Tarmac Cement National Laboratory

Yelsway Lane
Waterhouses
Staffordshire
ST10 3AZ

27/11/2024

Composition of Ground Granulated Blastfurnace Slag

Dunkirk EN 15167-1 GGBS
(0099/CPR/B34/0001)

Based on the **August 2024** monthly composite sample: 3108

Property			Value	BS EN 15167-1 Limit
Magnesia	MgO	%	6.93	≤ 18.0%
Sulfate	SO_3	%	0.20	≤ 2.5%
Sulfide	$S2^-$	%	0.80	≤ 2.0%
Chloride	Cl^-	%	0.01	≤ 0.1%
Alkalis	Na_2Oeq	%	0.51	-
Alumina	Al_2O_3	%	12.40	≤ 14%*
Fineness	SSA	m^2/kg	476	≥ 275 m^2/kg
7 Day Activity Index – July Sample		%	55	>40%
28 Day Activity Index – July Sample		%	82	>65%
Declared Mean Alkali Content	Na_2Oeq	%	0.70	-
Declared Maximum Chloride Content	Cl^-	%	0.05	-

Upper limit in BS 8500 for use in '+SR' combinations

For and on behalf of Tarmac Cement:

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Conformity of Ground Granulated Blast Furnace Slag to BS 8500-2: Annex B
Dunkirk EN 15167-1 GGBS
(1164-CPR-LGM002)

Based on the composite samples for the Month of: August 2024

Constituent	Source
EN 15167-1 GGBS	Dunkirk
EN 197-1 CEM I	Aberthaw

The results of compressive strength testing (in accordance with BS EN 196-1) on a 50:50 blend of CEM I with GGBS were:

7 Day Strength (MPa)	27.3
28 Day Strength (MPa)	51.8

Based on equivalent results obtained for the last **6** Months, the permitted proportions of combinations conforming to the requirements of Annex B of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	44	75
42,5L	6	57
52,5L	6	24

BS 8500-2 Combination Designation	GGBS Content (%)	
	Min	Max
CIIS	6	35
CIIIA	36	65
CIIIB	66	80

For and on behalf of Tarmac Cement:
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Based on the composite samples for the Month of: August 2024

Constituent	Source
EN 15167-1 GGBS	Dunkirk
EN 197-1 CEM II/A-LL	Aberthaw

The results of compressive strength testing (in accordance with BS EN 196-1) on a 50:50 blend of CEM II/A-LL with GGBS were:

7 Day Strength (MPa)	28.8
28 Day Strength (MPa)	49.9

Based on equivalent results obtained for the last **6** Months, the permitted proportions of combinations conforming to the requirements of Annex B of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	42	73
42,5L	6	56
52,5L	--	--

BS 8500-2 Combination Designation	GGBS Content (%)	
	Min	Max
CIIS	6	35
CIIIA	36	65
CIIIB	66	80

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Based on the composite samples for the Month of: August 2024

Constituent	Source
EN 15167-1 GGBS	Dunkirk
EN 197-1 CEM I	Cauldon

The results of compressive strength testing (in accordance with BS EN 196-1) on a 50:50 blend of CEM I with GGBS were:

7 Day Strength (MPa)	25.5
28 Day Strength (MPa)	48.1

Based on equivalent results obtained for the last **5** Months, the permitted proportions of combinations conforming to the requirements of Annex B of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	44	76
42,5L	6	57
52,5L	6	33

BS 8500-2 Combination Designation	GGBS Content (%)	
	Min	Max
CIIS	6	35
CIIIA	36	65
CIIIB	66	80

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Based on the composite samples for the Month of: August 2024

Constituent	Source
EN 15167-1 GGBS	Dunkirk
EN 197-1 CEM I	Hope

The results of compressive strength testing (in accordance with BS EN 196-1) on a 50:50 blend of CEM I with GGBS were:

7 Day Strength (MPa)	28.9
28 Day Strength (MPa)	55.2

Based on equivalent results obtained for the last **6** Months, the permitted proportions of combinations conforming to the requirements of Annex B of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	52	78
42,5L	14	63
52,5L	6	38

BS 8500-2 Combination Designation	GGBS Content (%)	
	Min	Max
CIIS	6	35
CIIIA	36	65
CIIIB	66	80

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Constituent	Source
EN 15167-1 GGBS	Dunkirk
EN 197-1 CEM I	Lemona

The results of compressive strength testing (in accordance with BS EN 196-1) on a 50:50 blend of CEM I with GGBS were:

7 Day Strength (MPa)	27.6
28 Day Strength (MPa)	52.1

Based on equivalent results obtained for the last **7** Months, the permitted proportions of combinations conforming to the requirements of Annex B of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	48	80
42,5L	26	65
52,5L	6	39

BS 8500-2 Combination Designation	GGBS Content (%)	
	Min	Max
CIIS	6	35
CIIIA	36	65
CIIIB	66	80

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Constituent	Source
EN 15167-1 GGBS	Dunkirk
EN 197-1 CEM I	Limerick

The results of compressive strength testing (in accordance with BS EN 196-1) on a 50:50 blend of CEM I with GGBS were:

7 Day Strength (MPa)	27.3
28 Day Strength (MPa)	52.1

Based on equivalent results obtained for the last **8** Months, the permitted proportions of combinations conforming to the requirements of Annex B of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	48	75
42,5L	6	59
52,5L	6	34

BS 8500-2 Combination Designation	GGBS Content (%)	
	Min	Max
CIIS	6	35
CIIIA	36	65
CIIIB	66	80

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Constituent	Source
EN 15167-1 GGBS	Dunkirk
EN 197-1 CEM I	Platin

The results of compressive strength testing (in accordance with BS EN 196-1) on a 50:50 blend of CEM I with GGBS were:

7 Day Strength (MPa)	28.5
28 Day Strength (MPa)	54.4

Based on equivalent results obtained for the last **8** Months, the permitted proportions of combinations conforming to the requirements of Annex B of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	50	78
42,5L	6	63
52,5L	6	36

BS 8500-2 Combination Designation	GGBS Content (%)	
	Min	Max
CIIS	6	35
CIIIA	36	65
CIIIB	66	80

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Constituent	Source
EN 15167-1 GGBS	Dunkirk
EN 197-1 CEM I	Tunstead

The results of compressive strength testing (in accordance with BS EN 196-1) on a 50:50 blend of CEM I with GGBS were:

7 Day Strength (MPa)	27.1
28 Day Strength (MPa)	55.7

Based on equivalent results obtained for the last **8** Months, the permitted proportions of combinations conforming to the requirements of Annex B of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	53	77
42,5L	24	59
52,5L	6	42

BS 8500-2 Combination Designation	GGBS Content (%)	
	Min	Max
CIIS	6	35
CIIIA	36	65
CIIIB	66	80

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