

干式 & 绝热高效空冷器

Dry & Adiabatic Efficient Air Cooler



山东凯翔传热科技有限公司

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我们的承诺是让客户工作的更轻松, 让客户的事业更简单、高效, 让客户的生活更具可持续性。我们如何履行承诺, 很简单:

我们不断地创新

在凯翔传热, 创新理念植入每位员工的心底。我们并非只是谈论创新, 它切实地贯穿我们的整个工作流程。我们持续寻找突破性的解决方案, 来改进现有的工作方式, 使之更加美好。在过去十年里, 我们积累了超过60项发明和实用新型专利。

我们用心设计

作为一家技术型企业, 我们为拥有行业中最具丰富经验的工程师和技术团队而感到自豪。这份自豪转化成对解决方案的用心设计, 高效输出。凯翔传热坚定承诺为全球客户提供一流的换热解决方案和服务。

我们良心智造

十年磨一剑, 凯翔传热始终坚持精益求精的品质追求, 每一个产品都倾注了凯翔人的心血。工厂配备现代化高精度生产设备, 拥有经验丰富的工业技师团队和技能过硬生产班组。公司通过ISO9001质量管理体系, 并结合战略管理、绩效管理、精益生产管理、6S管理等, 制定一系列具有公司特色的管理方法, 并坚定的实施, 匠心打造高标准产品, 靠品质赢得市场信赖。

我们保证性能

每一个凯翔传热的解决方案都要经过严谨的研究和测试, 以确保其高效和可靠性。凯翔传热设计、生产标准符合第三方国际性能认证, 并通过CTI等一系列国际性能测试, 保证了性能达到国际标准-- 所以您可以放心地规划您的项目。

我们保护环境

凯翔传热以环境保护为己任。我们的工业换热设备不仅力求节电、节水, 减少噪音污染, 而且在结构材质中全部选用可循环再生的材质, 拒绝FRP玻璃钢等不可回收的材质。从节电节水到降低噪音和消除化学品, 我们持续进行结构优化, 不断研发新技术, 为人类的可持续发展贡献一份力量!





新型 高效节能绝热冷却技术

NEW TECHNOLOGY EFFICIENT ENERGY SAVING WATER SAVING

干/湿混合运行模式 Dry/Wet Mixed Operation Mode

空气冷却器是以环境空气作为冷却介质，横掠翅片管外使管内高温工艺流体得到冷却或冷凝的设备。

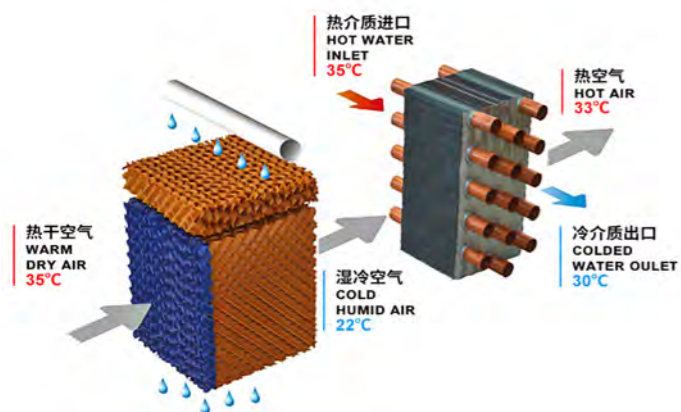
Air cooler in ambient air as cooling medium, the horizontal sweep outside fin tube inside the high temperature process fluid get cooling or cooling equipment.

凯翔绝热高效空冷器系统在干式空冷器系统基础上增设了蒸发式湿帘。

绝热冷却根据热力学原理运行，其中能量（热量）作为“功”从一种介质转移到另一种介质，而没有实际的质量交换。当系统内的压力降低导致体积膨胀时，就会发生绝热冷却过程，从而对周围环境产生“功”。为机组带来了更大的排热能力。

