

Tarmac Cement
National Laboratory
Yelsway Lane
Waterhouses
Staffordshire
ST10 3AZ

10/06/2024

Composition of Fly ash

**Tudela Fly Ash
EN 450-1 LOI Cat. B, Fineness Cat.N
0086-CPR-756089**

Based on the **April 2024** monthly composite sample: 1419

Property			Value	BS EN 450-1 Limit
Fineness (Residue)	45µm	%	10.4	Declared Value 15% ± 10% <i>(Tested in accordance with BS EN 450-1 cl. 5.3.1)</i>
APD		g/cm ³	2.49	< 200kg/m ³ from declared value
28 Day Activity Index – Mar sample		%	76	>75%
90 Day Activity Index – Feb sample		%	89	>85%
Sulfate	SO ₃	%	1.03	≤ 3.0%
Loss on Ignition	LOI	%	3.88	≤ 7.0%
Chloride	Cl ⁻	%	0.01	≤ 0.1%
Calcium Oxide	CaO	%	5.09	≤ 10.0%
SiO ₂ + Al ₂ O ₃ + Fe ₂ O ₃	-	%	83.65	≥ 70.0%
Free Lime	-	%	0.18	≤ 1.5%
Alkalis	Na ₂ Oeq	%	1.01	≤ 5.0%
Declared Mean Alkali Content	Na ₂ Oeq	%	1.50	-
Declared Maximum Chloride Content	Cl ⁻	%	0.05	-

*BS EN 933-10:2009 method replacing the 63 µm sieve with a 45 µm sieve

For and on behalf of Tarmac Cement:



Simon Chudley

**National Commercial Technical Manager
Tarmac Cement**

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**Conformity of Fly Ash to BS 8500-2: Annex B
Tudela EN 450-1 Fly Ash
0086-CPR-756089**

Based on the composite samples for the month of: April 2024

Constituent	Source
EN 450-1 Fly Ash	Tudela
EN 197-1 CEM I	Aberthaw

The results of compressive strength testing (in accordance with BS EN 196-1) of a 70:30 blend of CEM I with Fly Ash were:

2 Day Strength (MPa)	19.8
28 Day Strength (MPa)	42.7

Based on equivalent results obtained for the last 9 months, the permitted proportions of combinations conforming to the requirements of Annex B of BS 8500-2 are:

Strength Class of Combination	Fly Ash Content (%)	
	Min	Max
32,5N	19	35
42,5N	6	27

BS 8500-2 Combination Designation	Fly Ash Content (%)	
	Min	Max
CIIA-V	6	20
CIIB-V	21	35

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Constituent	Source
EN 450-1 Fly Ash	Tudela
EN 197-1 CEM I	Cauldon

The results of compressive strength testing (in accordance with BS EN 196-1) of a 70:30 blend of CEM I with Fly Ash were:

2 Day Strength (MPa)	20.6
28 Day Strength (MPa)	43.9

Based on equivalent results obtained for the last 9 months, the permitted proportions of combinations conforming to the requirements of Annex B of BS 8500-2 are:

Strength Class of Combination	Fly Ash Content (%)	
	Min	Max
32,5N	13	35
42,5N	6	24

BS 8500-2 Combination Designation	Fly Ash Content (%)	
	Min	Max
CIIA-V	6	20
CIIB-V	21	35

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Based on the composite samples for the month of: April 2024

Constituent	Source
EN 450-1 Fly Ash	Tudela
EN 197-1 CEM I	Dunbar

The results of compressive strength testing (in accordance with BS EN 196-1) of a 70:30 blend of CEM I with Fly Ash were:

2 Day Strength (MPa)	17.9
28 Day Strength (MPa)	41.6

Based on equivalent results obtained for the last 9 months, the permitted proportions of combinations conforming to the requirements of Annex B of BS 8500-2 are:

Strength Class of Combination	Fly Ash Content (%)	
	Min	Max
32,5N	18	35
42,5N	6	25

BS 8500-2 Combination Designation	Fly Ash Content (%)	
	Min	Max
CIIA-V	6	20
CIIB-V	21	35

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Based on the composite samples for the month of: April 2024

Constituent	Source
EN 450-1 Fly Ash	Tudela
EN 197-1 CEM I	Limerick

The results of compressive strength testing (in accordance with BS EN 196-1) of a 70:30 blend of CEM I with Fly Ash were:

2 Day Strength (MPa)	18.5
28 Day Strength (MPa)	42.3

Based on equivalent results obtained for the last 9 months, the permitted proportions of combinations conforming to the requirements of Annex B of BS 8500-2 are:

Strength Class of Combination	Fly Ash Content (%)	
	Min	Max
32,5N	18	35
42,5N	6	27

BS 8500-2 Combination Designation	Fly Ash Content (%)	
	Min	Max
CIIA-V	6	20
CIIB-V	21	35

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Constituent	Source
EN 450-1 Fly Ash	Tudela
EN 197-1 CEM I	Platin

The results of compressive strength testing (in accordance with BS EN 196-1)
of a 70:30 blend of CEM I with Fly Ash were:

2 Day Strength (MPa)	19.0
28 Day Strength (MPa)	44.2

Based on equivalent results obtained for the last 9 months, the permitted proportions of
combinations conforming to the requirements of Annex B of BS 8500-2 are:

Strength Class of Combination	Fly Ash Content (%)	
	Min	Max
32,5N	15	35
42,5N	6	24

BS 8500-2 Combination Designation	Fly Ash Content (%)	
	Min	Max
CIIA-V	6	20
CIIB-V	21	35

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Based on the composite samples for the month of: April 2024

Constituent	Source
EN 450-1 Fly Ash	Tudela
EN 197-1 CEM I	Rugby

The results of compressive strength testing (in accordance with BS EN 196-1) of a 70:30 blend of CEM I with Fly Ash were:

2 Day Strength (MPa)	17.3
28 Day Strength (MPa)	43.9

Based on equivalent results obtained for the last 9 months, the permitted proportions of combinations conforming to the requirements of Annex B of BS 8500-2 are:

Strength Class of Combination	Fly Ash Content (%)	
	Min	Max
32,5N	16	35
42,5N	6	26

BS 8500-2 Combination Designation	Fly Ash Content (%)	
	Min	Max
CIIA-V	6	20
CIIB-V	21	35

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Based on the composite samples for the month of: April 2024

Constituent	Source
EN 450-1 Fly Ash	Tudela
EN 197-1 CEM I	Tunstead

The results of compressive strength testing (in accordance with BS EN 196-1) of a 70:30 blend of CEM I with Fly Ash were:

2 Day Strength (MPa)	17.5
28 Day Strength (MPa)	45.8

Based on equivalent results obtained for the last 9 months, the permitted proportions of combinations conforming to the requirements of Annex B of BS 8500-2 are:

Strength Class of Combination	Fly Ash Content (%)	
	Min	Max
32,5N	22	35
42,5N	6	32

BS 8500-2 Combination Designation	Fly Ash Content (%)	
	Min	Max
CIIA-V	6	20
CIIB-V	21	35

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