

### PAHARPUR COOLING TOWERS LIMITED

**Cooling Tower Division** 

806, Ashoka Estate, 24, Barakhamba Road, New Delhi-110001, India Tel.: 23357846-49, E-mail: pctdel@paharpur.com

Process Cooling Equipment

N1T221469/1/RC December 17, 2022

Jindal Aluminium Limited SP-2/333, Industrial Area, Bhiwadi Dist, Alwar, (Rajasthan) – 301019.

Attn: Mr. Shankaranand Mishra

Sub: Requirement of Paharpur Cooling Tower

Dear Sir.

We refer your email enquiry dated 16.12.22 regarding revision in your requirement of cooling towers.

We are pleased to submit our offer for cooling towers as per following options:

### Option A1 (Timber Structured)

We have selected Paharpur Series 10DF induced draft cross flow, 2 cell, cooling tower model 372-102 guaranteed for cooling 400 CMH of water from 44°C to 32°C at a design wet bulb temperature of 28°C. Not suggested

Option A2 (Pultruded-FRP Structured)

We have selected Paharpur Series F10DF induced draft cross flow, 2 cell, cooling tower model F372-102 guaranteed for cooling 400 CMH of water from 44°C to 32°C at a design wet bulb temperature of 28°C.

The full technical details of the offered cooling towers are given in this covering letter and in the following annexures:

ANNEXURE I

COOLING TOWER DATA SHEETS

ANNEXURE II

SCOPE OF SUPPLY/SERVICES BY PAHARPUR

ANNEXURE III

OWNER'S RESPONSIBILITY

ANNEXURE IV

SCHEDULE OF PRICES TERMS & CONDITIONS

The cooling towers are of cross-flow design, Uniform water & air distribution, low fill air velocity and the unique cross flow design ensure efficient cooling.

The main construction features of the cooling towers are given below:

FANS: The cooling tower will be equipped with Paharpur axial propeller type fan with adjustable pitch type. The fan blades shall be of FRP & hub shall be of cast iron. The fans will be statically balanced to ensure vibration - free operation.

<u>GEAR BOX</u>: Paharpur spiral bevel gear box shall be supplied. These are heavy duty speed reducers & have been specially designed for cooling tower service. The gear box has been selected for a service factor of over 2.0 & LB-10 life of 35,000 hours.

<u>DRIVE SHAFTS</u>: Paharpur dynamically balanced driveshaft shall be supplied. This is non-lubricated type driveshaft with flexible elements.

MOTORS: The cooling tower will be furnished with TEFC-WP motor conforming to IP - 55 & suitable for 415V/3Ph/50Hz electric supply. The motor rating will be based on 50°C ambient.

<u>CASING & LOUVERS</u>: These shall be of corrugated ACB for cooling tower model 372-102 & FRP for cooling tower model F372-102.

FILL: The fill will consist of PVC V2 bar supported on SS 304 grids.

<u>DISTRIBUTION SYSTEM</u>: Hot water distribution shall be of the open basin gravity type with polypropylene spiral target nozzles. Flow control valves shall be provided for regulating the water flow to individual cells. All hot water piping is excluded from our scope.

<u>HARDWARES</u>: All bolts, nut & washers shall be of HDG steel and all nails shall be of stainless steel 304.

R.C.C. COLD WATER BASIN: Our proposal exclude RCC basin & basin fittings. This has to be 'designed & constructed and procured by the purchaser as per general arrangement drawing to be furnished by us.

