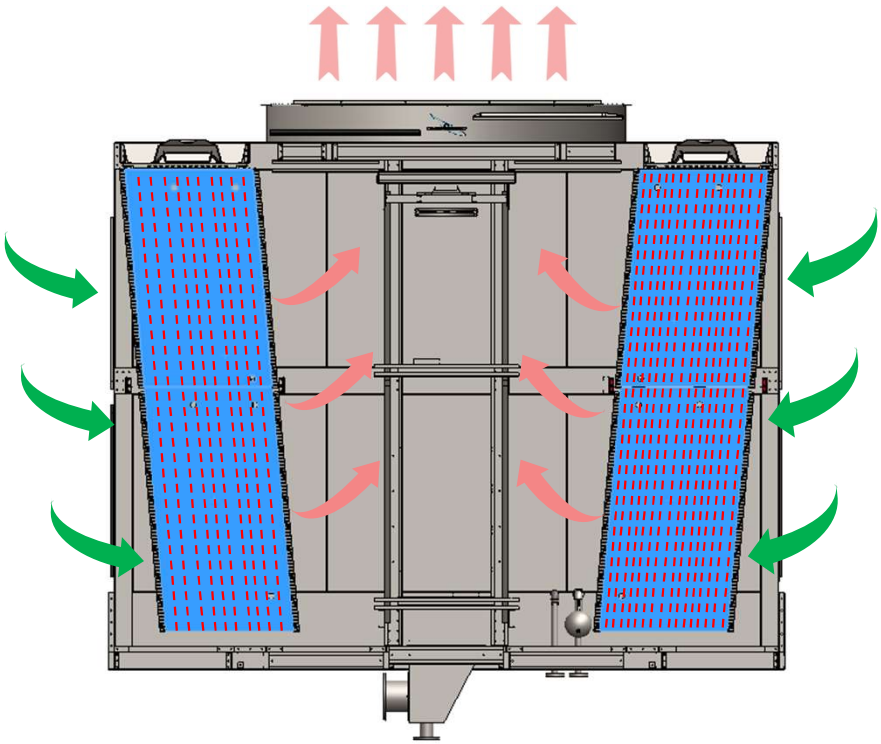
Ebara TKH Cooling Tower Advantages Features

EBARA's Cross-flow Open Cooling Tower- TKH

- Configuration: **steel tower**, **FRP tower**
- High quality **magnesium-aluminum-zinc plated steel** materials
- Maximum standard capacity of a single fan is **1,500 m^3/h**
- Performance is over 100%, and entire series has passed CTI certification
- A total of **108** models have simultaneously passed the **energy & water conservation** certification
- Non-metallic components have passed inspection & testing by the **National Fire Department**
- **FM** Certification

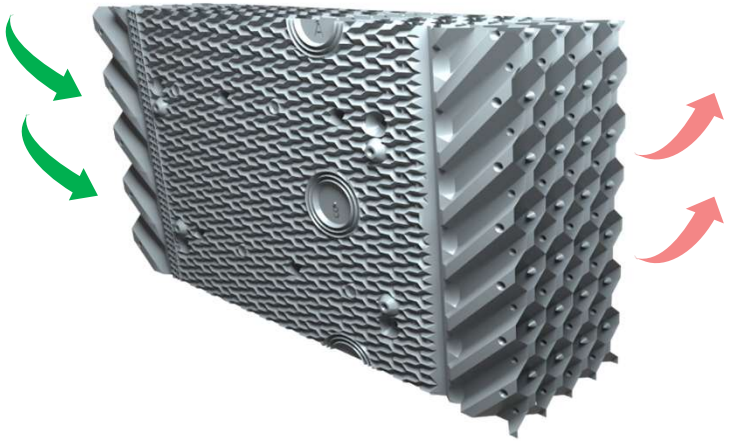
EBARA's Cross-flow Open Cooling Towers - TKH

