

**Composition of Ground Granulated Blastfurnace Slag**

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

Based on the **October 2022** monthly composite sample:

Property			Value	BS EN 15167-1 Limit
Magnesia	MgO	%	7.82	≤ 18.0%
Sulfate	SO <sub>3</sub>	%	0.19	≤ 2.5%
Sulfide	S <sup>2-</sup>	%	0.70	≤ 2.0%
Chloride	Cl <sup>-</sup>	%	0.02	≤ 0.1%
Alkalis	Na <sub>2</sub> O <sub>eq</sub>	%	0.61	-
Alumina	Al <sub>2</sub> O <sub>3</sub>	%	10.31	≤ 14%*
Fineness	SSA	m <sup>2</sup> /kg	546	≥ 275 m <sup>2</sup> /kg
7 Day Activity Index – Sep Sample		%	57	>40%
28 Day Activity Index – Sep Sample		%	81	>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: October 2022

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)	31.4
28 Day Strength (MPa)	53.3

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	55	80
42,5L	21	73
52,5L	6	36

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

For and on behalf of Tarmac Cement:

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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: October 2022

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

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)	29.8
28 Day Strength (MPa)	54.2

Based on equivalent results obtained for the last 8 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	68
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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**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: October 2022

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)	31.6
28 Day Strength (MPa)	55.3

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	68	80
42,5L	6	76
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  
(0099/CPR/B34/0001)**

Based on the composite samples for the month of: October 2022

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)	20.8
28 Day Strength (MPa)	51.6

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	51	80
42,5L	32	54
52,5L	6	42

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: October 2022

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)	30.9
28 Day Strength (MPa)	54.6

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	71
52,5L	6	15

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: October 2022

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)	29.3
28 Day Strength (MPa)	53.4

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	68
52,5L	6	24

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

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Tudela EN 15167-1 GGBS  
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Based on the composite samples for the month of: October 2022

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)	33.0
28 Day Strength (MPa)	56.8

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	65	80
42,5L	6	74
52,5L	6	42

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: October 2022

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)	27.9
28 Day Strength (MPa)	52.9

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	48	80
42,5L	6	66
52,5L	6	34

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: October 2022

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)	27.8
28 Day Strength (MPa)	56.7

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	55	80
42,5L	6	68
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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