

Building Materials Laboratory

The lab is equipped with various accessories to test chemical, physical and mechanical properties of building materials, such as concrete (in both fresh and hardened states), gypsum, lime, masonry, plaster, grout, natural stone, metals, timber, fiber-reinforced materials, chemical and mineral admixtures for concrete, as well as industrial by-products, such as coal fly ash, chemical gypsum, recycled aggregates, recycled plastics, rock waste. The lab facilities can be used to simulate behavior of various building materials under special environmental and loading conditions, and for testing strength, permeability and durability, shrinkage-induced cracking, corrosion resistance, water/gas/water penetration, sorptivity, resistance to salt attack, UV radiation, thermal and hygric cycles. The lab is also equipped for non-destructive testing of mechanical properties.



The specific equipment in this lab includes:

- Climatic Rooms: Regulated temperature $\pm 0.5^{\circ}\text{C}$ and humidity $\pm 5\%$.
- Climatic Chambers: Temperature range: -10°C to $+150^{\circ}\text{C}$, RH = 25%-99%.
- Carbon Dioxide Chamber: up to 5% of CO_2 .
- Ovens: For drying and heating.
- Mercury Intrusion Porosimeter: up to 0.4 GPa.
- Thermo-Gravimetric Analyzer TGS-2.
- Scanning Electron Microscope (SEM).
- Small Wind Tunnel: 90 cm X 60 cm cross-section and 180 cm length, for testing building materials under drying conditions in hot climates.
- Uniaxial Restrained Shrinkage Apparatus: Closed loop system for measuring strains and stresses in early age concrete.
- Chemical Shrinkage Measuring System.
- Adiabatic and Isothermal Calorimeters: For measuring heat of cement hydration.
- Rheometer: For measuring rheological properties of fresh concrete mixes.
- Portative Non-Destructive Testing Instruments: For ultrasonic pulse, rebound, electromagnetic, electrical conductivity, optical and other measurements.
- Chloride and Water Penetration Measuring Systems.
- Set-up for Testing Corrosion of Reinforcement Steel in Concrete.