



## Tyres: Retiring Environment

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### Abstract

Open burning of scrap (bicycle, motorcycle, canard truck) tyres (OBST) was simulated in the laboratory to investigate their impact on the ambient air quality. The types maples were burnt in combustion chamber, and gaseous pollutants (CO, NO<sub>2</sub> and SO<sub>2</sub>) emitted were quantified, while concentrations and elemental compositions of emit-ted total suspended particulates (TSP) were determined. Emission levels of SO<sub>2</sub> from the entire tyre samples exceeded USEPA allowable (156.74 lg/m<sup>3</sup>) limit. CO due to car and truck tyres exceeded USEPA allowable (10,285.71 lg/m<sup>3</sup>) limit, while NO<sub>2</sub> concentration was below the allowable limit (56.33 lg/m<sup>3</sup>) only in bicycle tyre. 25% of all the gaseous pollutants emitted are within the Air Quality Index range of 101–150. TSP concentrations from all the tyres ambles were higher than the Federal Ministry of Environment standard (250 lg /m<sup>3</sup>) for ambient TSP. There is strong correlation (R) of 0.885, 0.949 and 0.802 among all the gaseous (CO/NO<sub>2</sub>, CO/SO<sub>2</sub> and NO<sub>2</sub>/SO<sub>2</sub>) pollutants, respectively, while the highest (0.999) and lowest (0.079) positive correlations were observed between Mg and Mn as well as Cd and Zn, respectively. The results of this study show that OBST emits hazardous pollutants, which pose serious threat to human health and environment.

**Key words:** Air quality, Environment impact, Scrap tyres burning, Ecology impact

**Introduction:** If we exclude the risk of fire, the scrap of tire how is a real danger to the environment. However, the ever growing mass of waste, the low degradation rate and compressibility are many disadvantages to their burial of the tyres. Because tyres are made of natural rubber and plastic, it's easy to miss just how much they contribute to pollution in our oceans. Small bits of degraded plastic from tire wear pervade the environment, including the oceans, researchers are discovering. Tyres do not decompose. When tyres pile up in landfills or junkyards, they can release chemicals into the air, ground, and water that alter the ecosystem. Just sitting in the sun, a waste tire releases methane gas into the air. This greenhouse gas increases our carbon footprint and can contribute to climate change.

- Objectives:**
1. study of tyres production in India.
  2. Use for tyres in India.
  3. Recycling of tyres.
  4. Environment pollution after burning the tyres.

### Hypotheses of the Study:

what thing adds in environment after throwing the tyres? After recycling what is the problem occur in environment and Effect of burning tyres.



**Study area:** This research paper has focused on tyres affecting factor of environment in research. In this we study how tyres burning are affecting our environment and ecology. Burning the tyres are relies many types of chemical gases and other molecules which can very dangerous to our environment. In India there are average growth rate of the tyres industry is 7%-8%. But what happen the after when tyres are damaged or bald. We throw the tyres in the open environment and leave. But what happen after these. We work on these how tyres are produced and what are the uses of tires and how tyres are affect theenvironment.

**Methodology:** This research paper aim is to understand, how the types are affected the environment. For this paper purposively interaction has made with participants, those who are participated in survey about the tyres the information is collected student, which was conducted at Bhiwandi. The data has collected through participants of survey. How the tyres production in India. The leading industries in India, after the uses of tyes in India. How the tyres are affected our environment the data collected through students and help of the site. The data has presented with help of tables and analyzed through use of percentage.

**Data Analysis:** The India tyre market attained 177 million units in 2020, driven by the surging automotive industry. Aided by the growing production of tyres, the market is expected to witness a further growth in the forecast period of 2023-2028,

In financial year 2021, the total tire production in India stood at around 169 millionunits. This was a decrease of four percent over the preceding year.

Production volume of tyres in India from financial year 2011 to 2021 (in million units)

<b>No. of Tyre Companies:</b>	<b>41</b>
No. of Tyre Plants:	62
<b>Industry Turnover 2018-19 (est.):</b>	<b>Rs. 63000 crore (US\$ 9 Bn)</b>
Exports 2018-19 (est.):	Rs. 12890 crore (US\$ 1.8 Bn)

