



EUROPE

ATMO  
sphere

solutions for europe

natural refrigerants

19 & 20 April, 2016 – Barcelona





solutions for europe  
**natural refrigerants**

19 & 20 April, 2016 – Barcelona

**ZANOTTI S.p.A**

**Experience in compact system with R290**

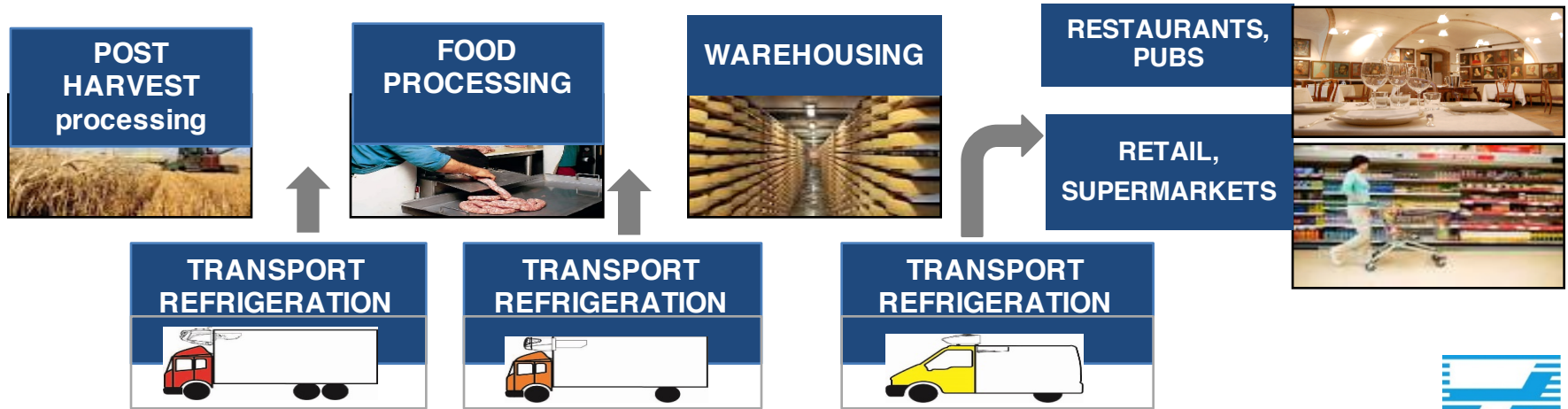
Monoblocks units for coldstores



# King of Cold



**The most complete range of refrigeration units for Food Industry**  
Zanotti creates an END-TO-END COLD CHAIN value propositions.



ZANOTTI COMPANY



## First case: England case history: Waitrose coldstores

This was the first approach, made, four years ago, through a direct contact from the two companies for a new unit with a lower GWP refrigerant for new plants used for supermarket refrigerated cold stores.

The project was a new target, for us, to create a new unit for the storage both in normal and low temperature with the maximum of the safety for the installation (under EN378)

For this, we develop special compact units, roof or wall mounted, water cooled, and this was the result:

Models available with R290:

Semihermetic compressor – Water cooled condenser

Model	Cool. Cap. Watt	Charge grams	V min m3
MSB135N--Y	2420	300	37,5
MSB135T--Y	3550	300	37,5
BSB135T--Y	2600	250	31,3
MAS135N--Y	2420	350	43,8
MAS135T--Y	3550	350	43,8
BAS135T--Y	2600	300	37,5



**SB**



**AS**

## Reference installation

### Waitrose







AS wall mounted  
R290 / R1270



Remote control panel



First case: England case history: Waitrose coldstore

With this first approach we verified the possibilities of the natural refrigerants:

Refrigerant reduction charge, with R290, compared with usual HFC:

50 % compared with the standard refrigerants same cooling capacity

But always with a refrigerant charge over 150 grams and this means have the limit of

8 g/m<sup>3</sup> as maximum refrigerant charge compared with the cold-room volume

Similar efficiency of usual HFC refrigerant

Cost: significant increasing compared with the same unit with HFC and hermetic compressor, because the ATEX components and the use of semihermetic compressor

First case: England case history: Waitrose coldstore

New step: use of R1270 (propylene)

Other reduction charge around 20/25%

Capacity Increasing around 15%

Problem: industry doesn't develop or follow this new step with specific components

