Alfa Laval Niagara Wet Surface Air Coolers (WSAC)

Efficient closed-loop, evaporative cooling systems

Introduction

Alfa Laval Niagara Wet Surface Air Coolers (WSAC®) are the most efficient and durable closed-loop, evaporative cooling systems available. These fluid cooling and vapor condensing systems are tailored to customer specifications for inlet and outlet temperature, as well as worst case ambient conditions.

WSAC systems provide optimal performance and are configured as packaged, modular, field erected, wet/dry or elevated pipe rack mounted designs depending on specifications and performance requirements.

Applications

Alfa Laval Niagara WSAC systems are optimized for industrial applications where rugged designs, and cost-effective, efficient closed-loop cooling and condensing duties are required. The WSAC has the ability to cool or condense a broad range of fluids more effectively than traditional air-cooled systems.

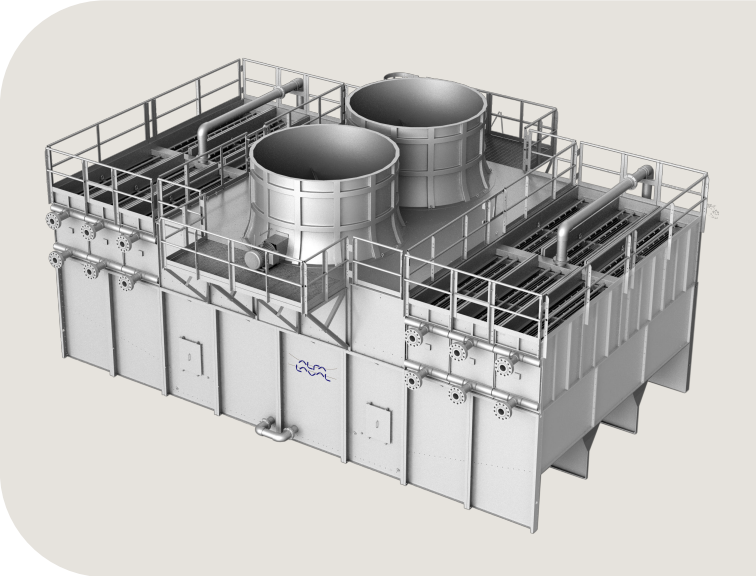
Niagara WSAC systems are used in power, process, refinery, wastewater, natural gas and petrochemical industries and are designed to meet customer's rigorous industry specifications.

Benefits

- Produces coldest possible process outlet temperature through single approach to ambient wet bulb temp.
- Low quality water can be used as makeup. When utilizing existing blowdown or wastewater streams, no additional fresh water is required.
- Increased water conservation due to higher concentration cycles with minimal makeup and blowdown.
- No plastic fill means minimum fouling and ensures 100% prime surface for reliable operation.
- Remote basin (surface mounted tank or underground sump) for spray water collection and storage allows for lighter weight installation on elevated structures.
- Long service life and minimal maintenance required in rugged industrial settings due to durable materials and simple design.

Working principle

The closed-loop design ensures that the process liquid or vapor flows through the inside of the heat exchanger tubes, with the cooling air and the spray water flow in the same direction on the outside of the tubes.



Air is induced downward over the tubes. Water flows downward along with the air. Heat from the process stream is released to the cascading water. Vaporization transfers heat from the cascading water to the air stream. The air stream is then forced to turn 180° providing maximum free water removal. Fans discharge air vertically at a high velocity to minimize recirculation.

Unique features

WetSurface
Maximum cooling efficiency and lowest possible outlet temperature.

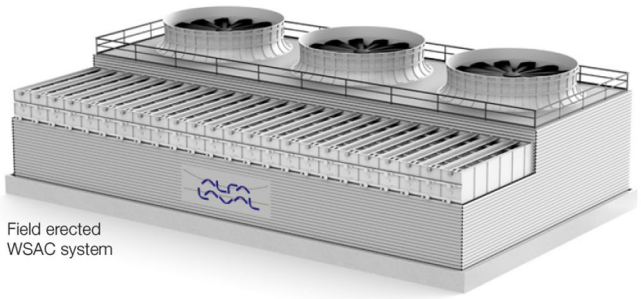
FlexWater
A WSAC can operate on recycled water of low quality such as blowdown water.

HybridCool
Combined wet and dry bulb cooling for minimized water consumption.

Learn more at **www.alfalaval.com/wsac**

Packaged
WSAC system

Modular
WSAC system



Field erected
WSAC system

Designs

Alfa Laval Niagara WSAC systems are engineered-to-order to provide optimal performance for each unique application. The WSAC configuration could be a packaged, modular, field erected, wet/dry or elevated pipe rack mounted design, depending on many factors, specifications and performance requirements. All WSAC are designed for long service life of 20+ years.

Packaged WSAC systems

- Skidded, pre-piped and pre-wired for plug and play installation
- Full redundancy of fans and pumps
- Includes control cabinet and water treatment
- Drain pan arrangement lowers operating weight
- Full factory testing
- Freeze protection for cold weather installs

Modular WSAC systems

- Shop fabricated modular design with final assembly on-site
- Direct or gear drive fan system
- Access package available
- Drain pan arrangement lowers operating weight
- Full factory testing

Field erected WSAC systems

- Poured in place reinforced concrete basin
- Pultruded FRP structure
- Interchangeable modules
- Reduced footprint for large systems
- Lowest optimized installed cost
- Economized layout

Technical data

Tube bundle options	
Tube bundles	Straight through/cleanable
	Serpentine
Code designs	ASME, PED
Material options	C.S., S.S., Exotics
Structure options	
Metal	Heavy duty 10-12 gauge carbon steel, H.D.G.A.F., stainless steel optional
Concrete	Poured in place reinforced concrete
FRP	Fiberglass reinforced plastic
Fan system options	
Fans	Direct drive 5 ft (1.524 m) diameter and smaller
	Gear drive 6 ft (1.8288 m) diameter and larger
Motors	Totally enclosed fan cooled (TEFC)
Spray system	
Design	Low pressure/high flow design for drenching coverage
Coverage	8-10 GPM/ft^2 spray water coverage
Nozzles	Quarter turn, quick disconnect for easy install/ clean out
Pumps	Centrifugal end suction
	Vertical turbine
Ancillary components	
Electrical options	Complete in-house electrical design
	Custom control panels
	PLC/HMI programming
Skids	Pump skids with available redundancy
	Water treatment skids
	Complete pre-wired systems with controls
Access packages	Ladders, walkways, platforms

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How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com