GAS COOLING SYSTEMS

TOWERCOOL™ - CYCLONECOOL™ - DUCTCOOL™ - COOLERCOOL™ - MILLCOOL™ - RAWCOOL™

Cooling Control®
gas conditioning systems

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gas conditioning systems

ABOUT

Cooling Control®

More than just an equipment supplier

sustainability based on economic, environmental, efficiency and social performance

FTR Makina Kimya Metalurji A.Ş. – Istanbul Turkey has activities and entrepreneurs in different fields including but not limited to engineering, design, fabrication as well as distribution of specialized products to domestic and worldwide markets.

One of the highly proficient subjects **FTR** deals is the gas cooling systems in cement, iron and steel, chemical, fertilizer, mining, incineration and power industries in which the sprayed liquid/water must be 100% evaporated without any wet bottom in places where gas conditioning is the part of the downstream process. The solutions for such applications require sophisticated engineering calculations as well as on-site experience to adopt the designed cooling system in to the process flow.

FTR has formed **COOLING CONTROL®** brand in 2005 to serve to the worldwide markets offering from engineering heat balance calculations, system manufacturing to installation, start-up and aftersales services.

COOLING CONTROL® engineers and technical experts are present for endusers' problems through on-site visits, calls, online meetings analysing problems and expectations in order to find most suited energy and production efficient remedies.

COOLING CONTROL® highly skilled engineering force, modern and certified production facilities ensure the highest product quality. Some of the obtained certifications in our production facility are **EN 1090-2 EXC-3, EN 3834-2, EN 13084-7, ISO 9001, ISO 18001, ISO 45001.**

Take a coffee break...

PROCESS

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COOLING CONTROL® process is mainly based on 3 steps while the cost and energy efficient, almost maintenance free and enviromentally friendly systems are designed. The close relation with the endusers enables **COOLING CONTROL®** experts to identify the actual needs of the downstream process from the point of gas conditioning so that the improvement of the present installations or new system requirements are implemented successfully.

This is what **COOLING CONTROL®** calls "Customer Oriented Solutions" rather than "Just Solutions"...

BEFORE PROJECT IMPLEMENTATION

A

- identifying and understanding the needs
- analysing, modelling and engineering calculations
- proposing solution(s)

DURING PROJECT EXECUTION

B

- final design and system manufacturing
- system delivery, on-site installation, adopting the control units
- cold and hot tests, training
- handing the system

AFTER PROJECT

C

- establishing maintenance programs
- 24/7 hotline helpdesk service
- spare part logistics management

CYCLONECOOL™

Gas cooling in top cyclones

- Return-flow single fluid water spray system
- Double Fluid water spray system
- Hybrid system (Return-flow and/or non-return flow single fluid water spray system)
-

CYCLONECOOL™ is solving;

- increase cyclone collection efficiency
- reducing recycling ratioin overall process
- problems of vibration in ID fans
- energy savings
- production increase or energy saving (subject to conditions)
- handling higher gas volumes due to reduced gas volume
- proper gas temperature reduction

