

MIST COOLING SYSTEM

A Superior Alternative to Cooling Tower



Conserving Power...



Preserving Nature



Mist Cooling System (MCS), pioneered by us, is a revolutionary system for cooling large quantities of hot water making conventional Cooling Towers and Spray System obsolete. It enhances the process output qualitatively as well as quantitatively and makes considerable savings on energy. It has been effectively used by various industries in India and abroad for last 25 years.

Mist Resonance Engineering Pvt. Ltd. (MREPL) are pioneers in developing revolutionary Mist Cooling System (MCS), a "Green Product" which provides efficient cooling solutions to various industries. MCS cools large quantities of hot water to lowest temperatures possible, making conventional Cooling Towers and Spray Ponds obsolete. It finds applications in wide range of industries ranging from Chemical, Power, Petroleum, Oil Extraction, Sugar Factories, HAVC and any industry where water cooling plays an important role in the process.

MCS has proved to be most efficient amongst available options for the purpose, like Cooling Tower (CT) and Spray Ponds by achieving excellent results since 25 years of operation. MCS brings down the water temperature to the most desired levels irrespective of the environmental conditions. It provides increase in production both quantitatively as well as qualitatively along with savings in energy, meeting the needs at most economical level. With enormous benefits offered, it ensures a pay-back period of 1 year in most cases.



Largest MCS, open type in operation, 12000 M³/Hr



Largest LTMCS in operation, 4000 M³/Hr

SALIENT FEATURES OF MIST COOLING SYSTEM (MCS)

MCS has unmatched features. Briefly they are as follows:

COLD WATER TEMPERATURE

Mist Cooling System ensures an approach of 1°C to WBT with a temperature drop of 12°C to 15°C.

ENERGY SAVINGS (Please refer diagrams Plan A & B)

Due to such high temperature drop obtained, water quantity required at the process side is much less. MCS requires water pressure equivalent to the height of cooling tower as shown in the following diagrams. Hence, considerable amount of energy is saved on circulation water pumping. Also, MCS does not require any fans for cooling. Thus, a huge amount of energy is saved on circulation and cooling.

PROCESS BENEFITS

Mist Cooling System will supply cold water at a temperature very close to WBT (Approach of 1°C) as against an approach of 4 to 5°C in cooling tower. This will reduce the product vapour losses in shell and tube heat exchangers. This will ensure that your plant operates at an enhanced yield in summer and monsoon, also giving stable throughput throughout the year.

MAINTENANCE

MCS has no moving parts. It does not use any Fills and Fins for cooling. Also the material used in the MCS is special grade saran polymer, a highly non-corrosive material having a life of more than 10-15 years.

CHOKeless DESIGN OF NOZZLE

MCS operates with a chokeless design. Size of smallest opening in MCS is more than one inch (25 MM) in diameter. Hence chances of particles choking the system are remote.

This make MCS absolutely maintenance free.

VARIOUS DESIGNS OF MCS TO SUIT SITE CONDITIONS:

A) OPEN TYPE MCS

Here, MCS ensures an approach of 1°C to WBT with a ΔT of 12 to 15°C . Water loss due to drift is 0.1 to 0.25% depending on wind load.



B) LOUVER TYPE MCS

Here MCS basin is closed from all sides, up to a height of 6 mtrs. by louver type cover sheeting. MCS ensures an approach of 2°C to WBT with a ΔT of 12 to 15°C . Drift loss can be limited up to 0.002% and also space requirement reduces considerably.

C) TABLE TOP DESIGN TO PREVENT ALGAE FORMATION

Latest table top design does not allow formation of water level inside the basin and all water passes to suction pit which is covered from top thus minimizing chances of algae formation.

D) MCS DESIGN FOR WORKING IN DUSTY ENVIRONMENT

Unique suction pit design does not allow dust to pass to the inlet of circulation pumps. Dust is drained from drain valve, while only clear water passes to circulation water pumps.



SYSTEM FLEXIBILITY (CAPACITY TURN DOWN RATIO)

MCS is offered with individual line isolation valve. MCS is the only system, which gives such a high flexibility in operation.

HYDRO-BALANCE VALVE

Hydro- Balance Valve is provided to take care of sub-cooling, which may happen in winter & also is helpful to release excess pressure which may develop on the system at times.

CHEMICAL TREATMENT

Chemical dosing requirements are similar to that of cooling tower as same hold-up of water is maintained in suction pit of table top MCS.

