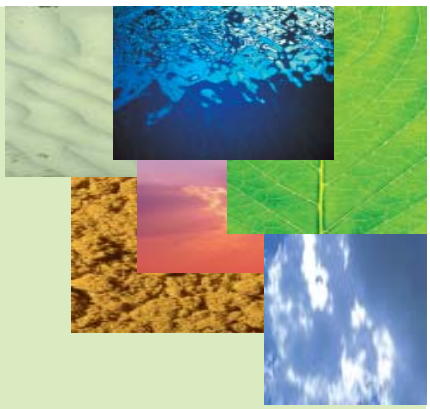
DONALDSON EUROPE
Gas Turbine Systems



EVAPORATIVE COOLER FOR GAS TURBINE COMBUSTION AIR COOLING

The Donaldson Evaporative Cooler enables this GE Frame 7FA Gas Turbine near Lubbock, Texas, USA, to yield maximum output especially during the hot dry summer months.

The Donaldson Evaporative Cooler is positioned downstream the gasturbine combustion air filtration unit.
In combination with the Donaldson filtration units, this modular design produces optimal cooled air, based upon the water evaporation method.

Donaldson's Evaporative Cooler is designed to achieve minimum field welding, sensitive water level controls, and non-corrodible major components to prevent rust.
This design provides easy access to key components for the convenience of maintenance personnel.

Cooler Air Improves Turbine Performance
Cooling the combustion air ingested by the turbine — even by a few degrees – can increase power output substantially. This because cooled air is denser and therefore gives the turbine a higher mass-flow rate and pressure ratio, resulting in increased turbine output and efficiency – as much as 0.5 % per degree Fahrenheit or about 1 % per degree Celsius. Another advantage in cogeneration are the higher exhaust mass flows, resulting in more steam generation for the steam turbine.

Donaldson evaporative coolers are currently cooling gas turbine engines in hot and warm, arid climates all over the world, from Southern California to Saudi Arabia.

Design ranges in size up to 45000 m³/min.

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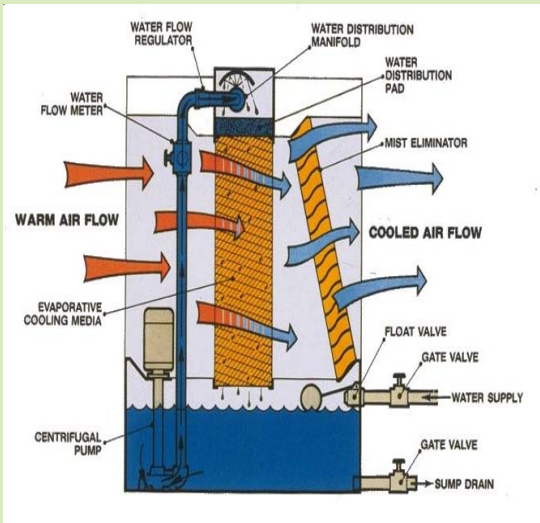
EVAPORATIVE COOLER

Improved Design
- Installation: The design is modular. This means faster, simpler and reliable installation
- The structural design yields leak-free operation for the life of the unit

How It Works
- When the cleaned air is directed from the air inlet filter system into the evaporative cooling media, it flows through wetted media, where it increases his moisture content by evaporation of water
- Cooled air then passes through the integral mist eliminator
- Clean, cooled air is then directed into the turbine inlet

Hazard Protection
- No water carryover
- Low air pressure drop of maximum 10 mmWG
- No loose fasteners downstream the final filtration stage
- Excellent corrosion protection: carbon steel structure protected by water-resistant paint coats



Even in moderate climates, the evaporative cooler increases power and reduces turbine power dips to justify its installation.
Example: a gas turbine with generator using a Donaldson evaporative cooler at a site having an ambient temperature of 100°F and a relative humidity of 30 % will deliver 20 to 21 megawatts, so an additional 3 megawatts to the 18 megawatts without an evaporative cooler are produced.
During the hottest part of the day, evaporative cooling can decrease inlet air temperatures up to 20° C.

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