

# A Quality Fly Ash from M L Enterprises

### **ML Flyash - Introduction**

#### ABOUT US: About M.L.ENTERPRISES, INDIA.

M.L.ENTERPRISES, INDIA is the flag ship company of M.L. Group, based at Himatnagar, Gujarat, India. The major product of the company is ML Fly Ash.

#### About Our ML Fly ash.

ML Fly Ash is a quality classified fly ash - One of the finest cement extenders in the world.

ML Fly Ash is produced by careful selection and beneficiation of coal based thermal power station. ML Fly Ash is available in various grades to suit vide range of applications.

#### M.L.Enterprises, India.

The biggest fly ash manufacturers & exporters in Gujarat, West India.

Quality manufacturers of FLY ASH in accordance with ASTM C 618 or BS: 3892 Part – 1 or IS standards.. Producing quality assured classified fly ash in accordance to interanational standards like ASTM C618, BS En 450 Catogary N and BS 3892 Part 1. We can supply our flyash in compliance to IS 3812 (Part -1):2003 and IS 3812 (Part -2):2003

80 % of Production of Fly ash is being exported by us.

Exporting quality assured classified fly ash to Middle East Asia, South Asia, South East Asia, Far East Asia and Africa.

M.L.ENTERPRISES belongs to forms a part of M.L.GROUP OF COMPANIES, which is having more than 6 years owned for rich business experience and goodwill for every year in construction field.

#### **Group Milestones**

Group consists of 2 Organizations.

1st Organization is related to ceramics production & marketing.

Serving to ceramic industries.

First Organization was started in the year 2005.

2nd Organization is related to fly ash utilization, manufacturing & exports.

M.L.ENTERPRISES was started in 2007.

It is very well known company now world wide for exports of fly ash.

Group turnover - About 5 Million USD (Current year forecast).

Group vision – 8 Million USD Turnover in 2013.

Projects under study – Ready mix concrete plant, Cement Blending Unit.

#### State of the Art Infrastructure

100,000 MT of fly ash per annum of Capacity of Production, Packing, Exports of fly ash.

Export availability: 8,000 MT / Month.

In-house Warehouse: 10,000 MT Storage.

Shipment during monsoon with warehouse.

Open Storage Area - 170,000 Sq Meter

Plant Area - 9,000 Sq Feet.

In-house Container Stuffing Facility as well.

In-house 24 x 7 lab facility.

Facility to provide 1000 MT loading rate.