<u>GUARANTEE</u>: The cooling tower shall be guaranteed against defects in materials, workmanship & deficiency in performance for a period of 12 months from start-up, 15 months from erection completion or 18 months from shipment ex-works, whichever occurs first. Any warranty replacement materials would be at F.O.B. factory with cost of freight & handling to be by others

Thanking you

Yours faithfully for PAHARPUR COOLING TOWERS LTD.,

Rahul Chandra

### **COOLING TOWER DATA SHEET**

2 V P T 2.12	Option A1 (Timber)	Option A2 (Pultruded FRP)
Cooling Tower Model	372-102	F372-102
Туре	Induced Draft Cross Flow	Induced Draft Cross Flow
No. of Cells	1 (One)	1 (One)
Performance	metics to the second	
Water flow rate, CMH	400	400
Hot Water Temperature, °C	44	44
Cold Water Temperature, °C	32	32
Wet Bulb Temperature, °C	28	28
Design Data		100 ( 11 2 0 m ) / 12 ( 12 m
Approx. Overall Dimension (in mm)		
Width	7 7063	7063
Length	<del>-7</del> 9946	9946
Height	<del>-7</del> 3814	3814
Inside basin dimension	1 11 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Width	<del>-7</del> 5386	5386
Length	9984	9984
Fans		
Number & Diameter	2 x 2438	2 x 2438
Material Blade  Hub	FRP Cast iron	FRP Cast iron
No. of Blades (Per Fan)	6 (Six)	6 (Six)
RPM	444	444
Fan BHP	2 x 16.5	2 x 16.5
Geareducers		
Paharpur Model	Series 20T	Series 20T
Type of Gears	Spiral Bevel	Spiral Bevel
Ratio	3.27:1	3.27:1
Drive Shafts		
Paharpur Type	Series 6Q	Series 6Q
Shaft Material	HDG steel	HDG steel
Yoke Material	HDG steel	HDG steel
Balancing	Dynamic	Dynamic

### ANNEXURE I (SELECTION A)

### COOLING TOWER DATA SHEET

372-102	F372-102
Crompton/Marathon/K	
	2 x 20
1500	1500
415/3Ph/50HZ	415/3Ph/50HZ
Class F	Class F
. V	THE COLUMN
Timber	Pultruded FRP
ACB	FRP
PVC V2 bar supported on SS 304 grids	PVC V2 bar supported or SS 304 grids
Treated plywood	PVC
HDG	HDG
Plywood	FRP
Polypropylene	Polypropylene
R.C.C. (By Purchaser)	R.C.C. (By Purchaser)
	TEFC Weather  2 x 20  1500  415/3Ph/50HZ  Class F  Timber  ACB  PVC V2 bar supported on  SS 304 grids  Treated plywood  HDG  Plywood  Polypropylene

#### ANNEXURE - II

### SCOPE OF SUPPLY/SERVICES BY PAHARPUR

- 1. \*Hub & Blade assemblies with motor.
- 2. \*Gear Reducers
- 3. \*Driveshaft assemblies.
- 4. \*Fan drive motor.
  - 5. \*Extended gear reducer oil lines with dipstick assembly.
  - 6. \*Mechanical equipment support torque tubes cum cross-over pipes.
  - 7. \* Fan cylinder.
  - 8. HDG steel bolts/nuts/washers.
  - 9. HDG steel tie rods & ceramic structural rings.
  - 10. CI anchor brackets & misc. HDG steel fittings.
  - 11. PVC V2 bar type fill supported on SS 304 grid.
  - 12. ACB casing for timber towers and FRP casing & louvers for pultruded FRP towers.
  - 13. Polypropylene target nozzles.
- 14. First fill of lubricants.
  - 15. Operation & maintenance manuals.
  - 16. General arrangement drawings/load data for the cold water basin.
- 7 17. Erection and commissioning of cooling tower.

#### NOTES:

- \*1. One (1) per cell
- 2. Any items not listed above, but required to complete the installation, shall be furnished by others.

for PAHARPUR COOLING TOWERS LTD.