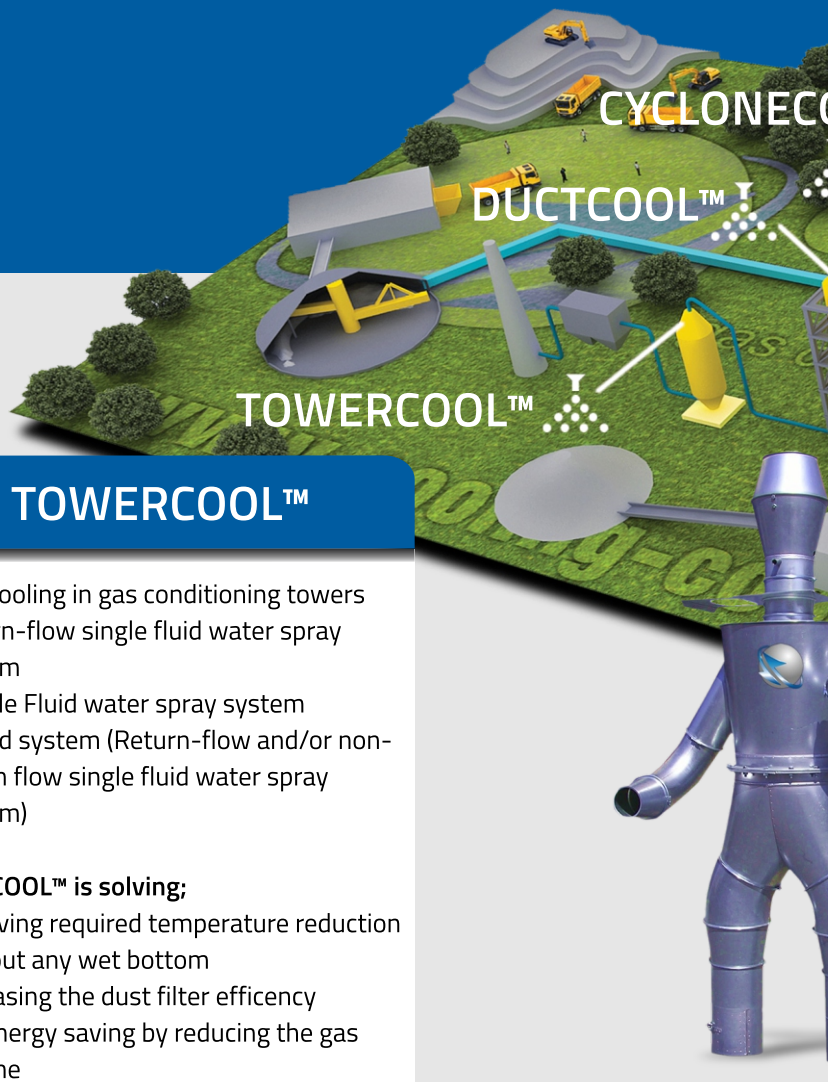
DUCTCOOL™

Gas cooling in downcomer ducts

- Double Fluid water spray system

DUCTCOOL™ is solving;

- problems of vibration in ID fans
- production increase or energy saving (subject to conditions)
- handling higher gas volumes due to reduced gas volume
- proper gas temperature reduction



TOWERCOOL™

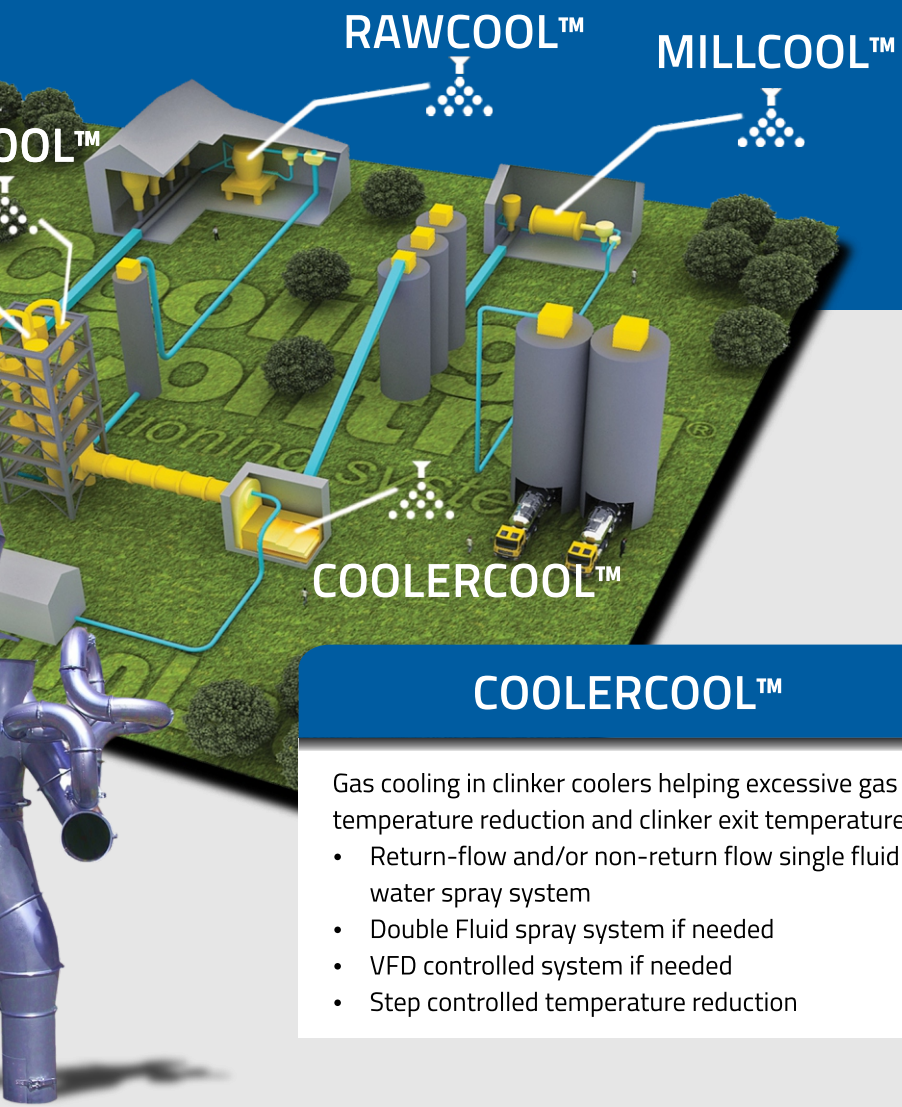
- Gas cooling in gas conditioning towers
- Return-flow single fluid water spray system
- Double Fluid water spray system
- Hybrid system (Return-flow and/or non-return flow single fluid water spray system)

