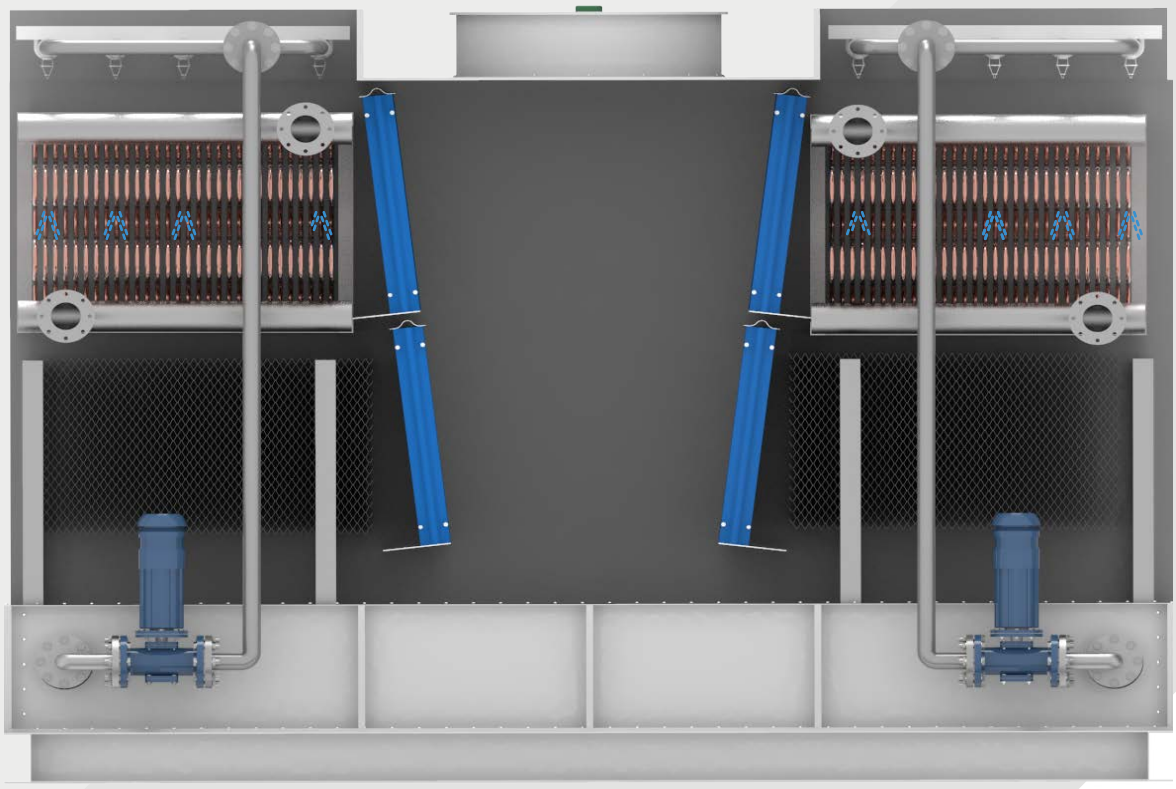
Feiyu Cooling

CLOSED CIRCUIT COOLING TOWERS



info@pvccoolingfill.com
www.flycoolingtower.com

Closed Circuit Cooling Towers

Closed circuit cooling tower, also known as closed circuit cooler, closed cooling tower or closed loop cooling tower, is a cooling device that is designed to remove the heat of the process fluid, thereby cooling the process fluid. With coil exchangers placed in the tower, the whole cooling process is achieved through heat transfer among the air, spray water & circulating water via coil exchanger inside.

Closed circuit cooling tower is an upgrade and replacement of open circuit cooling towers. The process fluid circulates in the coil, thereby eliminating the efficiency reduction and system failures caused by floaters, dirt and other matters entering the cooling water system. As a result, it is generally used for cooling projects that require high cleanness of process fluid.

According to water flow direction and air intake direction, closed circuit cooling tower can be divided into counter flow cooling tower, cross flow cooling tower and mixed cooling tower.

In the counter flow closed circuit cooling tower, the air is introduced at the bottom of the tower and flows from bottom to top, in the opposite direction of spray water, therefore, it is named as counter flow closed circuit cooling tower.
In the cross flow closed circuit cooling tower, the air is introduced from the side of the tower and flows horizontally, making a right angle to the direction of spray water, therefore, it is named as cross flow closed circuit cooling tower.

Mixed flow closed circuit cooler has two air inlet directions. In one direction, the air enters from the top of the cooling tower and flows from top to bottom, in the same direction as the spray water. In the other direction, the air enters from one side of the tower at the bottom and flows from bottom to top, in the opposite direction of spray water, therefore, it is called as mixed flow closed circuit cooling tower.

- ✔ All-round corrosion protection
  - Tower body is made of stainless steel 304 or DX51D+AZ120 aluminized zinc plate.
  - Coil is constructed of stainless steel or copper pipes.
  - Framework and lifting lugs are made of hot galvanized plate.
  - Bolts and fasteners are made of stainless steel materials.

- ✔ Stable tower structure
  - Reasonable reinforced framework design
  - The joints of the tower body are fastened with bolts and bolts are reasonably and densely arranged.

- ✔ Great cooling effect
  - Advanced system design
  - Efficient fan
  - High quality coil, packing and heat transfer

- ✔ 100% cooling capacity assurance
  - We have professional thermal performance test platform.
  - All series of products have passed normative tests.

