



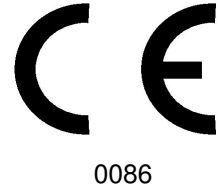
Fly ash Test Report

United Kingdom

Technical Department

Portland House
Bickenhill Lane, Solihull
Birmingham. B37 7BQ

Telephone: 0845 812 6400
Facsimile: 0845 812 6200



Date: **05 March 2010**

Aberthaw

Fly ash BS EN 450-1

Fineness category:N, Loss on ignition category:A

Monthly average data for

October 2009

A) Physical and chemical properties of the fly ash sample

| Test Property | Test result | BS EN 450-1 |
|--|-------------|---------------------|
| Fineness (%) | 14.2 | declared value 22.0 |
| Sulfuric anhydride (%) | | max 3.0 |
| Loss on ignition (%) | 3.6 | 0.0 to 5.0 |
| Chloride (%) | | max 0.1 |
| Calcium oxide (%) | | max 10.0 |
| SiO ₂ +Al ₂ O ₃ +Fe ₂ O ₃ (%) | | min 70.0 |
| Free Lime (%) | | max 1.0 |
| Acid soluble alkali (%) | | max 5.0 |
| Additional information: | | |
| Declared particle density (kg/m ³) | 2200 | |

B) Physical properties of a 25:75 blend of the fly ash with a reference Portland cement

PC Source:

Ribblesdale

PC Initial setting time (min):

205

PC 28 day strength (MPa)

| Test Property | Test result | BS EN 450-1 |
|----------------------------|-------------|-------------------------|
| Activity index @ 28 days | 97 | min 75 |
| Initial Setting Time (min) | 235 | max 120min more than PC |

Note: This report has been produced from data supplied by the manufacturer, Celtic Ash

For and on behalf of Lafarge Cement UK :

National Commercial Technical Manager

Lafarge Cement UK PLC

Registered in England and Wales. Registered number 66558. Registered Office: Granite House, Granite Way, Syston, Leicester. LE1 1PL



Certificate of Conformity to BS 8500-2 Annex A

United Kingdom

Technical Department

Portland House
Bickenhill Lane
Solihull
Birmingham
B37 7BQ

Telephone: 0845 812 6400

Facsimile: 0845 812 6200

Date: **05 March 2010**

For a composite sample of

Aberthaw fly ash to BS EN 450-1

Fineness category:N, Loss on ignition category:A

prepared by Celtic Ash

and a composite sample of

Aberthaw PC-RM, BS EN 197-1 CEM I 52.5N

prepared by Lafarge Cement UK

each relating to product supplied during

October 2009

the results of test carried out in accordance with
BS 196-1 on a 70:30 blend of the CEM I with the
fly ash were

| | | |
|-----------------|-------------|-----|
| 2 day strength | 18.6 | MPa |
| 28 day strength | 43.1 | MPa |

Based on equivalent results obtained for the last **9** months
the permitted proportion of combinations conforming with the requirements
of Annex A of BS 8500-2 are

| Strength class of combination | fly ash content (as a percentage) | |
|----------------------------------|--------------------------------------|-----------|
| | min | max |
| 32,5 R | 20 | 41 |
| 42,5 N | 0 | 28 |

For and on behalf of Lafarge Cement UK :

National Commercial Technical Manager



Certificate of Conformity to BS 8500-2 Annex A

United Kingdom

Technical Department

Portland House
Bickenhill Lane
Solihull
Birmingham
B37 7BQ

Telephone: 0845 812 6400

Facsimile: 0845 812 6200

Date: **05 March 2010**

For a composite sample of

Aberthaw fly ash to BS EN 450-1

Fineness category:N, Loss on ignition category:A

prepared by Celtic Ash

and a composite sample of

Hope PC-RM, BS EN 197-1 CEM I 52,5N

prepared by Lafarge Cement UK

each relating to product supplied during

October 2009

the results of test carried out in accordance with
BS 196-1 on a 70:30 blend of the CEM I with the
fly ash were

| | | |
|-----------------|-------------|-----|
| 2 day strength | 18.6 | MPa |
| 28 day strength | 41.7 | MPa |

Based on equivalent results obtained for the last **9** months
the permitted proportion of combinations conforming with the requirements
of Annex A of BS 8500-2 are

| Strength class of combination | fly ash content (as a percentage) | |
|----------------------------------|--------------------------------------|-----------|
| | min | max |
| 32,5 R | 17 | 37 |
| 42,5 N | 4 | 26 |

For and on behalf of Lafarge Cement UK :