TOWERCOOL™ is solving;

- achieving required temperature reduction without any wet bottom
- increasing the dust filter efficency
- fan energy saving by reducing the gas volume

COOLING CONTROL® are fully automated systems that p
efficiency, user friendly design with compact structu

The solutions of **COOLING CONTROL®** are based on tailor-m
required temperature reduction, energy saving, enviroment



MILLCOOL™

Gas cooling in horizontal ball mills,

- water injection to tube mills
- tailor made lances and connection box
- ultra fine atomisation to enable fast evaporation
- quick temperature drop
- spray towards to mill inside from 1st chamber inlet or 2nd chamber outlet
- spray towards to mill inside from intermediate diaphragm to 1st or 2nd chamber

MILLCOOL™ is solving;

- dehydration and wet clogging of gypsum
- deterioration of cement quality

COOLERCOOL™

Gas cooling in clinker coolers helping excessive gas temperature reduction and clinker exit temperature,

- Return-flow and/or non-return flow single fluid water spray system
- Double Fluid spray system if needed
- VFD controlled system if needed
- Step controlled temperature reduction

COOLERCOOL™ is solving;

- problems of instant temperature increases
- fan energy saving by reducing the air volume
- reduction the load on process filters
- reduction in clinker temperature
- problems at the pan conveyors due to higher clinker temperature