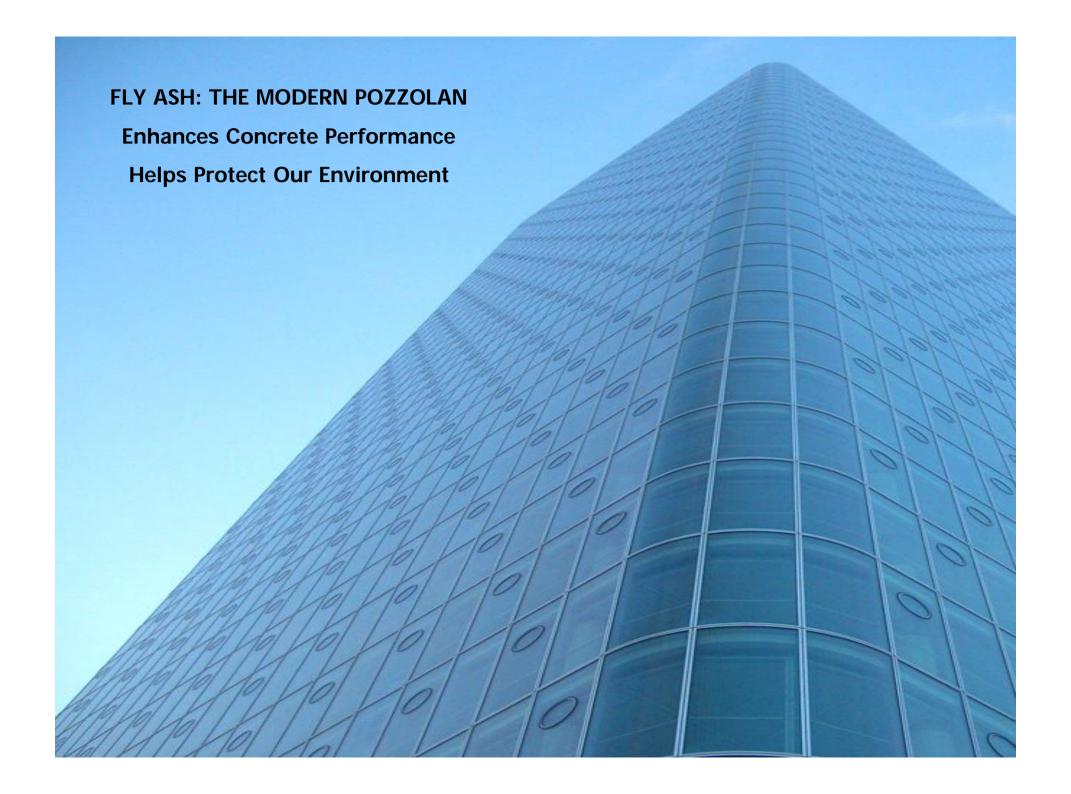
#### **Plant Location**

250 Km from Mundra Sea Port our loading port for shipments in Gujarat state.

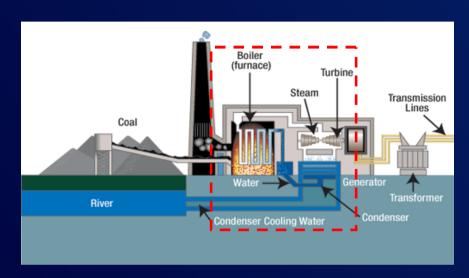
300 Km from Pipavav Sea Port, our loading port for shipments in Gujarat state.

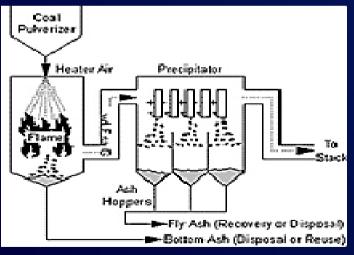
Nearest Railway Station, Ahmedabad - 50 Km

Nearest Airport, Baroda 80 Km



#### What is Fly Ash?





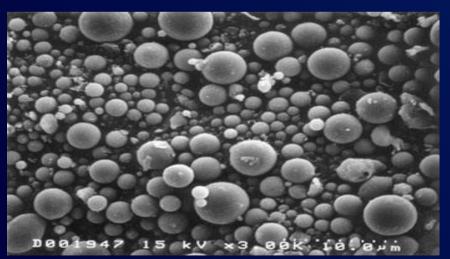
Power plants fueled by coal produce a material that is fast becoming a vital ingredient for improving the performance of a wide range of concrete products. That material is fly ash.

Fly ash is comprised of the non-combustible mineral portion of coal. When coal is consumed in a power plant, it is first ground to the fineness of powder. Blown into the power plant's boiler, the carbon is consumed — leaving molten particles rich in silica, alumina and calcium. These particles solidify as microscopic, glassy spheres that are collected from the power plant's exhaust before they can 'fly' away — hence the product's name: Fly Ash.

Chemically, fly ash is a pozzolan. When mixed with lime (calcium hydroxide), pozzolans combine to form cementitious compounds. Concrete containing fly ash becomes stronger, more durable, and more resistant to chemical attack.

### Why Fly Ash?





Mechanically, fly ash also pays dividends for concrete production. Because fly ash particles are small, they effectively fill voids. Because fly ash particles are hard and round, they have a "ball bearing" effect that allows concrete to be produced using less water. Both characteristics contribute to enhanced concrete workability and durability.

Fly ash use creates significant benefits for our environment. Fly ash use conserves natural resources and avoids landfill disposal of ash products. By making concrete more durable, life cycle costs of roads and structures are reduced.

Furthermore, fly ash use partially displaces production of other concrete ingredients, resulting in significant energy savings and reductions in greenhouse gas emissions.

### **Types of Fly Ash**





There are two basic types of fly ash: Class F and Class C. Both types react in concrete in similar ways.

Both Class F and Class C fly ashes undergo a "pozzolanic reaction" with the lime (calcium hydroxide) created by the hydration (chemical reaction) of cement and water, to create the same binder (calcium silicate hydrate) as cement. In addition, some Class C fly ashes may possess enough lime to be self-cementing, in addition to the pozzolanic reaction with lime from cement hydration.

The main benefit of fly ash in concrete is that it not only reduces the amount of non-durable calcium hydroxide (lime), but in the process converts it into calcium silicate hydrate (CSH), which is the strongest and most durable portion of the paste in concrete. Fly ash also makes substantial contributions to workability, chemical resistance and the environment.

### ML Fly Ash

ML fly ash is sourced from state-of-the-art thermal power plants - quality tested and packed as per requirements. We offer fly ash for local markets as well as exports.

We can supply consistent, quality assured fly-ash on a regular basis at all times of the year, at competitive prices. The provision of a container stuffing facility within our plant and different types of packing options makes it possible to safely export fly-ash all seasons & during the monsoons as well.

