NEXT

NEXT COOLING | IWC | ASCTI

# Mechanical Draft Cooling Towers

Global Presence, Local Expertise

www.nextcooling.com

# Mechanical Draft Cooling Towers

NEXT Cooling's solutions optimise energy and water usage while maintaining high cooling efficiency and minimising visual impact.

Our experienced team of engineers can design both wet and hybrid (wet/dry) cooling solutions as required by site conditions and specifications.

Our mechanical draft cooling towers effectively cool hot water in many industries, such as power generation, oil and gas, chemical processing, steel production, and food manufacturing.

We offer both mechanical and natural draft cooling solutions and can design for a wide range of project requirements, such as seismic, noise, corrosive conditions, low temperature operation (sub-zero), and seawater use.

These towers are classified as induced or forced draft, based on fan positioning, and as either counterflow or crossflow, based on the relative direction of air vs water flow.

## Bulk Air Cooling Towers & Spray Chambers

Bulk Air Coolers (BAC's) are critical infrastructure in deep-level mining environments, they are designed to mitigate extreme underground temperatures and ensure safe, productive working conditions. BAC's can either be surface-mounted or installed underground, with the primary function being to reduce the temperature of the air in underground mine workings.

BAC's are tailored to site-specific airflows and thermal load requirements. Underground BAC's are usually constructed within the mine workings and in stopes specifically for this purpose.

## Hybrid Cooling Towers (Wet/Dry)

Hybrid systems combine air-cooled and water-cooled technologies to effectively reduce visible plume emissions. By dynamically switching between evaporative or hybrid modes, our systems ensure environmental compliance and operational efficiency.



## Closed Circuit Evaporative Cooler

A closed-circuit evaporative cooler is an energy-efficient system that removes heat from process fluids without exposing them to outside air. It circulates the fluid through a sealed coil, while water cascades over the coil and a fan draws air through the unit. As the water evaporates, it absorbs heat from the fluid inside the coil, cooling it efficiently while keeping it clean and contamination-free.

**Key Benefits:**

- **Clean Loop**
  No direct contact between process fluid and air, which is ideal for sensitive or recirculated systems
- **Water-Efficient**
  Uses evaporation to maximize cooling with minimal water consumption
- **Low Maintenance**
  Reduces fouling, scaling, and chemical treatment needs
- **Versatile**
  Perfect for industrial processes, furnace cooling as well as HVAC, and data centre cooling applications.

## Evaporative Condenser

An evaporative condenser condenses refrigerant vapor by water evaporation. The refrigerant flows through a coil, while water is sprayed over the coil and a fan draws air through the unit. As the water evaporates, it removes heat from the coil, condensing the vapor inside into liquid form.

**Key Benefits:**

- **Energy-Efficient**
  Uses natural evaporation to reduce compressor load and lower energy costs
- **Compact Design**
  Combines heat exchange and cooling in a single unit, saving space
- **Clean Operation**
  Closed-loop refrigerant system minimizes contamination and leakage
- **Reliable Performance**
  Ideal for HVAC, industrial refrigeration, and process cooling

## Slurry & Solution Cooling Towers

NEXT Cooling's slurry and solution (including zinc electrolyte) cooling towers are purpose-built for demanding industrial applications that involve high-solids slurries and corrosive or abrasive solutions. These field-erected units feature a fill-less design that minimises fouling and corrosion while ensuring reliable thermal performance. Built to withstand highly corrosive fluids and suspended solids, these towers combine efficiency, durability, and chemical resistance. Typical construction includes fibreglass-reinforced plastic (FRP) or corrosion-resistant duplex stainless steel and aluminium-zinc plate materials, ensuring long-term structural integrity and safe operation under demanding process conditions.

These towers are ideally suited to the harsh operating environments of the minerals and metals processing industry.

# Cooling Tower Materials of Construction

Cooling towers can be constructed from FRP (Fibre Reinforced Polymer), concrete, steel or timber.

## FRP (Fibre Reinforced Polymer)

Our FRP Cooling Towers are built using pultruded profiles made from fiber-reinforced polymer, offering excellent corrosion resistance and structural strength.

Frame structures are spaced between 1.8 and 2.4 meters and delivered pre-cut and pre-drilled for efficient on-site assembly. The lightweight nature of FRP reduces foundation loads and simplifies handling.

NEXT Cooling's FRP cooling towers conform to CTI, EN, DIN and ASTM standards as required.

## Concrete

Concrete Cooling Towers are engineered for environments with harsh water conditions. These towers provide robust structural integrity and are ideal for areas with high wind loads or seismic activity. We can offer both cast in situ and pre-cast solutions.

## Timber

Timber Cooling Towers provide a traditional yet practical way to cool water in industrial applications. These towers, made of natural lumber, provide optimum thermal performance while also blending with their environment.

## Steel

We offer cooling towers with structures constructed of various grades of steel, including but not limited to the following:

- Hot-dip galvanised carbon steel
- Epoxy-coated carbon steel
- Stainless steel (316 or 304)

## Local Codes and Standards

NEXT Cooling's engineers design our cooling towers to comply with local wind and seismic codes and standards.



# Special Design Considerations

Recognising that each facility presents unique operational challenges, we provide bespoke cooling solutions tailored to specific site requirements.

NEXT Cooling prioritises ease of maintenance, with designs that enhance accessibility and streamline servicing activities.

## Noise Management

Effective noise control is critical in cooling tower installations, influencing both operational efficiency and regulatory compliance. Noise may originate from mechanical components, such as fans, or from water impact.

NEXT conducts comprehensive acoustic assessments early in the design phase to evaluate alternative mitigation strategies.

**Our solutions include:**

- **Impact Attenuation in the Water Basin**
  Floating surfaces are installed to dampen the sound of falling water in the basin.
- **Inlet and Outlet Silencers**
  These devices reduce noise from air intake and exhaust flows.
- **Low-Noise Fans**
  Specially designed blades minimise sound emissions while maintaining airflow efficiency.
- **Soundproof Enclosures**
  Soundproof boxes are used to contain and reduce motor-generated noise.

## Cold Climate Adaptations

For operations in sub-zero environments, we offer advanced solutions to prevent freezing and ensure uninterrupted performance:

- Bypass systems
- De-icing systems with warm water spray at air inlets
- Heat tracing
- Insulated and heated lubrication systems
- Use of cold-resistant materials

## Marine Environment Solutions

Seawater cooling applications demand materials that withstand high salinity and corrosion. NEXT designs and supplies systems using corrosion-resistant alloys and protective coatings, ensuring durability and reliability in marine conditions.

## Fire Protection

Our cooling towers are compliant with the NFPA 214 guidelines or local standards as needed. NFPA 214 standards are for fire protection for field-erected and factory-assembled water-cooling towers of combustible construction, or those in which the fill is of combustible material.

- Natural Draft Cooling Towers
- Air cooled Condensers
- Package Cooling Towers
- Aftermarket Services
- Heat Exchangers

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