

17th
National Award for
Excellence in Energy Management 2016
22,23 & 24 August 2016 - HICC, Hyderabad

Case study on Innovative Product Award Winner



ULTRA LOW PRESSURE WATER VAPOUR DRIVEN VAM



**Ultra Low Pressure Water Vapour
driven VAM**

Potato contains 60-70% moisture

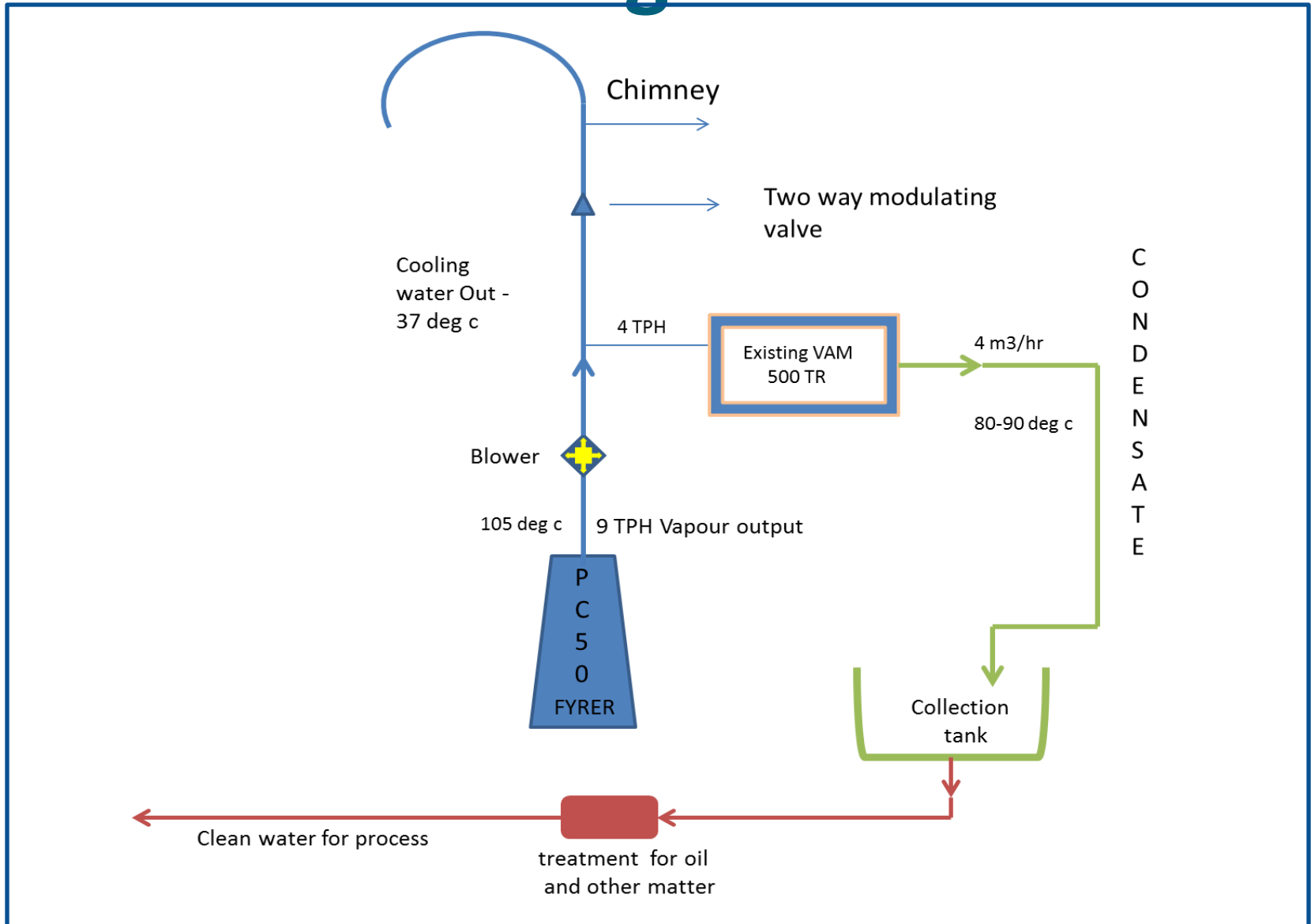
This moisture is vented out to atmosphere during frying

The moisture leaves in the form of vapour at 80-95°C and atmospheric pressure through a chimney connected to the fryer.