We periodically take product quality certification from reputed laboratories. Also, an in-house laboratory at the plant enables us to conduct continuous fly ash quality testing and detect product defects at an early stage.

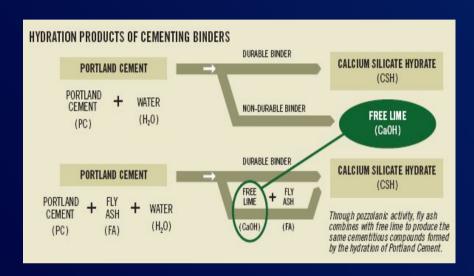
Packing options: 1 to 1.4 MT Jumbo Bags

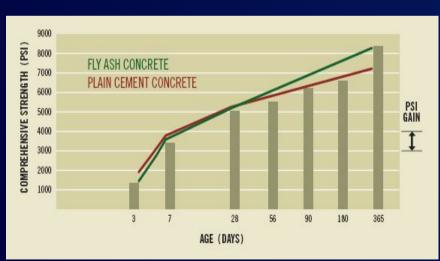
**Delivery:** By trucks to the sea ports

**Exports:** FOB basis at Pipavav/Kandla/Mundra Port, India or CIF basis to any international port (either by break bulk vessels or containers)

### ML Fly Ash

					ML		
Properties	Unit	Typical Performance	IS 3812 Part 1	ASTM C618 Class F	BS 3892	BS EN 450 Category N	
Loss on Ignition (LOI)	%	1.5-3	5 max	6 max	7 max	5 max	
Chloride as Cl	%	0.01	0.05 max		0.1 max	0.1 max	
SO3	%	0.5-1.0	3 max	5 max	2 max	3 max	
Free CaO	%	0.0-0.5				2.5 max	
Reactive CaO	%	3.5-5.0			10 max	10 max	
SiO2 Silica	%	50-60	35 min				
Al2O3 Alumina	%	30-35					
Fe2O3 Iron Oxide	%	3.0 - 4.0					
SiO2 + Al2O3 + Fe2O3	%	85 - 95	70 min	70 min	70 min	70 min	
Na2O	%	0.5-0.75	1.5 max			5 max	
MgO	%	0.6-0.9	5 max			4 max	
P205	mg/kg	5-10				100 max	
Fineness (retention on 45 micron sieve)	%	18-20	34 max	34 max	12 max	40 max	
Particle Density	kg/m3	2200-2300					
Moisture	%	0.2-0.8	2 max	3 max	2 max	2 max	





Concrete is a composite material, which essentially consists of two components: aggregates and cementitious paste. In production of concrete, economics and local aggregate sources dictate the quality of materials used. The result is that excess voids often exist between aggregate particles which must be duly filled with paste and air to sustain durability, strength and other properties.

#### **Durability and Compressive Strength**

When ML Fly Ash is added to concrete, it reacts with calcium hydroxide Ca(OH)<sub>2</sub> liberated during the hydration of cement to form extra C-S-H gel which refines the microstructure of concrete and enhances a range of properties.

The strength gain in ML Fly Ash concrete continues for a long time.





#### Workability

ML Fly Ash produces more cementitious paste and has a lower unit weight, thus contributing roughly 30% more volume of cementitious material per pound versus cement.

The ML fly ash reduces the amount of water needed to produce a given slump by 2% to 10%, depending on a number of factors including the amount used and class of fly ash.

ML Fly ash also reduces the amount of sand needed in the mix to produce workability.

The greater the percentage of ML fly ash "ball bearings" in the paste, the better lubricated the aggregates are and the better concrete flows. Hence, there is ease of handling, placing, pumping and compacting concrete. It also helps reduce consumption of admixtures.





#### **Permeability and Corrosion Protection**

The extra C-S-H gel formed from the reaction between Fly ash and Ca(OH)<sub>2</sub> fills capillaries and bleed water channels occupied by water-soluble calcium hydroxide, thus reducing permeability. This guards concrete from onslaught of deleterious chemicals from the atmosphere as well as from sub-soil. By decreasing concrete permeability, ML Fly ash can reduce the rate of ingress of water, corrosive chemicals and oxygen – so protecting steel reinforcement from corrosion and its subsequent expansive result.

#### **Bleeding and Cohesiveness**

The refinement of microstructure results in reduction of bleeding and improvement in cohesiveness of concrete - thus giving smooth form finished concrete without honey-combing or segregation.





