Nürnberg, Germany

9.–10.9.2009

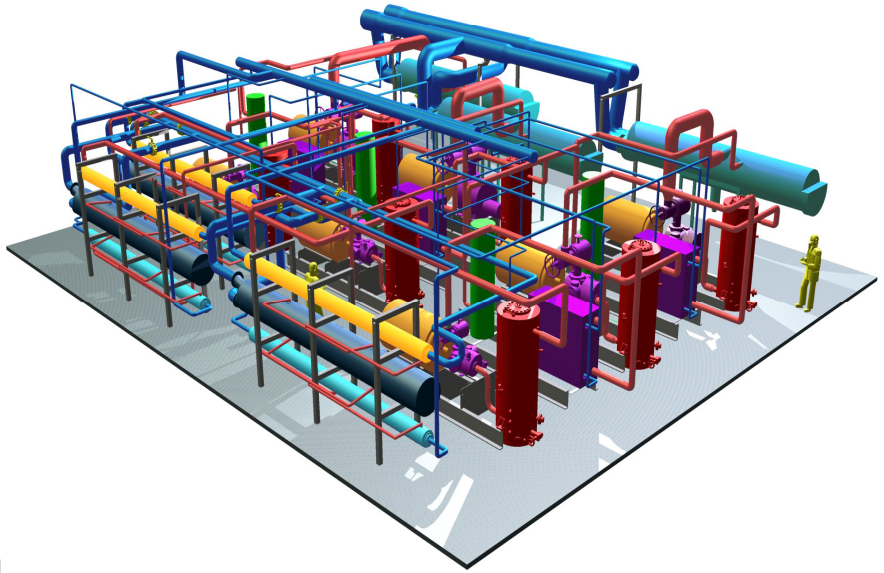
EUROPEAN HEAT PUMP SUMMIT 2009

Powered by Chillventa

Symposium + Expo

Industrial • Commercial • Residential
Heating & Cooling • Components & Equipment

90°C R717 Heat Pumps for district heating systems and factory process applications



Dr Andy Pearson

Star Refrigeration

EUROPEAN HEAT PUMP SUMMIT 2009 Powered by Chillventa

90°C R717 Heat Pumps

- The three “whys”
  - Why Ammonia?
  - Why not before?
  - Why now?
- Case Study – District Heating
- Case Study – Food Factory
- Conclusions

Ammonia? – Why try?

- The “Fashionable” reasons -

Ammonia? – why try?

- The “Business” reasons -

Ammonia? - Why not before?

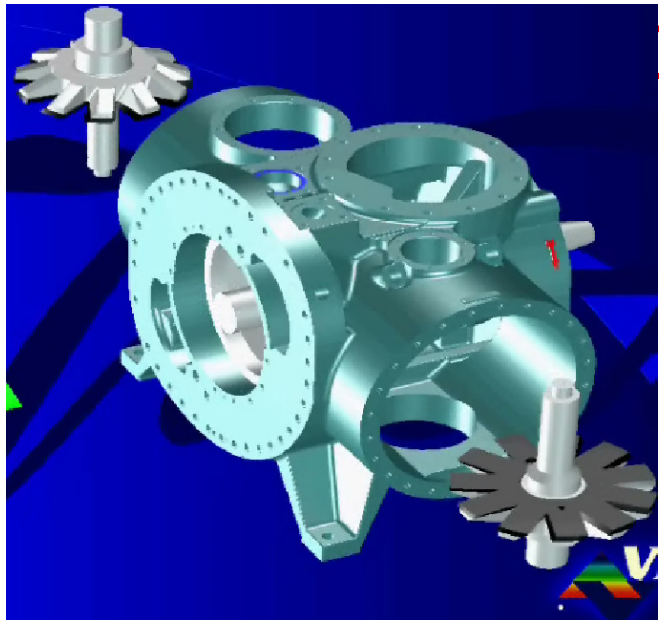
- The “Fashionable” reasons -

Ammonia? - Why not before?

- The “Business” reasons -

Ammonia? - Why now?