- ✔ Various design types for your option
  - Counter flow cooling tower
  - Cross flow cooling tower
  - Mixed flow cooling tower

- ✔ Easy maintenance, repair & cleaning
  - Cross flow & mixed flow cooling towers are equipped with large access doors and channels.
  - Efficient water tank can avoid channel blockage and reduce cleaning frequency.

Closed Circuit Cooling Towers

Counter Flow

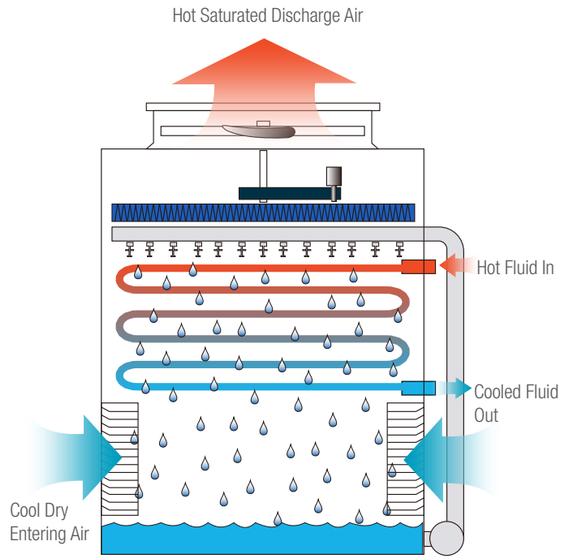
Counter flow cooling tower is a cooling device that is designed to remove the heat of the process fluid, thereby cooling the process fluid. With coil exchangers placed in the tower, the whole cooling process is achieved through heat change among the air, spray water & circulating water via coil exchanger inside.

In the counter flow closed circuit cooling tower, the air is introduced at the bottom of the tower and flows from bottom to top, in the opposite direction of spray water, therefore, it is named as counter flow cooling tower. It is widely used in industrial refrigeration, commercial air conditioning, process processing, district cooling, power industry, etc.

Fan is a mechanical device that is used to increase the air pressure in the cooling tower and discharge the air out. There are two types of fans for counter flow closed circuit cooling tower. One is forced draft fan and the other is induced-draft axial fan. Closed circuit cooling tower with a low height generally adopts a forced shaft fan and is suitable for indoor installation and air duct installation. It is your ideal choice for precise replacement projects.

Counter Flow
Closed Circuit Cooling Tower

- The process fluid circulates in the coil, thereby eliminating the efficiency reduction and system failures caused by floaters, dirt and other matters entering the cooling water system.
- Compact structure, small floor area, super small model is available.
- The coil has a large heat transfer area, realizing high efficiency and water saving.
- No packing design, suitable for high temperature fluid cooling and antifreeze in winter.
- Reliable, easy operation, low maintenance cost and low annual operating costs.
- Wide range of heat rejection
  · Heat rejection capacity of cooling towers with a forced shaft fan: 170–4119 MBH
  · Heat rejection capacity of cooling towers with an induced-draft axial fan: 91–37765 MBH.
- Customized solutions, tailored for your projects, bringing you more reasonable suggestions and assurance.



How Does It Work?

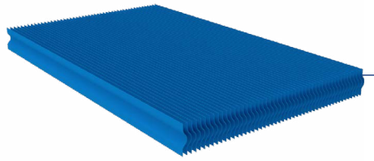
Hot process fluid enters the coil (or tube bundle) from the water intake, and the spray system and fan system are started at the same time. The heat of process fluid undertakes heat transfer via tube walls and is transferred to the spray water running through the outer surface of the tube. The process water becomes cool and then flows out from the water outlet for internal circuit. Driven by the fan, the air outside the unit enters from the air intake, in the opposite direction of water flow, and moves upward through the coil. A small amount of water evaporates and flows through the drift eliminator, collecting the excess moisture into the water tank. Meanwhile, the hot and humid air is dispatched into the atmosphere from the top of the tower. The rest of the water falls into the water tank at the bottom, recycles to the spray system via the water pump, and then returns to the tube bundle.

Structure & Components

Axial fan

Tower body plate

Stainless steel 304 or DX51D+AZ120 aluminized zinc plate tower body. It provides excellent corrosion resistance in harsh environments.

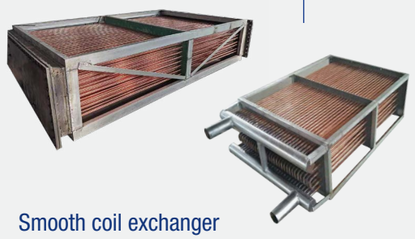


Drift eliminator

Made of selected high quality PVC material, the drift rate is limited to 0.001% lower than the circulating water rate, reducing water loss during wet operation.

Spray system

Nozzles are designed to be clog-free while providing uniform, constant water distribution, thereby offering the industry's best-performing non-corrosive, maintenance-free water distribution system.



