



HEIDELBERGCEMENT Group

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MONTHLY CERTIFICATE OF CHEMICAL AND PHYSICAL TESTS TWIGA EXTRA, CEM II/B-L CLASS 32.5 R SEPTEMBER, 2022

Sampled and tested in accordance with the requirements of the Tanzanian Bureau of Standards

TZS 727-1/EAS 18-1

| CHEMICAL TEST RESULTS | | | |
|---|----------------------|------------------------------|---------------------------|
| Test | Unit | Test results monthly average | Specified requirements |
| Loss on ignition | [%] | 13.2 | No Requirement |
| Insoluble Residue | [%] | 1.2 | Less than 5.0% |
| CaO | [%] | 57.3 | No Requirement |
| SiO ₂ | [%] | 17.5 | No Requirement |
| CaO/SiO ₂ | [-] | 3.3 | Not less than 2.0% |
| Al ₂ O ₃ | [%] | 4.4 | No Requirement |
| Fe ₂ O ₃ | [%] | 2.7 | No Requirement |
| MgO | [%] | 1.0 | Not more than 5.0% |
| SO ₃ | [%] | 2.5 | Less than 3.5% |
| K ₂ O | [%] | 0.35 | No Requirement |
| Na ₂ O | [%] | 0.10 | No Requirement |
| P ₂ O ₅ | [%] | 0.05 | No Requirement |
| TiO ₂ | [%] | 0.40 | No Requirement |
| MnO | [%] | 0.06 | No Requirement |
| (Na ₂ O+0.658K ₂ O) | [%] | 0.33 | No Requirement |
| Cl | [%] | 0.002 | Less than 0.10% |
| PHYSICAL TEST RESULTS | | | |
| Density | [kg/m ³] | 3100 | No requirement |
| Specific Surface (Blaine) | [m ² /kg] | 449 | No Requirement |
| Sieving Residue on 45 mic. | [%] | 9.5 | No Requirement |
| Initial setting time | [minutes] | 116 | Not less than 75 minutes |
| Soundness (expansion) | [mm.] | 1.0 | Not more than 10 mm. |
| Compressive strength 2 days | [MPa] | 14.2 | More than 10 MPa. |
| Compressive strength 28 days* | [MPa] | 35.1 | Between 32.5 and 52.5 MPa |

Remarks: *The 28 days strength is the average of previous month.

Wazo Hill, 2022/10/06th

Quality Control Manager

Board Directors:
Hakan Gurdal (Turkish)
Alfonso Velez (Spanish)
Francesco Brambilla (Italian)

Plant Manager

Ruth Zaipuna (Tanzanian)
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Commercial Director