- It is possible

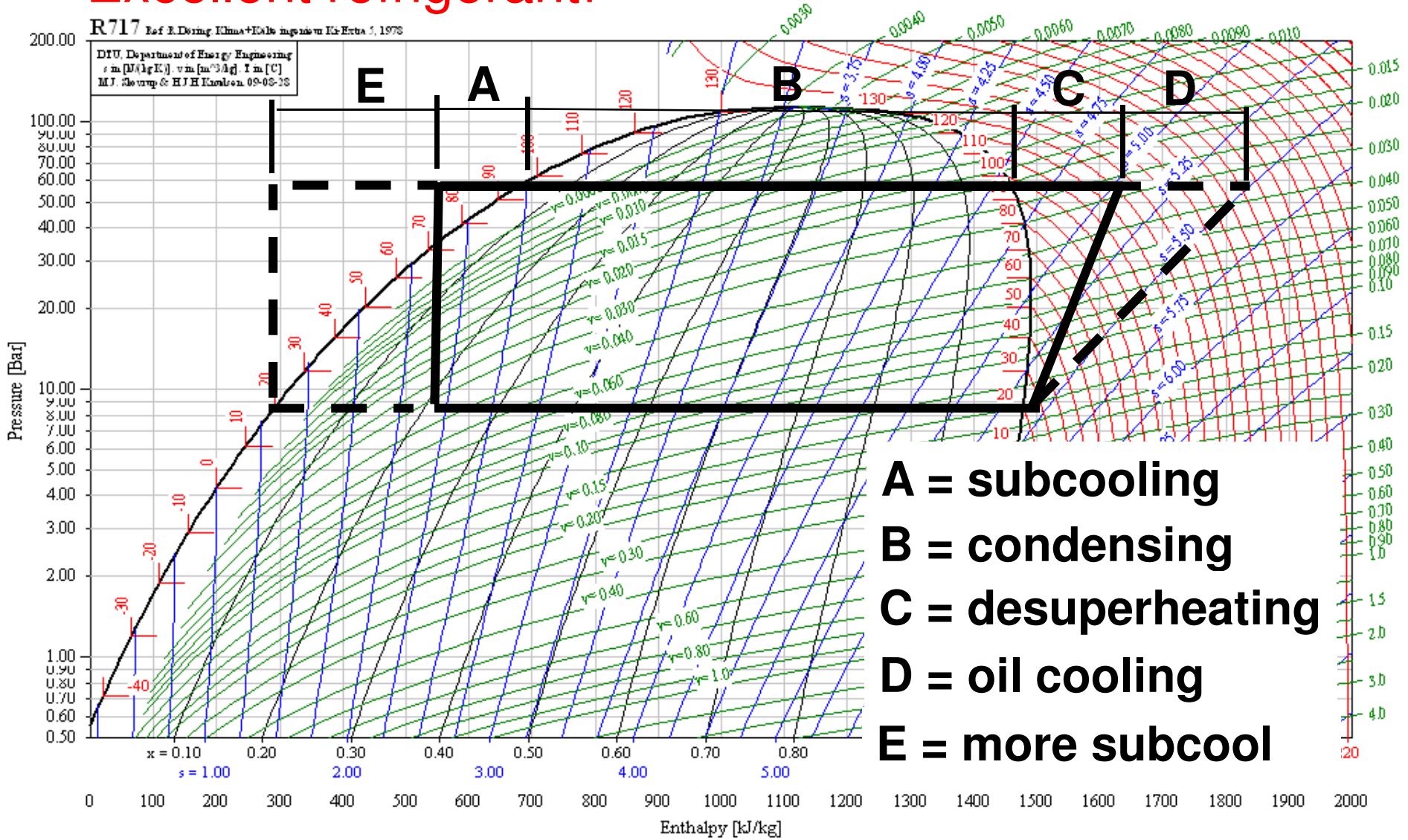


Recent Compressor development offers high pressure compressors with balanced radial and axial forces suitable for condensing ammonia at 95°C

