

# ATMOsphere 2015

The best environmental solutions in a climate that is cost driven

## Background

- Refrigeration is a core engineering discipline in a retail food environment and one of the biggest engineering spend areas.
- We have a 2020 target against a 2006 baseline for 50% reduction of our direct carbon emissions
- The quality and capability to install & maintain refrigeration systems varies around the world!
- We currently have 194 CO2 stores incl. 63 in rest of Europe and 12 in Asia plus 1 hydrocarbon, across all formats though Express is not currently sustainable. Integrated Ref/HVAC is a key innovation moving forward



**Bob Hurley**  
Tesco Group Head Ref & HVAC

# Key leakage points

One particular initiative developed over time is to continually monitor and in turn, address the Top 10 “Leak Points” on both Tesco - HFC and C02 systems, namely :-

NUMBER	HFC	C02
1	Shut Off Valves – Schraeders	Plant
2	Compressors – Rotolocks	Pipework (vibration etc.)
3	Pipework- flare nuts etc	Low Refrigerant Level (over charged charge)
4	Evaporators (counters-acids etc.)	Compressors – Rotolocks
5	PRV’s	Shut Off Valves – Schraeders
6	Solenoid Valves & O ring seals	Oil System
7	Filters/Driers	PRV’s
8	Pack Hoses	EEV’s
9	Low Refrigerant Level	Condensers
10	Condensers	Pressure Switches

## Some practical ways of reducing leaks

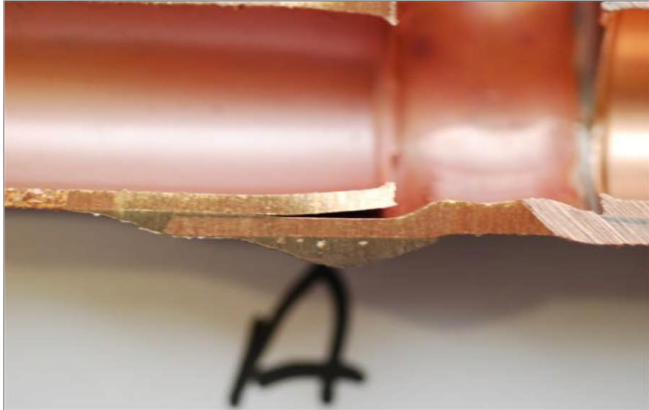
A flared TEV,  
manufacturers should  
stop this option



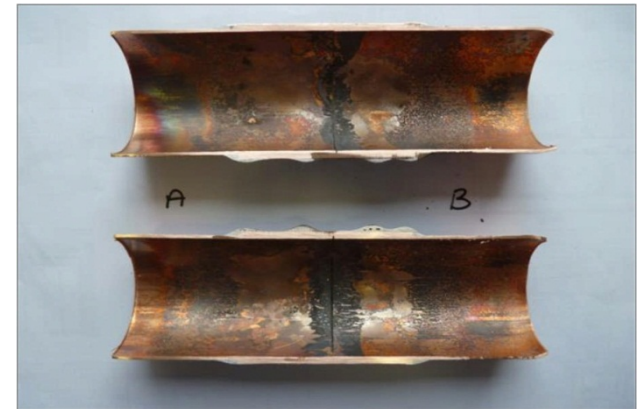
Schrader valve-one  
of the biggest leak  
offenders



Refrigeration brazing quality- we can all improve on-easily



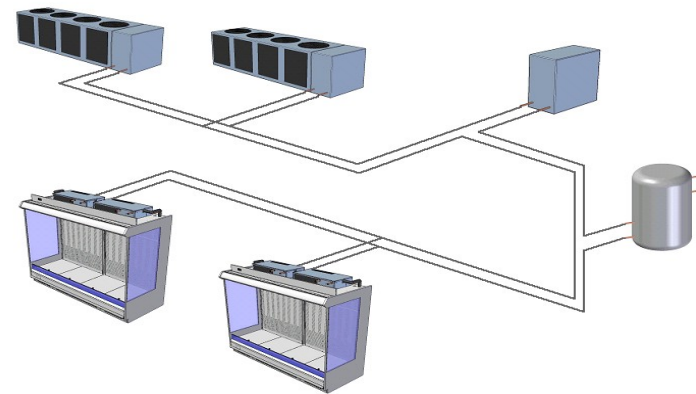
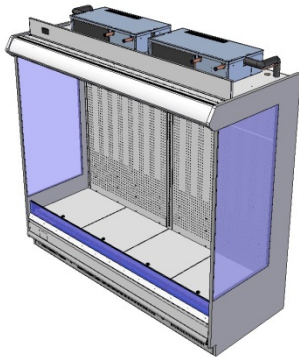
A classic 'more brazing rod on the outside  
of the pipe' picture



