



WEBINAIRE DE FORMATION U-3ARC No 12

SYSTÈME DE REFROIDISSEMENT À ABSORPTION

MESHACK ODHIAMBO

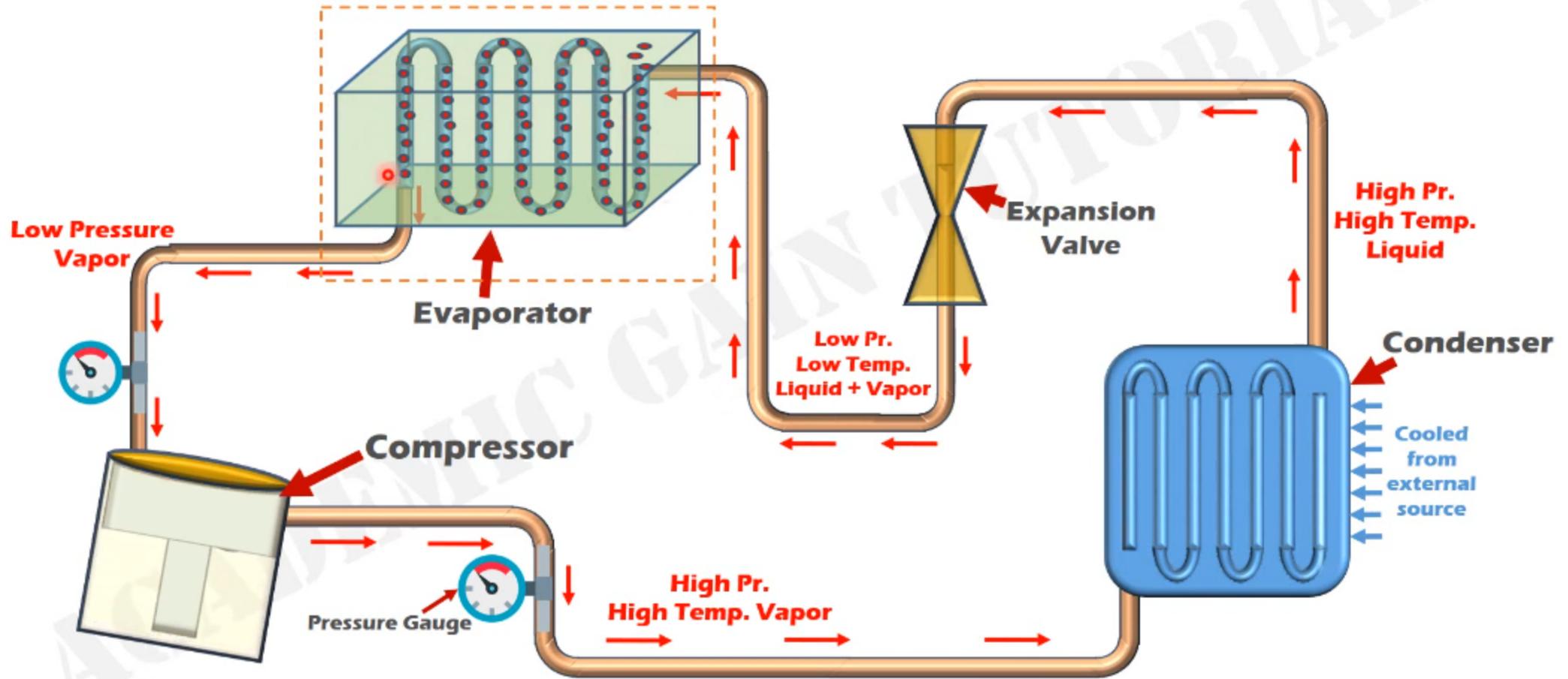
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CONTENU



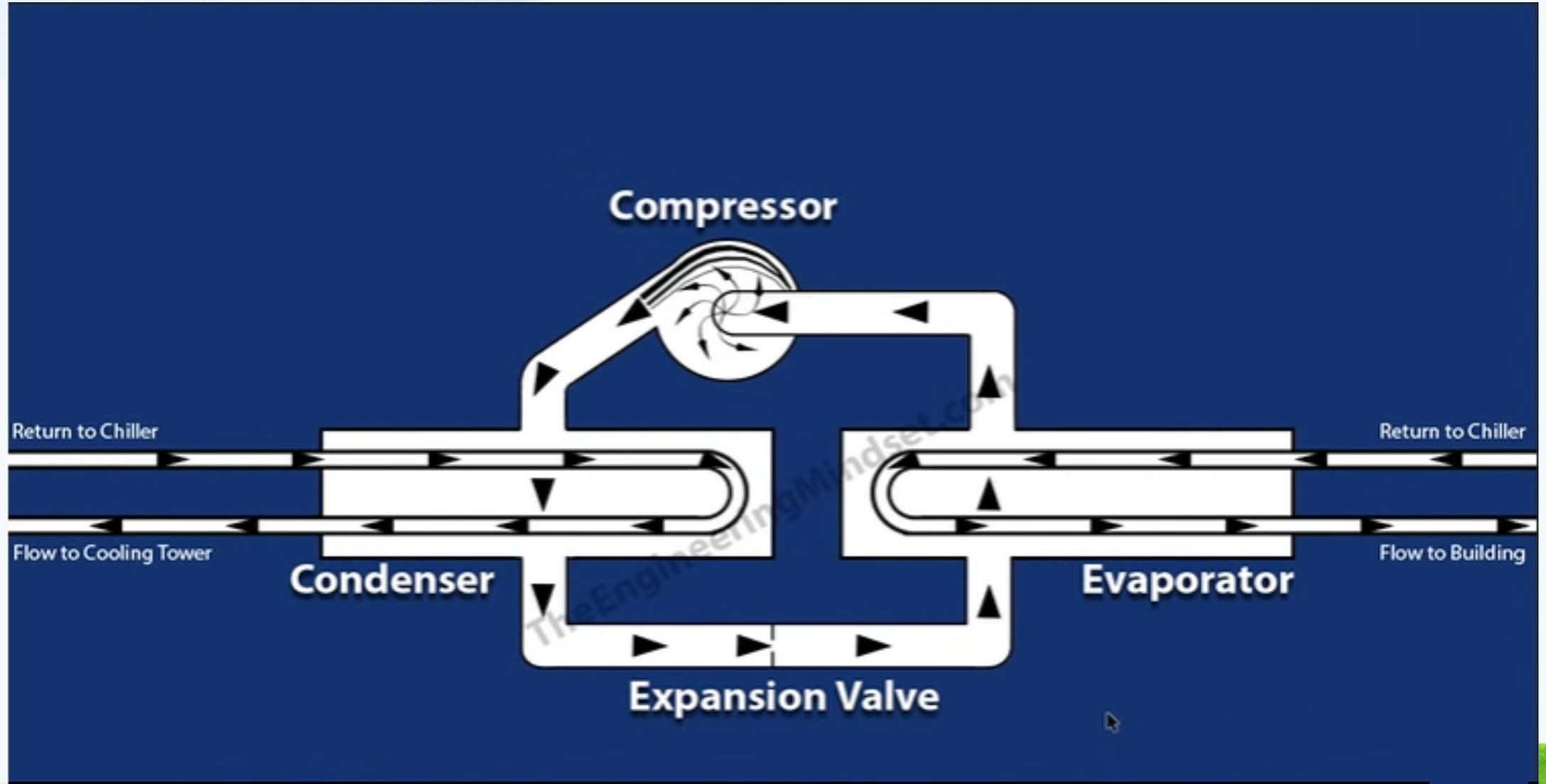
1. RAPPEL DU CYCLE DE COMPRESSION DE VAPEUR
2. APERÇU DU SYSTÈME DE REFROIDISSEMENT
3. PRINCIPES DE FONCTIONNEMENT DU REFROIDISSEUR À ABSORPTION
4. CYCLE DE REFROIDISSEMENT À ABSORPTION
5. DIVERSES PARTIES DU CYCLE
6. RÉSUMÉ - LOGIQUE FONCTIONNELLE DU CYCLE
7. IMAGES DE L'INSTALLATION DU REFROIDISSEUR À ABSORPTION

