



the data over a period of time. Some international organizations are conducting LCIA (Life Cycle Impact Assessment) on many products. LCIA on plastics products will be an important tool to compare plastics with other products in terms of pollution nature.

Till such time LCIA studies are released and those results accepted by different countries, we may assess the issue of environmental pollution as per existing norms and rules.

### AIR POLLUTION

Air Pollution is considered the most serious concern, mainly in the highly populated/industrial areas.

Table shows the major air pollutants and type of industries/sources responsible for such pollutions. The industries which have been identified as major sources of air pollution under this by Central Pollution Control Board (CPCB) are:

- Thermal Power Plants
- Brick Kilns
- Potteries
- Steel rolling plants and
- Induction furnaces

Plastics processing has been kept under non-polluting (Green) category.

During production of commodity plastics raw materials, mainly four chemicals are involved which attract attention of critics. These are:

- Ethylene
- Propylene
- Chlorine / Vinyl Chloride Monomer (VCM), and
- Benzene

Critical characteristics and safety limits, TLV (Threshold Limit Value), IDLH (Immediately Dangerous to Life or Health) limit etc. are available.

PVC is the most controversial plastic material which attracts the attention and criticism of the environmentalists lobby and hence it is the most researched material all over the world. The topic is vast and calls for elaborate discussion. The major issues concerning PVC are:

*Issue-1: PVC contains VCM - which is carcinogenic:*

Most manufacturers are today offering PVC containing Residual Vinyl Chloride Monomer (RVCM) less than 5 ppm level - a safe limit for the environment. Some of the new plants can even boast of RVCM level of 1 ppm and below.

*Issue-2: PVC evolves Chlorine and Hydrochloric Acid (HCl) during processing, which are hazardous:*

If enough HCl is evolved from PVC during processing, then the product degrades which is indicated by yellowing, browning and ultimately blackening of the product.

In reality, HCl is not allowed to evolve from PVC during processing by the action of stabilizers which fix the HCl inside the compound

**Table : AIR POLLUTANTS AND THEIR EFFECTS ON ENVIRONMENT**

SR NO	POLLUTANT	TYPE OF INDUSTRY/ SOURCE RESPONSIBLE	EFFECTS ON ENVIRONMENT
1	Suspended Particulate Matter (SPM)	Fuel burning, stacks of boilers, dust storm, volcanic eruptions, explosions, cement, mining	Deposition of leaves and hence reduced photosynthesis, respiratory diseases and pulmonary tuberculosis and bronchial asthma.
2	Sulphur Dioxide (SO <sub>2</sub> )	Fuel burning, sulphuric acid, incineration of city's solid wastes, chemical industries, smelting, refinery.	Acid rains, leaf burn, chlorophyll destruction, corrosion of stones, and monuments, damage of testicles, irritation to membranes and lachrymal, reduced visibility, asthma.
3	Oxide of Nitrogen (Nox)	Petroleum operations, industrial and automobile combustion, lightning.	Irritation to mucous membranes, chlorotic mot premature needle drops, rymation.
4	Carbon Monoxide (CO)	Incomplete combustion of fuels and hydro carbons in industry and automobiles.	Asphyxiating gas in enclosed places, headache, loss of visual acuity, loss of a lity to accurately estimate time intervals, decrease in muscular co-ordination, loss of oxygen from blood, disruption of nitrogen fixation free living bacteria and nitrogen fixers.

\* Plastics are not considered as sources of these pollutions.