Introduction to Properties of Refractories: Course Outline

Learn the significant properties of all classes of refractories

This course addresses most of the significant properties of refractories, both theoretically and experimentally. The lectures emphasize microstructural-property relationships. The live laboratory demonstrations are designed to give participants the knowledge of common refractory testing techniques. The individual sessions are titled in the accompanying outline of the daily topics.

Class Dates	Topics / Activities During Class
Lecture 1	• Thermal Properties • Volume Stability • Reversible Changes • Irreversible or Permanent Changes • Heat Capacity • Thermal Conductivity • Laboratory Demonstrations • Thermal Expansion - ASTM E228 • Thermal Conductivity (Steady State) - ASTM C201 • Thermal Conductivity (Transient) - ASTM C1113
Lecture 2	• Mechanical Properties • Elasticity • Brittle Fracture • Creep • Laboratory Demonstrations • Elasticity - ASTM C1548 • Strength (Flexural and Compressive) - ASTM C133 • Creep - ASTM C832
Lecture 3	• Thermo-Mechanical Properties • Thermal Stresses • Thermo-Elastic Theory • Thermal Shock Damage Resistance Theory • Laboratory Demonstrations • Fracture Surface Energies - γNBT and γWOF • Thermal Shock - ASTM C1171
Lecture 4	• Corrosion Properties • Fundamental Principles of Liquid-Solid Corrosion • Liquid Phase Formation • Wetting • Phase Equilibrium Diagrams • Laboratory Demonstrations

	• Melting Behavior - ASTM C24 • Static Corrosion - ASTM C621 • Dynamic Corrosion - ASTM C874