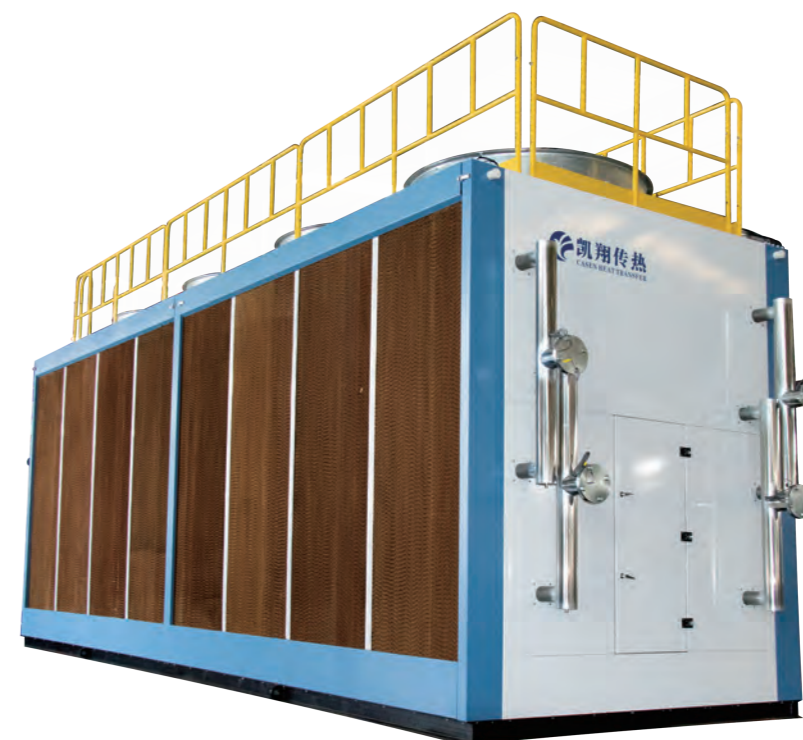
Casen Adiabatic Efficient Air Cooler adds an evaporative wet curtain to the dry air cooler.

Adiabatic cooling operates on the principles of thermodynamics where energy (heat) is transferred from one medium to another as “work” without an actual exchange of mass. The adiabatic cooling process occurs when a reduction in the pressure within a system causes a volume expansion, resulting in “work” on the surrounding environment. Therefore, the adiabatic cooler has a better heat rejection capacity.



绝热高效空冷器

Adiabatic Efficient Air Cooler



绝热高效空冷器系统的作用与干式空冷器系统相似，但增设了蒸发式湿帘。水流过蒸发式湿帘，同时吸入机组的空气也通过蒸发式湿帘，此时由于系统内的压力降低导致体积膨胀时，就会发生绝热冷却过程，从而对周围环境产生“功”。入口空气的干球温度被降低。降低的干球温度为机组带来了更大的排热能力。

The function of the Adiabatic Efficient Air Cooler is similar to that of the dry air cooler system, but an evaporative wet curtain is added. The water flows through the evaporative wet curtain, and the air sucked into the unit also passes through the evaporative wet pad. At this time, the adiabatic cooling process occurs when a reduction in the pressure within a system causes a volume expansion, resulting in “work” on the surrounding environment. The dry bulb temperature of the inlet air is reduced. The reduced dry bulb temperature gives the unit greater heat rejection capacity.

绝热高效空冷器系统在高温干燥环境中非常有效，而且耗水量比传统的蒸发式设备少。绝热机组也比同样规格的（指能够满足需要的冷却能力）的完全干式空冷器/冷凝器所需要的占地面积更小、通风机电机的功率更低。

Adiabatic Efficient Air Cooler are very effective in high temperature dry environments and need less water than traditional evaporative equipment. It also require a smaller footprint and lower fan motor power than dry air cooler or condenser of the same size (referring to the required cooling capacity).

