



Cleaner Building Materials (Walling & Flooring) Green Fly Ash Products

Centre for Science & Environment

December 2017



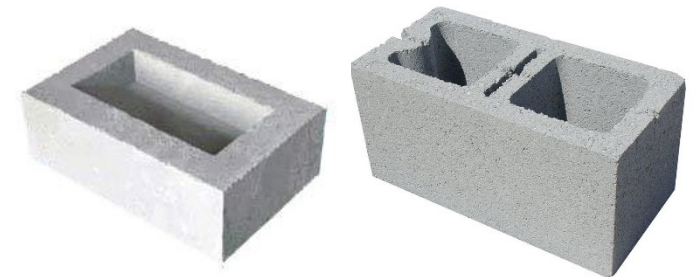
Technology Transformation ...



Burnt Clay Red Brick



Cement Concrete



Fly Ash Brick & Block

Air Pollution 1 of 2...

India 3rd most polluting nation in the world

2.5 billion ton CO₂ emissions

3.5% generated by burnt clay red brick kilns

Burn pollutants like coal, petcoke, briquette, LDO, rubber tyre, and husk using outdated technology

Emit poisonous gases – CO, NO_x, and Sulphur



0.5% generated by open dumping of Fly Ash

400+ thermal power plants in India, generate 250+ million ton of Fly Ash every year

MoP spends crores to dump this Fly Ash on highways, garbage yards, river banks, and sea



FAP – The Solution ...2 of 2

Climate Change Plan – Indian Govt. has committed to reduce emissions by 33%, at an expense of \$2.5 trillion (₹162.5 Lakh Cr)



Fly Ash product industry can help achieve 12% of this target without any capital outlay from Govt.



Utilize:



To make building materials which are:

- Sustainable
- High Quality
- Cost-effective
- Eco-reviving



Coal waste (Fly Ash)



POP/Flouron waste (Gypsum)



Acetylene Gas waste (Lime)



Crushers waste (Stone Dust)



With 250+ million ton annual Fly Ash and trillions of tons of Historical Fly Ash, FAP can completely replace the annual 25,000 crore production and consumption of red bricks

Water Pollution

In a race to dispose Flyash, rather than utilization, thermal plants have started giving Flyash for



Highway Soil Stabilization



Mines Refilling

- Various studies have proven that rainwater, if passed through Flyash dumps, leads to **Leaching**
- This contaminated water spoils underground water reserves and becomes reason for unsolved diseases and eventually deaths

Food Security



India faces 30 million tons supply shortage of vegetables, fruits, edible oils, rice, and pulses, every year



- **Burnt Clay Red Bricks eat-up 500+ km²** (equivalent to the size of Mumbai city) **of fertile top soil every year**
- This irreversible damage to the cultivable land by burnt clay red brick industry, will **further aggravate this threat to the National Food Security**



On the other hand, **Fly Ash products will free-up the land currently occupied by Fly Ash mounds and dumping yards, for a more productive land utilization**

Employment Gain

Burnt Clay Red Brick Kilns

- 24-hour continuous firing process, covered in tiring long double shifts of 12-hours each
- Seasonal production – only 6 months of employment in a year, leading to irregular income for workers
- Heavy physical work – tough for women; Promotion of child labour
- Poor working conditions – no covered sheds, extreme heat and pollution due to fuel burning



Fly Ash Brick Plants




- Easy mechanized stop-start process, 8-hour working shift with flex-time options
- Full-year production providing security of permanent income throughout the year
- Mostly mechanized, and less physical, work suits men and women equally
- Better working conditions – production under covered sheds, no burning of fuel, no pollution



Though Burnt Clay Red Bricks industry employs a little more work force than Fly Ash Product industry, their employment is seasonal and work environment poor

