

## SNOWBREEZE 2

Snowbreeze 2 and 3 have been invented to maximize utilization of the resources of the family refrigerator, both in the form of ice and ice-cold water (below 5°C).

It is to be noted that cheap ice (Rs.2 or 4 cents per kg) is freely available in the market throughout India and home deliverable in most localities.

Yet the cost-benefit ratio of Snowbreeze takes a quantum leap when linked to the spare capacity of the refrigerator in the house, even partially.

As I see it the economics of snowbreeze is to be judged by these facts:

According to a chart issued with every monthly bill by BSES (the private company that supplies power to Delhi) a 265 litre fridge consumes just 5% of the power used by a 1.5 ton wall A.C.

Appliance	Capacity	Consumption (units per hour)
Refrigerator	265ltr.	0.10 ***
Air Conditioner	1.5ton	2.00 ***
CFL	15W	0.02
Bulb/Tube	40W	0.04
Fan 48"	60W	0.06
Geysar	2000W	2.00

The figures speak for themselves. A 1.5-ton room air conditioner consumes 2000 units of power in one hour, which is sufficient to produce 30 kilograms of ice in an ice factory. With that much ice Snowbreeze can keep a room almost equally cool and dehumidified for eight hours. Mukesh Agrawal, owner of Jaswant Cold Storage and Ice Factory in Delhi, said that his plant produced 21 tons of ice in 24 hours against a power consumption of 1,119 units, averaging an output of 19 Kg ice from one unit of electricity. A 21 ton plant manufactured by Metalex, advertised on the company's website, consumes 1080 units in 24 hours, giving an even higher average.

One might say there are distribution losses in ice deliveries. Under Indian conditions electricity transmission losses are no less, for which there are a variety of reasons including technical deficiencies and massive “thefts”, committed in the open, mainly by the richer power guzzling sections of society such as big factories and large bungalows and flats.

Add to that the colossal investments in the shape of electrical energy and finance to create the giant-sized infrastructure of power houses and transmission lines for every additional megawatt of power. If you take all this into account you will arrive at the sobering conclusion that a gadget which consumes one unit of energy per hour is in fact using two, the other half being invisible.

### People’s AC That Runs on Water

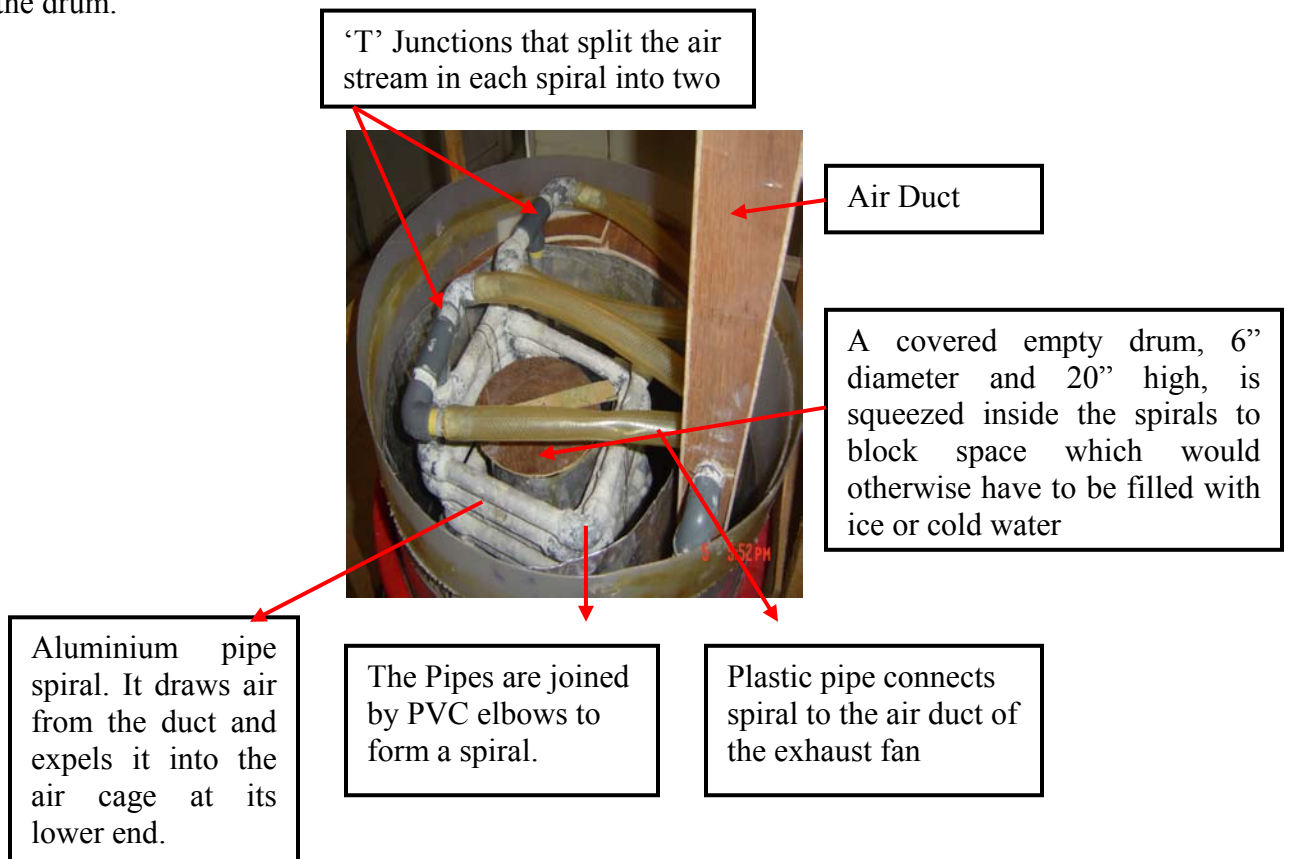


In Snowbreeze-2 we have used aluminium pipes of 20 mm (0.75 inch) diameter in place of the grooves in snowbreeze-1. Though the pipe length used is only fifty feet, less than half the length of the grooves, the volume of air cooled and pumped out by the whole unit is much more than in the earlier model. The pipes are placed in a large aluminum drum of 14” diameter and 16” high which is filled with ice and ice-cold water from a refrigerator.

