IS 16415 :2015

COMPOSITE CEMENT - SPECIFICATION

Composite Cement is a blended cement produced either by intimately inter-grinding Portland cement clinker, granulated slag, and fly ash, or by intimatley and uniformly blending ordinary Portland cement (OPC) with finely ground granulated slag and fine fly ash. This cement type is designed to enhance sustainability by incorporating industrial by-products, making it eco-friendly and suitable for various construction applications. Composite cement offers advantages such as **improved durability**, **reduced heat of hydration**, and **better resistance to chemical attacks**, making it ideal for residential, commercial, and infrastructure projects. Its applications include foundations, pavements, bridges, and marine structures, where enhanced strength and long-term performance are crucial.

Consumers expect composite cement to deliver **consistent strength**, **workability**, and **durability**, while ensuring environmental benefits. They also look for cement with **low shrinkage**, **resistance to sulfate and chloride attacks**, and **smooth application** during construction. Ease of mixing, controlled setting times, and **uniform particle size** are additional quality parameters sought by users for reliable performance.

The **chemical specifications** focus on stability and safety. **Insoluble residue** limits impurities that could weaken the cement, while **magnesia (MgO)** content prevents cracking caused by unsoundness. **Total sulfur content** and **anhydride SO_3** are controlled to avoid expansion-related damage, and **sulfide sulfur** is restricted to prevent harmful chemical reactions. **Loss on ignition** ensures the cement's freshness by limiting volatile compounds, while **chloride content** protects reinforcement steel from corrosion. Additionally, **alkali content** is managed to reduce the risk of alkali-silica reactions that cause cracking.

The **physical requirements** ensure performance and usability. **Fineness**, measured as surface area, ensures proper mixing and strength development. **Soundness** testing prevents excessive expansion after setting, maintaining structural stability. **Initial and final setting times** are regulated to ensure workability during construction while avoiding premature or delayed setting. **Compressive strength**, tested at 3, 7, and 28 days, verifies the cement's load-bearing capacity, while **drying shrinkage** limits ensure the material remains stable over time. For specific applications, **transverse strength** is optionally tested to evaluate bending resistance.

By addressing these aspects, IS 16415:2015 ensures that **Composite Cement** meets consumer expectations for **strength, durability, and reliability**, providing a high-quality and sustainable construction material suitable for a wide range of applications.