Vapour Compression Refrigeration System

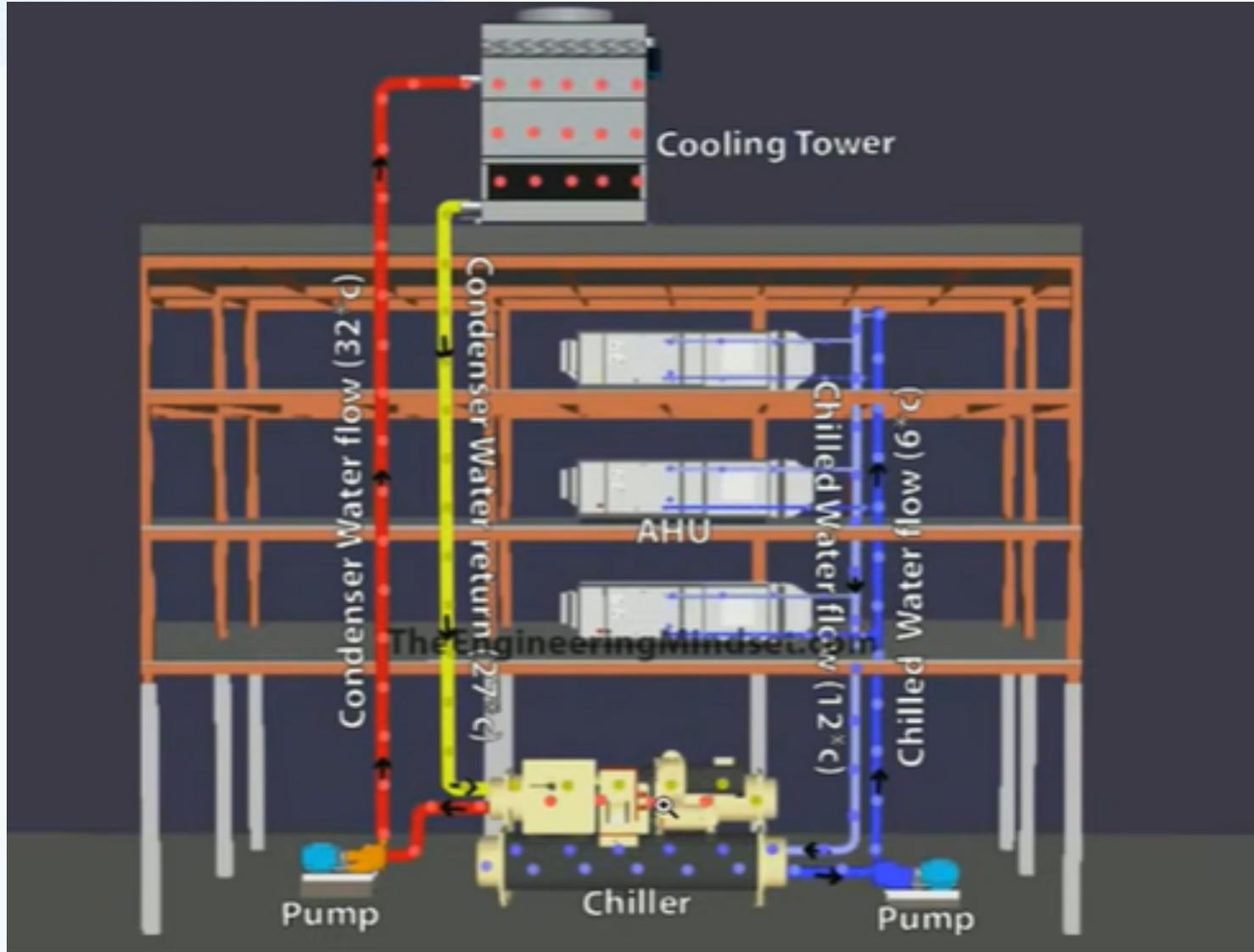


4 COMPOSANTS DE BASE DU REFROIDISSEUR – 3

CIRCUITS GENERAUX



BREF SYSTÈME DE REFROIDISSEMENT – CONFIGURATION GÉNÉRALE





PRINCIPES/CONCEPTS DE FONCTIONNEMENT DU REFROIDISSEUR À ABSORPTION

- CHANGEMENT DE PRESSION
- MISCIBILITÉ DE L'EAU AVEC D'AUTRES LIQUIDES/SOLUTIONS AYANT DIFFÉRENTES PROPRIÉTÉS D'ABSORPTION/REJET DE CHALEUR DE L'EAU
- AMMONIAC OU BROMURE DE LITHIUM

CHANGEMENT DE TEMPÉRATURE AVEC LA PRESSION



How Absorption Chillers Works

Boiling Point
Temperature: 100°C / 212°F
Pressure: 101kPa / 14.7psi



Sea Level

Boiling Point
Temperature: 70°C / 158°F
Pressure: 34kPa / 4.9psi



High Altitude

Boiling Point
Temperature: 4.5°C / 40°F
Pressure: 0.84kPa / 0.12psia



Vacuum

BROMURE DE LITHIUM ET MISCIBILITÉ AVEC L'EAU



How Absorption Chillers Works

Water Vapour



Lithium Bromide
(Salt)

CHAUFFAGE DU MÉLANGE BROMURE DE LITHIUM-EAU

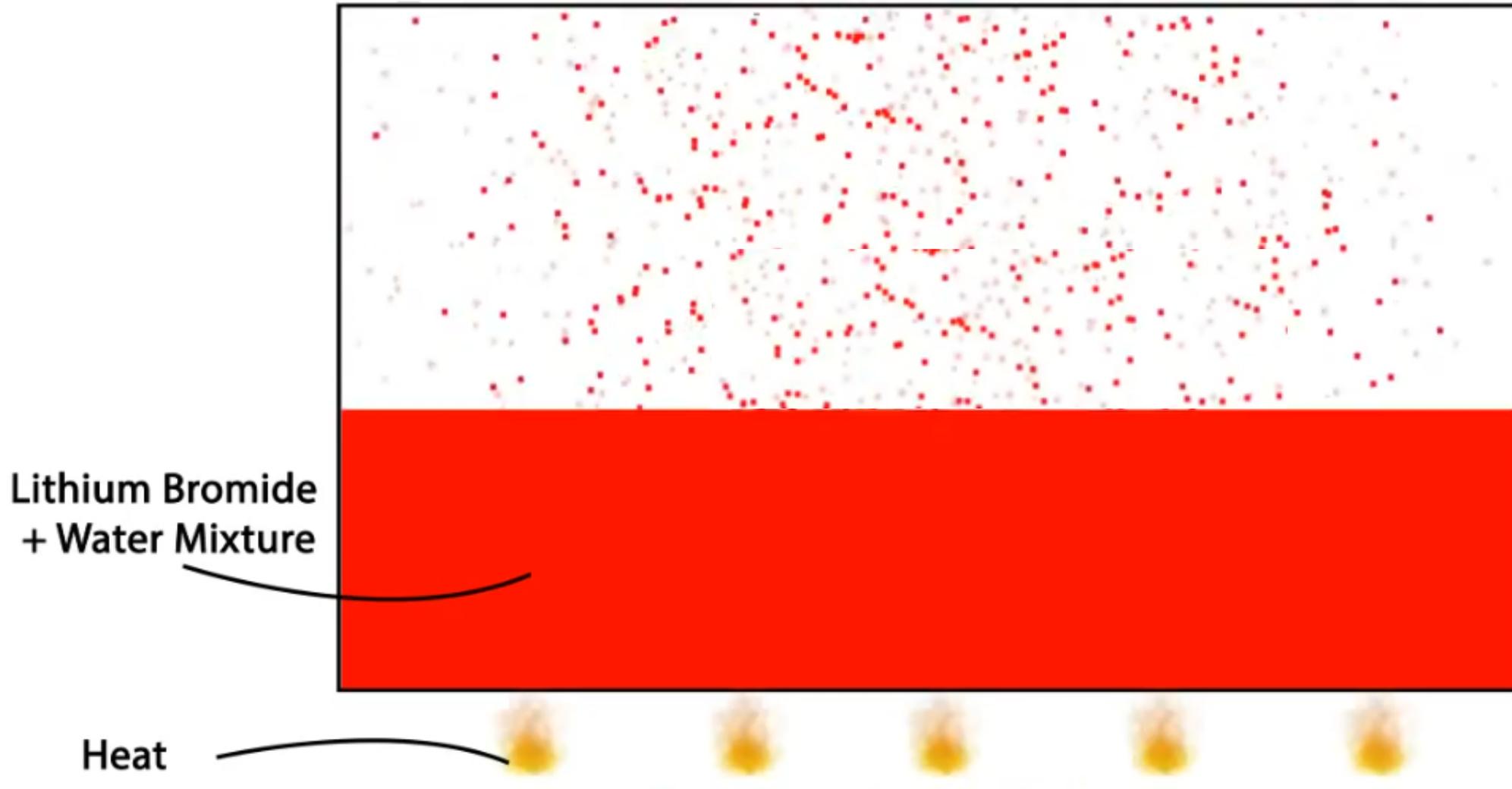
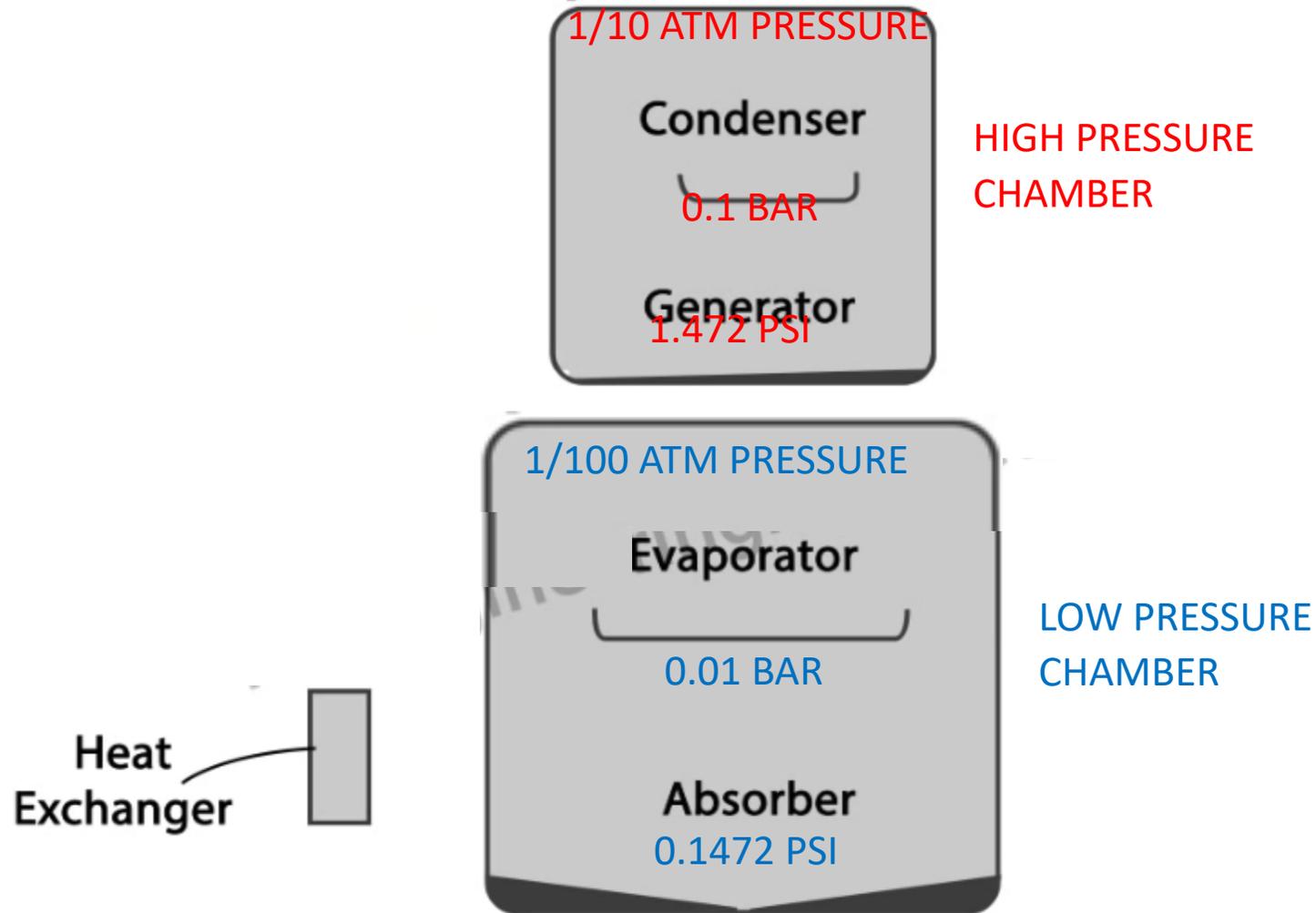


