MAYA FAN AIR ENGINEERING PRIVATE LIMITED

An ISO 9001:2008 Certified Company

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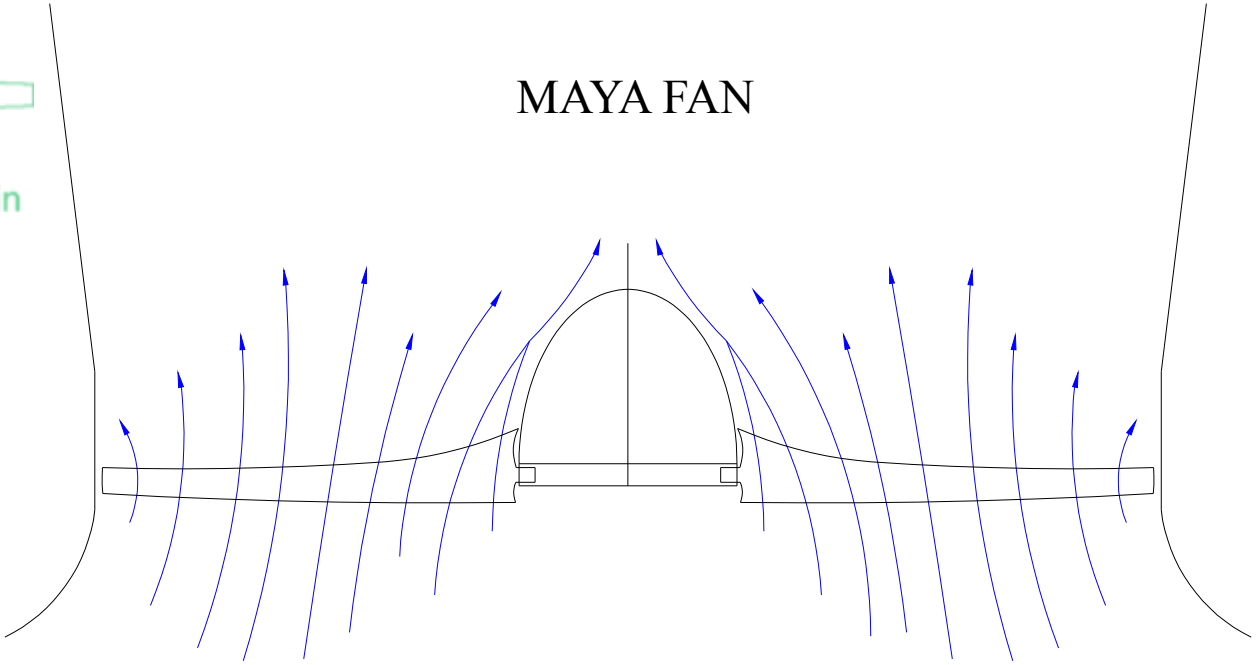
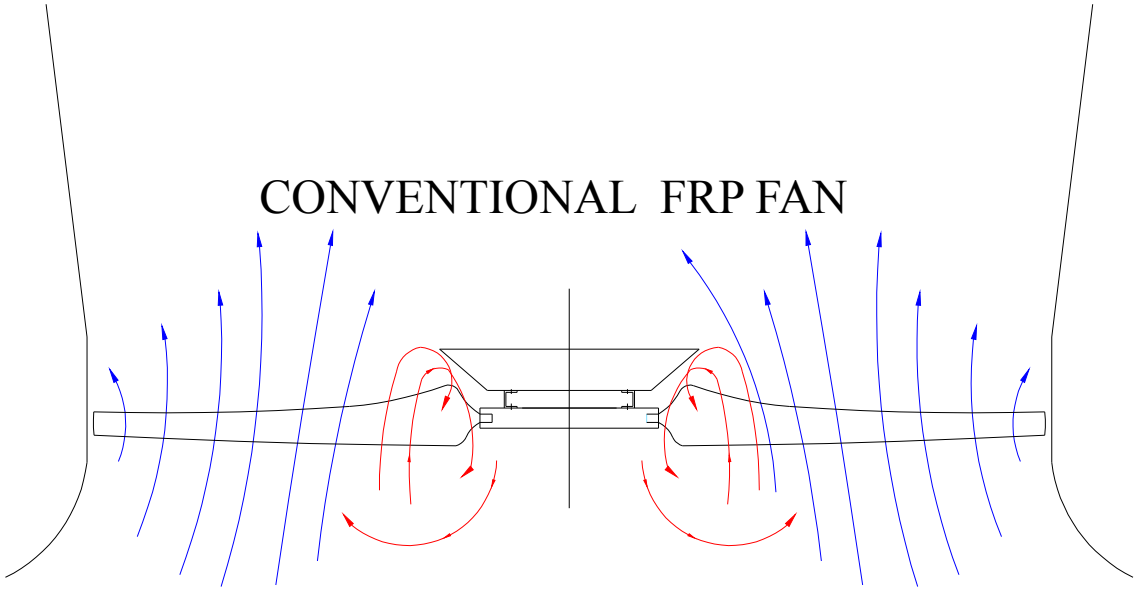
MAYA FAN



Special Features of “MAYA” FRP Fans

CONVENTIONAL FRP FAN



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Our Observation about power shaving & Fan performance

Today there are many type of hollow FRP fan available in industries and there are many user using these hollow FRP fan But still many of us are not satisfied regarding the power saving and it's performance. Many of us are still facing various problem like.

There is power saving but airflow in not equal.
#improper Δt.
#overall cooling tower performance is reduced.
#After replacement of fan problem faced in summer.
#By increasing the blade angles vibration is more.

We do agree, there are these problem in the FRP fans due to improper fan and aerodynamic hub design.

Thus to over come all these issue MAYA fan have built a new ladder in the field of power saving by overall new design. Which even strengthen by our "application specific selection" , and most advance manufacturing processes, Detail and impact of all these three is described in this presentation.

Special Features of “MAYA”FRP Fans Design

Blades:- Today most of the conventional blades are as per fig A which having blank Portion of about 15% to 20% of the total blade length . This blank portion dose not have any aerodynamic profile thus it is approximately ineffective part of the blades . This portion is extended only to reduce the diameter of the mechanical hub. So at very first we remove this ineffective portion in Maya fan blade by full length aerodynamic profile as shown in fig B.

