A

PRESENTATION ON TURBO VENTILATORS,

THEIR WORKING PRINCIPLES, TECHNICAL FEASIBILITY, ECONOMIC VIABILITY & AREAS OF APPLICATIONS…!

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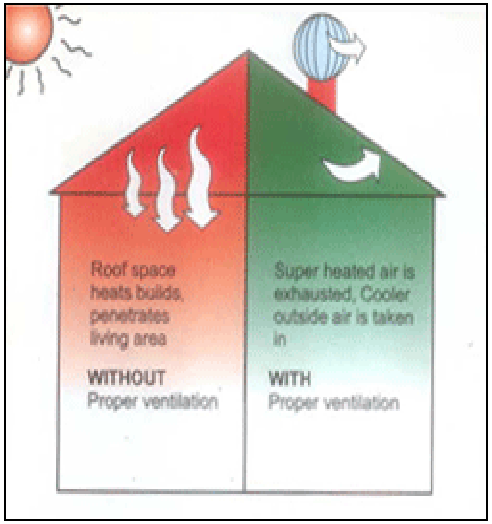
ABOUT TURBO VENTILATORS & WORKING PRINCIPLES

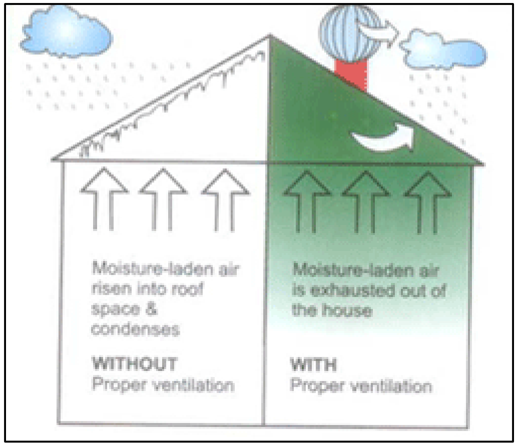
Turbo Ventilator is a combination of both natural & forced air ventilation system. It is a free spinning roof ventilator which works by utilizing the velocity energy of the wind to induce air flow by Centrifugal Action. The Centrifugal Force caused by the spinning vanes creates a region of low pressure area which draws and throws out air from below and causes fresh cool air from the outside to come in. The slightest breeze will cause the Turbo ventilator to spin. Even after the breeze has stopped, the Fly Wheel Effect of the Rotor Cage will use its stored energy to continuously remove stale air, gases, fumes and smoke giving rise to ventilation. Suction is maintained even at low wind velocity. Convective Thermal Currents are given boost by venture dome to further enhance the rotation of the Turbo Ventilator.

Cooler air from outside will rush into the negative space within the building in order to maintain a condition of equilibrium.

Some of its most important features are:

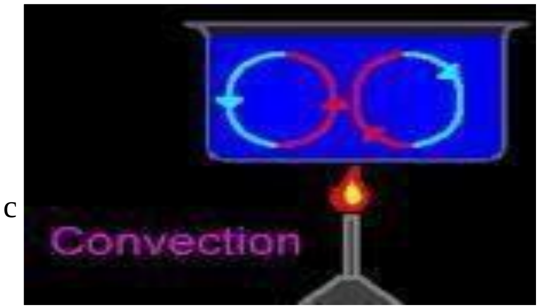
- Round the year effective ventilation at no running cost.
- Runs on wind power.
- Completely weather & storm proof.
- Mechanically strong, impact resistant & light weight.
- Adaptable to any kind of roofing.
- Economical & eco - friendly.
- Maintenance free.
- Noise free.
- Entitled for depreciation at an accelerated rate under present Taxlaws.





Diagrammatic Presentation

CONVECTION CURRENTS



- Convection, in the most general terms, refers to the movement of currents

within fluids (i.e. liquids, gases and rheids).