**Tyres production in India, Indian Tyres Industry:**

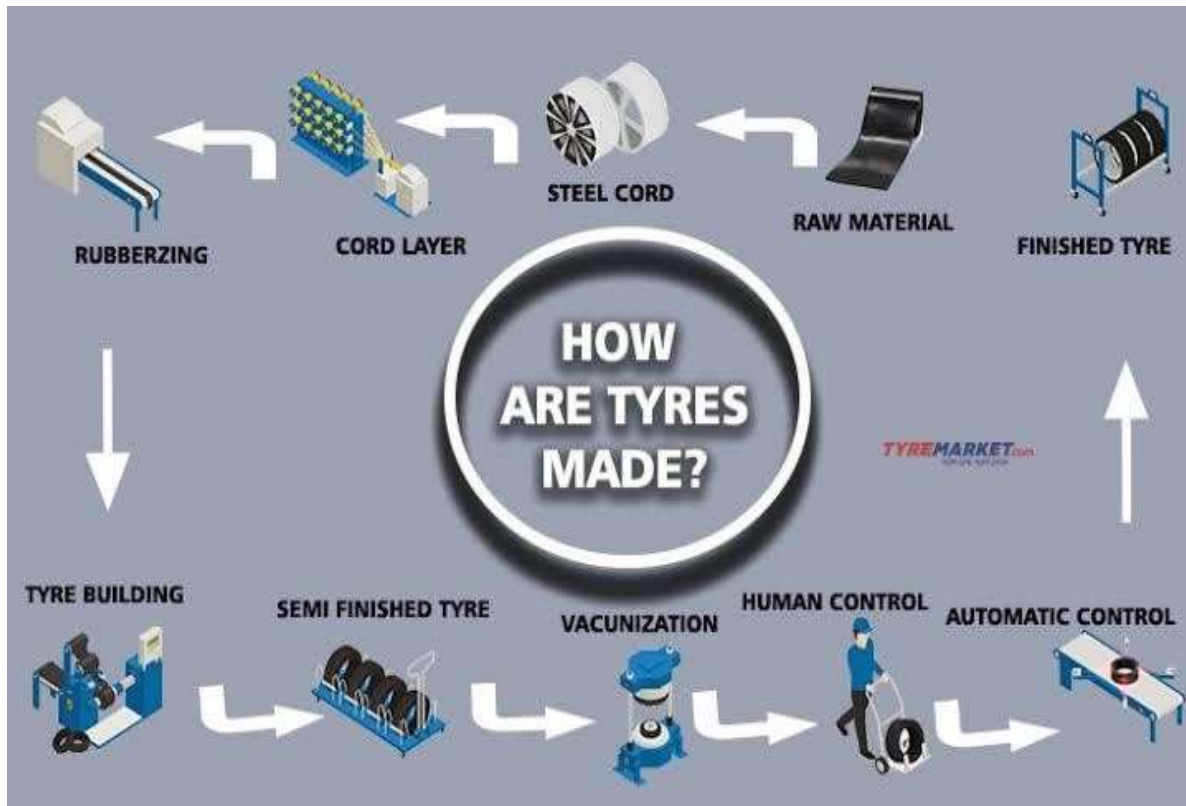
A Snapshot  
Number of Tyre Companies: 41  
No. of Manufacturing Plants: 66  
Estimated Industry Turnover Value (FY 20) Rs. 60000 Crores+Est. Export Value (FY 20) Rs. 12800 crores  
Sources of Raw Material

**Natural Rubber** Major Tyre Manufacturers in India:  
MRF, Apollo, JK, Ceat, Goodyear, Bridgestone, Balkrishna, TVS Srichakra, Birla, Falco  
Production of Tyres In India:  
All Categories (in Numbers)

YEAR	QUANTITY (Lakh/pieces)
2017-18	1776.7
2018-19	1919.8
2019-20	1767.9

Tyres production in India last three years report.

**1. Uses of tyres in India**



**Segment-wise Tyre Production (in Numbers) 2019-20**

SEGMENT	NUMBER OF TYRES PRODUCED
Truck/Bus	179.6
Light Commercial (LCV)	111.7
Car	407.7
Tractor/Farm	57.6
Two/Three Wheeler	997.5
OTR (Off-the-road)	9.7
Others (ADV/Industrial)	4.1

**2. Recycles of tyres:** The tire recycling production line is widely used for producing variety rubber products, like playground runway, modified asphalt, rubber floor, rubber tube, rubber overshoes etc.

