



SHINNIHON REIKI
**CORPORATE
PROFILE**

Save the Water Planet. ———

We live on a "water planet" called Earth.

The birth of life and the birth of civilization all began with the existence of water.

All life on earth, including us humans, depend on water as the source of life and livelihood.

However, Japan is one of the countries with the lowest annual rainfall per capita in the world.

In addition, the development of industrial society, the urbanization of cities, and the rise in living standards have made it more and more difficult to secure water, the source of life, year by year.

Moreover, the expansion of production activities in human society has drastically changed the natural water cycle. In some cases, it causes a great impact on human life and human livelihoods.

It is a great challenge for us human beings to keep the Earth, a beautiful water planet, a good place to live.

It is our mission to treat water with care and to reuse it.

With the concept of "taking good care of the water planet" as the backbone of our management philosophy, Shinnihon Reiki continues to make efforts to achieve our goal of water reuse.

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Industrial Cooling Tower

With over 70 years of experience, our cooling towers are durable, maintainable, and easy to use.



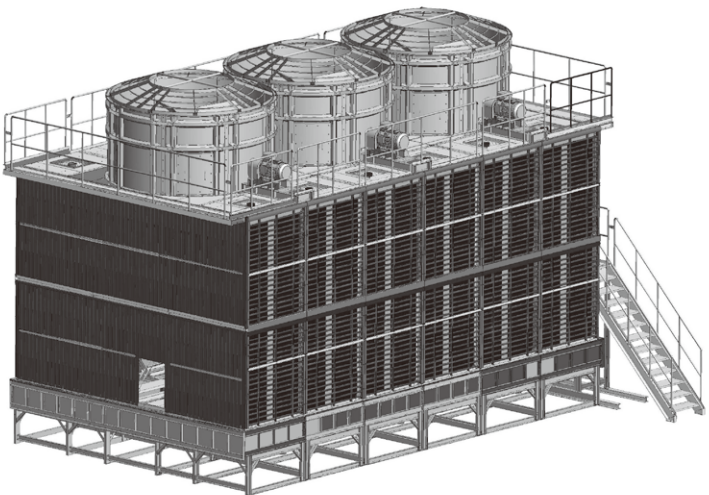
Satisfies customer's needs

Considering temperature conditions, installation space, water quality, power consumption and pump head, etc., we offer the best solution for you.

Steel	Hot dip galvanized steel mold is used. Durable and recyclable. (Stainless steel structure is also available.)
FRP	FRP (Fiber Reinforced Plastics) pultrusion is used. Excellent corrosive-resistant and light weight.
Wood	Uses wood that has undergone a special preservative treatment to improve durability. Suitable for low pH water.
Concrete	Constructed with water basin. Concrete structure is durable and robust

Cooling Tower for DHC

The district heating and cooling (DHC) systems helps urban development and improvement, also it is good idea for effective use of energy. Based on our extensive experience since 1955, we have been developing a series of cooling towers for large-scale cooling and heating facilities to meet customer needs.



Cooling Tower =
The Behind-the-Scenes Driving Force
of the Facility

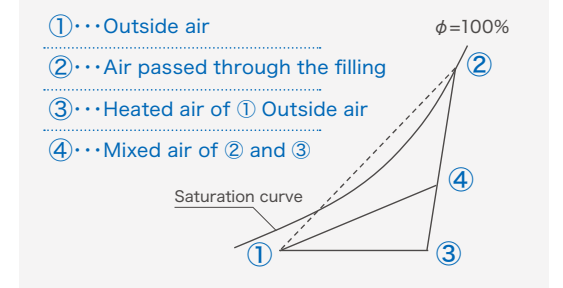
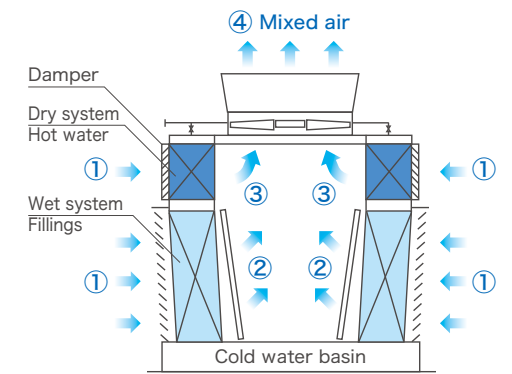
We provide cooling towers that cool the heat generated
by any kind of industrial facility.

Problem Solving Ability = Our Technology

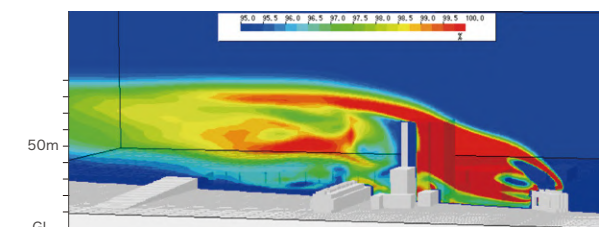
Applying our technologies, we provide
a proposal to solve cooling tower related problems.

