MIST
imitating nature

PRESENTATION ON TECHNOLOGY OF INDUCED DRAFT MIST COOLING TOWER FOR INDUSTRIAL WATER COOLING REQUIREMENT

BY

MIST RESSONANCE ENGINEERING PVT. LTD.

Pune 411002 INDIA .

Mist Ressonance Engineering Pvt. Ltd.

History

The ultimate Mist Creation Technology was invented & developed by our company's founder Late Mr. Arvind S. Chitale in 1980 and was recognized at various international platforms. Now, we have a growing family of satisfied clients spread across various countries in many industries. They are benefited by the technology rooted in Eco-friendly base, energy conservation and quality production. The systems are eco-friendly and Energy conservation is achieved at the highest level.

Board of Directors

The present Directors of the Company are :

- **Mrs. Madhuri A. Chitale : Managing Director**
- **Mr. Makarand A. Chitale : Director – Technical**
- **Mr. Bhupendra P. Shroff : Director**

Mist Ressonance Engineering Pvt. Ltd.

Member : CTI

COOLING TECHNOLOGY INSTITUTE
PO Box 73383, Houston, TX 77273 / 2611 FM 1960 Rd., W, Ste A-101 / Houston, TX 77068
Phone: 281.583.4087 / Fax: 281.537.1721 / email: vmanser@cti.org / http://www.cti.org

June 19, 2007

Mr. Makarand Arvind Chitale
Mist Ressonance Engg. (P) Ltd.
1304-1/7, Shukrawap Peth, Bajirad Road
Pune 411002 Maharashika INDIA

Dear Mr. Chitale:

It is indeed a pleasure to inform you that your application for Corporate Membership in the **Cooling Technology Institute** has been acknowledged and approved by the **Cooling Technology Institute**.

A complimentary set of **CTI** Standard Specifications and Research Reports, a membership directory, and the Bylaws are enclosed. You are now eligible to receive the updated pages of the directory once a year. Your firm will be listed in the manufacturers section of the directory with you as the voting delegate.

All employees of your firm will receive member discounts on publications and meeting fees. We encourage you to use the **CTI** logo on your letterhead, business cards and sales brochures. A copy is enclosed. The word "member" must accompany the logo.

An attractive walnut membership plaque engraved with your company name is available.

We look forward to your active participation in the meetings and committees. The next CTI Committee Workshop is scheduled for July 7-12, 2007, at The Westin, La Cantera, San Antonio, Texas. Information is posted on our website www.cti.org We hope that you will find it convenient to attend. Please call me if you have any questions, or if we may be of service to you.

Sincerely,

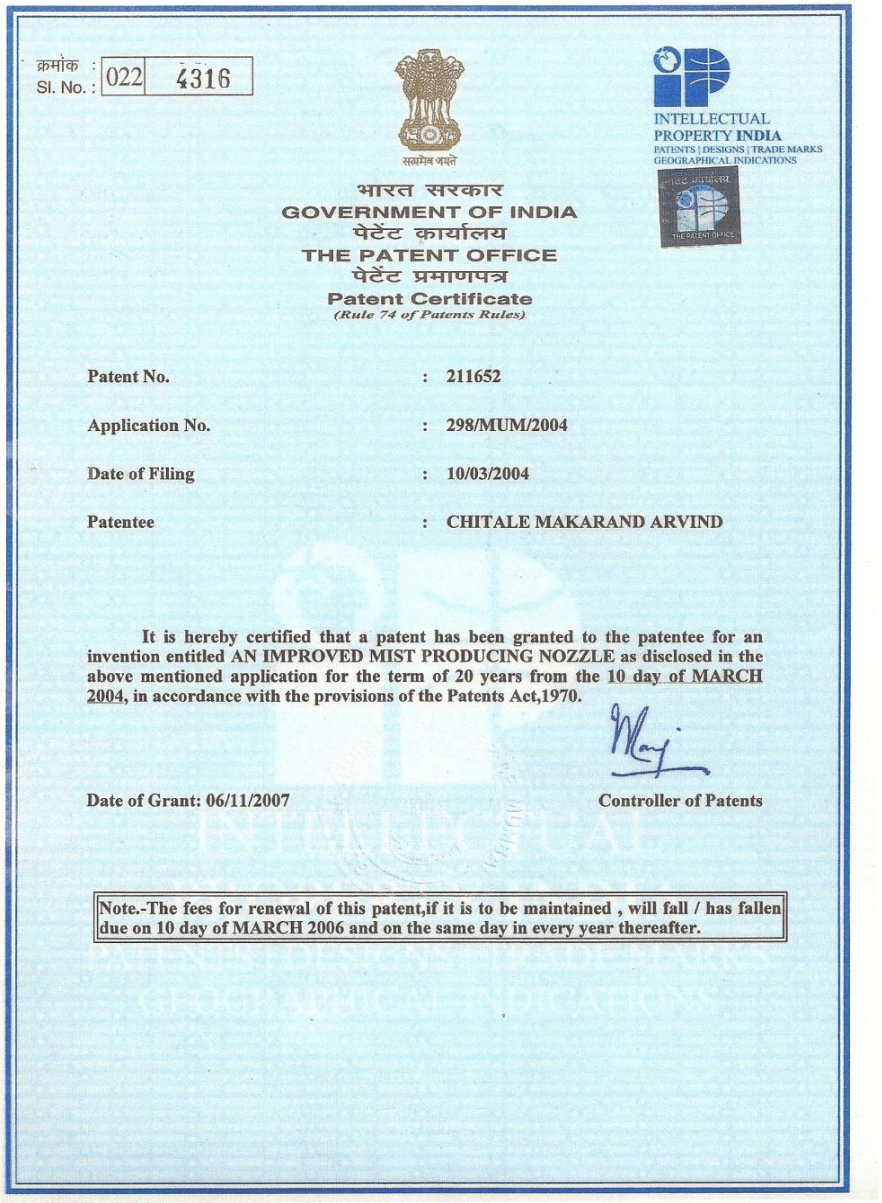
CTI Administrator

VAM/
Enclosures

cc: w/o enclosures
Steve Chaloupka, President
Thomas Bugler, Vice President
Ken Kozelski, Board Member
Frank Foster, Membership Chairperson
File

Mist Ressonance Engineering Pvt. Ltd.

Patented Technology



क्रमांक : 022 4316
Sl. No. :

सत्यमेव जयते

भारत सरकार
GOVERNMENT OF INDIA
पेटेंट कार्यालय
THE PATENT OFFICE
पेटेंट प्रमाणपत्र
Patent Certificate
(Rule 74 of Patents Rules)

INTELLECTUAL PROPERTY INDIA
PATENTS | DESIGNS | TRADE MARKS
GEOGRAPHICAL INDICATIONS

Patent No.	:	211652
Application No.	:	298/MUM/2004
Date of Filing	:	10/03/2004
Patentee	:	CHITALE MAKARAND ARVIND

It is hereby certified that a patent has been granted to the patentee for an invention entitled AN IMPROVED MIST PRODUCING NOZZLE as disclosed in the above mentioned application for the term of 20 years from the 10 day of MARCH 2004, in accordance with the provisions of the Patents Act,1970.

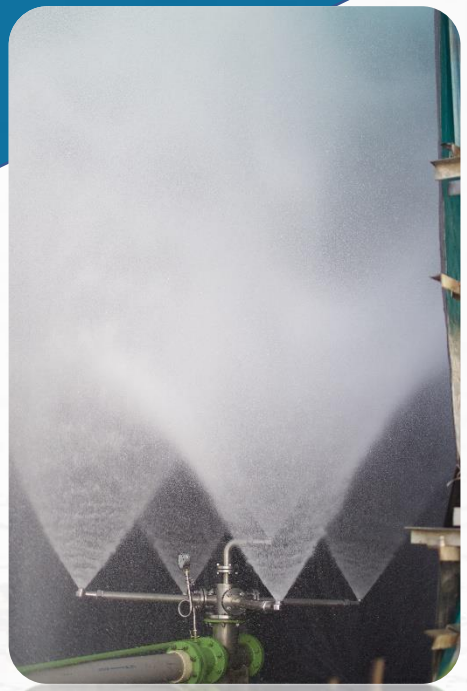
Date of Grant: 06/11/2007

Controller of Patents

Note.-The fees for renewal of this patent,if it is to be maintained , will fall / has fallen due on 10 day of MARCH 2006 and on the same day in every year thereafter.

Mist Ressonance Engineering Pvt. Ltd.

Mist Creation Technology



Mist creation induces water to intensive atomization- i.e. water particles are sub-divided to around 5 microns. The atomized particles shoot out of MIST-CREATOR nozzles at immense speed and rise to a height & travel a distance of 4 to 5 meters in fine mist form above the nozzles. This ensures extensively large surface area for a longer interval and at high velocity providing a mist formation. Surface evaporation is very fast, faster than the time needed for reaching equilibrium.

MIST COOLING SYSTEM is based on Natural Cooling Principal with very high efficiency, which ensures an approach of 1°C to Wet bulb temperature. MCS is the only system which ensures a ΔT of 50°C in one stroke. No other cooling system can operate with such efficiency & it makes cooling tower/spray pond systems obsolete.

Using the same technology, in order to optimize the plot size requirement we have successfully combined the technology of Mist Creation & Fan power to successfully developed our latest technology of Induced Draft Mist Cooling Tower (IDMCT).