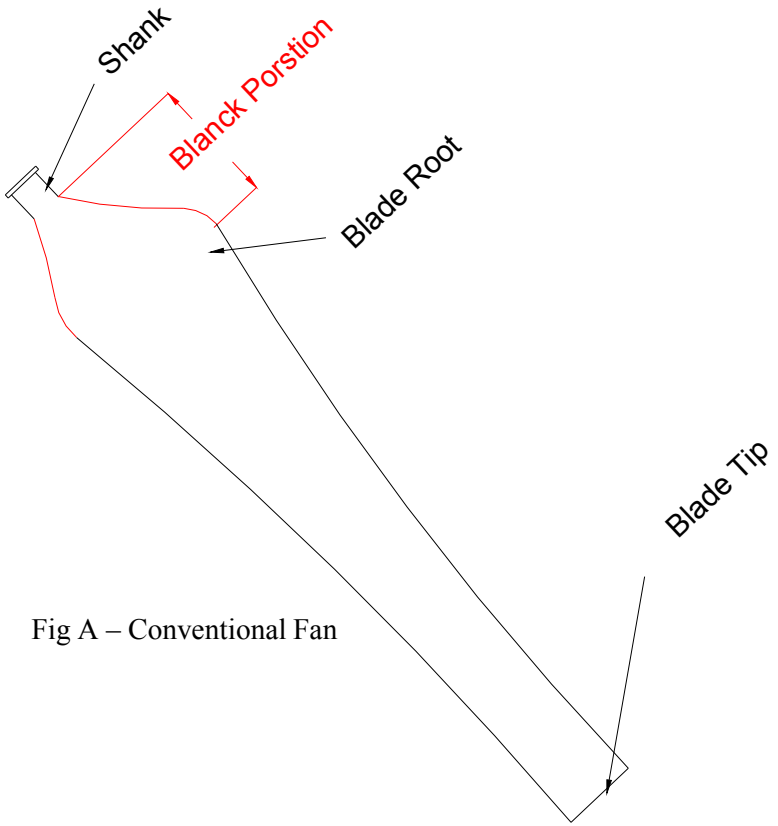


Fig A – Conventional Fan

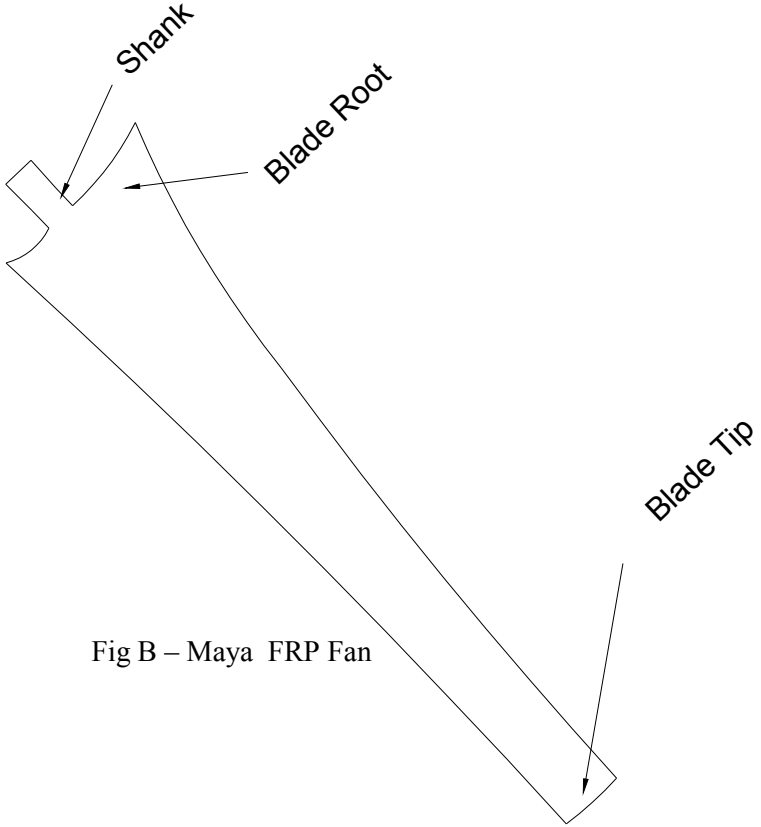


Fig B – Maya FRP Fan

Aerodynamic Hub:- Most of hollow FRP fan manufacturer do not provide any aerodynamic hub or their conventional aerodynamic hub is as shown in fig C . And its airflow variation curve along the length are as given in the next slide .

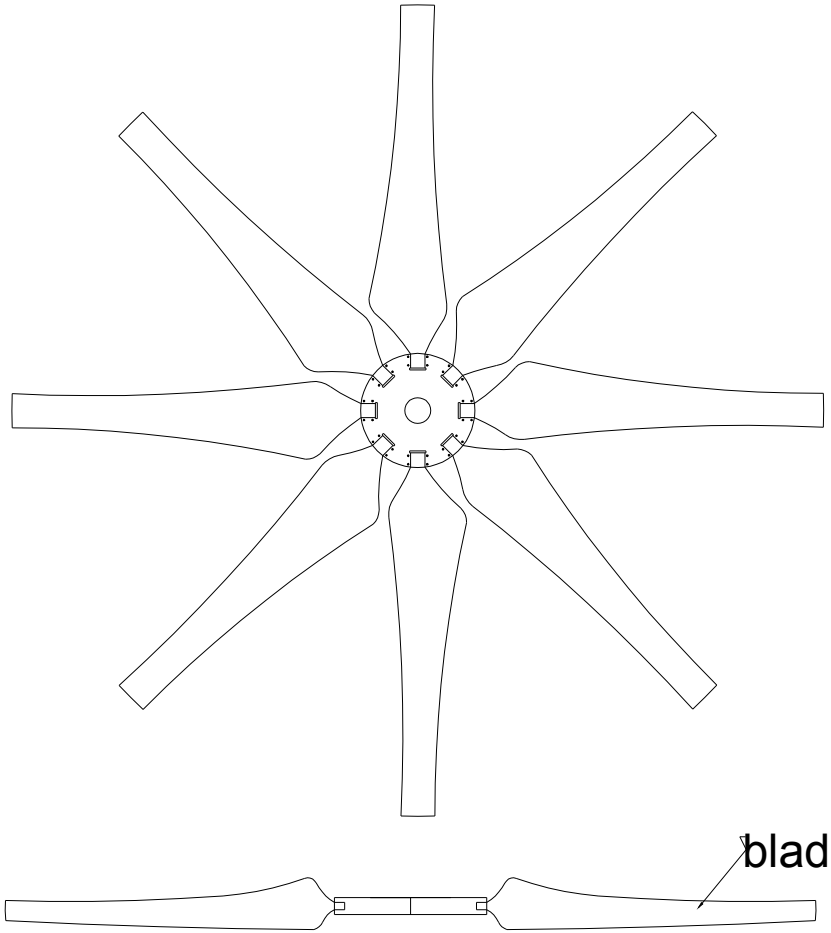
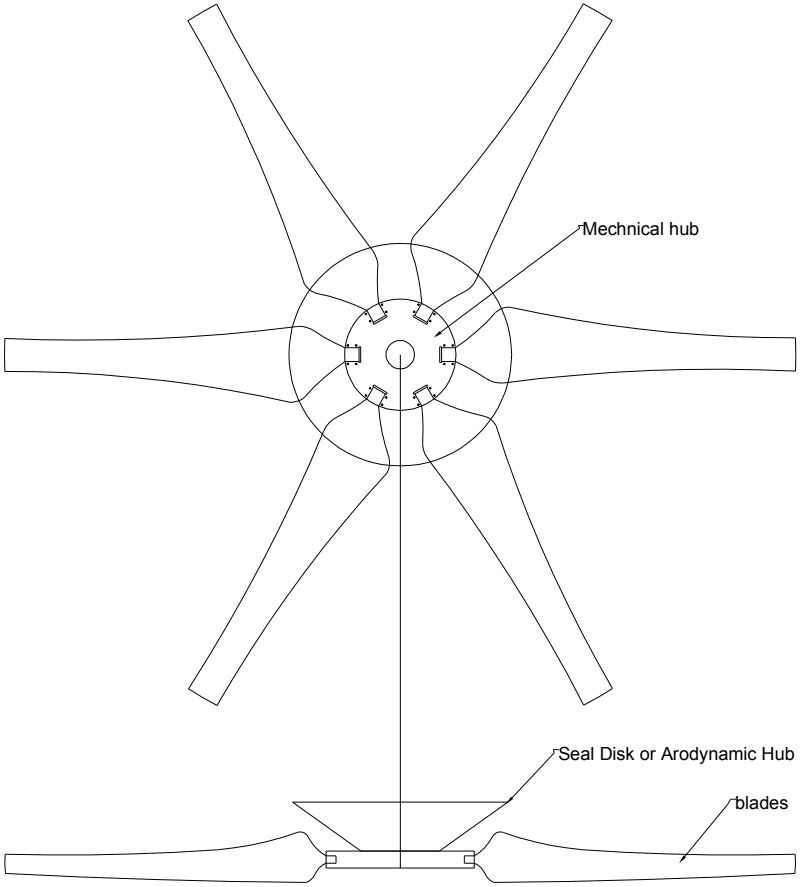