Performance Guarantee



- **Ebara's patented herringbone corrugated filling**

  Patent No.: ZL 2022 2 3332768.8

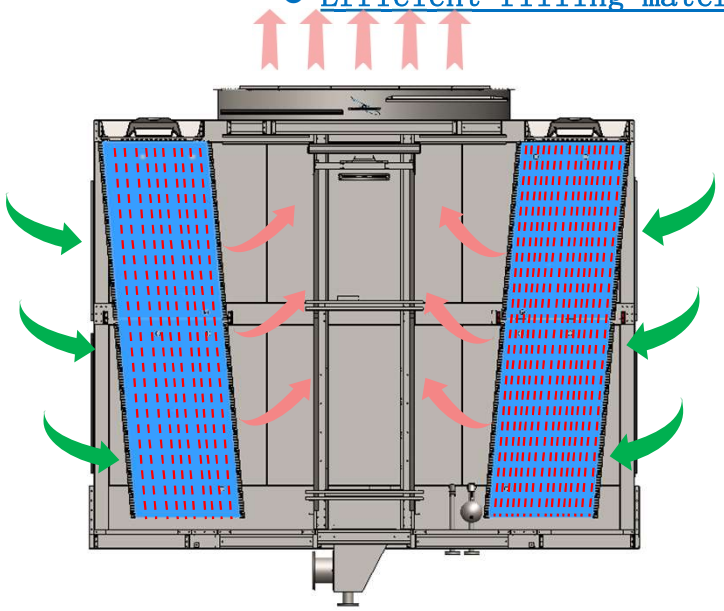


- **Slant arrangement and hanging installation** of filling to maximize heat transfer area;
- The "herringbone" corrugation provides sufficient evaporation and heat dissipation in summer, and high convective heat transfer efficiency in winter, resulting in an overall improvement of **5-10%.**
- Equipped with wind guiding and water collection device to reduce wind resistance, **Splash-proof, ice-proof**, with a water drift rate as low as 0.0002%.

EBARA's Cross-flow Open Cooling Towers - TKH

High-Efficiency Water Conservation

- Efficient filling material for inclined suspension



--**Slant Arrangement**
- The combined directions of gravity and wind force are fully considered to ensure the full utilization of the filling;
- It has better water collection performance.

-- H**anging Installation**
- It is more convenient for installation and disassembly;
- Since the adhesive is flammable and highly toxic, the suspended type can avoid potential safety hazards on site

EBARA's Cross-flow Open Cooling Towers - TKH

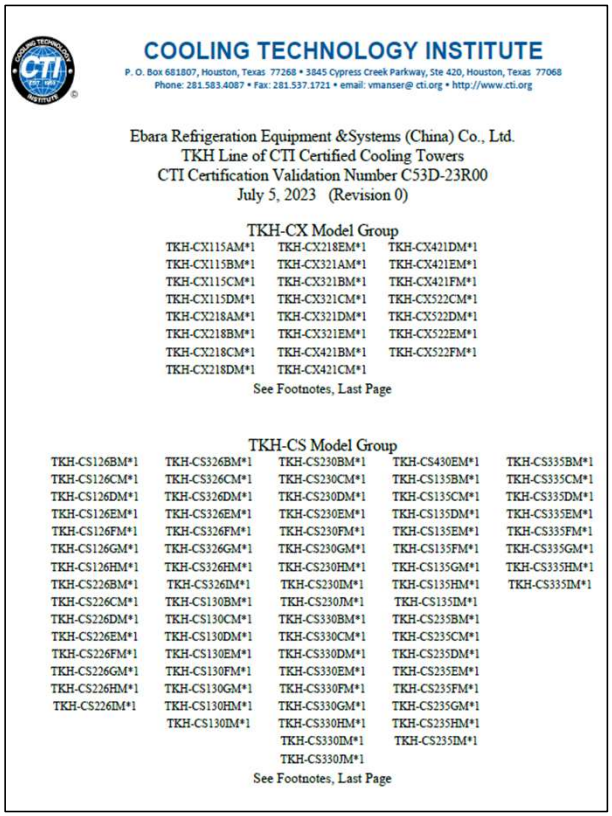
Performance Guarantee

Entire series has passed CTI certification

- CTI is the world's most authoritative third-party thermal performance certification for cooling towers;
- Entire series of Ebara cross-flow open towers have passed CTI certification, with performance reaching 100% or above;
- Optional Z700, FRP and stainless steel materials are available without affecting performance.

A guarantee for customers

- Ensure that users & operators can get a full return on their investment. Avoid disadvantage of high long-term operating costs due to insufficient equipment capacity, and this guarantee for engineering projects does not require any additional costs.