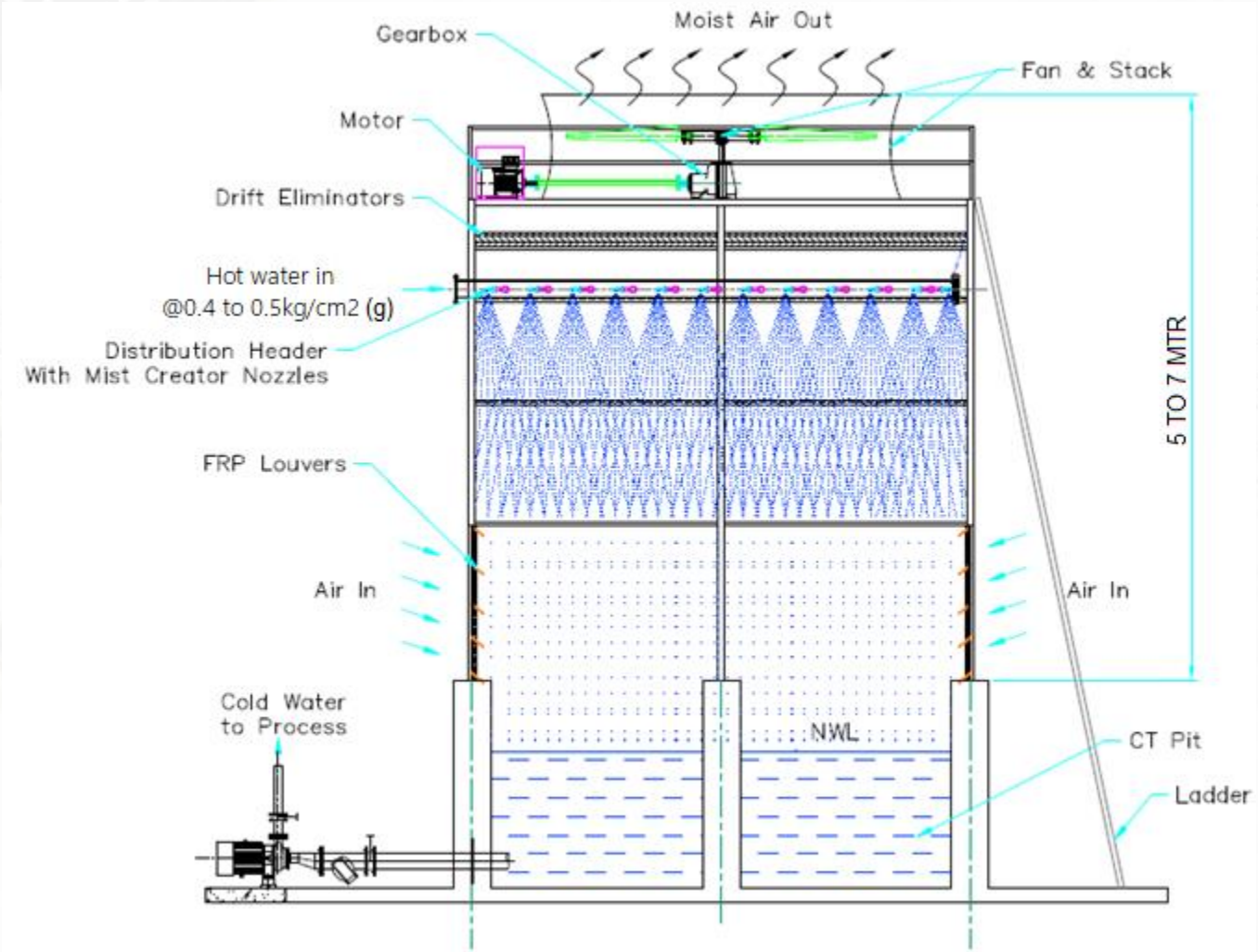
Induced Draft Mist Cooling Tower Technology

(Fill-Less Design, First time in the world)

- MREPL has invented a FILL-LESS IDMCT first time in the world to overcome the constraint of higher Foot Print required by MCS.
- Here we have combined the technology of Mist creation with Induced draft to achieve the desired effect without help of any Fills.
- Water is sprayed from nozzles in the form of fine Mist (average 50 micron), so that large surface area is available for heat and mass transfer between air and water which allows IDMCT to operate without any Fills.
- Air shall come in contact with the fine mist water particles in countercurrent direction and thus water evaporation is achieved in very short time to get desired Cold water temperature at an Approach of 3 to 4^{o}C to WBT.

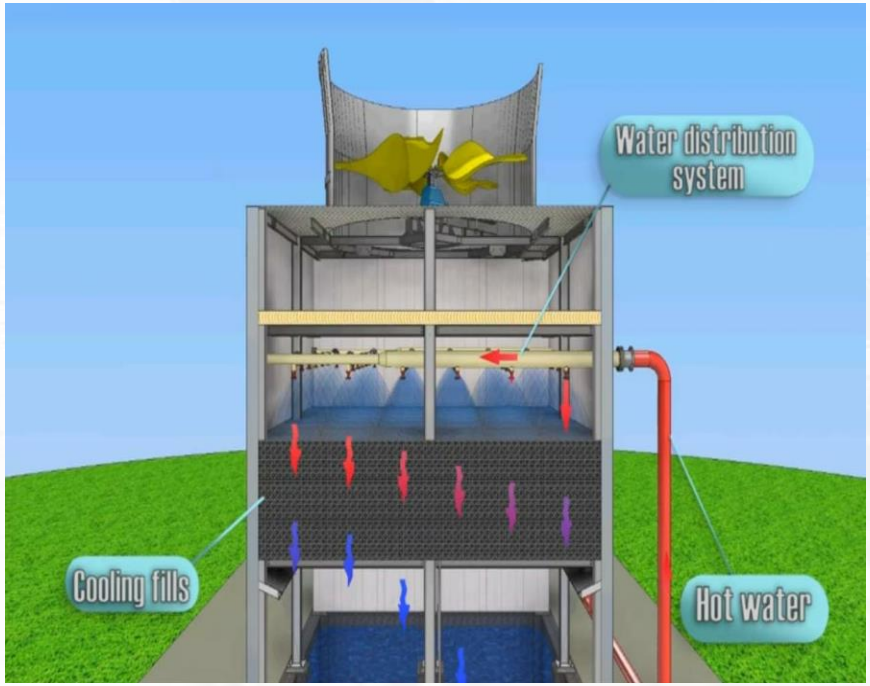
Mist Ressonance Engineering Pvt. Ltd.

General Arrangement of IDMCT



Mist Ressonance Engineering Pvt. Ltd.

INSIDE VIEW OF COOLING TOWER -



Conventional Induced Draft Cooling Tower with FILLS

Induced Draft Mist Cooling Tower with-out any FILLS

Mist Ressonance Engineering Pvt. Ltd.

Salient Features of IDMCT

- **COLD WATER TEMPERATURE**
  An approach of 3 to 4°C is ensured to design WBT with a temperature drop up to 10°C.

- **NO FILLS USED**
  IDMCT does not require any Fills. The required surface area is obtained by creation of fine mist combined with induced air through small axial fans.

- **FOOT-PRINT AREA**
  Footprint required is same as compared to Conventional IDCT.

- **SAVINGS ON FAN POWER.**
  Fan power required is reduced up to 50% due to combination of 2 technologies & minimum pressure drop across the system. This saves huge energy on cooling.

- **15 YEARS PLUS LIFE**
  Rugged structure with Pultruded FRP/ HDGI MOC and FRP casing with Stainless Steel 304 Nozzles, ensuring a life of 15 years plus. Choke less design of our Mist Creator Nozzles ensures a maintenance free operation for lifetime.

- **MAINTENANCE FREE OPERATION**
  Induced Draft Mist Cooling Towers are completely maintenance free.

- **MAKE-UP WATER REQUIREMENT**
  Due to use of latest drift eliminators, drift loss through IDMCT is limited upto 0.02%. Hence, Overall make-up water quantity is same as Conventional IDCT.

- **GUARANTEED DESIGNED PERFORMANCE EVEN IN SUMMER & MONSOON.**

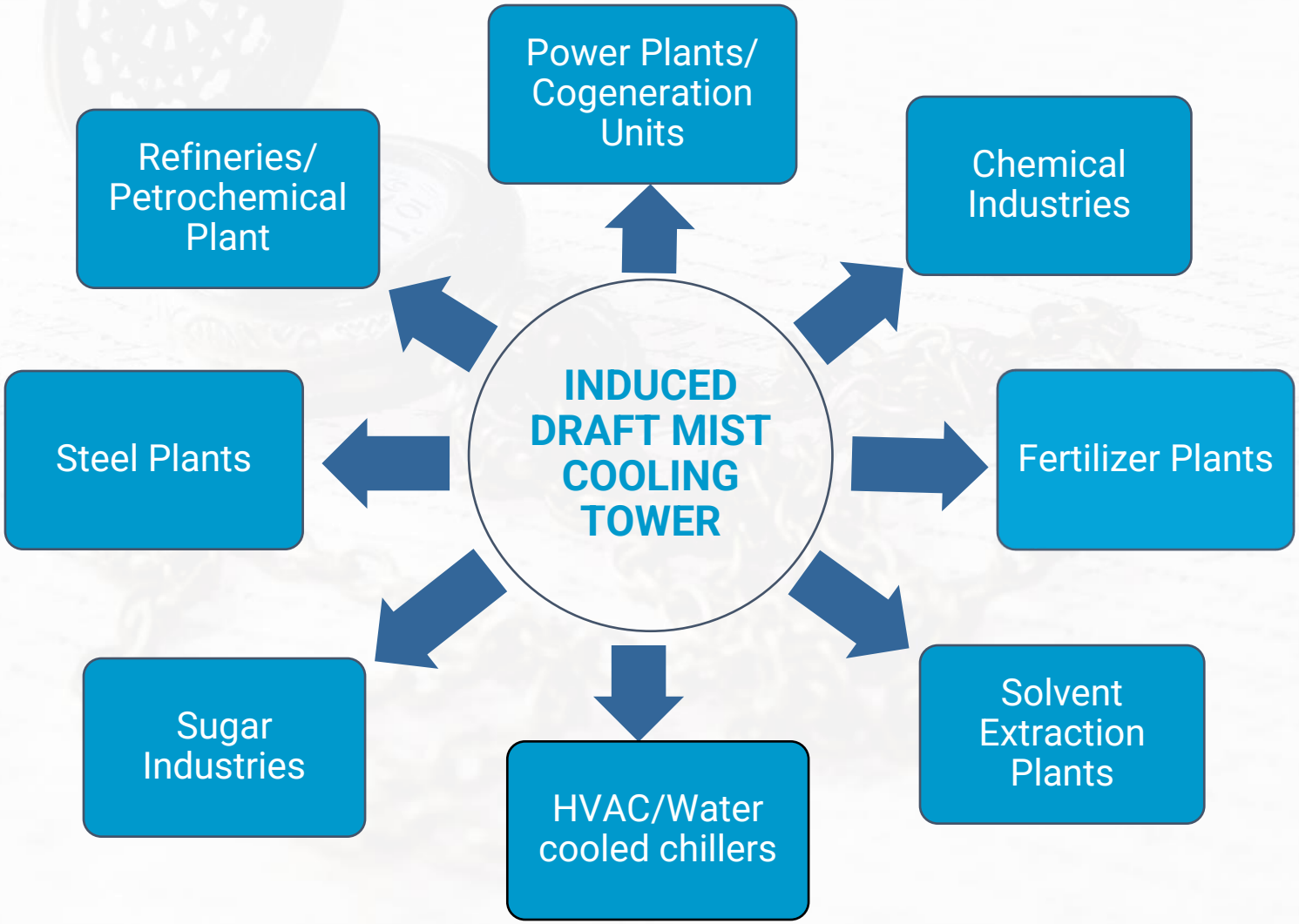
Mist Ressonance Engineering Pvt. Ltd.