Fig C



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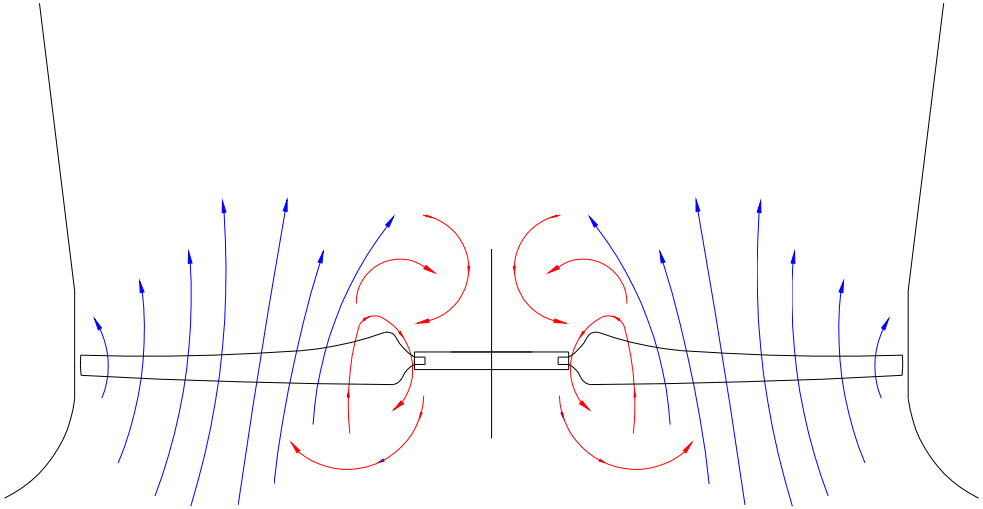
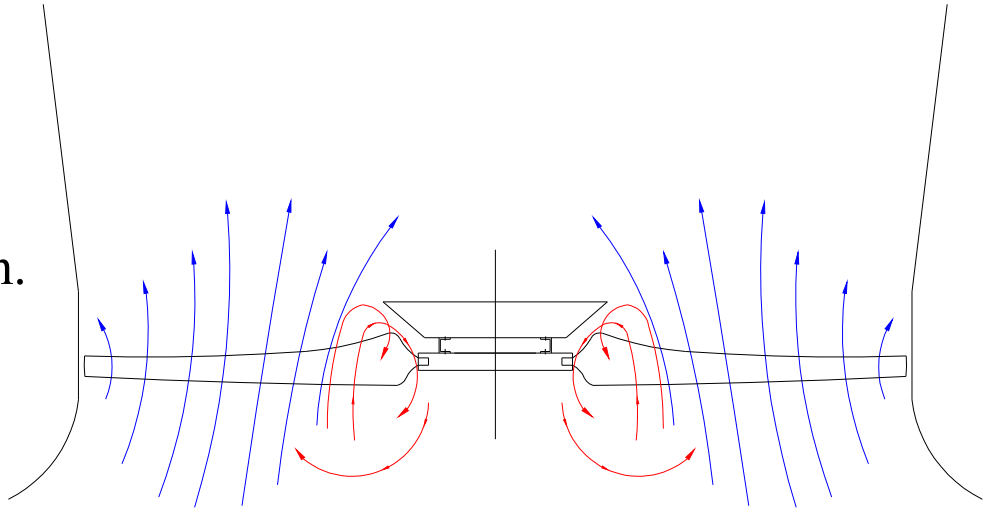
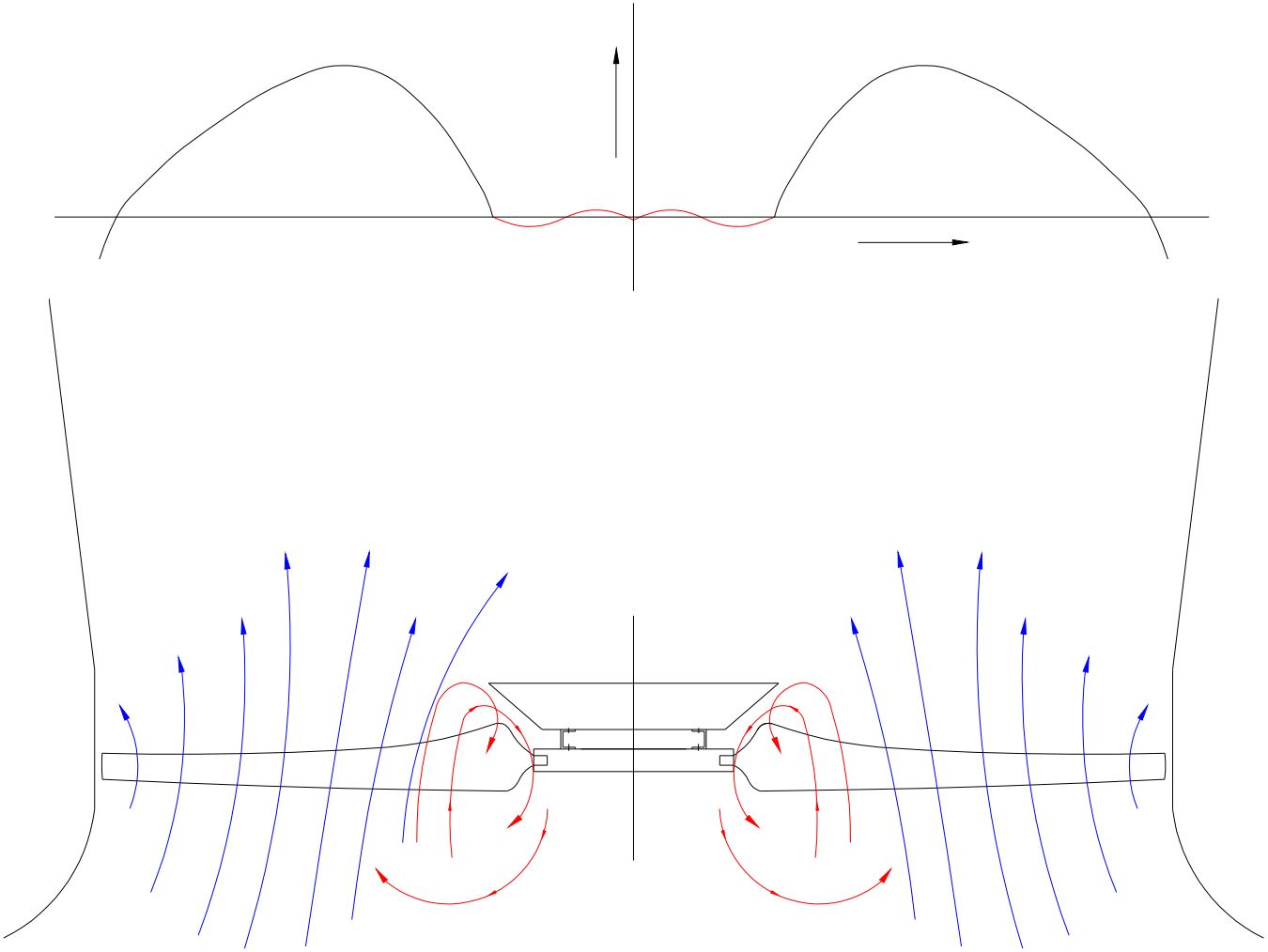


It become even worst if hub is spider type and sealed disc is not provided .

3% to 5% of air volume is tabulated in operating condition in conventional fan.



