

5-Day Cement Industry Training Course In

QUALITY OF CEMENT (SITE VISIT)

Cairo - Egypt, 29 June – 03 July 2026

COURSE LEVEL: BASIC

COURSE OVERVIEW:

The quality of cement is the primary determinant of its performance in concrete and mortar, directly impacting the safety and longevity of infrastructure. This course defines the fundamental physical and chemical properties that characterize high quality cement and the basic testing methods used to verify them. It serves as an essential introduction for those needing to understand what makes cement "fit for purpose" in the construction market.

The scope of this training covers the basic parameters of cement quality, including fineness, setting time, and compressive strength. It introduces the participants to the laboratory environment and the standardized tools used to measure these critical variables. Furthermore, the course addresses the simple but vital role of additives—like gypsum—in regulating the chemical behavior of cement during its initial contact with water.

Coverage includes a practical tour of the cement plant laboratory where participants will see the physical testing equipment in action. They will explore how cement is sampled and the importance of cleanliness and precision in the testing process. Through the study of the basic EN and ASTM classifications, attendees will gain a foundational understanding of how different cements are used for different structural needs.

COURSE OBJECTIVES:

After completion of this course, the participants will be able to:

- Identify the main characteristics of high quality cement.
- Understand the difference between chemical and physical properties.
- Explain the importance of "Fineness" and how it is measured.
- Describe the process of measuring "Setting Time" with the Vicat needle.
- Understand the basic purpose of compressive strength testing.
- Identify the role of gypsum in controlling cement setting.
- Recognize the different types of cement available in the market.
- Understand the importance of proper sample collection.
- Describe the visual signs of good quality clinker.
- Identify the basic equipment used in a cement laboratory.
- Understand the meaning of "Soundness" in cement.
- Appreciate the role of quality control in customer satisfaction.

TARGET AUDIENCE:

This course is intended for Junior Operators, Sales Personnel, Logistics Staff, and New Graduate Trainees.

TRAINING COURSE METHODOLOGY:

A highly interactive combination of lectures, discussion sessions, and case studies will be employed to maximize the transfer of information, knowledge, and experience. The course will be intensive, practical, and highly interactive. The sessions will start by raising the most relevant questions and motivating everybody to find the right answers. The attendants will also be encouraged to raise more of their questions and to share in developing the right answers using their analysis and experience. There will also be some indoor experiential activities to enhance the learning experience. Course material will be provided in PowerPoint, with necessary animations, learning videos, and general discussions.

The course participants shall be evaluated before, during, and at the end of the course.

COURSE CERTIFICATE:

National Consultant Centre for Training LLC (NCC) will issue an Attendance Certificate to all participants completing a minimum of 80% of the total attendance time requirement.

COURSE OUTLINE / COURSE CONTENT:**MODULE 1: INTRODUCTION TO CEMENT PROPERTIES**

- What is "Quality" in the context of cement?
- Overview of the cement manufacturing process and quality touchpoints.
- Introduction to hydraulic binders and how they work.
- Importance of consistency in the construction industry.
- Safety rules for the plant and laboratory site visit.

MODULE 2: PHYSICAL PROPERTIES OF CEMENT

- Understanding "Fineness" (Blaine) and its impact on strength.
- The concept of "Setting Time": Initial and Final.
- What is "Soundness" and why it matters for concrete.
- Density and specific gravity of cement.
- Standard colors and their significance.

MODULE 3: CHEMICAL PROPERTIES AND COMPOSITION

- Basic minerals in cement: Alite, Belite, Aluminate, and Ferrite.
- The role of Lime (CaO) and Silica (SiO₂).
- Understanding the function of Gypsum in cement.
- Introduction to "Free Lime" and its impact on quality.
- Basic chemical analysis: Loss on Ignition (LOI) and Insoluble Residue.

MODULE 4: TYPES OF CEMENT AND THEIR USES

- Understanding Ordinary Portland Cement (OPC).
- Introduction to Blended Cements (Limestone, Fly Ash, Slag).
- Special cements: Sulfate Resistant and White Cement.
- Reading the cement bag: Standards and classifications.
- Choosing the right cement for the right application.

MODULE 5: LABORATORY SAMPLING AND PREPARATION

- How to take a representative sample from a silo or belt.
- Importance of dry and clean sampling containers.
- Basic sample preparation: Quartering and splitting.
- Introduction to the pneumatic sample transport system.
- Record keeping: Labeling and identifying samples.

MODULE 6: PHYSICAL TESTING DEMONSTRATION (SITE VISIT)

- Observation of the Blaine fineness test.
- Seeing the Vicat needle in operation for setting time.
- Demonstration of the Le Chatelier test for soundness.
- Understanding the humidity and temperature of the lab.
- Observing the weighing and measuring process.

MODULE 7: STRENGTH TESTING BASICS

- Introduction to mortar: Cement, Sand, and Water.
- Watching the preparation of mortar prisms.
- Overview of the curing process in water tanks.
- Demonstration of the compressive strength machine.
- Understanding the meaning of "28-day strength."

MODULE 8: CEMENT ADDITIVES AND REAGENTS

- Why do we add Gypsum to the cement mill?
- Introduction to "Grinding Aids" and their benefits.
- Managing the quality of mineral components (Pozzolan).
- How additives change the behavior of the final product.
- Environmental benefits of blended cements.

MODULE 9: THE PACKING PLANT AND QUALITY CHECK

- Inspecting the final product at the packing machine.
- Check-weighing and bag integrity.
- Managing "Best Before" dates and storage conditions.
- Palletizing and loading quality checks.
- Sample collection from the final product stream.

MODULE 10: COURSE REVIEW AND CONCLUSION

- Summary of the key quality parameters discussed.
- Q and A session on the site visit observations.
- Importance of quality in a competitive market.

- Final quiz on cement quality basics.
- Awarding of certificates and closing remarks.