

Composition of Ground Granulated Blastfurnace Slag

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

 Based on the **October 2024** monthly composite sample: 3953

| Property | | | Value | BS EN 15167-1 Limit |
|--|---------------------------------|--------------------|-------|--------------------------|
| Magnesia | MgO | % | 6.96 | ≤ 18.0% |
| Sulfate | SO ₃ | % | 0.22 | ≤ 2.5% |
| Sulfide | S ²⁻ | % | 0.69 | ≤ 2.0% |
| Chloride | Cl ⁻ | % | 0.01 | ≤ 0.1% |
| Alkalis | Na ₂ O _{eq} | % | 0.52 | - |
| Alumina | Al ₂ O ₃ | % | 12.42 | ≤ 14%* |
| Fineness | SSA | m ² /kg | 475 | ≥ 275 m ² /kg |
| 7 Day Activity Index – September Sample | | % | 58 | >40% |
| 28 Day Activity Index – September 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:


Simon Chudley
**National Commercial Technical Manager
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Tarmac Trading Limited Registered in England and Wales. Company No. 453791
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 Tarmac Services Limited Registered in England and Wales. Company No. 8197397
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**Conformity of Ground Granulated Blast Furnace Slag to BS 8500-2: Annex B
 Dunkirk EN 15167-1 GGBS
 (1164-CPR-LGM002)**

Based on the composite samples for the Month of: October 2024

| Constituent | Source |
|-----------------|----------|
| EN 15167-1 GGBS | Dunkirk |
| EN 197-1 CEM I | Aberthaw |

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) | 27.9 |
| 28 Day Strength (MPa) | 52.6 |

Based on equivalent results obtained for the last 8 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 | 45 | 76 |
| 42,5L | 6 | 58 |
| 52,5L | 6 | 26 |

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

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 Dunkirk EN 15167-1 GGBS
 (1164-CPR-LGM002)**

Based on the composite samples for the Month of: October 2024

| Constituent | Source |
|----------------------|----------|
| EN 15167-1 GGBS | Dunkirk |
| EN 197-1 CEM II/A-LL | Aberthaw |

The results of compressive strength testing (in accordance with BS EN 196-1) on a 50:50 blend of CEM II/A-LL with GGBS were:

| | |
|-----------------------|------|
| 7 Day Strength (MPa) | 30.2 |
| 28 Day Strength (MPa) | 51.2 |

Based on equivalent results obtained for the last 8 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 | 44 | 73 |
| 42,5L | 6 | 56 |
| 52,5L | -- | -- |

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

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 (1164-CPR-LGM002)**

Based on the composite samples for the Month of: October 2024

| Constituent | Source |
|-----------------|---------|
| EN 15167-1 GGBS | Dunkirk |
| EN 197-1 CEM I | Cauldon |

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) | 25.3 |
| 28 Day Strength (MPa) | 45.5 |

Based on equivalent results obtained for the last 7 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 | 43 | 75 |
| 42,5L | 6 | 54 |
| 52,5L | 6 | 30 |

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

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 Dunkirk EN 15167-1 GGBS
 (1164-CPR-LGM002)**

Based on the composite samples for the Month of: October 2024

| Constituent | Source |
|---------------------|---------|
| EN 15167-1 GGBS | Dunkirk |
| EN 197-1 CEM II A-L | Cauldon |

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

| | |
|-----------------------|------|
| 7 Day Strength (MPa) | 30.1 |
| 28 Day Strength (MPa) | 53.3 |

Based on equivalent results obtained for the last 1 Month, 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 | 53 | 80 |
| 42,5L | 6 | 68 |
| 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 B Dunkirk EN 15167-1 GGBS (1164-CPR-LGM002)

Based on the composite samples for the Month of: October 2024

| Constituent | Source |
|-----------------|---------|
| EN 15167-1 GGBS | Dunkirk |
| EN 197-1 CEM I | Hope |

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) | 29.5 |
| 28 Day Strength (MPa) | 56.5 |

Based on equivalent results obtained for the last 8 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 | 78 |
| 42,5L | 18 | 65 |
| 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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 Dunkirk EN 15167-1 GGBS
 (1164-CPR-LGM002)**

Based on the composite samples for the Month of: October 2024

| Constituent | Source |
|---------------------|---------|
| EN 15167-1 GGBS | Dunkirk |
| EN 197-1 CEM II A-L | Hope |

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

| | |
|-----------------------|------|
| 7 Day Strength (MPa) | 33.1 |
| 28 Day Strength (MPa) | 53.5 |

Based on equivalent results obtained for the last 1 Month, 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 | 53 | 76 |
| 42,5L | 6 | 64 |
| 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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Based on the composite samples for the Month of: October 2024

| Constituent | Source |
|-----------------|---------|
| EN 15167-1 GGBS | Dunkirk |
| EN 197-1 CEM I | Platin |

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) | 29.1 |
| 28 Day Strength (MPa) | 53.9 |

Based on equivalent results obtained for the last **10** 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 | 77 |
| 42,5L | 6 | 61 |
| 52,5L | 6 | 26 |

| 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 | Dunkirk |
| EN 197-1 CEM II A-L | Platin |

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

| | |
|-----------------------|------|
| 7 Day Strength (MPa) | 30.1 |
| 28 Day Strength (MPa) | 52.9 |

Based on equivalent results obtained for the last 1 Month, 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 | 77 |
| 42,5L | 6 | 64 |
| 52,5L | -- | -- |

| 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 | Dunkirk |
| EN 197-1 CEM I | Tunstead |

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) | 26.4 |
| 28 Day Strength (MPa) | 55.8 |

Based on equivalent results obtained for the last **10** 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 | 78 |
| 42,5L | 27 | 59 |
| 52,5L | 6 | 43 |

| 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 | Dunkirk |
| EN 197-1 CEM II/A-LL | Tunstead |

The results of compressive strength testing (in accordance with BS EN 196-1) on a 50:50 blend of CEM II/A-LL with GGBS were:

| | |
|-----------------------|------|
| 7 Day Strength (MPa) | 29.1 |
| 28 Day Strength (MPa) | 51.4 |

Based on equivalent results obtained for the last 1 Month, 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 | 47 | 75 |
| 42,5L | 6 | 60 |
| 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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