

Tarmac Cement  
National Laboratory  
Yelsway Lane  
Waterhouses  
Staffordshire  
ST10 3AZ

30.08.2023

**Composition of Fly ash**

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

Based on the **May 2023** monthly composite sample: 1478

| Property   |                     |                   | Value | BS EN 450-1 Limit  |
|--|---------------------|-------------------|-------|--|
| Fineness (Residue)   | 45µm                | %                 | 9.9   | Declared Value 15% ± 10%<br><i>(Tested in accordance with BS EN 450-1 cl. 5.3.1)</i> |
| APD  |                     | g/cm <sup>3</sup> | 2.52  | < 200kg/m <sup>3</sup> from declared value   |
| 28 Day Activity Index – Apr sample   |                     | %                 | 75    | >75%   |
| 90 Day Activity Index – Mar sample   |                     | %                 | 89    | >85%   |
| Sulfate  | SO <sub>3</sub>     | %                 | 0.70  | ≤ 3.0%   |
| Loss on Ignition   | LOI                 | %                 | 2.93  | ≤ 7.0%   |
| Chloride   | Cl <sup>-</sup>     | %                 | 0.01  | ≤ 0.1%   |
| Calcium Oxide  | CaO                 | %                 | 4.94  | ≤ 10.0%  |
| SiO <sub>2</sub> + Al <sub>2</sub> O <sub>3</sub> + Fe <sub>2</sub> O <sub>3</sub> | -                   | %                 | 84.54 | ≥ 70.0%  |
| Free Lime  | -                   | %                 | 0.26  | ≤ 1.5%   |
| Alkalis  | Na <sub>2</sub> Oeq | %                 | 1.21  | ≤ 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**

Tarmac Trading Limited Registered in England and Wales. Company No. 453791  
Tarmac Cement and Lime Limited Registered in England and Wales. Company No. 66558  
Tarmac Services Limited Registered in England and Wales. Company No. 8197397  
Registered address for all companies: T3 Trinity Park, Bickenhill Lane, Birmingham, B37 7ES

T3 Trinity Park, Bickenhill Lane,  
Birmingham, B37 7ES  
**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: May 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)  | 21.6 |
| 28 Day Strength (MPa) | 47.7 |

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 |
| 32,5N                         | 20                  | 35  |
| 42,5N                         | 6                   | 29  |

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

For and on behalf of Tarmac Cement:

**Simon Chudley**



**National Commercial Technical Manager Tarmac Cement**  
[TARMAC.COM](http://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: May 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)  | 17.7 |
| 28 Day Strength (MPa) | 42.0 |

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                         | 12                  | 35  |
| 42,5N                         | 6                   | 27  |

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

For and on behalf of Tarmac Cement:

**Simon Chudley**



**National Commercial Technical Manager Tarmac 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: May 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)  | 19.8 |
| 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 |
| 32,5N                         | 22                  | 35  |
| 42,5N                         | 6                   | 28  |

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

For and on behalf of Tarmac Cement:

**Simon Chudley**



**National Commercial Technical Manager Tarmac Cement**  
[TARMAC.COM](http://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: May 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)  | 20.7 |
| 28 Day Strength (MPa) | 45.8 |

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                         | 8                   | 35  |
| 42,5N                         | 6                   | 20  |

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

For and on behalf of Tarmac Cement:

**Simon Chudley**



**National Commercial Technical Manager Tarmac Cement**  
[TARMAC.COM](http://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: May 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)  | 20.0 |
| 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 |
| 32,5N                         | 12                  | 35  |
| 42,5N                         | 6                   | 23  |

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

For and on behalf of Tarmac Cement:

**Simon Chudley**



**National Commercial Technical Manager Tarmac Cement**  
[TARMAC.COM](http://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: May 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)  | 21.0 |
| 28 Day Strength (MPa) | 46.8 |

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                         | 19                  | 35  |
| 42,5N                         | 6                   | 28  |

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

For and on behalf of Tarmac Cement:

**Simon Chudley**



**National Commercial Technical Manager Tarmac Cement**  
[TARMAC.COM](http://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: May 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)  | 20.0 |
| 28 Day Strength (MPa) | 49.6 |

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                         | 24                  | 35  |
| 42,5N                         | 6                   | 35  |

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

For and on behalf of Tarmac Cement:

**Simon Chudley**



**National Commercial Technical Manager Tarmac Cement**  
[TARMAC.COM](http://TARMAC.COM)