COOLING TECHNOLOGY INSTITUTE

P. O. Box 681807, Houston, Texas 77268 • 3845 Cypress Creek Parkway, Ste 420, Houston, Texas 77068
Phone: 281.583.4087 • Fax: 281.537.1721 • email: vmanser@ cti.org • http://www.cti.org

Ebara Refrigeration Equipment &Systems (China) Co., Ltd.
TKH Line of CTI Certified Cooling Towers
CTI Certification Validation Number C53D-23R00
July 5, 2023 (Revision 0)

TKH-CX Model Group

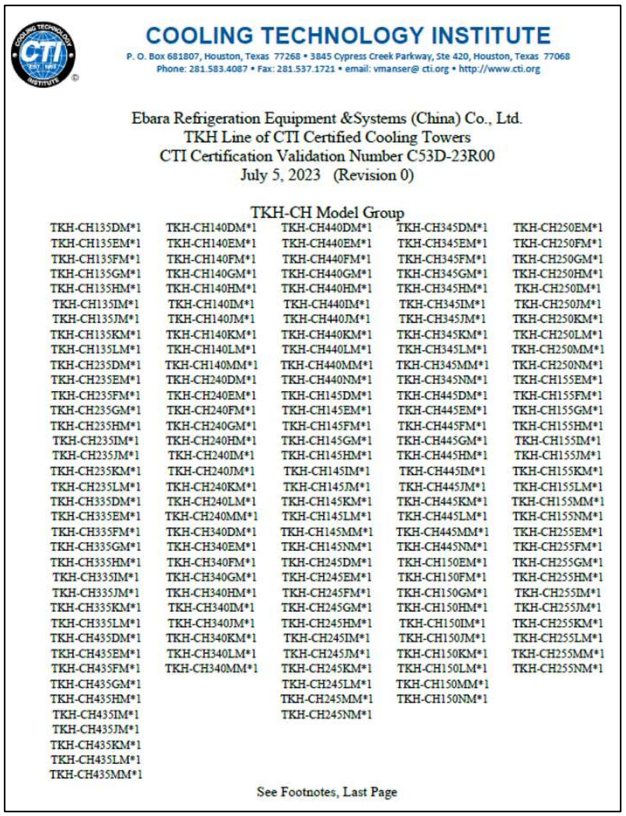
TKH-CX115AM*1	TKH-CX218EM*1	TKH-CX421DM*1
TKH-CX115BM*1	TKH-CX321AM*1	TKH-CX421EM*1
TKH-CX115CM*1	TKH-CX321BM*1	TKH-CX421FM*1
TKH-CX115DM*1	TKH-CX321CM*1	TKH-CX522CM*1
TKH-CX218AM*1	TKH-CX321DM*1	TKH-CX522DM*1
TKH-CX218BM*1	TKH-CX321EM*1	TKH-CX522EM*1
TKH-CX218CM*1	TKH-CX421BM*1	TKH-CX522FM*1
TKH-CX218DM*1	TKH-CX421CM*1	

See Footnotes, Last Page

TKH-CS Model Group

TKH-CS126BM*1	TKH-CS326BM*1	TKH-CS230BM*1	TKH-CS430EM*1	TKH-CS335BM*1
TKH-CS126CM*1	TKH-CS326CM*1	TKH-CS230CM*1	TKH-CS135BM*1	TKH-CS335CM*1
TKH-CS126DM*1	TKH-CS326DM*1	TKH-CS230DM*1	TKH-CS135CM*1	TKH-CS335DM*1
TKH-CS126EM*1	TKH-CS326EM*1	TKH-CS230EM*1	TKH-CS135DM*1	TKH-CS335EM*1
TKH-CS126FM*1	TKH-CS326FM*1	TKH-CS230FM*1	TKH-CS135EM*1	TKH-CS335FM*1
TKH-CS126GM*1	TKH-CS326GM*1	TKH-CS230GM*1	TKH-CS135FM*1	TKH-CS335GM*1
TKH-CS126HM*1	TKH-CS326HM*1	TKH-CS230HM*1	TKH-CS135GM*1	TKH-CS335HM*1
TKH-CS226BM*1	TKH-CS326JM*1	TKH-CS230JM*1	TKH-CS135HM*1	TKH-CS335JM*1
TKH-CS226CM*1	TKH-CS130BM*1	TKH-CS230JM*1	TKH-CS135JM*1	
TKH-CS226DM*1	TKH-CS130CM*1	TKH-CS330BM*1	TKH-CS235BM*1	
TKH-CS226EM*1	TKH-CS130DM*1	TKH-CS330CM*1	TKH-CS235CM*1	
TKH-CS226FM*1	TKH-CS130EM*1	TKH-CS330DM*1	TKH-CS235DM*1	
TKH-CS226GM*1	TKH-CS130FM*1	TKH-CS330EM*1	TKH-CS235EM*1	
TKH-CS226HM*1	TKH-CS130GM*1	TKH-CS330FM*1	TKH-CS235FM*1	
TKH-CS226JM*1	TKH-CS130HM*1	TKH-CS330GM*1	TKH-CS235GM*1	
	TKH-CS130JM*1	TKH-CS330HM*1	TKH-CS235HM*1	
		TKH-CS330DM*1	TKH-CS235JM*1	
		TKH-CS330JM*1		