新技术换热效率更高 NEW TECHNOLOGY MORE EFFICIENT

干/湿混合运行模式
节能高效

Dry/Wet Mixed Operation Mode
Energy saving and high efficiency

节水90% WATER SAVING 90%

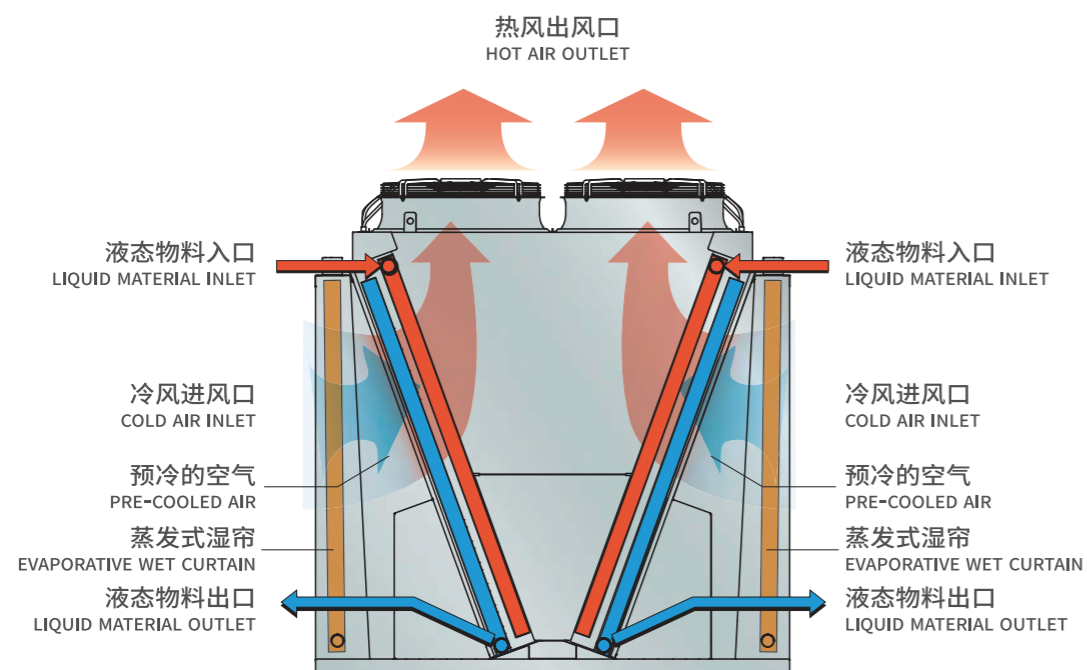
零蒸发冷却
零间歇排污
封闭环境中运行
No Evaporative Cooling
No intermittent sewage
Run in a closed environment

