



# Fly ash Test Report

United Kingdom

Technical Department

Portland House  
Bickenhill Lane, Solihull  
Birmingham. B37 7BQ

Telephone: 0845 812 6400  
Facsimile: 0845 812 6200



0086

Date: **21 July 2009**

## Cottam

Fly ash BS EN 450-1

Fineness category:S, Loss on ignition category:B

Monthly average data for

**May 2009**

### A) Physical and chemical properties of the fly ash sample

Test Property	Test result	BS EN 450-1
Fineness (%)	<b>8.9</b>	max 12.0
Sulfuric anhydride (%)	<b>1.0</b>	max 3.0
Loss on ignition (%)	<b>5.0</b>	2.0 to 7.0
Chloride (%)	<b>0.02</b>	max 0.1
Calcium oxide (%)	<b>4.00</b>	max 10.0
SiO <sub>2</sub> +Al <sub>2</sub> O <sub>3</sub> +Fe <sub>2</sub> O <sub>3</sub> (%)	<b>86.3</b>	min 70.0
Free Lime (%)	<b>0.0</b>	max 1.0
Acid soluble alkali (%)	<b>2.86</b>	max 5.0

Additional information:

Colour index	<b>4</b>
Declared particle density (kg/m <sup>3</sup> )	<b>2255</b>

### 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): **160**

PC 28 day strength (MPa) **55.2**

Test Property	Test result	BS EN 450-1
Water requirement (%)	<b>93</b>	max 95
Activity index @ 28 days	<b>79</b>	min 75
Initial Setting Time (min)	<b>200</b>	max 120min more than PC

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

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: **21 July 2009**

For a composite sample of

## **Cottam** fly ash to BS EN 450-1

Fineness category:S, Loss on ignition category:B

prepared by Processing Ash LLP

and a composite sample of

## **Cauldon PC-RM, BS EN 197-1 CEM I 52.5N**

prepared by Lafarge Cement UK

each relating to product supplied during

**May 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	<b>17.2</b>	MPa
28 day strength	<b>44.6</b>	MPa

Based on equivalent results obtained for the last **12** 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	<b>16</b>	<b>39</b>
42,5 N	<b>6</b>	<b>25</b>

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: **21 July 2009**

For a composite sample of

## **Cottam** fly ash to BS EN 450-1

Fineness category:S, Loss on ignition category:B

prepared by Processing Ash LLP

and a composite sample of

### **Dragon Alpha**

prepared by the manufacturer

each relating to product supplied during

### **May 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	<b>19.6</b>	MPa
28 day strength	<b>43.4</b>	MPa

Based on equivalent results obtained for the last **12** 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	<b>8</b>	<b>40</b>
42,5 N	<b>6</b>	<b>20</b>

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: **21 July 2009**

For a composite sample of

## **Cottam** fly ash to BS EN 450-1

Fineness category:S, Loss on ignition category:B

prepared by Processing Ash LLP

and a composite sample of

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

prepared by Lafarge Cement UK

each relating to product supplied during

**May 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	<b>16.3</b>	MPa
28 day strength	<b>42.7</b>	MPa

Based on equivalent results obtained for the last **12** 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	<b>19</b>	<b>38</b>
42,5 N	<b>7</b>	<b>26</b>

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: **21 July 2009**

For a composite sample of

## **Cottam** fly ash to BS EN 450-1

Fineness category:S, Loss on ignition category:B

prepared by Processing Ash LLP

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

**May 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	<b>18.1</b>	MPa
28 day strength	<b>43.1</b>	MPa

Based on equivalent results obtained for the last **12** 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	<b>16</b>	<b>42</b>
42,5 N	<b>6</b>	<b>26</b>

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: **21 July 2009**

For a composite sample of

## **Cottam** fly ash to BS EN 450-1

Fineness category:S, Loss on ignition category:B

prepared by Processing Ash LLP

and a composite sample of

### **Castle Ketton**

prepared by the manufacturer

each relating to product supplied during

**May 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	<b>17.9</b>	MPa
28 day strength	<b>44.7</b>	MPa

Based on equivalent results obtained for the last **12** 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	<b>19</b>	<b>46</b>
42,5 N	<b>6</b>	<b>29</b>