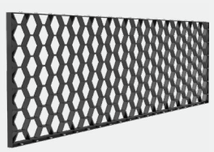
Smooth coil exchanger

Copper or stainless steel coil or tubular bundle, pipe diameter: 16, 19, 22 and 25 mm

Spray pump

Spray water return pipe

Water tank



Air inlet louver

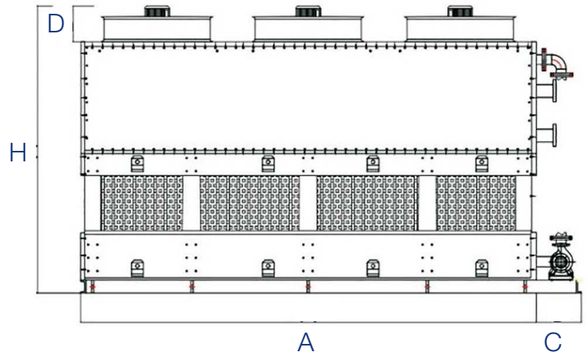
It can be made of the same material as the tower body or made into PVC louver.

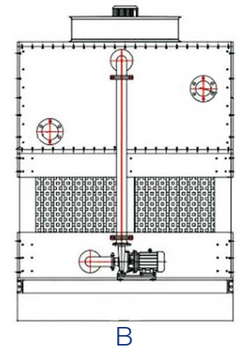
1. PVC honeycomb air inlet louvers improve the flow of the air into the cooling tower.
 - No fasteners required, easy to disassemble.
 - Prevent debris from entering and water from splashing.
 - This design prevents direct sunlight and algae breeding.
 - Reduce the tower noise and improve the tower appearance.
2. Air inlet louvers made of stainless steel or galvanized steel plate provide excellent corrosion protection.

Performance Technical Data

Model	Normal Heat Rejection	Axial Fan			Spray Water Pump		Weight	
	kcal/h	Amount Unit	Blowing Rat (m^3/h)	Power (kW)	Flow Rate (m^3/h)	Power (kW)	Net Weight (kg)	Operating (kg)
FYBN-6	30135	1	10000	0.55 × 1	12.5	0.75	287	730
FYBN-10	50000	1	11800	0.75 × 1	12.5	0.75	402	950
FYBN-15	74900	1	13000	1.1 × 1	12.5	0.75	465	1200
FYBN-20	100000	2	20000	0.55 × 2	22	0.75	490	1300
FYBN-30	150000	2	23600	0.75 × 2	25	0.75	650	1800
FYBN-40	200000	2	25000	1.1 × 2	25	0.75	750	1950
FYBN-50	254000	2	28000	1.1 × 2	25	0.75	980	2200
FYBN-60	300000	2	33000	1.1 × 2	25	0.75	1050	2400
FYBN-70	350000	2	40000	1.5 × 2	44.5	1.5	1280	3050
FYBN-80	40000o	2	52000	2.2 × 2	44.5	1.5	1450	3600
FYBN-100	500000	2	52000	2.2 × 2	44.5	1.5	1870	4100
FYBN-125	625000	2	76000	3.0 × 2	87	3	2450	5200
FYBN-150	750000	2	88000	3.0 × 2	87	3	2850	6050
FYBN-175	875600	2	110000	3.0 × 2	100	4	3150	6700
FYBN-200	1000000	2	125000	3.0 × 2	140	5.5	3600	7680
FYBN-250	1251000	2	160000	4.0 × 2	140	5.5	5400	12300
FYBN-300	1501500	2	200000	5.5 × 2	176	7.5	7900	16700
FYBN-350	1751000	2	230000	7.5 × 2	176	7.5	8700	18500
FYBN-400	2001800	2	280000	7.5 × 2	200	4.0 × 2	10900	22900
FYBN-450	2250000	2	360000	11 × 2	200	4.0 × 2	12300	26600
FYBN-500	2500000	2	420000	15 × 2	280	5.5 × 2	13600	28800
FYBN-550	2750000	3	480000	11 × 3	280	5.5 × 2	15600	33200
FYBN-600	3000000	3	570000	11 × 3	352	7.5 × 2	17500	37250