Units number delivered for this first project: in three years around 1500 units

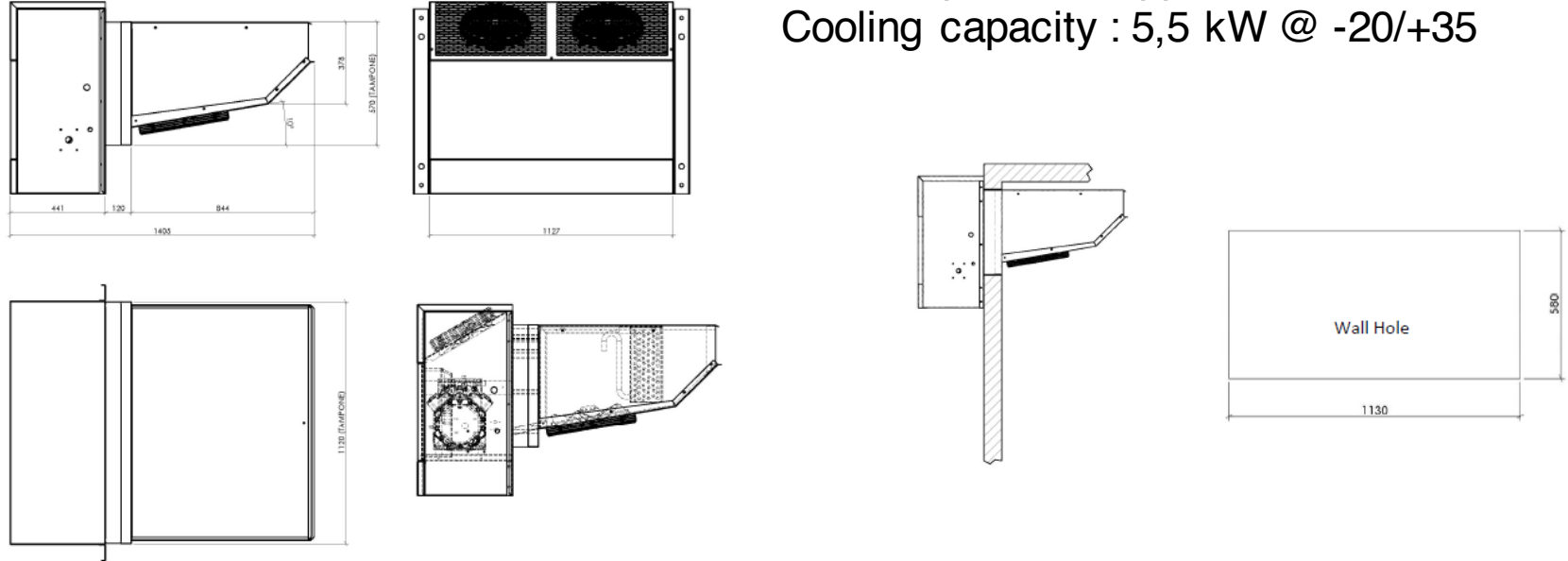
## Second case: Vietnam case history: UNIDO project

With this second project, under UNIDO and Vietnam government agreement, our company has verified the possibilities to use the natural refrigerants in fishery storage in different places :

For this we have developed a special wall mounted units (with R290), for various cold-rooms for frozen fish storage installed in Hanoi and Ho Chi Minh.

This projects started in October 2014, in September 2015, 25 units were installed in 4 different companies and these were the first results:

Model: BAS235  
Low temperature application  
Cooling capacity : 5,5 kW @ -20/+35







Reference installation

UNIDO – MONRE



Reference installation  
UNIDO – MONRE



Reference installation  
UNIDO – MONRE



Reference installation

UNIDO - MONRE



## Second case: Vietnam case history: UNIDO project

Report of three months of normal functioning from September to December 2015

The comparison is between the old plants (multicompressor system) made with R22 and new one (independent system) with R290. I summarize some paragraph from our internal report:

“All the 9 cold rooms now have much better room temperature, temperature of  $-20^{\circ}\text{C}$  is easy to maintain even though the installed power of HC290 refrigeration equipment is only from 45% to 60% of installed power of previous R22 refrigeration equipment that had been replaced.

All the 25 HC290 refrigeration units had been successfully installed in the four selected companies”

## Second case: Vietnam case history: UNIDO project

HC290 pilot project in Vietnamese had been implemented successfully, in most of the cases new HC 290 refrigeration equipment can automatically maintain cold store room temperature at the required level with the power consumption about 25% lower than the power consumption of R22 refrigeration equipment previously operated for the cold store.

It is recommended to have a follow up activity to replicate this new HC290 technology for the other cold stores in Vietnam.

## Barriers and Solutions

What means use natural refrigerant?

Is not so difficult, from the technical point of view, use HC (R290 or similar)

But we have very big barrier because the actual international standard

The actual limit of 150 grams, it's too restrictive

Higher cost of the unit is (for units over 150 grams) around 40% -60% and this doesn't help to push HC solutions.

## Barriers and Solutions

The new target, to try to increase the use the HC in the refrigeration field, specially in the small coldrooms, 10/15 m<sup>3</sup>, is develop compact system (with hermetic compressors) and remain inside the actual limit of 150 grams

This means that the component manufacturer industry follow this idea developing bigger compressors with a new solutions to remain inside this limit.

In this case we identify a cost increase not over 8/10% of the actual prices.

But this is a very big challenge.



## Lessons learnt

What we have learnt from this two cases?

The needs to give a global solution

A global approach to produce a safe unit and convince the end user that this solution isn't only environment friendly but even a "normal" machine that can be installed and used everywhere.

Train the people that have to install and follow the unit for the maintenance.

Specially when the installation is far from our usual places

## Future plans

It's not so easy, to preview what will be the use, in the next future, of the natural refrigerant in the commercial or industrial field.

We have to fight every day against many problems; production or installation standards, transport problems, training programs, that the industry can not solve with its own forces.

At this time it's hard to think of going beyond a niche production, we need a political approach to convince that this approach can be a good solution for our future.



**ZANOTTI**

**ZANOTTI Spa**

Martin L.King, 30

46020 Pegognaga (MN) Italy

T. +39-0376-5551 – F. +39-0376-536554

info@zanotti.com

www.zanotti.com

*Follows us*



**THANK YOU FOR YOUR ATTENTION**