

# CERTIFICATE OF ANALYSIS: PORT MANATEE, FL (Zonguldak, Turkey)

## ASTM: FLY ASH, CLASS F (FA-54)



ASTM C618 & AASHTO M295 REQUIREMENTS		LIMITS ASTM (AASHTO)	RESULTS	ANALYSIS OF: Apr-2024 TEST METHOD
PHYSICAL	Fineness; Retained when wet-sieved 45 µm (No. 325) Sieve, max. %	34	18	ASTM C311
	<b>Strength Activity Index</b>			
	7 day; min. percent of control	75 <sup>†</sup>	85	ASTM C311
	28 day, min. percent of control	75 <sup>†</sup>	99	ASTM C311
	Water Requirement; max. percent of control	105	96	ASTM C311
	Density, specific gravity (g/cm <sup>3</sup> )	--	2.30	ASTM C311
	Density; max. variation from average, %	5	NA	ASTM C311
	Fineness, max. variation from average, %	5	NA	ASTM C311

CHEMICAL	Sum of SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , and Fe <sub>2</sub> O <sub>3</sub> , min. %	50.0	87.2	ASTM C311
	Sulphur Trioxide (SO <sub>3</sub> ), max. %	5.0	0.4	ASTM C311
	Moisture content, max. %	3.0	0.1	ASTM C311
	Loss on ignition, max. %	6.0	2.1	ASTM C311
	Silica Oxide (SiO <sub>2</sub> ) (%)	--	58.0	ASTM C311
	Alumina Oxide (Al <sub>2</sub> O <sub>3</sub> ) (%)	--	22.2	ASTM C311
	Iron Oxide (Fe <sub>2</sub> O <sub>3</sub> ) (%)	--	7.0	ASTM C311
	Calcium Oxide (CaO) (%)	C > 18.0/F 18.0 max	3.3	ASTM C311
	Magnesium Oxide (MgO) (%)	--	2.1	ASTM C311
	Sodium Oxide (Na <sub>2</sub> O) (%)	--	0.8	ASTM C311
	Potassium Oxide (K <sub>2</sub> O) (%)	--	1.9	ASTM C311
	Total alkalis (Na <sub>2</sub> O) eq. = Na <sub>2</sub> O + 0.658 K <sub>2</sub> O (%)	--	2.1	ASTM C311
	Available alkalis, Na <sub>2</sub> O eq., (%)	‡	--	ASTM C311

### COMMENTS:

Parameters with no limit listed are included for information purposes only, and are not requirements of the standards.  
 † Meeting the 7 day or the 28 day strength activity index indicates compliance with the specification.  
 ‡ Not a requirement of ASTM C618 or AASHTO M295. Required only when requested by purchaser to limit alkali content in concrete containing reactive aggregate.

This certifies compliance with the most current editions of ASTM C618 and AASHTO M295 standards.

REPORT PREPARED BY:	PRINT DATE:
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Tests performed by Ash Grove Cement - Technical Center	