Plume Abatement (measures)

Plume is pure water vapor, but measures to prevent plume are sometimes taken in consideration of the local communities, and a typical example is the heating method. The heating method (DRY & WET) is a method that reduces the humidity of supersaturated air by mixing "high-temperature, high-humidity air" and "heated outside air" and discharges it as unsaturated air.

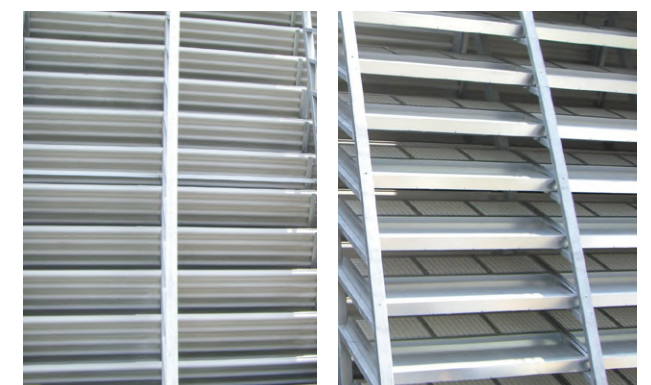


Simulation of plume in Cooling Tower



Noise Abatement (measures)

The source of cooling tower noise is the sound of the blower and the sound of falling water, which is transmitted outside the tower. There are two ways to prevent noise: lowering the sound source itself or attenuating it by using sound absorption equipment. For the former, low-noise blowers are used, and for the latter, sound-absorbing louvers, sound-absorbing ducts, and sound insulation walls are used.



Standard louver

Sound absorbing louver

We Specialize in Manufacturing Cooling Towers

We exert maximum technological capabilities as a manufacturer specialized in cooling towers, and provide products that satisfy our customers.

Construction

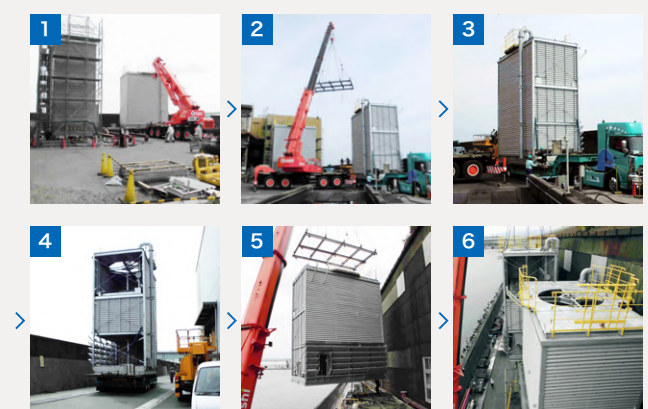
Based on our years of experience and achievements, we ensure construction within a set construction period by paying careful attention to process control based on the operation and shutdown conditions of facilities, with safety as the first priority.

Shortening construction periods

The lifting method enables a speedy construction of cooling tower.



Procedure of the lifting method

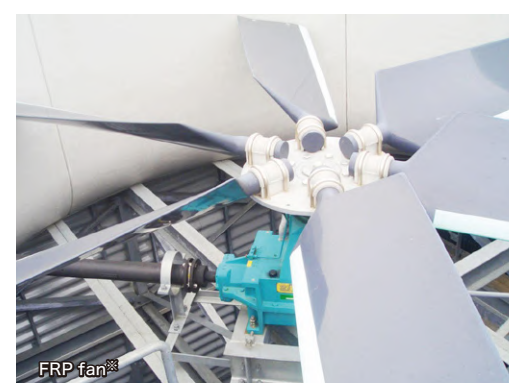


Axial Blower

The axial blower fan used in our cooling towers incorporated with the latest aerodynamic blade theory and new technologies. They have earned a reputation in a wide range of fields for their high performance, high efficiency, durability, and energy-saving, low-noise fans that match the demands of the times.

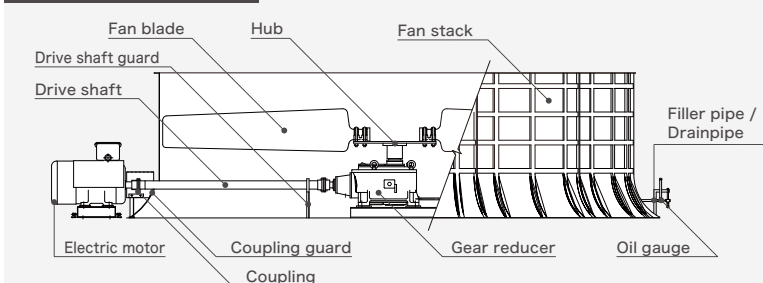


Bevel Gear Drive (B.G)
Fan is rotated by transmitting the rotation of electric motor to gear reducer.