External Dimension Specifications



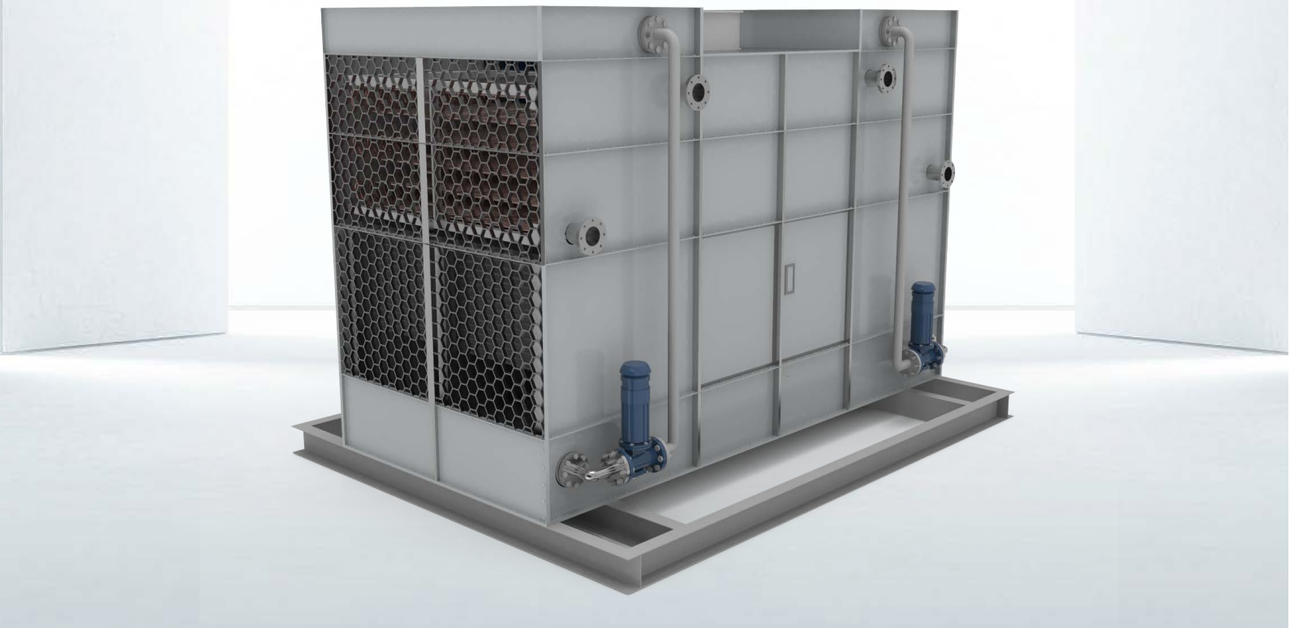


Model	External Dimensions					Intake	Outlet	Make-Up Water Inlet	Drain	Over Flow
	A (mm)	B (mm)	C (mm)	D (mm)	H (mm)					
FYBN-6	1350	1000	300	300	2000	DN40	DN40	DN16	DN32	DN32
FYBN-10	1500	1000	300	300	2000	DN40	DN40	DN16	DN32	DN32
FYBN-15	2350	1000	300	320	2100	DN50	DN50	DN16	DN32	DN32
FYBN-20	2350	1000	300	300	2200	DN50	DN50	DN20	DN32	DN32
FYBN-30	2850	1220	350	300	2400	DN65	DN65	DN20	DN40	DN40
FYBN-40	2850	1220	350	320	2500	DN65	DN65	DN20	DN40	DN40
FYBN-50	2850	1220	350	320	2600	DN80	DN80	DN20	DN40	DN40
FYBN-60	2850	1220	350	320	2600	DN80	DN80	DN20	DN40	DN40
FYBN-70	2850	1500	400	320	2750	DN80	DN80	DN20	DN40	DN40
FYBN-80	2850	1700	400	360	2800	DN100	DN100	DN25	DN40	DN40
FYBN-100	2850	1700	400	360	2900	DN100	DN100	DN25	DN40	DN40
FYBN-125	3150	1800	450	490	3100	DN125	DN125	DN25	DN40	DN40
FYBN-150	3350	1900	500	420	3300	DN150	DN150	DN25	DN50	DN50
FYBN-175	4000	1900	500	420	3400	DN150	DN150	DN25	DN50	DN50
FYBN-200	4350	2000	500	600	3600	DN200	DN200	DN32	DN50	DN50
FYBN-250	4800	2200	500	650	3800	DN150 × 2	DN150 × 2	DN32	DN50	DN50
FYBN-300	6500	2500	500	700	4000	DN150 × 2	DN150 × 2	DN32	DN65	DN65
FYBN-350	7500	2700	550	750	4200	DN150 × 2	DN150 × 2	DN40	DN65	DN65
FYBN-400	8000	2700	600	750	4400	DN200 × 2	DN200 × 2	DN40	DN65	DN65
FYBN-450	8000	3000	600	750	4400	DN200 × 2	DN200 × 2	DN40	DN65	DN65
FYBN-500	9000	3000	600	800	4600	DN200 × 2	DN200 × 2	DN40	DN80	DN80
FYBN-550	9000	3300	600	800	4600	DN200 × 2	DN200 × 2	DN40	DN80	DN80
FYBN-600	9000	3500	600	850	4750	DN250 × 2	DN250 × 2	DN40	DN80	DN80

Closed Circuit Cooling Towers

Cross Flow

Cross flow cooling tower is a cooling device that is designed to remove the heat of the process fluid, thereby cooling the process fluid. With tubular exchangers placed in the tower and combed with the packing as the heat exchanger, the whole cooling process is achieved through heat change among cross flow air, spray water & circulating water via tubular exchanger inside.



The Difference Between and Counter Flow Cooling Tower:

They have different air inlet directions. In the cross flow cooler, the air is introduced from the side of the tower and flows horizontally, making a right angle to the direction of spray water. However, in the counter flow cooler, the air is introduced at the bottom of the tower and flows from bottom to top, in the opposite direction of spray water.

Cross flow cooling tower is equipped with access doors and channels in the middle of the tower, while the counter flow cooling tower does not.

In the counter flow cooling tower, coil or tubular bundle serves as heat transfer, however, in the cross flow cooling tower, a combination of coil and packing or a combination of tube bundle and packing serves as heat transfer.

The Difference Between and Mixed Flow Cooling Tower:

They have different air inlet directions. In the cross flow cooler, the air inlet direction and spray water flow direction make a right angle. However, mixed flow closed circuit cooler has two air inlet directions. In one direction, the air enters from the top of the cooling tower. In the other direction, the air enters from one side of the tower at the bottom.