Picture courtesy of Vilter Mfg Corp

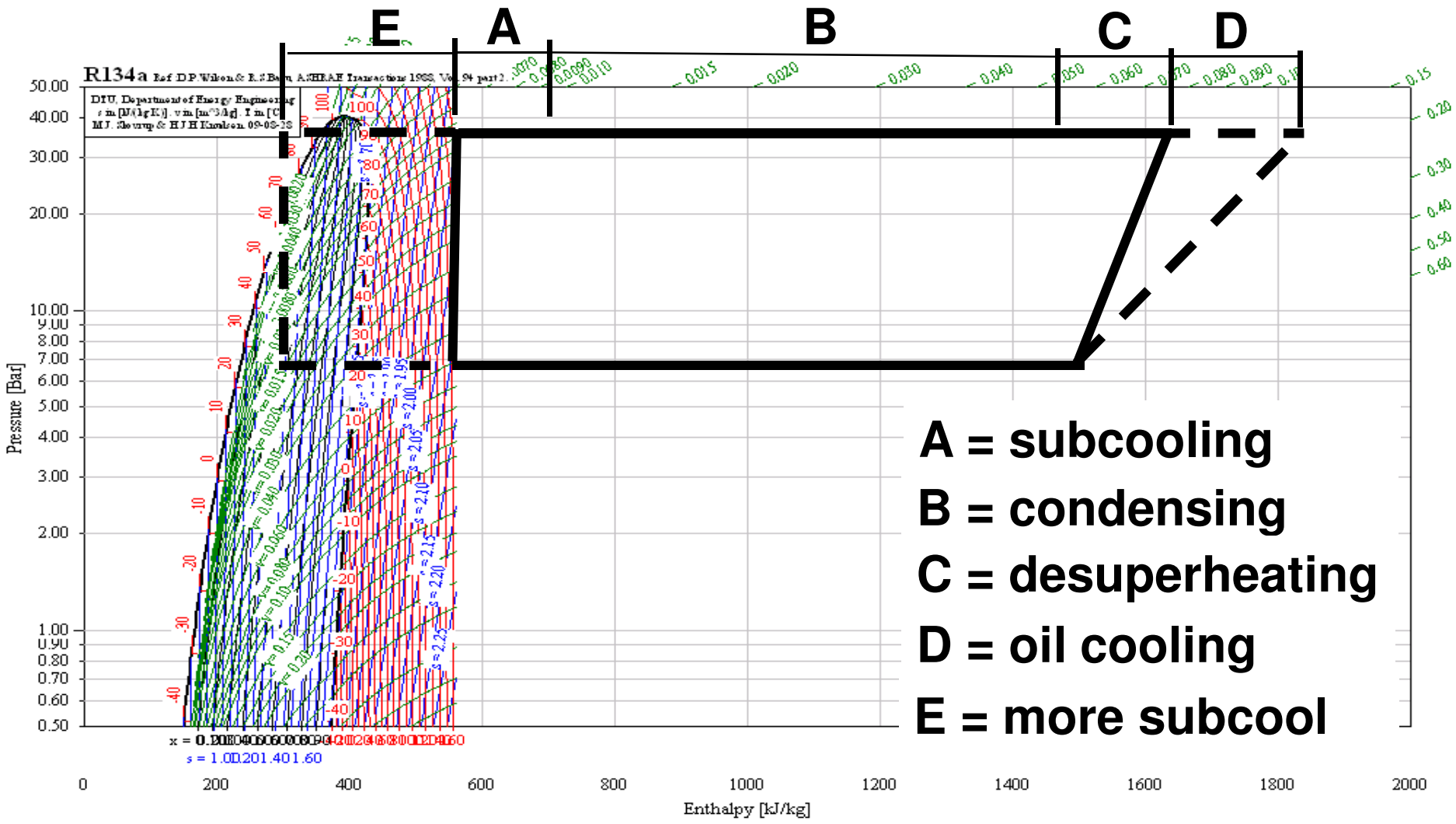
Ammonia? - Why now?

- Excellent refrigerant!