Rahul Chandra

#### ANNEXURE - III

### OWNER'S RESPONSIBILITY

- Transit, storage & erection insurance including third party risks.
- 2. Receiving the materials at site, unloading including safe storage.
- JAL ALC 3. Handing over all the equipment to our staff within 15M of the cooling tower
- 4. All taxes & duties.
- 5. All civil works, accessories & civil work embedments.
- All hot water piping external to the cooling tower. 6.
- 7. Motor control center.
- 8. Power & control cables.
- 9. Illumination systems.
- 10 Lightning protection & earthing system.
- 11. All Instrumentation
- 12. Chemical injection system.
- 13. Blow down & make up water system
- Circulating water system is including pumps & accessories. 14
- 15. Electric power for our portable tools free of charge.
- 16. Use of Owner's telecommunication facilities.
- 17. Providing general security/watch/ward at site.
- 18. Providing owner's crane facilities free of charge.
- 19. Scaffolding arrangement, if required.

for PAHARPUR COOLING TOWERS LTD.

Rahul Chandra

#### ANNEXURE IV

### SCHEDULE OF PRICES TERMS & CONDITIONS

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SEI	H			^

7	N 1	Option A1 (Timber)	Option A2 (Pultruded FRP)
COC	DLING TOWER MODEL	372-102	F372-102
1.0	PRICES (In Rs.)		
1.1	Price of cooling tower components on F.O.B. our Sahibabad works basis.	Rs. 20,30,000/-	Rs. 26,00,000/-
1.2	Labour, supervision, erection and commissioning charges	Rs. 2,00,000/-	Rs. 2,60,000/-

2.0 TERMS & CONDITIONS

2.1 PRICE BASIS: FOB Our Sahibabad Works basis

2.2 GST ON SUPPLY: Extra @ 18%.

2.3 GST ON ERECTION: Extra @ 18%

3.0 DELIVERY: 12-14 weeks from the date of receipt of purchase order alongwith advance payment. Erection shall take (5-6 weeks.)

4.0 PAYMENT TERMS: 25% advance along with order and balance against dispatch documents through bank on pro-rata basis. Exection charges shall be payable in advance.

MORK BY OTHERS: Concrete basin (Design & construction as per our general arrangement drawing), fan motor starters & control pumps, piping, cabling & concrete basin fittings shall be supplied by others. However, 2 Nos. flow control valves per cell will be included in our scope of supply.

Please note receiving of material at site, unloading & safe storage till our erectionerew reaches at site and shifting near to cooling tower foundation (50ft distance) shall be arranged by purchaser.

.0 TRANSIT RISK, Transit insurance is to be arranged by the purchaser.

Penuled fraleq. 7.0 VALIDITY: 90 days.

for PAHARPUR COOLING TOWERS, LTD.

sarranty! One year

Rahul Chandra Advance agasust

65%. +100%. GST bagaswit

10% after successful commissionly



### IINDUSTAN COOLING SYSTEI

COOLING TOWERS I COOLING TOWER REPAIRS I CHILLING PLANTS

HCS/QUO/AJ-1202/2022

Nor. Jit-mdra Insopec.05.2022 MD Turpover - 2ll

Jindal Aluminium Ltd. Bhiwadi, Alwar, Rajasthan, India.

Kind Attn:

Mr. Shankaranand Mishra (09611195336)

E-mail:

smishra@iindalaluminium.com

Subject:

Offer for Wooden Cooling Tower-1500TR.

Dear Sir,

This is with reference to your Query with undersigned today regarding your requirement of Wooden Cooling Towers.

#### INTRODUCTION

tindustan Cooling Systems is a reputed & well recognized Manufacturer & Service Provider for Industrial Water Cooling Systems. Our Plant is Located at Pathreri-The Industrial Hub of North India. For More Info about Our Company & Products Please visit Our Website:

www.hindustancoolingsystems.com

Based on the same, we are pleased to submit our most competitive offer along with terms & conditions as under.

Cooling Tower Designed to cool 800m3/h of water temperature from 42°C to 30°C at Wet Bulb Temperature of 29°C

### Details of the Cooling Tower:

Type of Cooling Tower & Shape

: Wooden Cross Flow Cooling Tower

Model No.