We put the drum in a plastic bucket with a bottom of the same diameter (i.e. 14”) and sloping upwards towards its rim of 19” diameter. The drum was placed on 2.5 inches high buffers to create space for an air cage around it and below its bottom. The entire thin space between the wall of the drum and the bucket was thus converted into a cool air chamber. The ice and cold water inside the drum cooled the air in the surrounding chamber. The air exit ends of the two pipe spirals of 25 feet each, placed vertically, one on top of the other, inside the drum, opened into the air chamber at the bottom of the drum.

The duct, tapering down from the exhaust fan to the bottom of the cool air chamber, was sucking large volumes of cool air from the bottom of the bucket. It was a mixture of air in the air chamber and the chilled air in the pipes inside the drum.

Since the air enters the pipes from the air chamber through an opening in the upper part of the duct and goes out after being chilled through an opening at the bottom of the drum, the circulation of air thus generated triggers convection currents in the water in the drum.

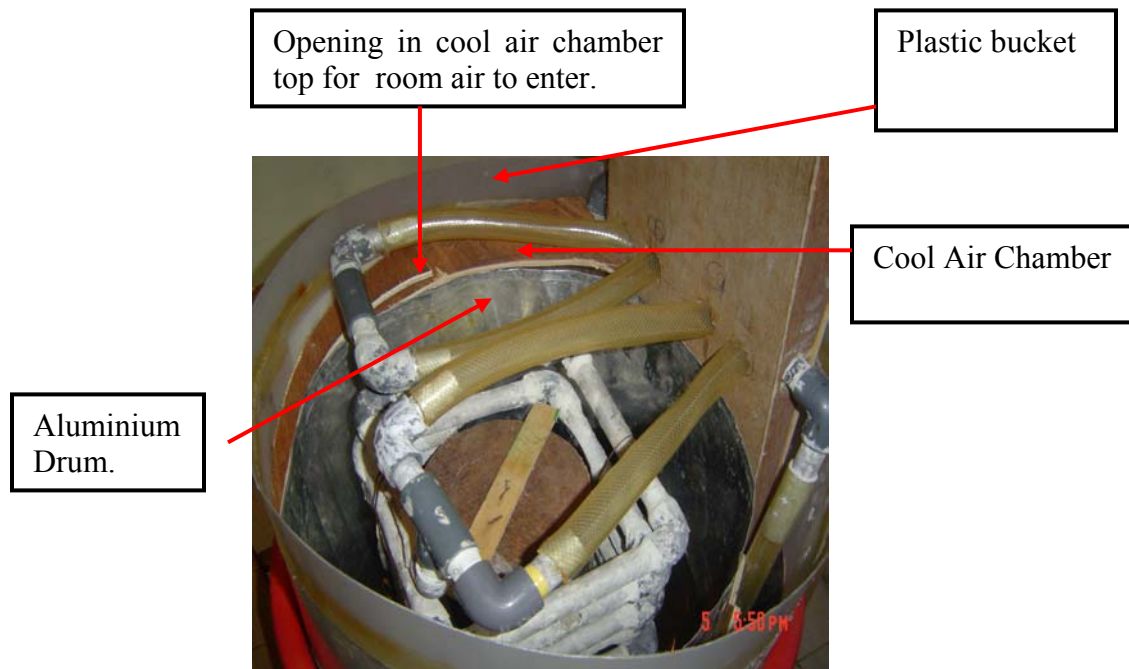


*This inevitably leads to evaporation of water in the drum and its simultaneous cooling, thus partly or wholly neutralising the heat it receives from the air, and maintaining a near constant temperature, or slowing down the warming up process. The continuous operation of this process in the water in the drum is confirmed by the fact that water at the bottom of the drum is always cooler than water on the surface. This difference can be felt any time by a mere touch of the lower part of the outer surface of the plastic bucket containing the drum.*

*What is more, the internal cooling process continues even while the unit is standing idle. When not running there is a difference of at least four degrees centigrade between the temperatures of the water in Snowbreeze 2 and the water in a tap or storage tank in the house.*

**This evaporation process does not humidify the room since the moist air of the tank carrying the evaporated water is immediately sucked back by the fan into the cooling air chamber as soon as it comes out of the drum, to be cooled and dehumidified again.**

In practice it means that when it is not too hot outside one can run the new model of Snowbreeze largely on self-cooling cold water, supplemented by measured quantities of ice, using the “Matka (pitcher) effect “, and operate it throughout the night on ice collected from the fridge in the past 24 hours.



**Our Next Move :** We shortly propose to replace the aluminium pipes with readymade copper coils of the same length to enhance the efficiency of this model. Results, expected by April 2009, will be promptly reported on this website.