绝热高效空冷器运行原理

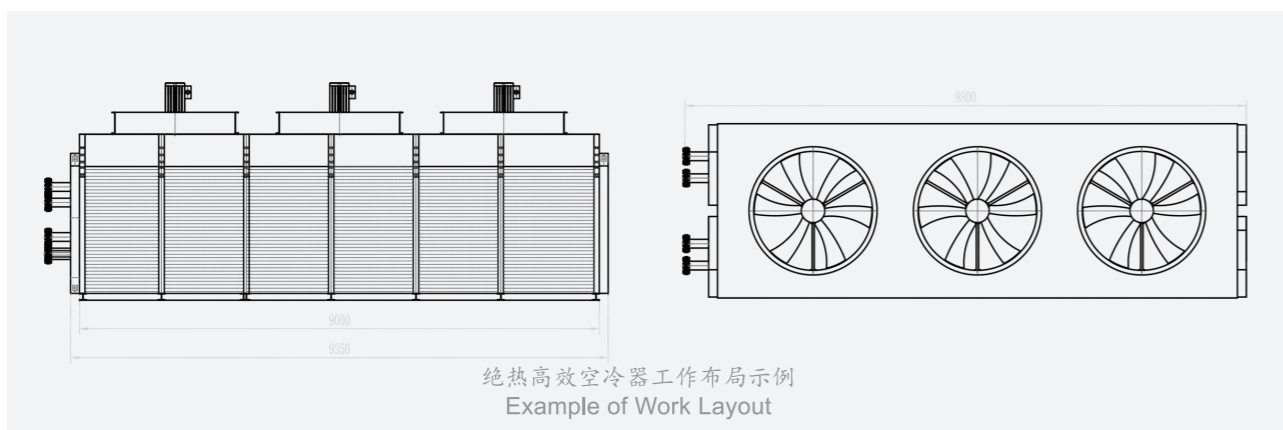
How Adiabatic Efficient Air Cooler work

热的液态物料进入盘管入口,如图中红色所示。液态物料的热量通过盘管表面散发并传递给翅片。空气加湿预冷系统包含位于盘管一侧彻底湿润的蒸发式湿帘。环境空气被位于顶部的通风机吸入机组,并流经蒸发式湿帘板。空气在通过蒸发式湿帘的过程中湿度增加,干球温度降低(与湿球之间只有几度温差)。被预冷的空气流过盘管和翅片表面,机组的排热能力得到显著提升。液态物料的热量传递给空气,然后排放到大气中。冷却后的液体经盘管出口流出机组,如图中蓝色所示。

Hot liquid material enters the coil inlet, shown in red. Heat from the process fluid is dissipated across the coil surfaces and transferred to the fins. The air humidification pre-cooling system consists of an evaporative wet curtain located on the side of the coil to thoroughly moisten. Ambient air is drawn into the unit by a ventilator located at the top. And flow through the evaporative wet curtain plate. As the air passes through the evaporative wet curtain, the humidity increases and the dry bulb temperature decreases (only a few degrees of temperature difference from the wet bulb). After that, the pre-cooled air flows over the surfaces of the coils and fins, and the heat removal capacity of the unit is significantly improved. The heat of the process fluid is transferred to the air, and then released into the atmosphere. The cooled liquid flows out of the unit through the coil outlet. As shown in blue.



绝热高效空冷器运行原理
Adiabatic Efficient Air Cooler Working Principle



01 节水高达90%

WATER SAVING UP TO 90%

绝热高效空冷器运行过程中,不会发生蒸发冷却,也不需要间歇排污,从而显著减少水的损失。可在干/湿混合运行模式,低温环境下实现100%干式运行,最大化减少水的消耗。

During the operation of the adiabatic efficient air cooler, no evaporative cooling and intermittent blowdown occurs, thus significantly reducing water loss. The adiabatic cooler can be operated in dry/wet mixed operation mode. The dry operation can be realized by 100°C in low temperature environment avoiding the consumption of water.

02 节能高达70%

ENERGY SAVING UP TO 70%

与其他冷却设备相比,节能效果显著,与传统的风冷系统相比,绝热高效空冷器可节能高达70%左右。在干燥模式下运行时,冷却器以低风扇速度运行,可实现间歇性启动,严格的温度调节大大提高了整机的冷却效率。

Compared with other cooling equipment, the energy saving effect is remarkable. Compared with the traditional air cooling system, the energy saving up to 70%. When operating in dry mode, the cooler runs at low fan speed, enabling intermittent startup. Strict temperature regulation greatly improves the cooling efficiency of the whole machine.

03 精准化自动控制

AUTOMATIC

自动温度控制,无需人工操作,简化的用户界面,使操作更容易。不会发生结垢,耐腐蚀能力强且维护简便。

Automatic temperature control, without manual operation, simplified user interface for easier operation. No scaling, strong corrosion resistance and simple maintenance

04 环保无污染 维护成本低

GREEN EASY TO MAINTAIN

零排污,不用除垢、抗菌处理,无需不断的补充水,耐腐蚀能力强且维护简便,设备运行过程中产生的废物很少,对周围环境的影响可以忽略不计。

Environmental protection, no pollution, no descaling, no antibacterial treatment and no need for constant water replenishment. Strong corrosion resistance and easy maintenance, little waste generated during equipment operation, and negligible impact on the surrounding environment

设计结构及特点

Design structure and features

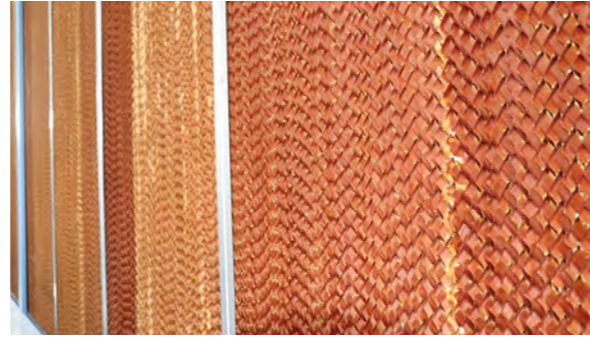


可变频风机调速

INVERTER CONTROLLED FAN AVAILABLE

变频控制风扇,工况稳定,节省能耗,部分负荷时可节能30%~40%,同等性能下电机尺寸更小。

The inverter fan runs more stably. In non-full operation mode, 30%~40% energy can be saved. Smaller motor size under the same performance.