There For variation of fan air flow along the fan diameter is as bellow -



Red arrow representing air turbulence

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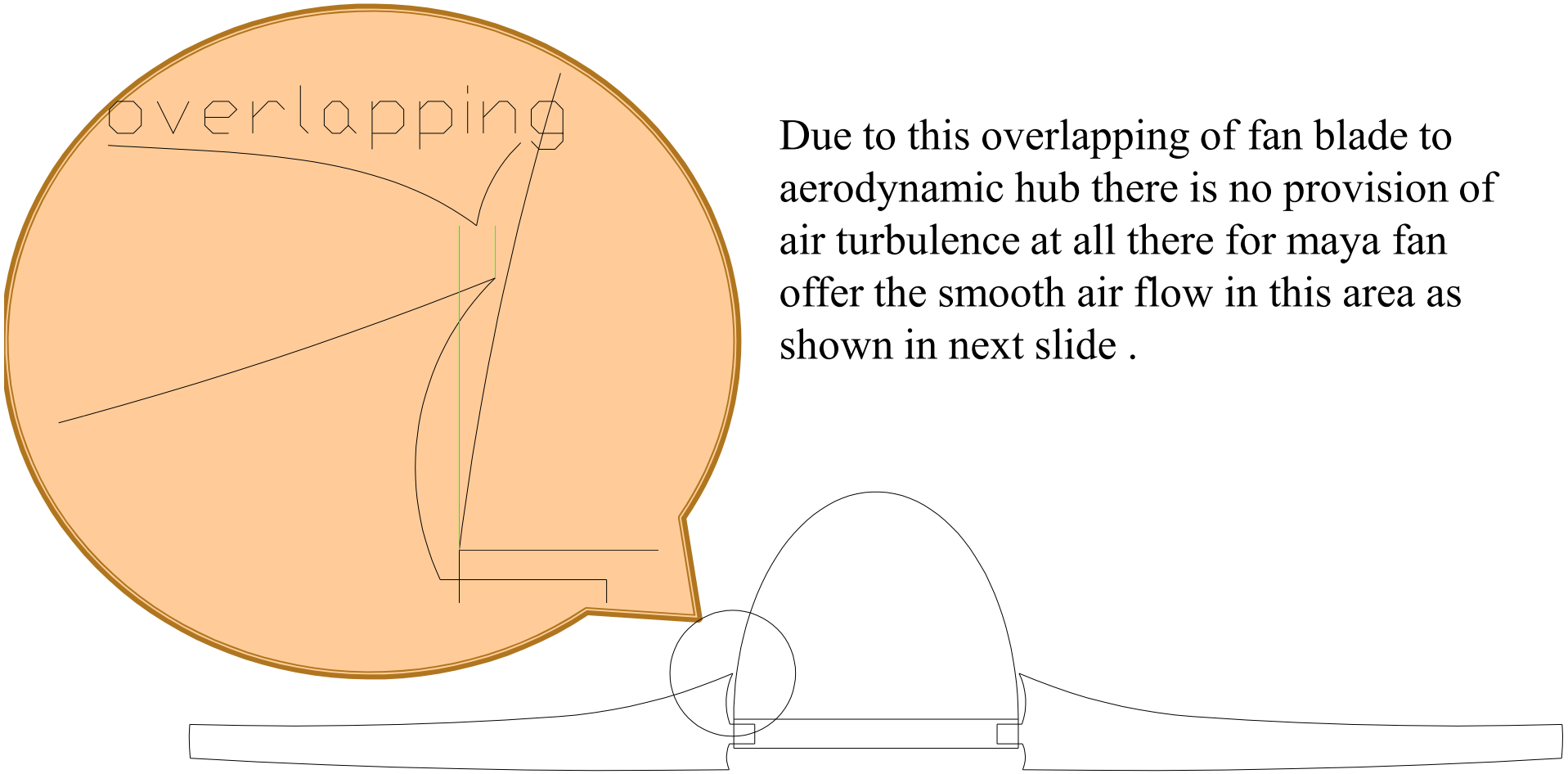
Thus Maya fan again refine the design of the aerodynamic hub to reduce the turbulence and achieve smooth airflow at the center of fan. which is shown bellow -



Due to this overlapping of fan blade to aerodynamic hub there is no provision of air turbulence at all there for maya fan offer the smooth air flow in this area as shown in next slide .

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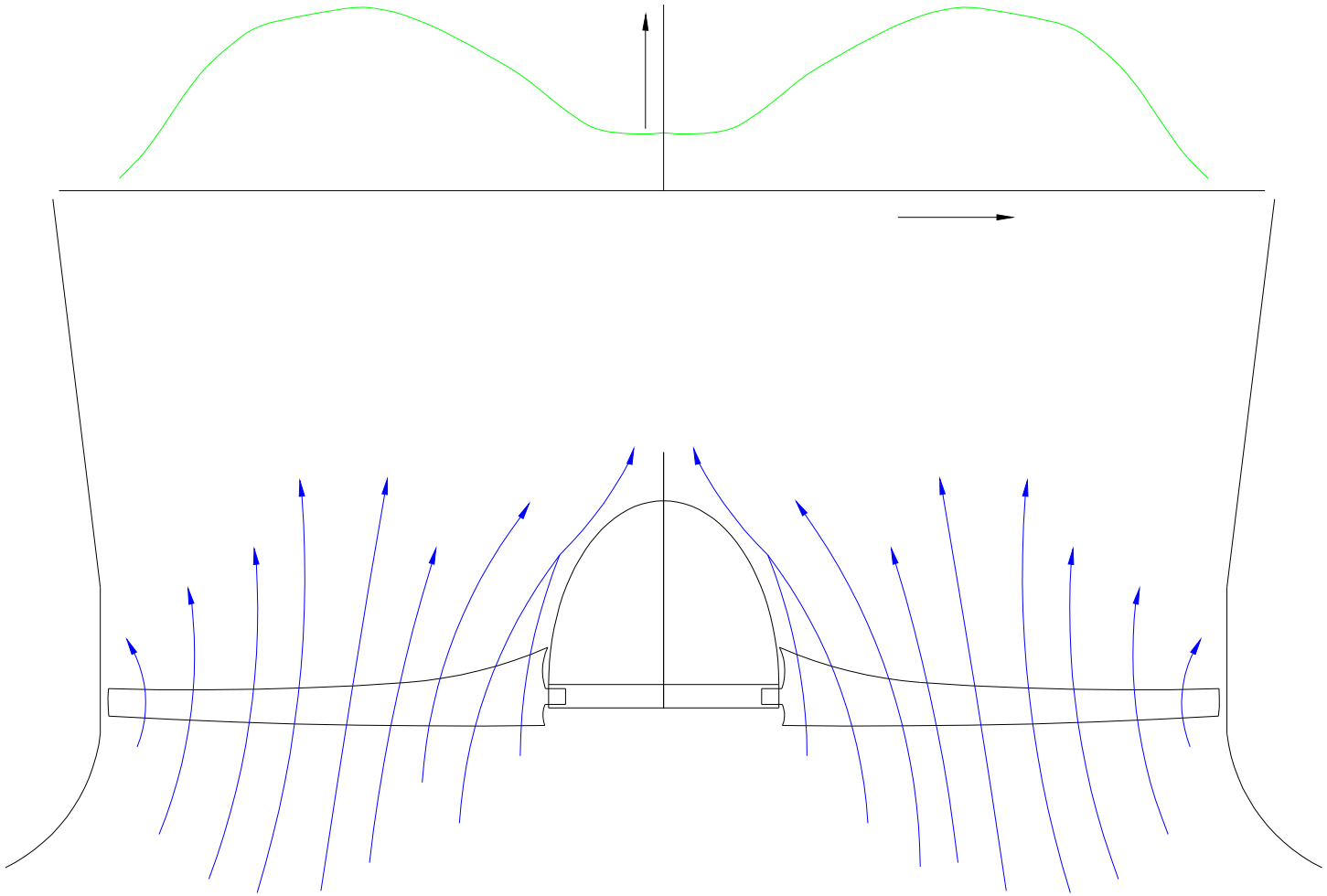

MAYA High Efficient FRP Fan Air Velocity Curve

But in maximum cases above deference in Maya Fan and other Fan dose not observed practically because most of the fan manufacturer practice the following way for Flow measurement –

1. Measurement for velocity is just taken as given in Fig-D (as per equal area method for five point)
2. And for calculation the area consider is of full blade length.
3. There for the area which is just suffering from turbulence and have no effective airflow is also consider as productive as the remaining blade length.

