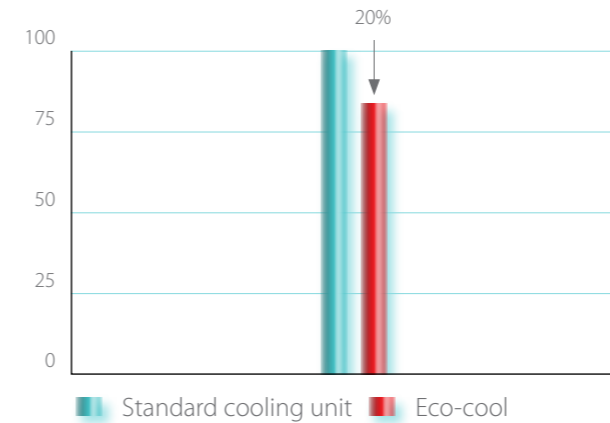
Reliable compressor with a long life span ensures greater operational security.

Two electronic controlled fans for a perfectly tuned cooling circuit.

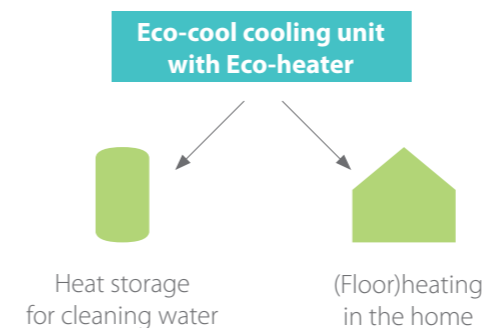
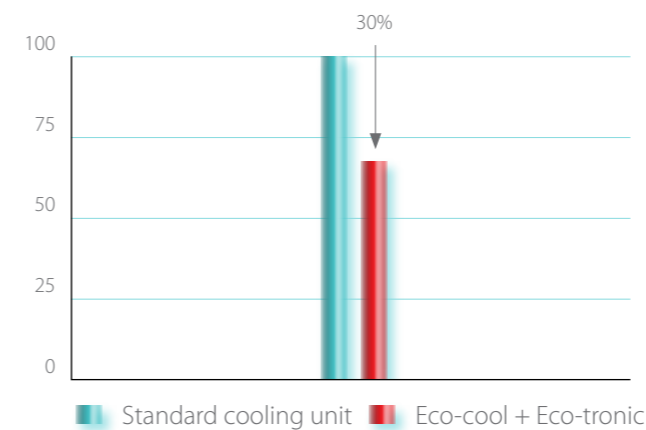


Extra large condenser for the most efficient heat dissipation.

Electricity consumption savings with Eco-cool



Electricity consumption savings with Eco-cool + Eco-tronic



### Eco-cool: the efficient cooling unit

Rapid, safe, economical and ecological cooling with the Eco-cool® cooling unit from Packo at all milk and ambient temperatures. This cooling unit cools milk safely without the risk of freezing. Eco-cool® also limits the electrical consumption of the cooling unit.

#### The advantages?

- lower investment costs
- up to 20% less energy consumption



### Eco-tronic: cooling milk with the minimum ecological footprint

The Packo Eco-tronic ensures an optimal flow of refrigerant in the cooling jacket at each stage of the cooling process. This technology ensures that the refrigerant is maximally and only evaporated through the warm milk. Every single square centimetre of the laser-welded evaporator is used optimally.

#### The advantages?

- up to 10% extra energy savings



### Eco-heater: free hot water

Hot milk is an excellent source of energy. Thanks to the Eco-heater unit you can reuse this heat by warming water up to 50°C that can be used for cleaning the tanks, or for heating your home.

