

Tarmac Cement  
National Laboratory  
Yelsway Lane  
Waterhouses  
Staffordshire  
ST10 3AZ

08.01.2024

**Composition of Fly ash**

**Tudela Fly ash  
EN 450-1 LOI Cat. B, Fineness Cat.N  
0099-CPR-A95-0019**

Based on the **October 2023** monthly composite sample: 2953

Property			Value	BS EN 450-1 Limit
Fineness (Residue)	45µm	%	10.8	Declared Value 15% ± 10% <i>(Tested in accordance with BS EN 450-1 cl. 5.3.1)</i>
APD		g/cm <sup>3</sup>	2.48	< 200kg/m <sup>3</sup> from declared value
28 Day Activity Index – Sep sample		%	83	>75%
90 Day Activity Index – Aug sample		%	89	>85%
Sulfate	SO <sub>3</sub>	%	1.28	≤ 3.0%
Loss on Ignition	LOI	%	4.06	≤ 7.0%
Chloride	Cl <sup>-</sup>	%	0.01	≤ 0.1%
Calcium Oxide	CaO	%	5.17	≤ 10.0%
SiO <sub>2</sub> + Al <sub>2</sub> O <sub>3</sub> + Fe <sub>2</sub> O <sub>3</sub>	-	%	83.75	≥ 70.0%
Free Lime	-	%	0.18	≤ 1.5%
Alkalis	Na <sub>2</sub> Oeq	%	1.32	≤ 5.0%
Declared Mean Alkali Content	Na <sub>2</sub> Oeq	%	1.50	-
Declared Maximum Chloride Content	Cl <sup>-</sup>	%	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:

*S. Chudley*

**Simon Chudley**

**National Commercial Technical Manager  
Tarmac Cement**

**TARMAC.COM**

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**0345 812 6232 info-cement@tarmac.com**

**Conformity of Fly Ash to BS 8500-2: Annex A  
Tudela EN 450-1 Fly Ash  
0099-CPR-A95-0019**

Based on the composite samples for the month of: October 2023

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)	19.6
28 Day Strength (MPa)	45.2

Based on equivalent results obtained for the last 3 months, the permitted proportions of combinations conforming to the requirements of Annex A 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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**Conformity of Fly Ash to BS 8500-2: Annex A  
Tudela EN 450-1 Fly Ash  
0099-CPR-A95-0019**

Based on the composite samples for the month of: October 2023

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)	20.2
28 Day Strength (MPa)	45.2

Based on equivalent results obtained for the last 3 months, the permitted proportions of combinations conforming to the requirements of Annex A of BS 8500-2 are:

Strength Class of Combination	Fly Ash Content (%)	
	Min	Max
32,5N	15	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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**Conformity of Fly Ash to BS 8500-2: Annex A  
Tudela EN 450-1 Fly Ash  
0099-CPR-A95-0019**

Based on the composite samples for the month of: October 2023

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)	19.4
28 Day Strength (MPa)	45.2

Based on equivalent results obtained for the last 3 months, the permitted proportions of combinations conforming to the requirements of Annex A of BS 8500-2 are:

Strength Class of Combination	Fly Ash Content (%)	
	Min	Max
32,5N	20	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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**Conformity of Fly Ash to BS 8500-2: Annex A  
Tudela EN 450-1 Fly Ash  
0099-CPR-A95-0019**

Based on the composite samples for the month of: October 2023

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)	20.3
28 Day Strength (MPa)	46.4

Based on equivalent results obtained for the last 3 months, the permitted proportions of  
combinations conforming to the requirements of Annex A 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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**Conformity of Fly Ash to BS 8500-2: Annex A  
Tudela EN 450-1 Fly Ash  
0099-CPR-A95-0019**

Based on the composite samples for the month of: October 2023

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)	18.3
28 Day Strength (MPa)	44.6

Based on equivalent results obtained for the last 3 months, the permitted proportions of combinations conforming to the requirements of Annex A of BS 8500-2 are:

Strength Class of Combination	Fly Ash Content (%)	
	Min	Max
32,5N	16	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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**Conformity of Fly Ash to BS 8500-2: Annex A  
Tudela EN 450-1 Fly Ash  
0099-CPR-A95-0019**

Based on the composite samples for the month of: October 2023

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)	19.3
28 Day Strength (MPa)	47.6

Based on equivalent results obtained for the last 3 months, the permitted proportions of  
combinations conforming to the requirements of Annex A of BS 8500-2 are:

Strength Class of Combination	Fly Ash Content (%)	
	Min	Max
32,5N	15	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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**Conformity of Fly Ash to BS 8500-2: Annex A  
Tudela EN 450-1 Fly Ash  
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Based on the composite samples for the month of: October 2023

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)	21.6
28 Day Strength (MPa)	51.6

Based on equivalent results obtained for the last 3 months, the permitted proportions of  
combinations conforming to the requirements of Annex A of BS 8500-2 are:

Strength Class of Combination	Fly Ash Content (%)	
	Min	Max
32,5N	25	35
42,5N	7	35

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

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