: HCS-WCT-1500

Length/Width of Cooling Tower

: 7350mm x 6100mm

Height at the top of Fan Cylinder

Weatherproof fan motor

Gear Box

Fan Diameter

:2x15 HP/1440 RPM -> OSWAL Make :2x20T (3.27:1) :2x Ø 2400mm (6 Blades) -of heils of FRP Ble :2x8" (200mm) :One Set

Water Inlet/Outlet Size

Quantity

Product Price:

Final Basic Price (1 No's): Rs.17, 85,000 (Including Packing & Erection Charges)

Head Office: Krishna Complex, 2nd Floor, NH-8, Manesar, Distt. Gurugram (Haryana) - 122051 Factory: Pathreri to Bhiwadi Industrial Road, Near Toll Tax, Distt. Gurugram (Haryana) Phone: +91-8510085210, 8506008321, E-mail: sales@hindustancoolingsystems.com

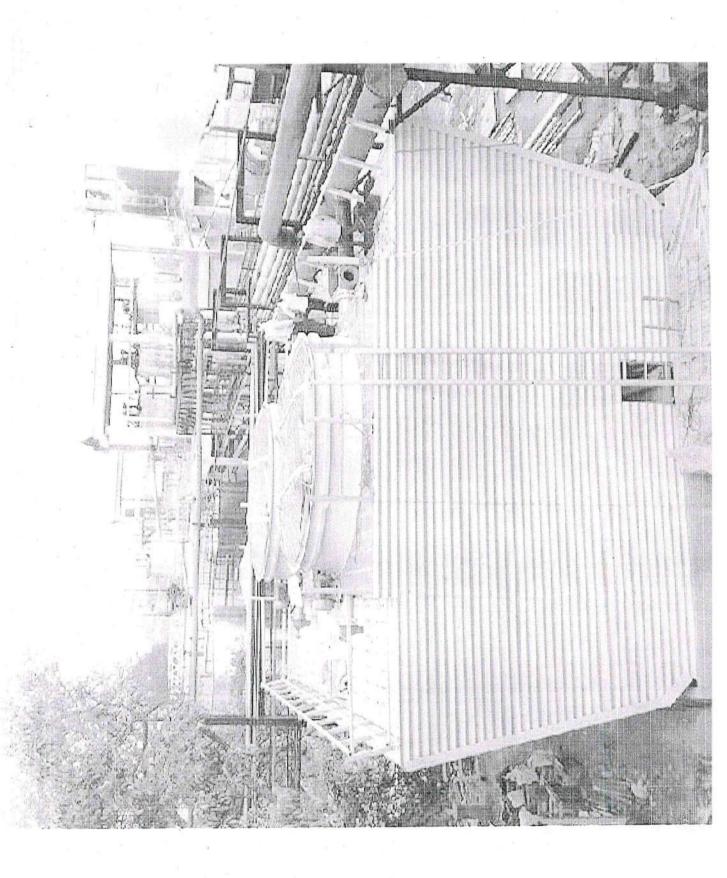


## HINDUSTAN COOLING SYSTEMS

COOLING TOWERS I COOLING TOWER REPAIRS I CHILLING PLANTS

### SPECIFICATION OF MATERIAL FOR WOODEN COOLING TOWER

Structural Fra	nework	: Wooden
Fills		: Wooden (7500 Pies.) -> Pine wood
Drift eliminato	ors	: Wooden
Grid .		: SS 304
Fan blades	8	: FRP
Fan Guard		: Hot Dipped Galvanized Steel
Bolts/nuts/wa	shers/Nails/Ladder	: SS 304
And all other s	teel components	: Hot Dipped Galvanized Steel
TERMS & CON	<u>DITIONS</u>	FOR-JAC BLIM
Prices		The Quoted Prices Are Ex-Works, Pathreri (Haryana)
2 Packing Ch	arges	Included
3 Taxes		Extra as Actual (GST @ 18%)
4 Erection C	narges	Included L
5 Freight Ch	arges.	Extra as Actual focluded
6 Validity		30 days w.e.f., issue of this offer.
7 Expected I	Pelivery	8 weeks Tower from the date of receipt of order.
B Expected I	rection Period	10-12 days per tower after handing over to us clear site with Civil foundation bolts complete, in all respects.