Summery

If maya fan is compare with any other fan by the above method and airflow found same (considering all other factor constant) then practically maya fan is around 5% more effective then other fan

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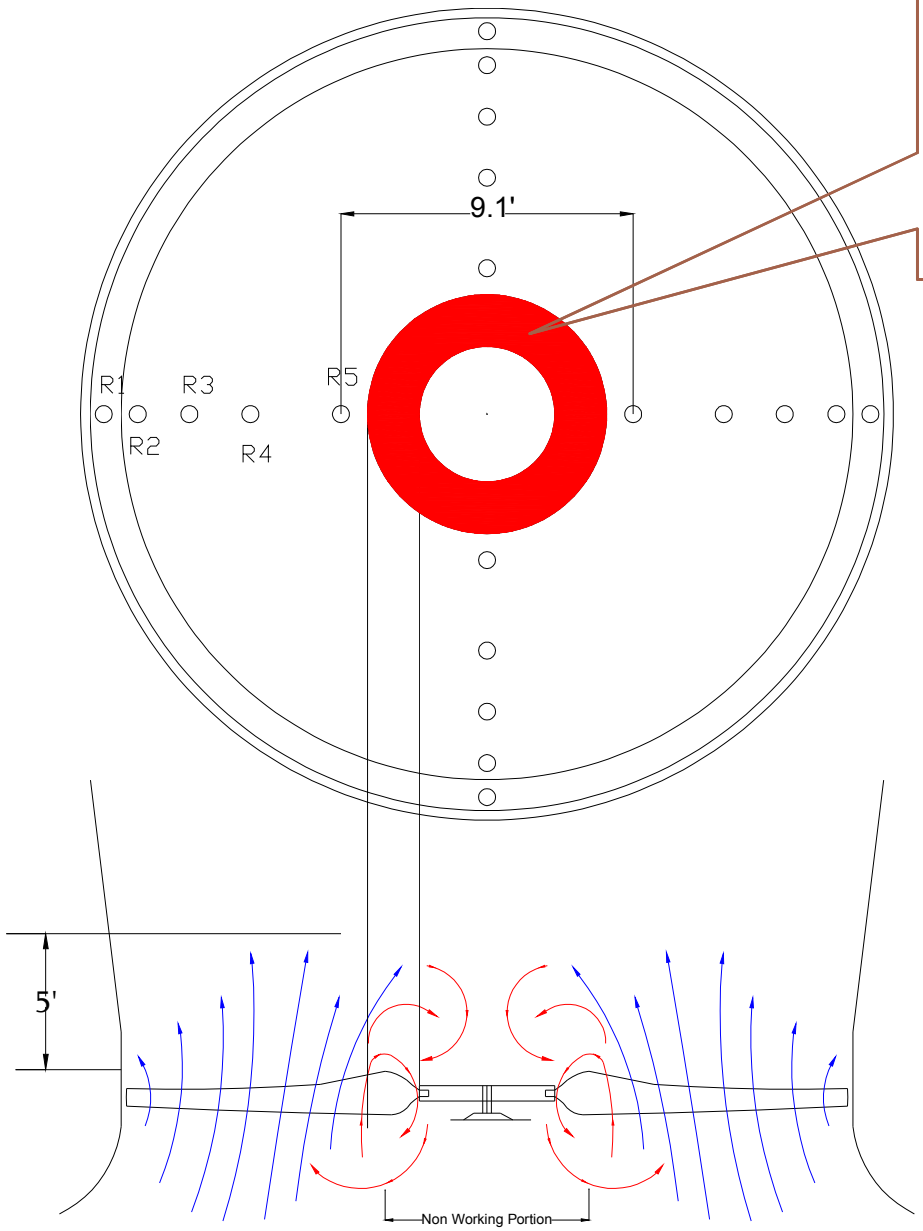
For 28’ diameter fan



This is the non productive area in conventional fan which is consider as productive as the remaining blade is.

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Fan selection:-

Selection of fan is considered as most use full task in the field of power shaving.

It is our practical experience that many times we even replaced very well designed fan for the power saving purpose just because of wrong selection of fan.

Thus we MAYA fan offer fan selection by our designer only to provide the specific and best solution for the application and because of our advance and economical manufacturing process we never compromise with the nearest alternative available.

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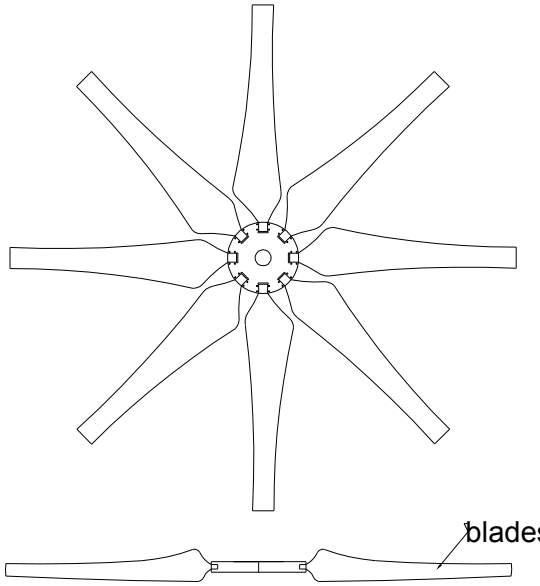
Production Method :-

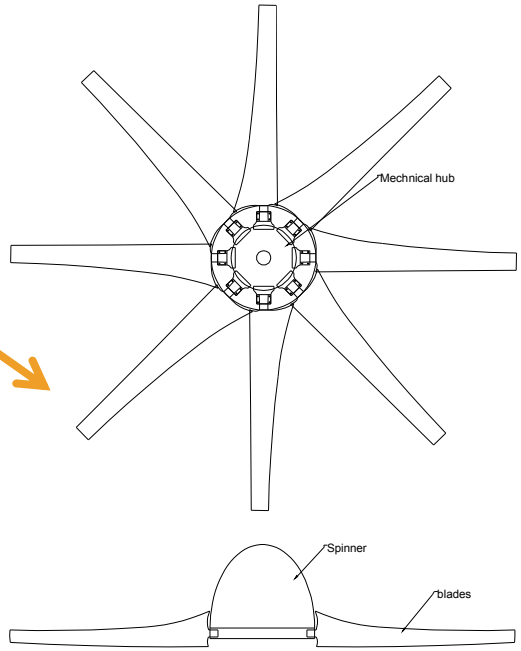
Our economical die making process by skilled labour provide us flexibility to develop more and more new product there for we develop the application specific product every time without compromise with the nearest alternative available .

Our best shell moulding process and quality material strengthen us with the best quality thus we did not receive any complain from our customer in last 8 year of business (During double the guaranty period).