#### **Sulphate Attack**

Sulphates present in sub-soil, ground-water and other sources to which the concrete is exposed, react to form an expansive ettringite, which results in cracking and spalling of concrete. ML Fly ash protects concrete from sulphate attack due to – overall reduction in  $C_3A$  content by partial replacement of cement; utilization of excess  $Ca(OH)_2$  in formation of extra C-S-H gel; impermeability of concrete restricts ingress and diffusion of sulphates within concrete.

#### **Alkali-Aggregate Reaction**

The product of chemical reaction between alkalis in cement and aggregates used is expansive in nature and results in cracking and spalling of concrete. ML Fly ash has the ability to react with the alkali hydroxides in cement paste, making them unavailable for reaction with reactive silica in certain aggregates. Reduced permeability also prevents diffusion of alkalis.

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#### **Heat of Hydration**

The hydration of cement is an exothermic reaction. Heat is generated very quickly, causing the concrete temperature to rise and accelerating the setting time and strength gain of the concrete.

Many applications exist where the rapid heat gain of cement increases the chances of thermal cracking, leading to reduced concrete strength and durability. In these applications, replacing large percentages of cement with ML Fly ash (fly ash generates only 15% to 35% as much heat as compared to cement at early ages) can reduce the damaging effects of thermal cracking.

Moreover, natural heating of the aggregates can cause even thin concrete slabs to suffer the damaging effects of thermal cracking, along with finishing difficulties caused by rapid uncontrolled setting. This can be controlled by using ML Fly ash.

In the long term,

'economic sustainability'

would depend on

'environment sustainability'

### ML Fly Ash helps protect our environment



One ton of Fly Ash used is equivalent to:

- Conserved Land-Fill Space Enough for 455 days of solid waste produced by an average American
- **Reduced CO**<sub>2</sub> **emissions** Equal to two months of emissions from an automobile
- Saved Energy Enough to provide electricity to an average American home for 24 days

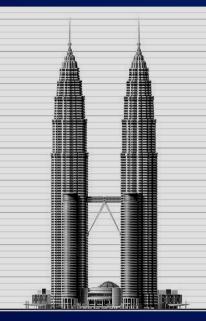
While making better, stronger, durable structures, ML Fly ash also helps in environmental protection by:

- Optimization in use of cement, hence conserving minerals and energy required for its production and also reduction in emission of CO<sub>2</sub>
- Utilization of industrial by-product (fuel ash) for making better, durable concrete, hence reducing green-house gases
- Conservation of concrete making materials like aggregates and sand by significantly improving the service life of structures. This also leads to huge energy savings

Fly ash use in concrete qualifies for credit under the U.S. Green Building Council's popular LEED™ rating system for sustainable construction.

### **Applications of ML Fly Ash**









Extensive research the world over by eminent concrete technologists has proved fly ash to be a very effective cementitious material leading to its wide use in all types of construction including infrastructure, housing and industrial projects.

It has been widely used in high strength, high performance concrete not only to enhance durability, but also to significantly increase service life of structures.

Some prominent structures where fly ash has been used are Petronas Towers, Malaysia; Sears Towers, USA; Euro Tunnel; Burj Dubai, UAE.

In India too, use of fly ash has increased dramatically over the last few years. Very important projects like Delhi Metro and Mumbai Urban Infrastructure Project are glaring examples of use of fly ash for high-strength, high-performance concrete.

### **Applications of ML Fly Ash**

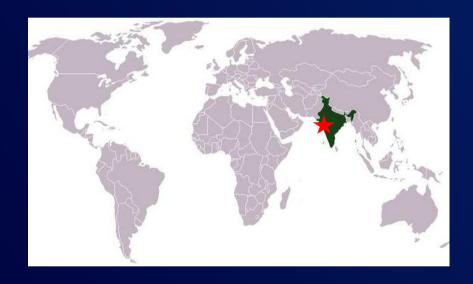
#### Major applications of ML Fly Ash are:

- All grades of concrete for residential, commercial as well as industrial structures
- Mortar for plastering in residential, commercial and industrial structures
- Foundations of residential, commercial, industrial structures
- Infrastructure projects where high strength, high performance concrete is required
- Marine constructions such as ports, harbors and jetties
- Bridges, flyovers, roads and pathways
- Dams and other mass concrete works
- Water treatment plants, water retaining structures, effluent treatment plants and sewage treatment plants
- In concrete products for shore protection
- In ready mix concrete of all grades
- For use in high volume fly ash (HVFA) concrete

Use of ML Fly Ash also leads to significant cost savings in cost of concrete by way of savings in cement and admixtures, finishing cots because of smoother finish obtained and lifecycle cost due to longer, repair-free service life of structures.

## " PIONEER IN FLY ASH EXPORTS " M.L.ENTERPRISES, INDIA

### Locations



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