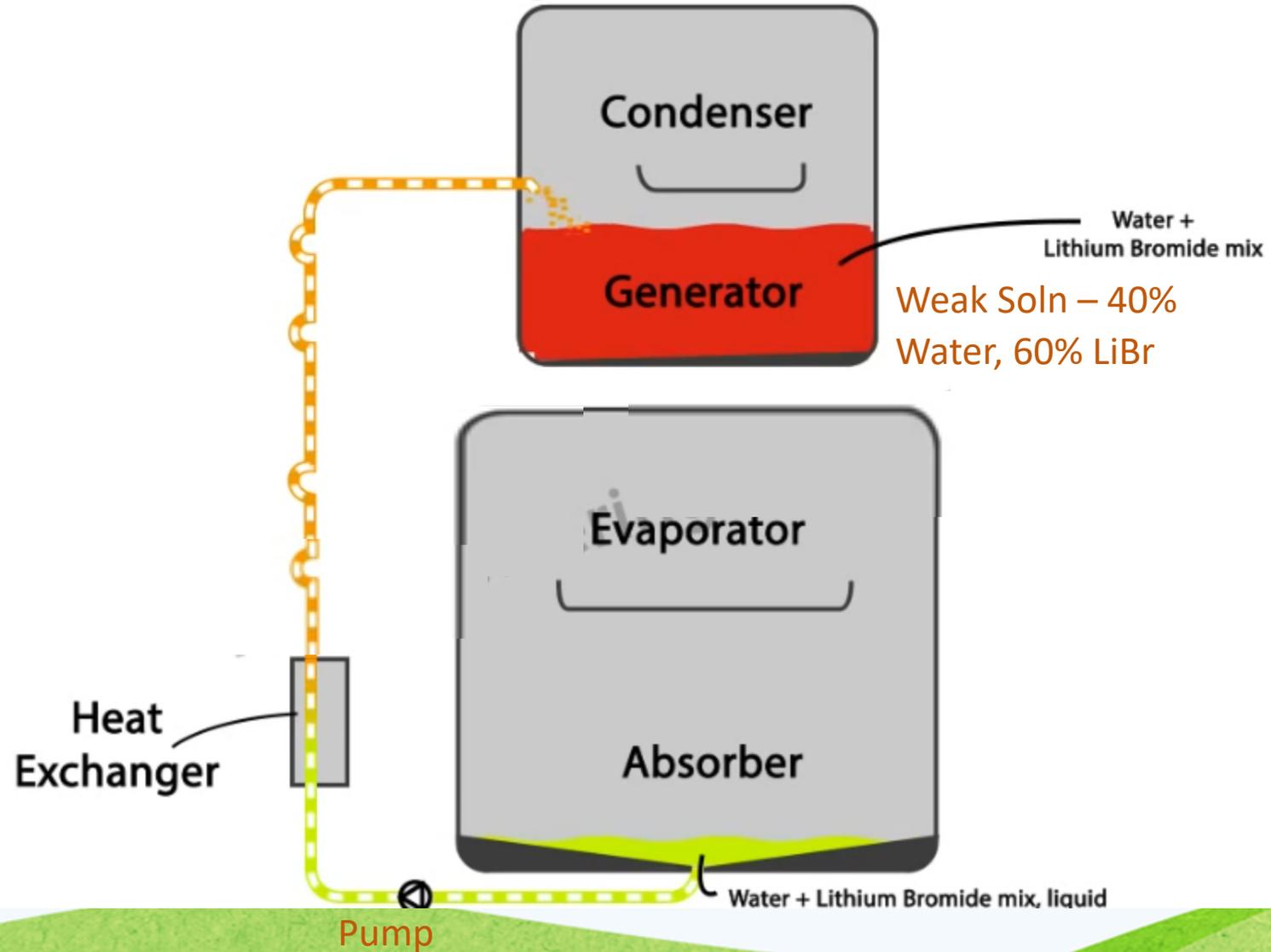
SCHÉMA DE FONCTIONNEMENT DU REFROIDISSEUR À ABSORPTION



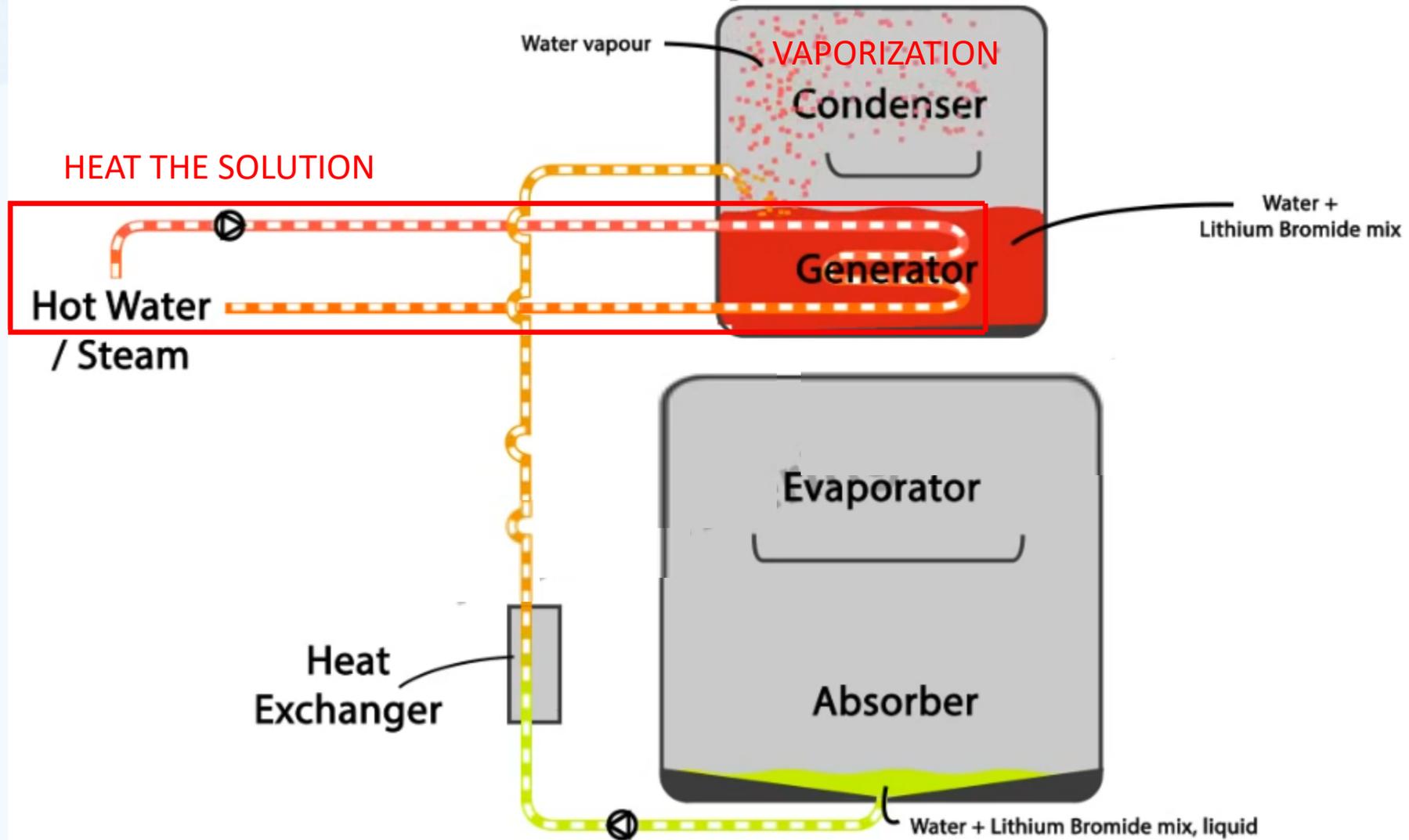
How Absorption Chillers Works



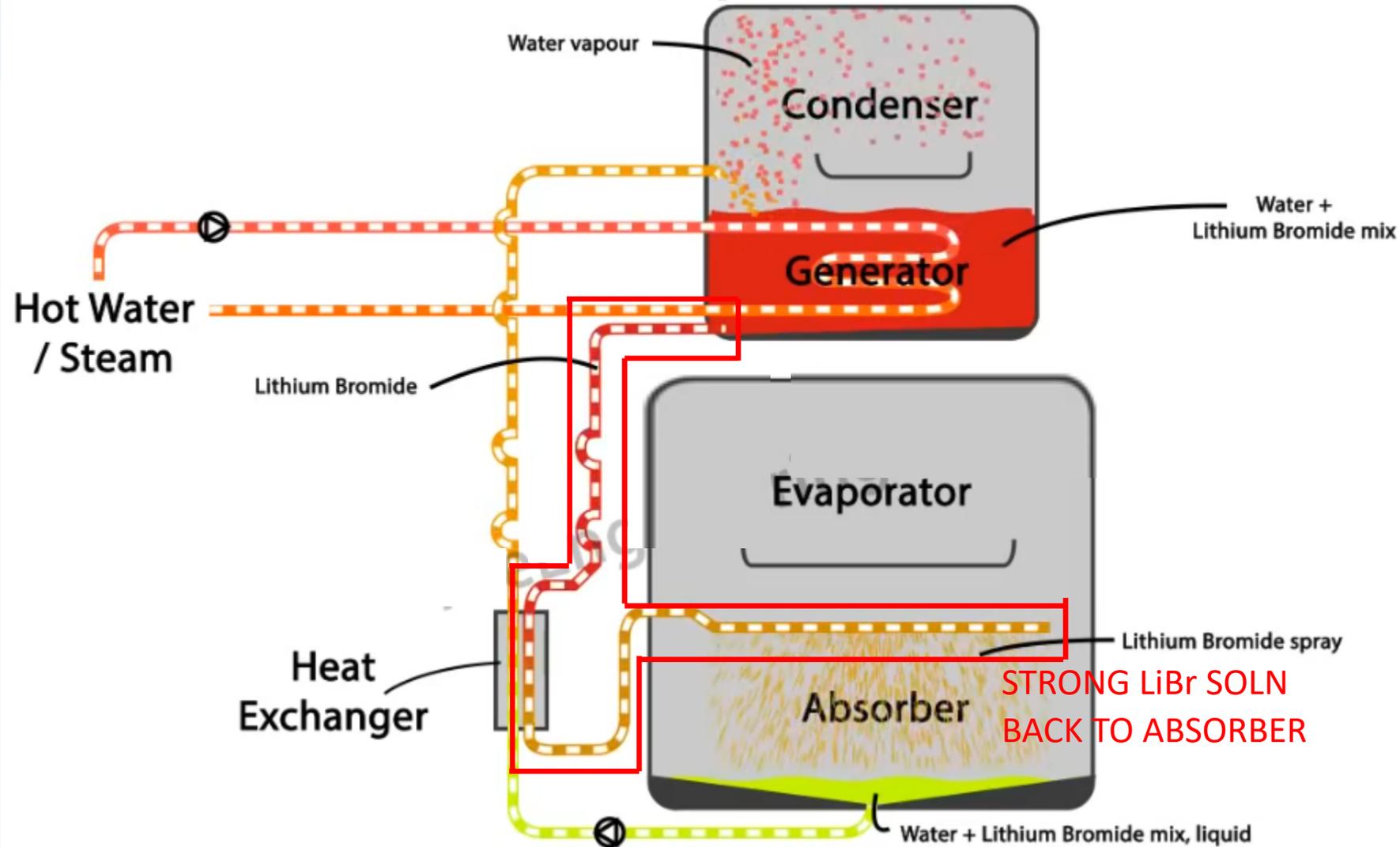
How Absorption Chillers Works



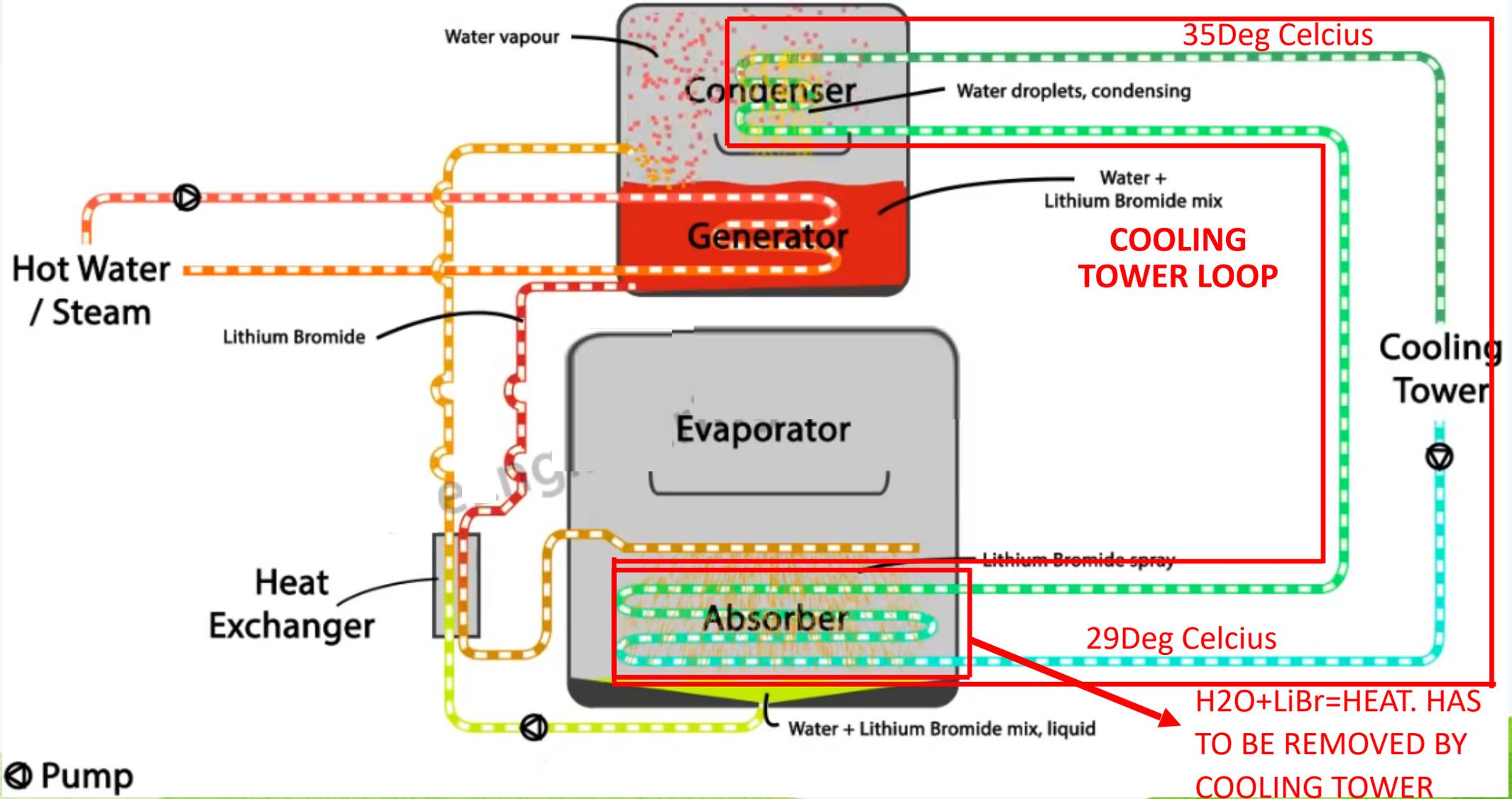
