TEBA OVERSEAS
construction material

TEBA FLY ASH Product Origin : Turkish (Class F)

What is fly ash class F

Teba Fly ash also known as flue-ash is one of the residues generated in combustion of coal and comprises the fine particles that rise with the flue gases. Ash which does not rise is termed bottom ash. Fly ash usually refers to ash produced during combustion of coal. Fly ash is generally captured by electrostatic precipitators or other particle filtration equipment before the flue gases reach the chimneys of coal-fired power plants and together with bottom ash removed from the bottom of the furnace is in this case jointly known as coal ash. The chemical properties are shown in Table A and picture **show the specification ASTM C618-22.** then table number 2 show the physical properties according to **specification ASTM C 618-22**

TABLE 1 Chemical Requirements

	Class		
	N	F	C
Silicon dioxide (SiO_2) plus aluminum oxide (Al_2O_3) plus iron oxide (Fe_2O_3), min, %	70.0	70.0	50.0
Sulfur trioxide (SO_3), max, %	4.0	5.0	5.0
Moisture content, max, %	3.0	3.0	3.0
Loss on ignition, max, %	10.0	6.0[A]	6.0

[A]The use of Class F pozzolan containing up to 12.0 % loss on ignition may be approved by the user if either acceptable performance records or laboratory test results are made available

Table A The chemical properties

Properties	Fly Ash (Class F 70.0)	Specification	Test Method
(SiO2 +Al2O3 +Fe2O3),min,%	70.00	ASTM C618-22	XRF
Sulphur trioxide (SO3), max,%	0.3	ASTM C618-22	XRF
Loss on ignition, max%	3.00	ASTM C618-22	XRF
SiO_2 %	50-65	ASTM C618-22	XRF
AL_2O_3 %	21-27	ASTM C618-22	XRF
CaO %	2-6	ASTM C618-22	XRF
Cl Chloride max 0.1%	0-0.01	ASTM C618-22	XRF
Moisture content %	0.5		
Na_2 Sodium oxide %	0.2-1.0	ASTM C618-22	XRF
K_2O Potasium Oxide %	0-3.0	ASTM C618-22	XRF
MgO Magnesium Oxide %	1-2	ASTM C618-22	XRF

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TABLE 2 Physical Requirements

	Class		
	N	F	C
Fineness:			
Amount retained when wet-sieved on 45 µm (No. 325) sieve, max, %[A]	34	34	34
Strength activity index: [B]			
With portland cement, at 7 days, min, percent of control	75[C]	75[C]	75[C]
With portland cement, at 28 days, min, percent of control	75[C]	75[C]	75[C]
Water requirement, max, percent of control	115	105	105
Soundness: [D]			
Autoclave expansion or contraction, max, %	0.8	0.8	0.8
Uniformity requirements:			
The density and fineness of individual samples shall not vary from the average established by the ten preceding tests, or by all preceding tests if the number is less than ten, by more than:			
Density, max variation from average, %	5	5	5
Percent retained on 45-µm (No. 325), max variation, percentage points from average	5	5	5

[A] Care should be taken to avoid the retaining of agglomerations of extremely fine material.

[B] The *strength* activity index with portland cement is not to be considered a measure of the compressive strength of concrete containing the fly ash or natural pozzolan. The mass of fly ash or natural pozzolan specified for the test to determine the *strength* activity index with portland cement is not considered to be the proportion recommended for the concrete to be used in the work. The optimum amount of fly ash or natural pozzolan for any specific project is determined by the required properties of the concrete and other constituents of the concrete and is to be established by testing. *Strength* activity index with portland cement is a measure of reactivity with a given cement and may vary as to the source of both the fly ash or natural pozzolan and the cement.

[C] Meeting the 7 day or 28 day *strength* activity index will indicate specification compliance.

[D] If the fly ash or natural pozzolan will constitute more than 20 % by weight of the cementitious material in the project mix design, the test specimens for autoclave expansion shall contain that anticipated percentage. Excessive autoclave expansion is highly significant in cases where water to fly ash or natural pozzolan and cement ratios are low, for example, in block or shotcrete mixes.

Table(B) Physical properties.

Properties	Fly Ash (Class F 70.0)	Test Method
45 µm Residue %	15 – 25	ASTM C618-22
Activity index 28 D (min 75)	77% mim	ASTM C618-22
Activity index 90 D (min85)	90%	ASTM C618-22
Soundness –Le Chatelier mm(max 10%)	0.8 mm	TS EN 196-3

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Fly Ash Applications and Uses

4. Classification

4.1 *Class N*—Raw or calcined natural pozzolans that comply with the applicable requirements for the class as given herein, such as some diatomaceous earths; opaline cherts and shales; tuffs and volcanic ashes or pumicites, calcined or uncalcined; and various materials requiring calcination to induce satisfactory properties, such as some clays and shales.

4.2 *Class F*—Fly ash normally produced from burning anthracite or bituminous coal that meets the applicable requirements for this class as given herein. This class of fly ash has pozzolanic properties.

4.3 *Class C*—Fly ash normally produced from lignite or subbituminous coal that meets the applicable requirements for this class as given herein. This class of fly ash, in addition to having pozzolanic properties, also has some cementitious properties.

In the commercial and industrial sectors, fly ash has a wide variety of applications and uses, though it is primarily known for improving the durability and workability of concrete mixes. Fly ash is also a filler in paints, adhesives, and metal and plastic composites. It's commonly used as structural fill for road construction and fly ash can be used to make bricks, ceramic tiles, plaster, Portland cement, and ready-mix cement.

Other building materials that may contain fly ash include hot mix asphalt, grout fill, wallboard, concrete pipes, and concrete bricks. In fact, fly ash can be substituted in a Portland cement mix at a ratio of about 1.5 pounds of fly ash for every 1 pound of cement mix. Accordingly, the amount of fine aggregate in the concrete mix must be reduced to accommodate the additional volume of the fly ash.

Advantages

contains extremely fine latently reactive fly ash presence of this substance imparts greatly improved internal cohesion and water retention.

When we use Fly ash the concrete will show the following properties:

Highly reduced chloride diffusion

Good workability

Increased durability

High early strengths

Increased ultimate strengths

Increased resistance to abrasion

Highly increased water tightness

Easy to work and economic benefits

Chloride free - does not attack any reinforcement

Dose

25-35 % by weight of cement

PSI: PRODUCT SAFETY INFORMATION.

First Aid Measures

Inhalation:	Remove exposed person from dusty area. Fresh air.
Skin contact:	Wash contaminated skin with water and/or a mild detergent.
Eye contact:	Rinse eyes with water/saline solution. If discomfort persists, obtain medical attention
Ingestion:	Not applicable

Fire Fighting Measures

The product is not combustible and there is no inherent risk of explosion. Extinguishing media: Not applicable Depending on surrounding fire.

Accidental Release Measures

Avoid exposure to dust of the product. Released material should be collected in suitable containers