Tarmac Cement
National Laboratory
Yelsway Lane
Waterhouses
Staffordshire
ST10 3AZ

27/02/2019

Composition of Fly ash

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

Based on the **December 2018** monthly composite sample:

Property	Value	BS EN 450-1 Limit
Fineness (45µm Residue %)	13.7	Declared Value 15% (± 10) *(Tested in accordance with BS EN 450-1 cl. 5.3.1)*
Sulfate (% SO_3)	0.69	Max 3.0%
Loss on Ignition (%LOI)	3.01	Max 7.0%
Chloride (% $Cl^{-)}$ %	0.008	Max 0.1%
Calcium Oxide (% CaO)	6.53	Max 10.0%
SiO_2+ Al_2O_3+Fe_2O_3 (%)	82.15	Min 70%
Free Lime (%)	0.57	Max 1.0%
Alkalis (% Na_2O eq)	0.65	Max 5.0%

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

For and on behalf of Tarmac Cement:

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27.02.2019

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

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

Based on the **December 2018** 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)	23.4
28 Day Strength (MPa)	53.1

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
32,5R	26	47
42,5N	0	34

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 **December 2018** 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)	21.4
28 Day Strength (MPa)	45.9

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
32,5R	16	38
42,5N	0	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
0099-CPR-A95-0019

Based on the **December 2018** monthly composite samples of:

Constituent	Source
EN 450-1 Fly Ash	Tudela
EN 197-1 CEM I	Lemona 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)	23.6
28 Day Strength (MPa)	51.2

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
32,5R	24	45
42,5N	6	33

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 **December 2018** 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)	19.2
28 Day Strength (MPa)	44.1

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
32,5R	14	41
42,5N	0	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 **December 2018** 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)	20.1
28 Day Strength (MPa)	46.7

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
32,5R	14	40
42,5N	0	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 **December 2018** 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)	20.8
28 Day Strength (MPa)	47.3

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
32,5R	20	40
42,5N	0	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 **December 2018** 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)	19.1
28 Day Strength (MPa)	48.9

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
32,5R	16	41
42,5N	0	26

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

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