MAKE-UP WATER REQUIREMENT

Due to latest "Louver Type" design, drift loss through MCS can be limited to less than 0.002%. Hence, Overall make-up water quantity required is approximately same as compared to cooling towers.

PAY BACK PERIOD

The Pay Back period of the MCS in most of the cases, will be obtained in less than ONE year only.



LTMCS installed on existing Cooling Tower pit



Terrace Top design of MCS

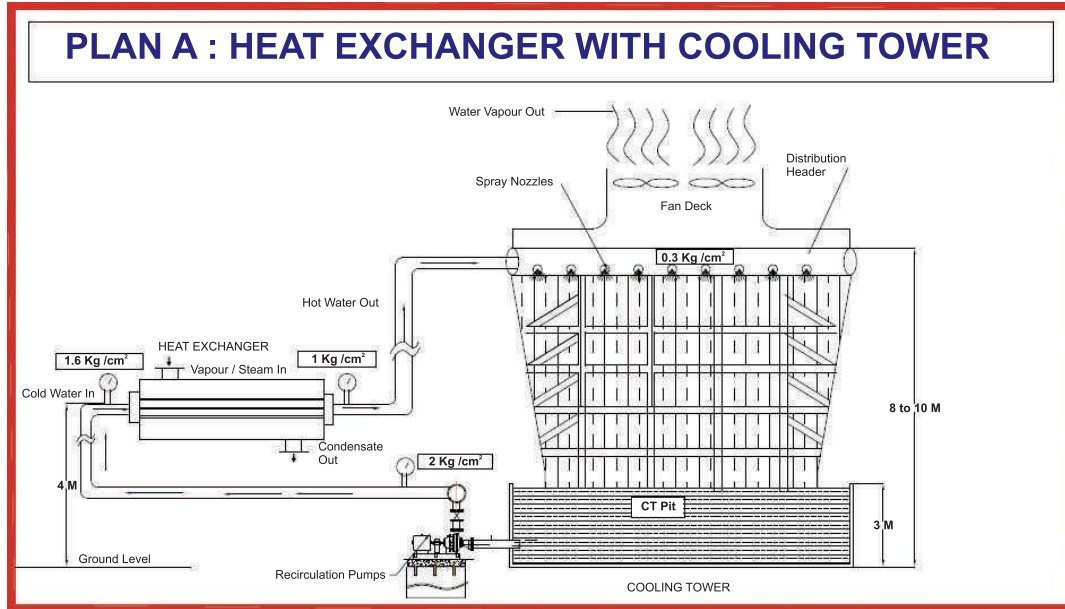


Open Type MCS design

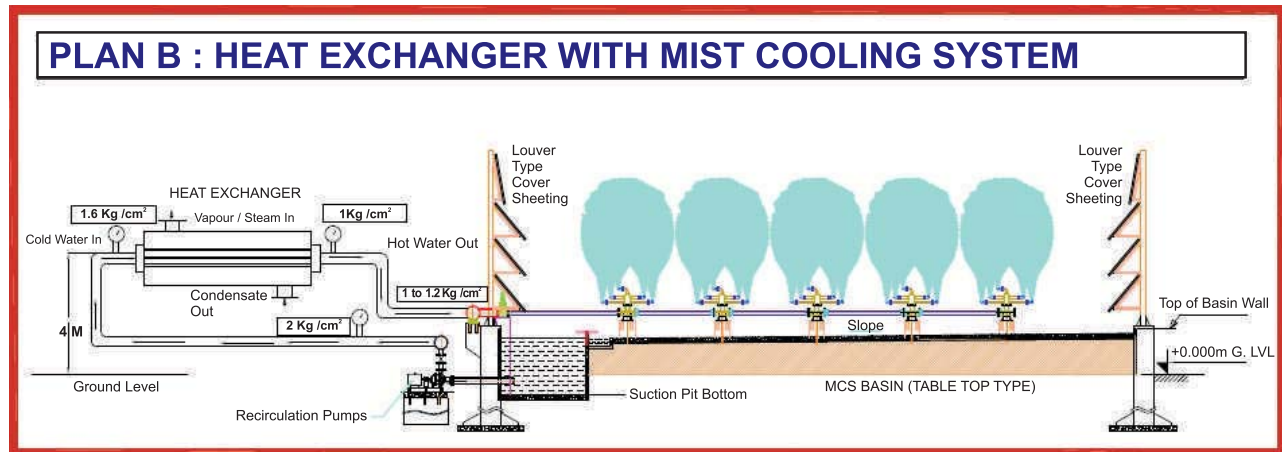


Louver Type MCS design

COMPARISON BETWEEN CIRCULATION WATER CYCLE IN INDUCED DRAFT COOLING TOWER V/S MIST COOLING SYSTEM SHOWING REQUIREMENT OF SAME INLET WATER PRESSURE FOR BOTH SYSTEMS