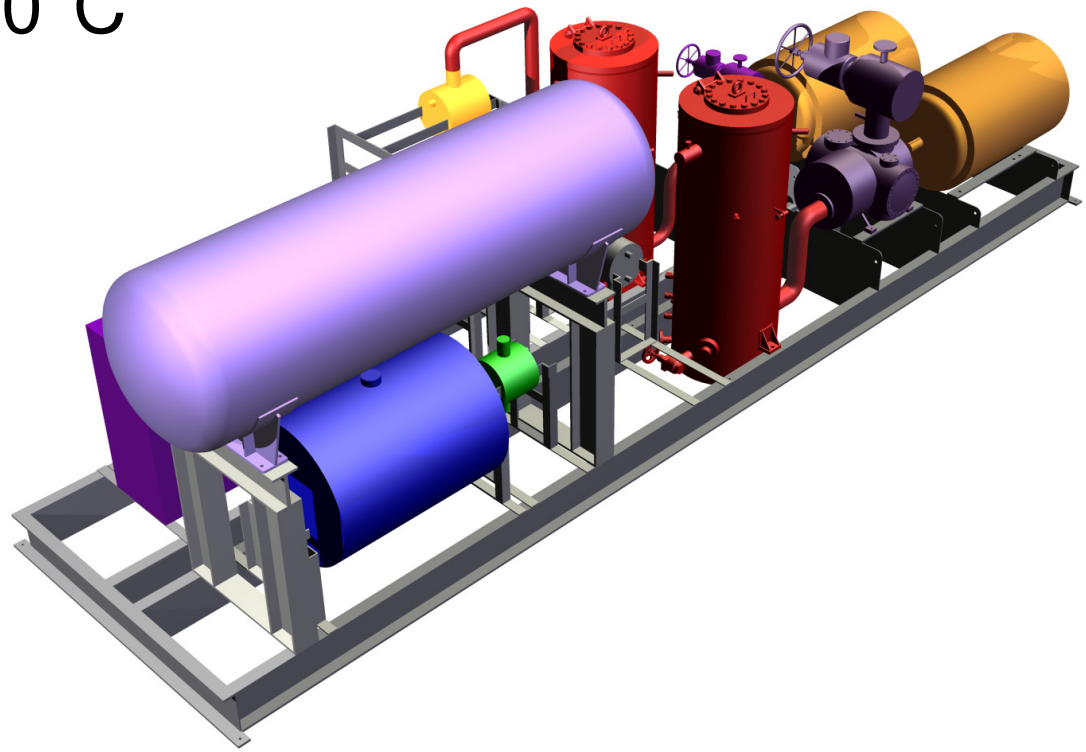
Ammonia? - Why now?

- Excellent refrigerant!



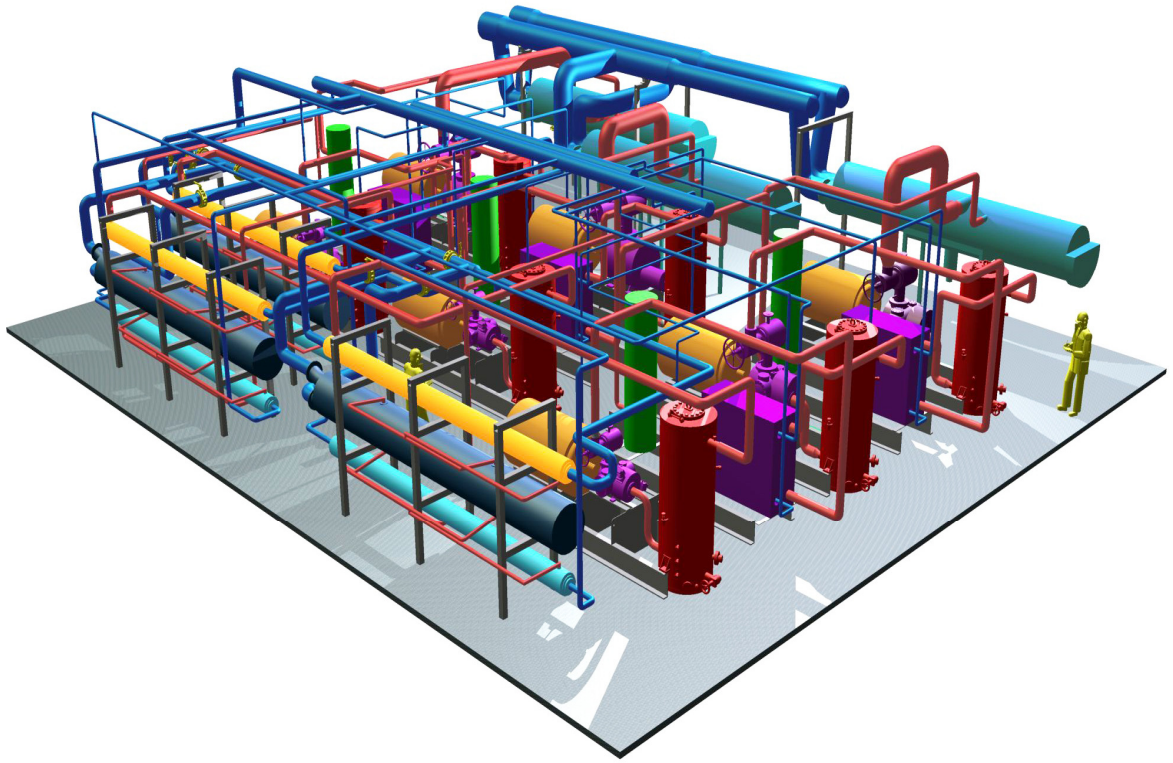
The Limits?