See Footnotes, Last Page



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TKH Line of CTI Certified Cooling Towers
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July 5, 2023 (Revision 0)

TKH-CH Model Group

TKH-CH135DM*1	TKH-CH140DM*1	TKH-CH440DM*1	TKH-CH345DM*1	TKH-CH250EM*1
TKH-CH135EM*1	TKH-CH140EM*1	TKH-CH440EM*1	TKH-CH345EM*1	TKH-CH250FM*1
TKH-CH135FM*1	TKH-CH140FM*1	TKH-CH440FM*1	TKH-CH345FM*1	TKH-CH250GM*1
TKH-CH135GM*1	TKH-CH140GM*1	TKH-CH440GM*1	TKH-CH345GM*1	TKH-CH250HM*1
TKH-CH135HM*1	TKH-CH140HM*1	TKH-CH440HM*1	TKH-CH345HM*1	TKH-CH250JM*1
TKH-CH135IM*1	TKH-CH140IM*1	TKH-CH440IM*1	TKH-CH345IM*1	TKH-CH250JM*1
TKH-CH135JM*1	TKH-CH140JM*1	TKH-CH440JM*1	TKH-CH345JM*1	TKH-CH250KM*1
TKH-CH135KM*1	TKH-CH140KM*1	TKH-CH440KM*1	TKH-CH345KM*1	TKH-CH250LM*1
TKH-CH135LM*1	TKH-CH140LM*1	TKH-CH440LM*1	TKH-CH345LM*1	TKH-CH250MM*1
TKH-CH235DM*1	TKH-CH140MM*1	TKH-CH440MM*1	TKH-CH345MM*1	TKH-CH250NM*1
TKH-CH235EM*1	TKH-CH240DM*1	TKH-CH440NM*1	TKH-CH345NM*1	TKH-CH155EM*1
TKH-CH235FM*1	TKH-CH240EM*1	TKH-CH145DM*1	TKH-CH445DM*1	TKH-CH155FM*1
TKH-CH235GM*1	TKH-CH240FM*1	TKH-CH145EM*1	TKH-CH445EM*1	TKH-CH155GM*1
TKH-CH235HM*1	TKH-CH240GM*1	TKH-CH145FM*1	TKH-CH445FM*1	TKH-CH155HM*1
TKH-CH235IM*1	TKH-CH240HM*1	TKH-CH145GM*1	TKH-CH445GM*1	TKH-CH155IM*1
TKH-CH235JM*1	TKH-CH240IM*1	TKH-CH145HM*1	TKH-CH445HM*1	TKH-CH155JM*1
TKH-CH235KM*1	TKH-CH240JM*1	TKH-CH145IM*1	TKH-CH445IM*1	TKH-CH155KM*1
TKH-CH235LM*1	TKH-CH240KM*1	TKH-CH145JM*1	TKH-CH445JM*1	TKH-CH155LM*1
TKH-CH335DM*1	TKH-CH240LM*1	TKH-CH145KM*1	TKH-CH445KM*1	TKH-CH155MM*1
TKH-CH335EM*1	TKH-CH240MM*1	TKH-CH145LM*1	TKH-CH445LM*1	TKH-CH155NM*1
TKH-CH335FM*1	TKH-CH340DM*1	TKH-CH145MM*1	TKH-CH445MM*1	TKH-CH255EM*1
TKH-CH335GM*1	TKH-CH340EM*1	TKH-CH145NM*1	TKH-CH445NM*1	TKH-CH255FM*1
TKH-CH335HM*1	TKH-CH340FM*1	TKH-CH245DM*1	TKH-CH150EM*1	TKH-CH255GM*1
TKH-CH335IM*1	TKH-CH340GM*1	TKH-CH245EM*1	TKH-CH150FM*1	TKH-CH255HM*1
TKH-CH335JM*1	TKH-CH340HM*1	TKH-CH245FM*1	TKH-CH150GM*1	TKH-CH255IM*1
TKH-CH335KM*1	TKH-CH340IM*1	TKH-CH245GM*1	TKH-CH150HM*1	TKH-CH255JM*1
TKH-CH335LM*1	TKH-CH340JM*1	TKH-CH245HM*1	TKH-CH150IM*1	TKH-CH255KM*1
TKH-CH435DM*1	TKH-CH340KM*1	TKH-CH245IM*1	TKH-CH150JM*1	TKH-CH255LM*1
TKH-CH435EM*1	TKH-CH340LM*1	TKH-CH245JM*1	TKH-CH150KM*1	TKH-CH255MM*1
TKH-CH435FM*1	TKH-CH340MM*1	TKH-CH245KM*1	TKH-CH150LM*1	TKH-CH255NM*1
TKH-CH435GM*1		TKH-CH245LM*1	TKH-CH150MM*1	
TKH-CH435HM*1		TKH-CH245MM*1	TKH-CH150NM*1	
TKH-CH435IM*1		TKH-CH245NM*1		
TKH-CH435JM*1				
TKH-CH435KM*1				
TKH-CH435LM*1				
TKH-CH435MM*1				