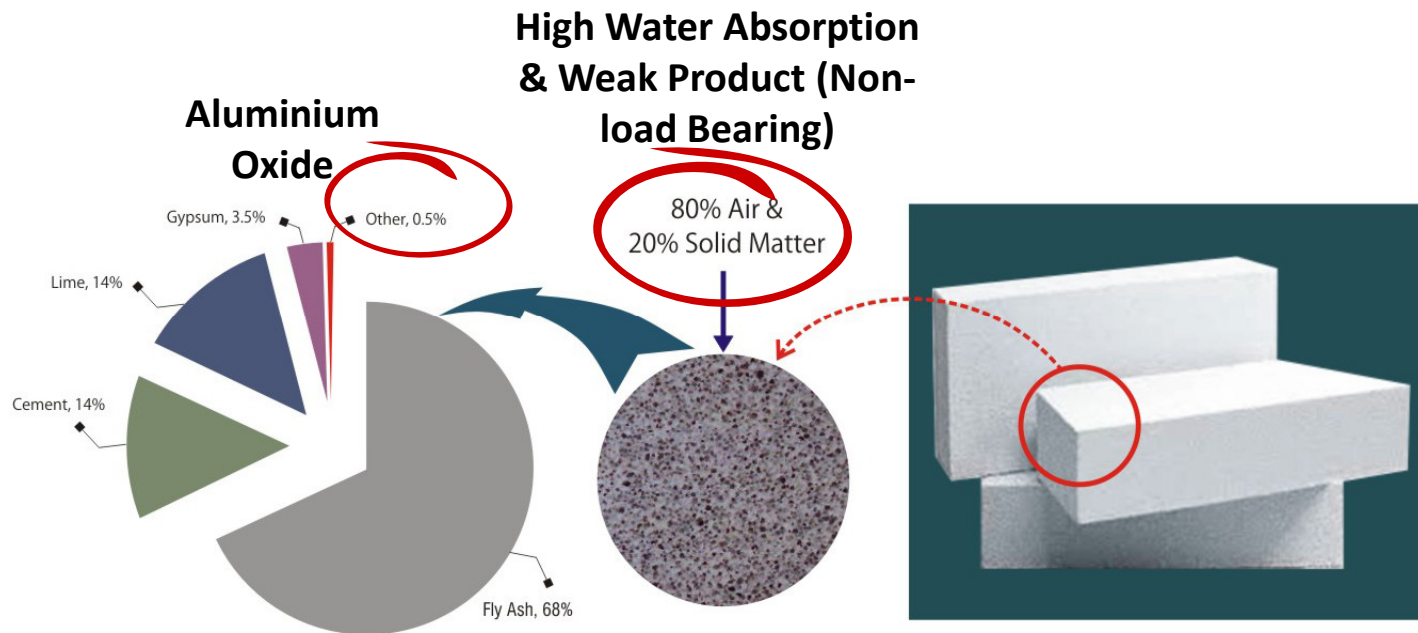
FAP in the Market ...1 of 2

Over time, FAP has evolved into following three kinds of products

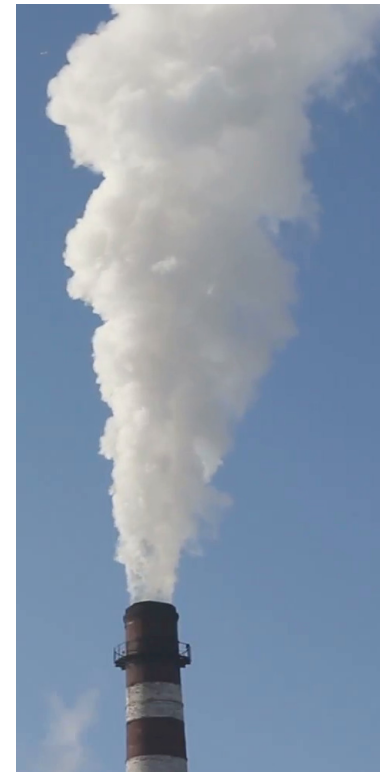
FAP Type	Fly Ash Percentage	Density (kg/m ³)	Load Bearing	Applicable GST
Fly Ash Concrete	25-35%	1800-2000		18%
Fly Ash / Bottom Ash Products	80-90%	1100-1200		5%
Fly Ash Ultra Light-weight Products	60-70%	500-600		12%

And Not Every FAP is Green ...2 of 2

Fly Ash Ultra Light-weight Products like Autoclaved Aerated Concrete (AAC) and Cellular Light-weight Concrete (CLC) are not as green as you think



Ultra Light-weight Products need pores --- pores need aluminium oxide and baking with steam at 200°C --- steam needs burning of coal, petcoke, briquette, LDO, rubber tyre, husk, etc. --- burning leads to pollution



Thank You

It has taken 20 long years to change the colour of brick from **Red** to **Grey** in engineering and diploma textbooks



Clean India, Make in India
Zero Defect, Zero Effect

Though
Yesterday was
Red, But
Tomorrow
must be **Green**



Together We Can and Together We Will...