▲ Circulation Water Cycle in Cooling Tower



▲ Circulation Water Cycle in Mist Cooling System



MCS replacing Cooling Tower

**COMPARISON TABLE BETWEEN
INDUCED DRAFT COOLING TOWER / FAN LESS COOLING TOWER AND
LOUVER TYPE MIST COOLING SYSTEM**

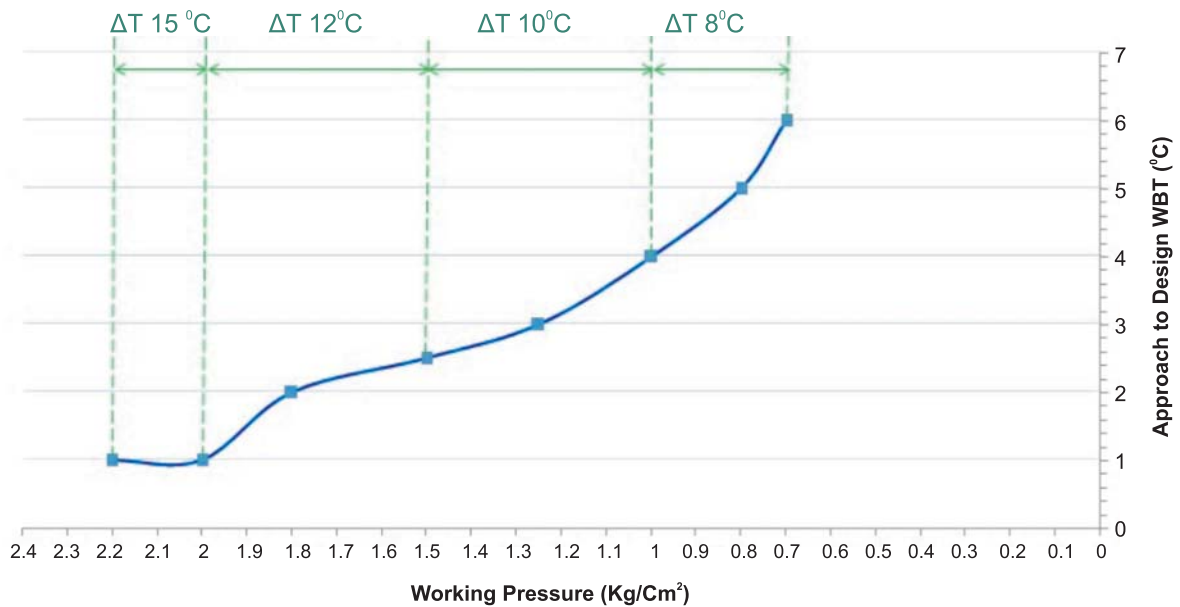
Sr. No.	Features	Induced Draft Cooling Tower (IDCT)	Fan less / Jet Cooling Tower	Louver Type Mist Cooling System
1	Approach to WBT	4 to 5° C	6 to 8° C	1 to 2° C
2	Temperature Drop	8 to 10° C	6 to 8° C	Regular : 12° C Advanced model guarantees upto 40° C in a single stroke
3	Power Consumed (Comparison for a 1000 m ³ /hr circulation flow assuming IDCT's total power as 100%)	100 HP : 100% [70 HP : 100% on Pumping and 30 HP : Fan]	100 HP : 100% [100 HP : 140% on Pumping and 00 HP : Fan]	70 HP : 70% [70 HP : 100% on Pumping and 00 HP : Fan]
4	Nozzles	Ordinary type which choke frequently	Ordinary Jet type which choke frequently	Special whirling type choke-which choke less design incorporating non-moving parts with 25 mm bore opening
5.	Water droplet size	5 mm	2 to 3 mm	Atomized to 5 to 50 Microns
6	Travel Time	Less due to Downward fall only	Less due to Downward fall only	Two time travel due to upward and downward travel leads to Double air retention time
7	Fills / Fins	Various type used - prone to scaling, need periodical changing	Various type used - prone to scaling, need periodical changing	ABSOLUTELY NO FILLS / NO FINS REQUIRED
8	Drift Loss	Same	Same	Same
9	Make up water	Same	Same	Same due to similar hold up
10	Flexibility	Limited	Limited	Individual Line Isolation offers maximum flexibility to use capacity as per requirement
11	Standby	Required	Not required	Not required
12	Erection/Delivery	Substantially high	Low	Fairly Less
13	Maintenance	Very high due to replacement of fills /fins/fan blades etc. Also due to deposition of dust on fills, efficiency reduces with time.	Very high due to replacement of fills /fins etc. Also due to deposition of dust on fills, efficiency reduces with time.	Negligible maintenance due to chokeless operation and non moving parts
14	Aesthetics	Bulky, generally neglected part in a plant	Untidy	Appears fresh and Dynamic resembling active water like fountain
15	Civil Construction	Heavy due to static and dynamic load	Less	Simple due to table top construction with static load
16	Total Footprint	Less	Higher than CT	* More by 2 to 4 times to IDCT

