

Tarmac Cement National Laboratory

Yelsway Lane
 Waterhouses
 Staffordshire
 ST10 3AZ

21/02/2025

Composition of Ground Granulated Blastfurnace Slag

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

Based on the **November 2024** monthly composite sample: 4384

Property			Value	BS EN 15167-1 Limit
Magnesia	MgO	%	6.77	≤ 18.0%
Sulfate	SO ₃	%	0.19	≤ 2.5%
Sulfide	S ²⁻	%	0.75	≤ 2.0%
Chloride	Cl ⁻	%	0.01	≤ 0.1%
Alkalis	Na ₂ Oeq	%	0.56	-
Alumina	Al ₂ O ₃	%	12.59	≤ 14%*
Fineness	SSA	m ² /kg	464	≥ 275 m ² /kg
7 Day Activity Index – October Sample		%	59	>40%
28 Day Activity Index – October Sample		%	93	>65%
Declared Mean Alkali Content	Na ₂ Oeq	%	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:

S. Chudley

Simon Chudley

**National Commercial Technical Manager
 Tarmac Cement**

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Tarmac Trading Limited Registered in England and Wales. Company No. 453791
 Tarmac Cement Limited Registered in England and Wales. Company No. 66558
 Tarmac Services Limited Registered in England and Wales. Company No. 8197397
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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: November 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)	27.5
28 Day Strength (MPa)	50.6

Based on equivalent results obtained for the last **9** 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	45	76
42,5L	6	58
52,5L	6	26

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

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Constituent	Source
EN 15167-1 GGBS	Dunkirk
EN 197-1 CEM II/A-LL	Aberthaw (limestone content 10-14%)

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)	28.9
28 Day Strength (MPa)	50.3

Based on equivalent results obtained for the last **9** 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	73
42,5L	6	56
52,5L	--	--

BS 8500-2 Combination Designation	GGBS Content (%)	
	Min	Max
CIIIA	36	65
CIIBB	66	80
CIIA-M	6	14
CIIB-M	6	29
CIIC-M	16	44
CVI	31	59

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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)	28.4
28 Day Strength (MPa)	53.1

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	44	75
42,5L	6	56
52,5L	6	32

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

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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)	28.5
28 Day Strength (MPa)	53.1

Based on equivalent results obtained for the last **9** 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	78
42,5L	17	64
52,5L	6	40

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

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Constituent	Source
EN 15167-1 GGBS	Dunkirk
EN 197-1 CEM II/A-L	Hope (limestone content 12.5-16.5%)

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

7 Day Strength (MPa)	30.9
28 Day Strength (MPa)	51.9

Based on equivalent results obtained for the last 2 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	51	76
42,5L	6	62
52,5L	6	34

BS 8500-2 Combination Designation	GGBS Content (%)	
	Min	Max
CIIIA	36	65
CIIBB	66	80
CIIA-M	6	14
CIIB-M	6	29
CIIC-M	16	44
CVI	31	59

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

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)	27.1
28 Day Strength (MPa)	52.7

Based on equivalent results obtained for the last **11** 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	77
42,5L	6	61
52,5L	6	26

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

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Constituent	Source
EN 15167-1 GGBS	Dunkirk
EN 197-1 CEM II/A-L	Platin (limestone content 12-16%)

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

7 Day Strength (MPa)	29.1
28 Day Strength (MPa)	49.3

Based on equivalent results obtained for the last 2 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	39	75
42,5L	6	60
52,5L	--	--

BS 8500-2 Combination Designation	GGBS Content (%)	
	Min	Max
CIIIA	36	65
CIIBB	66	80
CIIA-M	6	14
CIIB-M	6	29
CIIC-M	16	44
CVI	31	59

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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)	24.0
28 Day Strength (MPa)	54.1

Based on equivalent results obtained for the last **11** 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	54	78
42,5L	27	59
52,5L	6	43

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

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