How Absorption Chillers Works



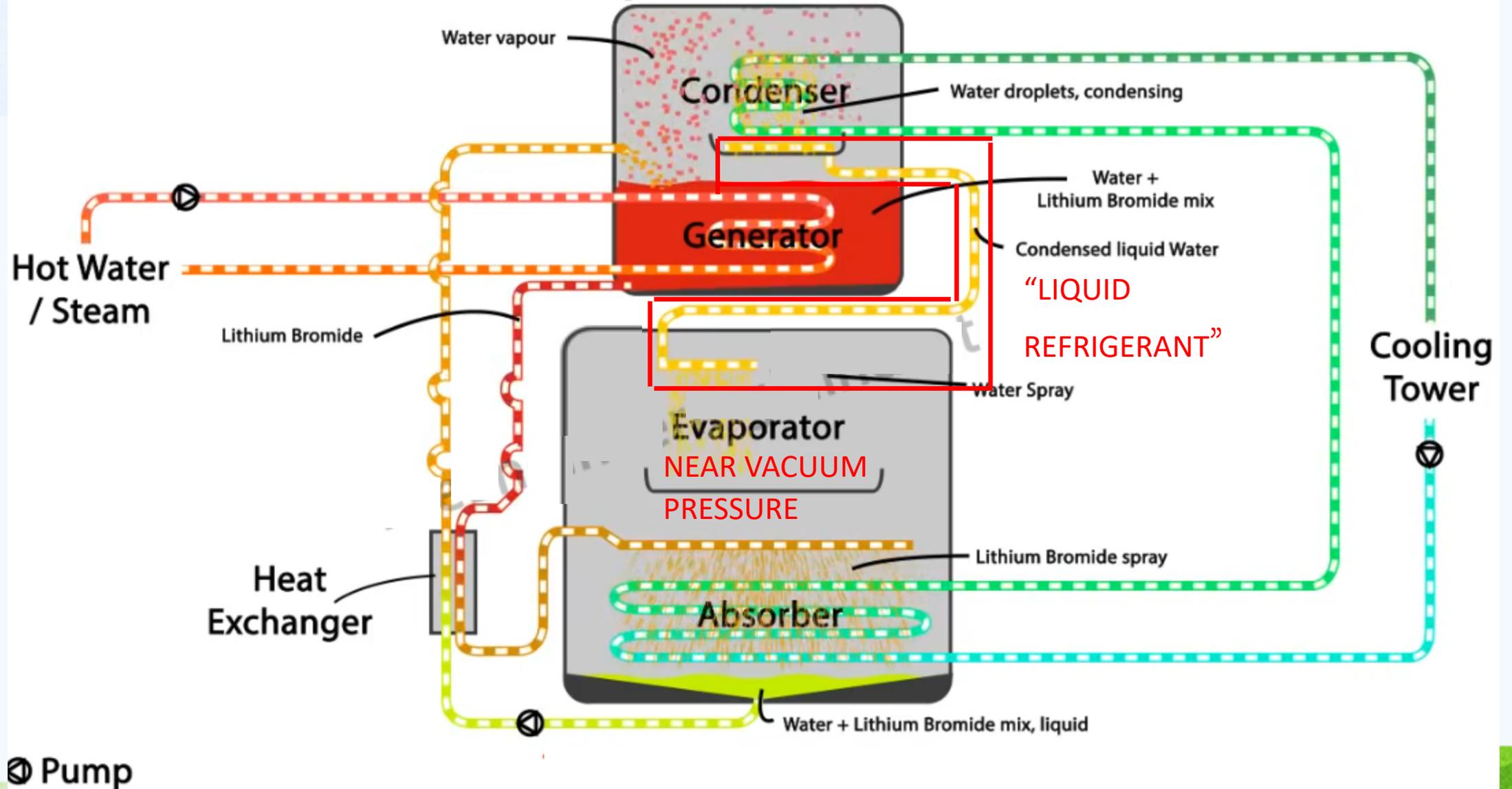
How Absorption Chillers Works



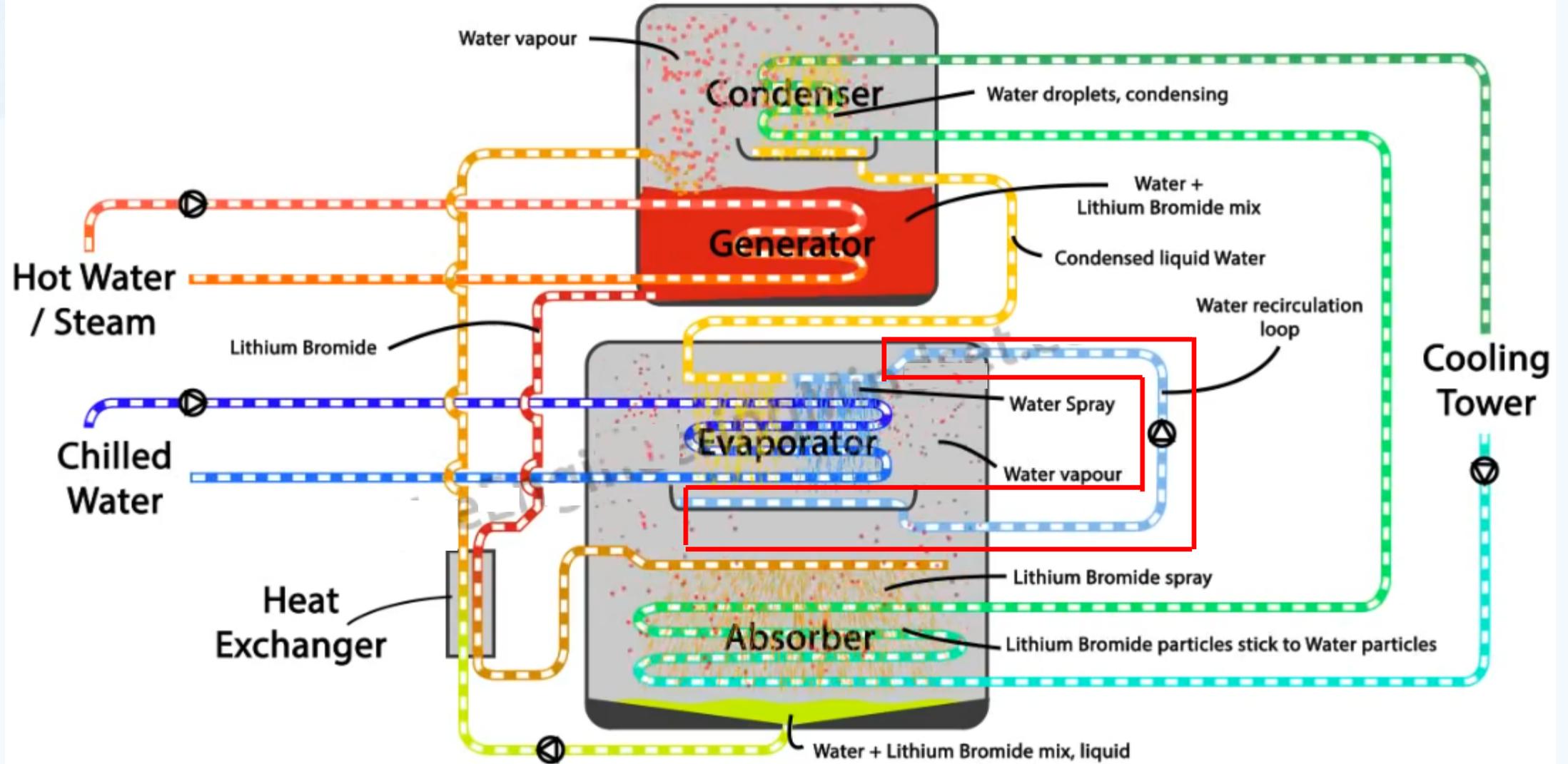
How Absorption Chillers Works



How Absorption Chillers Works



How Absorption Chillers Works



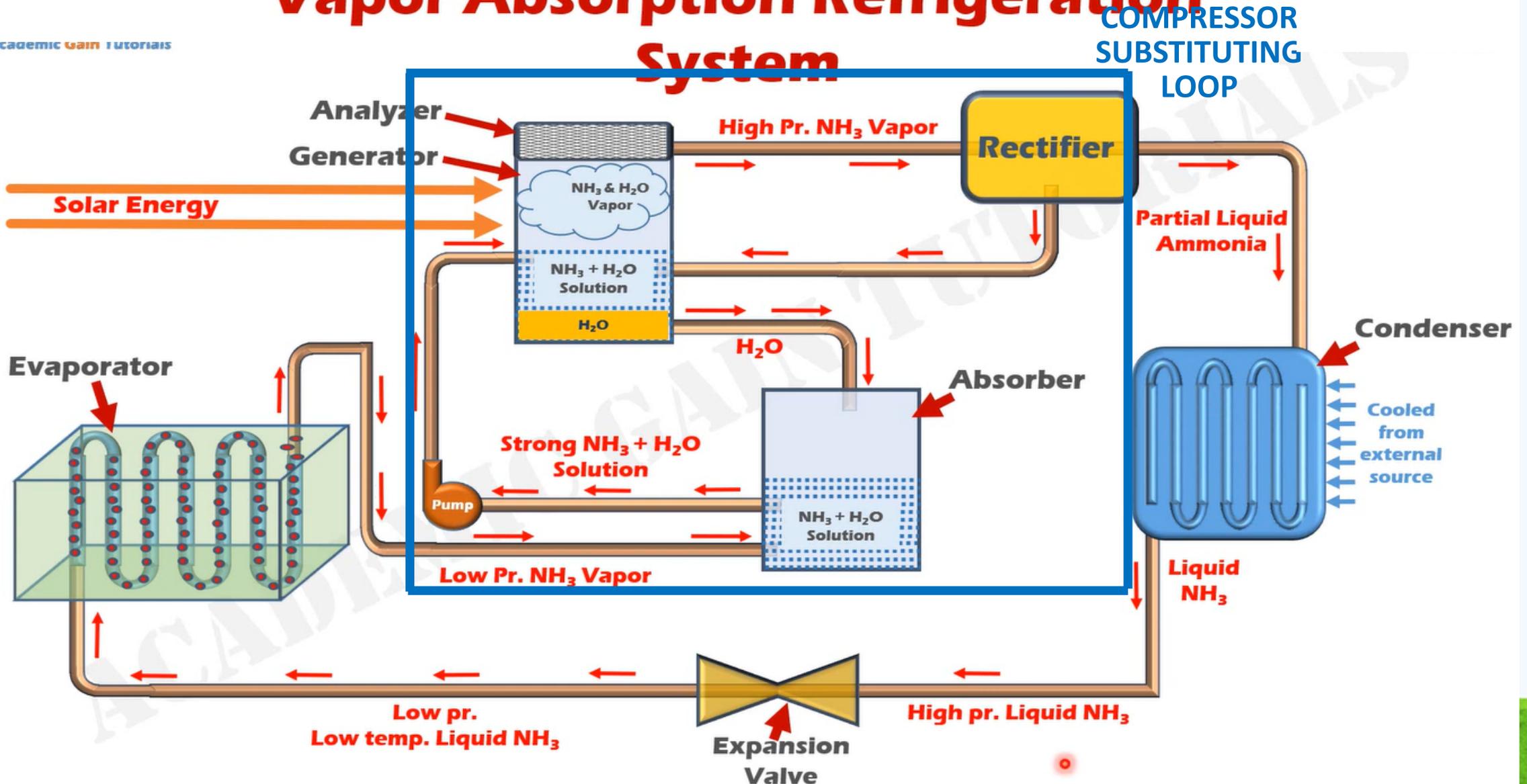