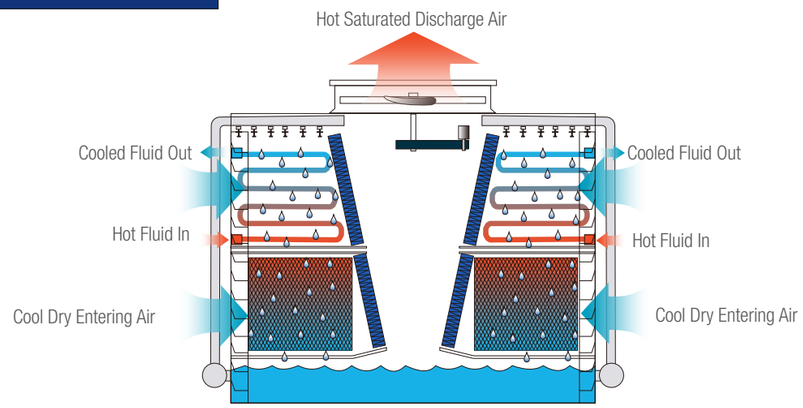
The Similarity Between Mixed Flow Cooling Tower:

Both cooling towers are equipped with access doors in the middle to create convenient access conditions. They are specifically developed for high capacity applications, such as data centers, factories, and large HVAC systems.

Cross Flow Closed Circuit Cooling Tower

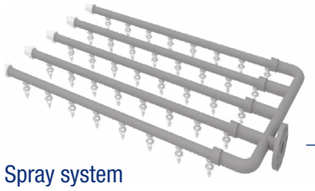
- Softened cooling water circulates in the closed circuit, thereby eliminating the efficiency reduction and system failures caused by floaters, dirt and other matters entering the cooling water system.
- The optimized layout of the new heat transfer and high-performance packing makes the maintenance and cleaning of the heat transfer coil & packing easier and more convenient.
- New fan blades are employed to further improve its exhaust capacity and reduce the running noise.
- Spray pipes are installed inside the cooling tower. It not only saves the external piping, but also makes the tower body more beautiful and lowers the on-site piping costs.
- Equipped with access channels to facilitate tower maintenance and repair.

How Does It Work?



Hot process fluid enters the tube bundle from the inlet, and the spray system and fan system are started at the same time. The spray water flows downward. The heat of process fluid is transferred to the circulating spray water running through the outer surface of the tube bundle in a way of tube wall heat transfer. The process fluid becomes cool and then flows out from the outlet. A large amount of the air enters from the air intake louver and flows through the unit at right angles to the spray water. A small amount of water evaporates, and flows through the drift eliminator, collecting the excess moisture into the water tank. The rest of the water is dispatched into the atmosphere from the top of the unit in the form of hot saturated steam. Most of the heat is absorbed by the spray water. The hot spray water flows downward through the packing and becomes cool via heat transfer with the packing. And then it falls into the water tank at the bottom, recycles to the spray system via the water pump, and then returns to the tube bundle.

Structure & Components



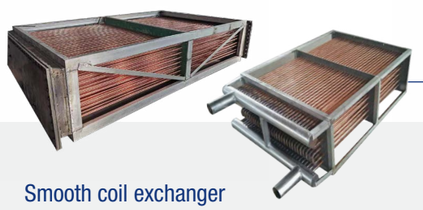
Spray system

Nozzles are designed to be clog-free while providing uniform, constant water distribution, thereby offering the industry's best-performing non-corrosive, maintenance-free water distribution system.