Insufficient nitrogen passing  
through during brazing

## A green future?

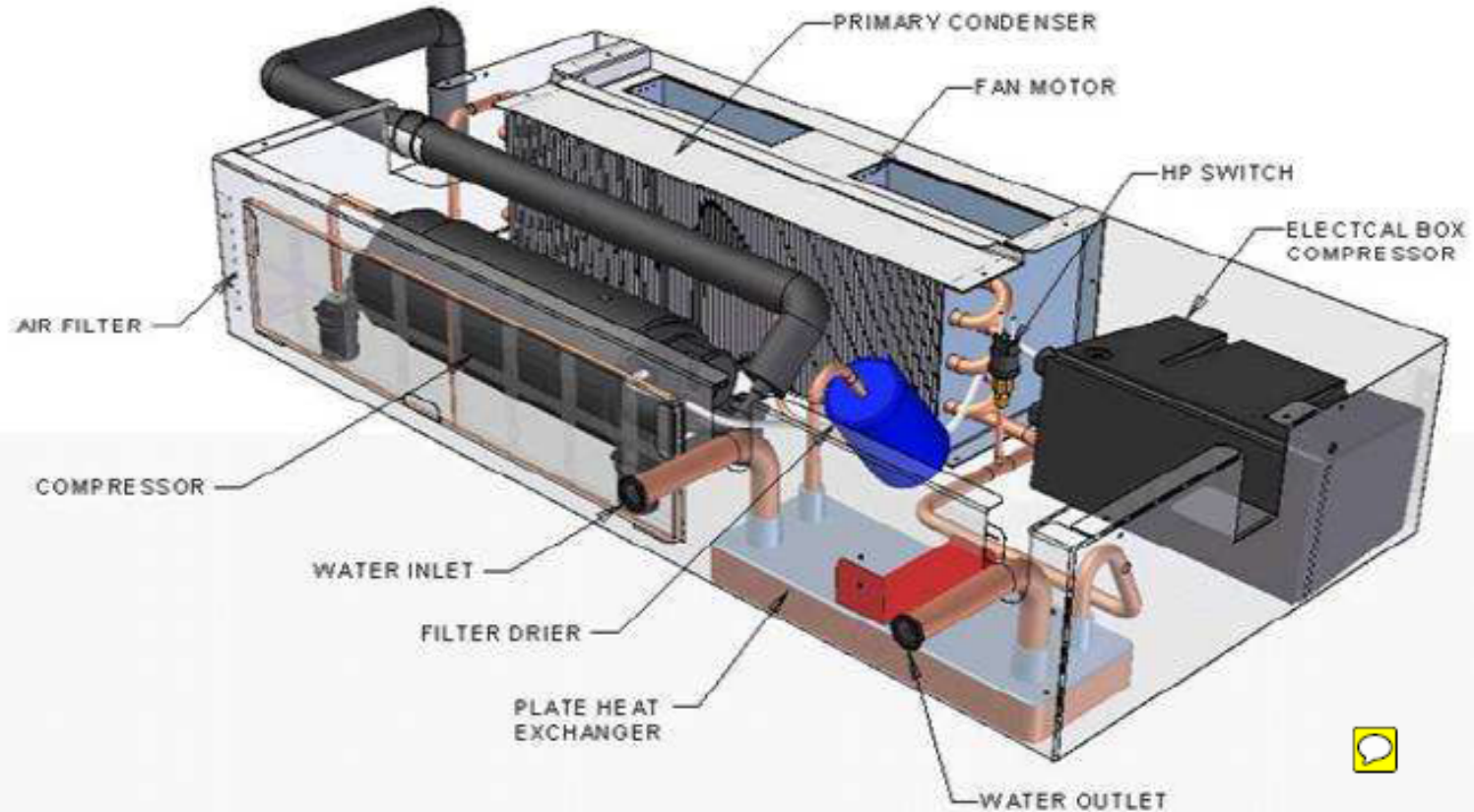
- Share as much knowledge as possible through forums such as the CGF, Shecco and of course country technical associations, I know this work has already started 😊.
- Simpler plant designs more consistent for installers and service companies
- Innovation-we installed a hydrocarbon project at Bang Pra in Thailand-Carbon Zero store.
  - This consists of small charge integral units and heat rejection to a plate exchanger-chiller
  - **This de-skills the installation side which then becomes a very familiar chilled water circuit**
  - Energy in terms of Thailand climate has not been increased
  - Service calls have been extremely low, 9 WO v ave 144 WO on HFC stores of same age (7 similar sites) we just need to get the cost model right and review the refrigerant, is a <150GWP refrigerant round the corner?.



- 1) Make CO2 systems with heat reclaim technology for all larger format stores
- 2) Make HFC (R407f) systems Design Standard for Express format stores and continue to innovate, trial alternatives such as small charge integral systems

# Plant detail of integral hydrocarbon cabinet

This design is already being improved but one major benefit of the design is the excellent, robust Hitachi compressor



## *Way forward*

- Work with Group/Country Energy teams to gain full engagement and monitor/analyse performance of systems
- Engage with manufacturers-we urgently need your innovation and products, especially in convenience where I believe in Japan there is much experience. I look forward to hearing from you.
- Support Country maintenance teams to continue the reduction in HFC refrigerant leaks
  - Look to align new refrigerants across Asia and Europe but also phase out at end of life allied with improved containment
- Minimise leaks from manufacturing (reduce number of joints and vibration) and installation (check quality), strive to get best value enabling us to re-invest in our environmental targets.
- Increasing capability in maintenance with training and simpler designs
- Talk, debate and share our learnings with other retailers-we only have one planet!

**Many thanks for your time and sorry I could not enter into discussions with you-next time😊**