charge.	nded by you free of	You are to provide lifting machine for motor. Unskilled manpower as required at site. Lodging, Boarding to our technician, during eraction and commissioning.
ESI/PF.	- JAC AL	40% in advance with Purchase Orders 50% plus taxes & duties against our Performa invoice prior to
10 Terms of I		vispatch 2 ACL 10% after Installation.
	D. TAR	Adolebrices do ot include starter for electric motor, cabling,
Larviely sigh	yours- Juc	piping to Cooling Tower, pumps, controls foundation, bolts, Civil works, instruments and any items not specified in our offer.
for hope you	will find the above in c	1 N O C
earliest.	2	The secretary of notestal.
Thanking yo	ر د د د د د د د د د د د د د د د د د د د	F class From The
Yours truly,	Digna Se	Searbi of mad
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### Member of





### ISHRAE

Indian Society of Heating, Refrigerating and Air Conditioning Engineers



(M): 9810337622, 9310337622

( A Unit of Ionmax Engineers)

OFFICE: BT-06/ 102, SEARS TOWER, OMAXE HEIGHT, SECTOR-86, FARIDABAD (HR)-121002

ID Mail: rajeevsuperflow@gmail.com,superflowcooling@yahoo.in WEBSITE: www.sfcoolingtower.com

REF: 6436/2022-23

DT: 30.05.2022

M/S- Jindal Aluminum Ltd.

SP-2/333, Riico Industrial Area.

Bhiwadi- 301019

Kind: Attention Mr. Shankaranand Mishra Ji,

Dear Sir,

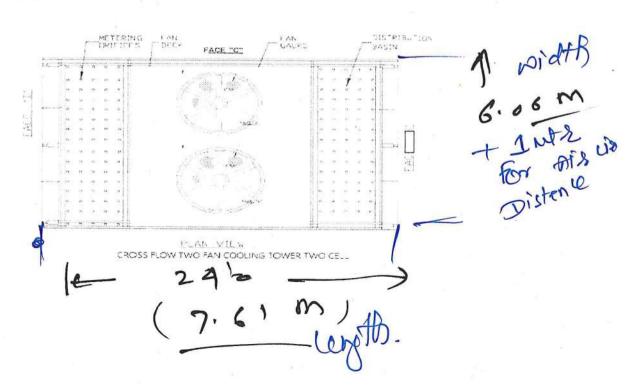
-> started - 2007 -> approp - 3000 to 4000 7000ets -> turnover - 8 cr fearly,

Sub.

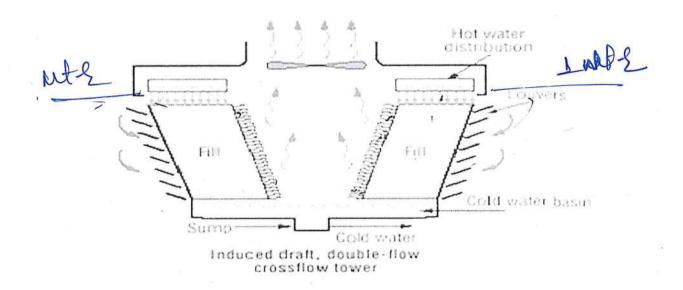
: Your Requirement of 1500 TR Square shape Wooden cooling tower

Dear Sir,

Withreferencetoabovementionedsubject, we now take pleasure in submitting our best for design, supply, erection and commissioning of Induced Draft cross Flow timber Cooling Tower