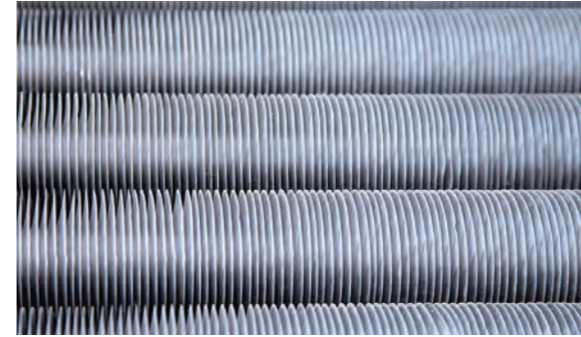


蒸发式湿帘

EVAPORATIVE WET CURTAIN

夏天可直接喷自来水,提高换热效率,维持流程水温稳定,喷水时间无限制且高效免维护。

You can spray tap water directly on the evaporative wet curtain to improve heat exchange efficiency and maintain a stable water temperature in summer. No time limit and no maintenance.

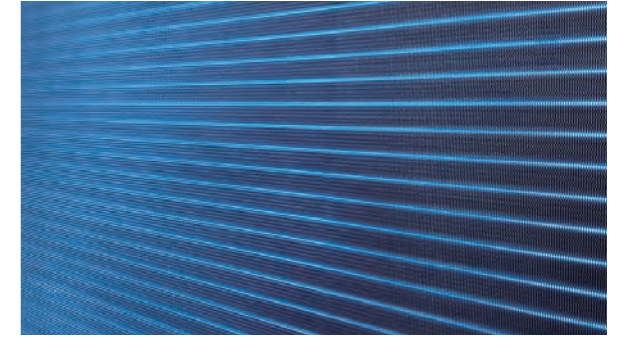


带铝翅片盘管

COIL WITH ALUMINUM FINNS

有效提高换热效率,通过在换热管的表面增加翅片,增大换热管的外表面积(或内表面积),从而达到提高换热效率的目的。

Effectively improve the heat exchange efficiency. By adding fins on the surface of the heat exchange tube, the outer surface area (or inner surface area) of the heat exchange tube is increased, so as to achieve the purpose of improving the heat exchange efficiency.



环氧涂层翅片

EPOXY COATED FINNS

提高耐腐蚀性,表面抗氧化能力强,提高设备使用寿命。

The epoxy coating can improve the corrosion resistance and surface oxidation resistance of the fins, and improve the use of fins.



V型(干式)空冷器系列

V-type (dry) Air Cooler

空气冷却器是以环境空气作为冷却介质，横掠翅片管外使管内高温工艺流体得到冷却或冷凝的设备，简称“空冷器”，也称“空冷式热交换器”。

The air cooler uses ambient air as the cooling medium, and traverses the finned tube to cool or condense the high-temperature process fluid in the tube, referred to as "air cooler", also known as "air-cooled heat exchange"

V型空冷器，是石油化工和油气加工生产中作为冷凝和冷却应用最多的一种换热设备。V型空冷器一般是由管束、管箱、风机、百叶窗和构架等主要部分组成。结构为V型，具有占地面积小，换热效率高，运输方便等特点。V型角度一般选用45°或者60°夹角。