⊗ Pump

CYCLE DE L'AMMONIAC

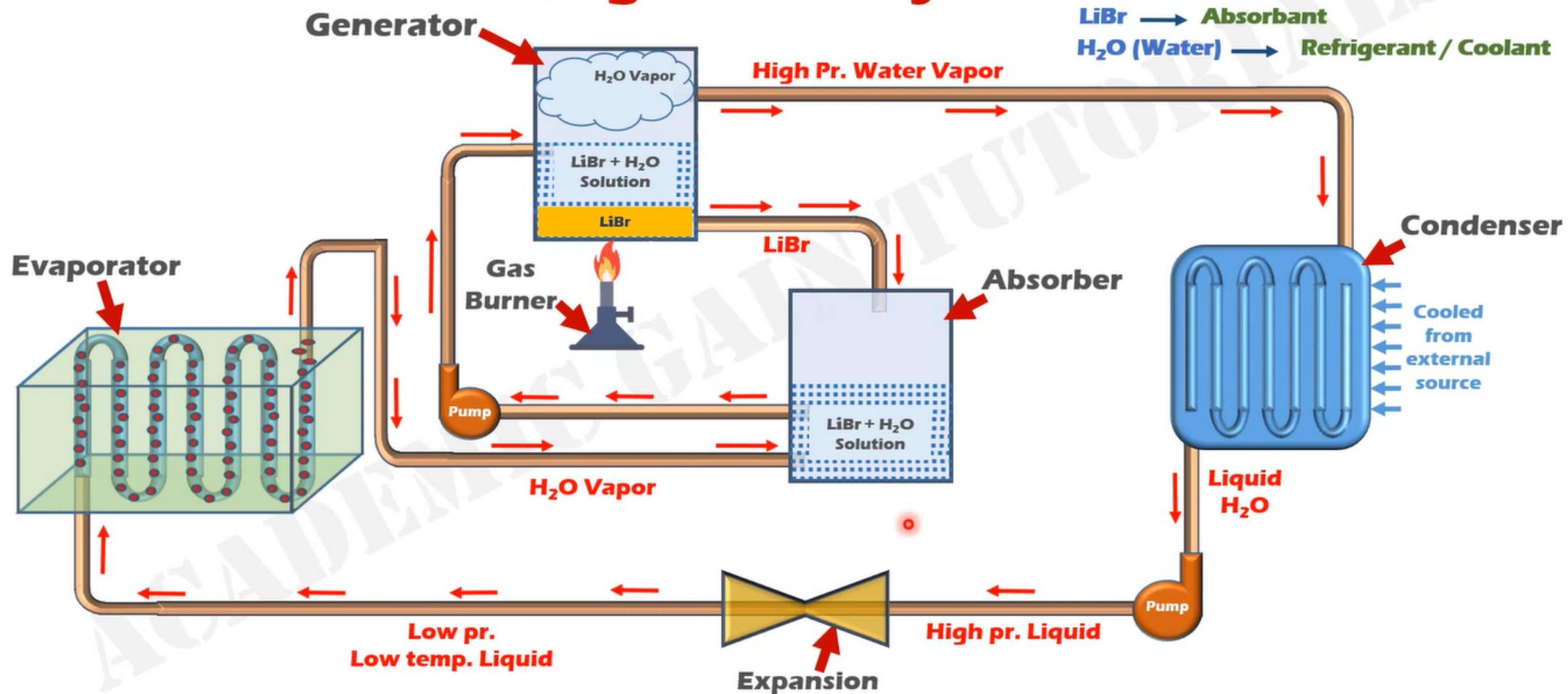


Vapor Absorption Refrigeration System

Academic Gain Tutorials

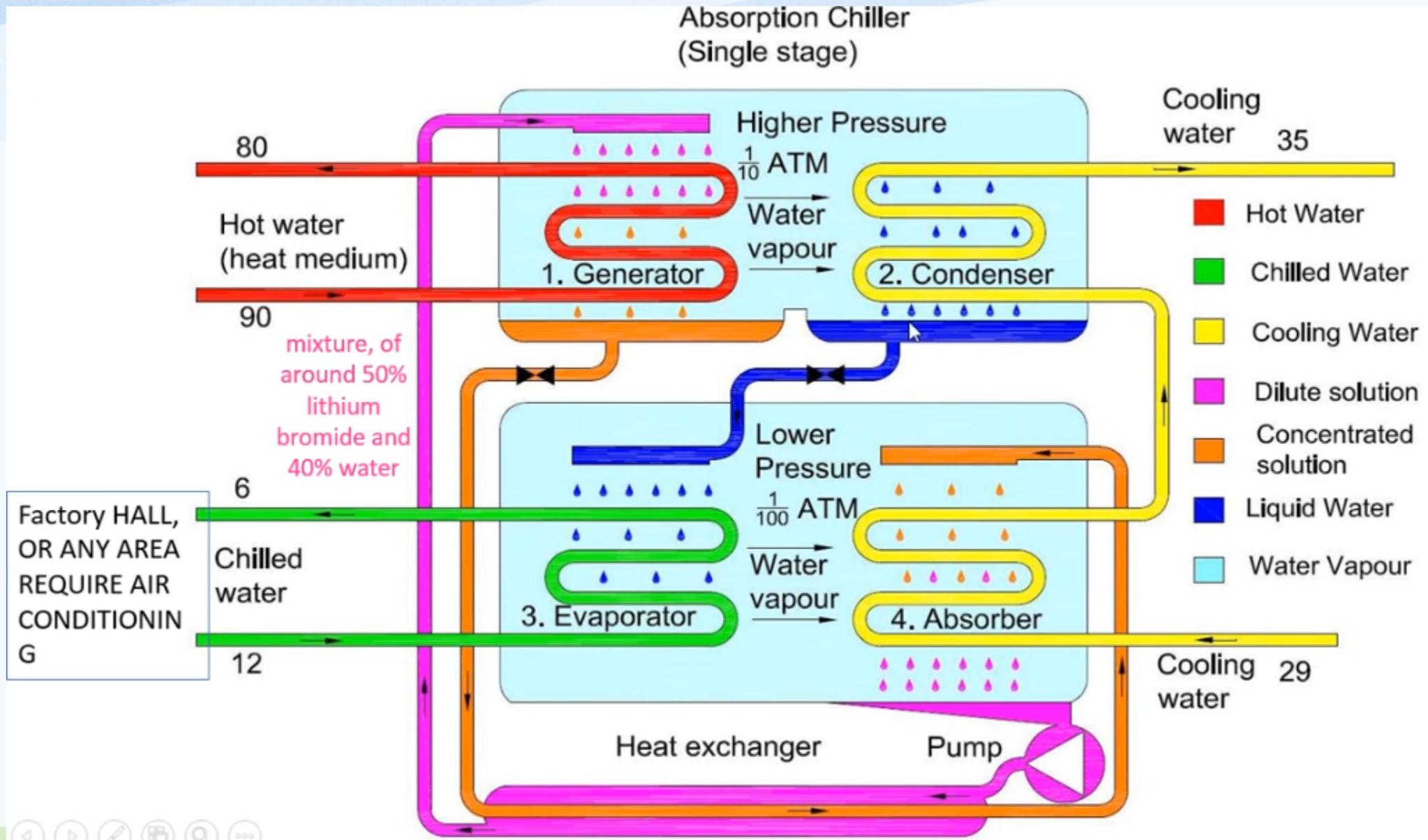


Lithium Bromide (LiBr) Absorption Refrigeration System



LiBr – More common because it is safer and non-toxic

