ASTM C618 FLYASH

BORAL RESOURCES

DOUG ANDERSON
ASTM C618

- STANDARD SPECIFICATION FOR COAL FLY ASH AND RAW OR CALCINED NATURAL POZZOLAN FOR USE IN CONCRETE WHERE CEMENTITIOUS OR POZZOLANIC ACTION, OR BOTH IS DESIRED, OR WHERE OTHER PROPERTIES NORMALLY ATTRIBUTED TO FLYASH OR POZZOLANS MAY BE DESIRED, OR WHERE BOTH OBJECTIVES ARE TO BE ACHIEVED
### SUM OF OXIDES

<table>
<thead>
<tr>
<th>Oxide</th>
<th>Results</th>
<th>ASTM Limit Class F/C</th>
<th>AASHTO Limit Class F/C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon Dioxide</td>
<td>30.22%</td>
<td>34 max</td>
<td>34 max</td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>10.04%</td>
<td>75 min</td>
<td>75 min</td>
</tr>
<tr>
<td>Iron Oxide</td>
<td>5.54%</td>
<td>70.0/70.0 min</td>
<td>70.0/70.0 min</td>
</tr>
<tr>
<td>Sulphur Trioxide</td>
<td>1.10%</td>
<td>5.0 max</td>
<td>5.0 max</td>
</tr>
<tr>
<td>Calcium Oxide</td>
<td>24.49%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium Oxide</td>
<td>4.55%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium Oxide</td>
<td>1.10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium Oxide</td>
<td>0.81%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium Oxide Equivalent (N2O=0.05K2O)</td>
<td>1.06%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Metallic**: 0.06% 3.0 max 3.0 max
**Loss on Ignition**: 0.07% 6.0 max 6.0 max

### Physical Analysis

- **Fineness**: 19.49% 34 max 34 max
- **Strength Activity Index**: 7 or 28 day requirement
  - 7 days, % of control: 101% 75 min 75 min
  - 28 days, % of control: 103% 75 min 75 min
- **Water Requirement, % of control**: 95% 100 max 100 max
- **Attenone Soundness**: 0.95% 0.8 max 0.8 max
- **Density**: 2.60

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**ASTM 618 LIMIT**

70/50 MIN
SULFUR TRIOXIDE

SO₃

HIGHER ALKALI RATIO

CORROSIVE

EFFLORESCENCE

EXPANSION
CALCIUM OXIDE
CAO

LIME
CLASS F OR Class C
DOESN'T REQUIRE AN ACTIVATOR
MAGNESIUM OXIDE
MGO
SODIUM OXIDE
NA2O
POTASSIUM OXIDE
K2O

MGO A FREE LIME CAN CAUSE VOLUME CHANGES IF HIGH AUTO CLAVE EXPANSION TEST

TRACE ALKALIS
**MOISTURE**

3.0 MAX

HIGH MOISTURE = STICKY
LOSS ON IGNITION

LOI

A MEASUREMENT OF UNBURNED CARBON (COAL) REMAINING IN THE ASH AND IS A CRITICAL CHARACTERISTIC OF FLYASH

HIGH LOI’S MAY CAUSE POSSIBLE AIR ENTRAINMENT ISSUES

FOAM INDEX
**FINENESS**

*Percent by weight of the material retained on the No 325 sieve*

**PARTICLE SIZE**

*Coarser material could affect reactivity*
STRENGTH ACTIVITY INDEX

ASTM C311

7 DAY AND 28 DAY COMPRESSION STRENGTHS

MORTAR CUBES WITH 20% MASS REPLACEMENT OF CEMENT

COMPAARED TO CONTROL WITHOUT FLYASH REPLACEMENT
BORAL RESOURCES

THANK YOU!