Summary

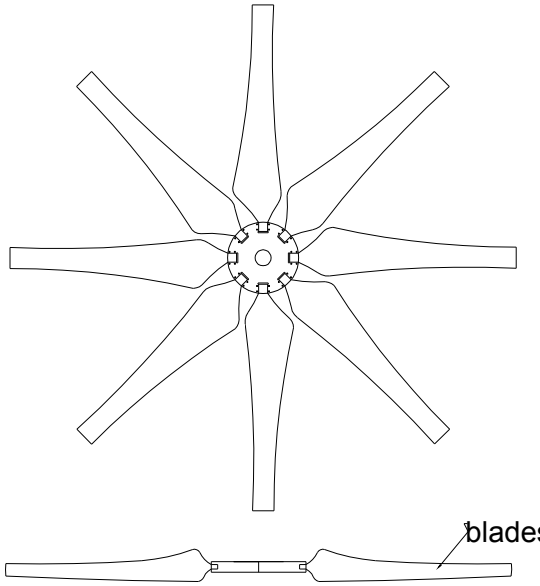


Switching from conventional FRP to MAYA fan will save 10-20 % power



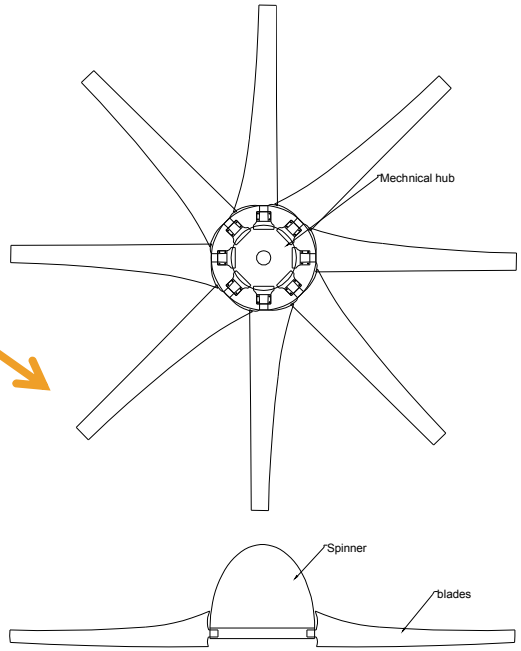
10-20% power saving

Summary



Switching from conventional metallic to MAYA fan will save 20-35 % power

20-35% power saving



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§ *Key Features of MAYA FRP Fan*

- Free trial – we provide free trial with committed power saving (conduction apply)
- Energy saving – Our fan are 20-35% more efficient compare to other metallic fan.
- Proprietary Aerodynamic High Efficient Designs
- Vibration and turbulence free operation.
- Corrosion Resistant
- Low Noise Level
- Zero maintenance

Case Study-1

Practical example of comparison at SAIL (BSP)(METAL to FRP)

Observation 1 for Air velocity range -
Air velocity range of maya fan is more uniform as compare to the existing fan.

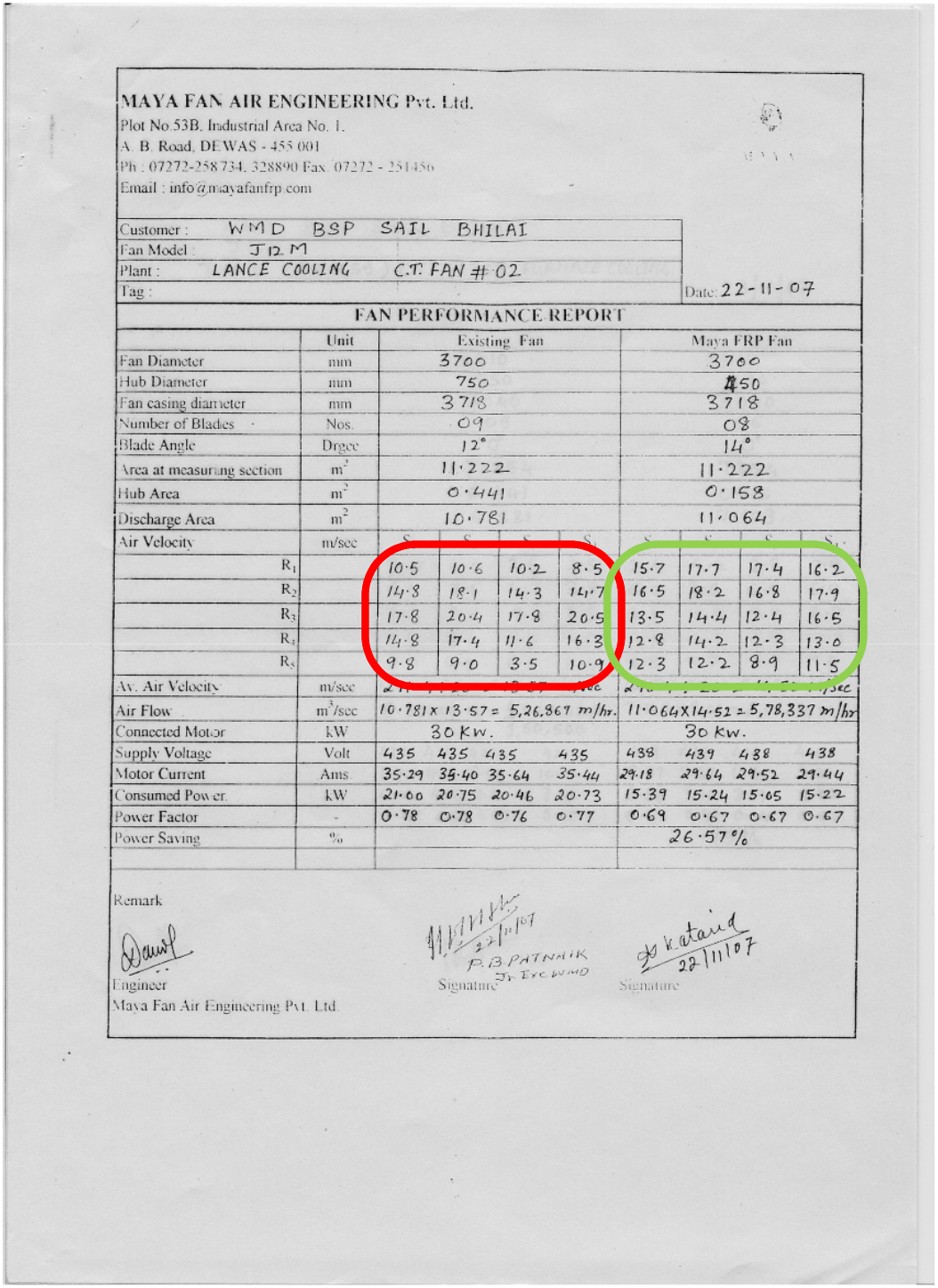
Ideally air velocity across the whole blade should be equal thus the range of airflow across the blade length should be zero.

Observation 2 for Air Flow –
Existing fan - 526867
Maya Fan - 578337

Airflow is higher then existing fan

Observation 3 for Power Consumption –
Existing fan - 20.73
Maya Fan - 15.22

Even with higher air flow power consumption is lower then the existing and our fan save 26.57% power over the existing fan.



MAYA FAN AIR ENGINEERING Pvt. Ltd.
Plot No.53B, Industrial Area No. 1,
A. B. Road, DEWAS - 455 001
Ph : 07272-258734, 328890 Fax : 07272 - 251456
Email : info@mayafanfrp.com

Customer : WMD BSP SAIL BHILAI
Fan Model : J12 M
Plant : LANCE COOLING C.T. FAN # 02
Tag :
Date: 22-11-07

FAN PERFORMANCE REPORT

	Unit	Existing Fan				Maya FRP Fan			
Fan Diameter	mm	3700				3700			
Hub Diameter	mm	750				450			
Fan casing diameter	mm	3718				3718			
Number of Blades	Nos.	09				08			
Blade Angle	Degee	12°				14°			
Area at measuring section	m^2	11·222				11·222			
Hub Area	m^2	0·441				0·158			
Discharge Area	m^2	10·781				11·064			
Air Velocity	m/sec	S	S	S	S	S	S	S	S
R_1		10·5	10·6	10·2	8·5	15·7	17·7	17·4	16·2
R_2		14·8	18·1	14·3	14·7	16·5	18·2	16·8	17·9
R_3		17·8	20·4	17·8	20·5	13·5	14·4	12·4	16·5
R_4		14·8	17·4	11·6	16·3	12·8	14·2	12·3	13·0
R_5		9·8	9·0	3·5	10·9	12·3	12·2	8·9	11·5
Av. Air Velocity	m/sec								
Air Flow	m^3/sec	10·781 x 13·57 = 5,26,867 m/hr.				11·064 x 14·52 = 5,78,337 m/hr			
Connected Motor	kW	30 KW.				30 KW.			
Supply Voltage	Volt	435	435	435	435	438	439	438	438
Motor Current	Amps	35·29	35·40	35·64	35·44	29·18	29·64	29·52	29·44
Consumed Power	kW	21·00	20·75	20·46	20·73	15·39	15·24	15·05	15·22
Power Factor	-	0·78	0·78	0·76	0·77	0·69	0·67	0·67	0·67
Power Saving	%					26·57%			

Remark

Engineer
Maya Fan Air Engineering Pvt. Ltd.