See Footnotes, Last Page

➢ EBARA's Cross-flow Open Cooling Towers - TKH

FM Certification

All Ebara TKH series cooling tower has Passed the FM certification，ensures compliance with strict safety and performance standards

FM Approvals

Certificate of Compliance

This certificate is issued for the following:

TKH Series Cooling Towers

Prepared for:

EBARA Refrigeration Equipment & Systems (China) Co Ltd
No 720 Yongda Rd, New & High Tech Zone, Fushan District, Yantai, Shandong Sheng, China

FM Approvals Class: 4930

Approval Identification: PR467212 Approval Granted: 18 June 2025

To verify the availability of the Approved product, please refer to www.approvalguide.com

Said Approval is subject to satisfactory field performance, continuing Surveillance Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.

Phillip J. Smith
VP - Manager of Materials
FM Approvals
One Technology Way
Norwood, MA 02062

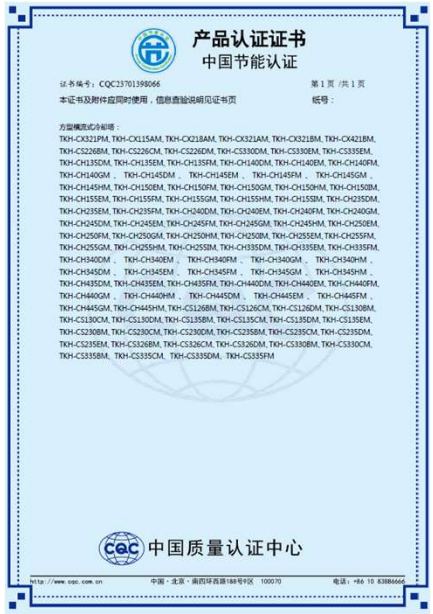
FM APPROVED

EBARA's Cross-flow Open Cooling Towers - TKH

Energy-Saving & Water-Saving

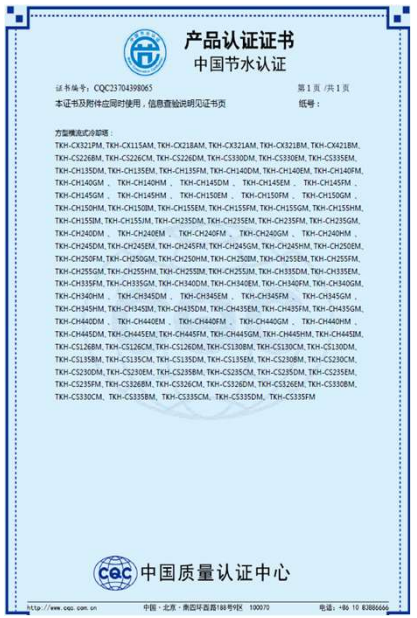
◆ Energy-saving

The Ebara Cross-flow open-tower TKH series has **108** models that have obtained the China Energy-saving Product Certification, which can meet the energy efficiency requirements of data centers, high-efficiency computer rooms and other occasions.



