

New WORLD-WIDE INNOVATION
with RS50 (R442A)

HD-COLD: Cooling Units with revolutionary temperature and moisture control for fruit cells.

Optimising the control of humidity and temperature in cold rooms in a controlled atmosphere: the patented HD-COLD system rose to this very challenge. Problems with weight loss are now long-gone. Make way for zero defrosting and firmness without compromise!

THE PROBLEM

Optimum fruit (or vegetable) preservation in a controlled atmosphere requires significant moisture levels to avoid weight loss in the produce and to retain its firmness while preserving it at a specific temperature close to 0°C.

Cells using classic cooling systems, owing to their frequent defrosting cycles, lead to weight losses of between 4 and 5% (loss of turnover) and alter the quality of the product by making them less firm and diminishing their organoleptic properties due to the addition of "sterile" humidification. What's more, defrosting is a source of electrical over-consumption and poses a risk of extremely harmful frequent failures.

"It is counter-productive to humidify on the one hand, and on the other to "pump" water for defrosting on the other. We need to redesign cooling systems in current fruit factories" stated Benoit Duparc, the manager of DPKL in Moissac, who designed HD-COLD.

THE HD-COLD SOLUTION

Simple and straightforward, the HD-COLD solution is designed with a focus on the quality of the product stored, without compromise.

Straightforward: without defrosting, without adding humidity from the outside, the system controls the desired degree of humidity and recycles solely the ambient humidity continuously.

Water stress (a major cause of post-harvest preservation disease development) is therefore kept under control.

Last but not least, weight loss is reduced tenfold (0.5%). Consequently, the fruit or vegetable is preserved optimally and naturally while keeping the system easy to use, reliable and accessible to anyone.

Serge Raymond,
Owner of DOMAINE DE MOUTASSE in Tarn and Garonne. Producer of quality Granny Smith, Royal Gala, American Red, Reinette Grise du Canada and Braeburn apples.... producing 4,000t/year.



INTERVIEW WITH SERGE RAYMOND.

Tell us about your experience with the HD-COLD system:

S.R.: Back in July 2014 we started up our first cell (400 t/1600m³) fitted with the HD-COLD system for Granny Smith apples. After 6 months of preservation, we were able to compare the same harvest stored in our HD-COLD cold room with the harvest in a nearby classic cold room. The most important quality criterion is the incredible firmness of fruit from the "HD-COLD" cell! Thanks to the 95% partial humidity in the cell, the apple is never dehydrated, thereby also perfectly retaining its flavour and its weight!



What are the financial benefits?

S.R.: The common sense of a cooling professional who is familiar with the problems in our industry has made it possible to devise an optimal, excellent preservation system. In addition to the unrivalled quality of the fruit, we are enjoying some major financial benefits on electricity consumption (-40%): there are no more ridiculous electrical defrosting cycles since we had to cool down

afterwards anyway, there is an improved COP thanks to the new, more powerful RS50 refrigerant.

The drop in temperature of the cell filled with warm fruit has also been improved by the saturated relative humidity. Last but not least, the return on our investment in the capital gain of the HD-cold is approximately 2 years. What's more, you need to consider the superior quality of the fruit, the 15 tonnes of extra apples sold per cell (since there was no weight loss), the reduction in the number of treatments, our corporate image...

DESCRIPTION OF INSTALLATION

- Unit on RIVACOLD cylinder
- BITZER 6H35Y 35CV compressor
- 50 kg RS50 refrigerant (R442A)
- CAREL frequency variator
- BITZER K1053HB water-cooled condensing unit
- HP and Floating LP
- CAREL regulation under HD-COLD licence.
- HD400-2 evaporator
- Overheating <1°C
- Near-submerged evaporator operation.



WHY CHOOSE R442A (RS50)?

Benoît Duparc, the manager of DPKL in Moissac, who designed HD-COLD.

B. Duparc: to anticipate the future ban on the use of R404A in 2020, we decided to use RS50 owing to its superior thermodynamic performance levels.

We discovered RS50 in early 2015. We tested it in classic units and immediately realised that the cooling capacity of RS50 was much higher (+30%) than that of R404A. What's more, since the exchange in the evaporator is perfectly uniform thanks to the complete miscibility of oil, this optimises the exchange, one of the challenges of the HD COLD.

Our customers in the agricultural industry are looking for straightforward solutions that are also cost-effective. They

have limited margins and electricity consumption plays a major role in preservation at 0/+2°C.

Our system combined with the RS50 refrigerant makes it possible, on the one hand, to optimise costs by selecting a smaller compressor (compared to R134A or R1234ze), and on the other to achieve a significant energy saving every day for our customers.

The system is perfectly optimised and we even got the chance to note that during static storage periods, the evaporators operated for 4 days without having to start the compressor. We expect to achieve energy savings of more than 40%.

IN CONCLUSION: HOW DO YOU SEE THE FUTURE?

B. Duparc: we have peace of mind because our system has already been sold in multiple countries. This technical break is important, and once our customers had tried it, it was eagerly implemented.

We are at the leading edge of fruit preservation, without any preservation treatment. Even ORGANIC producers have adopted our solution.

Our solution has been adopted for similar problematic applications:

- Storage of vegetables, flowers ...
- Vernalisation cell (reproducing the seasons)
- Dryer, refining
- Meat cold room...

Touch control screen by Carel

