

PRCB-39 — Fly Ash for Stabilisation and Concrete

Class F and Class C · pozzolan for cementitious mixes

In accordance with ASTM C618 / AASHTO M 295 — Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

1. Description

PRCB-39 is coal-derived fly ash, a finely divided pozzolanic material that, in the presence of moisture, reacts chemically with calcium hydroxide to form compounds with cementitious properties. It is used as a supplementary cementitious addition in concrete and as a stabilising agent in soils and granular bases, where it reduces plasticity, improves workability and increases long-term strength.

The standard distinguishes three classes: Class N corresponds to raw or calcined natural pozzolans; Classes F and C correspond to coal ashes and are differentiated by their calcium oxide content. Class C, with higher CaO content, has cementitious properties of its own in addition to pozzolanic ones, which makes it especially effective in soil stabilisation.

2. Applications

- Stabilisation of subgrades, sub-bases and granular bases, alone or combined with lime or cement.
- Cold recycling of pavements with cementitious addition.
- Supplementary cementitious addition in hydraulic concretes and mortars.
- Controlled low-strength material (CLSM) flowable fills.
- Reduction of the heat of hydration in mass concrete.

3. Specifications

Chemical requirements — ASTM C618, Table 1

Property	Method	Class N	Class F	Class C
SiO ₂ + Al ₂ O ₃ + Fe ₂ O ₃ (%), min.	ASTM C311	70.0	50.0	50.0
Calcium oxide, CaO (%)	ASTM C311	Report	18.0 max.	> 18.0
Sulfur trioxide, SO ₃ (%), max.	ASTM C311	4.0	5.0	5.0
Moisture content (%), max.	ASTM C311	3.0	3.0	3.0
Loss on ignition (%), max.	ASTM C311	10.0	6.0	6.0

Physical requirements — ASTM C618, Table 2

Property	Method	Class N	Class F	Class C
Amount retained on 45 µm (No. 325) sieve (%), max.	ASTM C311	34	34	34
Amount retained on No. 100 (150 µm) sieve (%), max.	ASTM C311	—	10	10
Strength activity index at 7 days (% of control), min.	ASTM C311	75	75	75
Strength activity index at 28 days (% of control), min.	ASTM C311	75	75	75
Water requirement (% of control), max.	ASTM C311	115	105	105
Autoclave expansion or contraction (%), max.	ASTM C151	0.8	0.8	0.8
Uniformity — max. variation of density from average (%)	ASTM C311	5	5	5
Uniformity — max. variation of amount retained on 45 µm (percentage points)	ASTM C311	5	5	5

Essential normative warning. The ASTM C618-19 revision substantially changed the classification: the minimum SiO₂ + Al₂O₃ + Fe₂O₃ for Class F fell from 70.0 % to 50.0 %, and the distinction between Class F and Class C is now based on CaO content (≤ 18 % for F; > 18 % for C). Numerous road agency specifications and technical documents still in circulation cite the earlier 70 % criterion. The No. 100 sieve requirement was introduced in the C618-23 revision. The strength activity index is satisfied by meeting the requirement at 7 days or at 28 days, not necessarily both. AASHTO M 295 may not yet have adopted these changes; verify which of the two governs the project.

4. Storage and transport

Store in a dry, covered and ventilated place, on pallets and away from the ground. Keep containers closed: prolonged contact with ambient moisture causes hydration, lump formation and loss of reactivity. Do not stack more than two pallets of big bags. Typical shelf life of 6 months in the original sealed packaging under suitable storage conditions. In bulk handling, protect silos against water ingress and verify ventilation before any confined-space entry.

5. Packaging and logistics

In bulk in pneumatic bulk carriers of 25–35 t · 1,000–1,500 kg big bags with discharge valve · 25 kg and 50 kg bags on ISPM-15 certified pallets. All packages are labelled in accordance with GHS.

6. Quality control

Every batch shipped is accompanied by a laboratory-issued quality certificate reporting the tests required by the applicable standard, with traceable batch identification. Additional testing or independent third-party inspection (SGS, Bureau Veritas, Intertek, Cotecna) at origin or destination can be arranged at the customer's request.

Consult the product Safety Data Sheet (SDS) before handling.

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