※Fan: an assembled unit of fan blades and hub

Structure of Blower fan



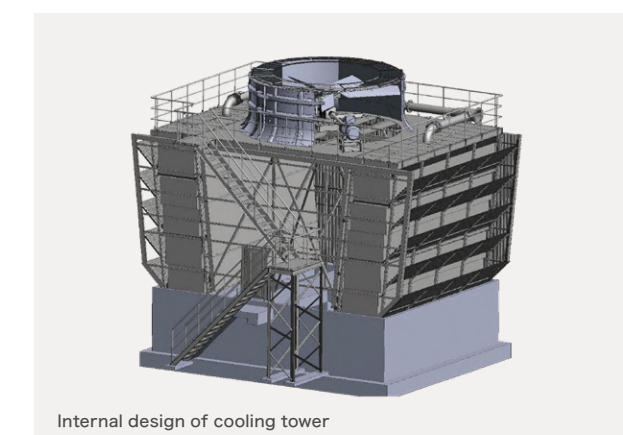
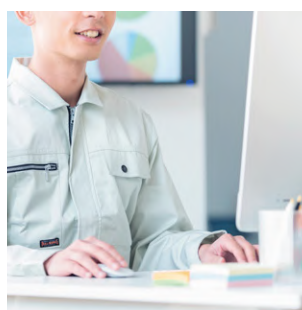
Research & Development

A full-scale and a small-scale demonstration cooling towers enable a development of plume abatement measures, filling materials, etc., in a manner close to actual operating conditions.



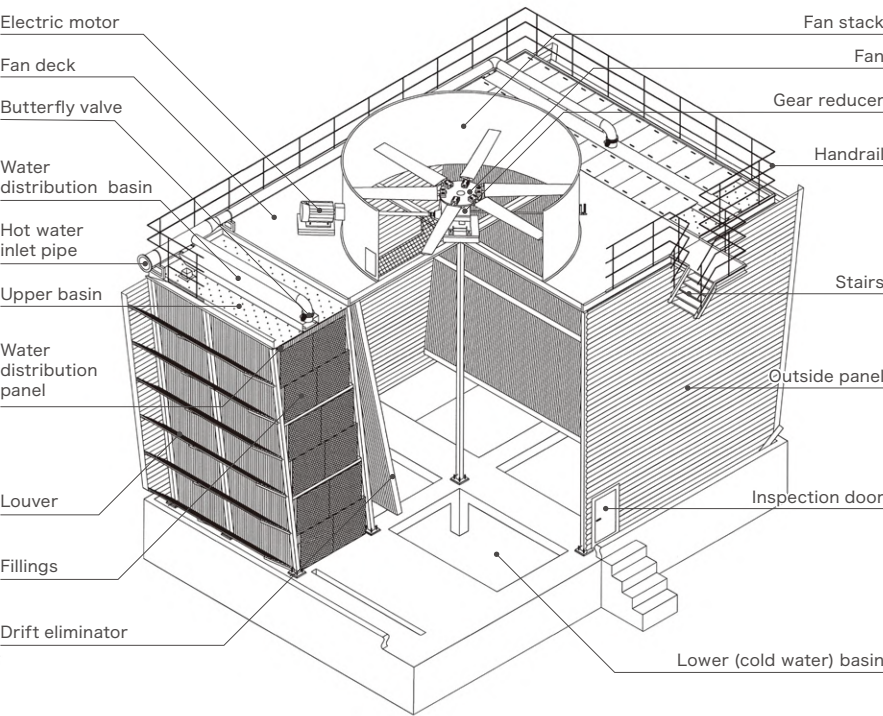
3D-CAD

3D-CAD is used for optimization and to check the details of design. 3D scanner is used to optimize the design for cooling tower repair, maintenance and replacement.



There are two major structure in Cooling Tower.
Considering efficiency and maintainability,
select the one that meets your requirement.

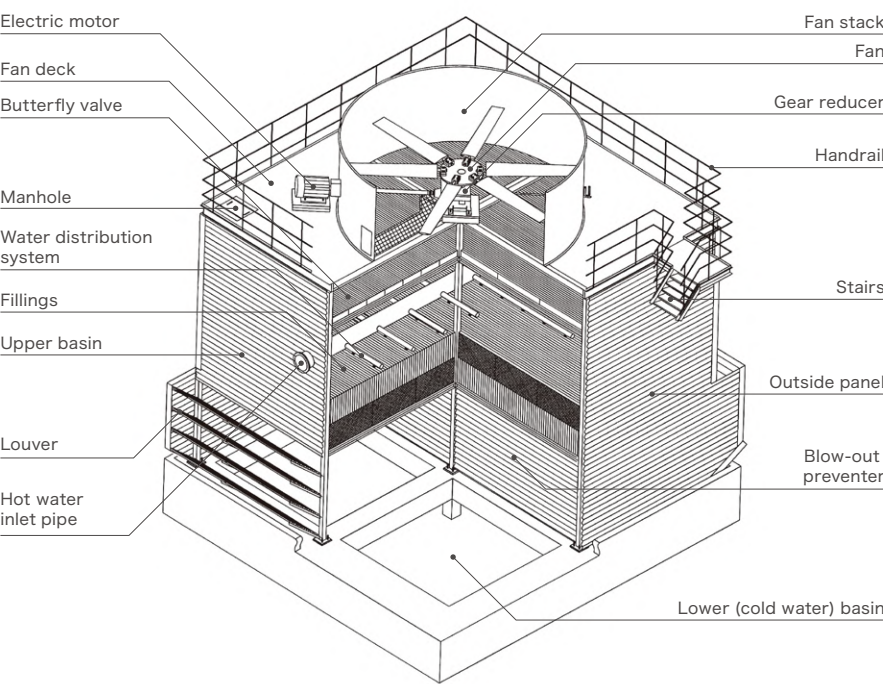
Crossflow cooling tower



Crossflow Cooling Tower

Hot water (circulating water) flows into the filling of the heat exchanger from the top, and outside air flows in from both sides, and the outside air takes away the latent heat of evaporation of the hot water and cools the hot water.

