



HEIDELBERGCEMENT Group

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MONTHLY CERTIFICATE OF CHEMICAL AND PHYSICAL TESTS TWIGA ORDINARY, CEM I CLASS 42.5 N

MARCH, 2023

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 | [%] | 4.7 | Less than 5.0% |
| Insoluble residue | [%] | 1.0 | Less than 5.0% |
| CaO | [%] | 59.5 | No Requirement |
| SiO ₂ | [%] | 20.1 | No Requirement |
| CaO/SiO ₂ | [-] | 3.0 | Not less than 2.0% |
| Al ₂ O ₃ | [%] | 5.5 | No Requirement |
| Fe ₂ O ₃ | [%] | 3.3 | No Requirement |
| MgO | [%] | 1.1 | Not more than 5.0% |
| SO ₃ | [%] | 2.5 | Less than 3.5% |
| K ₂ O | [%] | 0.39 | No Requirement |
| Na ₂ O | [%] | 0.16 | No Requirement |
| P ₂ O ₅ | [%] | 0.09 | No Requirement |
| TiO ₂ | [%] | 0.43 | No Requirement |
| MnO | [%] | 0.05 | No Requirement |
| (Na ₂ O+0.658K ₂ O) | [%] | 0.42 | No Requirement |
| Cl ⁻ | [%] | 0.001 | Less than 0.10% |
| PHYSICAL TEST RESULTS | | | |
| Density | [kg/m ³] | 3000 | No requirement |
| Specific Surface (Blaine) | [m ² /kg] | 371 | No Requirement |
| Sieving Residue on 45 mic. | [%] | 12.8 | No Requirement |
| Initial setting time | [minutes] | 107 | Not less than 60 minutes |
| Soundness (expansion) | [mm.] | 1.0 | Not more than 10 mm. |
| Compressive strength 2 days | [MPa] | 20.7 | More than 10 MPa. |
| Compressive strength 28 days* | [MPa] | 50.0 | Between 42.5 and 62.5 MPa |

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

Wazo Hill, 2023/04/05th

Quality Control Manager

Plant Manager

Commercial Director

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

Ruth Zaipuna (Tanzanian)
Gary Whitehead (British)
Oswald Urassa (Tanzanian)