### InducedDraftCROSSFlowCoolingTower



### TECHNO-COMMERCIALOFFER

TYPE	INDUCEDDRAFTCRO SFLOW	os
MOC	Timber CT	- Pine w
QUANTITY	01Nos.	(7.
MODEL	SFCT- W-27	
CAPACITY	1500 TR	
NO OF CELLS	02	
HOTWATERTEMPERATURE	45°C	
COLDWATERTEMPERATURE	32°C	
WETBULBTEMPERATURE	28°C	

We are enclosing the annexure as follows:

- TechnicalBid: Giving therein the Technical Data Sheet Duly Filledin, Mate rial of Construction as well as Scope of Supply from our end as well as from your end.
- 2) Commercial Bid: Priced commercial Terms and Conditions.
- 3) General Arrangement Drawing: Enclosed

Sincerely Yours,

For' SuperFlow Cooling Towers Pvt Ltd.

RAJEEV DUBEY

Cell: 9810337622 & 9310337622

### TECHNICAL BID

A)	SCOPEOFSUPPLY	SFCT- W-27
1.	COOLINGTOWERIDFANASSEMBLY, FILLSTRUCTUREETC -	SUPPLIER
2.	FLANGE MOUNTED Elect . MOTOR, Waleshower OSWalswater Boof	SUPPLIER
INTERNALFILL&PVCELIMINATORS, Nozzles , ss wire grid		
4.	STRUCTURALMATERIALSOFCOMPLETECOOLINGTOWER	SUPPLIER
5.	HWDSYSTEM	SUPPLIER

### NOTE:-{scope Erection, Installation of above supplied material].

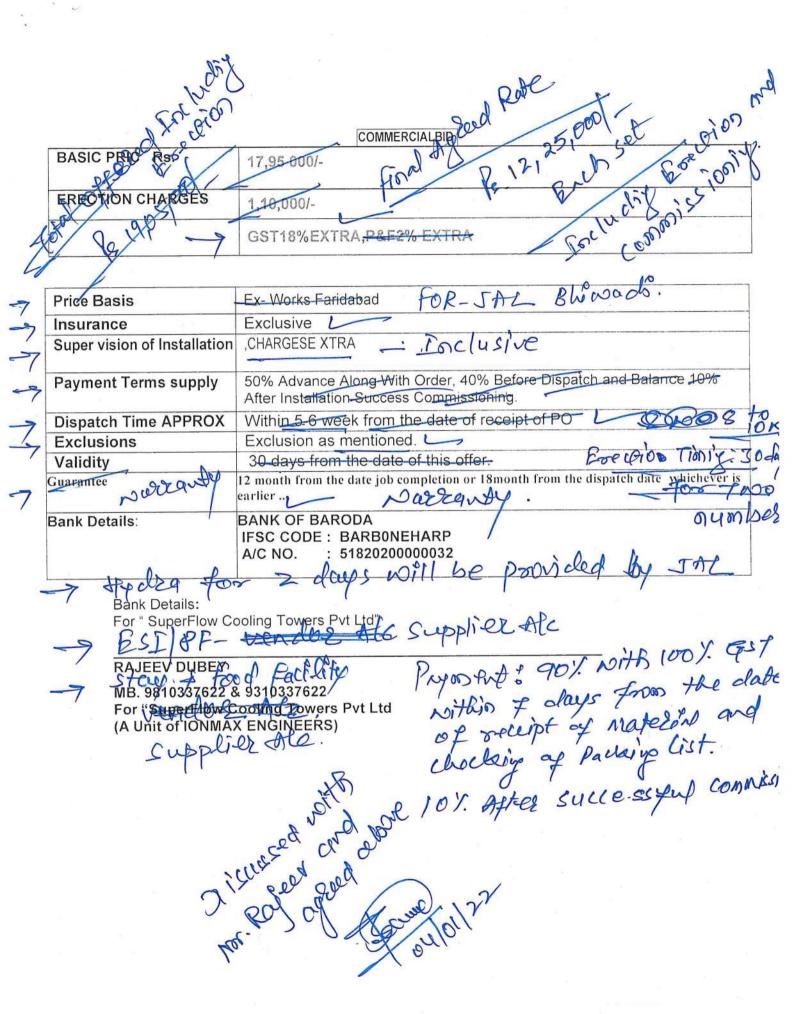
B)	SCOPEOFSUPPLY&WORKBYCUSTOMER - JAL SUPP	0110
17	LEVELING & GRADINGOFSITE, MOTORCONTROLCENTRE, CABLING&LIGHTING, ALL POWER&CONTROLCABLES	BYRUROHASERY
2.	RCCCOLD WATER BASIN AND SUPERSTRUCTURE, MOTORCONTROLCENTRE, CIRCULATING WATER PUMP SET, CIVIL, RCC JOBS, EXCAVATION, ALL EXTERNAL PIPING WORK: HOTWATER UP TO TERMINAL POINT TO DISTRIBUTION HEADER ETC	BY ORCHASER
7-3.	POWER&CONTROLCABLES, LAYINGTERMINATIONTHEREOF, CABLETRAYSANDETC	BYPURCHASER