- Process Heating + 90°C
- Process Cooling - 40°C
- 5MW Packs
- Turndown to 10%
- Renewable Heat



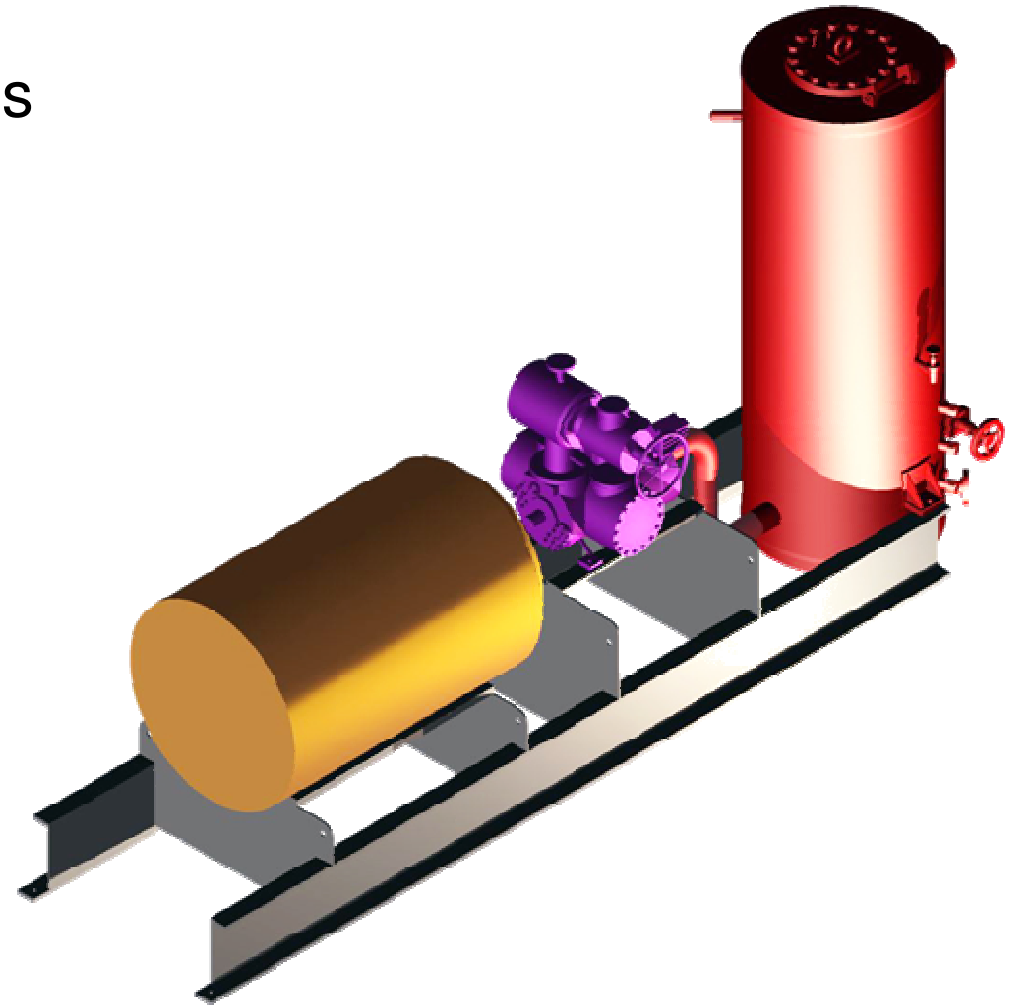
90°C 15 MW District Heating

- CoP> 3.0
  - Heating + 90°C
  - Cooling +8/4°C
  - 5MW Packs
  - Turndown to 10%
  - Future Proof
  - Similar Capital Cost