GENERAL COMPARISON BETWEEN IDCT & IDMCT

SR. NO.	PARAMETER	CONVENTIONAL INDUCED DRAFT COOLING TOWER (IDCT)	INDUCED DRAFT MIST COOLING TOWER (IDMCT)
1]	Approach to Wet Bulb Temperature (WBT)	4 to 6°C	3 to 4 °C
2]	Circulation pump power consumed	Same	Same
3]	Fan Power Consumed	---	30 to 50% LESS DUE TO LOWER PRESSURE DROP ACROSS IDMCT
4]	Nozzles	Ordinary type PVC/PP which choke frequently	Special whirling type choke less design with 14 mm bore opening in SS 304 MOC
5]	Water Droplet Size	Much bigger in size	Average 50 Micron size
6]	Performance of System	Deteriorated over the period of time since scale formation takes place on surface of Fills which reduces the cooling efficiency and desired CWT is not achieved.	Consistent Performance throughout its lifetime due to Fill- less design.
7]	Fills/Fins	Various Types used- Prone to scaling, choking and need periodical replacement.	NO FILLS USED (Higher surface area obtained in comparison to fill/V-bar design due to combination of Mist and Fan technology.)
8]	Drift Loss	SAME	SAME
9]	Make up water	SAME	SAME
10]	Maintenance	Very High	Negligible
11]	**Total Footprint**	**SAME**	SAME

Mist Ressonance Engineering Pvt. Ltd.

APPLICATION OF IDMCT IN VARIOUS INDUSTRIES



Mist Ressonance Engineering Pvt. Ltd.

Our Prominent Clients

SREE RAYALASEEMA HI-STRENGTH HYPO LIMITED

INJ BOA

Grupo EL ÁNGEL
Somos más que azúcar

Schreiber Dynamix

Pantaleon
Ingenio Monte Rosa

TATA

ADITYA BIRLA GROUP

VESTRO GROUP

KAY JAY
AN IATF 16949 CO.

KAY JAY FORGINGS

vedanta
transforming for good

SIGNET GROUP

RKFL

श्री पांडुरंग सहकारी साखर कारखाना लि.
श्रीपूर, जि.सोलापूर

Rusan
A TECHNOLOGY DRIVEN ENTERPRISE

ELPPE
Crafting Enduring Partnerships

Gokul Sugar

Arihant
Oilseeds Processing

IDMCT GALLERY -

M/s. Ingenio EL Angel, S.A. DE C.V.

IDMCT GALLERY -

REFURBISHMENT OF CONVENTIONAL IDCT TO MREPL MAKE IDMCT
AT M/S. VEDANTA LTD, Jharsuguda, Odisha.

SHREE PANDURANG SSK LTD.

RUSAN PHARMA LTD FOR HVAC APPLICATION

IDMCT GALLERY -

IDMCT is getting installed at M/s. M/s. INGENIO MONTE ROSA, Nicaragua

IDMCT GALLERY -

RAMKRISHNA FORGINGS LTD.

DETOX INDIA PVT. LTD.

SCHREIBER DYNAMIX DAIRIES PVT. LTD.

3F INDUSTRIES LIMITED.

ELPPE CHEMICALS PVT. LTD.

CENTURY RAYON.

RAMKRISHNA FORGINGS LTD.

Mist Ressonance Engineering Pvt. Ltd.

Case Study of Installation of
Louver Type Mist Cooling System(LTMCS) &
Induced Draft Mist Cooling Tower (IDMCT)
at
M/S. Ramakrishna Forgings Ltd., Tatanagar.

Mist Ressonance Engineering Pvt. Ltd.

HISTORY & CASE STUDY

1. M/s. RKFL are one of the leading Forging industry based at Jamshedpur, Tatanagar Jharkhand. They manufacture open and closed die forgings of carbon and alloy steel, micro alloy steel and stainless-steel forgings.
2. M/s. RKFL has a strong client base in sectors like Automotive, Railways, Farm Equipment, Bearings, Oil & Gas, Power and Construction, Earth Moving & Mining, both in India & overseas markets.
3. To cater the requirement of cooling water for the furnaces M/s. RKFL were using Conventional Induced draft cooling towers at all their plants. However, client faced lot of difficulties to maintain the desired cooling water temperature due to frequent choking of Nozzles & fills thus affecting performance of the plant. Also due to this, plant was not able to operate at full load due to high temperature of water & frequent shut down for maintenance of cooling tower.
4. In order to reduce the cold-water temperature which was going beyond 38°C to improve the efficiency of their process and power saving, M/s. RKFL were looking for better cooling solution.

old cooling towers at M/s. RKFL

Mist Ressonance Engineering Pvt. Ltd.

Case Study of Installation of LTMCS & IDMCT at M/S. Ramakrishna Forgings Ltd.,Tatanagar.

5. M/s. RKFL contacted MREPL for evaluating the possibility of installation of MCS/IDMCT by replacing existing cooling towers.

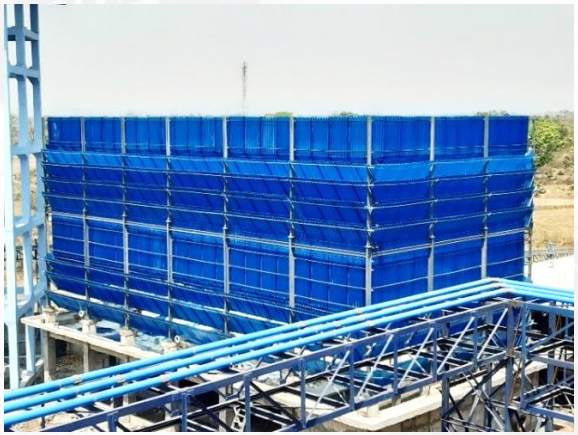
6. MREPL team visited the site where M/s. RKFL has total 7 nos. plants. As per the site feasibility LTMCS was offered for the plants which had required plot size available and for rest of the plants where plot size availability was less, IDMCT's were offered.

7. The order was finalized on MREPL & it was decided to implement the same in phases as the total requirement was for 4 nos. of MCS & 11 Nos. of IDMCT making it a total capacity of 6624 M3/hr.

8. The first 2 LTMCS were successfully commissioned in the year of 2020 & then all 11 nos IDMCT were installed, some in 2021 & some in 2022. Total 15 nos. conventional type induced draft cooling towers were removed with Mist cooling technology successfully.

Mist Ressonance Engineering Pvt. Ltd.

PHOTO GALLERY
At M/S. Ramakrishna Forgings Ltd.,Tatanagar.



Photographs of LTMCS at M/s. RKFL

Photographs of IDMCT at M/s. RKFL

Mist Ressonance Engineering Pvt. Ltd.

Case Study of Installation of LTMCS & IDMCT at M/S. Ramakrishna Forgings Ltd.,Tatanagar.

A tabular summary giving the details of earlier installed old conventional cooling tower vs new installed LTMCS/IDMCT is given below for ready reference –

Unit No-1				
Description	Requirement 1		Requirement 2	
	IDCT	IDMCT	IDCT,	IDMCT
Capacity	384 M3/hr (192 M3/hr x 2 Nos Qty)	384 M3/hr (192 M3/hr x 2 Nos Qty)	480 M3/Hr (240 M3/hr x 2 Nos Qty)	480 M3/Hr (240 M3/hr x 2 Nos Qty)
Hot Water Temperature	42°C	39°C	42°C	39°C
Cold Water Temperature	34°C /35°C	31°C /32°C	34°C /35°C	31°C /32°C
Temperature Difference	7 to 8°C	7 to 8°C	7 to 8°C	7 to 8°C
WBT	28°C	28°C	28°C	28°C
Approach	6 to 7°C	3 to 4°C	6 to 7°C	3 to 4°C
Circulation water Pump Power	SAME	SAME	SAME	SAME
Fan power	25 kW/hr	12.5 kW/hr	30 kW/hr	15.6 kW/hr
Total Power saved	-	12.5 kW/hr	-	14.4 kW/hr

Mist Ressonance Engineering Pvt. Ltd.

Case Study of Installation of LTMCS & IDMCT at M/S. Ramakrishna Forgings Ltd.,Tatanagar.

Unit No-3				
	Requirement 1		Requirement 2	
Description	IDCT	IDMCT	IDCT	IDMCT
Capacity	60 m3/hr (2 Nos Qty)	60 m3/hr (2 Nos Qty)	120 m3/hr (1 No Qty)	120 m3/hr (1 Nos Qty)
Hot Water Temperature	42°C	39°C	42°C	39°C
Cold Water Temperature	34°C /35°C	31°C /32°C	34°C /35°C	31°C /32°C
Temperature Difference	7 to 8°C	7 to 8°C	7 to 8°C	7 to 8°C
WBT	28°C	28°C	28°C	28°C
Approach	6 to 7°C	3 to 4°C	6 to 7°C	3 to 4°C
Circulation water Pump Power	SAME	SAME	SAME	SAME
Fan power	8 kW/hr	3.66 kW/hr	8 kW/hr	3.66 kW/hr
Total Power saved	-	4.34 kW/hr	-	4.34 kW/hr

Mist Ressonance Engineering Pvt. Ltd.

Case Study of Installation of LTMCS & IDMCT at M/S. Ramakrishna Forgings Ltd.,Tatanagar.

Unit No-4		
	Requirement 1	
Description	IDCT	IDMCT
Capacity	150 m3/hr (2 Nos Qty)	150 m3/hr (2 Nos Qty)
Hot Water Temperature	42°C	39°C
Cold Water Temperature	34°C /35°C	31°C /32°C
Temperature Difference	7 to 8°C	7 to 8°C
WBT	28°C	28°C
Approach	6 to 7°C	3 to 4°C
Circulation water Pump Power	SAME	SAME
Fan power	19 kW/hr	10 kW/hr
Total Power saved	-	9 kW/hr

Mist Ressonance Engineering Pvt. Ltd.

Case Study of Installation of LTMCS & IDMCT at M/S. Ramakrishna Forgings Ltd.,Tatanagar.