EN RÉSUMÉ – SCHÉMA DU CYCLE COMPACT



VARIATIONS DE PRODUCTION DES REFROIDISSEURS À ABSORPTION DANS LE MONDE





EXEMPLE DE PRODUIT DE LIGNE DE PRODUCTION



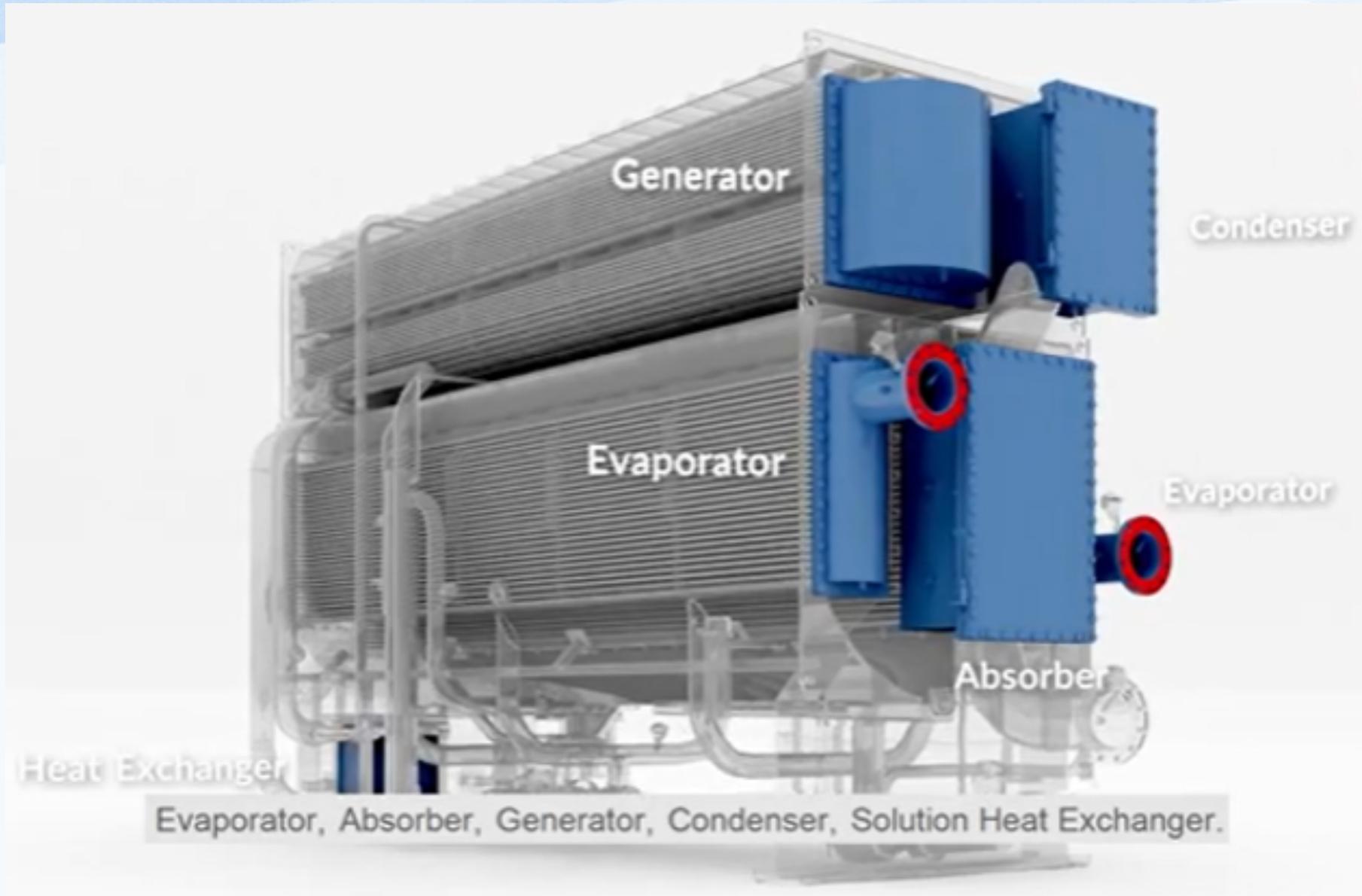
6,300+
installation

with 6,300 plus installation across the globe over the last 30 years