◆ Water-saving

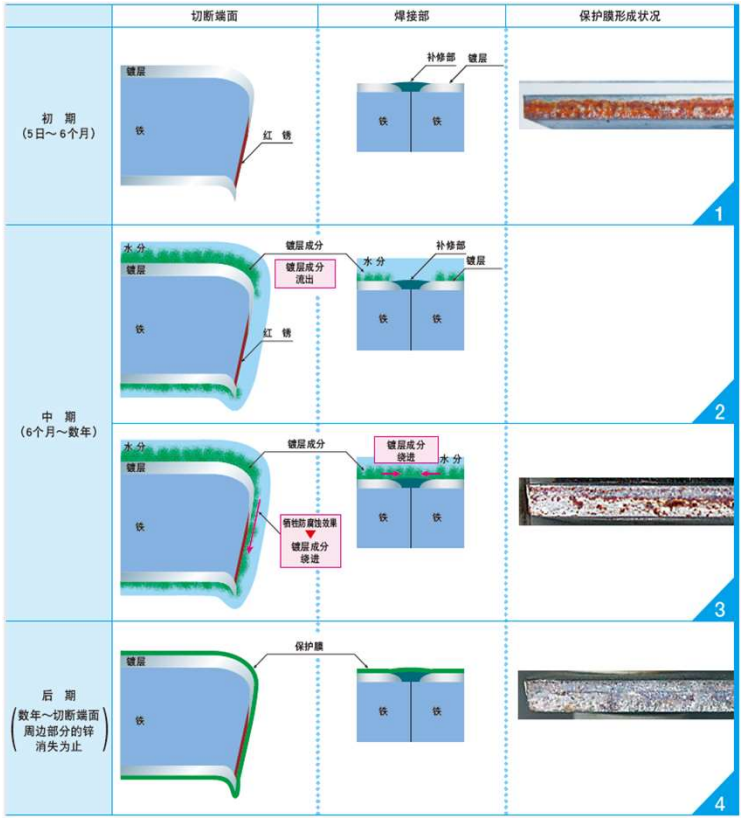
The Ebara cross-flow open-tower TKH series has **120** models that have obtained the China Water-saving Product Certification, which can meet the requirements of occasions with high water-saving demands.



EBARA's Cross-flow Open Cooling Towers - TKH

Stable Quality

- **Super corrosion-resistant magnesium-aluminum-zinc plated materials**



◆ **Coating composition：11%Al-3%Mg-0.2%Si**

Al： Oxidation passivation, delaying corrosion

Mg： Strong fluidity, healing corrosion layer

Si： High hardness and wear resistance

◆ **Super corrosion resistance**

This alloy coating is formed by high-temperature hot-dip galvanizing of zinc, aluminum, magnesium and microalloying elements. A dense protective film is formed on the surface of coating, which has strong corrosion resistance. Especially in harsh environmental conditions such as alkaline environment, marine environment and hot and humid environment, its corrosion resistance is 10 to 20 times that of ordinary hot-dip galvanized steel plates.

◆ **The coating is denser and has higher**

◆ **Self-repairing property of the coating**

EBARA's Cross-flow Open Cooling Towers - TKH

Stable and Reliable

- Super Corrosion Resistance – Magnesium-Aluminum-Zinc Plates

◆China National Center for Analysis and Testing of Nonferrous Metals and Electronic Materials

分 析 测 试 报 告

中心编号:20170501269

委托单位:甘肃酒钢集团宏兴钢铁股份有限公司

检验类别:委托检验

国家有色金属及电子材料分析测试中心
National Center of Analysis and Testing for
Non-ferrous Metals & Electronic Materials
(No.2 Xinjiekouwai Street, Beijing,100088 China)

国家有色金属及电子材料分析测试中心
分 析 测 试 报 告

中心编号：20170501269　　报告日期：2017 年 11 月 10 日

委托单位	甘肃酒钢集团宏兴钢铁股份有限公司		
联系电话	13993780879	样品名称	酒钢 SCS 镀层板
样品数量	3	规格型号	1.2×75×150mm
送样日期	2017 年 05 月 15 日	牌　号	SCS51D
检测项目	盐雾试验（NSS）		
其他信息	镀层重量：150g/m²		
以上信息由客户提供			
测试依据	盐雾试验（NSS）：GB/T 10125-2012		
备　注	/		

测试结果：

样品编号	样品原编号	盐雾试验（NSS）
001	JG050-1	3792h 试样表面出现红锈
002	JG050-2	3792h 试样表面出现红锈
003	JG050-3	3792h 试样表面出现红锈

以下空白

批准：　审核：　编制：

国家有色金属及电子材料分析测试中心
分 析 测 试 报 告

中心编号：20170501265　　报告日期：2017 年 12 月 12 日

委托单位	甘肃酒钢集团宏兴钢铁股份有限公司		
联系电话	13993780879	样品名称	酒钢 SCS 镀层板
样品数量	3	牌　号	SCS570
送样日期	2017 年 05 月 15 日	规格型号	0.8×75×150mm
检测项目	盐雾试验（NSS）		
其他信息	镀层重量：275g/m²		
以上信息由客户提供			
测试依据	盐雾试验（NSS）：GB/T 10125-2012		
备　注	/		