Unit No.- 5						
	Requirement 1		Requirement 2		Requirement 3	
Description	IDCT	IDMCT	IDCT	LTMCS	IDCT	LTMCS
Capacity	570 m3/Hr (285 M3/hr X 2 Cell)	570 m3/Hr (285 M3/hr X 2 Cell)	750 M3/Hr	750 M3/Hr	1200 m3/hr	1200 m3/hr
Hot Water Temperature	42°C	39°C	42°C	39°C	42°C	UNDER IMPLEMENTATION
Cold Water Temperature	34°C /35°C	31°C /32°C	34°C /35°C	31°C /32°C	34°C /35°C	
Temperature Difference	7 to 8°C	7 to 8°C	7 to 8°C	7 to 8°C	7 to 8°C	
WBT	28°C	28°C	28°C	28°C	28°C	
Approach	6 to 7°C	3 to 4°C	6 to 7°C	3 to 4°C	6 to 7°C	
Circulation water Pump Power	SAME	SAME	SAME	SAME	SAME	
Fan power	34 kW/hr	15 kW/hr	45 kW/hr	NIL (MCS Does not require Fan)	75 kW/hr	
Total Power saved	-	19 kW/hr	-	45 kW/hr	-	

Mist Ressonance Engineering Pvt. Ltd.

Case Study of Installation of LTMCS & IDMCT at M/S. Ramakrishna Forgings Ltd.,Tatanagar.

Unit No. - 7				
	Requirement 1		Requirement 2	
Description	IDCT	LTMCS	IDCT	LTMCS
Capacity	1500 m3/hr	1500 m3/hr	1200 m3/hr	1200 m3/hr
Hot Water Temperature	42°C	UNDER IMPLEMENTATION	42°C	39°C
Cold Water Temperature	34°C /35°C		34°C /35°C	31°C /32°C
Temperature Difference	7 to 8°C		7 to 8°C	7 to 8°C
WBT	28°C		28°C	28°C
Approach	6 to 7°C		6 to 7°C	3 to 4°C
Circulation water Pump Power	SAME		SAME	SAME
Fan power	100 kW/hr		75 kW/hr	NIL (MCS Does not require Fan)
Total Power saved	-		-	75 kW/hr

Mist Ressonance Engineering Pvt. Ltd.

Case Study of Installation of LTMCS & IDMCT at M/S. Ramakrishna Forgings Ltd.,Tatanagar.

After installation of Mist Technology client has till date saved total Power of **183.58 kW/hr.** Hence considering a unit electric rate of Rs.8/KWH, around Rs.32,248/- per day are saved only on Power.

Thus considering 360 days of operation per year, total saving only on power by installation of Mist Technology will be around **Rs. 1,16,09,280/-** Per Annum, year after year.

Payback period of entire system was achieved in quick time. Also, when the balance 2 LTMCS get commissioned additional saving of 175 kwh will be achieved.

Since its installation the LTMCS & IDMCT's are running absolutely Smooth and trouble-free & client is very happy with results.

Recently, M/s. RKFL has placed a repeat order on us for IDMCT to be installed at M/s. JMT Auto Plants which they have taken over.

Mist Ressonance Engineering Pvt. Ltd.

Case Study of Installation of LTMCS & IDMCT at M/S. Ramakrishna Forgings Ltd.,Tatanagar.

After installation of Mist Technology client has till date saved total Power of **183.58 kW/hr.** Hence considering a unit electric rate of Rs.8/KWH, around Rs.32,248/- per day are saved only on Power.

Thus considering 360 days of operation per year, total saving only on power by installation of Mist Technology will be around **Rs. 1,16,09,280/-** Per Annum, year after year.

Payback period of entire system was achieved in quick time. Also, when the balance 2 LTMCS get commissioned additional saving of 175 kwh will be achieved.

Since its installation the LTMCS & IDMCT's are running absolutely Smooth and trouble-free & client is very happy with results.

Recently, M/s. RKFL has placed a repeat order on us for IDMCT to be installed at M/s. JMT Auto Plants which they have taken over.

CASE STUDY FOR REFURBISHMENT OF CONVENTIONAL INDUCED DARFT COOLING TOWER (IDCT) TO INDUCED DRAFT MIST COOLING TOWER (IDMCT)

AT M/S. VEDANTA LTD, Jharsuguda, Odisha.

VARIOUS DESIGNED PARAMETERS / OPERATING PARAMETERS BEFORE AND AFTER REFURBISHMENT

Description	Designed parameters	Old parameters Before Refurbishment (Conventional IDCT with Fills)	Parameters obtained after Refurbishment to IDMCT (Fill Less Design)
Cooling water flow	2500 m3/hr	2500 m3/hr	2500 m3/hr
Hot water temperature	42.4°C	35°C	33°C
Cold water temperature	32.4°C	29°C	27°C
Designed ambient DBT/WBT	48/ 28.4	40/ 23 to 24.5	40/ 23 to 24.5
Approach to WBT	4°C	5 to 6°C	3 to 4°C
Fan Amp / kwh	67 Amp / 43 kwh	90 Amp / 58 kwh	62 Amp / 40.10 kwh

HISTORY

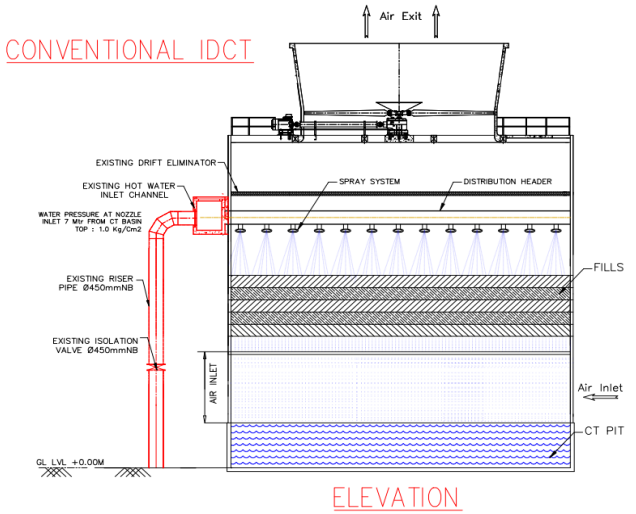
- M/S. VEDANTA LTD, Jharsuguda, Odisha is an operating company of Vedanta in aluminium and leading producer of metallurgical grade alumina and other aluminums products.
- M/S. Vedanta Ltd. were using conventional IDCTS running at water flow of 2500 M3/Hr X 4 Cells since last 20 years for their SMELTER-II plant. Due to accumulation of coal dust, frequent choking of CT PVC Fills, nozzles etc. was observed, thus deteriorating the CT performance which affected the entire operation of the plant. Also, these Fills needed frequent cleaning / replacement every.
- Due to above problems, M/S. VEDANTA LTD. were searching for better option of Fills when we at MREPL reached their plant and explained about unique technology of Induced Draft Mist Cooling Tower (IDMCT) which does not require any fills. In IDMCT, the required surface area for cooling is generated by mist of our patented Mist Creator Nozzles, thus eliminating the necessity of Fills.

Existing IDCT

- MREPL studied the design of existing Timber construction, Counter Flow cooling tower & suggested refurbishment of existing IDCT to IDMCT.
- M/s. Vedanta Ltd. has total 4 cells of IDCT with capacity of 2500 m3/hr per cell. Client decided to refurbish one cooling tower cell at a time by shifting the load temporarily to other three cooling tower cells. For this a total time period about 6 to 8 weeks was agreed upon.
- MREPL supplied the system in 8 weeks time & then M/s. Vedanta Ltd. Shifted the load and isolated one cooling tower cell. Following activities were carried out for refurbishment.

1) Complete Fills of existing IDCT were removed.
2) Mist/drift Eliminators were shifted upwards to get the required Mist Spray height as per MREPL design.
3) Existing spray system was replaced by our high efficiency Mist creation system with piping in HDGI & S.S 304 Mist Creator Nozzles. Mist Creation was installed at designed Hight spraying water downwards in the form of fine mist.
4) No other changes were made in existing IDCT thus keeping its structure, fan assembly, etc. as it is. However, VFD along with VFD Panel was installed for existing Fan motor .The entire activity was completed in time period of 6 weeks.

- After completion of above modification, a constant Cold-Water temperature of 27°C is maintained with approach of 3 to 4°C & temperature drop of up to 6°C which was in-line with the guarantee parameters.