Counterflow cooling tower

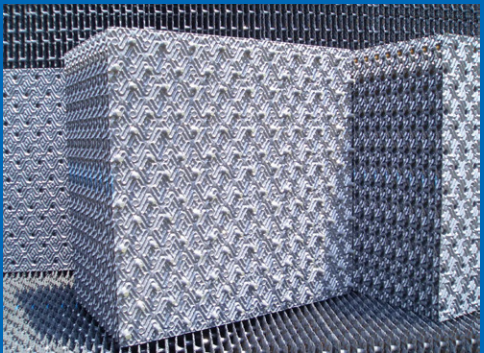


Counterflow Cooling Tower

Hot water (circulating water) is distributed downward from a water distribution pipe with nozzles attached to the top of the cooling tower, and outside air is taken in from the bottom of the tower to cool the hot water by depriving the outside air of the evaporative latent water of the hot water.

Fillings

It is one of the core components of the cooling part, which exchanges heat by bringing hot water and air into a contact.



Film type fillings

Hot water is dispersed in the form of a membrane to increase the air-liquid contact area and achieve high efficiency.

Material: Hard Polyvinyl Chloride (PVC)



Splash type fillings

This method disperses hot water in the form of small particles and brings it into contact with air.

Material: Polypropylene (PP)

Water Distribution System

It distributes hot water efficiently and evenly over the filling.



For crossflow cooling tower

It is installed at the top of the tower, the watering condition can be monitored and the water volume can be easily adjusted.



For counterflow cooling tower

It is installed inside the tower and generally distributes water with nozzles.

Drift Eliminator

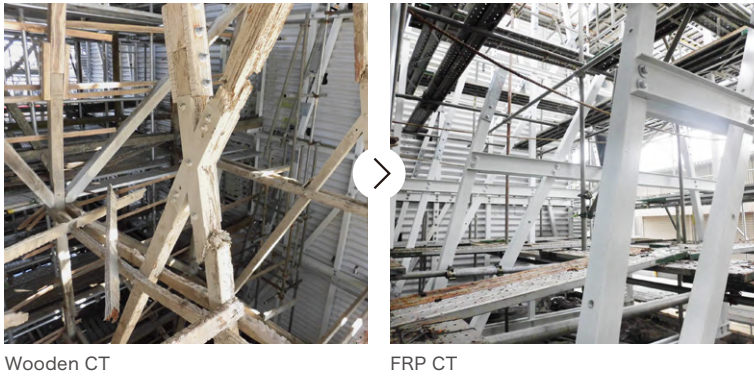
It catches the water splashed from the fillings and prevents it from coming out of the tower.



Shinnihon Reiki provides repairing, capacity restoration (capacity improvement), and periodic maintenance services for both our products and other manufactures' products.

Repair of wooden cooling tower to FRP

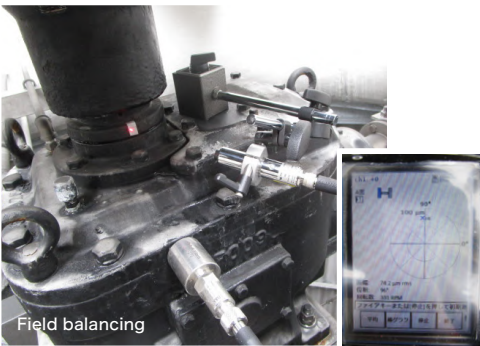
Wooden cooling towers used for many years increase maintenance costs. We offer partial repair and renewal from wood to FRP structure.



Inspection & Diagnosis

Regular inspections and management are required for stable operation of the cooling tower. We perform various equipment diagnosis and performance diagnosis, and contribute to stable operation and energy saving.

- Inspection, diagnosis & report
- Performance measurement, diagnosis, report
- Vibration measurement, diagnosis, report
- Field balancing, report



Maintenance Plan (Steel CT)

[Reference]															
Years	1st year	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th
# of necessary days/1cell ^{※1}	1	1	2	1	15~20	1	1	2	1	15~20	1	1	2	10~15	15~20
Inspection details	Basic	Basic	Advanced	Basic	Full	Basic	Basic	Advanced	Basic	Full	Basic	Basic	Advanced	Full	Full
Visual check of cooling tower ^{※2}	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Replacement of gear reducer oil	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Coupling elements check	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Replacement of coupling elements and bolts			○		○			○		○			○		○
Replacement of drive shaft and couplings					○					○					○
Drive shaft centering check & adjustmet			○		○			○		○			○		○
Touch-up paint of gear reducer, etc.			○		○			○		○			○		○
Retightening of bolts for fan	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Overhaul of electric motor					○					○					○
Overhaul of fan					○					○					○
Overhaul of gear reducer					○					○					○
Uninstall and reinstall of equipment	none	none	necessary	none	necessary	none	none	necessary	none	necessary	none	none	necessary	none	necessary
Tower inspection					○					○				○	
Performance test					○					○				○	
Replacement of fillings & drift eliminator ^{※3}					○					○				○	