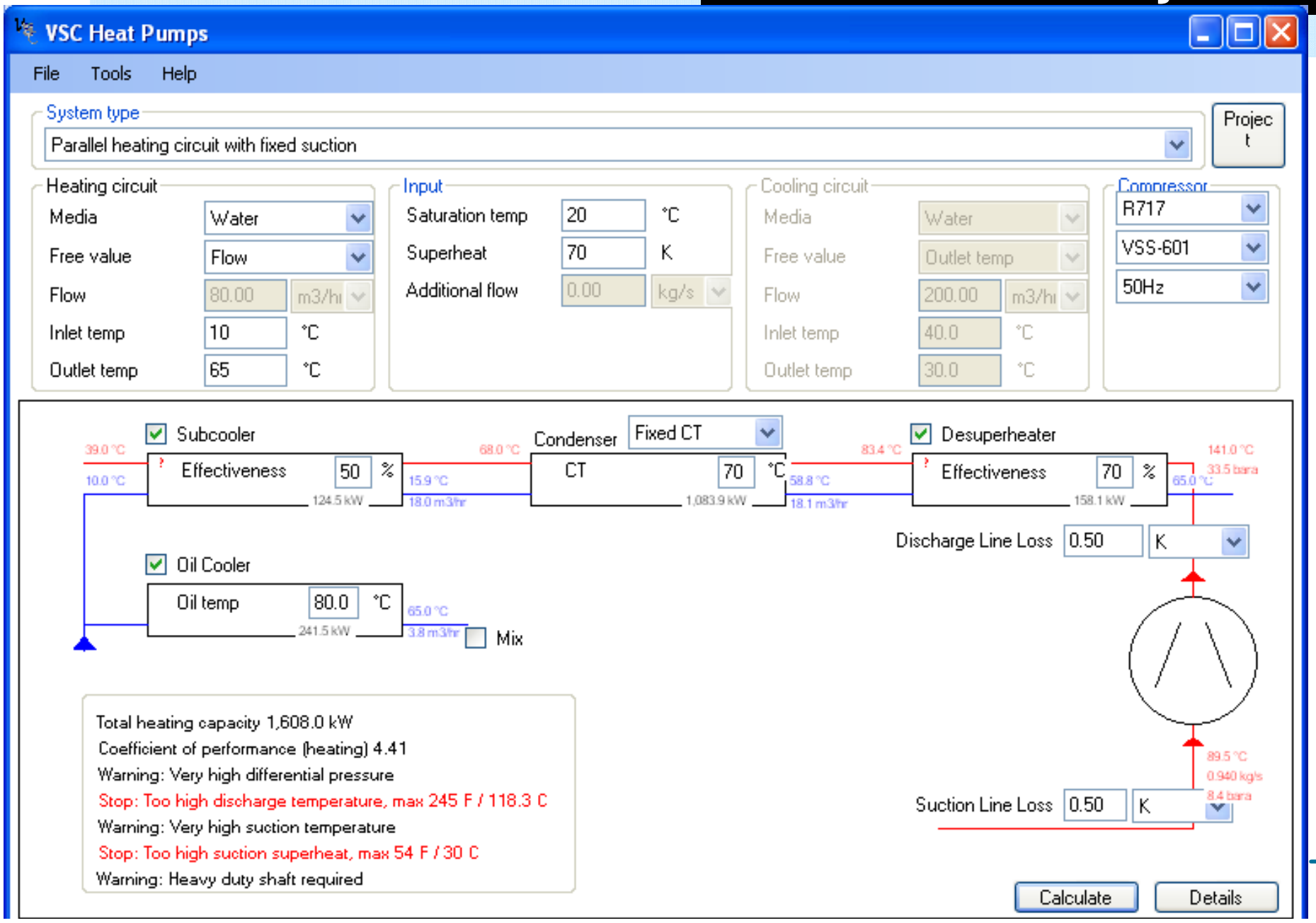


60°C Food Factory

- CoP> 4.5
  - Renewable Heat Incentives
  - Heating + 65°C
  - Scavenge Rejected Heat
  - Turndown to 10%
  - 60% Cost of gas heating
  - 0.5MW Packs to 1.5MW

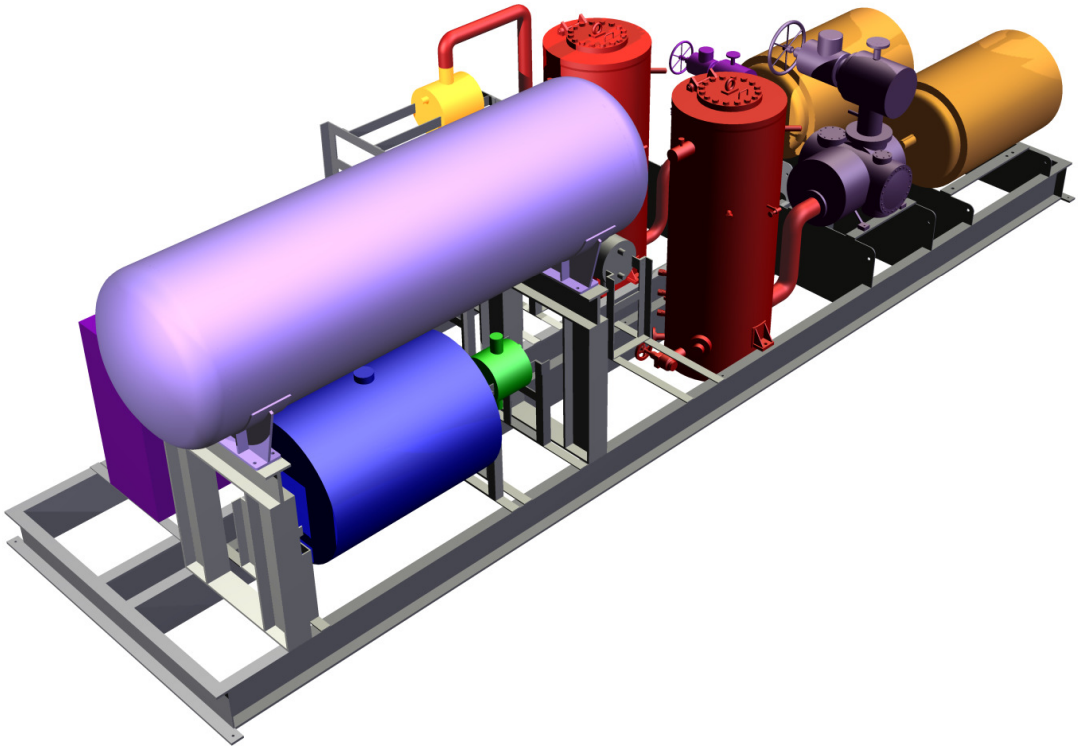


60°C Food Factory



Conclusions

- High Temperature Heat Pumps are
  - Proven Technology
  - Favourable Costs
  - Future Proof
  - Low Carbon
  - Retrofit
  - Expansion
  - New build



Nürnberg, Germany

9.–10.9.2009

EUROPEAN HEAT PUMP SUMMIT 2009

Powered by Chillventa

Symposium + Expo

Industrial • Commercial • Residential
Heating & Cooling • Components & Equipment