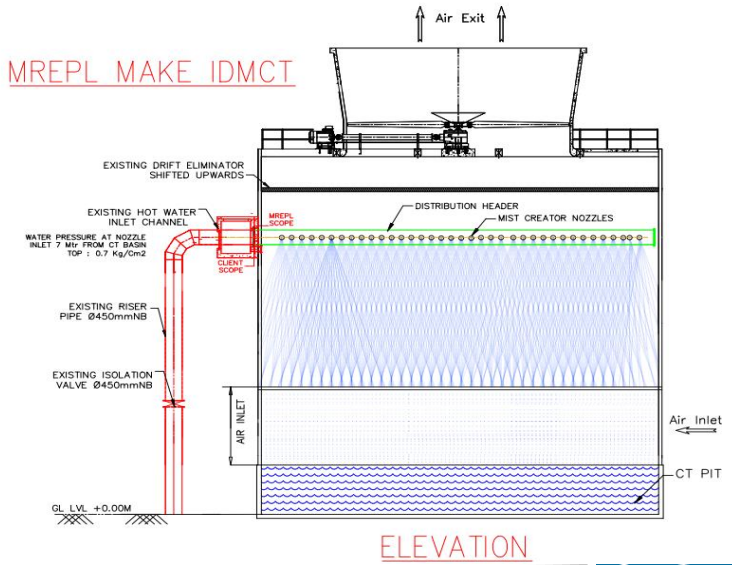


PHOTO GALLERY

OLD IDCT PICTURES AT M/S. VEDANTA LTD. BEFORE REFURBISHMENT

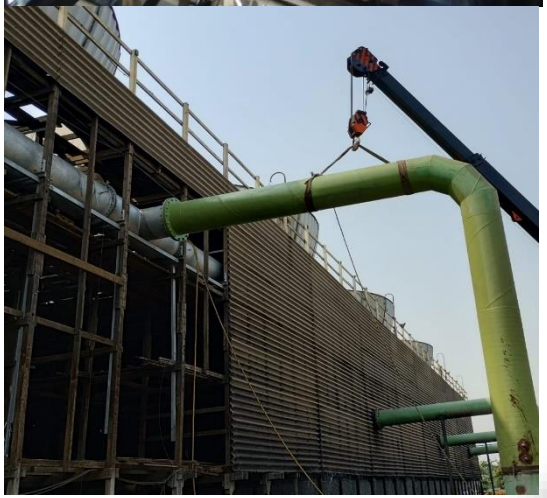
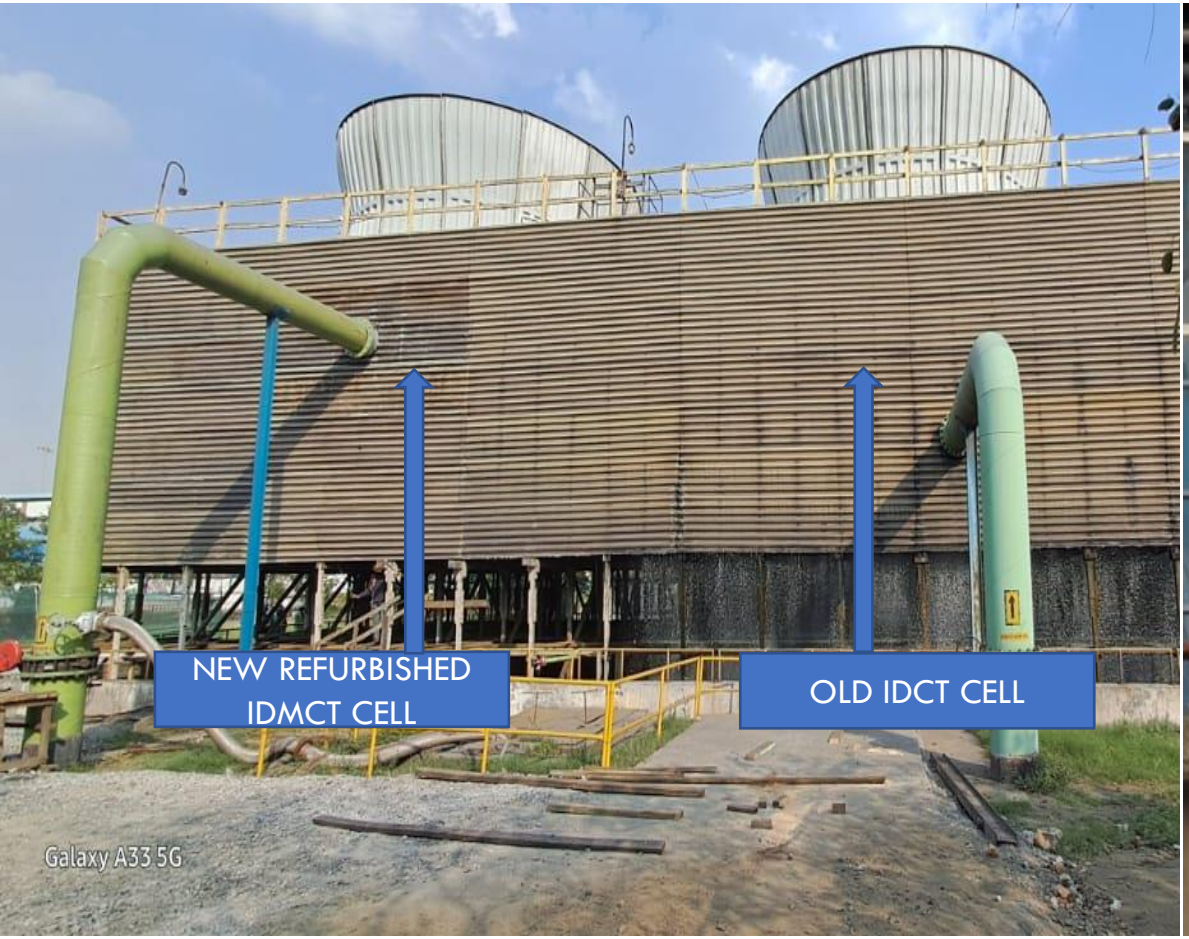
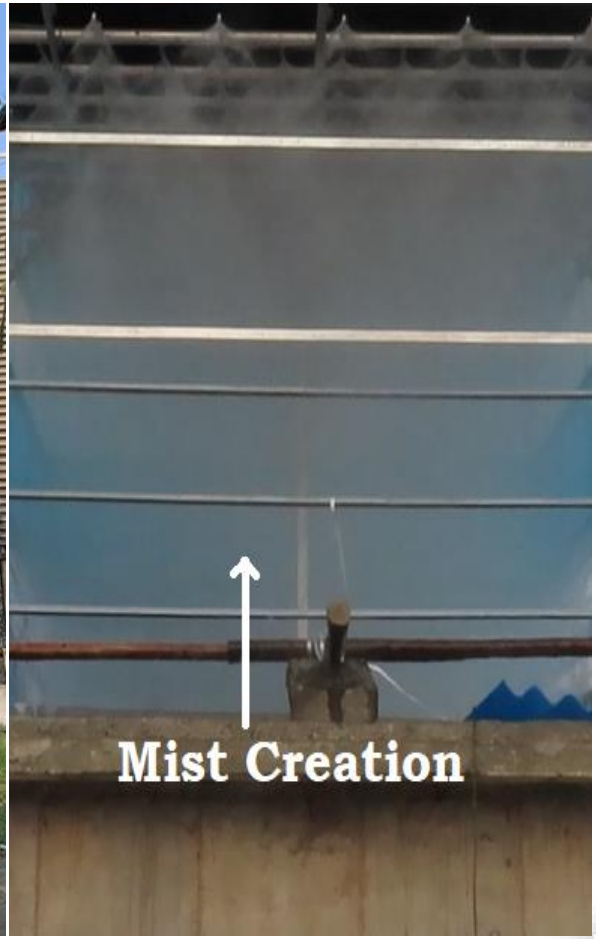


PHOTO GALLERY

NEW IDMCT PICTURES AT M/S. VEDANTA LTD. AFTER REFURBISHMENT





CONCLUSION :

- **Refurbishment of IDCT to IDMCT was carried out in a total time period of 5 to 6 weeks & it recorded remarkable improvement in performance as follows:**

1) Constant CWT of 27°C was obtained with ΔT of up to 6°C with temperature drops equivalent to conventional IDCT throughout complete trial duration.
2) Smooth and trouble-free operation of IDMCT due to absence of Fills.
3) An approximate power saving of about 30% (required Fan Power of 40.10 kwh as against 58 kwh on IDCT) on fan power was obtained due to overall reduction in pressure drop across the cooling tower due to absence of fills.
4) Client is extremely satisfied and looking forward to change/refurbish all existing IDCT's to IDMCT.

MIST
imitating nature

INDUCED DRAFT MIST COOLING TOWER (IDMCT) - 2500 m3/h

vedanta
transforming for good

MIST
Mitigating Inclusive Solutions

KEY HIGHLIGHTS

ADVANTAGES OF ID MIST COOLING TOWER

- Approach to WBT of 3°C with temperature drop of 10°C is achieved.
- IDMCT operates without Fills ensuring maintenance free operation for lifetime even for contaminated water application.
- IDMCT requires same or less area as compared to conventional cooling towers and also saves Power on Fans.
- Rugged structure with HDGI MOC and FRP casing with Stainless Steel 304 Nozzles, ensuring a life of 10 years plus.

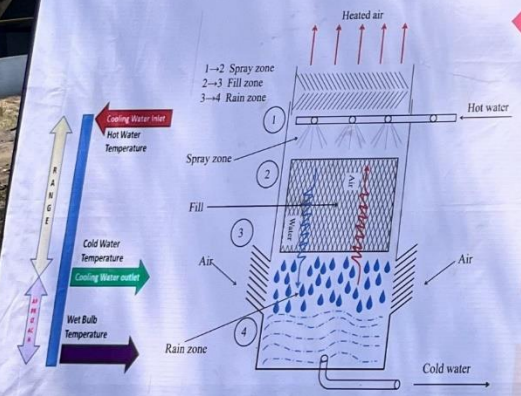
PATENTED NOZZLE TECHNOLGY

- ENERGY EFFICIENT (Upto 50% reduction in power consumption)
- IMPROVED COOLING CAPACITY (Range upto 10°C)
- REDUCED MAINTENANCE COST (No replacement of Fills required)
- ENVIRONMENTAL BENEFITS (No Disposal of used fills required)

CONVERSION ROADMAP

PROS
- Cost Effective Upto 40% cost saving considering life cycle maintenance cost
- Energy saving (4 Cells): 1080 KWH/day, 0.33 Cr/annum
- Payback Period: 7 Months
- Structure stability is high as no Fills are there.
- Environment and fire issue eliminated as fills disposal not required.

CONS
- High Initial Investment Cost

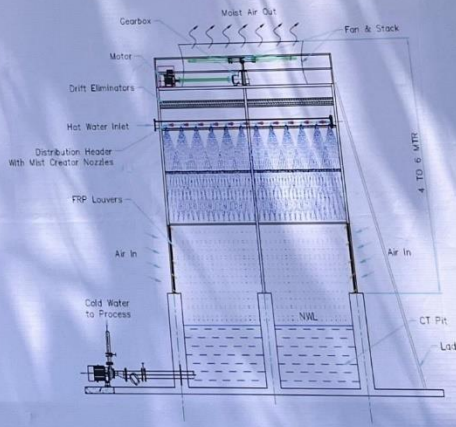


BEFORE (SCHEMATIC REPRESENTATION)

CONVENTIONAL COOLING TOWER | MIST COOLING TOWER

S.No.	Parameters	Conventional Cooling Tower	Mist Cooling Tower
1	Temperature drop (Δt)	10°C	10°C
2	Approach to Wet Bulb Temperature (WBT)	5 to 6°C	4°C
4	Nozzle	Ordinary type which chokes frequently	Special whirling type choke less design in SS304 MOC.
5	Water droplet size	1 to 2 mm (approx.)	50 Microns (avg.)
6	Fills	PVC Fills Pack	No Fills required
7	Structure Stability	Needs Periodically Inspection	High Stability as no fills are installed
8	Evaporation Loss	1.43% per 10°C cooling range	1.46% per 10°C cooling range
9	Drift Loss	0.02% of circulating water flow	0.02% of circulating water flow
10	Fills Life	3 yrs. max	15+ yrs. of reliable operation (No Fills)

DESIGN PARAMETERS COMPARISION SHEET



AFTER (SCHEMATIC REPRESENTATION)

CASE STUDY FOR REFURBISHMENT OF CONVENTIONAL INDUCED DARFT COOLING TOWER (IDCT) TO INDUCED DRAFT MIST COOLING TOWER (IDMCT)