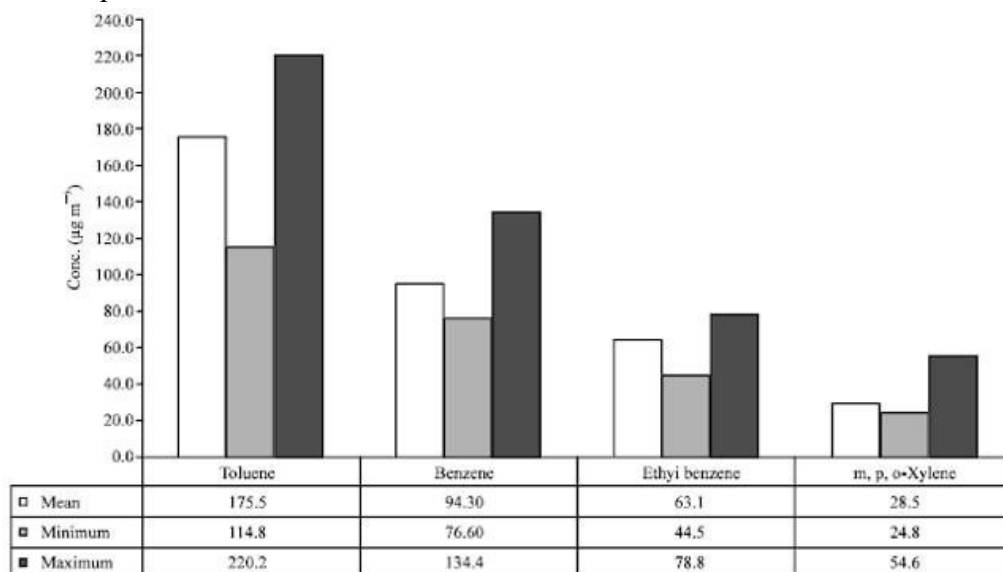
◆.Main machines: twin-shaft machine--steel wires separate machine--magnetic separator--high-speed crusher--vibrating screening machine--dust collection--rubber granules packing machine, etc.

### 3. Environment affect after burning the tyres

In summer 2012, a landfill liner comprising an estimated 1.3 million shredded tyres burned in Iowa City, Iowa. During the fire, continuous monitoring and laboratory measurements were used to characterize the gaseous and particulate emissions and to provide new insights into the qualitative nature of the smoke and the quantity of pollutants emitted.

Significant enrichments in ambient concentrations of CO, CO<sub>2</sub>, SO<sub>2</sub>, particle number (PN), fine particulate (PM<sub>2.5</sub>) mass, elemental carbon (EC), and polycyclic aromatic hydrocarbons (PAH) were observed. For the first time, PM<sub>2.5</sub> from tire combustion was shown to contain PAH with nitrogen heteroatom (a.k.a. azaarenes) and picene, a compound previously suggested being unique to coal-burning. Despite prior laboratory studies' findings, metals used in manufacturing tyres (i.e. Zn, Pb, Fe) were not detected in coarse particulate matter (PM<sub>10</sub>) at a distance of 4.2 km downwind. Ambient measurements were used to derive the first in situ fuel-based emission factors (EF) for the uncontrolled open burning of tyres, revealing substantial emissions of SO<sub>2</sub> (7.1 g kg<sup>-1</sup>), particle number (3.5 × 10<sup>16</sup> kg<sup>-1</sup>)

PM<sub>2.5</sub> (5.3 g kg<sup>-1</sup>), EC (2.37 g kg<sup>-1</sup>), and 19 individual PAH (totaling 56 mg kg<sup>-1</sup>). A large degree of variability was observed in day-to-day EF, reflecting a range of flaming and smoldering conditions of the large-scale fire, for which the modified combustion efficiency ranged from 0.85 to 0.98. Recommendations for future research on this under-characterized source are also provided.



(Recycle of tyres in India last five year)

As with most pollutants, experts suggest that though recycling is imperative, the ultimate goal should be a reduction of usage. If guidelines on recycling the tyres continue to be ignored, the air pollution crisis in India will only become worse. Emissions from tyres are known to contain a myriad of toxic mixtures especially particulate matter (PM), volatile organic compounds, hazardous air pollutants, and inspirable metals, some of which are known human carcinogens. Natural rubber is widely considered a more eco-friendly and better product than synthetic rubber, but it still presents some **Issues. Natural rubber contributes to deforestation, biodiversity loss, pollution, and more.** But climate change and disease also threaten natural rubber.



Paralysis is the thermal decomposition of tyres in the absence of oxygen. Shredded tyres, at temperatures between 250° C and 500° C, produce liquid oil and gases. Recovering energy in this process was deemed safer than traditional methods of burning. The pollution board, however, mandated that the pyrolysis plants dispose the carbon black – a harmful particulate matter pollutant – safely.

**Conclusion:**

The health and environmental impacts of open burning of scrap tyres have been assessed. This study has significantly established that gaseous pollutants (CO, NO<sub>2</sub> and SO<sub>2</sub>) are present at varying concentrations in all categories of tyres when burnt. The presence of heavy metals in TSP at varying concentration levels in all the four categories of tyre samples investigated was also established. The highest concentration was observed in Zn in car tyre. The continuous exposure to gaseous and particulate emissions from OBST could pose major threats to human health and environment. Hence, scrap tyre management practices, which involve reduction, reuse, recycling, energy recovery and proper disposal, are recommended to be adopted along with strict compliance with both national and international laws and regulation.

**References:**

1. Environment geography .Dr.F. M. Nadaf
2. Enphyclopi
3. Human Geography . Dr. Majjid Hussen
4. Physical geography . sou.shri, Date