

**Composition of Ground Granulated Blastfurnace Slag**

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

Based on the **April 2023** monthly composite sample: 1314

Property			Value	BS EN 15167-1 Limit
Magnesia	MgO	%	7.44	≤ 18.0%
Sulfate	SO <sub>3</sub>	%	0.21	≤ 2.5%
Sulfide	S <sup>2-</sup>	%	0.66	≤ 2.0%
Chloride	Cl <sup>-</sup>	%	0.02	≤ 0.1%
Alkalis	Na <sub>2</sub> O <sub>eq</sub>	%	0.58	-
Alumina	Al <sub>2</sub> O <sub>3</sub>	%	11.34	≤ 14%*
Fineness	SSA	m <sup>2</sup> /kg	526	≥ 275 m <sup>2</sup> /kg
7 Day Activity Index – March Sample		%	55	>40%
28 Day Activity Index – March Sample		%	82	>65%
Declared Mean Alkali Content	Na <sub>2</sub> O <sub>eq</sub>	%	0.70	-
Declared Maximum Chloride Content	Cl <sup>-</sup>	%	0.05	-

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

For and on behalf of Tarmac Cement:

*S. Chudley*

**Simon Chudley**

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**Conformity of Ground Granulated Blast Furnace Slag to BS 8500-2: Annex A  
 Tudela EN 15167-1 GGBS  
 (0099/CPR/B34/0001)**

Based on the composite samples for the month of: April 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)	27.7
28 Day Strength (MPa)	51.3

Based on equivalent results obtained for the last 12 months, the permitted proportions of  
 combinations conforming to the requirements of Annex A of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	50	80
42,5L	18	71
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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**Conformity of Ground Granulated Blast Furnace Slag to BS 8500-2: Annex A  
Tudela EN 15167-1 GGBS  
(0099/CPR/B34/0001)**

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

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)	28.6
28 Day Strength (MPa)	49.7

Based on equivalent results obtained for the last 12 months, the permitted proportions of combinations conforming to the requirements of Annex A of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	64	80
42,5L	6	75
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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**Conformity of Ground Granulated Blast Furnace Slag to BS 8500-2: Annex A  
Tudela EN 15167-1 GGBS  
(0099/CPR/B34/0001)**

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

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)	21.6
28 Day Strength (MPa)	49.7

Based on equivalent results obtained for the last 12 months, the permitted proportions of combinations conforming to the requirements of Annex A of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	49	80
42,5L	29	50
52,5L	6	41

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

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**Conformity of Ground Granulated Blast Furnace Slag to BS 8500-2: Annex A  
Tudela EN 15167-1 GGBS  
(0099/CPR/B34/0001)**

Based on the composite samples for the month of: April 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)	30.4
28 Day Strength (MPa)	53.9

Based on equivalent results obtained for the last 12 months, the permitted proportions of  
combinations conforming to the requirements of Annex A of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	59	80
42,5L	6	71
52,5L	6	17

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

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**Conformity of Ground Granulated Blast Furnace Slag to BS 8500-2: Annex A  
Tudela EN 15167-1 GGBS  
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Based on the composite samples for the month of: April 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)	31.5
28 Day Strength (MPa)	54.9

Based on equivalent results obtained for the last 1 months, the permitted proportions of  
combinations conforming to the requirements of Annex A of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	57	79
42,5L	6	67
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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**Conformity of Ground Granulated Blast Furnace Slag to BS 8500-2: Annex A  
Tudela EN 15167-1 GGBS  
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Based on the composite samples for the month of: April 2023

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)	27.4
28 Day Strength (MPa)	50.3

Based on equivalent results obtained for the last 12 months, the permitted proportions of combinations conforming to the requirements of Annex A of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	50	80
42,5L	6	69
52,5L	6	27

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

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**Conformity of Ground Granulated Blast Furnace Slag to BS 8500-2: Annex A  
Tudela EN 15167-1 GGBS  
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Based on the composite samples for the month of: April 2023

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)	31.3
28 Day Strength (MPa)	53.8

Based on equivalent results obtained for the last 12 months, the permitted proportions of  
combinations conforming to the requirements of Annex A of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	59	80
42,5L	6	72
52,5L	6	38

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

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**Conformity of Ground Granulated Blast Furnace Slag to BS 8500-2: Annex A  
Tudela EN 15167-1 GGBS  
(0099/CPR/B34/0001)**

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

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)	26.9
28 Day Strength (MPa)	51.7

Based on equivalent results obtained for the last 12 months, the permitted proportions of combinations conforming to the requirements of Annex A of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	48	80
42,5L	6	66
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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**Conformity of Ground Granulated Blast Furnace Slag to BS 8500-2: Annex A  
Tudela EN 15167-1 GGBS  
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Based on the composite samples for the month of: April 2023

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)	25.5
28 Day Strength (MPa)	53.5

Based on equivalent results obtained for the last 12 months, the permitted proportions of  
combinations conforming to the requirements of Annex A of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	58	80
42,5L	6	70
52,5L	6	31

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

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