

**Composition of Ground Granulated Blastfurnace Slag**

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

Based on the **May 2023** monthly composite sample: 1475

Property			Value	BS EN 15167-1 Limit
Magnesia	MgO	%	7.61	≤ 18.0%
Sulfate	SO <sub>3</sub>	%	0.17	≤ 2.5%
Sulfide	S <sup>2-</sup>	%	0.58	≤ 2.0%
Chloride	Cl <sup>-</sup>	%	0.02	≤ 0.1%
Alkalis	Na <sub>2</sub> O <sub>eq</sub>	%	0.57	-
Alumina	Al <sub>2</sub> O <sub>3</sub>	%	11.24	≤ 14%*
Fineness	SSA	m <sup>2</sup> /kg	564	≥ 275 m <sup>2</sup> /kg
7 Day Activity Index – April Sample		%	50	>40%
28 Day Activity Index – April Sample		%	76	>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**

**National Commercial Technical Manager  
Tarmac Cement**

**TARMAC.COM**

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 Tarmac Cement and Lime Limited Registered in England and Wales. Company No. 66558  
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 Registered address for all companies: T3 Trinity Park, Bickenhill Lane, Birmingham, B37 7ES

T3 Trinity Park, Bickenhill Lane,  
 Birmingham, B37 7ES  
**0345 812 6232 info-cement@tarmac.com**

Tarmac Cement National Laboratory  
Yelsway Lane  
Waterhouses  
Staffordshire  
ST10 3AZ



**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: May 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)	30.0
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	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

For and on behalf of Tarmac Cement:

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**National Commercial Technical Manager Tarmac Cement**

**TARMAC.COM**

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Registered address: T3 Trinity Park, Bickenhill Lane, Birmingham, B37 7ES

Tarmac Cement National Laboratory  
Yelsway Lane  
Waterhouses  
Staffordshire  
ST10 3AZ



**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: May 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)	27.6
28 Day Strength (MPa)	49.2

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	75
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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**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: May 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)	24.6
28 Day Strength (MPa)	52.3

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	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
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: May 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)	31.1
28 Day Strength (MPa)	53.6

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	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: May 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)	35.0
28 Day Strength (MPa)	56.2

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	58	80
42,5L	13	68
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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[TARMAC.COM](http://TARMAC.COM)

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Yelsway Lane  
Waterhouses  
Staffordshire  
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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: May 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)	29.7
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	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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Based on the composite samples for the month of: May 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)	31.6
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	58	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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**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: May 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)	27.8
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	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: May 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)	26.4
28 Day Strength (MPa)	55.2

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	70
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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