测试结果：

样品编号	样品原编号	盐雾试验（NSS）
001	JG010-1	4440h 时试样表面出现红锈
002	JG010-2	4800h 时试样表面出现少量轻微红锈
003	JG010-3	4800h 时试样表面出现少量红锈

批准：　审核：　编制：

VS

国家有色金属及电子材料分析测试中心
分 析 测 试 报 告

中心编号：20170501271　　报告日期：2017 年 11 月 10 日

委托单位	甘肃酒钢集团宏兴钢铁股份有限公司		
联系电话	13993780879	样品名称	镀锌板
样品数量	3	规格型号	2.0×75×150mm
送样日期	2017 年 05 月 15 日	牌　号	DX51D+Z
检测项目	盐雾试验（NSS）		
其他信息	镀层重量：700g/m²		
以上信息由客户提供			
测试依据	盐雾试验（NSS）：GB/T 10125-2012		
备　注	/		

测试结果：

样品编号	样品原编号	盐雾试验（NSS）
001	JG040-1	3528h 试样表面出现红锈
002	JG040-2	3264h 试样表面出现红锈
003	JG040-3	3528h 试样表面出现红锈

空白

批准：　审核：　编制：

Red rust first appears on the Z700 plate.

Ebara：Magnesium-Aluminum-Zinc Coated Plates

Z700 Plate

EBARA's Cross-flow Open Cooling Towers - TKH

Stable Quality

Stable and durable transmission system

Transmission system is built-in as a whole:

- Motor noise is covered inside the tower, reducing the overall noise of the cooling tower;
- The entire transmission system is supported by an internal frame, with a lower center of gravity, ensuring more stable operation.。

Belt drive:

- Imported Banto/Opet belts, with guaranteed lifespan;
- The surface of the pulley is treated with phosphating and blackening to ensure it will never rust.
- Ebara's unique four-hole bushing design makes disassembly more convenient.

Integrated bearing housing:

- The integrated fully enclosed bearing box shortens the actual on-site installation and reduces installation quality issues.
- It adopts NTI/NSK bearings imported from Japan, which are oil-free and maintenance-free, and have a service life of up to 40,000 hours.

EBARA's Cross-flow Open Cooling Towers - TKH

High-Efficiency Water Conservation

- High Efficient Dripping Technology

High-Efficiency Dripping Tech: Orifice + Water Grid Gravity Pool Distribution

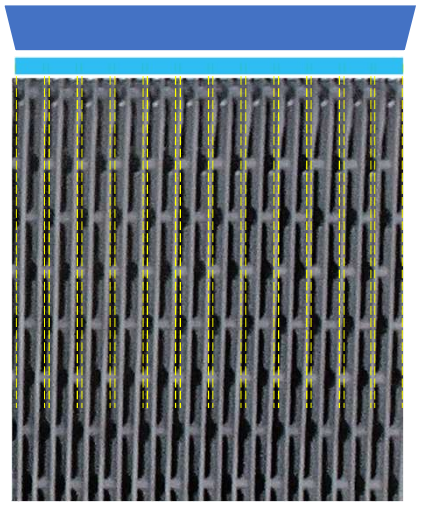
--EBARA's unique design pre-makes water into films for efficient heat exchange with filling.
--Orifice distribution: no pressure loss, anti-clogging, easy to clean.
-- It connects seamlessly with the filling, featuring a low height difference, which greatly reduces the water drift loss caused by the draft of the fan at this location.

EBARA's Cross-flow Open Cooling Towers - TKH

High-Efficiency Water Conservation

- High Efficient Dripping Technology

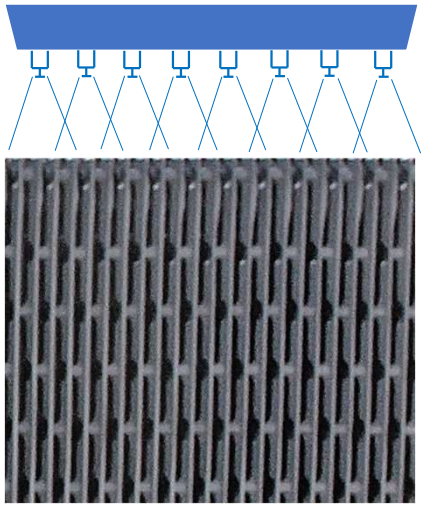
Ebara: Orifice + Water Grid Gravity Distribution



Additional increase in height difference

- There are dead zones where water cannot reach, requiring the sacrifice of part of the area.
- A large space in the atomization zone leads to an increase in water drift rate.