RAWCOOL™

Water injection to vertical roller mills,

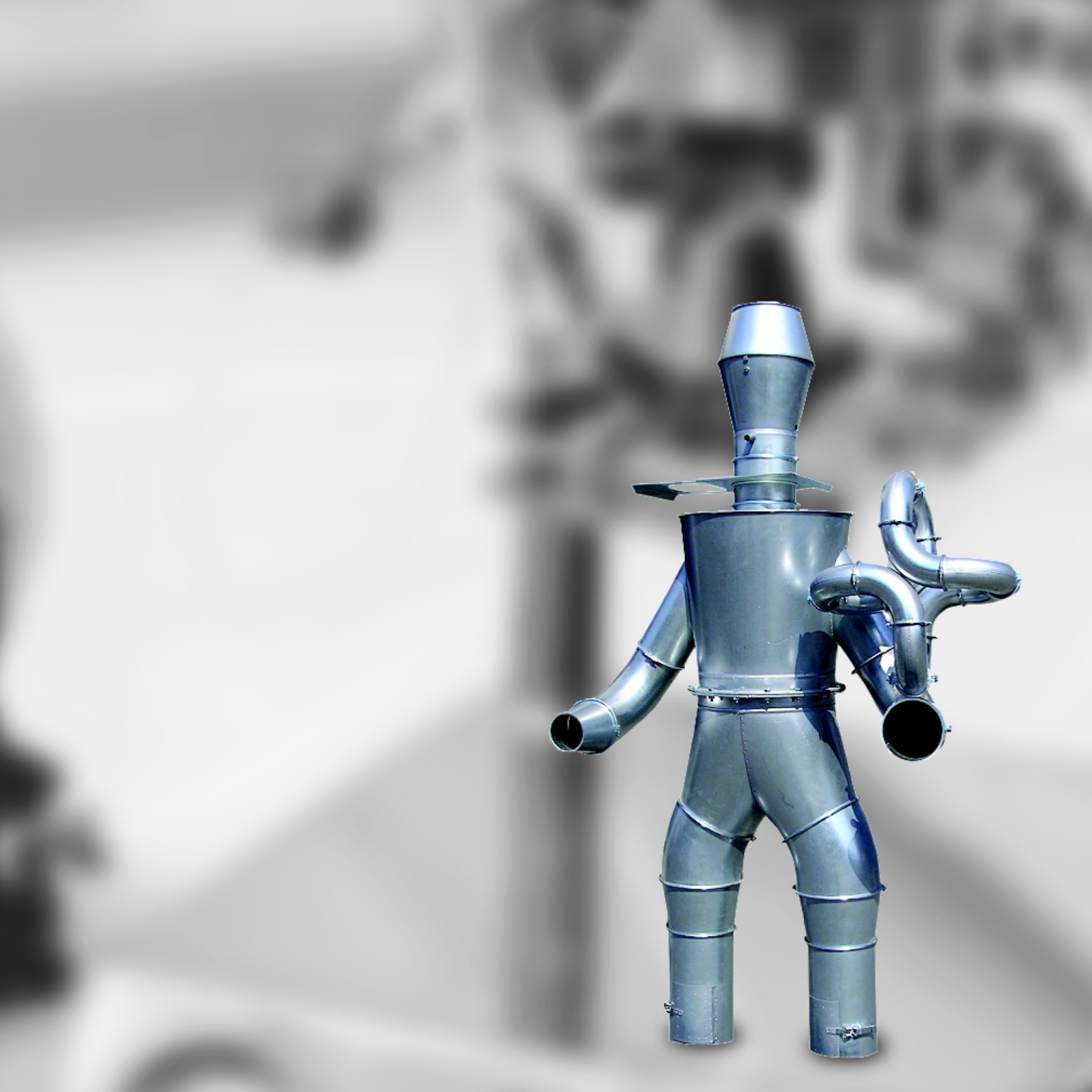
- water injection as single fluid
- homogenious spray across the table width

RAWCOOL™ is solving;

- vibration problems in the mill
- providing more stable material bed on the table

provides cost savings, reduction in maintenance, highest
ure, safer for labourers and environmentally friendly.

made in respect to enduser focused requirements while the
cal issues and opex & capex criteria are accomplished 100%.



INNOVATIONS

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COOLING CONTROL® keeps itself updated investing the research and development of new cooling technologies for gas conditioning. The R&D team is continously working on new lance and nozzle designs in order to improve the spray fineness so that the reaction length for full evaporation is minimised.

The unique design light weight quality **COOLING CONTROL®** spray lances performing with highest efficiency are the only design in the world which carry in-built filter and in-built check valve on its body.

COOLING CONTROL® introduced the gas cooling in the top cyclones to the world cement industry in 2005 as being the 1st inventor in the world. The gas cooling inside the top cyclones brings several advantages while energy saving and/or capacity increase are achieved.

COOLING CONTROL® utilises in some cases in order to maximize the quality of the spray system by introducing Variable Frequency Drive to minimise the energy required for full evaporation.

The engineering team keeps on developing new features which makes **COOLING CONTROL®** a standard-setting body for gas cooling systems.

HYBRID SYSTEMS

Hybrid gas cooling systems are the combination of return-flow lances & high performance multi orifice lances without return-flow.

Unique internal design of multi orifice nozzles maintains the droplets of ultra fine spray at an average of 150 microns which gives a quicker evaporation rate compared to full return-flow system.

The overall reaction length needed for full evaporation becomes shorter so that most of the double fluid systems can be converted to the new generation Hyrbrid Systems based on single fluid spray.

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NEW GENERATION HIGH PERFORMANCE SPRAY NOZZLES AND LANCES

COOLING CONTROL® multiple orifice nozzles are designed on a single body operating on the principle of pressurized atomization so that finer droplets are generated compared to one orifice nozzle design.

