

ECOLAIRE Advanced Direct Contact Condenser

Overview

Godrej & Boyce's Advanced Direct Contact Condenser (ADCC) is a licensed technology designed for geothermal power that condenses steam directly from geothermal wells or steam flashed from hot brine.

The ADCC uses a turbulent film to condense the steam. The higher thermal efficiency of the ADCC enables many benefits for a geothermal power system.

Primary Benefits

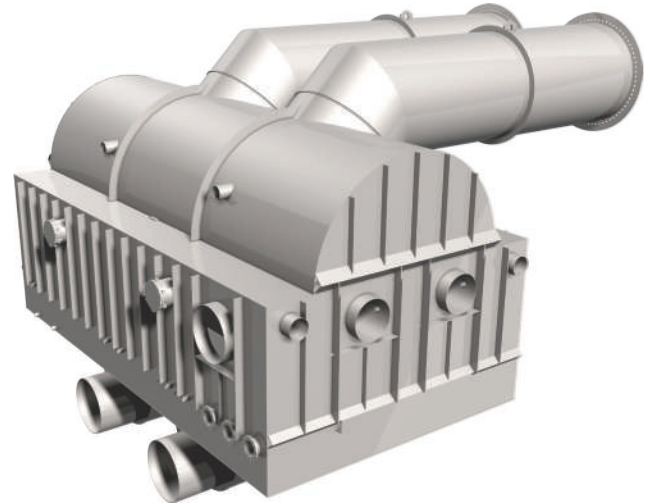
- Can be designed for lower condenser pressure and/or less cooling water flow helping reduce the size of other major components.
- Reduced parasitic power consumption and/or motive steam flow for the gas removal system resulting in net power generation gain.
- Reduced unit height, leading to smaller building heights, potentially aiding with tight spacing requirements.
- Low susceptibility to fouling and corrosion.

Added Benefits

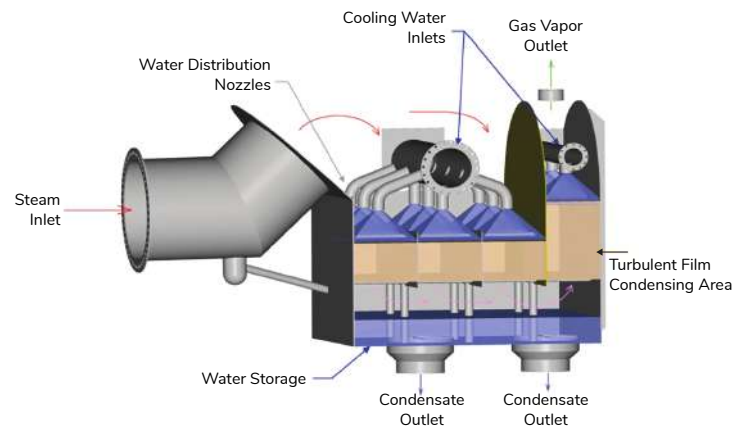
- Low liquid side inlet pressure.
- Low vapor side pressure drop.
- Minimal degradation of heat transfer by noncondensibles.
- Prediction of absorption of noncondensibles.

Savings from ADCC Features

- Lower cooling water usage minimizing cooling water circuit first costs and power consumption or:
- Lower condenser pressure increasing power generation.
- Lower exiting vapor temperature and lower vapor side pressure drop minimizing gas removal system first costs and steam consumption for ejectors and/ or electrical consumption for vacuum pumps – typically 8-15% parasitic power savings.



Advanced Direct Contact Condenser - ADCC



ADCC Cross Section



Internal Distribution Water Nozzles and Packing Arrangement

more 

Outperform the competition

Relative Performance Overview

	ADCC	Spray	Tray
Cooling Water Inlet Pressure	3-4 psi above condenser pressure	7-10 psi above condenser pressure	2-3 psi above condenser pressure
Gas Vapor Approach Temperature	≈ 3°F maximum	≈ 5°F minimum	≈ 5°F minimum
Pressure Drop Through Condenser	0.1" Hg maximum	0.3-0.5" Hg	0.4-0.6" Hg

- The lower ADCC cooling water inlet pressure offers greater flexibility in selecting the cooling tower elevations.
- The lower ADCC gas vapor approach temperature equates to less water vapor with the noncondensibles and lower gas removal system parasitic power and motive steam usage.
- The lower ADCC pressure drop through the condenser yields a higher suction pressure for the gas removal system, utilizing less parasitic power and motive steam. This means more money for your customer long term.

Increase Plant Savings

Reduce or Eliminate

- Separate foundations for inter and after condensers.
- Support structures for inter and after condensers.
- Support structures for ejectors.
- Interconnecting gas vapor piping and valves between main condenser, ejectors, and inter and after condensers.
- Cooling water piping - drain piping - steam piping.



Germencik - 45MW - Germencik, Turkey. The largest geothermal power plant in Turkey comprises eight wells with drilling depths between 1,000 and 2,400 meters.



San Jacinto Tizate 1 & 2 - 38MW - San Jacinto, Nicaragua. Tizate is one of the highest-quality geothermal reservoirs that have been developed.