Again, In the potato fryer industry the packing area needs to be air-conditioned. Conventionally, electric chillers were used for this purpose.

The idea was to tap the energy of the vented water vapours from the fryer and use it to run a vapour absorption chiller which will in turn cool the packing area.

Process Flow Diagram





**Chiller Capacity : 350
TR
at Haldiram Foods**



**Chiller Capacity : 680
TR
at Pepsico**

- The chillers have been successfully commissioned and are running at Haldiram's, Fritolay and Hariomkar. We have orders from ITC .
- Using the vapour we can also give medium pressure steam up to 3 bar using type 2 heat pump.



Similar to Potatoes, Noodles contain 30 – 50% moisture before Frying process which is reduced to 2%

- Generated water vapour of 0.5 barg at fryer is be vented out which has high latent heat available
- This heat can be recovered to run VAM & condensate can be reused for other applications like washing
- Steam Ejected at Steamer in Noodle line to add moisture to noodles is also vented out which can also be used



Typically in Cigarette Manufacturing Units Tobacco is injected with steam to increase its moisture

- 2 -3 barg of steam is used for adding moisture into tobacco
- Used steam of 0-0.5 barg is vented out as only 20-25% of it is consumed by tobacco
- This steam has a huge potential latent heat conservation
- Also generated condensate can be used other processes

Sustainability

VAM Capacity

- **500 TR** Thermax's vapour absorption chiller

Savings

- Substantial Water Savings

Electricity Savings

- **2.9 million units of electricity per annum** which is equivalent to lighting up of **3200 homes in a year.**

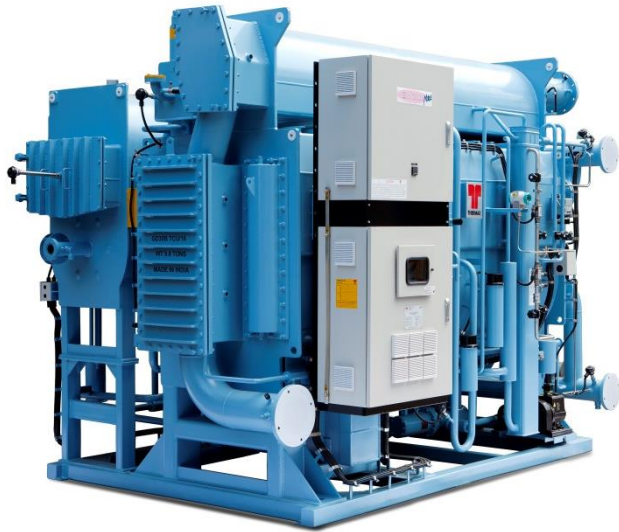
Reduction in CO₂ Emissions

- **400 Tons of carbon dioxide per annum** which is equivalent to taking **3300 cars off the road** in a year

Where this product can be used

- Potato Chips Industry & all food products where water vapour is emitted can use this product
- Refineries and petro chemicals where CO₂ is let out along with high temperature water vapour, this product can utilize the waste heat and also help in CO₂ recovery

Types of Vapor Absorption Machine

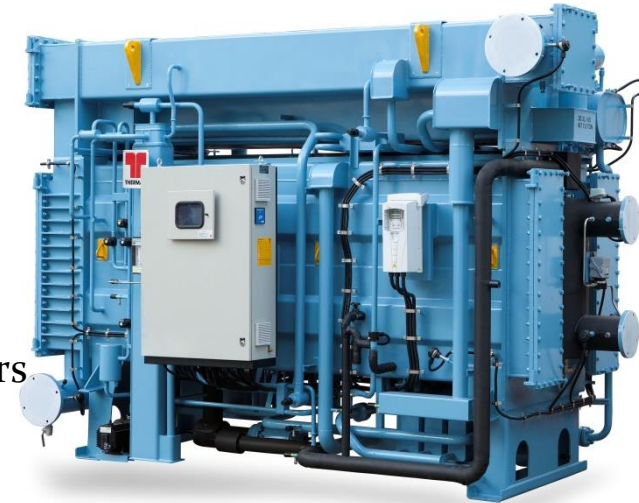


- Direct Fired Chillers

- Steam Driven Chillers

- Hot Water Driven Chillers

- Exhaust Gas driven Chillers



- Multi Energy Chillers

- Heat Pumps

- Chiller Heater



Thank You !