* Note : As capacity (Flow, m³/Hr) through MCS increases, ratio of area required between MCS and CT reduces.

TABLE GIVING ASSURED APPROACH TO WBT AT VARIOUS WORKING PRESSURE AT INLET OF MIST COOLING SYSTEM (LTMCS)

Sr. No.	Working Pressure [Kg/cm ² (g)]	Approach to design WBT (°C)	ΔT (°C) [up to]
1	0.7	6	8
2	0.8	5	8
3	1	4	10
4	1.25	3	10
5	1.5	2.5	12
6	1.8	2	12
7	2	1	12
8	2.2	1	15

Graphical Representation of Approach to Design WBT at Various Working Pressure at Inlet of MCS



Note : This is general representation, may change from case to case.





OTHER PRODUCTS FROM MREPL

- ◆ MCS as water spray support for Air Cooled Condensers
- ◆ Mist Evaporation System for Zero Liquid Discharge
- ◆ Mist Type Water Jet Vacuum System

OUR PROMINENT CLIENTS

- ◆ Haldia Petrochemicals Ltd., Haldia
- ◆ Gas Authority of India Ltd. (GAIL), Pata.
- ◆ Indian Oil Corporation Ltd., Vadodara, Gujrat
- ◆ IFFCO, U. P.
- ◆ Apcotex Industries Ltd, Mumbai
- ◆ Department Of Atomic Energy Heavy Water Plant
- ◆ Deepak Fertilizers Ltd., Andhra Pradesh
- ◆ GlaxoSmithKline, Nabha, Punjab
- ◆ Sree Rayalseema Hi-Strength Hypo Ltd., Andhra Pradesh
- ◆ L & T Special Steel & Heavy Forgings Pvt Ltd., Gujarat
- ◆ Gujarat Ambuja Exports Ltd., Ahmedabad
- ◆ Hidustan Copper Ltd. Ghatsila.
- ◆ Orient Paper Mills, Amlai
- ◆ Shri Bajrang Power & Ispat Ltd., Raipur
- ◆ Vitthalrao Shinde SSK Ltd., Maharashtra
- ◆ Shri Chhatrapati Sahu S. S. K. Ltd., Maharashtra
- ◆ Sonhira S.S.K Ltd, Maharashtra
- ◆ Sugar Corporation of Uganda Ltd. Lugazi, Uganda
- ◆ Gula Padang Terap Bhp., Malasia

ORIGINAL EQUIPMENT MANUFACTURERS (OEM)

- ◆ Thermax Ltd. Pune
- ◆ Bridge & Roof Company (India) Ltd., Kolkatta
- ◆ Glamptech Agro Process Pvt Ltd., Mumbai
- ◆ DVC Process Technologists, Pune



Mist Ressonance Engineering Pvt. Ltd.

Regd Office : 'Anandi', 1304-1/7, Shukrawar Peth, Bajirao Road, Pune - 411 002. INDIA.

Tel : (+ 91 20) 2447 2726 / 2447 1184 ■ Fax : (+91 20) 2447 4972

E-mail : mistcreation@gmail.com ■ mistcool@vsnl.com ■ Website : www.mistcreation.com