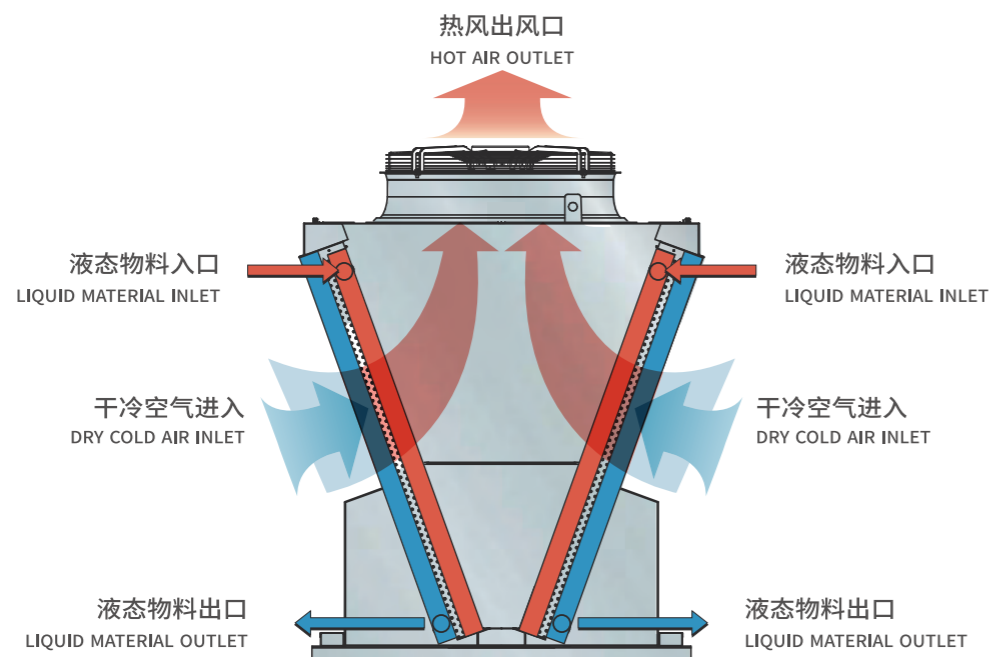
V-type air cooler is the most widely used heat exchange equipment for condensation and cooling in petrochemical and oil and gas processing and production. V-type air cooler is generally composed of tube bundles, tube boxes, fans, shutters and the main components of the structure. The structure is V-shaped, which has the characteristics of small footprint, high heat exchange efficiency and convenient transportation. The V-shaped angle is generally 45° or 60°.

V型空冷器运行原理

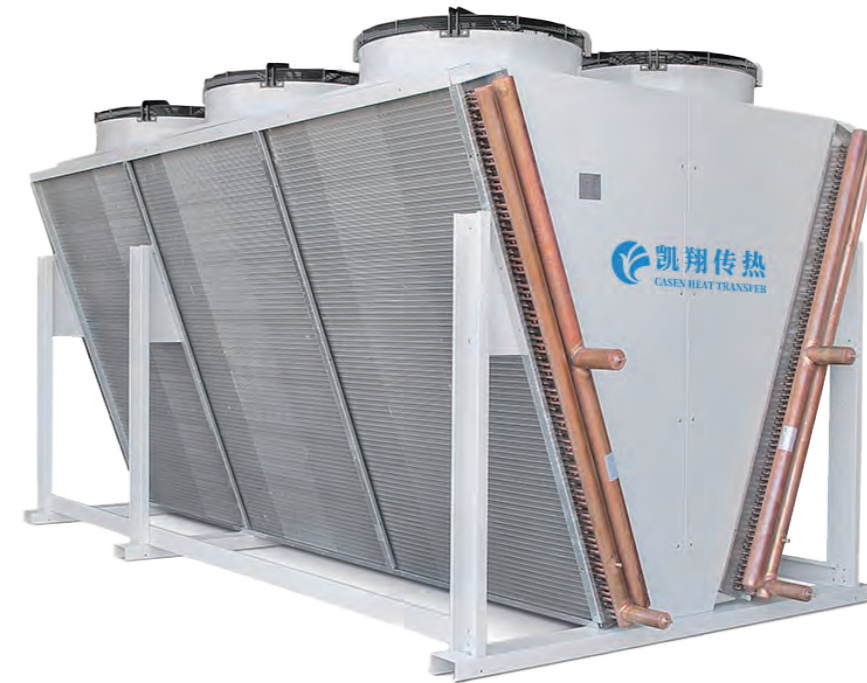
How V-type air cooler work

热的液体物料进入盘管入口，如图中红色所示。液体物料的热量通过盘管表面散发并传递给翅片。环境空气被位于顶部的通风机吸入机组并流经盘管表面。液体物料的热量传递给空气，然后排放到大气中。冷却后的液体经盘管出口流出机组，如图中蓝色所示。

Hot liquid material enters the coil inlet, shown in red. Heat from the process fluid is dissipated across the coil surfaces and transferred to the fins. Ambient air is drawn into the unit by a top-located fan and flows over the coil surfaces. Heat from the process fluid is transferred to the air and then vented to the atmosphere. The cold liquid material flows out of the unit through the coil outlet, as shown in blue in the figure.