Ultra-low noise fan

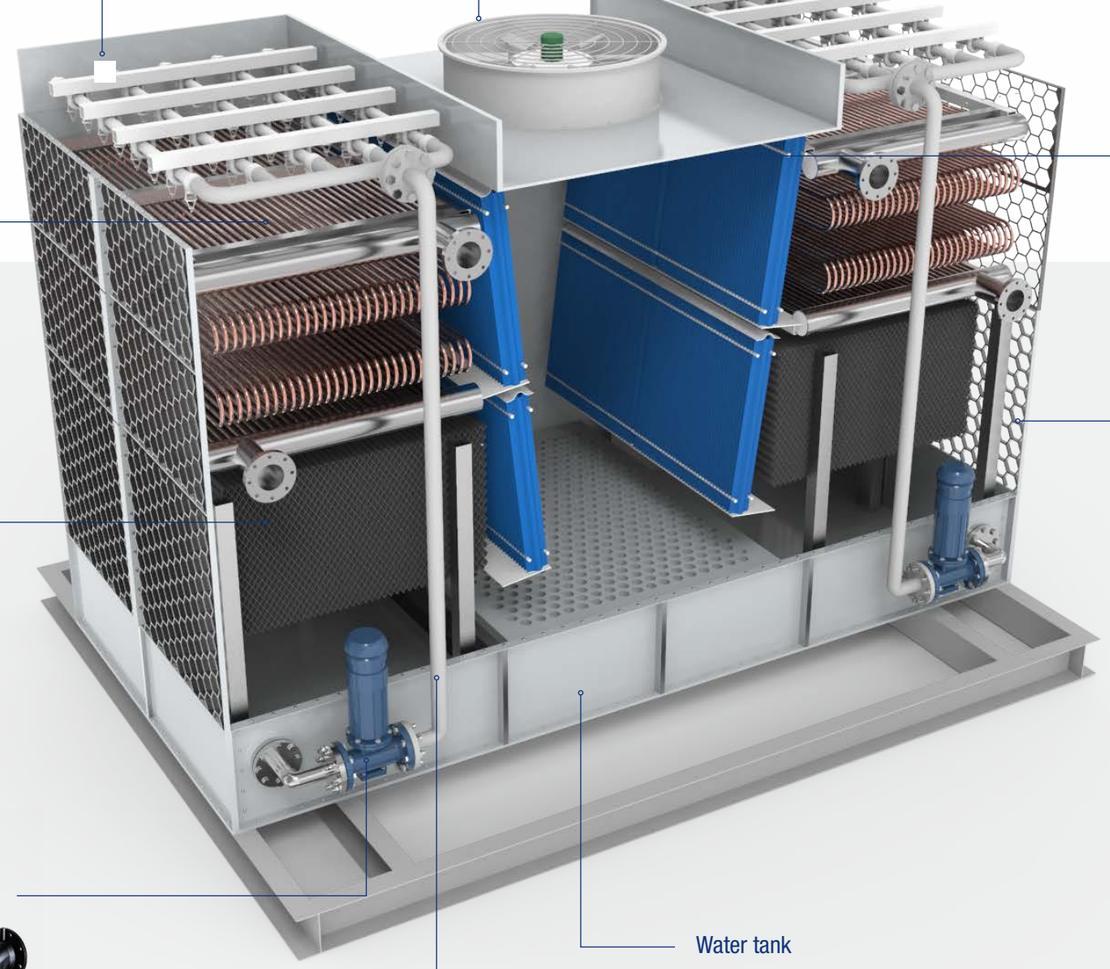
Tower body plate

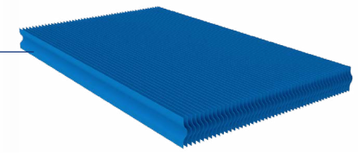
Stainless steel 304 or DX51D+AZ120 aluminized zinc plate tower body. It provides excellent corrosion resistance in harsh environments.



Smooth coil exchanger

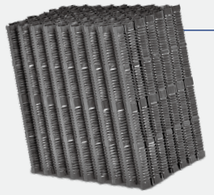
Copper or stainless steel coil or tubular bundle, pipe diameter: 16, 19, 22 and 25 mm





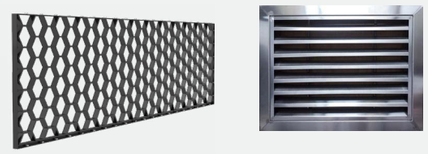
Drift eliminator

Made of selected high quality PVC material, the drift rate is limited to 0.001% lower than the circulating water rate, reducing water loss during wet operation.



PVC packing

- It allows the air and water to be fully mixed for efficient heat transfer.
- Special inclined tank design can withstand high water load without causing excessive pressure drop.
- Operating temperature up to 65 °C.



Air inlet louver

It can be made of the same material as the tower body or made into PVC louver.

1. PVC honeycomb air inlet louvers improve the flow of the air into the cooling tower.
   - No fasteners required, easy to disassemble.
   - Prevent debris from entering and water from splashing.
   - This design prevents direct sunlight and algae breeding.
   - Reduce the tower noise and improve the tower appearance.
2. Air inlet louvers made of stainless steel or galvanized steel plate provide excellent corrosion protection.