AT M/S. Jamkhandi Sugars Ltd. (JSL), Karnataka

MIST
imitating nature

VARIOUS DESIGNED PARAMETERS / OPERATING PARAMETERS BEFORE AND AFTER REFURBISHMENT

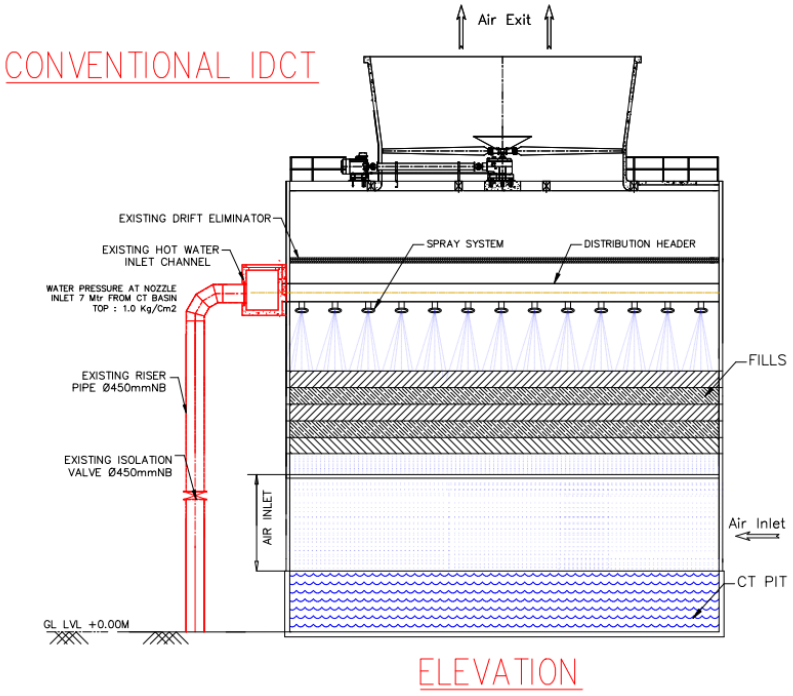
Description	Designed parameters	Old parameters Before Refurbishment (Conventional IDCT with Fills)	New parameters obtained after Refurbishment to IDMCT (Fill Less Design)
Cooling water flow	1100 m3/hr	1100 m3/hr	1100 m3/hr
Hot water temperature	43 to 45°C	50°C	45°C
Cold water temperature	33 to 35°C	40°C	33 to 35°C
Designed ambient DBT/WBT	40/28	40/28	40/28
Fan CFM / HP	55 Amp / 50 HP	58 Amp / 50 HP	48 Amp / 50 HP
Vacuum obtained at boiling house	@ around 650 mm of hg (25 to 26 inch)	@ around 525 mm of hg (20 to 21 inch)	@ around 650 mm of hg (25 to 26 inch)

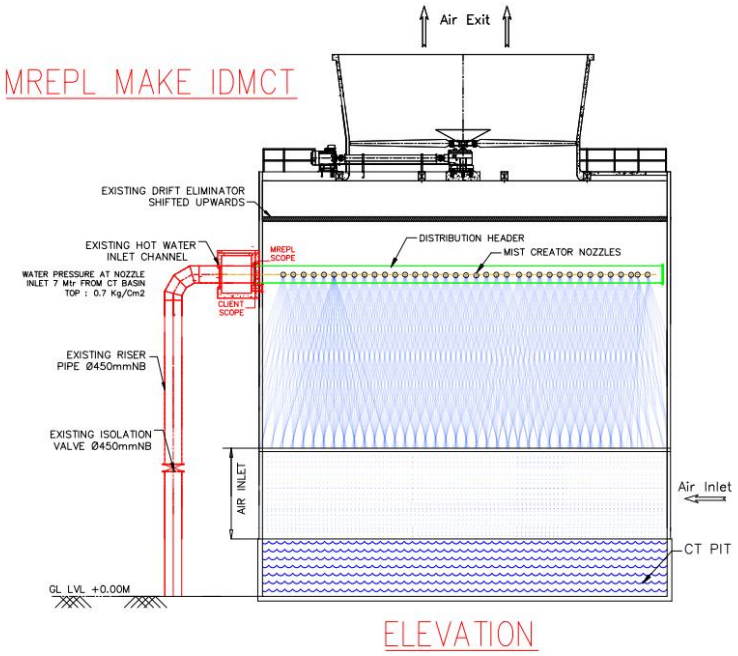
HISTORY

- M/S. Jamkhandi Sugars Ltd. (JSL) is a renowned sugar industry group located in Karnataka and has many plants operational.
- M/S. JSL were using conventional IDCTS running at water flow of 1100 M3/Hr since year 2020 for their juice to ethanol evaporator bodies. Due to dust & contaminated water, client were experiencing choking/clogging of CT PVC Fills, nozzles etc. and frequent cleaning was required. Also these fills were required to be replaced once in every 3 years.
- Due to above problems of choking, the efficiency of existing IDCT had gone down and cold-water temperature was not able to reach less than 40°C, thus Causing huge loss in production efficiency due to lower vacuum at boiling house.

Existing IDCT

- M/s. JSL were searching for better option of Fills when we at MREPL reached their plant and explained about unique technology of Induced Draft Mist Cooling Tower which does not require any fills.
- The required surface area for cooling is generated by our patented Mist Creator Nozzles, thus eliminating the necessity of Fills.
- MREPL studied the design of existing RCC cooling tower & suggested M/s. JSL the refurbishment of existing IDCT to IDMCT.
- Here, you can see from photographs that complete fills where removed by MREPL team along with removal of existing conventional spray system.
- Complete piping in HDGI along with Mist creator nozzles in SS304 MOC was installed at designed height spraying water downwards in form of fine mist.





MIST
imitating nature

- Also, existing Mist/drift Eliminators were Replaced with new one & shifted upwards to get the required Mist Spray height as per MREPL design.

ELIMINATORS AT OLD IDCT

ELIMINATORS AT NEW IDMCT

- No other changes was made in existing IDCT thus keeping its structure, fan assembly, etc. as it is.
- After completion of above modification, a constant Cold-Water temperature of 33 to 35°C is maintained with a temperature drop of 10 to 12°C which was in-line with the guarantee parameters.

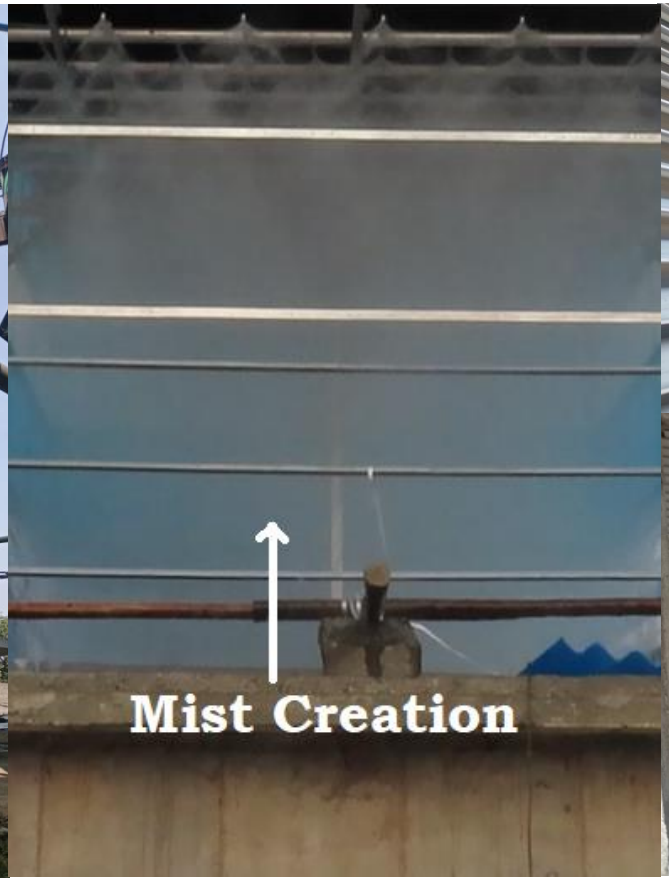
MIST
imitating nature

PHOTO GALLERY

OLD IDCT PICTURES AT M/S. JSL BEFORE REFURBISHMENT

PHOTO GALLERY

NEW IDMCT PICTURES AT M/S. JSL AFTER REFURBISHMENT



CONCLUSION :

- Refurbishment of IDCT to IDMCT was carried out in a total time period of 3 to 4 weeks & it recorded remarkable improvement in performance as follows-

  1. Constant CWT of 33 to 35°C was obtained with ΔT of 10 to 12°C.
  2. Increase in process vacuum thus increase in production capacity of the plant with better yield.
  3. Smooth and trouble-free operation of IDMCT due to absence of Fills.

- An approximate power saving of 15 to 20% on fan power was obtained due to overall reduction in pressure drop across the cooling tower due to absence of fills.

- Client is extremely satisfied and looking forward to change/refurbish all existing IDCT's to IDMCT.

MIST
imitating nature

PERFORMANCE CERTIFICATE OF IDMCT

M/s. SUGAR CORPORATION OF UGANDA LIMITED, Uganda

Sugar Corporation of Uganda Limited

An ISO 9001 & 14001 Certified Company

P.O. BOX 1, LUGAZI, UGANDA. Tel: 256-312-55 55 00, Fax: 256-312-55 52 96

Email: scoul@mehtagroup.com Website: www.mehtagroup.com

Date: 03.09.2024

To,

Mr. Makarand Chitale
Mist Ressonance Engg. Pvt. Ltd.
Bajirao Road, Shukrawar peth, Pune

Subject: Performance Certificate for Modification of Conventional Induced Draft Cooling Tower (IDCT) to Induced Draft Mist Cooling Tower (IDMCT) for our Sugar Plant at Lugazi, Uganda. Capacity: 2500 M^3/hr.

Dear Sir,

This has reference to the above subject.

M/s. SCOUL in Lugazi, Uganda, stands as the third largest sugar manufacturer in Uganda and is under the ownership of the esteemed Mehta Group from India. The company exports its sugar products to Kenya, Tanzania, Rwanda, Burundi, and the Democratic Republic of Congo.

We engaged M/s. Mist Resonance Engineering Pvt. Ltd. (MREPL) in Pune, India, to undertake the design, supply, and installation of an Induced Draft Mist Cooling Tower (Fill Less).

MREPL intricately executed the task of designing the IDMCT and successfully modified our existing IDCT to Induced Draft Mist Cooling Tower of Fill Less design for a circulation rate of 2500cmh, functioning in 1 cell.

Following a meticulous year-long monitoring of the Induced Draft Mist Cooling Tower (Fill Less), our assessment revealed good outcomes. Specifically, the temperature of cold water remained at 29°C to 32°C with an average delta temperature of 10°C-13°C.

