

Clearsky®

PLUME ABATEMENT SYSTEM

MARLEY®



Nothing Could Be Clearer

Cooling tower systems have been around for decades; in fact, the Marley brand has been synonymous with leading cooling tower technology since 1922.

And while every Marley cooling system is designed for maximum performance, certain environmental conditions can lead to visible water vapor plumes — plumes that can affect visibility and safety as well as public perception, and potentially delay permits and jeopardize project timelines.

For many, finding a cooling solution that provides exceptional performance and value while minimizing plume development has been challenging.





A Break in the Clouds

ClearSky Plume Abatement System

Why is plume abatement important?

Aesthetics / Neighbor Relations – Even though the cooling tower plume is made up of water vapor, a community may perceive it as unwanted or smoke-related. This may affect the use of nearby land or decrease property values.

Safety – Community concerns regarding visibility can be removed by significantly reducing visible plume.

Retrofit – The ClearSky Plume Abatement System can be added to existing cooling towers in many cases, making plume abatement even more economical.

Permitting – Permitting can be a long and costly process. Eliminating the visible plume may enhance a smooth permitting process.

Water Conservation – Water is increasingly becoming a scarce and valuable commodity. Removing water from the vapor plume can help decrease water-related costs and help the environment.



Marley created the industry's first plume abatement tower.

Performance with Leading Edge Technologies

Marley ClearSky Plume Abatement System is a ground-breaking approach to the reduction of cooling plumes. Employing leading-edge technology, not only does ClearSky provide the proven performance you need — including design flexibility — but it can also lower installation and operating costs. In fact, ClearSky has simply the best value proposition in plume abatement — it can even be installed into existing cooling tower applications, negating the need for complete system replacement.

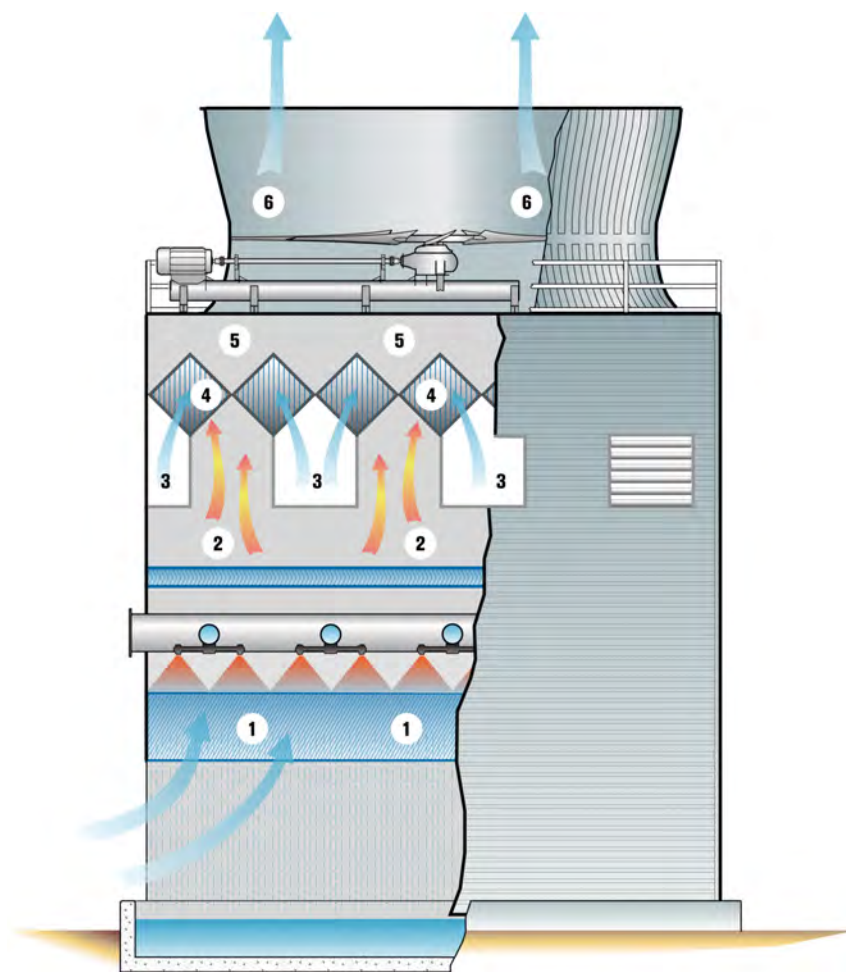
For applications that require high-performance cooling systems but can't afford the generation of visible plumes, ClearSky offers customers an effective solution without compromise.