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: **21 July 2009**

For a composite sample of

## **Cottam** fly ash to BS EN 450-1

Fineness category:S, Loss on ignition category:B

prepared by Processing Ash LLP

and a composite sample of

### **Castle Padeswood**

prepared by the manufacturer

each relating to product supplied during

**May 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	<b>13.3</b>	MPa
28 day strength	<b>37.8</b>	MPa

Based on equivalent results obtained for the last **12** 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	<b>10</b>	<b>35</b>
42,5 N	<b>6</b>	<b>20</b>

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: **21 July 2009**

For a composite sample of

## **Cottam** fly ash to BS EN 450-1

Fineness category:S, Loss on ignition category:B

prepared by Processing Ash LLP

and a composite sample of

## **Paragon Chatham**

prepared by the manufacturer

each relating to product supplied during

**May 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	<b>17.7</b>	MPa
28 day strength	<b>45.2</b>	MPa

Based on equivalent results obtained for the last **11** 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	<b>26</b>	<b>45</b>
42,5 N	<b>12</b>	<b>34</b>

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: **21 July 2009**

For a composite sample of

### **Cottam** fly ash to BS EN 450-1

Fineness category:S, Loss on ignition category:B

prepared by Processing Ash LLP

and a composite sample of

### **Castle Ribblesdale**

prepared by the manufacturer

each relating to product supplied during

**May 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	<b>18.9</b>	MPa
28 day strength	<b>44.8</b>	MPa

Based on equivalent results obtained for the last **12** 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	<b>16</b>	<b>41</b>
42,5 N	<b>6</b>	<b>26</b>

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: **21 July 2009**

For a composite sample of

### **Cottam** fly ash to BS EN 450-1

Fineness category:S, Loss on ignition category:B

prepared by Processing Ash LLP

and a composite sample of

### **Cemex Rugby**

prepared by the manufacturer

each relating to product supplied during

**May 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	<b>19.7</b>	MPa
28 day strength	<b>42.2</b>	MPa

Based on equivalent results obtained for the last **12** 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	<b>15</b>	<b>38</b>
42,5 N	<b>6</b>	<b>24</b>

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: **21 July 2009**

For a composite sample of

## **Cottam** fly ash to BS EN 450-1

Fineness category:S, Loss on ignition category:B

prepared by Processing Ash LLP

and a composite sample of

### **Cemex South Ferriby**

prepared by Lafarge Cement UK

each relating to product supplied during

**May 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	<b>18.1</b>	MPa
28 day strength	<b>40.2</b>	MPa

Based on equivalent results obtained for the last **12** 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	<b>13</b>	<b>37</b>
42,5 N	<b>6</b>	<b>22</b>

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: **21 July 2009**

For a composite sample of

### **Cottam** fly ash to BS EN 450-1

Fineness category:S, Loss on ignition category:B

prepared by Processing Ash LLP

and a composite sample of

#### **Southern (Uniland)**

prepared by Lafarge Cement UK

each relating to product supplied during

**May 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	<b>21.3</b>	MPa
28 day strength	<b>40.9</b>	MPa

Based on equivalent results obtained for the last **12** 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	<b>6</b>	<b>40</b>
42,5 N	<b>6</b>	<b>19</b>

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: **21 July 2009**

For a composite sample of

### **Cottam** fly ash to BS EN 450-1

Fineness category:S, Loss on ignition category:B

prepared by Processing Ash LLP

and a composite sample of

#### **BLI Tunstead**

prepared by Lafarge Cement UK

each relating to product supplied during

#### **May 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	<b>16.1</b>	MPa
28 day strength	<b>42.5</b>	MPa

Based on equivalent results obtained for the last **12** 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	<b>15</b>	<b>41</b>
42,5 N	<b>6</b>	<b>25</b>

For and on behalf of Lafarge Cement UK :

National Commercial Technical Manager