Spray pump

Spray water return pipe

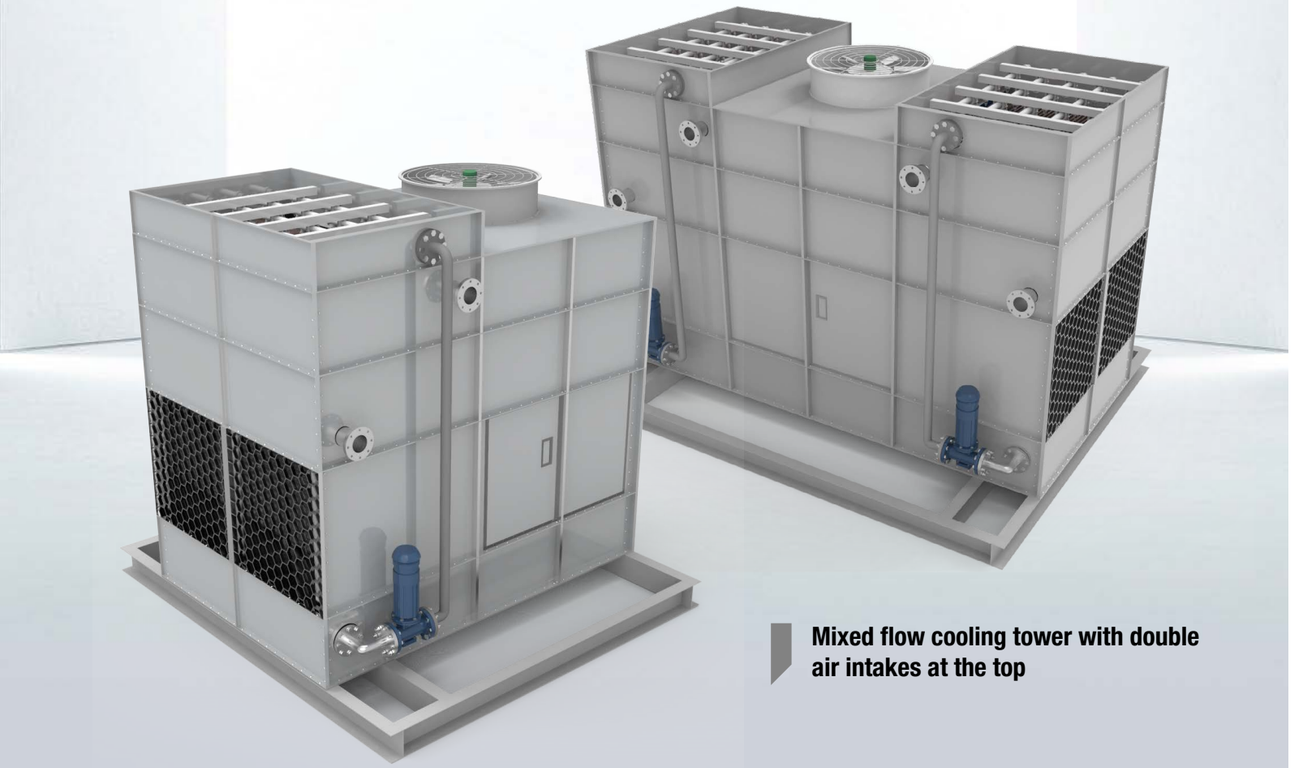
Water tank

Closed Circuit Cooling Towers

Mixed Flow

Mixed flow cooling tower is a cooling device that is designed to remove the heat of the process fluid, thereby cooling the process fluid. With a combination of packing module and tube bundle module serving as the heat transfer, the whole cooling process is achieved through heat transfer among the air, spray water & circulating water in the tube bundle.

Mixed flow cooling tower has two air inlet directions. In one direction, the air enters from the top of the cooling tower and flows from top to bottom, in the same direction as the spray water. In the other direction, the air enters from one side of the tower at the bottom and flows horizontally, making a right angle to the direction of spray water. Of which, air inlet at the top of the unit is divided into single air inlet and double air intakes.



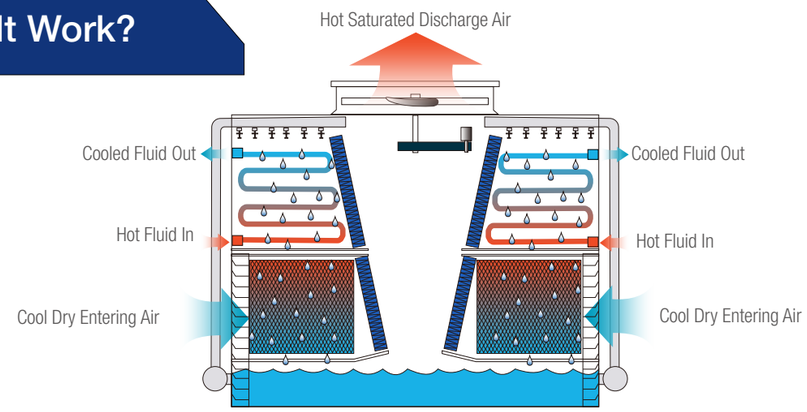
Mixed flow cooling tower with double air intakes at the top

Mixed flow cooling tower with single air intake

Mixed Flow
Closed Circuit Cooling Tower

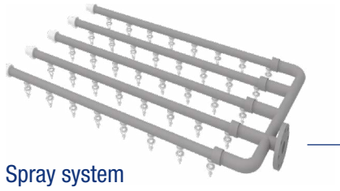
- Fully optimized structure design, double air inlets can effectively prevent the surface of the tube bundle from fouling
- Softened cooling water circulates in the closed circuit, thereby eliminating the efficiency reduction and system failures caused by floaters, dirt and other matters entering the cooling water system.
- High fan cylinder exhaust system ensures ventilation, fast heat dissipation and great cooling effect.
- It allows both fan frequency conversion operation and fan stop operation, thereby achieving high efficiency and energy saving.
- The packing and coil combination design greatly improves the spray & heat transfer efficiency.
- Top air inlet system is available in both single and double air lets. Of which, packing and tube bundle in the cooling tower with double air inlets are bilaterally arranged and the fan cylinder are maximized. In this way, a large air ventilation space is created to achieve better cooling effect.
- Large access space, access door and channel are available for easy maintenance.

How Does It Work?



Hot process fluid enters the tube bundle from the inlet, and the spray system and fan system are started at the same time. Spray water is evenly sprayed on the surface of the tube bundle and a large amount of the air enters from the air inlet louver at the top of the tower and flows downward, in the same direction as the spray water. The air is in direct contact with the spray water and undertakes heat transfer with the hot process fluid in the tube bundle via the outer surface of the tube bundle. The process fluid cools and flows out from the outlet of the tube bundle for recycling. A small amount of water evaporates, and flows through the drift eliminator, collecting the excess moisture into the water tank. Meanwhile, the hot and humid air is dispatched into the atmosphere from the top of the tower. The hot spray water continues to spray on the packing and becomes cool through the heat transfer between cold air from the side of the tower at the bottom and the packing. And then it falls into the water tank and recycles to the spray system via the water pump.

Structure & Components



Spray system

Nozzles are designed to be clog-free while providing uniform, constant water distribution, thereby offering the industry's best-performing non-corrosive, maintenance-free water distribution system.