Forget What You've Seen Before

The power behind the ClearSky system lies in its elegance and simplicity. Building on the highly successful and effective Marley coil plume solution system, ClearSky provides the latest, evolutionary solution with its unique patented design that is as effective as it is unconventional.





ClearSky Cooling Process

- 1** Ambient air passes through the warm, wet section
- 2** Warm, saturated air travels in between alternate pairs of plates
- 3** Ambient air passes into ducts
- 4** Ambient air travels in between alternate pairs of plates
- 5** Cooler, saturated air from the wet section side and warmer dryer air from ambient side mix together
- 6** Air leaving

Clear the air with your neighbors. Clear away your plume.





Now You See It Now You Don't

It's not enough to simply say something works — you need proof. That's why the ClearSky story begins with Marley, a leading name in cooling towers for more than 90 years. Marley has more than 80 plume abatement installations worldwide, and the story continues based on technology funded in part by the U.S. Department of Energy as well as hundreds of thousands of hours of real-world operation.

Empowered by that legacy and expertise, the ClearSky Plume Abatement System provides effective, economical operation.



COST SAVINGS

Lower Investment Costs

Lower Maintenance Costs

Lower Operation Costs



OTHER BENEFITS

Improved Permitting

Improved Safety

Design Flexibility



A large cooling tower fan cell, with ClearSky, can save over 1,000,000 gallons of water annually.

Multiple Needs, Singular Solution

The ClearSky system offers several unique benefits to EPCs, End Users and Regulators. That's because ClearSky was developed based on a variety of criteria, reflecting diverse needs, applications, and conditions, including the following:

- » Safety and visibility concerns
- » Regulation compliance
- » Sunlight impairment
- » Aesthetics
- » Community and neighbor relations
- » Water Conservation

As a result, ClearSky offers solutions for multiple audiences, in turn providing them with the key features and benefits they need to meet their own specific challenges.

Engineering, Procurement, Construction

For EPCs, ClearSky provides a clear choice over conventional systems when selecting plume abatement, including greater back-to-back design flexibility as well as more economical investment, operating, and maintenance costs versus conventional systems.

- » **Lower Installation Cost** – Less piping means less investment than conventional systems
- » **Greater Design Flexibility** – Back-to-back design allows for easy installation, including retrofits
- » **Reduced Maintenance Costs** – Unique patented design and materials means less need for maintenance
- » **Reduced Auxiliary Power Usage** – Driven by reduced pump head, ClearSky towers can effectively reduce auxiliary power usage when compared to coil type hybrid towers



End Users/Operators

When plume abatement is necessary, ClearSky allows cooling tower operators to reduce plume production, minimizing operating costs without compromising cooling performance versus more expensive dry solutions.

- » **Reduced Maintenance** – No coil replacement or fin cleaning, plus reduced operator monitoring and training
- » **Improved Permitting** – Smoother process with reduced likelihood of interruptions due to public comment
- » **Lower Cost Versus Dry** – The high-performance operation you need with fewer costs
- » **Reduced Auxiliary Power Usage** – Driven by reduced pump head, ClearSky towers can effectively reduce auxiliary power usage when compared to coil type hybrid towers

Regulators

By minimizing visibility and safety issues, ClearSky provides cooling tower operators with an effective and reasonable solution for compliance with plume regulations.

- » **Environmental Agency Regulations** – Utilizes less energy, and has lower carbon footprint, than dry systems
- » **Local Municipal Codes** – Improved safety for surrounding transportation and improved neighbor relations
- » **Improved Permitting** – Smoother process with reduced likelihood of interruptions due to public comment



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