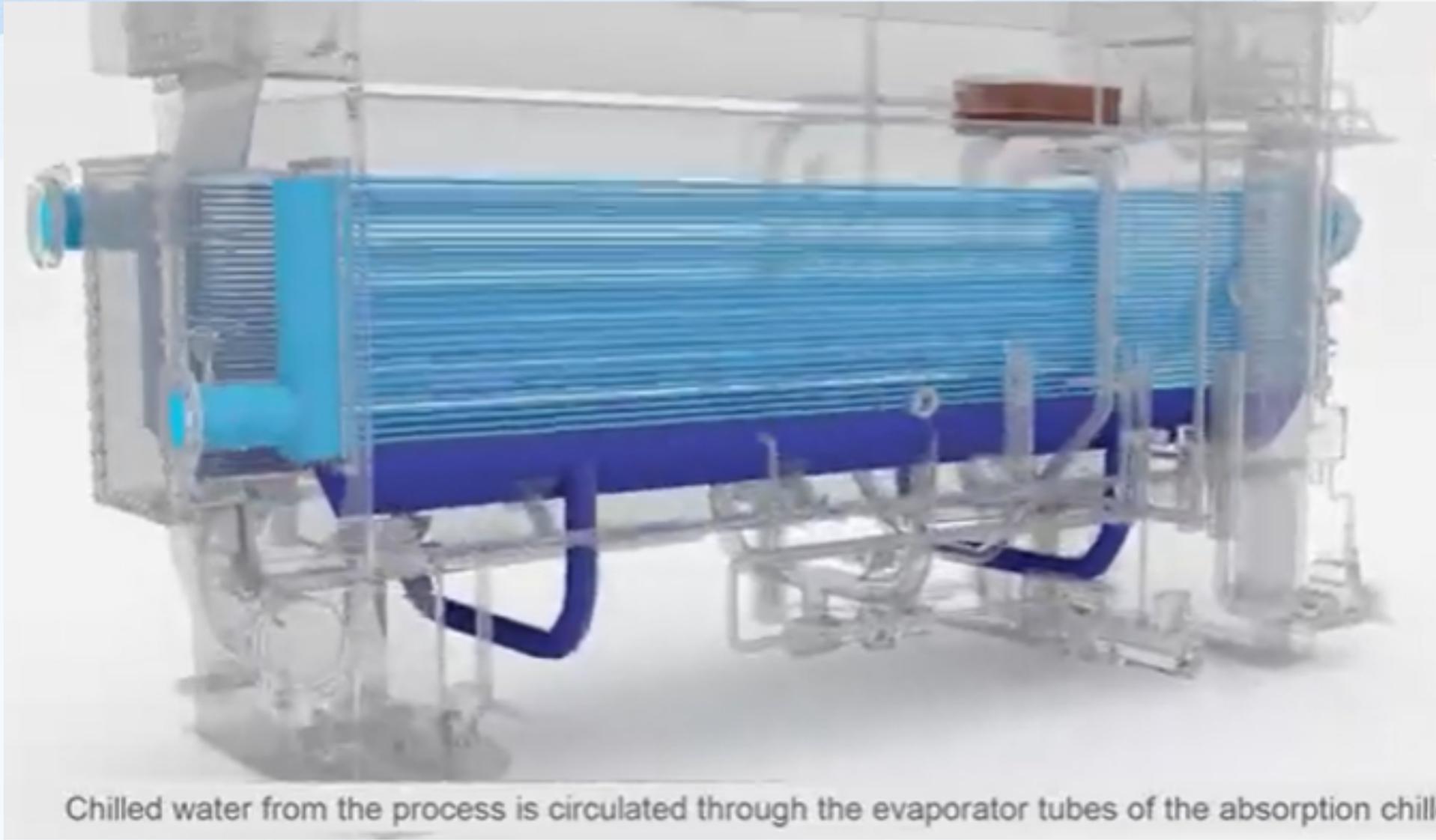




capable of delivering up to -5 degree Celsius catering to various cooling requirements



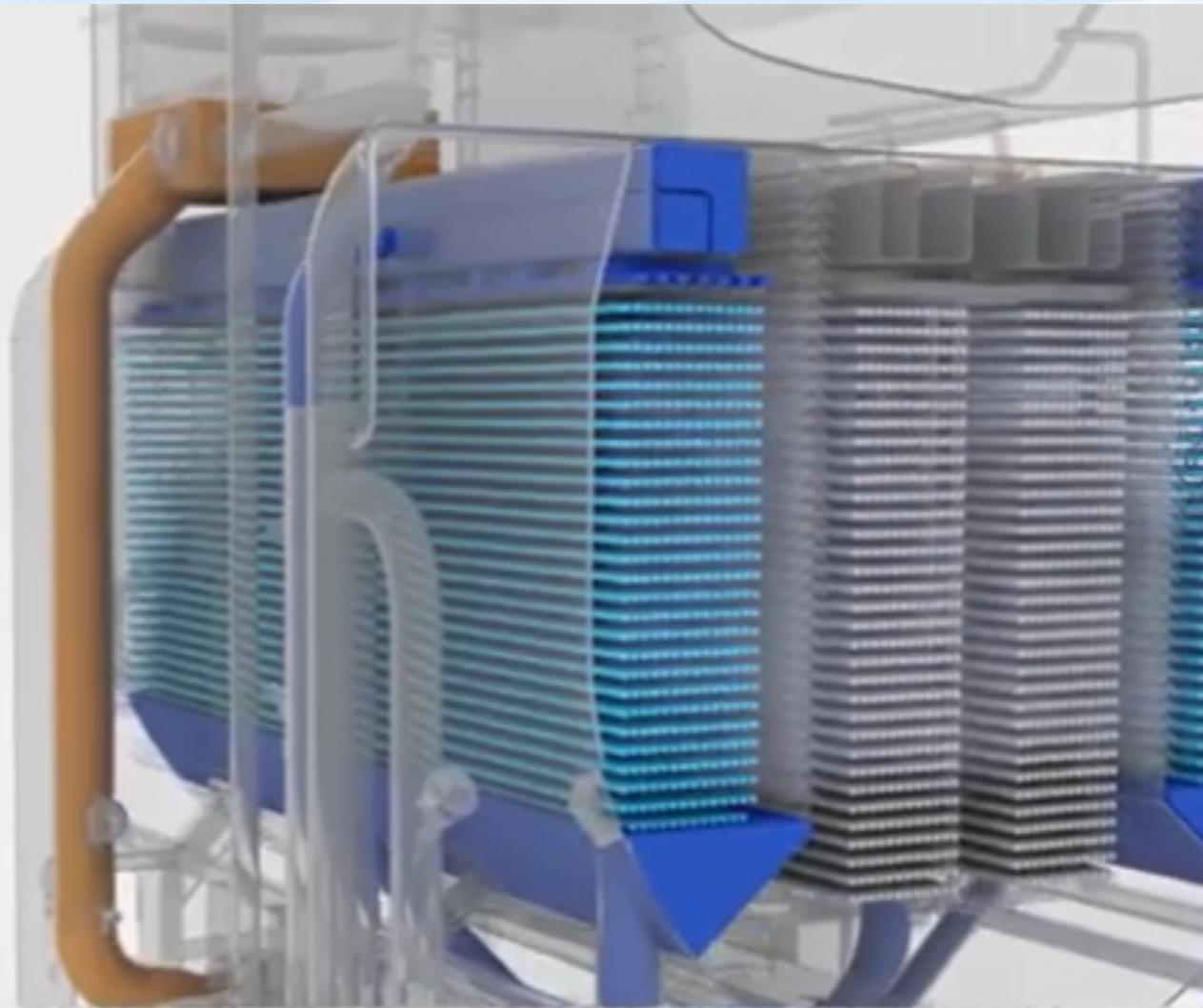
Evaporator, Absorber, Generator, Condenser, Solution Heat Exchanger.