We submit below the performance data with IDMCT in operation.

Performance Data		Proposal	IDMCT in operation Average
Flow	(m^3/hr)	2500	2500
Hot water	(°C)	42	42
Cold water	(°C)	29	29 to 32
WBT	(°C)	24	24 to 27
Operating Pressure	Kg/Cm^2 (g)	0.7	0.5
Fan power consumed	**KWH**	**68**	**66**

We can confirm the excellent product quality, consistent support, and services provided by MREPL. The implementation of the Induced Draft Mist Cooling Tower (Fill Less) has brought significant benefits.

Now, we look forward to changing one remaining cell to IDMCT shortly from you.

Thanking You,
For M/s. Sugar Corporation of Uganda Limited.

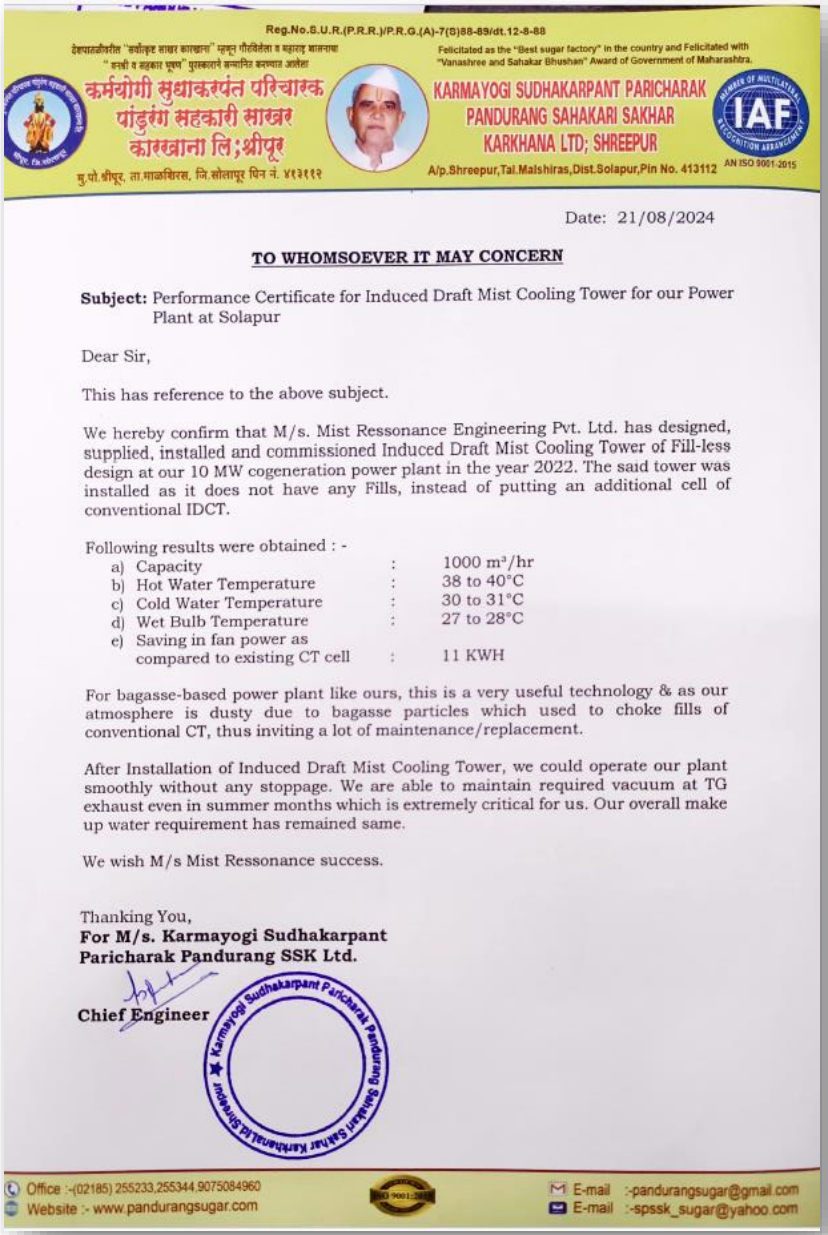
Mr. Vijay Dongare
Deputy Chief Executive Projects

SUGAR CORPORATION OF UGANDA LTD.

Kampala office: 133/135, 6th Street Industrial Area, P.O. Box 1185, Kampala UGANDA. Tel: 256-414-25 50 36 Fax: 256-414-34 75 97

PERFORMANCE CERTIFICATE OF IDMCT

M/s. SHREE PANDURANG SAHAKARI SAKHAR KARKHANA LTD., Solapur, India



Reg.No.S.U.R.(P.R.R.)/P.R.G.(A)-7(S)88-89/dt.12-8-88

देशपातळीवरील "सर्वोत्कृष्ट साखर कारखाना" मानाचा "वनश्री व सहकार भूषण" पुरस्काराने सन्मानित करण्यात आलेला

Felicitated as the "Best sugar factory" in the country and Felicitated with "Vanashree and Sahakar Bhushan" Award of Government of Maharashtra.

कर्मयोगी सुधाकरपंत परिचारक पांडुरंग सहकारी साखर कारखाना लि;श्रीपूर

KARMAYOGI SUDHAKARPANT PARICHARAK PANDURANG SAHAKARI SAKHAR KARKHANA LTD; SHREEPUR

पो.श्रीपूर, ता.माळशिरस, जि.सोलापूर पिन नं. ४१३११२

A/p.Shreepur,Tal.Malshiras,Dist.Solapur,Pin No. 413112

AN ISO 9001:2015

Date: 21/08/2024

TO WHOMSOEVER IT MAY CONCERN

Subject: Performance Certificate for Induced Draft Mist Cooling Tower for our Power Plant at Solapur

Dear Sir,

This has reference to the above subject.

We hereby confirm that M/s. Mist Ressonance Engineering Pvt. Ltd. has designed, supplied, installed and commissioned Induced Draft Mist Cooling Tower of Fill-less design at our 10 MW cogeneration power plant in the year 2022. The said tower was installed as it does not have any Fills, instead of putting an additional cell of conventional IDCT.

Following results were obtained : -

a)	Capacity	:	1000 m^3/hr
b)	Hot Water Temperature	:	38 to 40°C
c)	Cold Water Temperature	:	30 to 31°C
d)	Wet Bulb Temperature	:	27 to 28°C
e)	Saving in fan power as compared to existing CT cell	:	11 KWH

For bagasse-based power plant like ours, this is a very useful technology & as our atmosphere is dusty due to bagasse particles which used to choke fills of conventional CT, thus inviting a lot of maintenance/replacement.

After Installation of Induced Draft Mist Cooling Tower, we could operate our plant smoothly without any stoppage. We are able to maintain required vacuum at TG exhaust even in summer months which is extremely critical for us. Our overall make up water requirement has remained same.

We wish M/s Mist Ressonance success.

Thanking You,
For M/s. Karmayogi Sudhakarpant Paricharak Pandurang SSK Ltd.

Chief Engineer

Karmayogi Sudhakarpant Paricharak Pandurang Sahakari Sakhar Karkhana Ltd. Shreepur

Office :-(02185) 255233,255344,9075084960
Website :- www.pandurangsugar.com

E-mail :-pandurangsugar@gmail.com
E-mail :-spssk_sugar@yahoo.com

PERFORMANCE CERTIFICATE OF IDMCT

M/s. RAMKRISHNA FORGINGS LTD. Jharkhand, India

RAMKRISHNA FORGINGS LIMITED

PLANT : VII
PLOT NO. 1988, MOUZA DUGNI, BLOCK-SARAIKELA
PO. DUGNI, SARAIKELA, KHARSAWAN
JHARKHAND-833220 (INDIA)

Date: 28th Aug, 2024

TO WHOM SOEVER IT MAY CONCERN

Subject: Performance Certificate of Induced Draft Mist Cooling Towers designed & supplied by M/s. Mist Ressonance Engg. Pvt. Ltd. Pune for our cooling water requirement.

We M/s. Ramakrishna Forgings Ltd. located at Jamshedpur, Tatanagar Jharkhand are manufacture, exporter & supplier of open and closed die forgings of carbon and alloy steel, micro alloy steel and stainless steel forgings for Automotive sectors, Railways, Farm Equipment, Bearings, Oil & Gas, Power and Construction, Earth Moving & Mining, both in India & overseas markets.

We are glad to confirm that M/s. Mist Ressonance Engineering Pvt. Ltd. has designed, supplied, installed & commissioned Induced Draft Mist Cooling Towers of various capacities ranging from 60 m3/hr to 570 m3/hr (Total 21 Cells) at Plant 1 to Plant 7 for our cooling water requirement in the year from 2020 to 2023. Our Conventional IDCTs were not performing well & we faced lot of difficulties to maintain the desired cooling water temperature due to frequent choking of Nozzles & fills, due to coal dust present in the environment. This affected performance of our plant & there were many maintenance issues. Hence, we decided to replace our IDCT with Fill-less Induced Draft Mist Cooling Towers of MREPL Make.

After thorough analysis we decided to replace all our cooling towers to Mist technology some with Louver type Mist cooling system (Zero Fan power) and some with Induced draft Mist cooling towers, Fill less design.

The Performance of LTMCS and IDMCTs is much better than expected and the results obtained are superior than earlier.

Following benefits were obtained :

1) Constant Cold water temperature of 32 deg C with temperature drop of 8 to 10 deg C.
2) Power saving on Fans by 40% for IDMCT and 100% for LTMCS.
3) Maintenance free operation.

We are happy to state that our induction process efficiency has greatly improved. We got a Payback Period of about two years due to above benefits by installation of IDMCT.

We strongly recommend these Induced Draft Mist Cooling Towers for all type steel and forging industry due to its unique Fill-Less Design & better approach to WBT.

For Ramakrishna Forgings Ltd., Tatanagar,

For RAMKRISHNA FORGINGS LTD.

Authorized signatory.

Authorised Signatory

THE ECONOMIC TIMES INDIA'S GROWTH CHAMPIONS 2020

REGISTERED & CORPORATE OFFICE
23 CIRCUS AVENUE, KOLKATA 700017, WEST BENGAL, INDIA
PHONE : (+91 33)4082 0900 / 7122 0900, FAX : (+91 33)4082 0998 / 7122 0998, EMAIL : info@ramkrishnaforgings.com, WEB : www.ramkrishnaforgings.com
CIN NO. :L74210WB1981PLC034281

PERFORMANCE CERTIFICATE OF IDMCT

M/s. KAY JAY FORGINGS PVT. LTD., Ludhiyana, India

KAY JAY

Kay Jay FORGINGS PRIVATE LIMITED
(UNIT-I)
(An IATF - 16949 Certified Co.)
CIN : U74899DL1983PTC029298

Date : 02/09/2023

TO WHOM SOEVER IT MAY CONCERN

Subject: Performance Certificate of Induced Draft Mist Cooling Tower for your cooling water requirement.