- Convection is one of the major modes of heat transfer and mass transfer. In fluids, c ıce

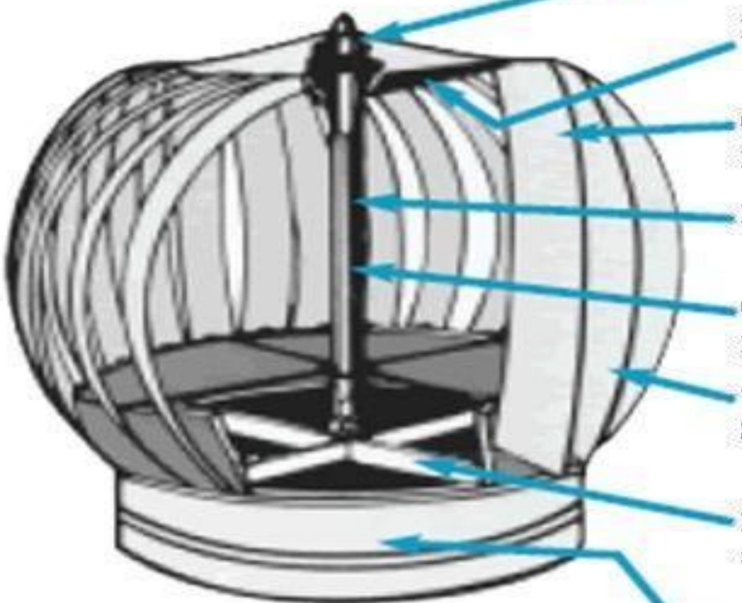
  through both diffusion –

the random Brownian motion of individual particles in the fluid – and by advection, in which matter or heat is transported by the larger - scale motion of currents in the fluid. In the context of heat and mass transfer, the term "convection" is used to refer to the sum of advective and diffusive transfer.

- A common use of the term convection leaves out the word "heat" but nevertheless refers to the case in which heat is the entity of interest being advected (carried). In one type of heat convection, the heat may be carried passively by fluid motion which would occur anyway without the heating process (a heat transfer process termed loosely as "forced convection"). In the other major type of heat convection, heating itself may cause the fluid motion (via expansion and buoyancy force), while at the same time also causing heat to be transported by this motion of the fluid (a process known loosely as natural convection, or "free convection"). In the latter case, the problem of heat transport (and related transport of other substances in the fluid due to it) is generally more complicated.

Both forced and natural types of heat convection may occur together.

DESIGN FEATURES & MATERIAL OF CONSTRUCTION



Aluminium Turbo Ventilator
(cross section)
Moldels in S.S. 202 & S.S 304 also available

TECHNICAL SPECIFICATIONS – ALUMINIUM VENTILATORS

S. NO.	TECHNICAL SPECS	ACTUAL	REMARKS
1.	SIZE (THROAT DIA)	24''(600MM) , 21''(530MM)	
2.	No of Vanes / Fins	32/26	Can be increased
3.	M.O.C. of Vanes / Fins	Hi-Grade Industrial Aluminium (Hindalco H-14)	
4.	Thickness of Vanes / Fins	0.5 MM	Can be increased
5.	Type of Vanes / Fins	Corrugated Roll Formed	
6.	M.O.C. of Top Cover & Mounting Ring	S.S. 430	Can be in S.S202/304
7.	Thickness of Top Cover & Ring	0.50 MM	Can be increased
8.	M.O.C. of Connecting Rods	Galvanized Iron (G.I.)	Can be in S.S.
9.	M.O.C. of Base Frame	Galvanized Iron (G.I.)	-do-
10.	M.O.C. of Shaft	Galvanized Iron (G.I.)	-do-
11.	Dia of Shaft	20 MM	
12.	Net Weight / Height of Ventilator	Approx. 4to5 18''/16''	
13.	Method of fixing Base Frame on to Mounting Ring	Spot Welding	
14.	Rotation System	Self lubricating (non-maintenance) Nylon Bush / Double Jet Ball Bearing (SKF / NBC Make)	
15.	M.O.C. of Rivets	Al-G.I.	
16.	M.O.C of Base Plate	F.R.P. or Polycarbonate (both U.V. Stabilized)	
17.	Packing	Corrugated Boxes	