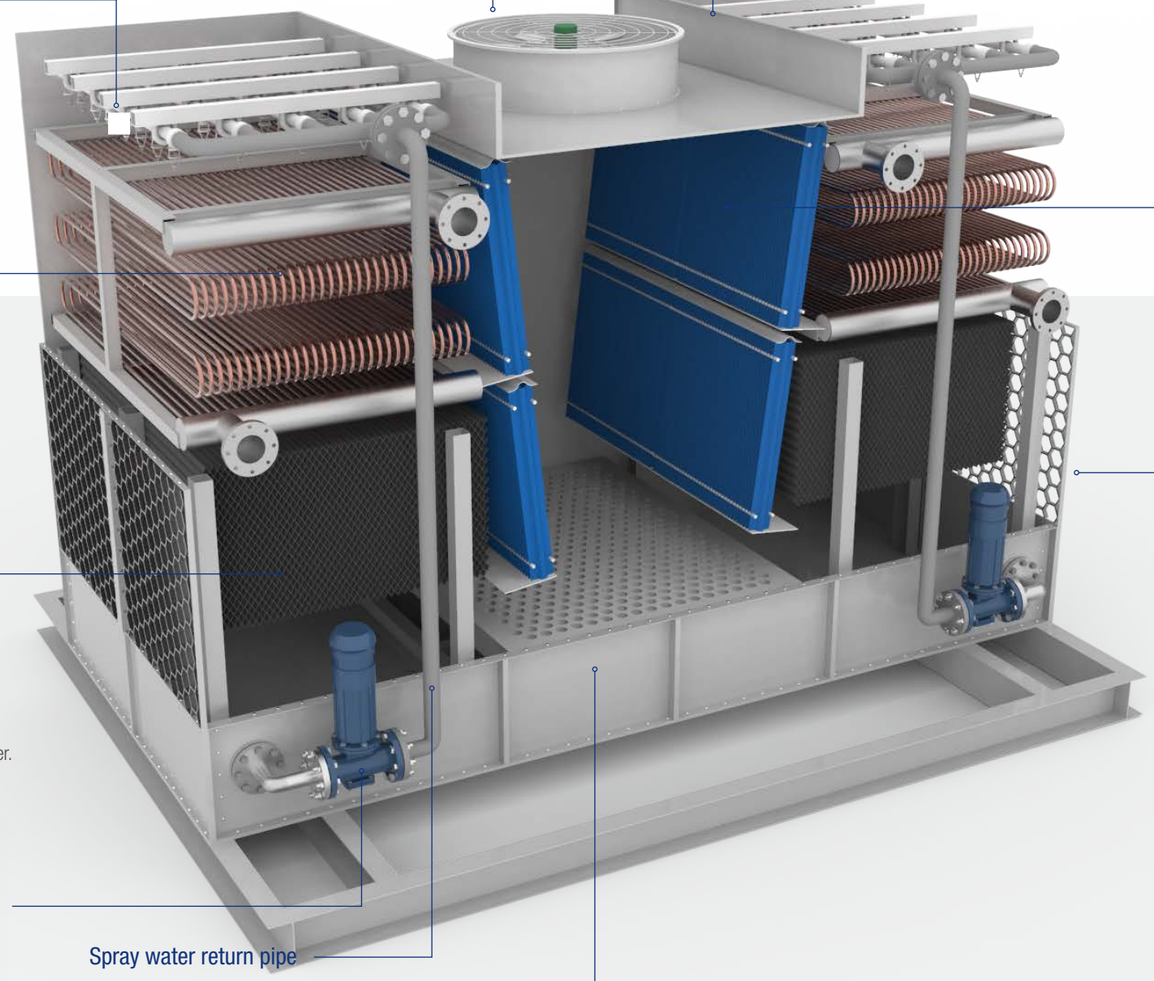
Ultra-low noise fan

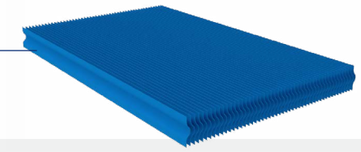
Tower body plate

Stainless steel 304 or DX51D+AZ120 aluminized zinc plate tower body. It provides excellent corrosion resistance in harsh environments.

Smooth coil exchanger

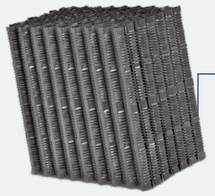
Copper or stainless steel coil or tubular bundle, pipe diameter: 16, 19, 22 and 25 mm





Drift eliminator

Made of selected high quality PVC material, the drift rate is limited to 0.001% lower than the circulating water rate, reducing water loss during wet operation.



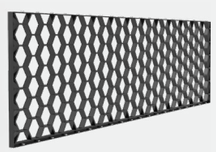
PVC packing

- It allows the air and water to be fully mixed for efficient heat transfer.
- Special inclined tank design can withstand high water load without causing excessive pressure drop.
- Operating temperature up to 65 °C.

Spray pump

Spray water return pipe

Water tank



Air inlet louver

It can be made of the same material as the tower body or made into PVC louver.

1. PVC honeycomb air inlet louvers improve the flow of the air into the cooling tower.
   - No fasteners required, easy to disassemble.
   - Prevent debris from entering and water from splashing.
   - This design prevents direct sunlight and algae breeding.
   - Reduce the tower noise and improve the tower appearance.
2. Air inlet louvers made of stainless steel or galvanized steel plate provide excellent corrosion protection.

Feiyu Cooling

Hebei Feiyu Cooling Equipment Co., Ltd.

Zhaohui Street, Zaoqiang Town, Zaoqiang County, Hengshui, Hebei Province

Phone/WhatsApp/WeChat: +86-15713184658 / +86-13931808425

Tel: +86-318-8222061

Email: info@pvccoolingfill.com

Website: www.flycoolingtower.com