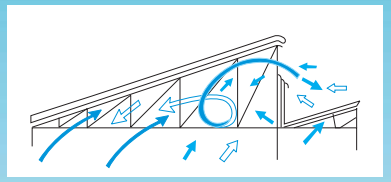
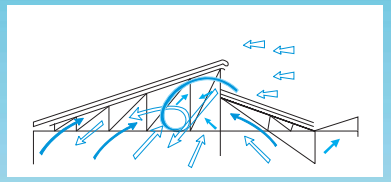
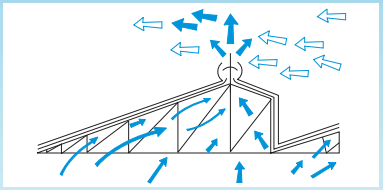


Conventional Northlight and semi - Northlight roofs, with wind blowing into the north face, as is bound to happen at some time of the year (Sometimes in



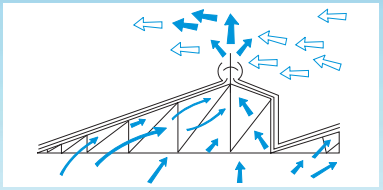
Turbulence- down draught -water leakage, galore. You may not see the turbulence as shown draught if there are no visible fumes or smoke, but they are there



Northlight (recommended modified profile) and semi - Northlight roofs with Gravent.

Gravent can be installed on the peak of conventional Northlight roof profile also in the same manner as shown for semi-Northlight roof above.

Orderly, smooth exhaust, with wind always giving a helping hand. No down draught or water ingress



RECOMMENDED VENTILATION ON AIR CHANGE BASIS

A convenient way to define the level of ventilation desired is to state the number of air changes required per hour. The higher the ambient temperature, the greater is the ventilation required for reasonable comfort. The following recommendations are

Type of Room	Recommended No. of Air - Changes per Hour
Offices above ground	6-20
Factories , Large open type	6-20
Factories and work rooms closely occupied	10-30
Workshop with unhealthy fumes	20-40
Laundries, dye-house, spinning mills	20-30
Kitchens	20-30
Lavatories	10-20
Boiler houses, Power Houses and Engine Room	20-40
Foundries , with exhaust plant, rolling mills	15-30
Foundries , without separate exhaust plant	20-40
Restaurants	20-30
Stores , Strong- Rooms	4-6
Assembly Halls	6-10

RCS
ISO 9001:2000 COMPANY
Touch Beyond

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GRAVENT

NATURAL GRAVITY VENTILATION SYSTEM

NO MOVING PARTS

NIL ENERGY

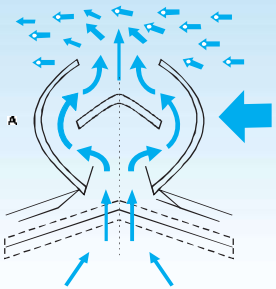
NOTHING TO FAIL

NOTHING TO MAINTAIN

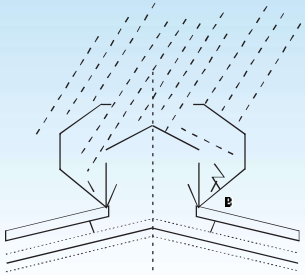
JUST FIT AND FORGET

The most efficient way of providing natural ventilation to an industrial building would be not to have the roof at all ! The hot air generated due to working conditions on shop floor would just rise and get lost in the atmosphere !

Unfortunately this is not practical, so we provide the next best solution with the GRAVENT industrial ventilation system. You will open up your roof to the sky, but we arrange to keep out the sun and



GRAVENTS gives free passage to hot air, smoke, fumes etc. (solid arrows) to leave the building irrespective of weather conditions or wind direction. Outside wind (hollow arrows) blowing in any direction, always helps extract inside air. Greater



Rain, no matter how heavy, drains out on the outside of the roof sheets. Not even a drop comes in, yet there is no obstruction for the exhaust of hot air.

