

Tarmac Cement  
 National Laboratory  
 Yelsway Lane  
 Waterhouses  
 Staffordshire  
 ST10 3AZ

15.10.2020

**Composition of Fly ash**

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

Based on the **June 2020** monthly composite sample:

Property			Value	BS EN 450-1 Limit
Fineness (Residue)	45µm	%	12.1	Declared Value 15% ± 10% (Tested in accordance with BS EN 450-1 cl. 5.3.1)
APD		g/cm <sup>3</sup>	2.46	< 200kg/m <sup>3</sup> from declared value
28 Day Activity Index – May Sample		%	82	>75%
90 Day Activity Index		%	--	>85%
Sulfate	SO <sub>3</sub>	%	0.61	≤ 3.0%
Loss on Ignition	LOI	%	3.76	≤ 7.0%
Chloride	Cl <sup>-</sup>	%	0.01	≤ 0.1%
Calcium Oxide	CaO	%	4.56	≤ 10.0%
SiO <sub>2</sub> + Al <sub>2</sub> O <sub>3</sub> + Fe <sub>2</sub> O <sub>3</sub>	-	%	85.30	≥ 70.0%
Free Lime	-	%	0.21	≤ 1.0%
Alkalis	Na <sub>2</sub> Oeq	%	0.73	≤ 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  
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11.08.2020

**Conformity of Fly Ash to BS 8500-2: Annex A**

**Tudela EN 450-1 Fly Ash  
 0099-CPR-A95-0019**

Based on the **June 2020** monthly composite samples of:

Constituent	Source
EN 450-1 Fly Ash	Tudela
EN 197-1 CEM I	Aberthaw CEM I 52,5N

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

2 Day Strength (MPa)	22.4
28 Day Strength (MPa)	50.2

Based on equivalent results obtained for the last **11** 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
32,5R	28	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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**Conformity of Fly Ash to BS 8500-2: Annex A**

**Tudela EN 450-1 Fly Ash  
 0099-CPR-A95-0019**

Based on the **June 2020** monthly composite samples of:

Constituent	Source
EN 450-1 Fly Ash	Tudela
EN 197-1 CEM I	Dunbar CEM I 52,5N

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

2 Day Strength (MPa)	22.2
28 Day Strength (MPa)	47.7

Based on equivalent results obtained for the last **11** 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
32,5R	22	35
42,5N	6	28

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 **June 2020** monthly composite samples of:

Constituent	Source
EN 450-1 Fly Ash	Tudela
EN 197-1 CEM I	Limerick CEM I 52,5N

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

2 Day Strength (MPa)	20.0
28 Day Strength (MPa)	46.1

Based on equivalent results obtained for the last **11** 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
32,5R	19	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 **June 2020** monthly composite samples of:

Constituent	Source
EN 450-1 Fly Ash	Tudela
EN 197-1 CEM I	Platin CEM I 52,5N

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

2 Day Strength (MPa)	20.5
28 Day Strength (MPa)	44.6

Based on equivalent results obtained for the last **11** 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
32,5R	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 **June 2020** monthly composite samples of:

Constituent	Source
EN 450-1 Fly Ash	Tudela
EN 197-1 CEM I	Rugby CEM I 52,5N

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

2 Day Strength (MPa)	23.2
28 Day Strength (MPa)	51.8

Based on equivalent results obtained for the last **11** 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
32,5R	20	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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**Tudela EN 450-1 Fly Ash  
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Based on the **June 2020** monthly composite samples of:

Constituent	Source
EN 450-1 Fly Ash	Tudela
EN 197-1 CEM I	Tunstead CEM I 52,5N

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

2 Day Strength (MPa)	19.3
28 Day Strength (MPa)	52.6

Based on equivalent results obtained for the last **11** 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
32,5R	23	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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