※1: The number of days is an estimate and may change depending on the number of cells and the content of the on-site work. After explaining the contents of the inspection, various conditions is considered and the appropriate number of days will be presented.
※2: Visual inspection does not take scaffolding into consideration. It will be a simple visual inspection within the visible range.
※3: Fillings and drift eliminators are made of PVC (rigid vinyl chloride). They are subject to ultraviolet deterioration over time. Same as the fan blower, these parts have a significant impact on cooling capacity. A systematic replacement plan is highly recommended.

● This table is an annual inspection and maintenance plan for 15 years from the next year of operation.
● This table is for a guideline only, as the timing of implementation will vary depending on the operating status of the cooling tower.
● Regarding the replacement schedule of the filling and drift eliminator, perform a performance test (intangible factors) and visual inspection (tangible factors) on a regular basis, and plan for replacement in advance considering the results.
● A separate consultation regarding maintenance time, pricing, etc. will be done for other parts and materials that are determined to require replacement due to operational reasons.
● Overhaul of a gear reducer requires at least 15 days for removal, maintenance at shop, and restoration. If overhaul of all gear reducers cannot be performed all at once, it is suggested to overhaul one by one in the cold weather season, or by purchase one gear reducer as a spare part.

Industrial Temporary Cooling Tower

Temporary cooling tower is recommended for various applications in case of an unexpected situation where stable cooling water cannot be supplied to the plant due to cooling tower problems.

Case 1

Cooling water does not cool down

Increase in wet bulb temperature due to global warming

Aging of cooling tower

Increase in heat load due to plant expansion or modification

Case 2

The cooling tower cannot be operated due to a fan blower trouble, etc.

Fan unit trouble

Damage inside cooling tower

Case 3

Cooling tower needs to be renewed or repaired but used in multiple systems

Case 4

Planning new construction

- Cannot be fit into the installation space.
- Design conditions are severe due to recent global warming, resulting in a larger layout.
- The number of cells increases due to recalculation considerations etc...

More compact in size

For a contingency case

Temporary cooling towers are recommended

A fan unit can also be rent.

Temporary cooling tower
500~4000m³/h

Temporary switchboard

3 poles, 400V or 200V
(Provided by the customer or use an electrical generator)

Temporary hose
use duct hose, camlock, etc.

Bypass
need to install nozzles
(construction by the customer)

Existing cooling tower
poor performance due to troubles, etc.

What Cooling Tower can do for the future.
We contribute to the realization of a sustainable society.

Here is some information necessary for the design
and selection of cooling equipment.
Please contact us for more details.

Energy-saving measure is an important factor for many facilities. To satisfy the requirements of ISO 14001-certified factories, it is necessary to reduce the power consumption of cooling towers.

Fan operation control according to controlled temperature

Operation control of circulation pumps by adjusting the circulating water volume

Use of high-efficiency motor

Reduction of load to the facility by improving the cooling tower performance

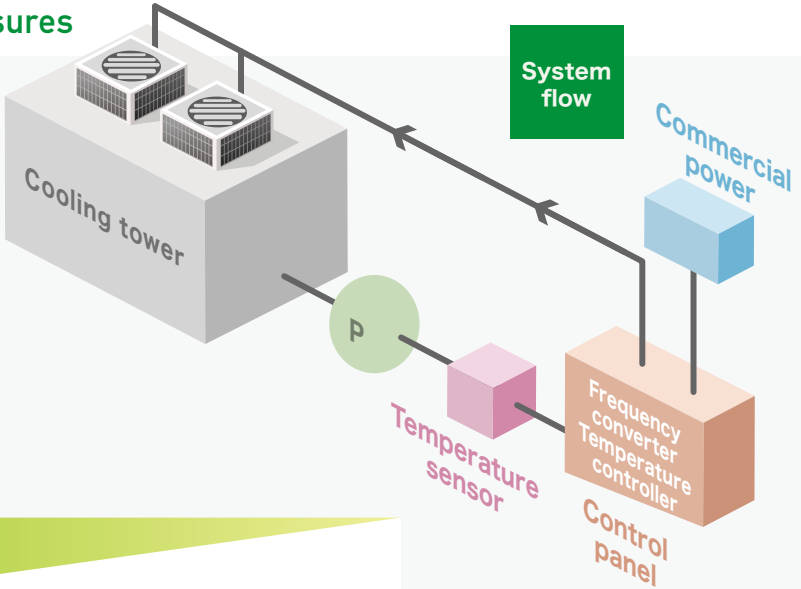
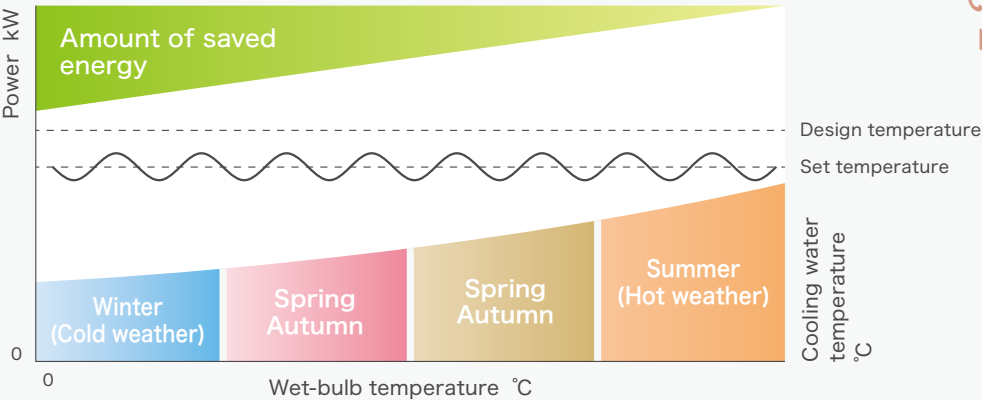
Reduction of power consumption of fan and circulation pumps by replacing with high-performance cooling tower