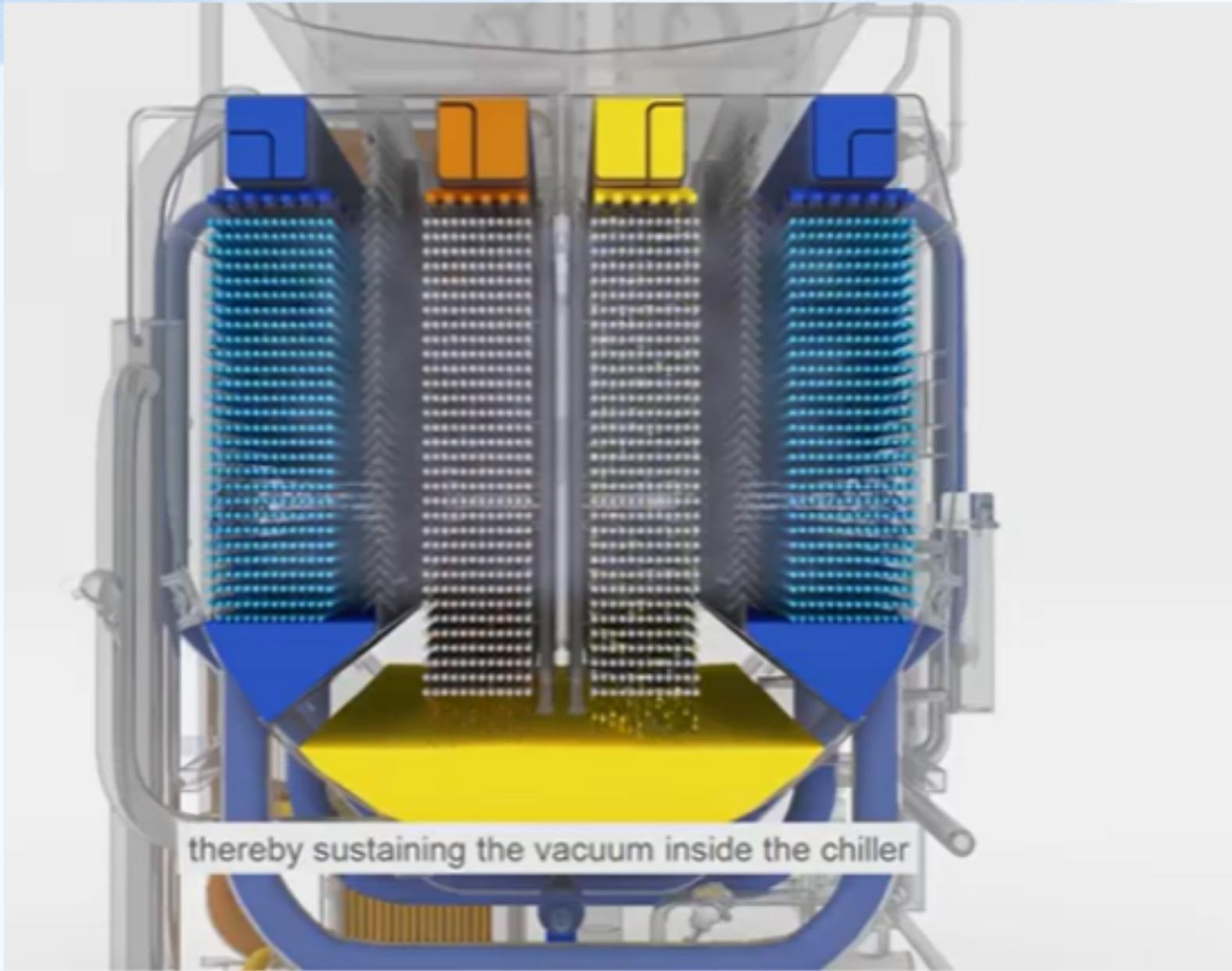
Chilled water from the process is circulated through the evaporator tubes of the absorption chiller.



Vacuum is maintained inside the chiller ensuring refrigerant evaporation at lower temperature



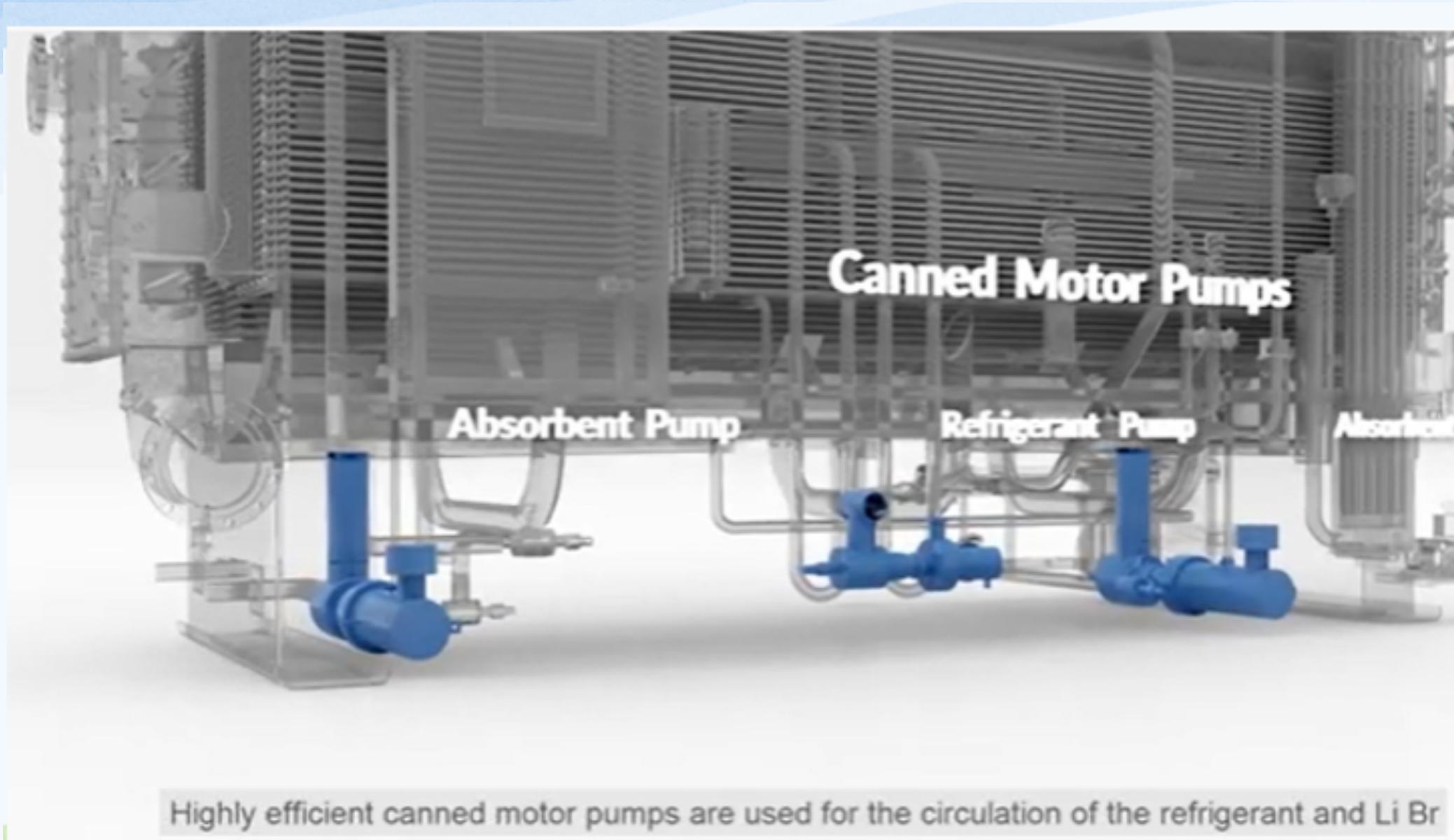
The refrigerant vapor gets absorbed by the concentrated Lithium Bromide solution sprayed in the absorber



thereby sustaining the vacuum inside the chiller



Heat of Dilution is rejected to the cooling tower water circulated inside the absorber tubes





Canned Motor Pumps

Absorbent Pump

Refrigerant Pump

Absorbent Pump

Which can operate maintenance free for over 60,000 hours



Applications & Uses

- **Manufacturing:** The manufacturing industry, especially plastics, use industrial grade process chillers to remove heat from processed materials. Without chillers, many forms of production would need to grind to a halt for air cooling.
- **Food and Beverage:** Federal law sets strict guidelines for any product intended for human consumption. Secure chillers provide even, reliable cooling systems for products and ingredients which need to be kept cold. Process chillers can flash-freeze tons of product at a time by surrounding products with sudden cold, without affecting moisture or ingredients.
- **Power Generation:** The modern world would not be possible without power plants generating electricity for towns and cities around the world. The power supply industry uses process chillers to reduce heat caused by power generation. Without chillers, power plants would not be able to supply the amount of power they do using the amount of space they have.
- **Medicine:** Medical equipment and supplies sometimes need low temperatures in order to function. MRI machines and other large medical equipment generate large amounts of heat while they scan patients, and process chillers help to keep these machines from overloading. Liquid chillers are also used for storing medical supplies at low temperatures.





MERCI

DES QUESTIONS?

UNION DES ASSOCIATIONS DES ACTEURS AFRICAINS DE RÉFRIGÉRATION & CLIMATISATION

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LE FROID : LA CLÉ DU DÉVELOPPEMENT DURABLE