22/11/07
P.B.PATNAIK
Sr. Exe. WMD
Signature

Signature

Case Study-2

Practical example of comparison at KRIBHCO (FRP to FRP)

Observation 1 for Air velocity range -
Air velocity range of maya fan is more uniform as compare to the existing fan.

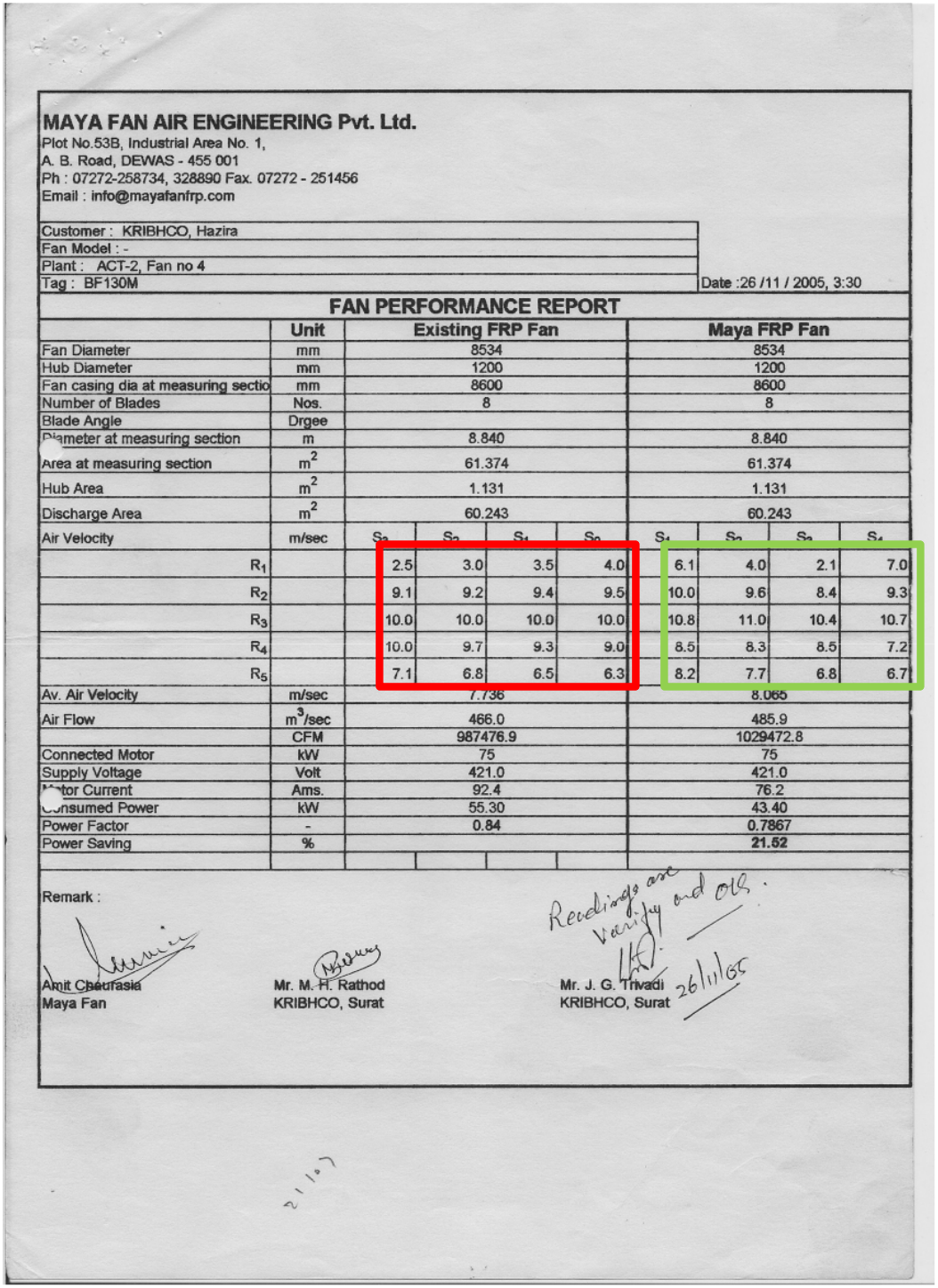
Ideally air velocity across the whole blade should be equal thus the range of airflow across the blade length should be zero.

Observation 2 for Air Flow –
Existing fan - 987476
Maya Fan - 1029472

Airflow is higher then existing fan

Observation 3 for Power Consumption –
Existing fan - 55.30
Maya Fan - 43.40

Even with higher air flow power consumption is lower then the existing and our fan save 21.52% power over the existing FRP fan.



MAYA FAN AIR ENGINEERING Pvt. Ltd.
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A. B. Road, DEWAS - 455 001
Ph : 07272-258734, 328890 Fax. 07272 - 251456
Email : info@mayafanfrp.com

Customer : KRIBHCO, Hazira
Fan Model : -
Plant : ACT-2, Fan no 4
Tag : BF130M
Date :26 /11 / 2005, 3:30

FAN PERFORMANCE REPORT

	Unit	Existing FRP Fan				Maya FRP Fan			
Fan Diameter	mm	8534				8534			
Hub Diameter	mm	1200				1200			
Fan casing dia at measuring sectio	mm	8600				8600			
Number of Blades	Nos.	8				8			
Blade Angle	Drgee								
Diameter at measuring section	m	8.840				8.840			
Area at measuring section	m^2	61.374				61.374			
Hub Area	m^2	1.131				1.131			
Discharge Area	m^2	60.243				60.243			
Air Velocity	m/sec	S_2	S_3	S_1	S_4	S_1	S_2	S_3	S_4
R_1		2.5	3.0	3.5	4.0	6.1	4.0	2.1	7.0
R_2		9.1	9.2	9.4	9.5	10.0	9.6	8.4	9.3
R_3		10.0	10.0	10.0	10.0	10.8	11.0	10.4	10.7
R_4		10.0	9.7	9.3	9.0	8.5	8.3	8.5	7.2
R_5		7.1	6.8	6.5	6.3	8.2	7.7	6.8	6.7
Av. Air Velocity	m/sec	7.736				8.065			
Air Flow	m^3/sec	466.0				485.9			
	CFM	987476.9				1029472.8			
Connected Motor	kW	75				75			
Supply Voltage	Volt	421.0				421.0			
Motor Current	Ams.	92.4				76.2			
Consumed Power	kW	55.30				43.40			
Power Factor	-	0.84				0.7867			
Power Saving	%					21.52			

Remark : Readings are Variable and OK.