National Commercial Technical Manager



United Kingdom

Certificate of Conformity to BS 8500-2 Annex A

Technical Department

Portland House
Bickenhill Lane
Solihull
Birmingham
B37 7BQ

Telephone: 0845 812 6400

Facsimile: 0845 812 6200

Date: **05 March 2010**

For a composite sample of

Aberthaw fly ash to BS EN 450-1

Fineness category:N, Loss on ignition category:A

prepared by Celtic Ash

and a composite sample of

Castle Padeswood PC

prepared by Lafarge Cement UK

each relating to product supplied during

October 2009

the results of test carried out in accordance with
BS 196-1 on a 70:30 blend of the CEM I with the
fly ash were

| | | |
|-----------------|-------------|-----|
| 2 day strength | 17.0 | MPa |
| 28 day strength | 39.0 | MPa |

Based on equivalent results obtained for the last **9** months
the permitted proportion of combinations conforming with the requirements
of Annex A of BS 8500-2 are

| Strength class of combination | fly ash content (as a percentage) | |
|----------------------------------|--------------------------------------|-----------|
| | min | max |
| 32,5 R | 15 | 32 |
| 42,5 N | 0 | 22 |

For and on behalf of Lafarge Cement UK :

National Commercial Technical Manager



Certificate of Conformity to BS 8500-2 Annex A

United Kingdom

Technical Department

Portland House
Bickenhill Lane
Solihull
Birmingham
B37 7BQ

Telephone: 0845 812 6400

Facsimile: 0845 812 6200

Date: **05 March 2010**

For a composite sample of

Aberthaw fly ash to BS EN 450-1

Fineness category:N, Loss on ignition category:A

prepared by Celtic Ash

and a composite sample of

Cemex Rugby PC

prepared by Lafarge Cement UK

each relating to product supplied during

October 2009

the results of test carried out in accordance with
BS 196-1 on a 70:30 blend of the CEM I with the
fly ash were

| | | |
|-----------------|-------------|-----|
| 2 day strength | 18.8 | MPa |
| 28 day strength | 44.8 | MPa |

Based on equivalent results obtained for the last **9** months
the permitted proportion of combinations conforming with the requirements
of Annex A of BS 8500-2 are

| Strength class of combination | fly ash content (as a percentage) | |
|----------------------------------|--------------------------------------|-----------|
| | min | max |
| 32,5 R | 18 | 39 |
| 42,5 N | 0 | 27 |

For and on behalf of Lafarge Cement UK :

National Commercial Technical Manager



Certificate of Conformity to BS 8500-2 Annex A

United Kingdom

Technical Department

Portland House
Bickenhill Lane
Solihull
Birmingham
B37 7BQ

Telephone: 0845 812 6400

Facsimile: 0845 812 6200

Date: **05 March 2010**

For a composite sample of

Aberthaw fly ash to BS EN 450-1

Fineness category:N, Loss on ignition category:A

prepared by Celtic Ash

and a composite sample of

Dragon Alfa PC

prepared by Lafarge Cement UK

each relating to product supplied during

October 2009

the results of test carried out in accordance with
BS 196-1 on a 70:30 blend of the CEM I with the
fly ash were

| | | |
|-----------------|-------------|-----|
| 2 day strength | 19.2 | MPa |
| 28 day strength | 44.2 | MPa |

Based on equivalent results obtained for the last **8** months
the permitted proportion of combinations conforming with the requirements
of Annex A of BS 8500-2 are

| Strength class of combination | fly ash content (as a percentage) | |
|----------------------------------|--------------------------------------|-----------|
| | min | max |
| 32,5 R | 14 | 34 |
| 42,5 N | 0 | 24 |

For and on behalf of Lafarge Cement UK :

National Commercial Technical Manager



Certificate of Conformity to BS 8500-2 Annex A

United Kingdom

Technical Department

Portland House
Bickenhill Lane
Solihull
Birmingham
B37 7BQ

Telephone: 0845 812 6400

Facsimile: 0845 812 6200

Date: **05 March 2010**

For a composite sample of

Aberthaw fly ash to BS EN 450-1

Fineness category:N, Loss on ignition category:A

prepared by Celtic Ash

and a composite sample of

Lagerdorf PC

prepared by Lafarge Cement UK

each relating to product supplied during

October 2009

the results of test carried out in accordance with
BS 196-1 on a 70:30 blend of the CEM I with the
fly ash were

| | | |
|-----------------|-------------|-----|
| 2 day strength | 20.9 | MPa |
| 28 day strength | 47.5 | MPa |

Based on equivalent results obtained for the last **1** months
the permitted proportion of combinations conforming with the requirements
of Annex A of BS 8500-2 are

| Strength class of combination | fly ash content (as a percentage) | |
|----------------------------------|--------------------------------------|-----------|
| | min | max |
| 32,5 R | 22 | 41 |
| 42,5 N | 0 | 30 |

For and on behalf of Lafarge Cement UK :

National Commercial Technical Manager