Others: Nozzle water distribution



① Easy to clean the water basin
② No pressure head, low pressure loss

➢ EBARA's Cross-flow Open Cooling Towers - TKH

Noise reduction operation

● Advanced noise reduction

Cooling tower full performance test bench

As shown in the picture, we are testing the noise and performance of the forward swept fan

Multiple optional ultra-low noise fans

◆ Wing type

◆ Forward swept type

◆ Large torsion angle type

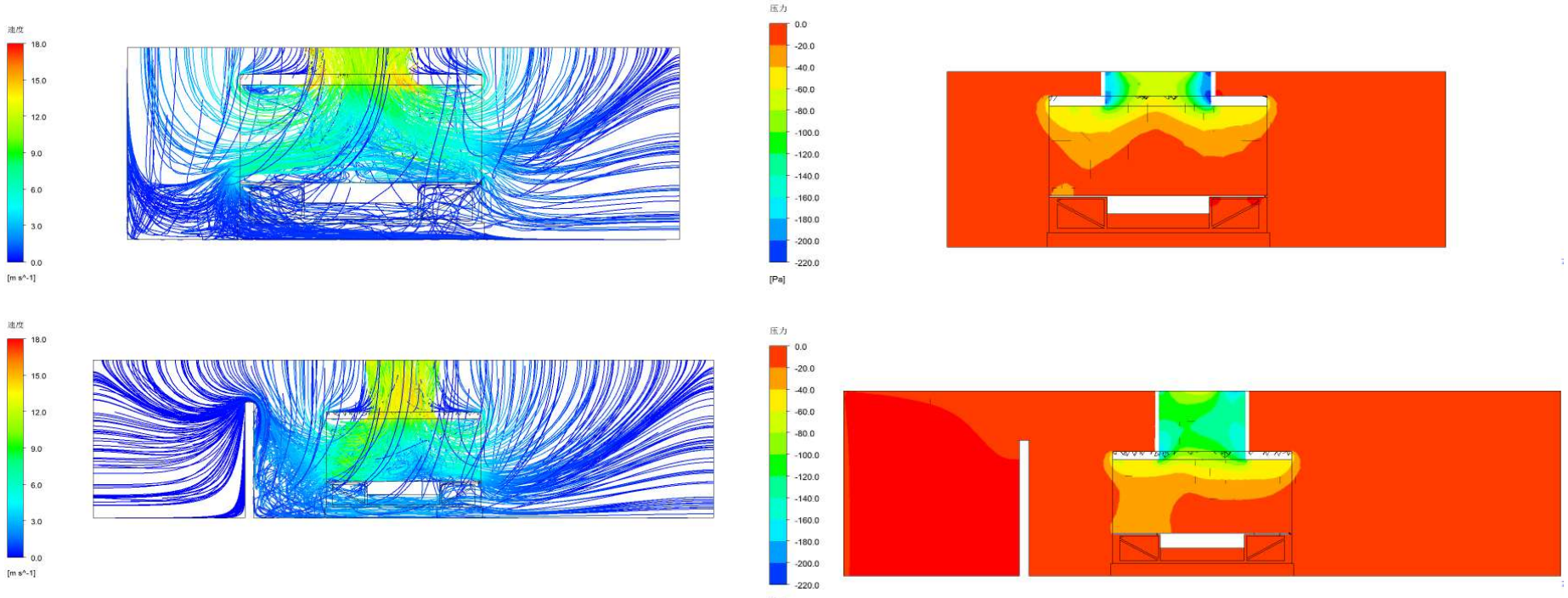
It can achieve lower and lower noise

- Brand: Credit (Test platform provided by Ebara)
- A variety of silent fans are available to fully meet the noise requirements of customers in various fields.。

EBARA's Cross-flow Open Cooling Towers- TKH

Space Saving

- **To Provide CFD (Computational Fluid Dynamics) Flow Field Analysis in a Targeted Manner**



CFD Flow Field Analysis -- Simulate the Influence of Compact Space and Placement of Multiple Modules on the Performance of Cooling Towers, and Provide the Optimal On-site Layout Scheme for Cooling Tower Performance

Thank You.

Looking ahead,
going beyond expectations

Ahead > Beyond