The turndown ratio of the system is achieved by the combination of control valve and two banks operation of the nozzle lances where one bank can be cut in or cut off depending on gas flow when a step temperature drop is required according to system parameters where the volume of atomized liquid is automatically controlled and adjusted within the operating range.

A droplet spectrum of virtually uniform fineness is achieved over the entire operating range. These nozzles atomize the liquids in the form of a hollow cone with a spray angle of 60°.

COOLING CONTROL® RETURN-FLOW & NON-RETURN FLOW LANCES OFFER

- Integral MICRO-BASKET strainer in S.S. material at the lance inlet
- In-built spring loaded check valve in S.S. material at the lance return-flow exit
- Latest Return-flow nozzles are 3 or 5 orifice design and hardened for longer life
- Tongue and grove type is the perfect leak sealing arrangement between the lance and mounting flange
- 3 pcs of swing type eyebolt with wing nut arrangement for clamping of the lances
- The lighest lance in the world even with the additional components, i.e. filter & check valve on the lance
- Precisely machined nozzles for optimum performance and wear resistance
- Pre-wired, pre-piped components for lower cost installation and commissioning
- Highest quality components with easy maintenance and low pressure drop
- User and enviromentally friendly, work safety for users.

Gas Cooling in TOP CYCLONES

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The hot gas is naturally used for certain purposes in the downstream process in a cement plant. It is an inevitable fact that the hot gas are cooled in different locations depending on the process flow and necessities.

The cooling of hot gas in other than downcomer duct or gas cooling tower is possible to do it inside the top cyclones to reach certain temperature drops. The gas cooling in the top cyclone, C**YCLONECOOL™,** purely means great deal of energy saving and/or production increase and reduction dust recycling ratio in the line.

The cooling water is injected close to the dipping tube against the gas flow in an absolute fine mist form to cool down the hot gas in the PH top cyclones called as **CYCLONECOOL™.**

THE ADVANTAGES OF GAS COOLING IN THE TOP CYCLONES

- The cyclone dust retention efficiency increases due to the density increase in the unit volume because of the cooled gas by moisture addition improving dust the collection efficiency
- Dust return ratio in the complete downstream process decreases by increased efficiency at the top cyclone after gas cooling
- Higher gas volumes can be handled by ID fan with the same KW due to fact that the cooled gas occupies less volume or power saving is achieved to handle the same gas volume
- It is mostly possible to eliminate fan coating and vibration problems due to the cooled gas, therefore kiln stoppages will not be an issue because of fan coating problems
- There is a great value of power saving in idle times of ID fan such as RM-OFF condition in case of ID fan is before the GCT (Gas Cooling Tower)
- The user can choose the desired temperature reduction up to delta T=150°C depending upon the process and cyclone parameters, and set these on the PLC within the calculated delta T by changing the set points giving the flexibility to the system operation.

VALUES

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CUSTOMER CARE

Our customer care programme serves you to multiple service options, such as maintenance and repair on site through our field service engineers or regular safety checks according to statutory rights. If hardware replacements are needed, our comprehensive warranty service ensures you are always covered.

MODERNISATION

We have been constantly developing new ways to upgrade our software and hardware to extend a system's lifetime, lower energy costs and increase efficiency. We will keep you updated of all relevant upgrade opportunities, based on an understanding of your business and system needs.

TRAINING AND QUALIFICATION

We offer standard and tailored customer training programmes to make sure your teams are fully qualified to operate your systems. With hands-on guidance, conducted either on-site or at **COOLING CONTROL®** locations, your teams can maintain optimal operational performance.

SPARE PARTS LOGISTICS

We guarantee spare part replacements around the world through our local partners. As a **COOLING CONTROL®** customer, you will have your own individual contact to assist you with technical inquiries, warranty issues or repair orders and to secure that your order is delivered on time.

HOTLINE SUPPORT

Our hotline support is manned **24/7** by highly trained, multi-skilled engineers all of who have at least four years of direct field experience. Most cases are solved remotely, however, should the problem require more specialised attention, a **COOLING CONTROL®** engineer will be quickly sent out.

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