We M/s. Kay Jay Forgings Private Limited are manufacturers, exporters & suppliers of forging parts, automobile components & precision sheet metal components for automotive sector.

We are glad to confirm that M/s. Mist Ressonance Engineering Pvt. Ltd. has designed, supplied, installed and commissioned Induced Draft Mist Cooling Tower of Capacity 420 M³/HR (210 M³/HR x 2 Cells) for our cooling water requirement in the year 2022, as our conventional IDCT was not performing & there were many maintenance issues. Hence, we decided to replace our IDCT with Fill-less Induced Draft Mist Cooling Towers.

The Performance of IDMCT is much better than expected and the results obtained are superior than earlier.

Sr. No.	Process Parameters	Conventional Cooling Tower used earlier	Induced Draft Mist Cooling Tower, Fill Less Design
1.	Capacity M³/Hr	420 M³/Hr	420 M³/Hr (210 M³/Hr x 2Cells)
2.	Design WBT (°C)	28°C	28°C
3.	Approach to WBT (°C)	5 to 6°C	4°C
4.	Cold Water Temp. (°C)	34°C	32°C
5.	Delta Temp. (°C)	4-5°C	6°C
6.	Water Circulation Pump Flow, Power & Head	Same	Same
7.	Fan Power Consumed (KW/Hr)	21 Kw/Hr	8.4 KW/Hr (4.2 KW/Hr x 2 nos.)
8.	Fan Power Saving	Nil	12.6 KW/Hr
9.	Maintenance Issues	a) Frequent damage to fills b) Choking of nozzles	Nil

We are happy to state that our induction process efficiency has greatly improved. We Anticipate a Payback Period of 1 Year considering all above benefits including trouble free operation of IDMCT.

We strongly recommend this Induced Draft Mist Cooling Tower for all type steel and forging industry for your constant cooling water requirement in dusty environment due to its unique Fill-Less Design.

Kay Jay Forgings Pvt. Ltd
(Unit-1)
C-3, & C-4, Focal Point,
LUDHIANA-141010
For Kay Jay Forgings Pvt. Ltd.

7/9/23

REGD. OFFICE : A-8, Mayapuri Industrial Area, Phase-I, New Delhi- 110 064. PHONES : 25440727, 25460303

Correspondence Address : E-2, FOCAL POINT, LUDHIANA-141 010 PH. +91-161-4687000 FAX : +91-161-2677766
E-mail : kjinfo@kayjayforgings.com Website : www.kayjayforgings.com GSTIN : 03AAACK0878P1Z9 PAN No. : AAACK0878P

WORKS : C-3 & C-4, FOCAL POINT, LUDHIANA-141 010.

INSTALLATION LIST OF INDUCED DRAFT MIST COOLING TOWER (IDMCT)

SR. NO.	FACTORY	TYPE OF INDUSTRY	NO OF UNITS	TOTAL CAPACITY	YEAR OF COMMISSIONING
1	**M/s. VEDANTA LTD,** Jharsuguda, Odisha	**Process Plant**	**1**	**2500 M3/Hr**	**2024**
2	**M/s. SUGAR CORPORATION OF UGANDA LIMITED,** P.O.Box – 1, Lugazi, Uganda	**Sugar Process Water Cooling**	**1**	**2500 M3/Hr**	**2024**
3	**M/s. INGENIO EL ANGEL. S.A. DE C.V.**	**Turbo-Generator Plant**	**2**	**1700 M^3/Hr**	**Under Implementation**
4	**M/s. INGENIO MONTE ROSA,** Nicaragua	**Power Plant**	**4**	**7,500 GPM (1702.5 M3/Hr) X 4 Nos.**	**Under Implementation**
5	**M/s. INGENIO CENTRAL AZUCARERO JIBOA** S.A. de C.V.	**Sugar Processing Plant**	**1**	**2000 M3/Hr)**	**Under Implementation**
	M**/s. NICARAGUA SUGAR ESTATES LIMITED** NICARAGUA.	**Condenser Cooling Water**	**1**	**1000 GPM (227 M3/Hr)**	**Under Implementation**
6	**M/s. SHREE PANDURANG SAHAKARI SAKHAR KARKHANA LTD.**, Shreepur Tal.: Malshiras, Dist.: Solapur	**Co-Generation Power Plant**	**1**	**1000 M^3/Hr**	**2023**
7	**M/s. JAMKHANDI SUGARS LTD.** Post, Dist, Hirepadasalagi, Jamkhandi, Karnataka	**Sugar Process Water Cooling**	**1**	**1100 M^3/Hr**	**2023**
8	**M/S. DETOX INDIA PVT. LTD.** Ankleshwar, Gujarat.	**IDMCT Installed for Effluent Cooling Requirement**	**1**	**337 M^3/Hr**	**2021**
9	**M/s. CENTURY RAYON.** Mumbai Maharashtra.	**Rayon Plant**	**1**	**410 M^3/Hr**	**2023**
		Rayon Plant	**1**	**120 M^3/Hr**	**2023**
10	**M/s. RAMKRISHNA FORGINGS LTD.** Adityapur, Jharkhand	**Forging Industry**	**10 nos. of various capacities**	**Upto 5000 M3/hr**	**2023**

INSTALLATION LIST OF INDUCED DRAFT MIST COOLING TOWER (IDMCT)

SR. NO.	FACTORY	TYPE OF INDUSTRY	NO OF UNITS	TOTAL CAPACITY	YEAR OF COMMISSIONING
11	**M/s. ARIHANT VEGOILS PRIVATE LIMITED** Latur, Maharashtra.	**Edible Oil Refinery Plant**	**2**	**100 M^3/Hr for Clean Water** **200 M^3/Hr for Dirty Water**	**2022** **2022**
12	**M/s. SCHREIBER DYNAMIX DAIRIES PVT. LTD.** Baramati Plant, Kuppam Plant.	**Dairy**	**2**	**100 M^3/Hr** **60 M^3/Hr**	**2023** **2022**
13	**M/s. ELPPE CHEMICALS PVT. LTD.** Roha, Maharashtra.	**Chemical Plant**	**1**	**200 M^3/Hr**	**2022**
14	**M/S. GOKUL SUGAR INDUSTRIES LTD.**	**IDMCT Installed for Co-generation Power Plant**	**1**	**250 M^3/Hr**	**2021**
15	**M/s. KAY JAY FORGINGS PVT. LTD.** E-2,Focal Point, Ludhiyana.	**Forging Industry**	**2**	**210 M^3/Hr**	**2022**
		Forging & Furnace Cooling UNIT-I	**2**	**210 M^3/Hr**	**Under Implementation**
16	**M/s. ECO CEMENTS LTD.** Varanasi, Utter Pradesh.	**Cement Plant**	**1**	**300 M^3/Hr**	**2023**
17	**M/s. SIGNET INDUSTRIES LTD.** Pithampur (M.P.)	**HVAC**	**1**	**450 M^3/Hr**	**2023**
18	**M/s. RUSAN PHARMA LIMITED** Mumbai - 400067, India.	**HVAC system/ Chiller system/Brine system**	**3**	**681 M^3/Hr**	**2024**
		Solvent Recovery	**1**	**75 M^3/Hr**	**2024**
		Process Condenser	**1**	**360 M^3/Hr**	**2024**
19	**M/s. ELPPE CHEMICALS PVT. LTD.** Roha, Maharashtra.	**Chemical Plant**	**1**	**200 M3/Hr**	**2023**

INSTALLATION LIST OF INDUCED DRAFT MIST COOLING TOWER (IDMCT)

SR. NO.	FACTORY	TYPE OF INDUSTRY	NO OF UNITS	TOTAL CAPACITY	YEAR OF COMMISSIONING
20	**M/S. 3F INDUSTRIES LIMITED.** Tadepalligudem AP-534101	**Edible Oil Refinery Plant**	**1**	**200 M3/Hr**	**2022**
21	**M/s. SREE RAYALASEEMA HI-STRENGTH HYPO LIMITED.** Kurnool, Andhra Pradesh	**Process Plant**	**1**	**500 M3/Hr**	**Under Implementation**
22	**M/s. VESTRO SOLVENTS PVT. LTD.** Hyderabad, Telangana.	**Process Plant**	**1**	**100 M3/Hr**	**Under Implementation**
23	**M/s. JMT Auto Ltd** Unit 1 and Unit 2 Jamshedpur.	**Forging Industry**	**3**	**300 M3/Hr (100M3/Hr X 3 Nos)**	**Under Implementation**
			2	**120 M3/Hr (60M3/Hr X 2 Nos.)**	
24	**M/s. JMT Auto Ltd** Unit 5 **Jamshedpur.**	**Foundry**	**2**	**120 M3/Hr 60M3/Hr X 3 Nos**	**Under Implementation**
25	**JMT Auto Ltd,** UNIT-III, **Jharkhand**	**Process Cooling**	**2**	**75M3/Hr X 2 Nos**	**Under Implementation**
26	**M/s. Sangir Plastics Pvt Ltd** Vapi	**Process Cooling**	**1**	**100 M3/Hr**	**Under Implementation**
27	**Bio-Energy Engineering Nagpur.**	**Starch Plant**	**2**	**125 M3/Hr. X 2 Cells**	**Under Implementation**
			1	**90 M3/Hr. X 1 Cell**	
28	**Empire Auto Pvt. Ltd., Jamshedpur**	**Process Cooling**	**1**	**180 M3/Hr. X 1 Cell.**	**Under Implementation**

For, Mist Ressonance Engg Pvt. Ltd. Pune.

MIST
imitating nature

MIST RESSONANCE ENGINEERING PVT. LTD.

Thank You!!!

OFFICE ADDRESS

"Anandi", 1304-1/7 Shukrawar Peth, Bajirao Road,

Pune - 411002, Maharashtra, India.

Tel: +9120 - 24472726, 24471184, 24474972

FACTORY ADDRESS

519 / 1, At Post Kelawade,

Pune – Bangalore Highway,

Tal – Bhor, Pune – 412213

Website: www.mistcreation.com

Email : mistcreation@gmail.com