Case Study of Energy-saving Measures

Inverter Control System

Power consumption can be reduced by adjusting the inverter frequency from the cooling water temperature and changing the fan speed. Even slight fluctuations in cooling water temperature have energy-saving effects.

Operation mode



Blowdown and makeup water volume

Blowdown volume

$$B = \frac{E}{N-1} - D$$

Makeup water volume

$$M = \frac{N}{N-1} E$$

B: Blowdown volume (m³/hr)

E: Evaporation loss (m³/hr)

N: Concentration loss (Generally about 2-5)

D: Drift loss (m³/hr)

M: Makeup water volume (m³/hr)

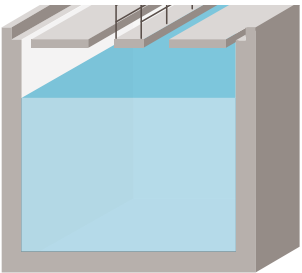
Select the filling

Fillings are available in film and splash types. If the water quality is very poor, no-fill can be a choice.

	UP (Film type)	SB (Splash type)
Material	PVC	PP
Water temperature	General: >45°C Heatproof: 45-70°C	≥ 75°C
Specific gravity	1.35	1.0-1.05
PH	5-9	3-10
Oil content	5ppm or less	20ppm or less
Evaporation residue	300ppm or less	1000ppm or less
Total hardness	250ppm or less	500ppm or less
SS	15ppm or less	500ppm or less
Turbidity	50% or less	—
Notes	If the oil content is less than 2ppm, SS: 80ppm	If oil is not content, SS: less than 800ppm BOD: less than 500ppm

Retained water volume of cold water basin

The retained water volume is vary depending on the facility but is determined based on the amount of water necessary to protect the water pumps in case the equipment is damaged.



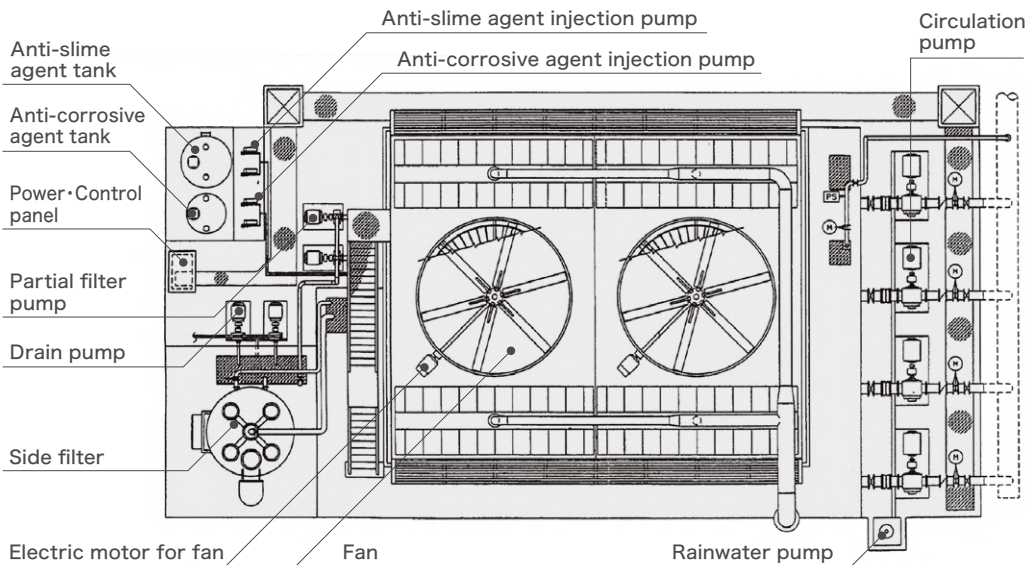
Equipment & accessories around cooling tower

We also supply necessary equipment and accessories for and around cooling tower.

Circulating water management system

Cold water circulation system

Power control system



1950

Mar, 1952

Establishment of Shinnihon Kogyo Co., Ltd., the predecessor of our company, in Fukuoka City with a capital of One million yen. Started manufacturing and selling fin tube radiators and ventilators.