### TECHNICAL SHEET

1)	Design Basis		SFCT- W-27	
a)	COOLINGTOWERMAKE		Superflow Cooling Towers	CP
b)	Type of Cooling Tower		TIMBER - CLOS	s M
c)	Total Rated Capacity	m3/hr	270 (4500 LPM)	
d)	No. Of Cells per Tower ( )	Nos.	02	
e)	Capacity per Cell	m3/hr	135 ( 22 <u>50 LPM</u> )	
f)	Hot Water Temp.	°C	45	
g)	Cold Water Temp.	°C	32	
n)	Ambient Wet Bulb Temp.	°C	28	
i)	Design Range	°C	13	
j)	Design Approach	°C	04	
k)	Tower Operation		Continuous	Λ.
1)	Evaporation Loss APPROX	%	1.7 of circu	Matter
m)	Drift Loss max	%	0.05	prox
n)				460
2)	Cooling Tower Overall Dimensions(Ap	oproximate)		•
a)	Cooling tower width APPROX	m	width 6.06x7.71 meter	TS.
c)	Cooling tower length APPROX	m	Ceryth 7.61.	

d)	Cooling tower height(from basin curb level Up totopoffan deck)	m	2.77MTRAPPROX text
e)	Pumping head(from basin curb level) APPROX	m	2.80APPROX
f)	Fill Height	m	2.64 MTR
3)	Cooling Tower Fan Assembly		
a)	Fan make Fors! Blade Alymi	nium lap	ub-Aryminium SFCT L
c)	Quantity per cell	Nos.	01
d)	Diameter	M	2.438
e)	Number of blades	Nos.	06
f)	Type off an and features		Axial flow propeller type with adjustable pitch
<del>g</del> )	Material of construction of blades		Aluminum BLADES with GI hub
)			
4)	Cooling Tower Fan Motor		
a) -	Type		FLANGE MOUNTED Squirrel Cage Induction
/	3,62		Motor
b)	Make		SABAR/MEGHA-OSWOL
c)	Mounting		Flange Mounted
d)	Number per Cell		01
e)	Enclosure		TEFCWeatherProofIP-55
f)	Rated Power HP	COPPE	12.5 HP - 200
g)	Synchronous Speed RPM		RPM 600
h)	Current characteristics		V/PH/Hz[415±10%/3/50±5%]
i)	Insulation Class		Class-'F'
j)	Method of coupling		Direct DRIVE
k)	Insulation class / temperature class		F/B
13	Ambient temperature		50°C
1)	, minoral terriporation		