Amit Chaurasia
Maya Fan

Mr. M. H. Rathod
KRIBHCO, Surat

Mr. J. G. Trivadi
KRIBHCO, Surat
26/11/05

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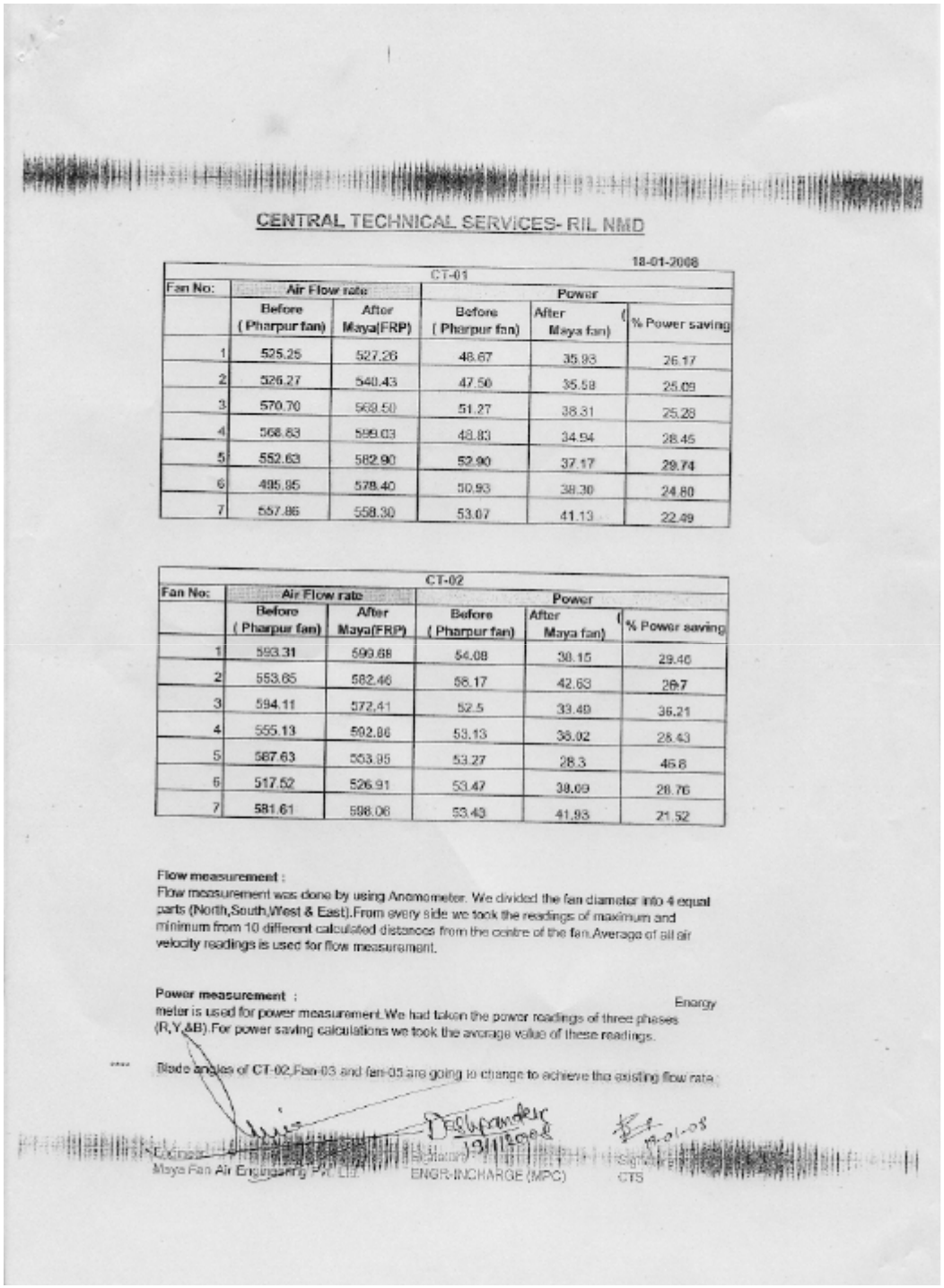
Our one of the prestige's project summery Report for 10M (33') for cooling tower application

At IPCL Nagothane

Average power saving in 14 fan is 28.63% which will save 209.34 kW per hour.



CENTRAL TECHNICAL SERVICES- RIL NMD

18-01-2008

CT-01

Fan No:	Air Flow rate		Power		
	Before (Pharpur fan)	After Maya(FRP)	Before (Pharpur fan)	After Maya fan)	% Power saving
1	525.25	527.26	48.67	35.93	26.17
2	526.27	540.43	47.50	35.58	25.09
3	570.70	569.50	51.27	38.31	25.28
4	568.63	599.03	48.83	34.94	28.45
5	552.63	582.90	52.90	37.17	29.74
6	495.85	578.40	50.93	38.30	24.80
7	557.86	558.30	53.07	41.13	22.49

CT-02

Fan No:	Air Flow rate		Power		
	Before (Pharpur fan)	After Maya(FRP)	Before (Pharpur fan)	After Maya fan)	% Power saving
1	593.31	599.68	54.08	38.15	29.46
2	553.65	582.46	58.17	42.63	26.7
3	594.11	572.41	52.5	33.49	36.21
4	555.13	592.86	53.13	38.02	28.43
5	587.63	553.95	53.27	28.3	46.8
6	517.52	526.91	53.47	38.09	28.76
7	581.61	598.06	53.43	41.93	21.52

Flow measurement :
Flow measurement was done by using Anemometer. We divided the fan diameter into 4 equal parts (North,South,West & East).From every side we took the readings of maximum and minimum from 10 different calculated distances from the centre of the fan.Average of all air velocity readings is used for flow measurement.

Power measurement :
Energy meter is used for power measurement.We had taken the power readings of three phases (R,Y,&B).For power saving calculations we took the average value of these readings.

Blade angles of CT-02,Fan-03 and fan-05 are going to change to achieve the existing flow rate.

Maya Fan Air Engineering Pvt. Ltd.

ENGR-INCHARGE (MPC)

CTS

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Based on all the above special feature Maya Fan has become the First and only company which having the ISO 9001:2008 Certification for -

"Manufacturing and Supply of Energy Saving FRP Bladed Fans."

Certificate of Registration

MOODY INTERNATIONAL

This is to certify that the Quality Management System of :

Maya Fan Air Engineering Pvt. Ltd.

Plot No.53-B,Industrial Area,No.1 A.B.Road,Dewas(M.P.)

has been assessed and found compliant with the requirements of :

ISO 9001:2008

Approval is hereby granted for registration on the proviso that the certification rules and conditions are observed at all times.

Certification Scope:

Manufacturing and Supply of Energy Saving FRP Bladed Fans.

Certificate No.: IIN-0298.09

Issue Date: 3 June 2009

Expiry Date: 2 June 2012

Authorised Signature

Moody International Certification Ltd.

www.moodyint.com

UKAS QUALITY MANAGEMENT 014

The use of the Accreditation Mark indicates accreditation in respect of those activities covered by the Accreditation Certificate 014.
The certificate remains the property of Moody International Certification Limited to whom it must be returned on request.

With all the above special feature Maya Fan offer the broadest range of product as given -

- Series CTA for Cooling Tower applications
- Series CTAVPA for Cooling Tower applications
- Series HEA for Air Cooled Heat Exchanger
- Series HEAVPA for Air Cooled Heat Exchanger
- Series HA for Humidification Plants
- Series HPA for High Pressure Ducted System
- Series TWA for Tea Withering
- Series DDA for General Air Handling Unit
- Series DDA, BTA, WAT, and HTA for General Air Handling Unit
- Series MVA for Under Ground Mine Ventilation
- Series DHPA for Very High Pressure Low Noise Ducted System
- Series RA for Roof Exhaust or Ventilation

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- Series MVBA – Mine Ventilation Booster Fan
- Series HVACA for HVAC Fan Applications
- Series AHUA for AHU Applications
- Series TUA - Tube Axial Fan
- Series IEA for Industrial Exhaust Application
- Series AV – Axial Ventilator
- Series DFA for Ducted System

Thank You

For any enquiry, quarry or suggestion feel free to contact us –

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