V型空冷器运行原理
V-type Air Coolers Working Principle

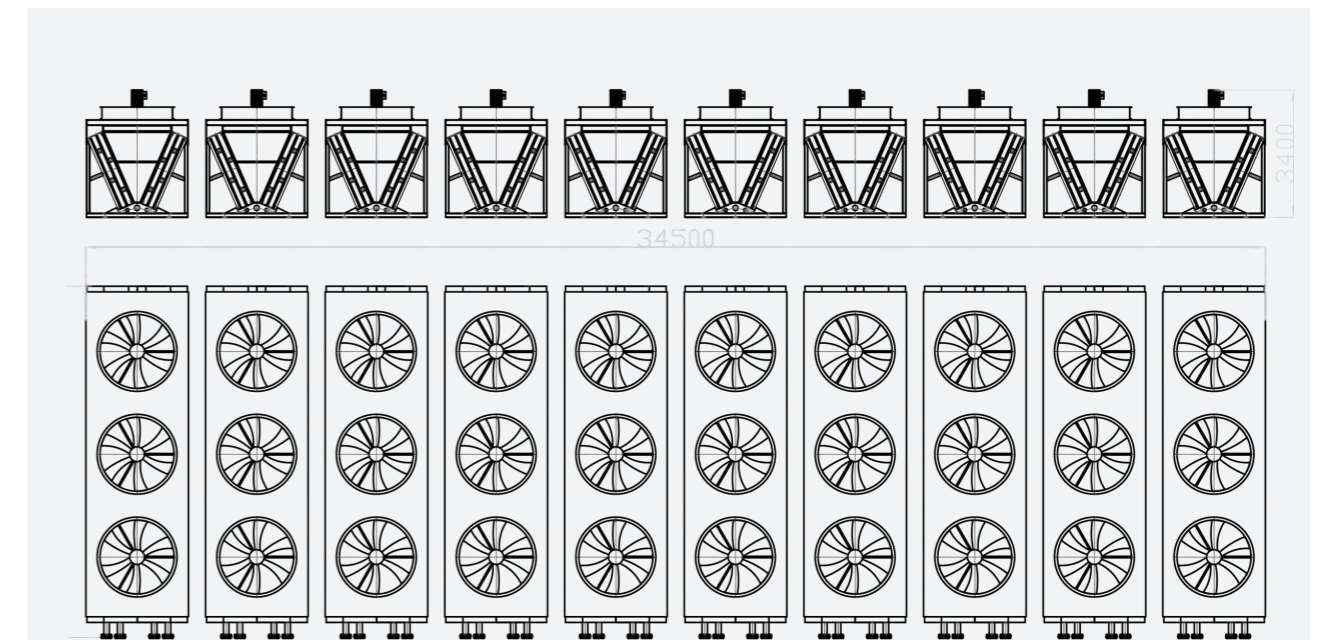


凯翔V型空冷器通过软件准确计算获得其换热面积和风量，充分保证其换热效率100%满足项目要求。

其管束有多种材质可选，凯翔工程师会根据工艺流体介质的成份、运行压力、周边环境、客户要求等综合因素进行推荐。

Casen V-type air cooler obtains its heat exchange area and air volume through software accurate calculation, fully ensuring that its heat exchange efficiency 100% meets the project requirements

The tube bundles are available in a variety of materials, and Kaixiang engineers will recommend them according to comprehensive factors such as the composition of the process fluid medium, operating pressure, surrounding environment, and customer requirements.



V型空冷器工作布局示例
V-type Air Coolers Example of work layout