5)	Material of Construction		
a)	Cold Water Basin/ Sump & Sludge Pit	RCC(BYYOU]	Jindal vendo
b)	Cooling Tower Superstructure	TIMBER -	ven do
c)	Cooling Tower Structural Casing & Louver	Corrug.ACB —	· -elo-
d)	Fan Guard	HDGI 👡	7
e)	Cooling Tower Fan deck	TIMBER	
f)	Fan Cylinder/ Stack With attaching Hardware's	MSHDG	
g)	Fill Materials	TIMBERSPLASHBAR	
h)	Fill Support Materials	MSHDG	
i)	Drift Eliminator	TREATED TIMBER Dri	t Eliminator
k)	Hot water Distribution Nozzles , Eliminator	PVC	ven go
m)	Bolts, Nuts and washers including Structural Connectors	MSHDGI	Cuon
0)	Base Casting/ Base Plates including Foundation bolts	MSHDGI	90
		× 11	



GSTIN NO: 06AAVCS3229D1Z8

### Member of





### ISHRAE

Indian Society of Heating, Refrigerating and Air Conditioning Engineers



(M): 9810337622, 9310337622

# Superflow Gooling Towers Pvic Ligh

(A Unit of Ionmax Engineers)

OFFICE: BT-06/ 102, SEARS TOWER, OMAXE HEIGHT, SECTOR-86.

ID Mail: <a href="mailto:rajeevsuperflow@gmail.com,superflowcooling@yahoo.in">rajeevsuperflow@gmail.com,superflowcooling@yahoo.in</a>
WEBSITE: <a href="mailto:www.sfcoolingtowers.com">www.sfcoolingtowers.com</a>

### Steel & Power Plant Clients:

S.No.	Client Name	Place	Supply & Installment of Products	Contact Person
1	M/S-Godavari Power Plant	Siltara Ind. Area Phase-2, Raipur		Mr. Nehra ji
2	M/S-Hira Ferro Alloys Itd	Urla Ind. Area Raipur	FRP Cooling Tower, Water TreatmentPlants	Mr C.S.Verma ji
3	M/s-Alok Ferro Alloys Itd	Urla Ind. Area Raipur	FRP Cooling Tower	Mr.Hitesh ji,
4	M/s-Balaji Power Plant	Mahasamund,Raipur	Water TreatmentPlants	Mr.Manger ji
5	M/s-Hitech Power Plant	Tilda, Raipur	FRP Cooling Tower, Water TreatmentPlants	Mr.Tiwari ji
6	M/s-Shri Bajrang Power Alliance(Ferro Divison)	Urla Guma Road Raipur	FRP Cooling Tower, Water TreatmentPlants	Mr.Updhaya ji
7	M/s-Vandana Global	Siltara Ind. Area Phase-1, Raipur	FRP Cooling Tower, Water TreatmentPlants	Mr.Deepak ji
8	M/s-J & k Rolling Mills	Gangyal, Jammu	FRP Cooling Towers & WTP	Mr.Pawan ji
9	M/s-Shree Guru Kripa Alloys	Bari Brahamana,jammu	FRP Cooling Towers & WTP.	Mr.Sanjeev ji
10	M/s-Narbada Steels Ltd.	Bari Brahamana,jammu	FRP Cooling Towers & WTP.	Mr. F.CSharma ji
11	M/s- Sudershan casting Pvt. Ltd	Bari Brahmana, Jammu	FRP Cooling Tower	Mr. Rakesh Ji
12	M/s- Mahavir Die Casters	Faridabad	FRP Cooling Tower & Water Treatment Plant	
13	M/s- Metal Fording	Delhi	FRP Cooling Tower	Mr. Satender Jair
14	M/s- Kamdhenu Ltd	Bhiwadi	FRP Cooling Tower	Mr. Harish Ji
15	M/s- Mass Wire & Steels	Bhiwadi, Rajasthan	FRP Cooling Tower & Water Treatment Plant	Mr. Jitender Ji

There are lot of clients of Pharma where had we supplied and erected cooling tower, Water treatment plants & Waste Water treatment plants.

Jindal Histor.