

Composition of Ground Granulated Blastfurnace Slag

**Tudela EN 15167-1 GGBS
(0086-CPR-780512)**

Based on the **December 2023** monthly composite sample: 3828

Property			Value	BS EN 15167-1 Limit
Magnesia	MgO	%	7.47	≤ 18.0%
Sulfate	SO ₃	%	0.22	≤ 2.5%
Sulfide	S ²⁻	%	0.73	≤ 2.0%
Chloride	Cl ⁻	%	0.02	≤ 0.1%
Alkalis	Na ₂ O _{eq}	%	0.47	-
Alumina	Al ₂ O ₃	%	11.10	≤ 14%*
Fineness	SSA	m ² /kg	378	≥ 275 m ² /kg
7 Day Activity Index – Nov Sample		%	59	>40%
28 Day Activity Index – Nov Sample		%	89	>65%
Declared Mean Alkali Content	Na ₂ O _{eq}	%	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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**Conformity of Ground Granulated Blast Furnace Slag to BS 8500-2: Annex B
Tudela EN 15167-1 GGBS
(0086-CPR-780512)**

Based on the composite samples for the month of: December 2023

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

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

7 Day Strength (MPa)	26.3
28 Day Strength (MPa)	52.5

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	49	80
42,5L	7	65
52,5L	6	33

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	Tudela
EN 197-1 CEM I	Cauldon

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

7 Day Strength (MPa)	25.8
28 Day Strength (MPa)	53.9

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	52	80
42,5L	6	72
52,5L	6	37

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	Tudela
EN 197-1 CEM I	Dunbar

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

7 Day Strength (MPa)	23.8
28 Day Strength (MPa)	54.7

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	51	80
42,5L	30	52
52,5L	6	41

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

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Based on the composite samples for the month of: December 2023

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

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

7 Day Strength (MPa)	28.0
28 Day Strength (MPa)	53.2

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	54	79
42,5L	24	64
52,5L	6	44

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

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Based on the composite samples for the month of: December 2023

Constituent	Source
EN 15167-1 GGBS	Tudela
EN 197-1 CEM I	Lagerdorf

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)	30.8
28 Day Strength (MPa)	54.1

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	59	80
42,5L	25	68
52,5L	6	46

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	Tudela
EN 197-1 CEM I	Limerick

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

7 Day Strength (MPa)	25.1
28 Day Strength (MPa)	52.7

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	51	76
42,5L	6	61
52,5L	n/a	n/a

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	Tudela
EN 197-1 CEM I	Mannock

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

7 Day Strength (MPa)	30.7
28 Day Strength (MPa)	56.9

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	56	80
42,5L	6	68
52,5L	6	35

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	Tudela
EN 197-1 CEM I	Platin

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

7 Day Strength (MPa)	27.5
28 Day Strength (MPa)	53.0

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	50	80
42,5L	6	65
52,5L	6	38

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	Tudela
EN 197-1 CEM I	Tunstead

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

7 Day Strength (MPa)	26.0
28 Day Strength (MPa)	56.5

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	58	80
42,5L	12	66
52,5L	6	44

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

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