TECHNICAL SPECIFICATIONS – S.S. 430/202/304 VENTILATORS

S. NO.	TECHNICAL SPECS	ACTUAL	REMARKS
1.	SIZE (Throat)	24"(600) 21"(530)	
2.	No of Vanes / Fins	32/26	Can be increased
3.	M.O.C. of Vanes / Fins	S.S. /430/202/304	
4.	Thickness of Vanes / Fins	0.71 MM	Can be increased
5.	Type of Vanes / Fins	Corrugated Roll Formed	
6.	M.O.C. of Top Cover & Mounting Ring	S.S. 430/202/304	
7.	Thickness of Top Cover & Ring	0.50 MM	Can be increased
8.	M.O.C. of Connecting Rods	Galvanized Iron (G.I.)/	Can be in S.S.
9.	M.O.C. of Base Frame	Galvanized Iron (G.I.)	-do-
10.	M.O.C. of Shaft	Galvanized Iron (G.I.)	-do-
11.	Dia of Shaft	20 MM	
12.	Net Weight / Height of Ventilator	Approx. 6kg/6kg/5.5kg	
13.	Method of fixing Base Frame on to Mounting Ring	Spot Welding	
14.	Rotation System	Self lubricating (non-maintenance) Nylon Bush / Double Jet Ball Bearing (SKF / NBC Make)	
15.	M.O.C. of Rivets	G.I.	
16.	M.O.C of Base Plate	F.R.P. or Polycarbonate (both U.V. Stabilized)	
17.	Packing	Corrugated Boxes	

TECHNICAL SPECIFICATIONS – S.S/PP TURBO VENT

S. NO.	TECHNICAL SPECS	ACTUAL	REMARKS
1.	SIZE (THROAT DIA)	24''(600MM) , 22''(560MM)	
2.	No of Vanes / Fins	28/24	
3.	M.O.C. of Vanes / Fins	S.S 304/202/430 & Polypropylene	
4.	Thickness of Vanes / Fins	0.40 MM/0.50MM	Can be increased
5.	Type of Vanes / Fins	Corrugated Roll Formed	
6.	M.O.C. of Top Cover & Mounting Ring	S.S. 430/Polypropylene	Can be in S.S/304
7.	Thickness of Top Cover	0.50 MM	
8.	M.O.C. of Connecting Rods	Galvanized Iron (G.I.)	
9.	M.O.C. of Base Frame	Polypropylene	
10.	M.O.C. of Shaft	Polypropylene	
11.	Dia of Shaft	20 MM	
12.	Net Weight / Height of Ventilator	Approx. 4to5 18''/16''	
13.	Method of fixing Base Frame on to Mounting Ring	Polypropylene	
14.	Rotation System	Self lubricating (non-maintenance) Nylon Bush / Double Jet Ball Bearing (SKF / NBC Make)	
15.	M.O.C. of Rivets	G.I/S.S screw	
16.	M.O.C of Base Plate	F.R.P. or Polycarbonate (both U.V. Stabilized)	
17.	Packing	Corrugated Boxes	

NO. OF VENTILATORS REQUIRED

where,

a. Required Ventilation Rate, Q (cfm) $= \dfrac{\textbf{Volume} \times \textbf{Air Change Rate}}{\textbf{60}}$

b. Volume of Space to be ventilated (ft^3) = **l** x **w** x **h**

c. Air Change Rates:

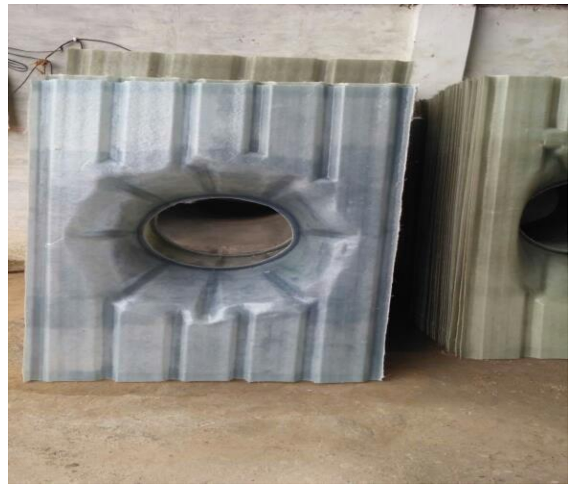
Type of Building	Air Change/Hour	Type of Building	Air Change/Hour
Ware Houses	4 – 6	Engine Room/Laundry & Plastic Factory	10 - 30
Textile Mill /Auditorium	4 – 12	Heavy Factory/Transformer Room	15 – 40
Factories (Light) /Hall	6 – 12	Paint Shop/Boiler Room/DG Room	15 – 60
Paper Mill /Brewery /Oil Mill /Packing Room	8 – 30		

NO. OF VENTILATORS REQUIRED (contd.)

Wind Velocity (mph)		3			8			10		
Temp. Diff. (Deg C)		3	5	10	3	5	10	3	5	10
Model No.	Stack (Height in Ft.)	* Exhaust Capacity in CFM								
HAV. 500	10	939	1000	1102	1436	1498	1600	1792	1858	1958
	20	1005	1084	1216	1503	1582	1714	1859	1938	2070
	30	1058	1154	1314	1556	1652	1812	1915	2010	2168
	40	1107	1216	1394	1605	1714	1896	1961	2070	2252

* The Exhaust Capacity of Turbo Ventilators of standard Belly dia size 28”, is a function of the wind velocity, temperature difference within and outside the shed area and the height at which these are to be installed.

PICTURE GALLERY



ECONOMIC VIABILITY

Turbo Ventilators, by helping save on power, meant for ventilation purpose and by creating a healthy & congenial working environment, prove to be highly cost effective in the long run.

According to a conservative estimate, the initial cost of procurement of these Turbo Ventilators can be recovered within 12 months from the date of their commissioning. Turbo Ventilators help maintain proper working conditions in the work area by helping remove stale air, smoke, obnoxious gases, dust and suspended particles from the production and /or production utility areas such As Boiler Rooms, Compressor Rooms, etc. and that too no running and maintenance costs.

Besides, helping industrial units cut down on power bills meant for ventilation purposes, Turbo Ventilators indirectly result in cost saving by helping claim a higher (80%) depreciation on these state of the art Ventilation Systems. This has been allowed by the government under the present Tax Regime, in order to promote and encourage their use in the Indian Industry, as these are environment friendly and do not use precious power, which continue to soak up scarce resources such as coal, oil etc.

BENEFITS

Turbo Ventilators offer the following advantages over conventional exhaust systems, which run on power:

- Provide effective round the year air - ventilation & that too at zero running costs
- Maintenance Free
- Runs on velocity energy of wind, which is a renewable source of energy
- Weather, Leakage and Storm Proof
- Noise Free
- Easy to install and is adaptable to any kind of roofing material
- Highly durable and comes with a long and guaranteed life expectancy
- Economical and environment friendly
- Entitled for accelerated depreciation under present Tax Laws

APPLICATIONS

Turbo Ventilators find use in:

- Warehouses
- Factories especially Filling Stations
- Industrial Sheds
- Workshops
- In Production Utility Areas like:
  - Boiler Rooms
  - Engine /D.G Set Rooms
  - Compressor Rooms
  - Transformer Rooms
  - Paint Shops
  - Packing Rooms