

**Composition of Ground Granulated Blastfurnace Slag**

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

Based on the **September 2023** monthly composite sample: 2695

Property			Value	BS EN 15167-1 Limit
Magnesia	MgO	%	7.21	≤ 18.0%
Sulfate	SO <sub>3</sub>	%	0.19	≤ 2.5%
Sulfide	S <sup>2-</sup>	%	0.74	≤ 2.0%
Chloride	Cl <sup>-</sup>	%	0.01	≤ 0.1%
Alkalis	Na <sub>2</sub> O <sub>eq</sub>	%	0.49	-
Alumina	Al <sub>2</sub> O <sub>3</sub>	%	11.50	≤ 14%*
Fineness	SSA	m <sup>2</sup> /kg	495	≥ 275 m <sup>2</sup> /kg
7 Day Activity Index – Aug Sample		%	52	>40%
28 Day Activity Index – Aug Sample		%	83	>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: September 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)	27.6
28 Day Strength (MPa)	48.5

Based on equivalent results obtained for the last 2 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	44	80
42,5L	6	60
52,5L	6	25

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: September 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)	32.5
28 Day Strength (MPa)	54.2

Based on equivalent results obtained for the last 2 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	51	80
42,5L	6	72
52,5L	6	36

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: September 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)	22.4
28 Day Strength (MPa)	52.9

Based on equivalent results obtained for the last 2 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	29	48
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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**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: September 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)	29.0
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 A of BS 8500-2 are:

Strength Class of Combination	GGBS Content (%)	
	Min	Max
32,5L	52	78
42,5L	6	62
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: September 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)	No
28 Day Strength (MPa)	Sample

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	80
42,5L	20	67
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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**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: September 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)	28.6
28 Day Strength (MPa)	53.7

Based on equivalent results obtained for the last 2 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	53	78
42,5L	6	62
52,5L	6	19

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: September 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)	29.6
28 Day Strength (MPa)	48.9

Based on equivalent results obtained for the last 2 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	45	78
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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**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: September 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)	26.6
28 Day Strength (MPa)	51.3

Based on equivalent results obtained for the last 2 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	6	63
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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**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: September 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)	26.7
28 Day Strength (MPa)	52.1

Based on equivalent results obtained for the last 2 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	54	79
42,5L	6	64
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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