

Tarmac Cement
 National Laboratory
 Yelsway Lane
 Waterhouses
 Staffordshire
 ST10 3AZ

09.03.2023

Composition of Fly ash

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

Based on the **December 2022** monthly composite sample:

Property			Value	BS EN 450-1 Limit
Fineness (Residue)	45µm	%	11.0	Declared Value 15% ± 10% (Tested in accordance with BS EN 450-1 cl. 5.3.1)
APD		g/cm ³	2.49	< 200kg/m ³ from declared value
28 Day Activity Index – Nov sample		%	79	>75%
90 Day Activity Index – Oct sample		%	94	>85%
Sulfate	SO ₃	%	1.35	≤ 3.0%
Loss on Ignition	LOI	%	3.04	≤ 7.0%
Chloride	Cl ⁻	%	0.01	≤ 0.1%
Calcium Oxide	CaO	%	5.81	≤ 10.0%
SiO ₂ + Al ₂ O ₃ + Fe ₂ O ₃	-	%	83.93	≥ 70.0%
Free Lime	-	%	0.36	≤ 1.5%
Alkalis	Na ₂ Oeq	%	1.27	≤ 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:

S. Chudley

Simon Chudley

**National Commercial Technical Manager
 Tarmac Cement**

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Tarmac Trading Limited Registered in England and Wales. Company No. 453791
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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: December 2022

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)	19.0
28 Day Strength (MPa)	45.4

Based on equivalent results obtained for the last 12 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	22	35
42,5N	6	31

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: December 2022

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

The results of compressive strength testing (in accordance with BS EN 196-1) on a 70:00 blend of CEM I with GGBS were:

7 Day Strength (MPa)	21.7
28 Day Strength (MPa)	43.4

Based on equivalent results obtained for the last 7 month, 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	12	35
42,5N	6	20

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: December 2022

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)	20.4
28 Day Strength (MPa)	46.0

Based on equivalent results obtained for the last 12 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	13	35
42,5N	6	29

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: December 2022

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)	18.3
28 Day Strength (MPa)	44.3

Based on equivalent results obtained for the last 12 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	22	35
42,5N	7	29

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

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Tudela EN 450-1 Fly Ash
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Based on the composite samples for the month of: December 2022

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)	18.1
28 Day Strength (MPa)	43.4

Based on equivalent results obtained for the last 12 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	9	35
42,5N	6	22

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: December 2022

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)	18.5
28 Day Strength (MPa)	42.6

Based on equivalent results obtained for the last 12 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	12	35
42,5N	6	23

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: December 2022

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)	19.2
28 Day Strength (MPa)	43.4

Based on equivalent results obtained for the last 12 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	22	35
42,5N	6	31

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: December 2022

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)	19.5
28 Day Strength (MPa)	50.6

Based on equivalent results obtained for the last 12 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	26	35
42,5N	6	35

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

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