Feb. 1955

Developed an axial flow fan and a cross-flow cooling tower under the guidance of Faculty of Engineering, Kyushu University. Became a designated supplier of Nippon Telegraph and Telephone Public Corporation (current NTT)

Jun, 1957

Received an order for the first industrial cooling tower from Yahata Steel (current Nippon Steel Corporation).

1960

Apr. 1960

Established Shinnihon Kensetsu Co., Ltd. in Chikushino City, Fukuoka, with a capital of 5 million yen as a manufacturer specializing in cooling towers, with capital participation from Asano Bussan Co., Ltd.

Apr. 1966

Marubeni Corporation merged with Toutsu Ltd. (the trade name after the merger of Asano Bussan Co., Ltd. and Asahi Bussan Co., Ltd.), making it an operating company under Marubeni Corporation.

Aug. 1966

Delivered cooling tower for compressor to Venezuela as the first exported unit.

1970

Sep. 1971

Changed the trade name to Shinnihon Reiki Co. Ltd. Delivered 22,000m³/h cooling tower for the ethylene plant at Mizushima Plant of Sanyo Ethylene Co. Ltd. (current Asahi Kasei Corporation). (Recognized as the best in the East at the time)

1980

Sep. 1980

Delivered a cooling tower for one facility from blast furnace to steelmaking to Shanghai Baoshan Steel Works in China.

1990

Aug. 1992

Increased capital to 88 million yen
Became a member of CTI (Cooling Technology Institute)

Apr. 1993

Delivered the first cooling tower with plume abatement countermeasures to the power generation facility at the Fuji Works of Honshu Paper Co., Ltd (current Oji Paper Co., Ltd.).

Dec. 1999

Obtained ISO9001 (Quality Management System) certification

2000

Aug. 2000

Increased capital to 288 million yen

2010

Apr. 2010

Celebration of 50th anniversary

Sep. 2011

Kurashiki Office moved to "Esutekku Building" in Kurashiki City, Okayama

Mar. 2015

Marubeni Corporation and Kuken Industries Co., Ltd. signed an agreement for the transfer of all shares and change the shareholder to Kuken Industries Co., Ltd.

Feb. 2016

Reduced capital to 100 million yen

Apr. 2019

Tokyo branch moved to Ryuen Building, Minato-ku, Tokyo
Osaka branch moved to Shinanobashi Mitsui Building, Nishi-ku, Osaka

2020

Mar. 2021

Using a temporary cooling tower, renewed the cooling tower in operation at Fuji Oil Co. Ltd.



Shinnihon Kogyo Co., Ltd.



Ground-breaking ceremony for the establishment of Shinnihon Kogyo



Production of cooling tower fan



The best cooling tower in the East (at the time)



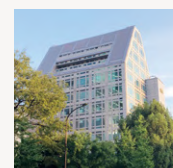
CTI logo



ISO9001 certified



HQ office and cherry blossoms



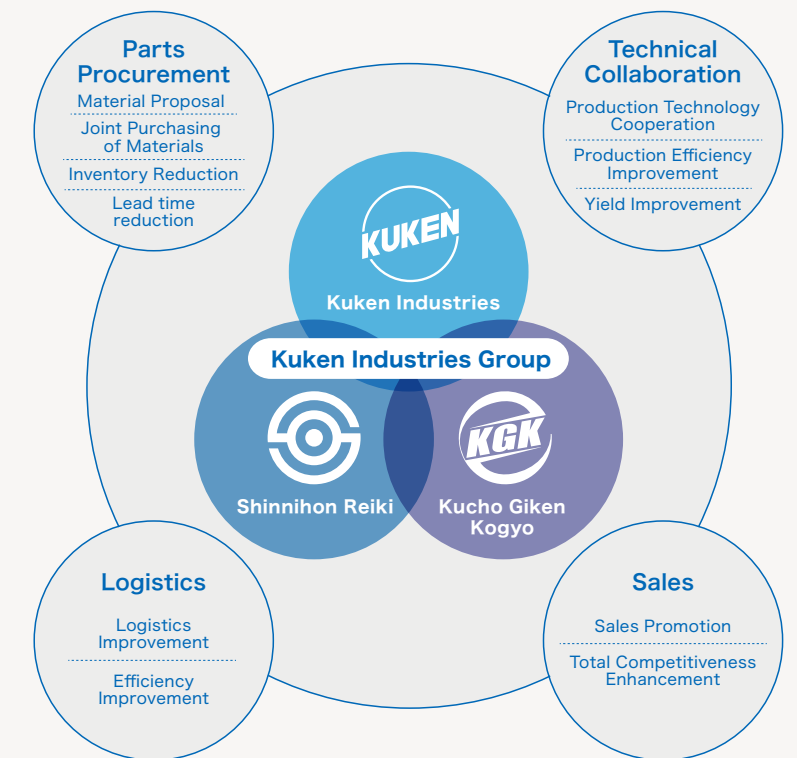
Tokyo branch

November, 2022

Basic Procurement and Purchasing Policy of Kuken Industries Group

The KUKEN INDUSTRIES GROUP regards the trust we have established thus far and the trust we will have in the future as an irreplaceable asset, and will speed up our procurement and purchasing reforms. Our group is always exposed to a tough competition bidding under general contractors and subcontractors, but our group selects suppliers based on continuous businesses, not by bidding. Also, basically, we avoid obtaining a quotation from a particular supplier. Depending on the model, we procure through development competitions*. Our group aims for mutual understanding with our suppliers, aiming for coexistence and co-prosperity on an equal basis, aiming for common benefits, and we will strive to respond with a sincere and quick action. The Group has established the following basic policy for procurement and purchasing activities.