#### The advantages?

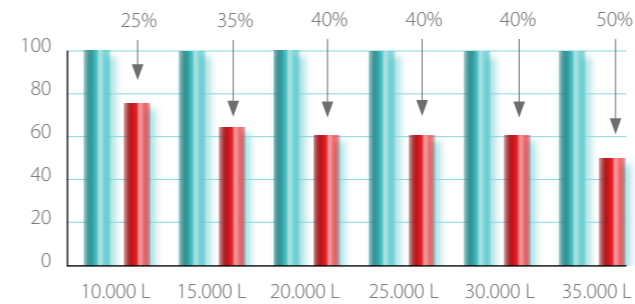
- up to 60% cost savings

# ECOLOGICAL SOLUTIONS THE PACKOLOGICAL CHOICE

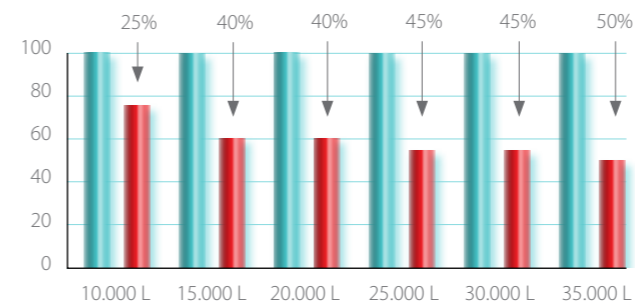
Eco-Tube is an unequalled tube cooler and the most obvious energy-saving investment.



Savings on cleaning times per cleaning cycle (%) with Eco-wash in function of tank volume.

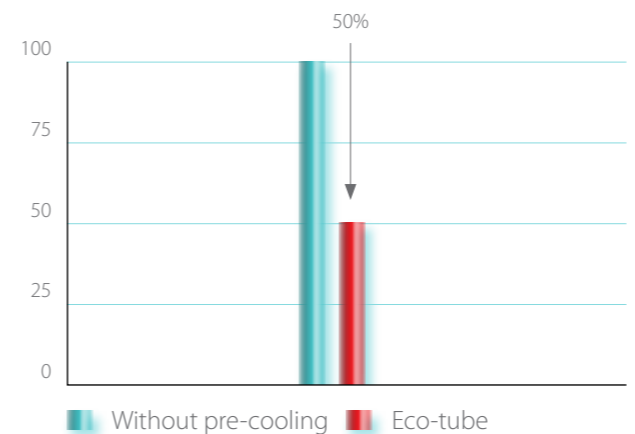


Savings on water consumption per cleaning cycle (%) with Eco-wash in function of tank volume.



Standard cleaning programme Eco-wash

Energy consumption savings with Eco-tube.



## Eco-wash rapid cleaning

Packo's Eco-wash ensures rapid and optimal cleaning with the **minimum water consumption**, ideal in combination with robotic milking. The system is based around the iControl with an extra reservoir for cold water. A level sensor monitors the filling of hot water and the tank is only cleaned once there is a sufficient volume of water available.

### The advantages?

- up to 50% less water consumption
- up to 50% faster



## Eco-drain: recovery of the cleaning water

With an extra drain cock valve it is possible to separate the flows of cleaning water. In the first cleaning phase the milk remains are discharged together with the initial rinsing water. The water used for the following phases in the cleaning cycle can be lead off to a local water storage facility via the Eco-drain. The recovered water can then be used for cleaning floors, milking positions, etc.

### The advantages?

- up to 80% recovery of the cleaning water



## Eco-tube: the obvious investment for saving energy

Packo Eco-tube cools warm milk with well or tap water before it goes into the cooling tank. Therefore **50% less energy is needed** to cool the milk down to 4°C in the tank. The heated well or tap water can then be used as drinking water for the cows. Nothing is wasted. Moreover, thanks to the seamless tube-in-tube system, maintenance is not required, nor is there the risk of contamination, thereby making substantial savings on maintenance costs. In other words, you will very quickly earn back your investment.

### The advantages?

- no maintenance
- up to 50% energy savings thanks to pre-cooling
- no risk of contamination or contagion

## SERVICE

**No matter where you are, the Packo Pilots are ready to help.**

Packo Cooling has an extensive international network consisting of over 100 Packo Pilots.

You can contact them all over the world for personalised advice, as well as the purchase, installation and maintenance of any of our milk cooling solutions.



### **Packo Inox NV**

Torhoutsesteenweg 154  
8210 Zedelgem - Belgium

T +32 50 25 06 10  
F +32 50 20 07 52

cooling@packo.com  
www.packocooling.com

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