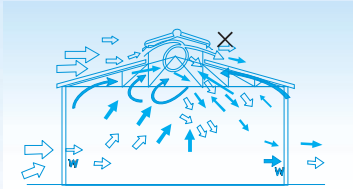
BEAT THE ENERGY CRISIS

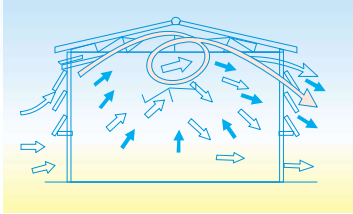
Conventional exhaust systems with powered fans involve vibrations, reverberatory noises and worst of all, consumption of power which is so scarce. Besides, regular maintenance is usually neglected as the units are fitted high up in the roof. Moreover, the systems stop functioning when power fails – just when it is most needed. Not so with GRAVENT which relies only on nature's own, unfailing principles of gravity and convection currents.

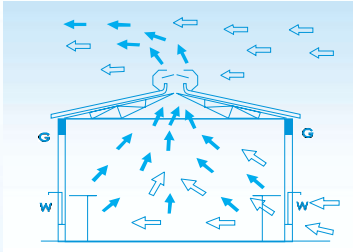
APPLICATIONS

Almost any type of industrial or commercial building would most likely have an application for GRAVENT. The throat size would depend upon the volume of air which is to be exhausted and other parameters such as height and temperature differential. Buildings with high heat loads such as steel rolling mills, foundries, smelters, heat treatment shops, forge shops, glass factories etc. are ideally suited. Also non industrial buildings such a godowns machine shops, assembly shops, stores, sterilization rooms, club houses, etc. are potential applications for GRAVENT.

One of the most common type of construction for industrial buildings is the MONITOR ROOF, which is also the least efficient design. The wind (hollow arrows) blowing in any direction enters the monitor from the windward face, causes a lot of turbulence and down draught, disturbs the current of hot air (solid arrows) and exits from the leeward face. Consequently one







If rain is accompanied by strong wind, rain drops enter the building with the wind. Quite often, the windward face, or even both the faces of the monitor are boarded up to keep the rain out, but this also keeps the hot air, smoke, and fumes in.

Side Louvres in asbestos cement / galvanised / aluminium sheeting is another common type of construction, equally ineffective and counterproductive for the same reasons as in the case of the monitor. Quite often a building has both, monitor and side louvers, and yet has very poor ventilation.

For a PITCH ROOF, installing GRAVENT along the ridge is the ideal ventilation arrangement. It is imperative that all the inlet openings should be located within a height of 2.5m to 3m. from floor level so that fresh air coming in actually ventilates the workers at their operating level. As it picks up heat, it rises and exhausts through the GRAVENT, silently, efficiently, without any cross current or turbulence. Wind (hollow arrows) blowing over the GRAVENT always adds to the exhaust capacity. This efficiency will be adversely affected if any high level openings such as ventilators, louvers, windows, grilles etc. are kept in the mistaken belief that they would add to ventilation. They do not do so, but only cause back draught and turbulence. Fixed glasses (G) can be provided any where for illumination if required.

For optimum efficiency of ventilation, the necessary dynamic area of side openings for make up air near floor level should be at least 50% higher than the total throat area of GRAVENT installation on the buildings.

EXHAUST CAPACITY

GRAVENT works exactly like a chimney or a stack and the amount of air it will exhaust depends upon three main factors viz. the throat area (length x width), its height form centre point of side air inlets and the temperature differential between exist point of hot air and inlet level of fresh air.

The temperature differential in turn depends on the inlet to outlet area ratio. A Base Rating multiplied by a temperature, height factor and throat area would give its actual exhaust capacity for given conditions. IS 3103-1975, First Revision, Code of Practice for Industrial Ventilation, lays down various requirements for natural ventilation in para 4.3.2 and gives formulae in para 6.2.3. Our design for ventilation systems always fully satisfies these requirements.

The actual length of a GRAVENT installation can be worked out by taking into consideration the volume of the building and the maximum number of air