*Procurement that takes into account the content of technical proposals such as VA proposals



1 Fair Supplier Selection

In our selection process to initiate transactions, we make decisions based on our evaluation on suppliers' reliability, including quality, cost, and delivery time, technical aspect, and other elements deemed necessary.

3 Ensuring Transparency

We clearly express our basic procurement and purchasing policies, information, and procedures, and disclose the reasons for acceptance or refusal upon request.

5 Compliance with Laws & Regulations, Environmental Preservation

We will comply with all applicable laws and regulations in our business dealings. We also actively work on environmental conservation and resource management, and fulfill our social responsibility in cooperation with our suppliers.

7 Confidentiality

We will strive to prevent information leaks by strictly managing all supplier information obtained through business transactions.

2 Open Transactions

The Kuken Industries Group aims for speedy globalization and seeks opportunities to do business both domestically and internationally, aiming for equal trading opportunities and free competition.

4 Individual Contracts

Each individual transaction is determined based on a comprehensive evaluation on quality, price, delivery time, technical capabilities, supply capacity, and other factors. In addition, each purchase transaction is to be made based on a written contract.

6 Purchasing Ethics

We do not seek for any personal interests in suppliers or potential suppliers. In other words, we do not condone any form of conduct (e.g., requesting or accepting bribes or goods, etc.) that we separately stipulate.

8 Continuous Development

We strive to build a relationship of trust based on the idea that we and our suppliers are partners, and we respect a mutual cooperative relationship that aims for continuous development.

Corporate Info.

Company name	Shinnihon Reiki Co., Ltd.
CEO	Takashi Naraki
Foundation	March, 1952
Establishment	April 5th, 1960
Headquarters	1-4-1, Futsukaichi Minami, Chikushino-shi, Fukuoka, 818-0057, JAPAN
Principal Business	Design, manufacture, installation and sales of industrial cooling towers and axial fan Repair, improvement work, inspection and maintenance of existing cooling towers
Capital	100 million JPY (Shareholder: Kuken Industries Co., Ltd. 100%)
Employees	87 employees (April, 2022)
Business sites	Headquarters, Tokyo branch, Osaka branch, Kurashiki office
Construction business license	Licensed by the Minister of Land, Infrastructure, Transport and Tourism
Applicable Standards	ISO 9001 certified
Management Philosophy	A company that cares about its customers. A company where all employees work with vigor and enthusiasm. A company that contributes to society and the community.
Quality Policy	We aim for quality improvement and continuous improvement with all employees, giving first priority to products that please our customers.

Business Sites

■...SNR's business sites
●...Group company's business sites

Headquarters

1-4-1, Futsukaichi Minami,
Chikushino-shi, Fukuoka,
818-0057, JAPAN
Tel. +81-92-929-3444

Tokyo branch

8F, Ryuen Bldg. 1-3-1, Shibakoen,
Minato-ku, 105-0011, Tokyo, Japan
Tel. +81-3-3437-3101

Kurashiki office

2F, Esutekku Bldg. 2-1-13 , Kaigandori, Mizushima,
Kurazhiki-shi, Okayama, 712-8071, Japan
Tel. +81-86-440-0080

Osaka branch

9F, Shinanobashi Mitsui Bldg., 1-11-7,
Utsubohonmachi, Nishi-ku, Osaka, 550-0004, Japan
Tel. +81-6-6445-5107

For Inquiries

Please provide us with the following information when inquiring about a cooling tower

Primary requirement	① Circulating water volume (m ³ /h) ② Inlet water · Outlet water · Wet-bulb temperature (°C) ③ Number of cells ④ Cooling tower body specification (steel, RC, wood, FRP etc.)
Installation requirements	① Installation place, allowable area, height, power, other specifications ② Voltage, frequency, soil bearing capacity, wind pressure, earthquake, snow load, etc. ③ Installation site environment, weather conditions
Conditions	① Conditions related to noise and plume abatement ② Circulating water quality, outdoor air conditions, use application, water storage volume, etc. ③ Energy saving measures, etc.
Site conditions	① Conditions in the vicinity of the planned construction site ② Height of the proposed construction site from the ground, etc.

Contact info1@reiki-ct.co.jp



Shinnihon Reiki Co., Ltd.

1-4-1, Futsukaichi Minami, Chikushino-shi,
Fukuoka, 818-0057, JAPAN



Corporate website
<http://www.reiki-ct.co.jp/english/index.html>
E-mail
info1@reiki-ct.co.jp

